

STRUCTURE JOB SITE PLAN
Scale: 1" = 50'

DESIGN SPECIFICATIONS:
(AASHTO) Standard Specifications for Highway Bridges (13th Edition)
with subsequent interim specifications.

DESIGN LOAD: HS-20-44
DESIGN STRESSES:
1. Reinforced concrete: $f_c = 0.40 f'_c = 1200 \text{ psi}$
2. Reinforcing steel: $f_s = 20,000 \text{ psi}$

MATERIALS:
1. Concrete: Class A
2. Reinforcing Steel: ASTM A615 Grade 40
3. Epoxy Grout: High early strength type (1,000 psi min. compressive strength & 4 hrs) approved by the Engineer and applied in strict accordance with the manufacturers recommendations
4. Structural Steel: ASTM A-36
5. H.S. Anchor Bolt: ASTM A-325

- CONSTRUCTION REQUIREMENTS:
- See Standard Specifications for Road & Bridge Construction (Hawaii 1985) & Special Provisions.
 - A-325 anchor bolts, structural steel shapes & plates shall be hot-dipped galvanized after fabrication.
 - The Contractor shall verify all grades & dimensions before commencing with any work.
 - Items designated for removal shall be removed in such a manner as to preclude any damage to the existing structure. Large, impacting or vibratory types of equipment will not be permitted in the removal operation nor in drilling holes for dowels. Small vibratory tools, approved by the Engineer, will be permitted.
 - Excavation for all footings & stems shall be accomplished by maintaining as near a vertical cut as possible, & it shall be the Contractor's responsibility to maintain the stability of the existing roadway prism throughout the course of work.
 - Where practical, all footings shall be excavated and poured next against undisturbed ground. In case of over-excavation, the space between the footing & the ground shall be filled with concrete of Class C, minimum quality as directed by the Engineer, at the Contractor's expense.
 - The Contractor shall be solely responsible for the protection of utilities & existing & new structures from damage due to his operation, & shall repair any damage at his expense, to the satisfaction of the Engineer.
 - Where reinforcing bars are cut in the removal of existing concrete, all exposed ends shall be undercut a minimum of 1 1/2" below the surface of concrete & patched with mortar. Cutting of reinforcing & patching with mortar shall be incidental to concrete removal.
 - The face of the existing slab to be epoxy bonded with the new slab shall be thoroughly wetted with clean water & scrubbed with a solution of not more than one part hydrochloric (muriatic) acid to nine parts water followed immediately by thoroughly rinsing with clean water.
 - Reinforced fabric pads shall be securely fastened to the abutments before placement of the precast planks.

- The lane adjacent to the new deck shall be closed during epoxying operation, & may be reopened 4 hours after the completion of epoxying operation.
- GENERAL:
- Items noted incidental will not be paid for separately.
 - The Contractor shall verify the location of all existing utility lines near the structures, & notify their respective owners before commencing work.

INDEX TO DRAWINGS		ESTIMATED QUANTITIES							
SHEET NO.	DESCRIPTION	CULVERT WIDENING							
51	CULVERT EXTENSION SITE PLAN, GEN. NOTES, EST. QUANTITIES	ITEM NO.	ITEM	TWIN 5'x5' BOX CULV'T	8'x3' CULVERT	8'x5' BOX CULV'T	6'x5' BOX CULV'T	UNIT	TOTAL
52	5'-0"x5'-0" TWIN CONC. BOX CULVERT AT STA. 170 + 63.33	202.0300	Removal of Portion of Existing Headwall & Wingwall	8	24	13	10	Lump Sum	64 cy
53	CULVERT EXTENSION AT STA. 414 + 21.08 - PLAN & PROFILE	206.6100	Structure Excavation for Culverts	36	200	138	105	C.Y.	470 cy
54	CULVERT EXTENSION AT STA. 414 + 21.08 - INLET END ABUT.#1	206.7000	Structure Backfill for Culverts	42	128	22	135	C.Y.	327 cy
55	CULVERT EXTENSION AT STA. 414 + 21.08 - INLET END ABUT.#2	206.8000	Filter Material	4	13	6	12	C.Y.	35 cy
56	CULVERT EXTENSION AT STA. 414 + 21.08 - OUTLET END ABUT.#2	207.0100	Ditch & Channel Excavation	30	—	15	6	Lump Sum	51 cy
57	CULVERT EXTENSION AT STA. 414 + 21.08 - DECK SECTION PRECAST CONC. PLANK	501.0100	Structural Steel	—	1,170	652	670	Lump Sum	2,402 lbs
58	8'-0"x5'-0" CONC. BOX CULVERT AT STA. 416 + 80.55	503.0200	Class A Concrete in Culverts & Wingwall	51	70	57	52	Lump Sum	230 cy
59	8'-0"x5'-0" CONC. BOX CULVERT AT STA. 416 + 80.55	503.1010	Precast Concrete Plank (7'-6" Wide)	—	100	—	—	S.F.	100 sf
510	6'-0"x5'-0" CONC. BOX CULVERT AT STA. 470 + 12	503.1011	Precast Concrete Plank (4'-3" Wide)	—	113	—	—	S.F.	113 sf
Q1	TYPICAL DETAILS - CONC. BOX CULVERT & SCHEDULE	508.0100	Cement Rubble Masonry	—	—	5	—	C.Y.	5 cy
Q2	TYPICAL DETAILS - CONC. BOX CULVERT HEADWALL	602.0400	Reinforcing Steel in Culverts & Wingwall	5,500	5,650	8,503	6,100	Lump Sum	25,753 lbs
Q3	TYPICAL DETAILS - PIPE SUPPORT BRACKET GUARD RAIL POST DET.	612.0100	Grouted Rubble Paving	—	21	8	—	C.Y.	20 cy
Q4	TYPICAL DETAILS - RETAINING WALL								

STATE OF HAWAII
DEPARTMENT OF TRANSPORTATION
HIGHWAYS DIVISION

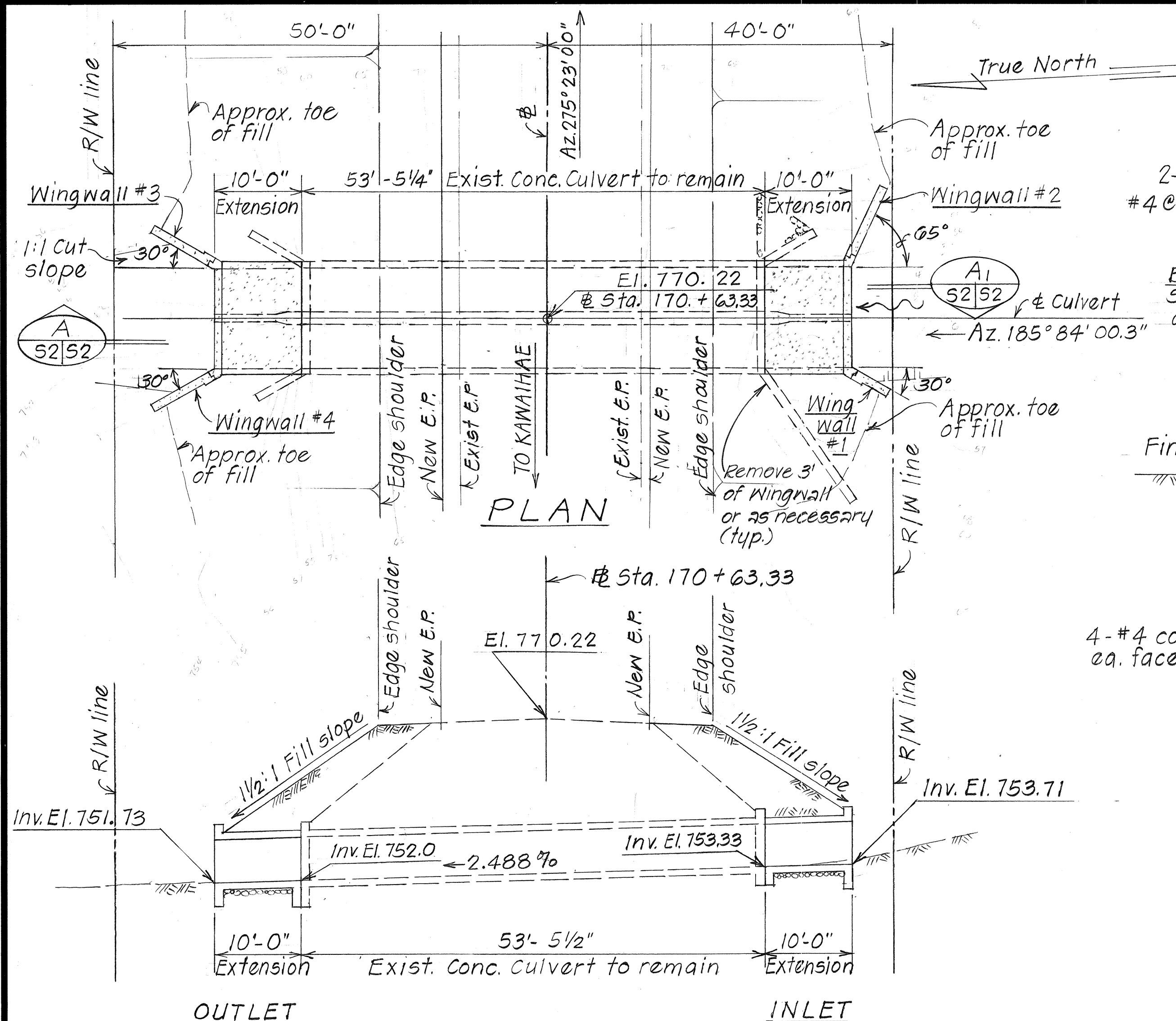
CULVERT EXTENSION SITE PLAN
GENERAL NOTES & EST. QUANTITIES
KAWAIIHAE RD. SAFETY IMPROVEMENTS - PHASE II
WAIMEA TO KAWAIIHAE
F.A.P. NO. HES-0100(28)

Scale: As Noted Date: May 1986

SHEET No. 51 OF 14 SHEETS

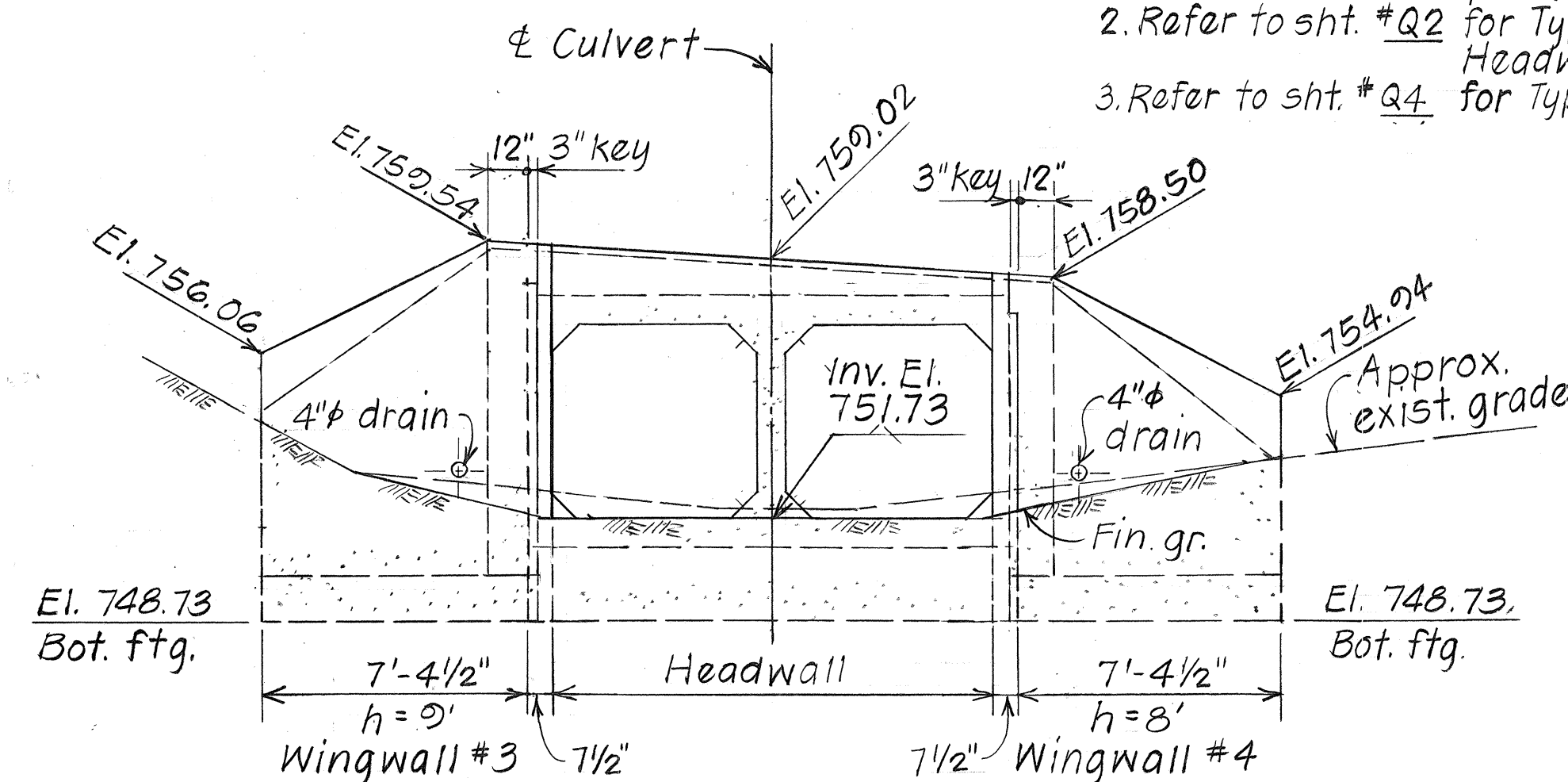
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DRAWN BY: 5/86
TRACED BY: M.S.T. 5/86
DESIGNED BY: 5/86
CHECKED BY: L.A., G.T. 5/86
ORIGINAL PLAN
NOTE BOOK
NO.

FED. ROAD DIST. NO.	STATE	FED. AID PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
HAWAII	HAW.	HE5-0100(28)	1986	18	67

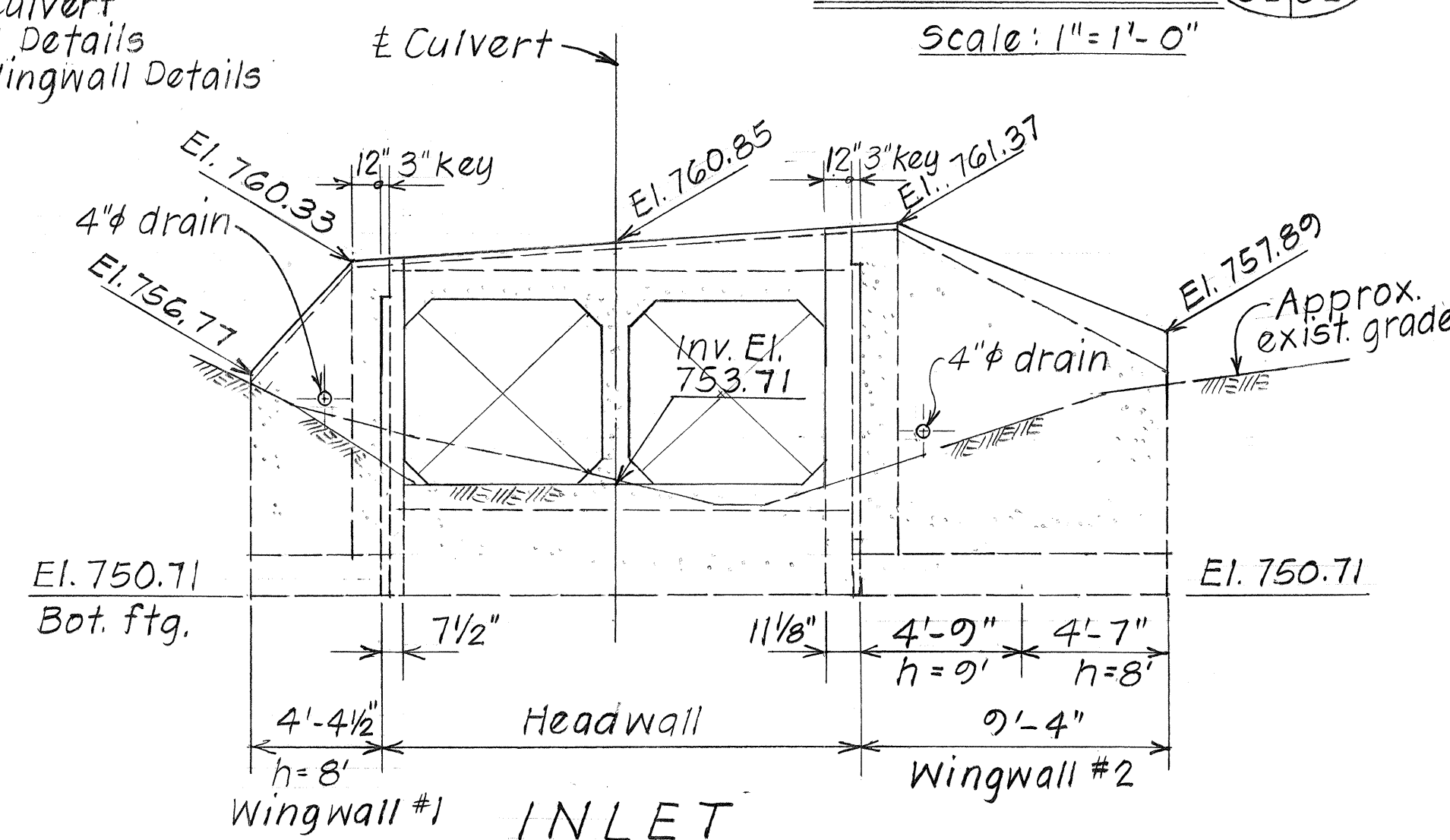


BOX CULVERT @ STA. 170+63.33
Scale: 1" = 10'

- NOTE:**
1. Refer to sht. #A1 for Typ. Culvert Details & Schedules
 2. Refer to sht. #Q2 for Typ. Culvert Headwall Details
 3. Refer to sht. #Q4 for Typ. Wingwall Details

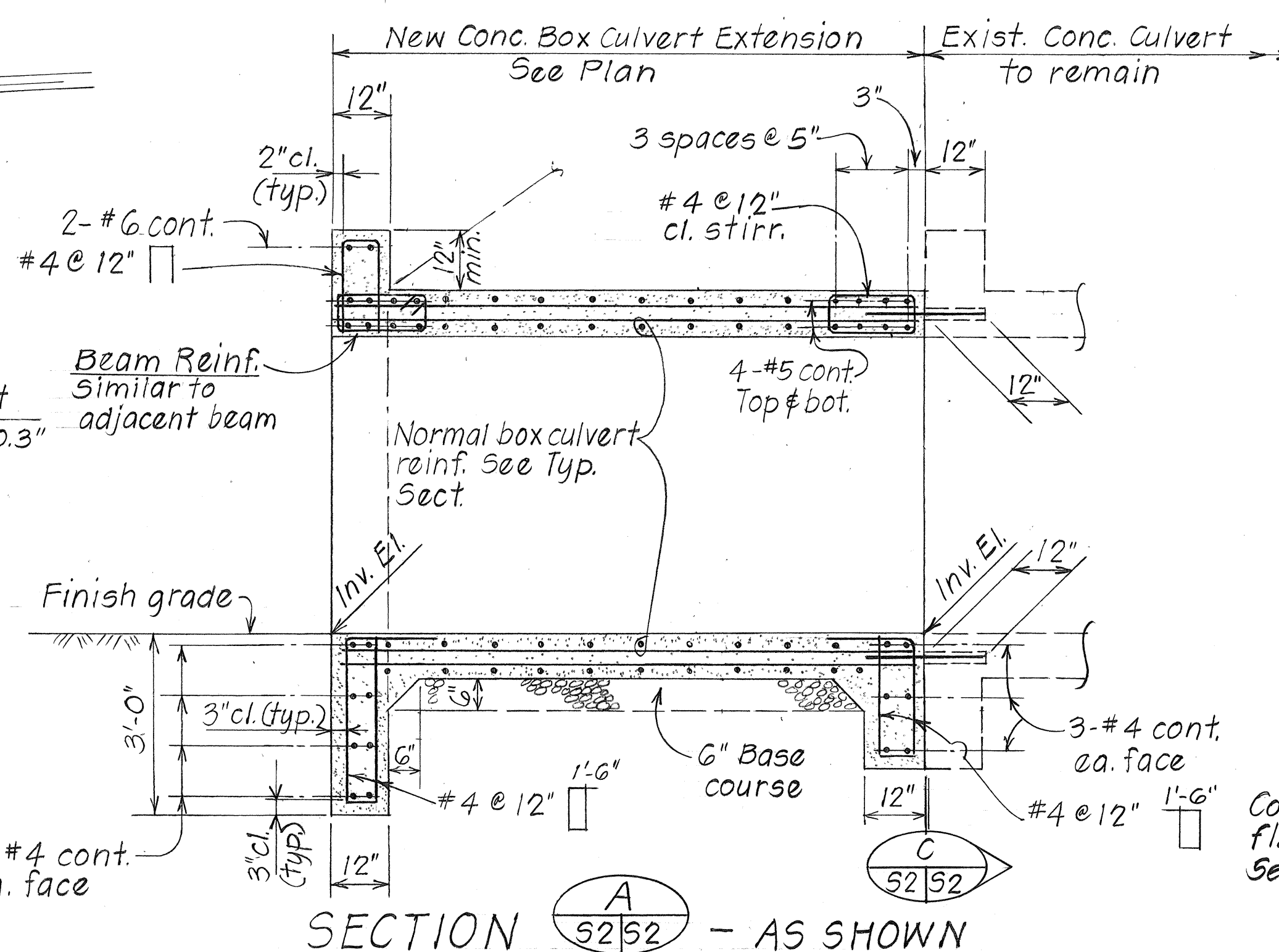


OUTLET

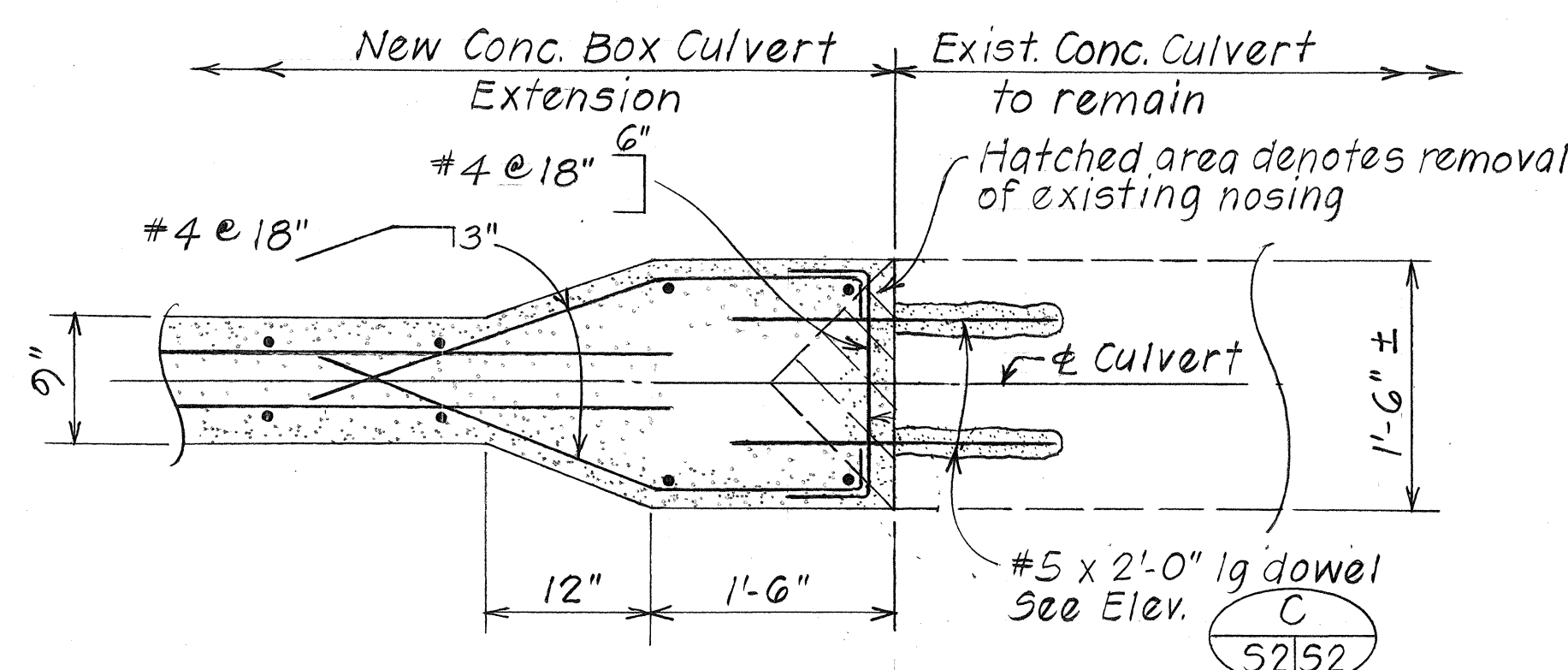


INLET

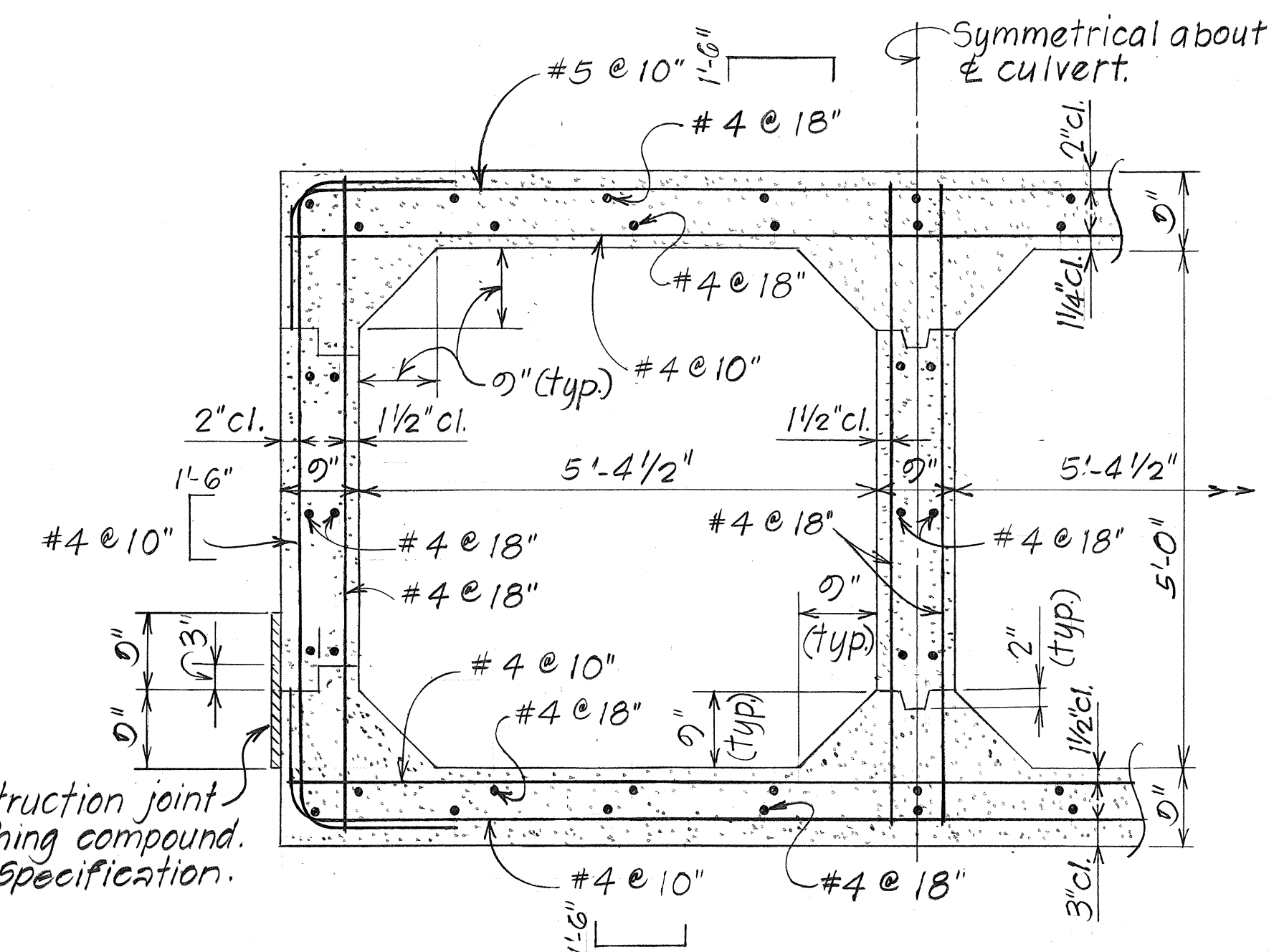
DEVELOPED ELEVATION
Scale: 1/4" = 1'-0"



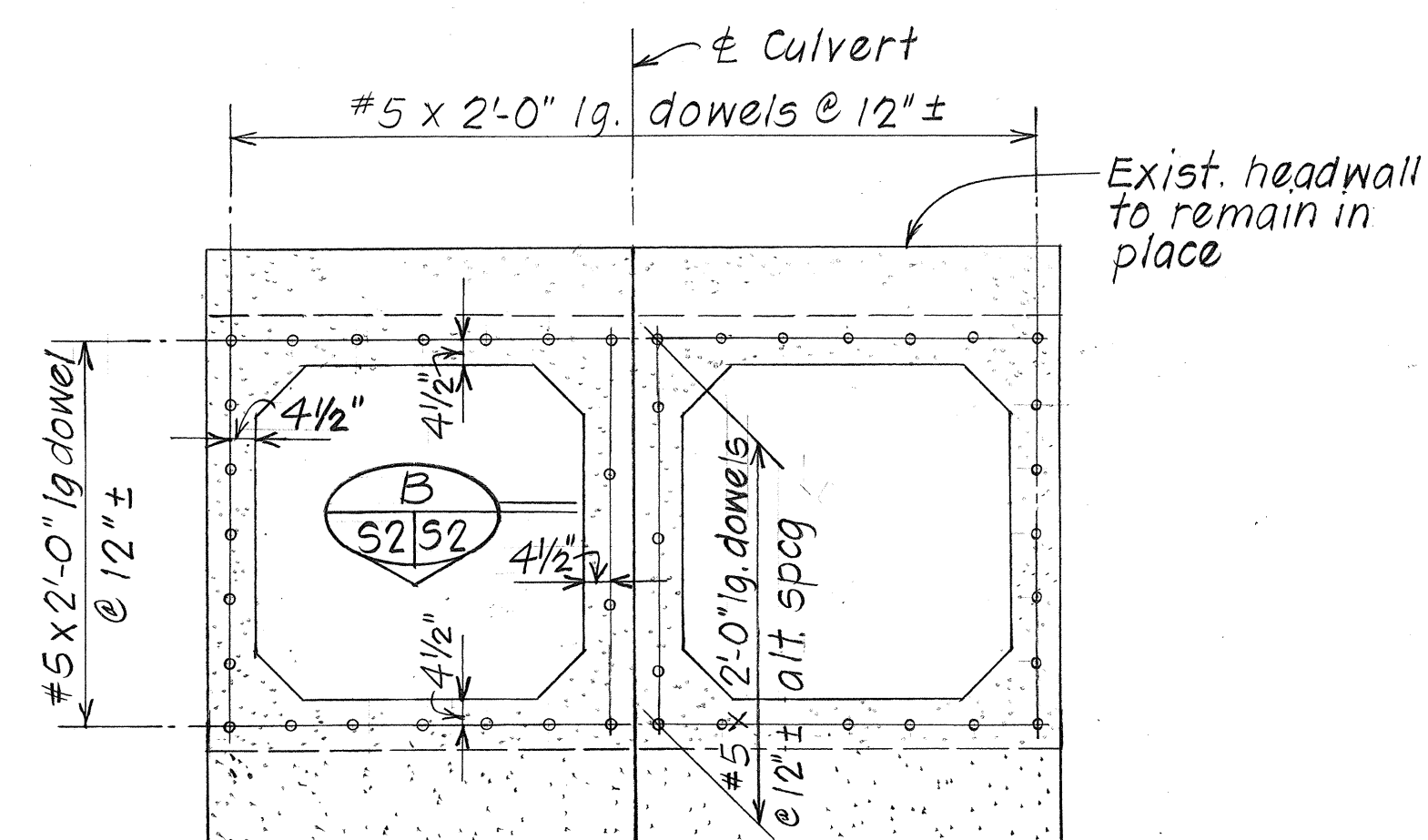
SECTION A-A - AS SHOWN
Scale: 1/2" = 1'-0"



SECTION B-B
Scale: 1" = 1'-0"



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



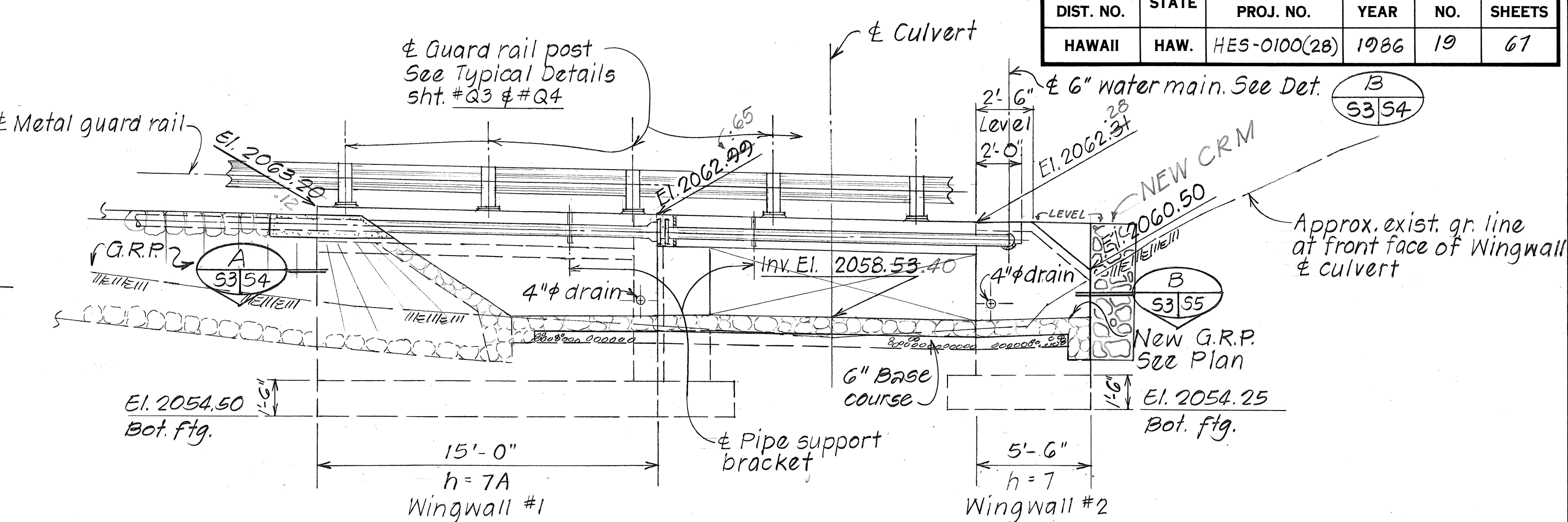
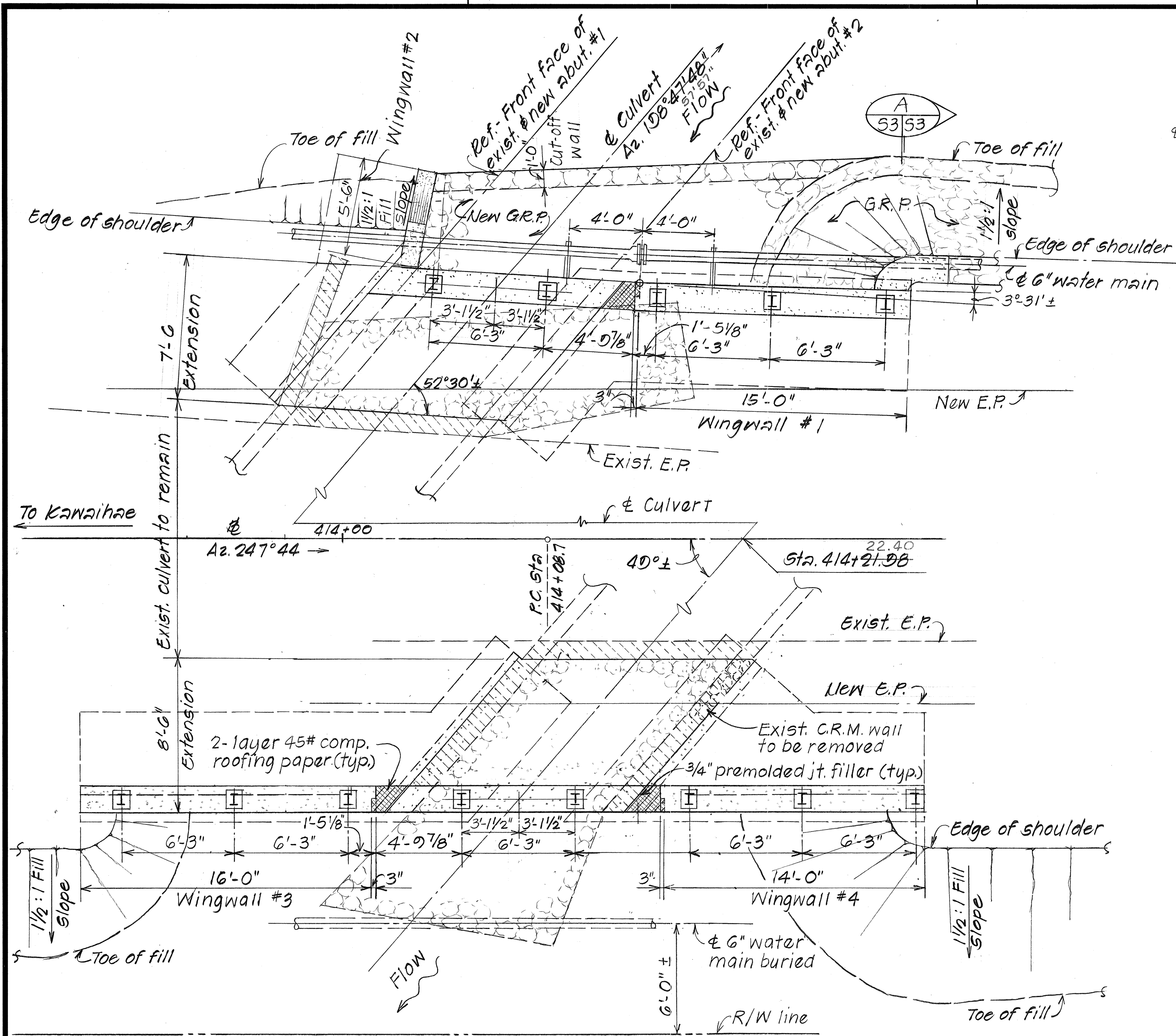
- NOTE:**
1. Dowels connecting new & old culvert shall be set in holes drilled 2" x 1'-0" deep & filled with epoxy grout.
 2. Epoxy grout shall be incidental to concrete.

TYPICAL CONNECTION TO EXISTING HEADWALL ELEVATION
Scale: 3/8" = 1'-0"

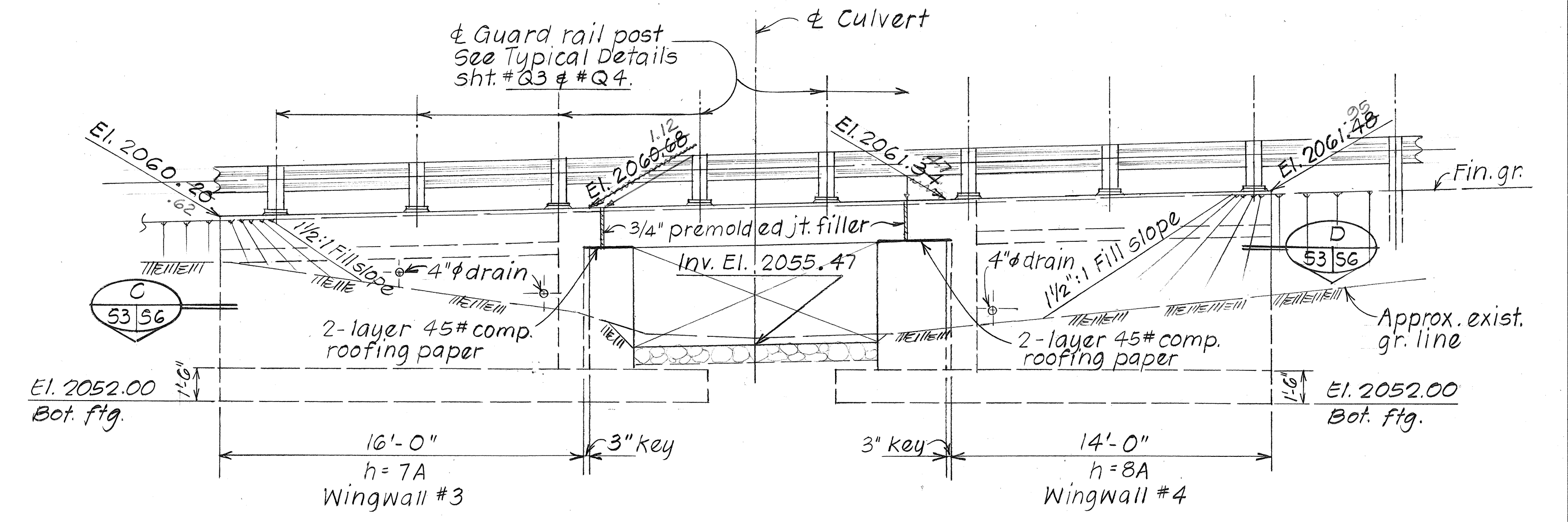
STATE OF HAWAII DEPARTMENT OF TRANSPORTATION HIGHWAYS DIVISION
5'-0"x5'-0" TWIN CONCRETE BOX CULVERT AT STA. 170+63.33 KAWAIHAE RD. SAFETY IMPROVEMENTS-PHASE II WAIMEA TO KAWAIHAE F.A.P. NO. HE5-0100(28)
Scale: As Noted Date: May 1986
SHEET No. 52 OF 14 SHEETS

SURVEY PLOTTED BY	DATE
DRAWN BY	4/86
DESIGNED BY	7/86
QUANTITIES BY	
CHECKED BY	LA, GT.
ORIGINAL PLAN	
NOTE BOOK	
NO.	

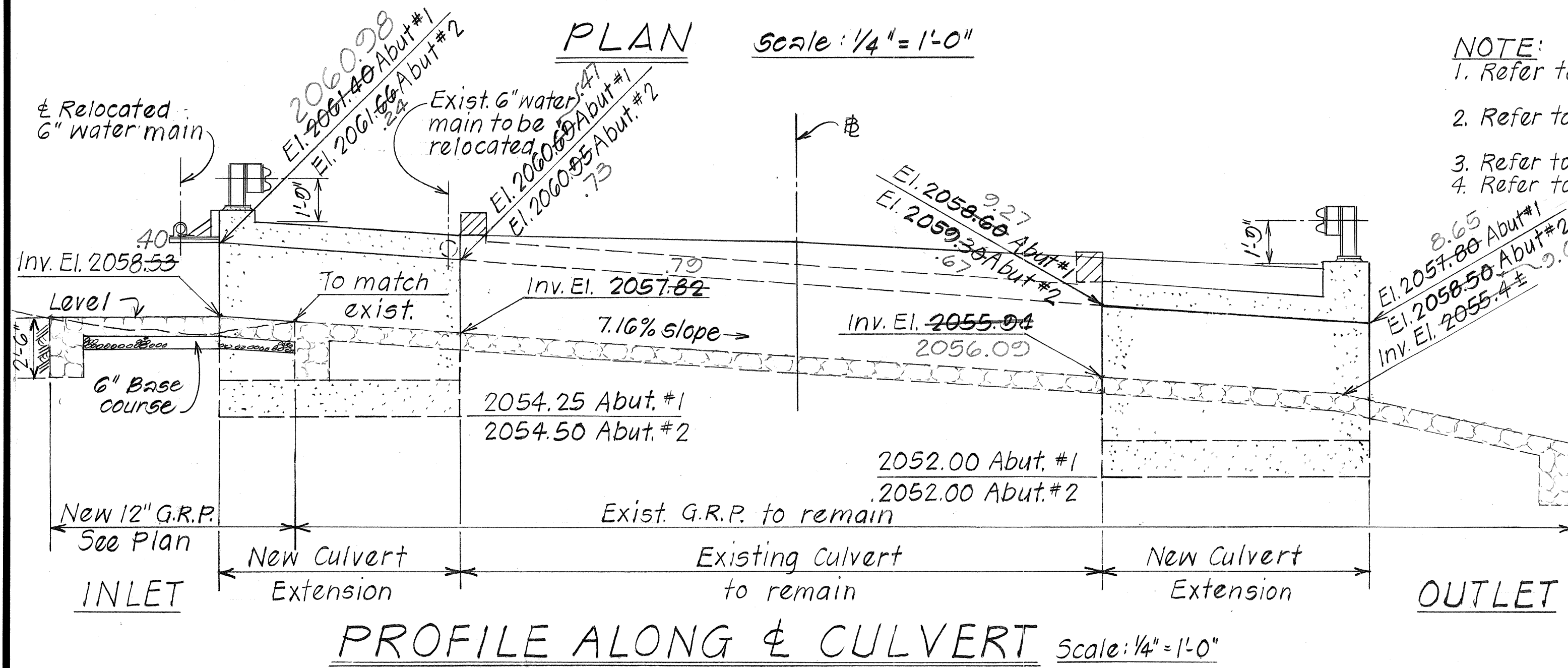
FED. ROAD DIST. NO.	STATE	FED. AID PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
HAWAII	HAW.	HES-0100(28)	1986	19	67



DEVELOPED INLET ELEVATION
Scale: 1/4" = 1'-0"

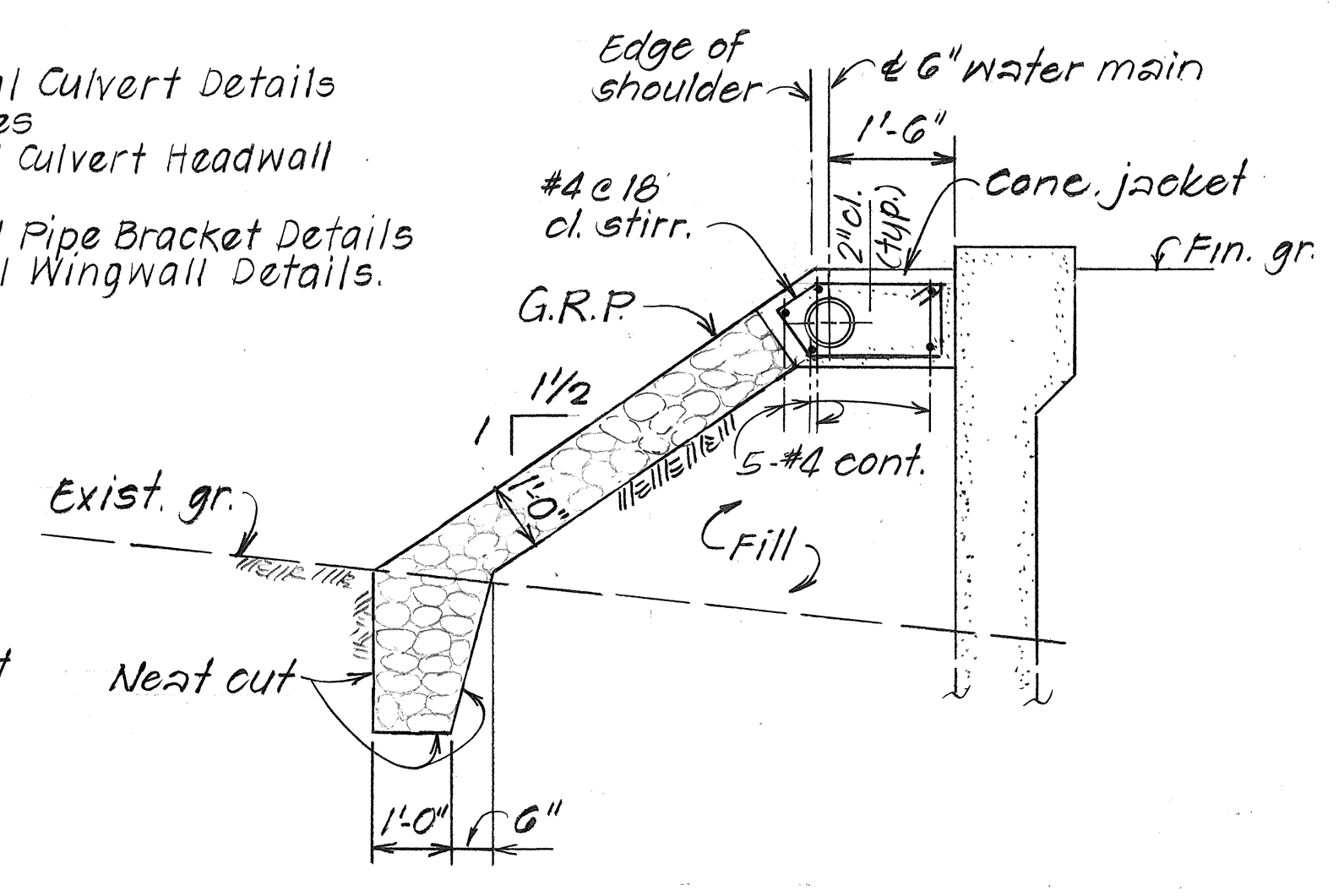


OUTLET ELEVATION
Scale: 1/4" = 1'-0"



PROFILE ALONG CULVERT Scale: 1/4" = 1'-0"

- NOTE:
1. Refer to sht. #Q1 for Typical Culvert Details & Schedules
 2. Refer to sht. #Q2 for Typical Culvert Headwall Details
 3. Refer to sht. #Q3 for Typical Pipe Bracket Details
 4. Refer to sht. #Q4 for Typical Wingwall Details



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

APPROVED: Date 6/10/86

MANAGER, DEPARTMENT OF WATER SUPPLY
COUNTY OF HAWAII

For work relating to D.W.S. water system only.

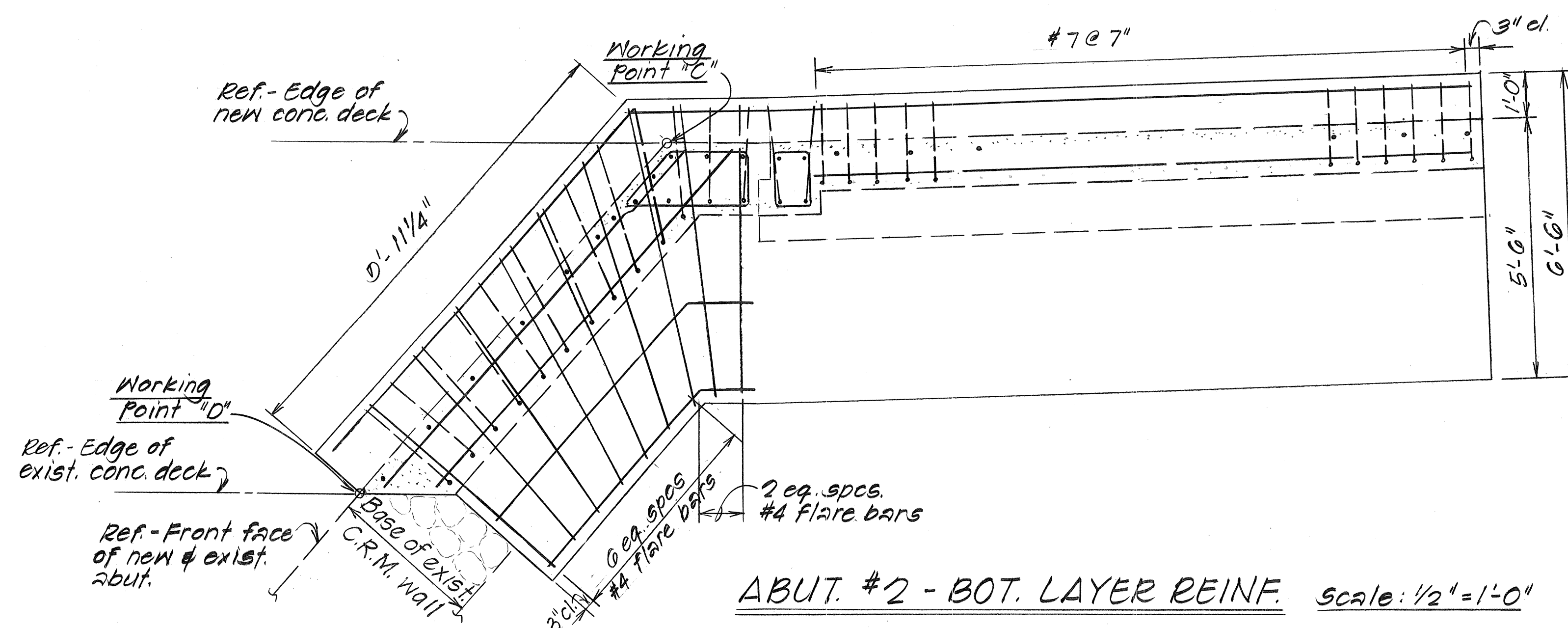
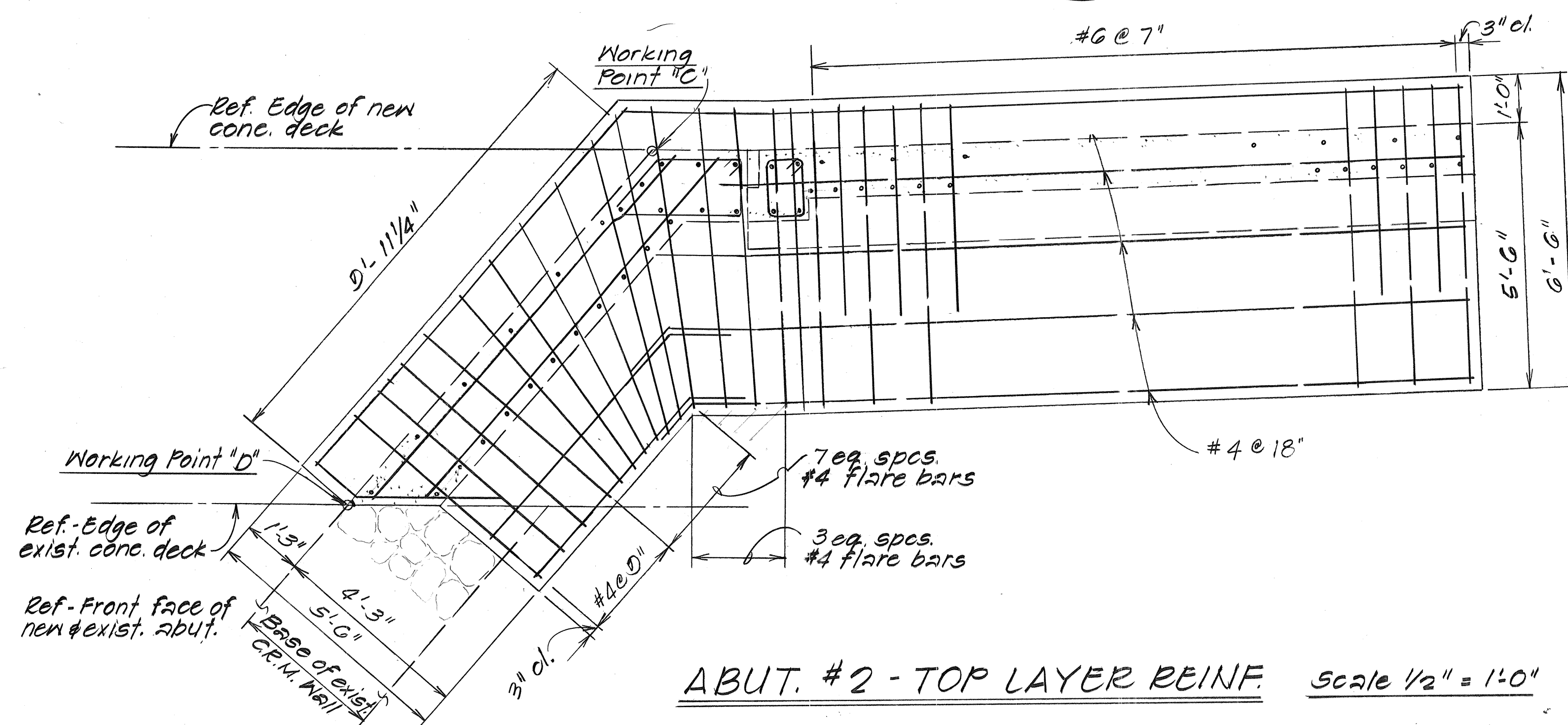
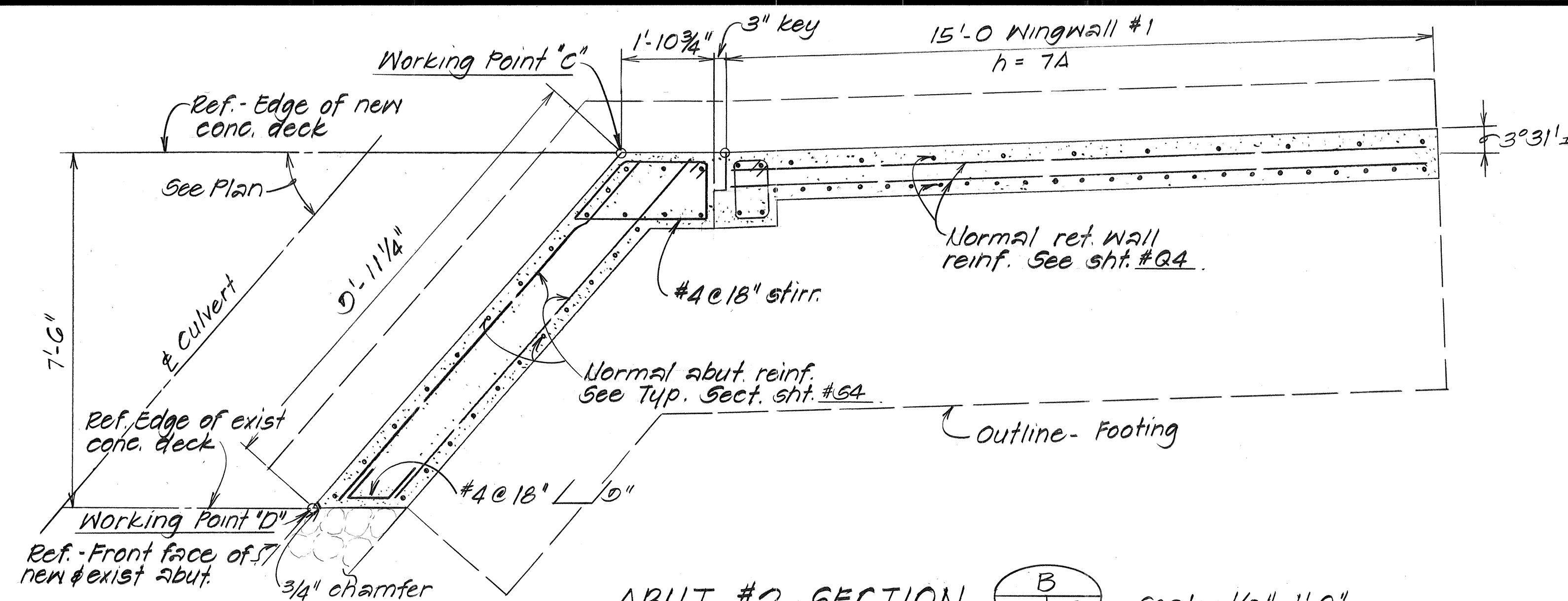
STATE OF HAWAII
DEPARTMENT OF TRANSPORTATION
HIGHWAYS DIVISION
+22.40
CULVERT AT STA. 414+21.98
PLAN, PROFILE, & ELEVATION
KAWAIHAE RD. SAFETY IMPROVEMENTS PHASE II
WAIMEA TO KAWAIHAE
F.A.P. NO. HES-0100(28)

Scale: As Noted Date: May 1986

SHEET NO. 53 OF 14 SHEETS

SURVEY PLOTTED BY	DATE
DRAWN BY	
DESIGNED BY	
CHECKED BY	
ORIGINAL PLAN	
NOTE BOOK	

FED. ROAD DIST. NO.	STATE	FED. AID PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
HAWAII	HAW.	HES-0100(28)	1986	21	67



ORIGINAL PLAN	DATE	5/86
DRAWN BY	H.E.	
CHECKED BY	M.S.T.	5/86
NOTED BY	M.S.T.	5/86
QUANTITIES BY	L.A.	G.I.
CHECKED BY		

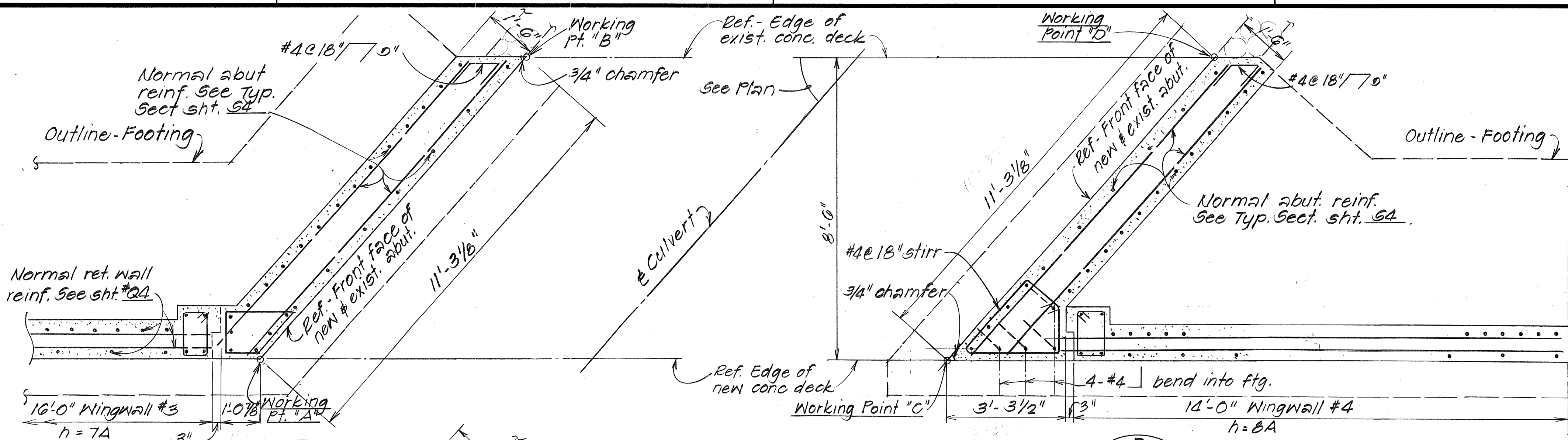
STATE OF HAWAII
DEPARTMENT OF TRANSPORTATION
HIGHWAYS DIVISION

CULVERT AT STA. 414+21.00
INLET END ABUT #2 FOOTING LAYOUT
KAWAII RD. SAFETY IMPROVEMENTS PHASE II
WAIMEA TO KAWAII
F.A.P. NO. HES-0100(28)

Scale: As Noted Date: May 1986

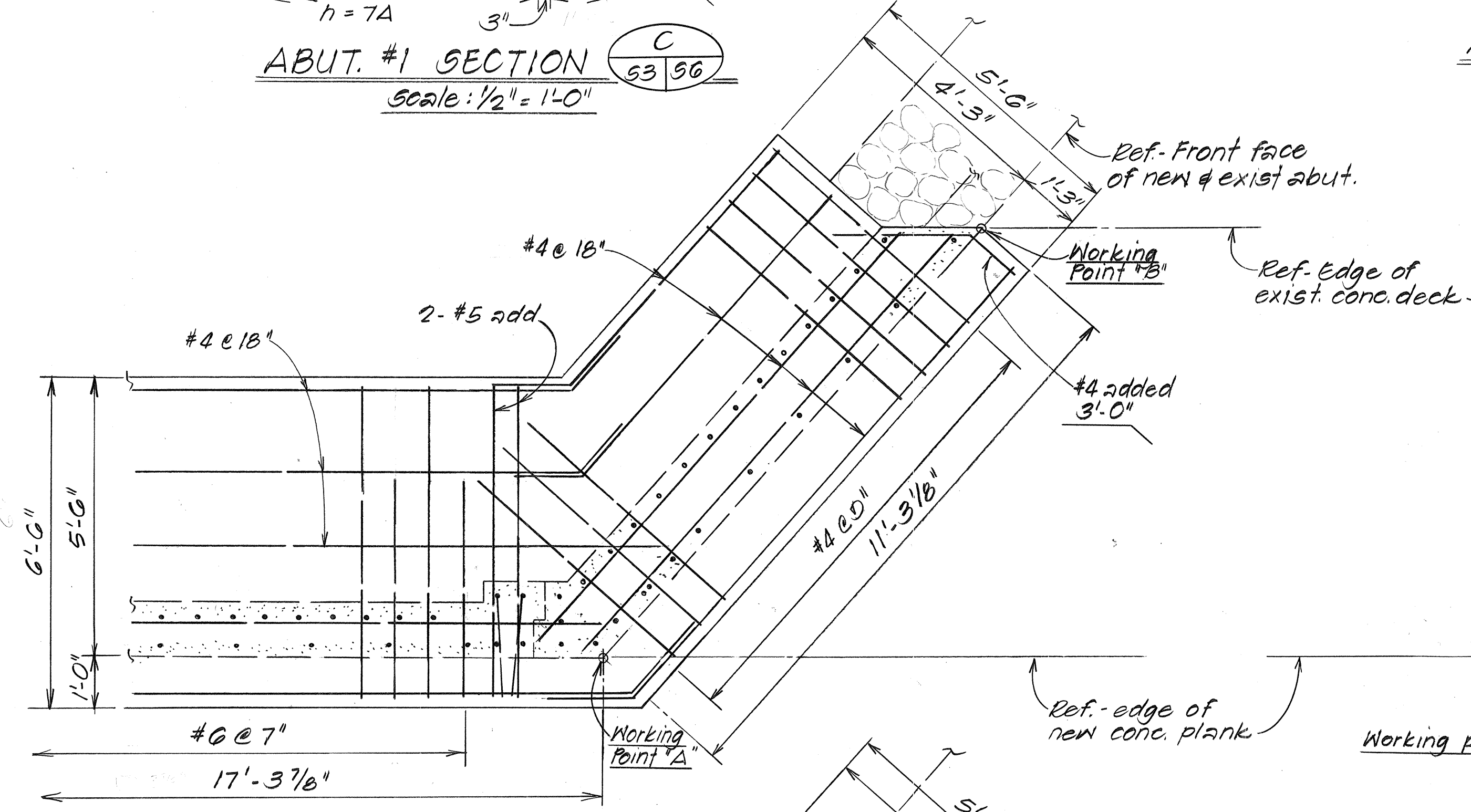
SHEET NO. 55 OF 14 SHEETS

FED. ROAD DIST. NO.	STATE	FED. AID PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
HAWAII	HAW.	HES-0100(28)	1986	22	67

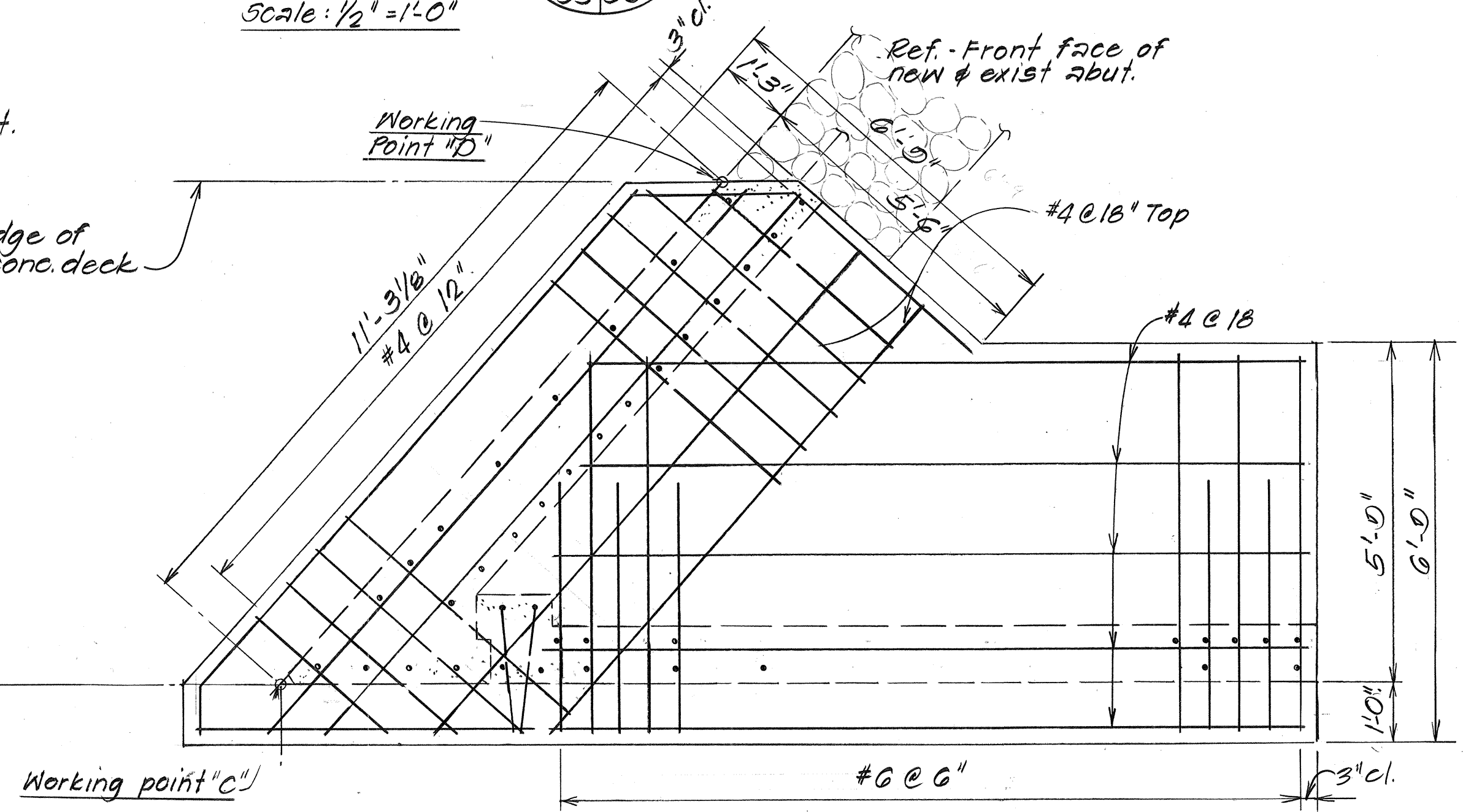


ABUT. #1 SECTION
Scale: 1/2" = 1'-0"

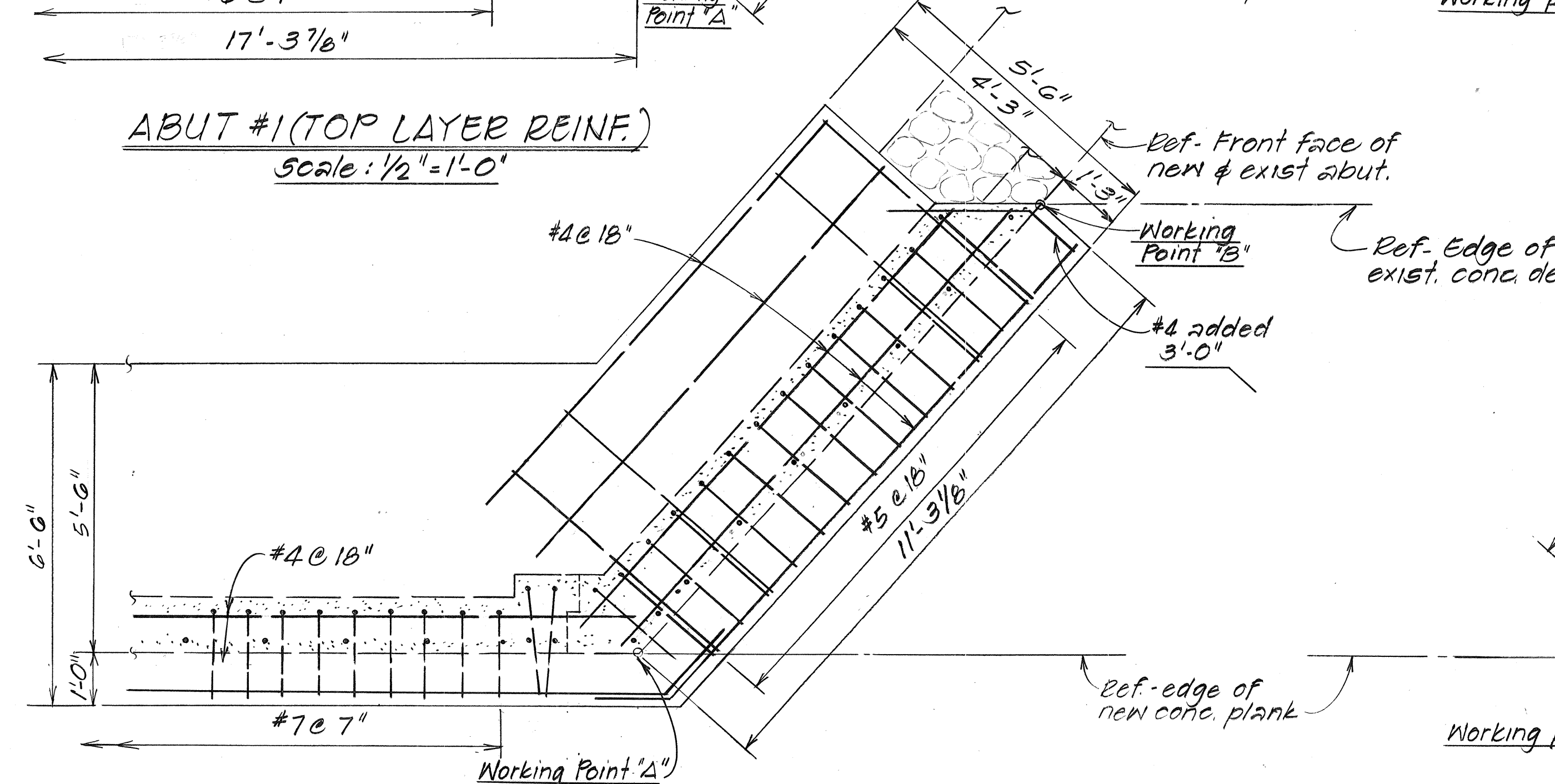
ABUT. #2 SECTION
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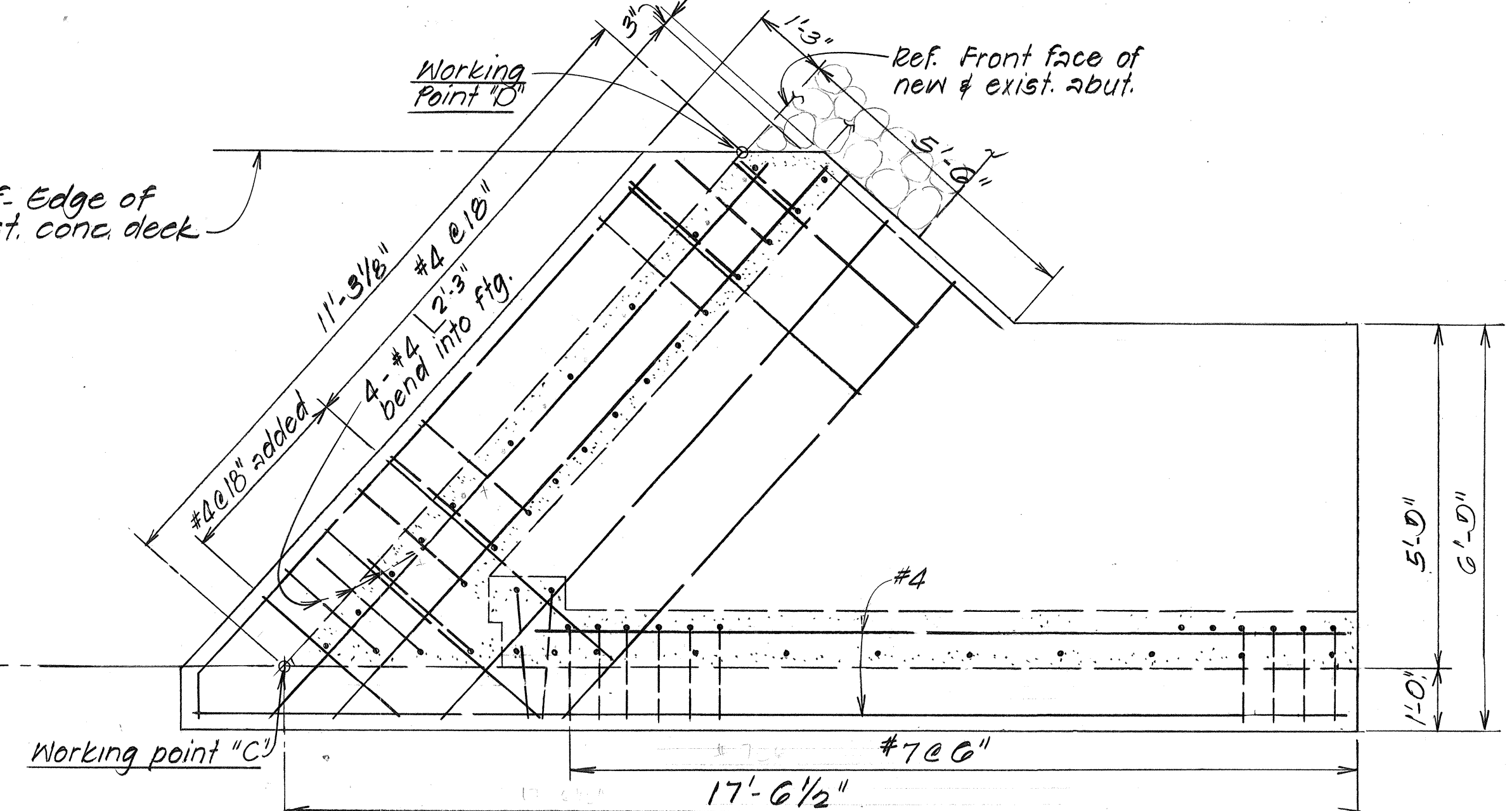
ABUT #1 (TOP LAYER REINF.)
Scale: 1/2" = 1'-0"



ABUT. #2 (TOP LAYER REINF.) Scale: 1/2" = 1'-0"



ABUT. #1 (BOT. LAYER REINF.) scale: 1/2" = 1'-0"



ABUT. #2 (BOT. LAYER REINF.) scale: 1/2" = 1'-0"

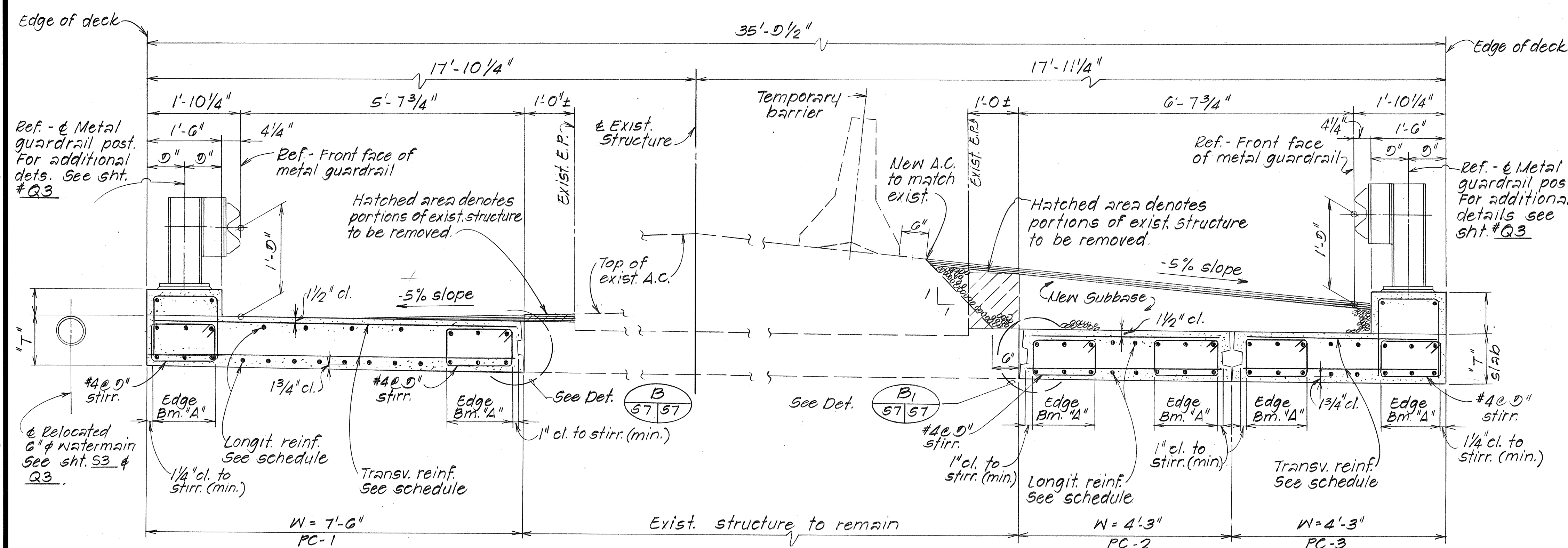
ORIGINAL PLAN	DATE	5/86
TRACED BY	DATE	5/86
NOTED BY	DATE	5/86
CHECKED BY	DATE	5/86

STATE OF HAWAII
DEPARTMENT OF TRANSPORTATION
HIGHWAYS DIVISION

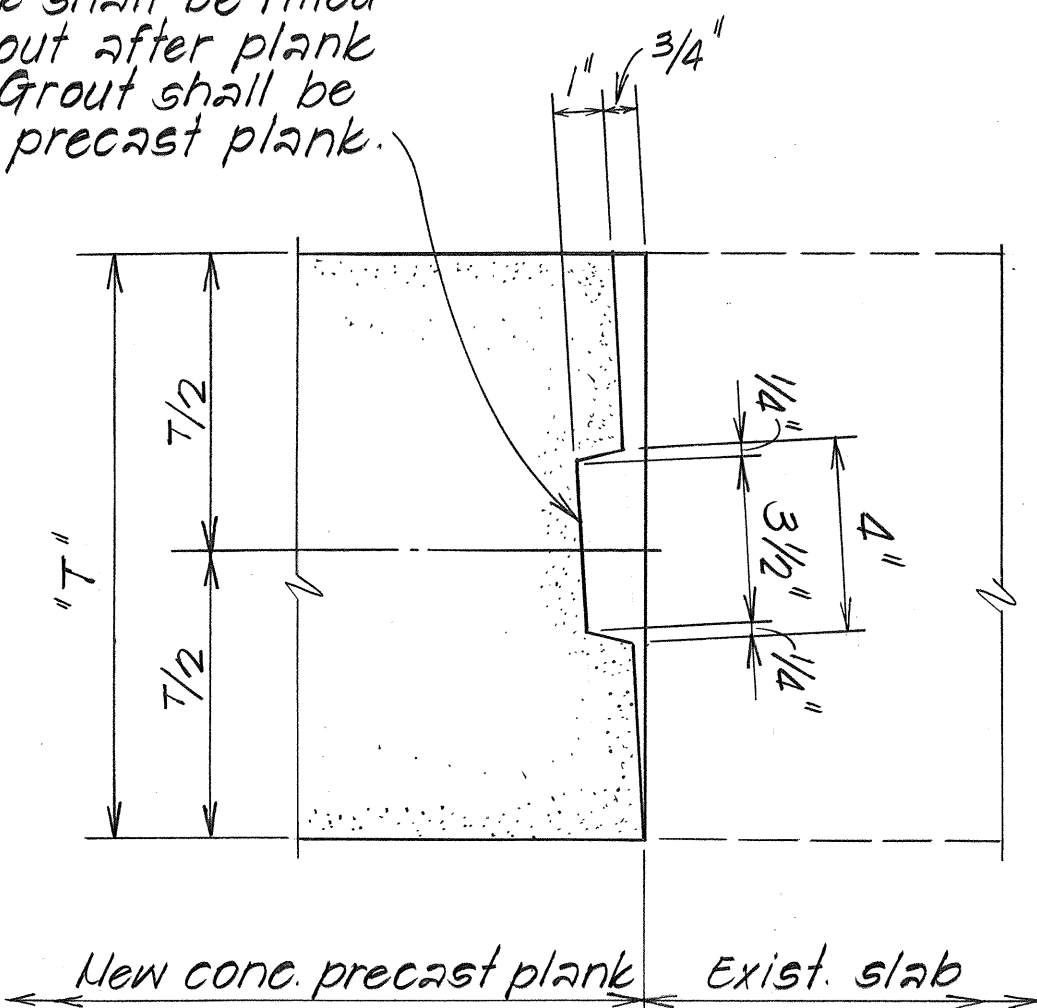
CULVERT AT STA. 414+21.98
OUTLET END FOOTING LAYOUT
KAWAIHAE RD. SAFETY IMPROVEMENTS PHASE II
WAIMEA TO KAWAIHAE
F.A.P. NO. HES-0100(28)
Scale: As Noted Date: May 1986

SHEET NO. 56 OF 14 SHEETS

FED. ROAD DIST. NO.	STATE	FED. AID PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
HAWAII	HAW.	HES-0100(28)	1986	23	61

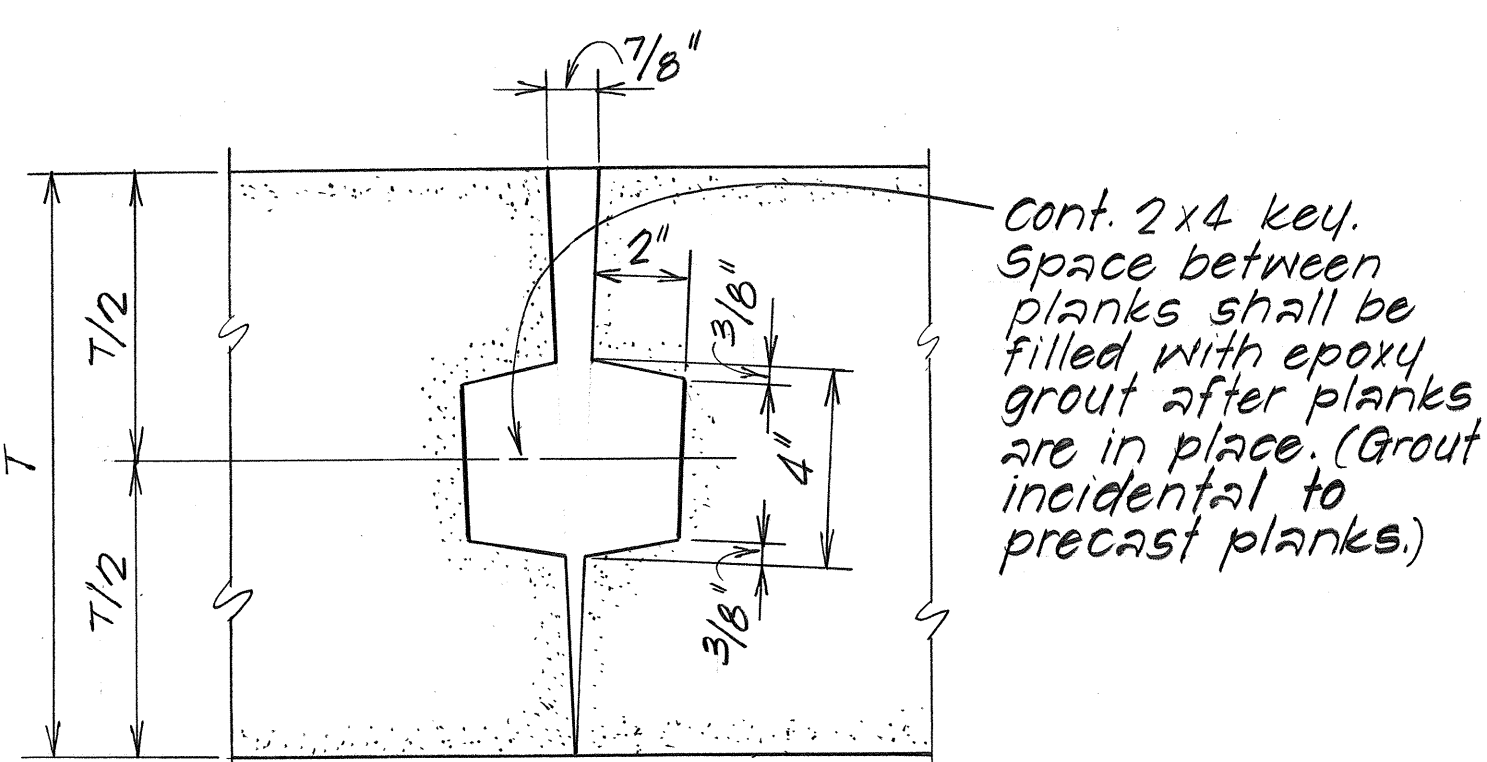
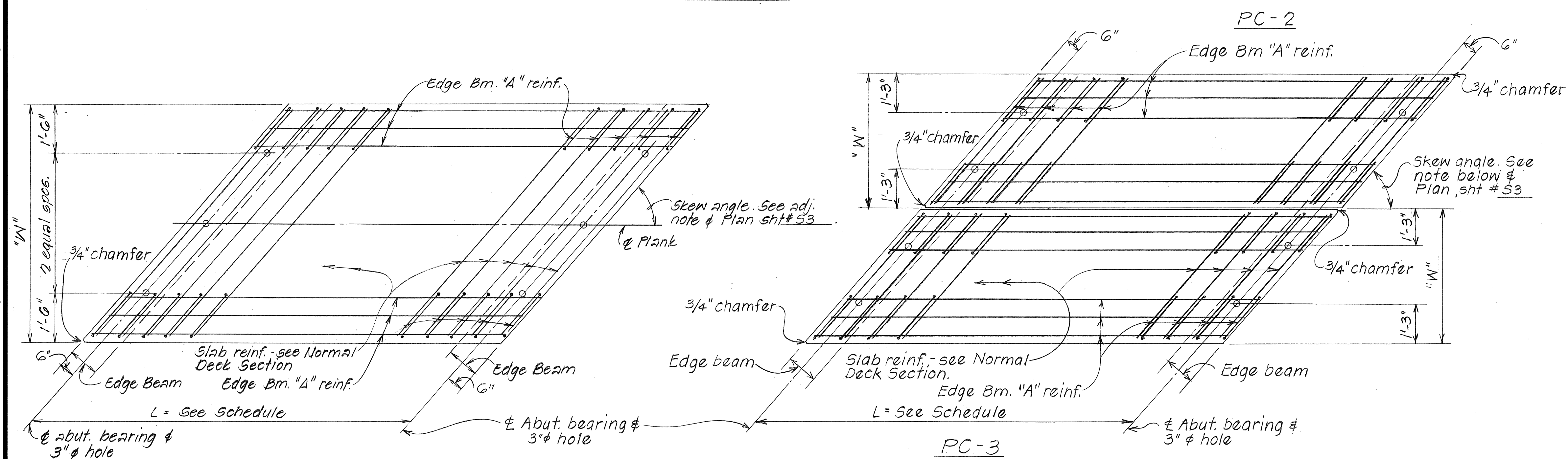


Continuous 1" x 4" key space between exist. slab & new precast plank shall be filled with epoxy grout after plank is in place. Grout shall be incidental to precast plank.



DETAIL B3 AS SHOWN
 DETAIL B1 SIMILAR EXCEPT OTHERWISE NOTED
 Scale: 3" = 1'-0"

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



SHEAR KEY DETAIL
 Scale: 3" = 1'-0"

NOTE: Contractor shall verify dimensions & angle before casting planks.

ITEM	PRECAST CONCRETE PLANK SCHEDULE									
	DIMENSION				REINFORCING STEEL					
	"W"	"L"	"T"	"2"	Edge Beam "A"		Longit. Bars		Transv. Bars	
LOCATION					Top Cont.	Bot. Cont.	Top Layer	Bot. Layer	Top Layer	Bot. Layer
PC-1	7'-6"	11'-11 1/8"	1'-0"		3-#7 @ 6"	3-#8 @ 6"	4 @ 12"	#7 @ 6"	#5 @ 8"	#6 @ 8"
PC-2	4'-3"	11'-11 1/8"	1'-0"		3-#7 @ 6"	3-#8 @ 6"	2-#5	2-#7	#5 @ 8"	#6 @ 8"
PC-3	4'-3"	11'-11 1/8"	1'-0"		3-#7 @ 6"	3-#8 @ 6"	2-#5	2-#7	#5 @ 8"	#6 @ 8"

STATE OF HAWAII

DEPARTMENT OF TRANSPORTATION

HIGHWAYS DIVISION

CULVERT AT STA. 414 + 21.08

DECK SECTION & PRECAST CONCRETE PLANK

KAWAIIHAE RD. SAFETY IMPROVEMENTS PHASE II

KAWAIIHAE TO KAWAIIHAE

F.A.P. NO. HES-0100(28)

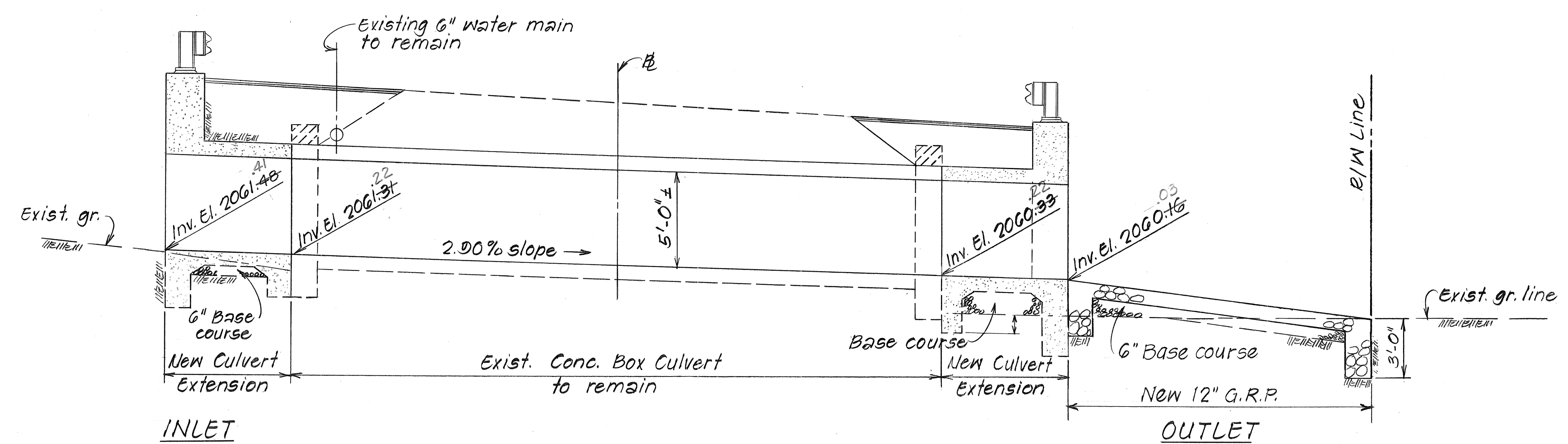
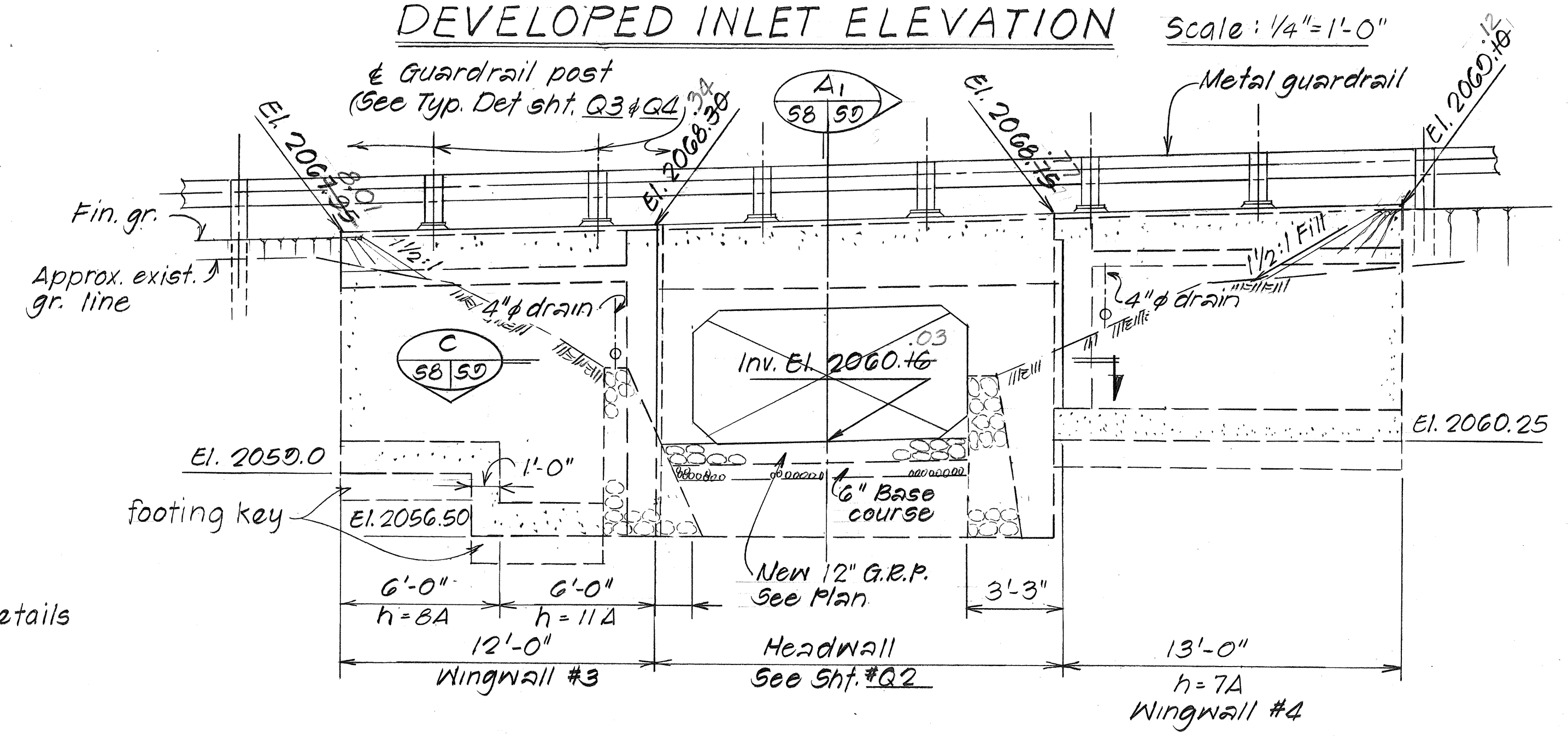
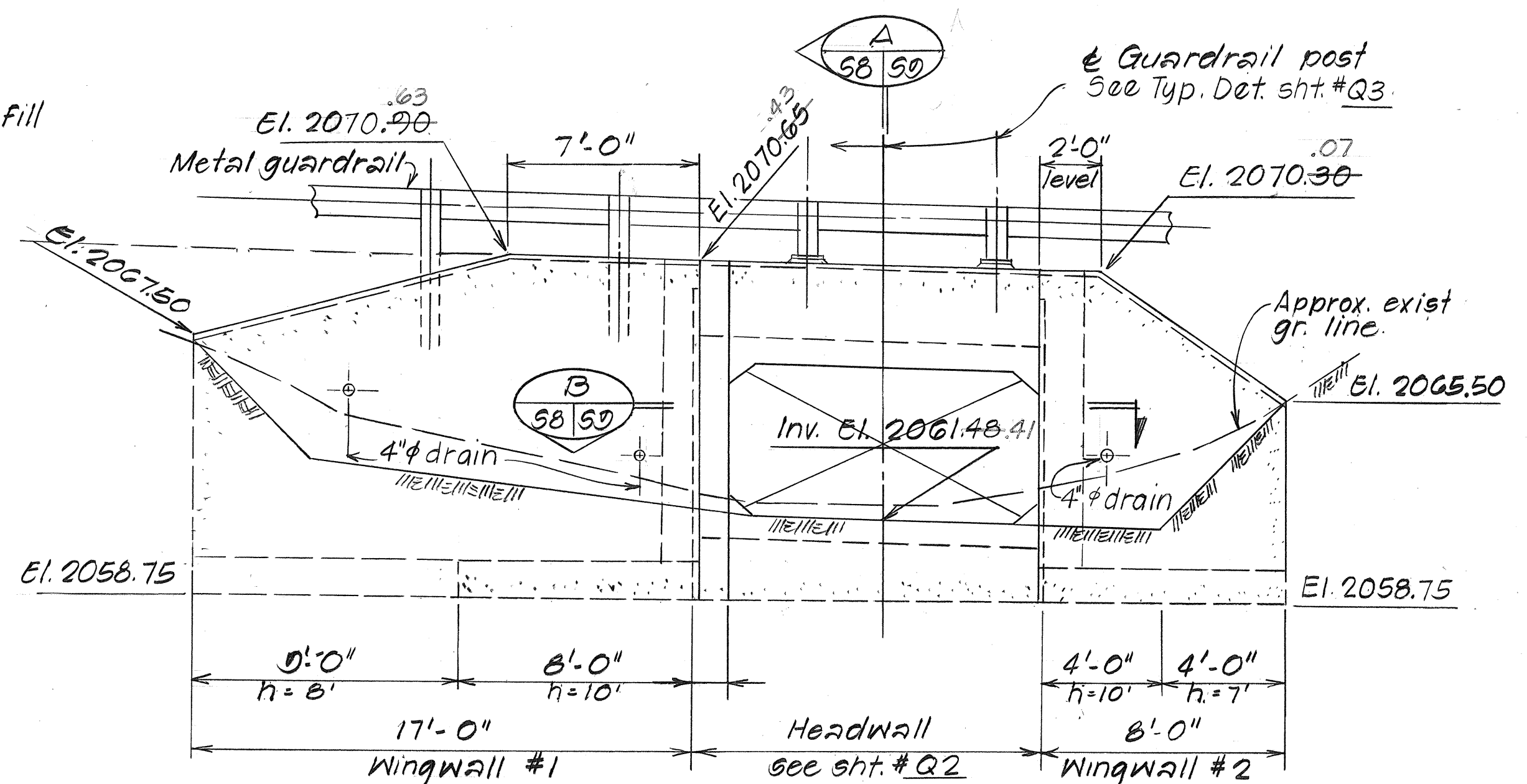
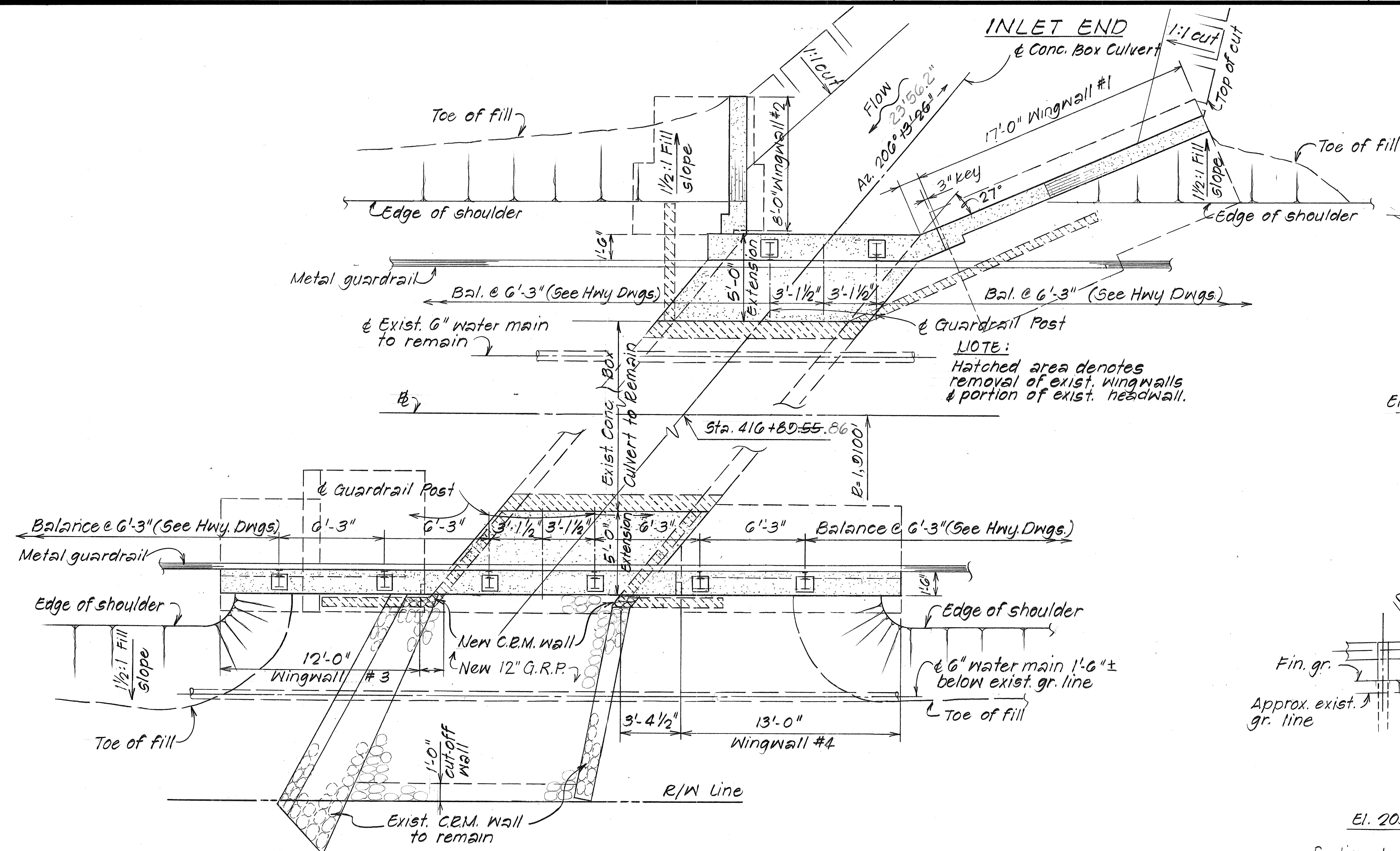
Scale: As Noted

Date: May 1986

SHEET NO. 57 OF 14 SHEETS

SURVEY PLOTTED BY	DATE
DRAWN BY	5/86
TRACED BY	5/86
CHECKED BY	5/86
NOTED BY	5/86
ORIGINAL PLAN	NO.

FED. ROAD DIST. NO.	STATE	FED. AID PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
HAWAII	HAW.	HES-0100(28)	1986	24	67



STATE OF HAWAII
 DEPARTMENT OF TRANSPORTATION
 HIGHWAYS DIVISION

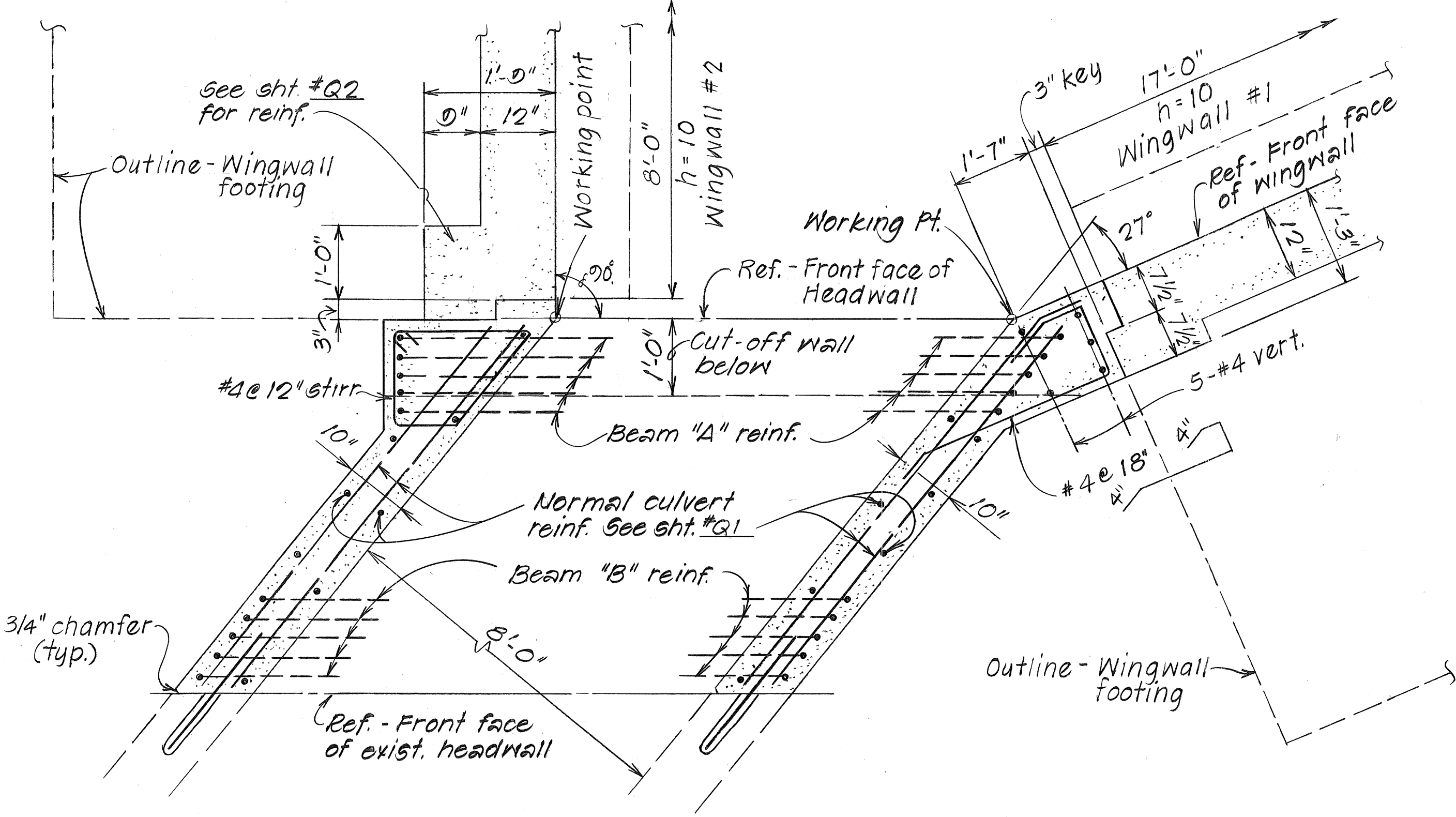
8'-0" x 5'-0" CONCRETE BOX CULVERT
AT STA. 416+80.55-86

KAWAIHAE RD. SAFETY IMPROVEMENTS PHASE II
 NAIIMEA TO KAWAIHAE
 F.A.P. NO. HES-0100(28)

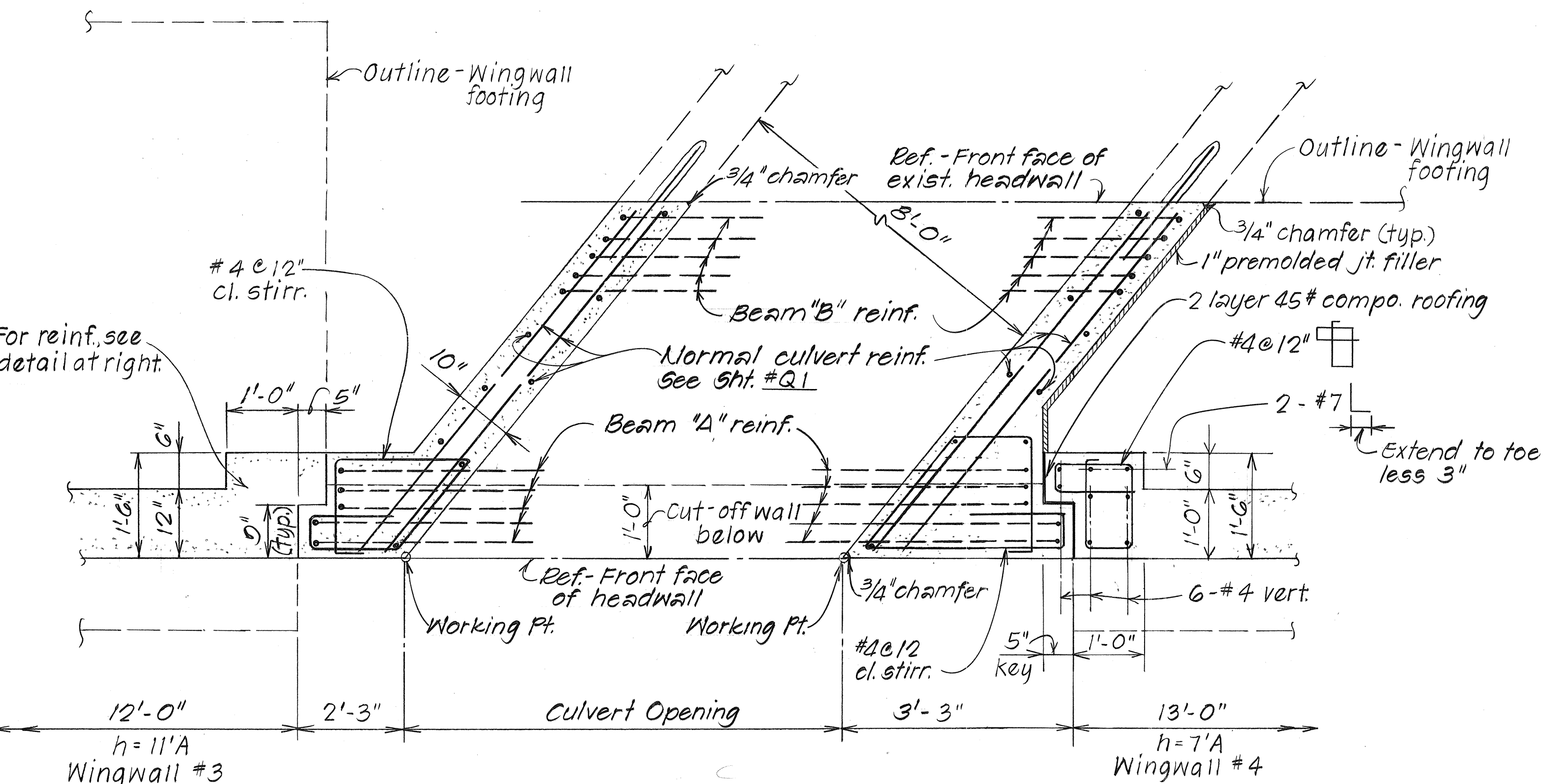
Scale: As Noted Date: May 1986

SHEET No. 58 OF 14 SHEETS

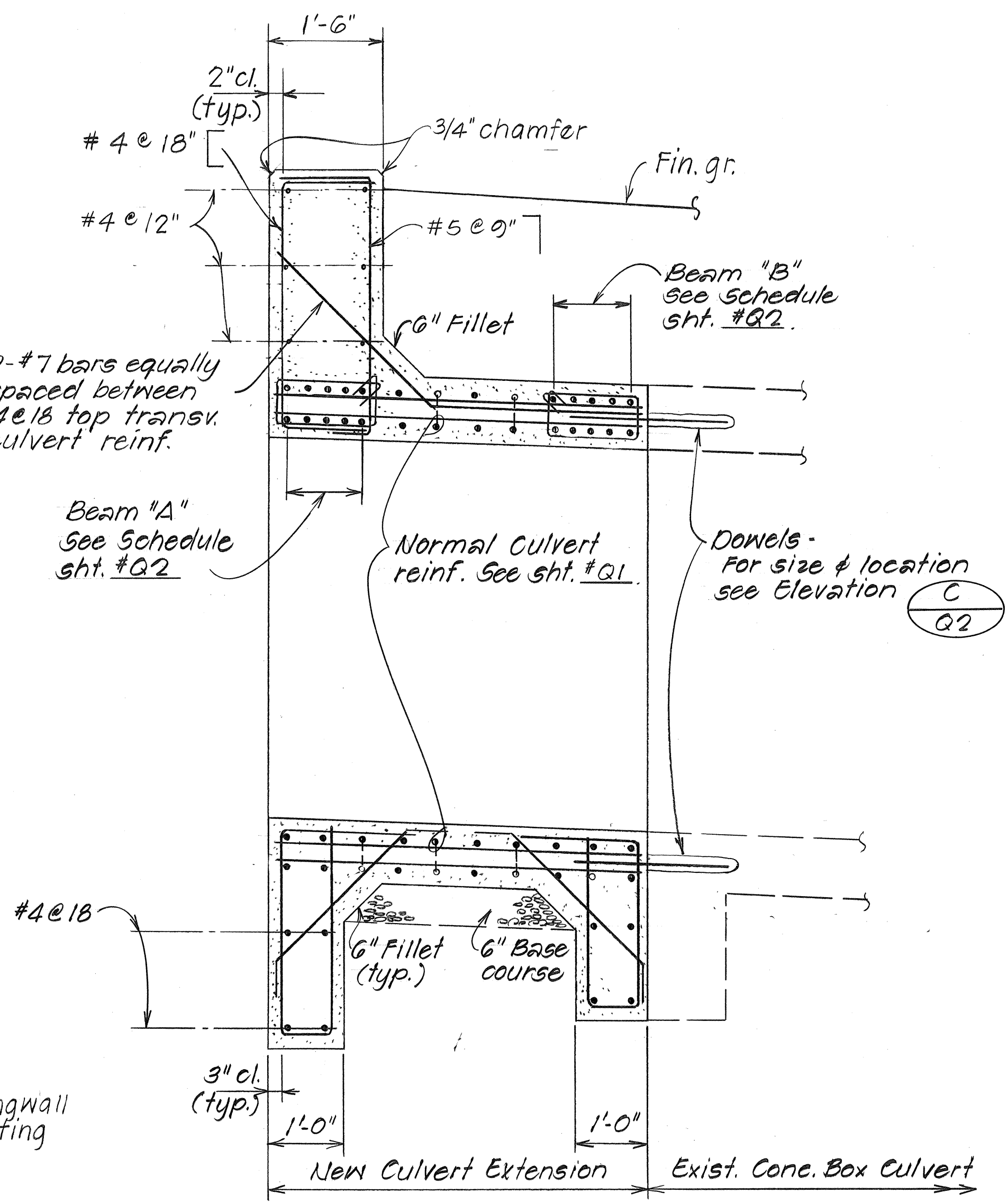
FED. ROAD DIST. NO.	STATE	FED. AID PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
HAWAII	HAW.	HES-0100(28)	1986	25	67



SECTION B 58/59
Scale: 3/4" = 1'-0"



SECTION C 58/59
Scale: 3/4" = 1'-0"



SECTION A 58/59 AS SHOWN
SECTION A 58/59 SIMILAR EXCEPT OPPOSITE HAND
Scale: 3/4" = 1'-0"

STATE OF HAWAII
DEPARTMENT OF TRANSPORTATION
HIGHWAYS DIVISION

8'-0" x 5'-0" CONCRETE BOX CULVERT
AT STA. 416+80.55

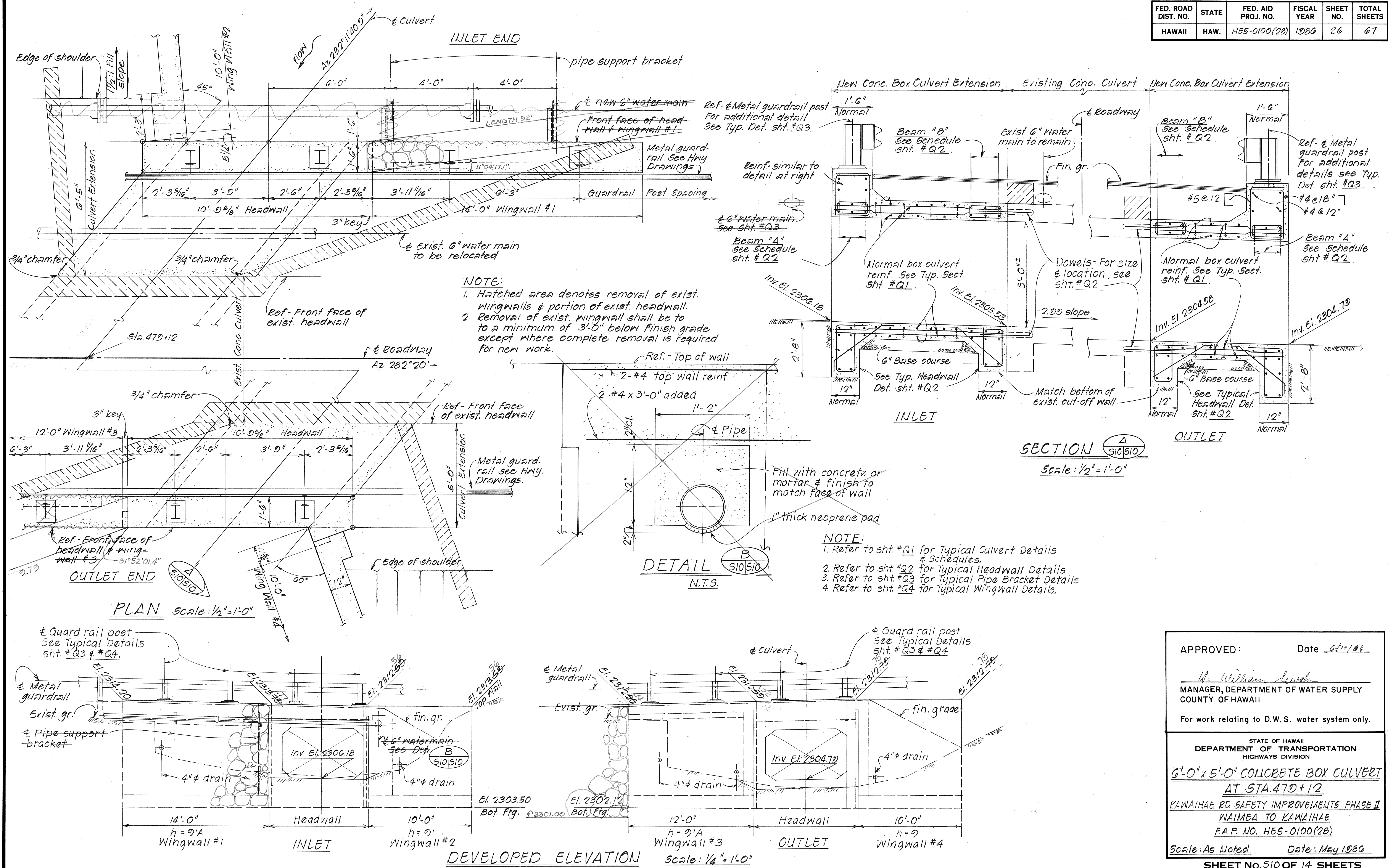
KAWAIHAE RD SAFETY IMPROVEMENTS PHASE II
WAIMEA TO KAWAIHAE
F.A.P. NO. HES-0100(28)

Scale: As Noted Date: _____

SHEET NO. 25 OF 14 SHEETS

SURVEY PLOTTED BY	DATE
DRAWN BY	
CHECKED BY	
QUANTITIES BY	
NO.	

FED. ROAD DIST. NO.	STATE	FED. AID PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
HAWAII	HAW.	HES-0100(28)	1986	26	67



APPROVED: Date 6/10/86

MANAGER, DEPARTMENT OF WATER SUPPLY
COUNTY OF HAWAII

For work relating to D.W.S. water system only.

STATE OF HAWAII
DEPARTMENT OF TRANSPORTATION
HIGHWAYS DIVISION

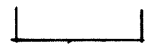
6'-0" x 5'-0" CONCRETE BOX CULVERT
AT STA. 470+12

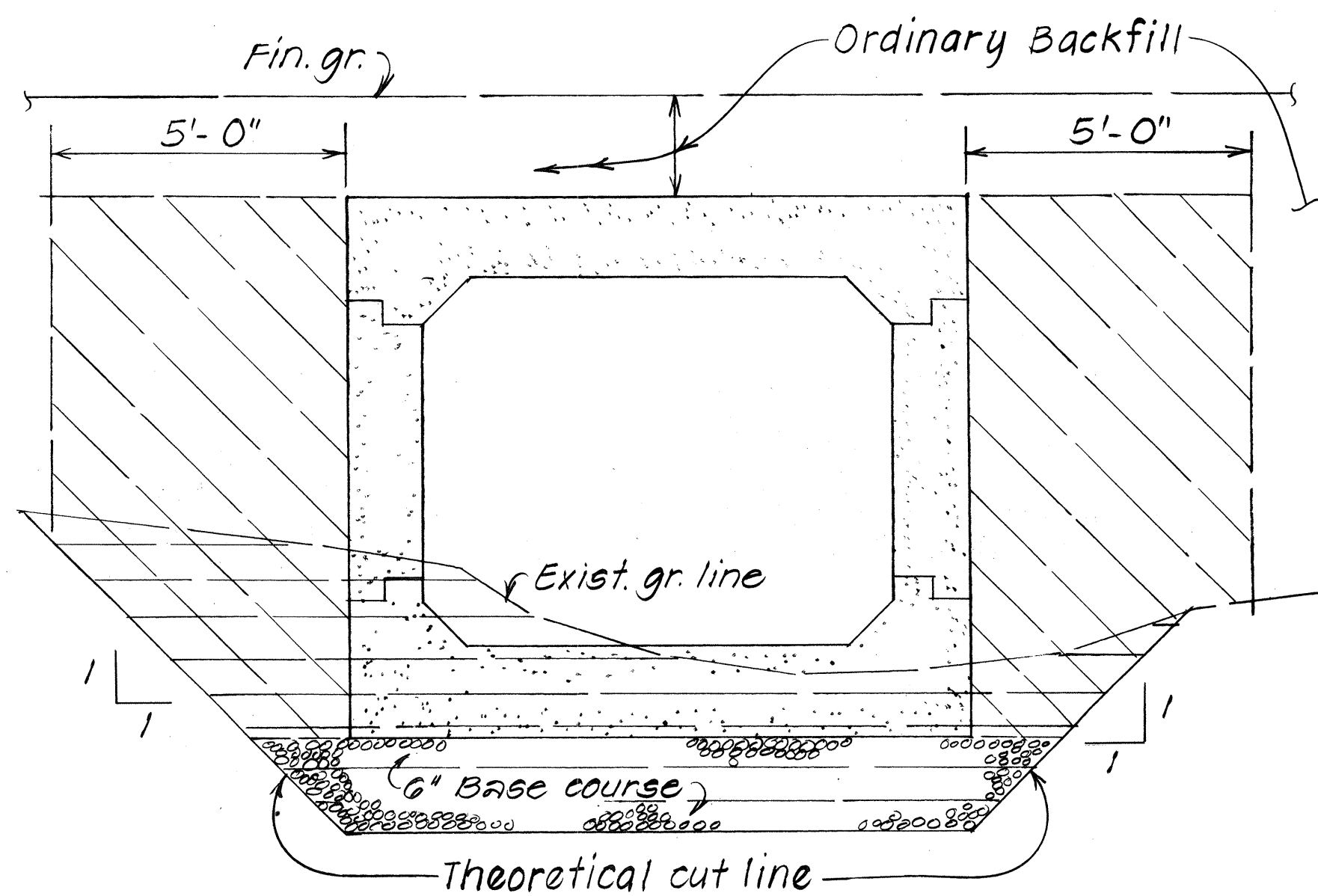
KAWAIIHAE RD. SAFETY IMPROVEMENTS PHASE II
WAIMEA TO KAWAIIHAE
F.A.P. NO. HES-0100(28)

Scale: As Noted Date: May 1986

SHEET No. 510 OF 14 SHEETS

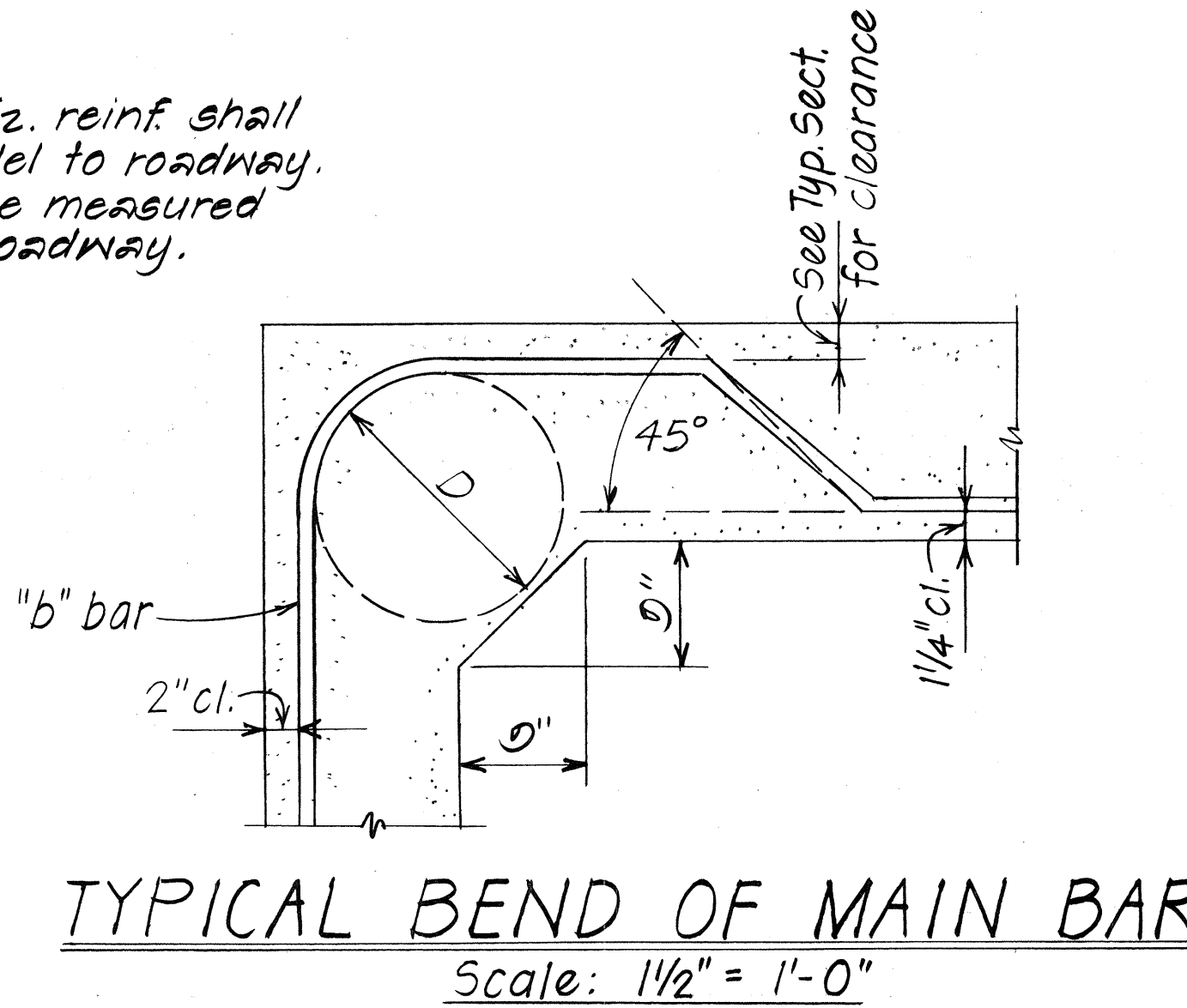
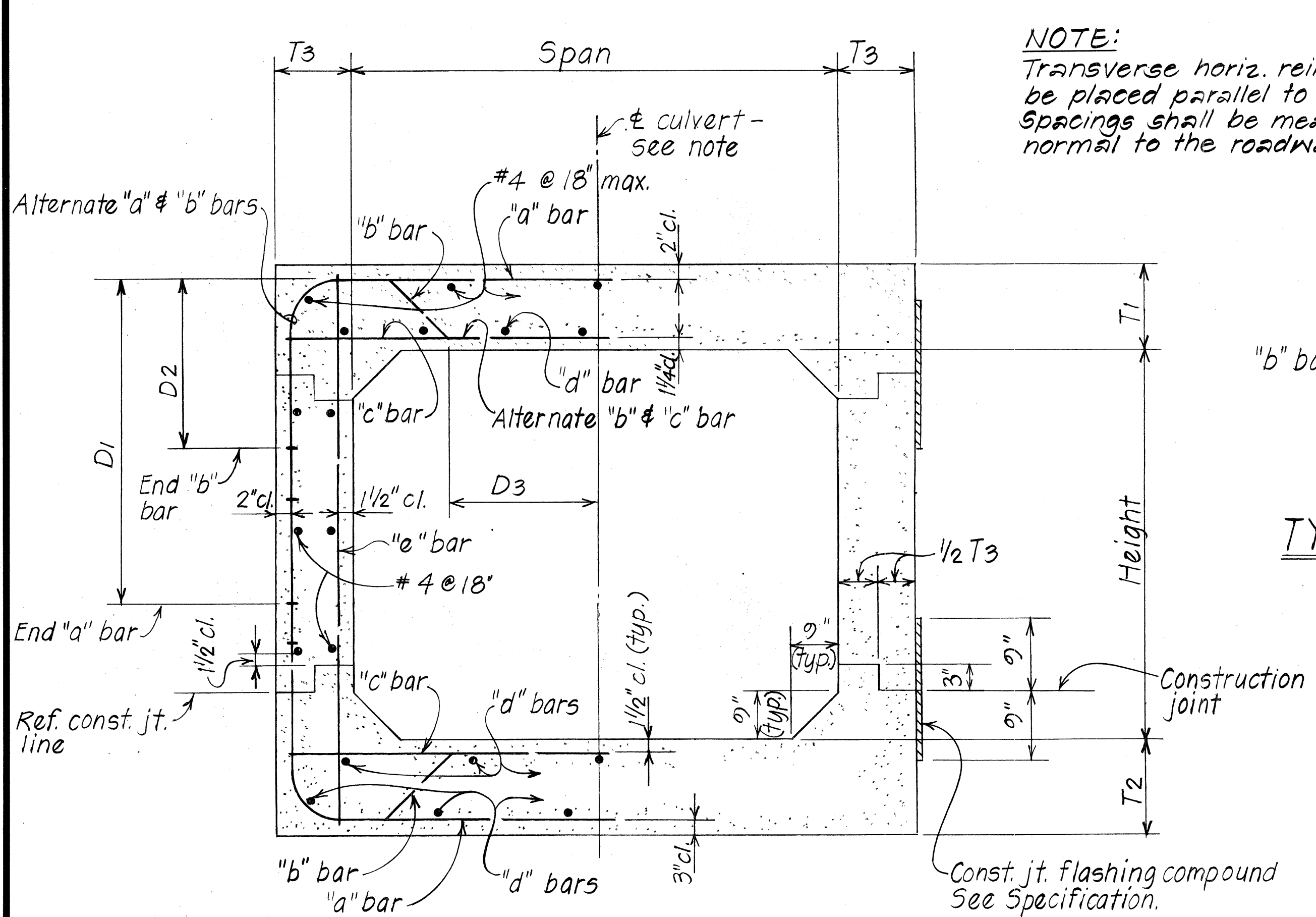
FED. ROAD DIST. NO.	STATE	FED. AID PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
HAWAII	HAW.	HES-0100(28)	1986	27	67

SPAN HEIGHT			8'-0"x 5'-0"	6'-0"x 5'-0"	
LOCATION			Sta. 416+89.55	Sta. 470+12.00	
MAX. FILL OVER TOP OF SLAB					
CONC.	TOP SLAB		T ₁	10"	10"
	BOTTOM SLAB		T ₂	10"	9"
	SIDE WALLS		T ₃	10"	8"
REINFORCING STEEL	DIMENSION		D ₁	3'-11"	3'-9"
	DIMENSION		D ₂	3'-0"	3'-11"
	DIMENSION		D ₃	2'-5½"	2'-3"
	T ₁		"a" bar	#5 @ 12"	#4 @ 12"
			"b" bar	#6 @ 12"	#6 @ 12"
			"c" bar	#8 @ 12"	#6 @ 12"
			cont. "d" bar	#4 @ 18"	#5 @ 12"
	T ₂		"a" bar	#5 @ 12"	#4 @ 12"
			"b" bar	#6 @ 12"	#6 @ 12"
			"c" bar	#6 @ 12"	#6 @ 12"
			cont. "d" bar	#5 @ 12"	#5 @ 12"
	T ₃		vert. "e" bar	#4 @ 18"	#4 @ 18"
QUAN.	CONCRETE: C.Y. PER LIN. FT.				
	REINFORCING STEEL: LBS. PER LIN. FT.				



NOTE:
 1. Hatched area shown thus denote limits of structure backfill.
 2. Hatched area shown thus denote limits of channel excavation.

TYPICAL CHANNEL EXCAVATION & BACKFILL
 Not to scale



SCHEDULE	
BAR SIZE	D
#4	3"
#5	3 3/4"
#6	4 1/2"
#7	5 1/4"
#8	6"
#9	9"

TYPICAL SECTION THRU
 CONCRETE BOX CULVERT
 Scale: 1" = 1'-0"

NOTE:
 Culvert details are symmetrical about the vertical and horizontal axis at center of culvert except where shown otherwise.

STATE OF HAWAII

DEPARTMENT OF TRANSPORTATION

HIGHWAYS DIVISION

TYPICAL DETAILS

CONC. BOX CULVERT & SCHEDULES

KAWAIHAE RD. SAFETY IMPROVEMENTS-PHASE II

WAIMEA TO KAWAIHAE

F.A.P. NO. HES-0100(28)

Scale: As Noted

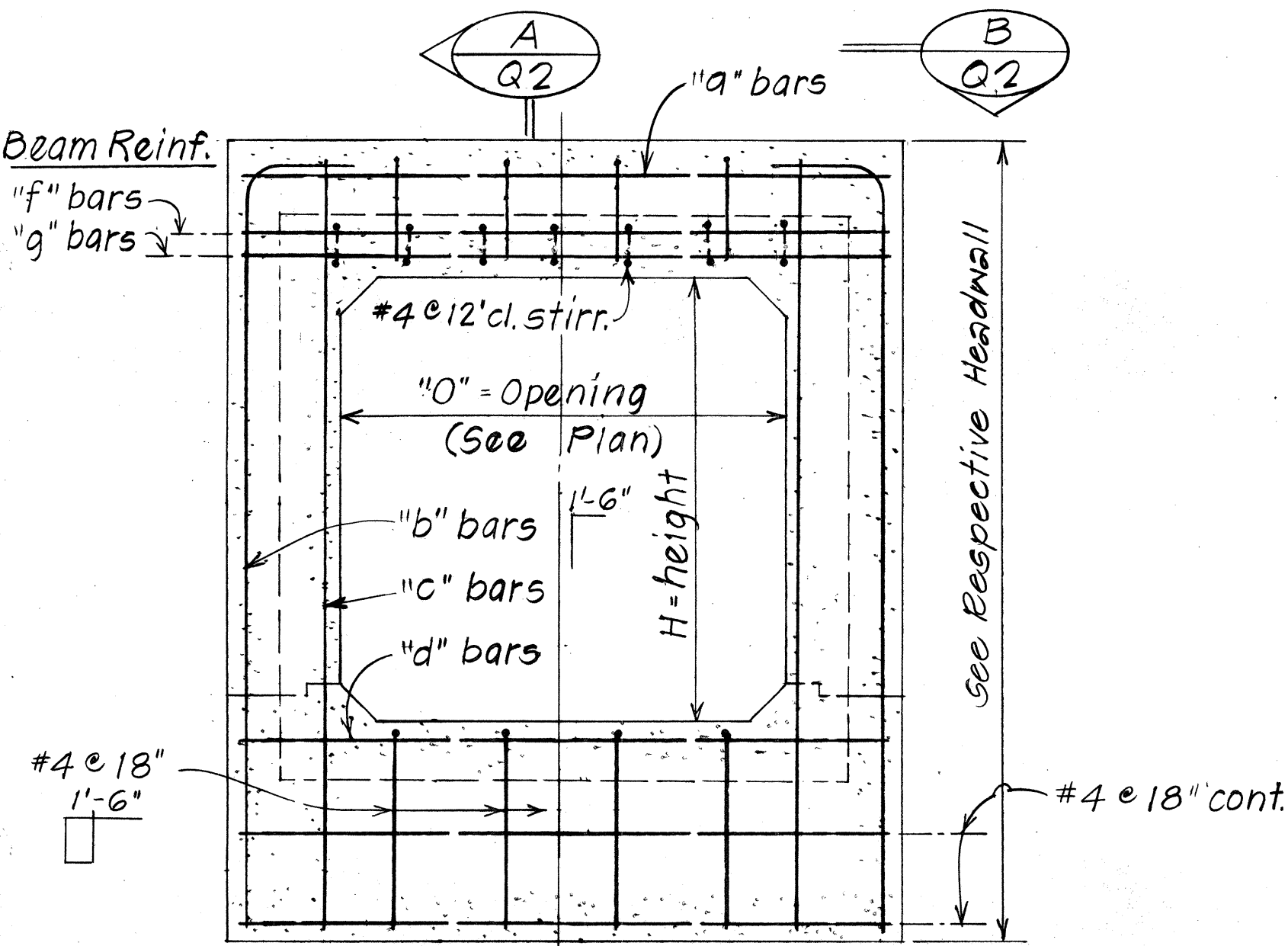
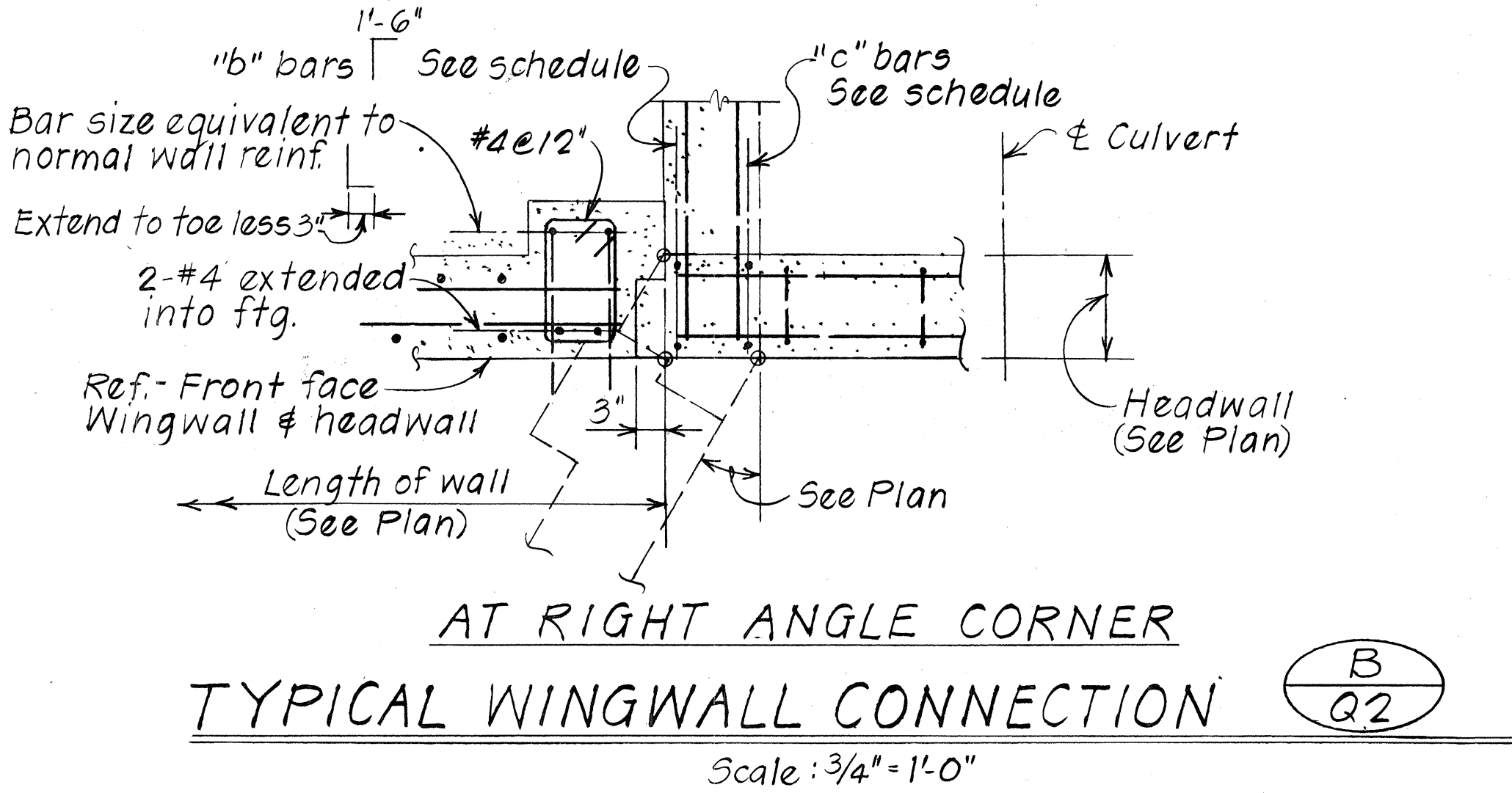
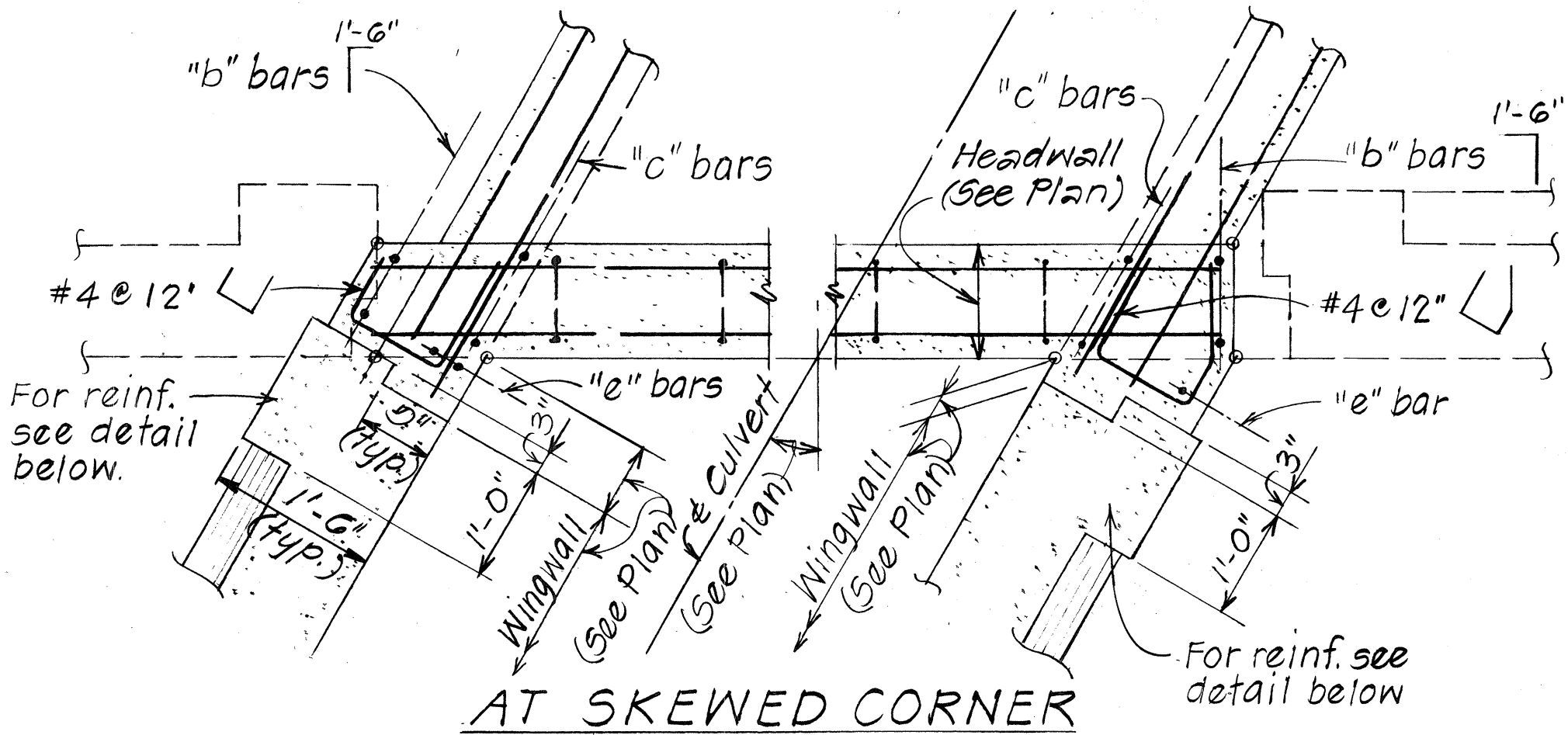
Date: May 1986

SHEET No. 21 OF 14 SHEETS

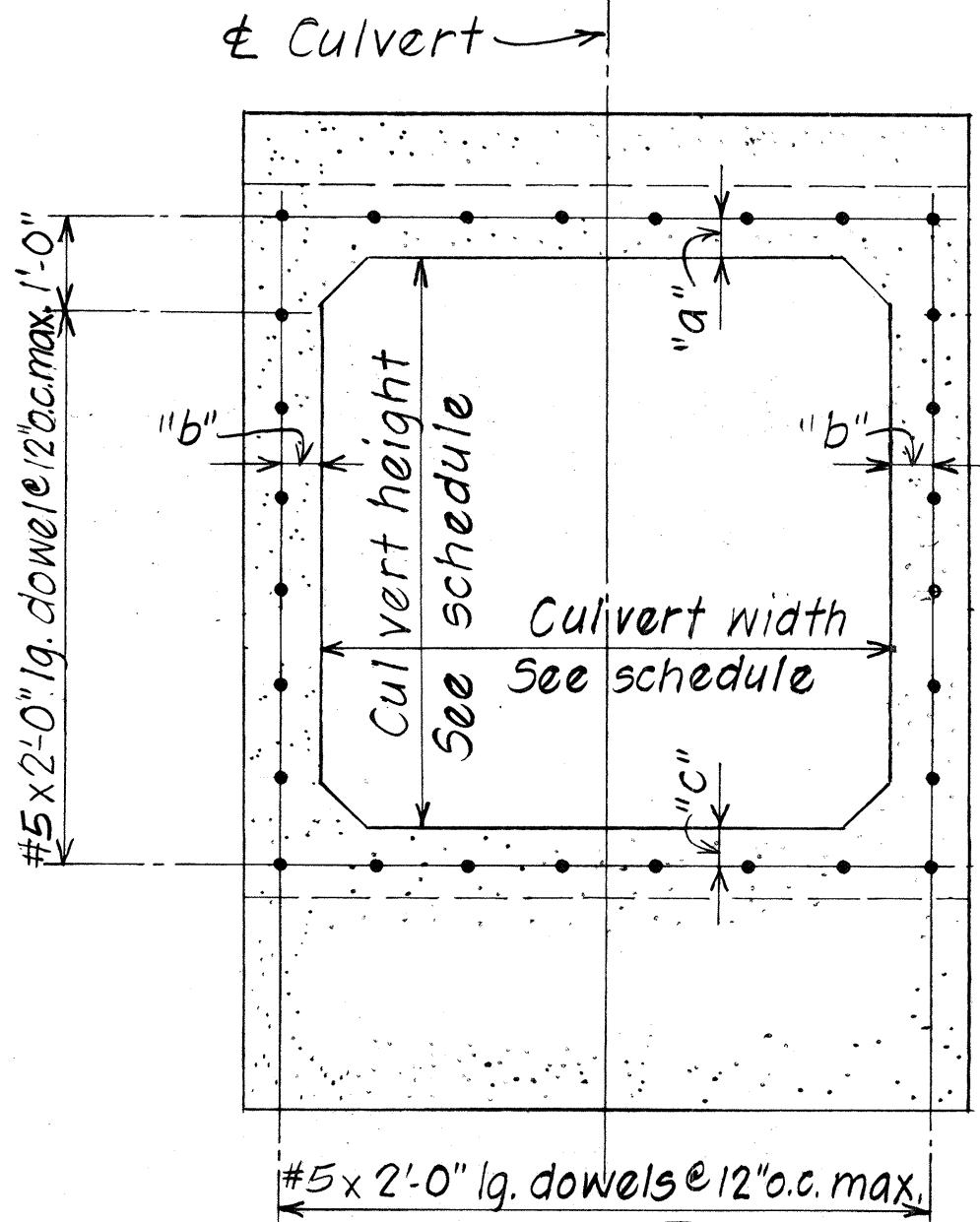
SURVEY PLOTTED BY: 5/86
 DATE: 5/86
 DESIGNED BY: L.A.
 CHECKED BY: L.A.
 QUANTITIES BY: L.A.
 NOTE BOOK: 5/86
 No.: 5/86

FED. ROAD DIST. NO.	STATE	FED. AID PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
HAWAII	HAW.	HES-0100(28)	1986	28	67

SIZE & REINFORCING STEEL FOR NEW CONCRETE BOX CULVERT HEADWALL & EDGE BEAM											
ITEM CULVERT LOCATION	HEADWALL OPENING		REINFORCING STEEL								
			HEADWALL					BEAM "A"		BEAM "B"	
	"O"	"H"	"a"	"b"	"c"	"d"	"e"	"f"	"g"	"F ₁ "	"g ₁ "
Sta. 416+89.55	10'-5 1/2"	5'-0"	#6	#6	#4	#4	#4	5-#6@3" 3'-11"	5-#6@3" 3'-11"	5-#6@3" 3'-11"	5-#6@3" 3'-11"
Sta 479+12.00	7'-9 1/2"	5'-0"	#6	#6	#4	#4	#4	3-#8@6" 3'-9"	3-#7@6" 3'-9"	3-#8@6" 3'-9"	3-#7@6" 3'-9"



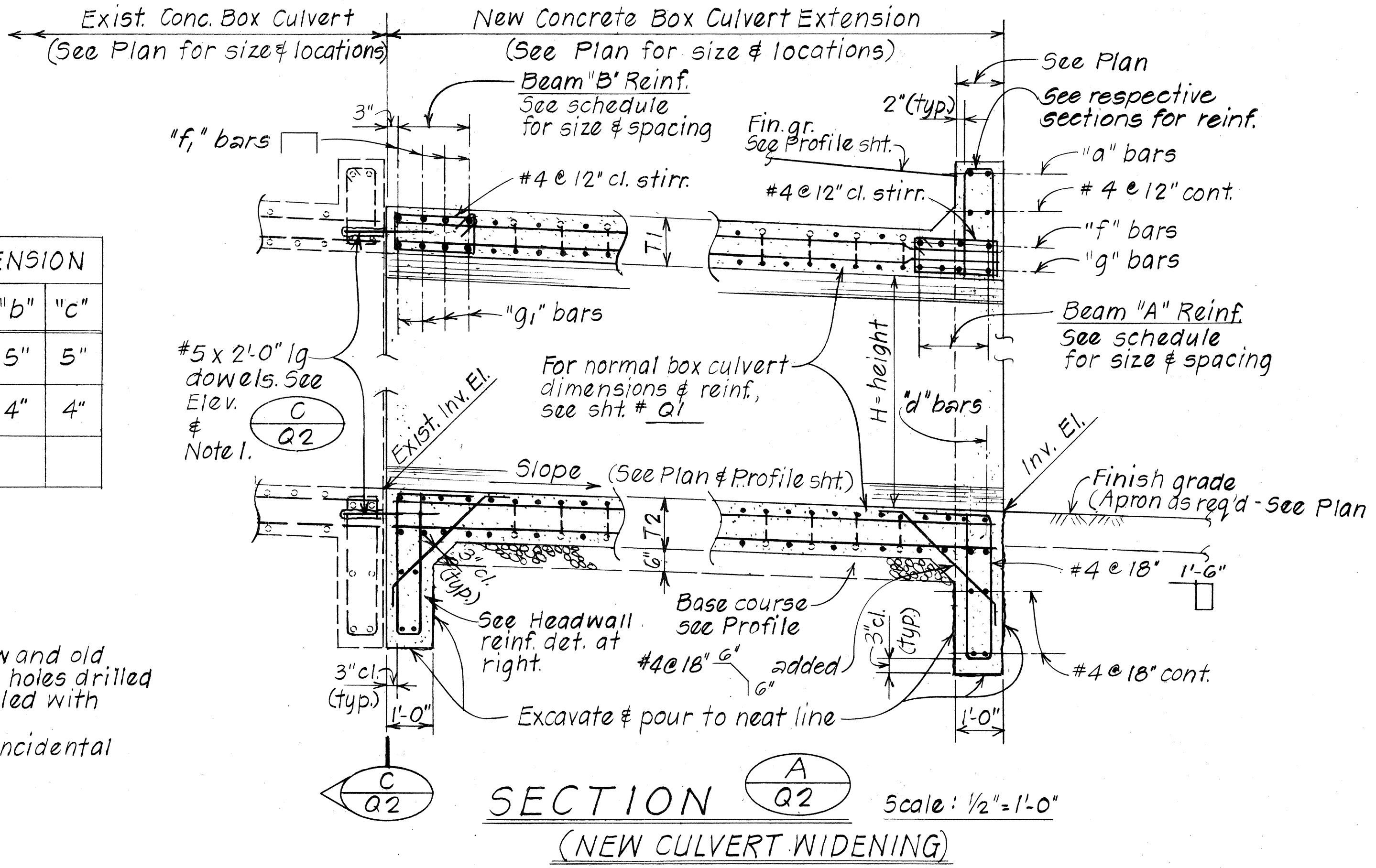
TYPICAL HEADWALL ELEVATION
(NEW CULVERT HEADWALL)
Scale: 1/2" = 1'-0"



ITEM	DIMENSION		
LOCATION	"a"	"b"	"c"
8'x5' Box Culvert Sta. 416+88±	5"	5"	5"
6'x5' Box Culvert Sta. 479+12	4"	4"	4"

NOTE:
1. Dowels connecting new and old culvert shall be set in holes drilled 2" x 1'-0" deep and filled with epoxy grout.
2. Epoxy grout shall be incidental to concrete.

ELEVATION C Q2 Scale: 1/2" = 1'-0"
(CONNECTION TO EXISTING HEADWALL)



SECTION A Q2 Scale: 1/2" = 1'-0"
(NEW CULVERT WIDENING)

STATE OF HAWAII

DEPARTMENT OF TRANSPORTATION

HIGHWAYS DIVISION

TYPICAL DETAILS

CONC. BOX CULVERT HEADWALL

KAWAIHAE RD. SAFETY IMPROVEMENTS-PHASE II

WAIMEA TO KAWAIHAE

F.A.P. NO. HES-0100(28)

Scale: As Noted

Date: May 1986

SHEET No. 02 OF 14 SHEETS

SURVEY PLOTTED BY

DATE: 5/86

DRAWN BY L.M.A.

TRACED BY

QUANTITIES BY

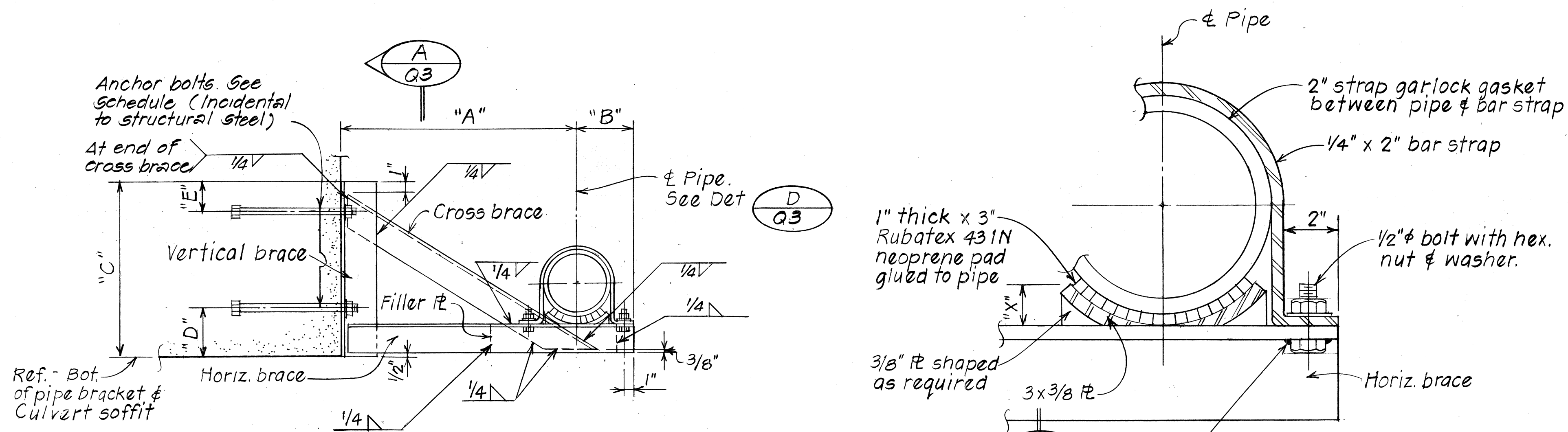
CHECKED BY L.A., G.T.

ORIGINAL PLAN

NOTE BOOK

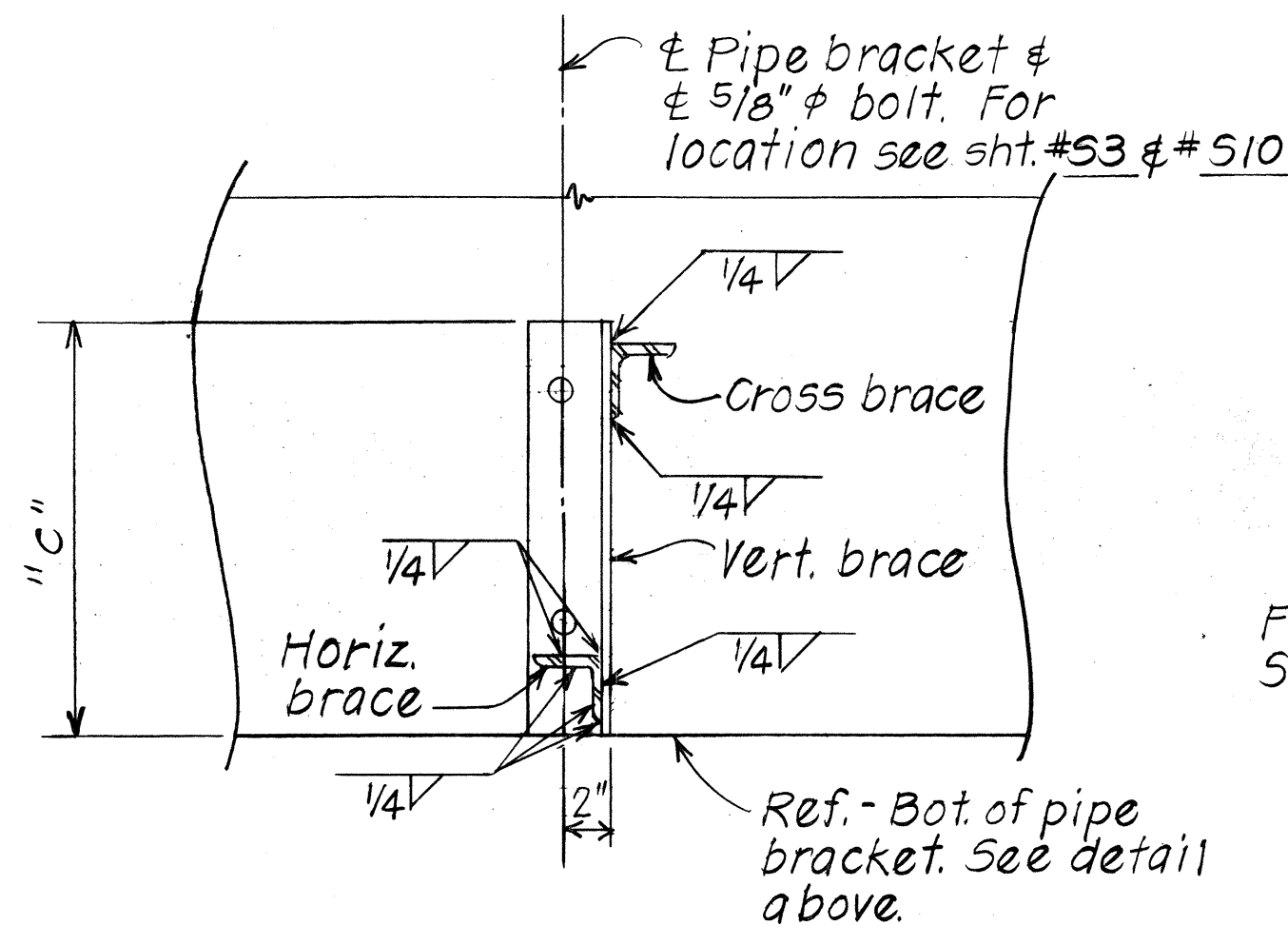
No.

FED. ROAD DIST. NO.	STATE	FED. AID PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
HAWAII	HAW.	HES-0100(28)	1986	29	67

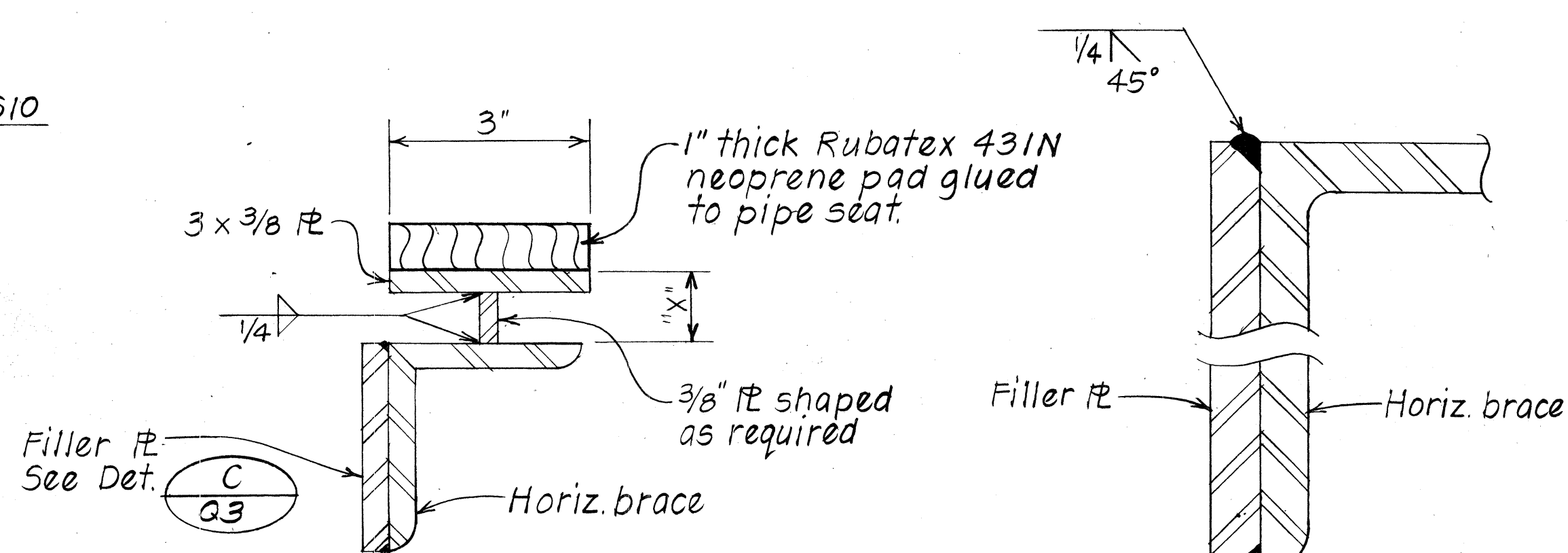


**TYPICAL WATER MAIN
SUPPORT BRACKET DETAIL**

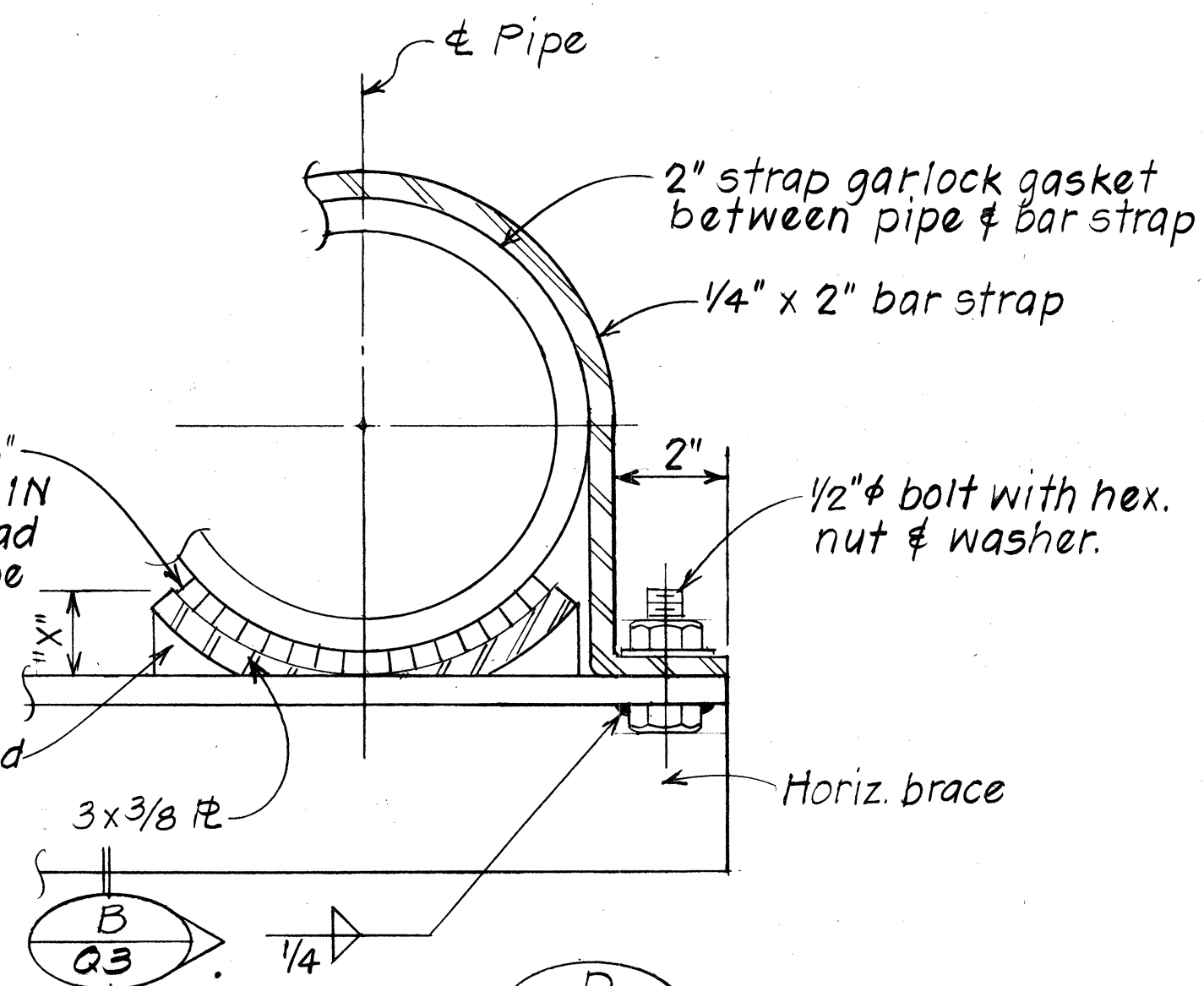
(For size & dimensions, see schedule)
Scale: 1 1/2" = 1'-0"



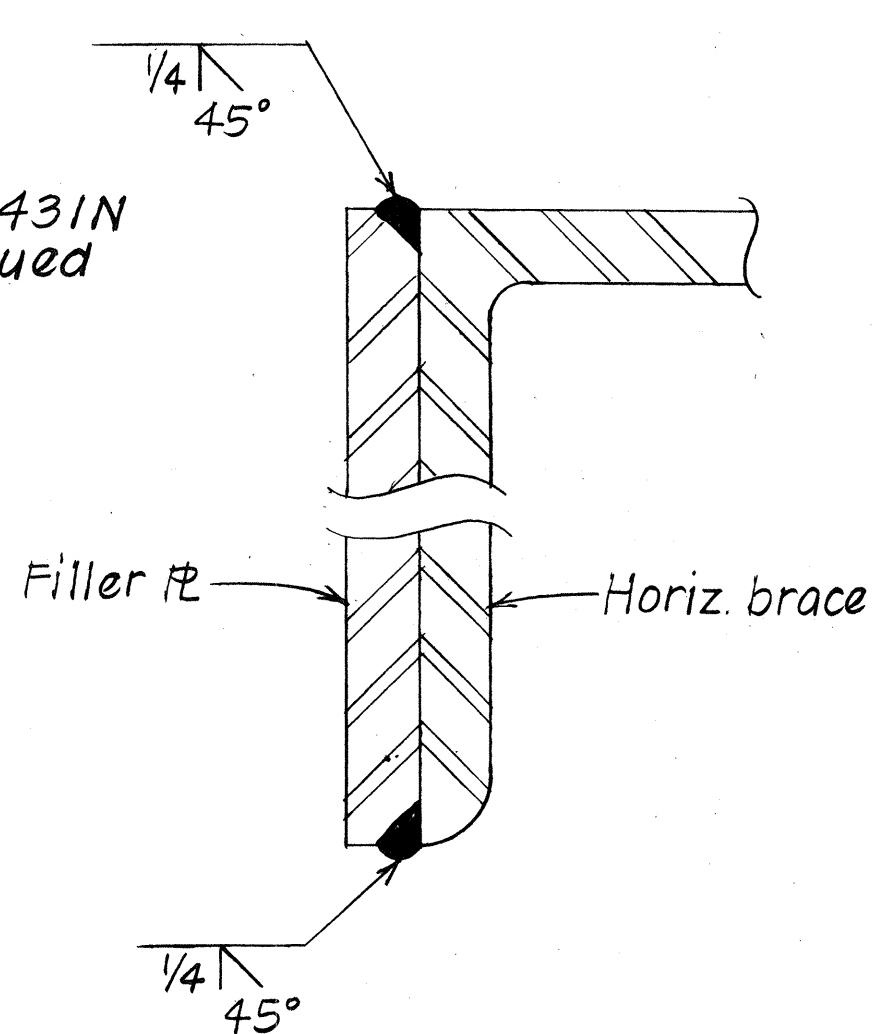
**SECTION A
Q3**
Scale: 1 1/2" = 1'-0"



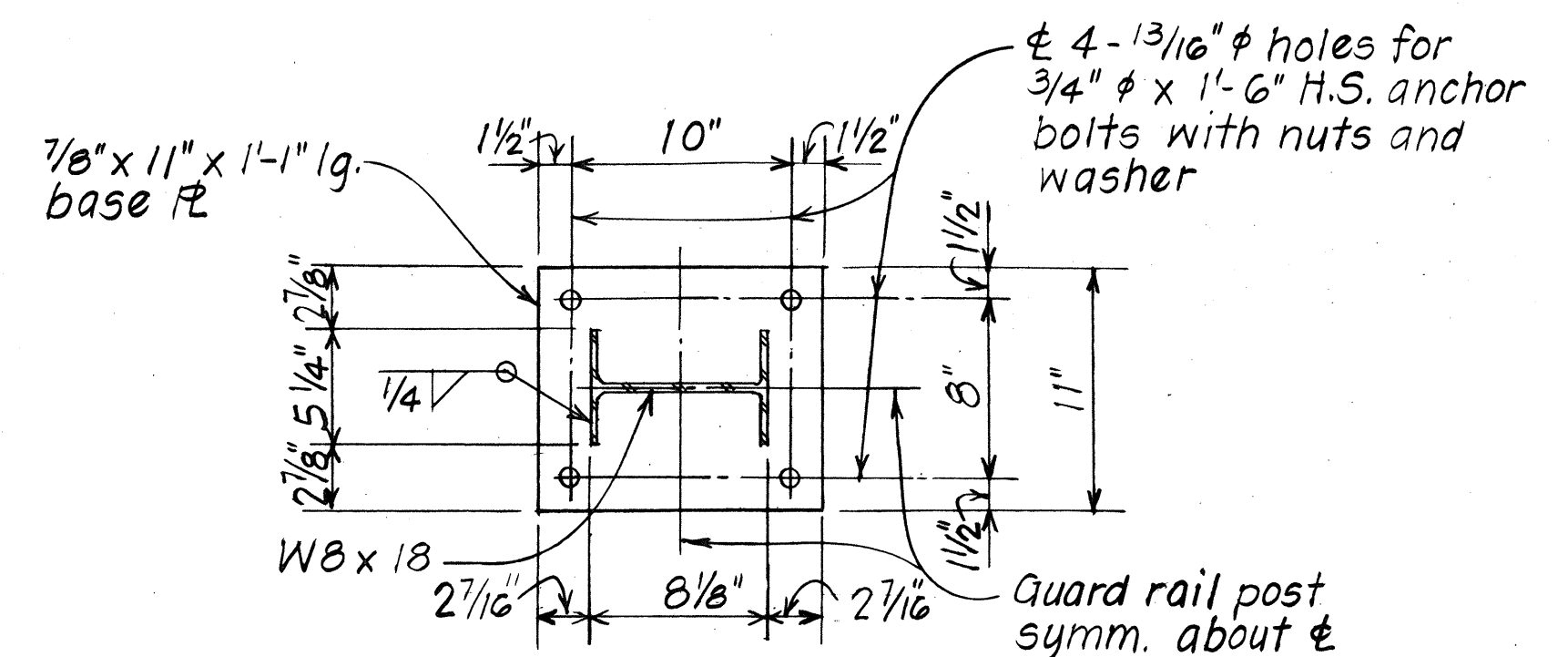
**SECTION B
Q3**
Scale: 3" = 1'-0"



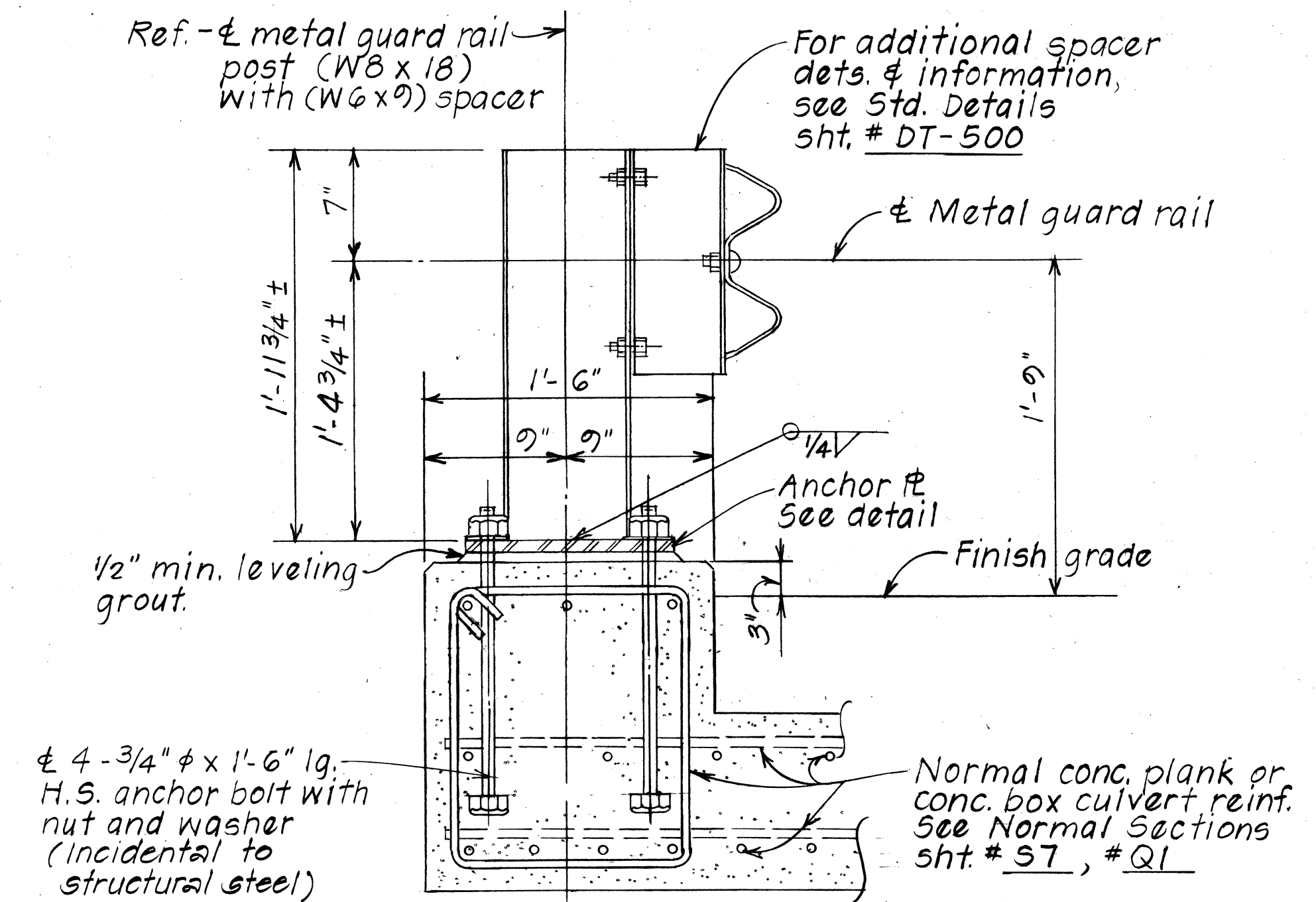
**DETAIL D
Q3**
Not to scale



**DETAIL C
Q3**
Full Scale



POST ANCHOR PLATE DETAIL
Scale: 1 1/2" = 1'-0"



TYPICAL GUARD RAIL SECTION
Scale: 1 1/2" = 1'-0"

PIPE SUPPORT BRACKET SCHEDULE

ITEM LOCATION	PIPE SIZE	DIMENSION					STRUCTURAL STEEL				
		"A"	"B"	"C"	"D"	"E"	"X"	VERT. BRACE	HORIZ. BRACE	CROSS BRACE	FILLER PL
Culvert @ Sta. 414+21.98	6" Water main	1'-6"	5 3/4"	1'-3"	5"	3"	1 3/16"	L3 1/2 x 3 1/2 x 3/8	L3 x 3 x 3/8	L3 x 3 x 3/8	3/8 x 3 x 1'-0"
6' x 5' Box Culvert Sta. 479+12.00	6" Water main	1'-6"	5 3/4"	1'-3"	5"	3"	1 3/16"	L3 1/2 x 3 1/2 x 3/8	L3 x 3 x 3/8	L3 x 3 x 3/8	3/8 x 3 x 1'-0"

APPROVED: Date 6/10/86

H. William Lewis
MANAGER, DEPARTMENT OF WATER SUPPLY
COUNTY OF HAWAII

For work relating to D.W.S. water system only.

STATE OF HAWAII
DEPARTMENT OF TRANSPORTATION
HIGHWAYS DIVISION

TYPICAL DETAILS

PIPE SUPPORT BRACKET DETAILS
GUARD RAIL POST BASE DETAILS

KAWAII RD SAFETY IMPROVEMENTS-PHASE II
WAIMEA TO KAWAII
F.A.R. NO. HES-0100(28)

Scale: As Noted Date: May 1986

SHEET NO. Q3 OF 14 SHEETS

ORIGINAL PLAN	DATE
NO.	5/86
DESIGNED BY	5/86
CHECKED BY	5/86
DATE	5/86

SCHEDULE OF DIMENSIONS
& REINFORCING STEEL FOR RETAINING WALL

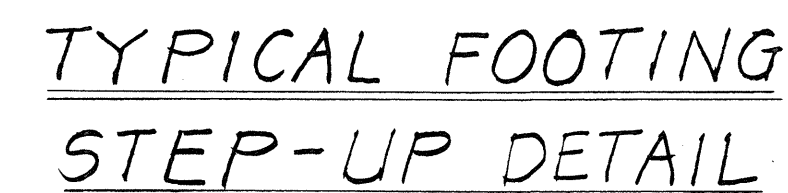
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HATCHED AREA

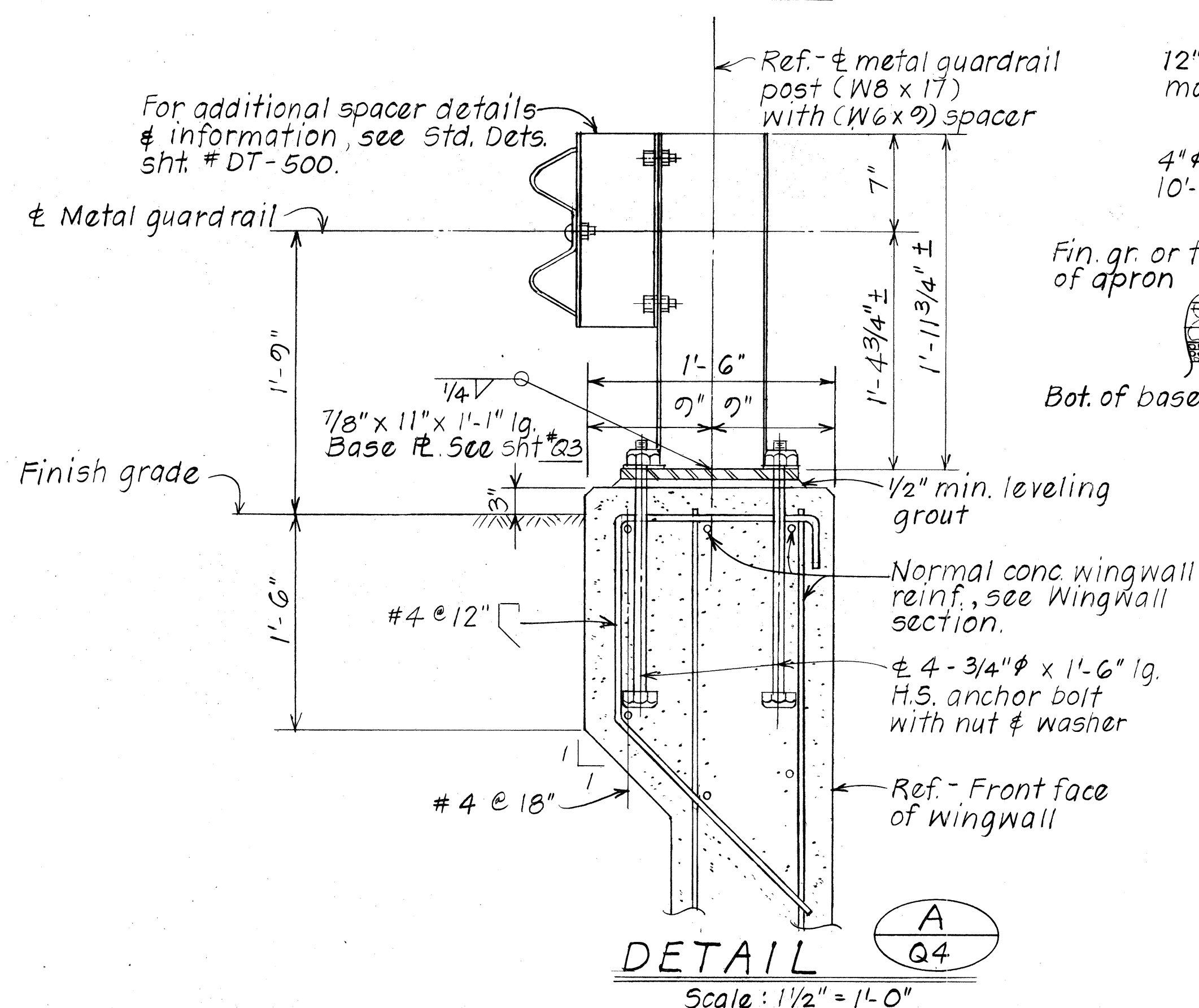
1. Hatched area shown thus  denotes limits of structure excavation pay line.
2. Hatched area shown thus  denotes limits of structure backfill.
3. Hatched area shown thus  denotes limits of channel excavation.

IMPERVIOUS MATERIAL

- Impervious material as selected by the Engineer shall be incidental to structure excavation. When "y" is 2'-0" or less, all backfill below PVC drain level shall be impervious material
- 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 embankment.

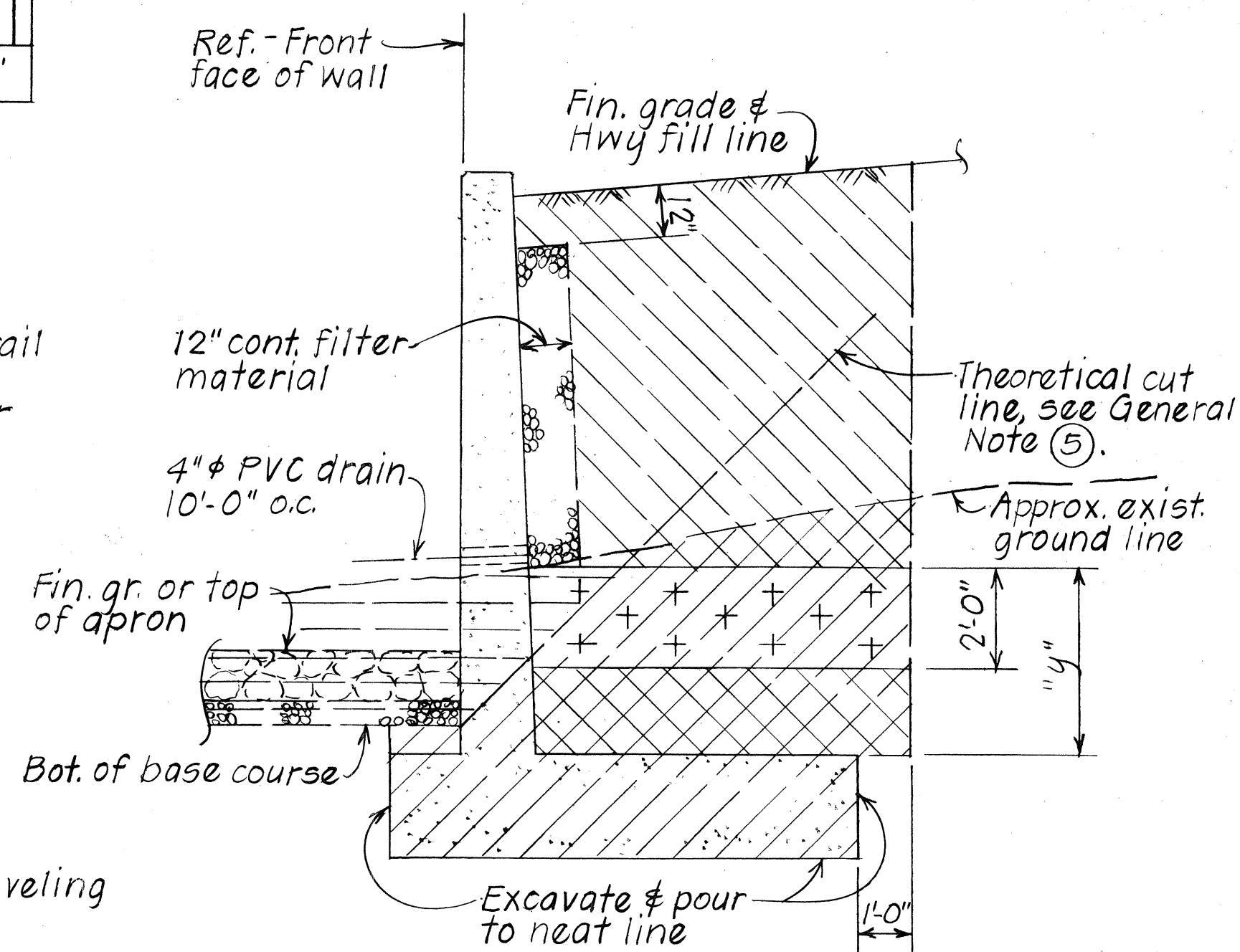


Scale: $\frac{1}{2}" = 1'-0"$



STRUCTURE EXCAVATION &
DRAINAGE DETAIL

N.T.S.



TYPICAL WALL SECTION

N. T. S.

STATE OF HAWAII
DEPARTMENT OF TRANSPORTATION
HIGHWAYS DIVISION

TYPICAL DETAILS
RETAINING WALL

KAWAIIAE RD. SAFETY IMPROVEMENTS-PHASE II
WAIMEA TO KAWAIIAE
F.A.P. NO. HES-0100(28)

Scale: As Noted Date: May 1986

SHEET No.Q4 OF 14 SHEETS