INDEX TO STRUCTURAL DRAWINGS

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HAWAII	HAW.	F-078-1(21)	1980	160	234

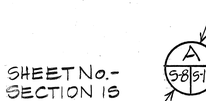
SHEET No.	DESCRIPTIONS
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	BRIDGE PIER DETAILS
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	WINGWALL #3 DETAILS
	FINISH ELEVATION AND DECK SLAB FRAMING PLAN (BRIDGES)
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	GENERAL FOUNDATION PLAN (TRESTLE)
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	ABUTMENT "T-1" DETAILS (TRESTLE)
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	BEAMS "X" "Y" & "Z" ELEVATIONS
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	ESTIMATED QUANTITIES, STRUCTURAL EXCAVATION & BACKFILL DETAILS AND ARCHITECTURAL WALL TREATMENT DETAIL
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	ABUTMENTS, CORNER WALLS & WINGWALLS - ELEVATIONS
	TYPICAL SECTIONS - ABUTMENT #1
	TYPICAL SECTIONS - ABUTMENT #2
	WINGWALLS #1 & #2 - PLANS & SECTION
	END POST DETAILS
	ABUTMENT SHELF - TYPICAL DETAILS
	PILE CAP FRAMING PLANS - PIERS #1 THRU #3
	PIERS #1 & #3 DETAILS
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	PIER CAP DETAILS
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	TOP SLAB REINFORCING PLAN
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	GIRDER ELEVATION, CENTER OF GRAVITY OF POST TENSION FORCES AND CAMBER DIAGRAM
	TYPICAL BEAMS "A" AND "B" DETAILS
	REINFORCING DETAILS FOR BEAM "A" AT GIRDERS
	SIDEWALK, CONC. RAILING AND RIGID BARRIER DETAILS
	EXPANSION JOINT DETAILS AT ABUTMENT AND MISCELLANEOUS DETAILS
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S-4	FOUNDATION LAYOUT PLAN
S-5	TYPICAL CROSS SECTIONS
S-6	TYPICAL LONGITUDINAL SECTION ALONG ℄
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S-8	ABUTMENT #1-PILE CAP FRAMING AND REINFORCING PLANS
S-9	ABUTMENT #2-PILE CAP FRAMING AND REINFORCING PLANS
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S-41	TYPE G WALL DETAILS
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S-44	TYPE P WALL DETAILS
S-45	TYPE Q & TYPE Q_R WALL DETAILS
S-46	TYPE R & TYPE S WALL DETAILS
S-47	TYPICAL WALL DETAILS
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N.I.C.

SYMBOLS AND ABBREVIATIONS



A.
- ABUT. ABUTMENT
- ADJ. ADJACENT
- ALT. ALTERNATE
- & AND
- APPROX. APPROXIMATE
- ARCH. ARCHITECTURAL
- @ AT
- AZ. AZIMUTH

B.
- BAL. BALANCE
- ℄ BASE LINE
- BM BEAM

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STATE OF HAWAII
DEPARTMENT OF TRANSPORTATION
HIGHWAYS DIVISION

INDEX TO STRUCTURAL DRAWINGS AND SYMBOLS AND ABBREVIATIONS

MOANALUA ROAD
PUULOA I.C. TO MIDDLE ST.-UNIT 3B
F.A. Proj. No. F-078-1(21)

SCALE: NONE DATE: AUG. 1, 1979

SHEET No. S-1 OF 63 SHEETS

ORIGINAL PLAN	SURVEY PLOTTED BY	DATE
NOTE BOOK	DRAWN BY	"
No.	TRACED BY	"
	DESIGN BY	"
	QUANTITIES BY	"
	CHECKED BY	"

FED. ROAD DIST. NO.	STATE	FED. AID PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
HAWAII	HAW.	F-078-1(21)	1980	161	234

GENERAL STRUCTURAL NOTES

DESIGN SPECIFICATIONS :

1. AASHTO, STANDARD SPECIFICATIONS FOR HIGHWAY BRIDGES (11TH. EDITION), INCLUDING INTERIM SPECIFICATIONS BRIDGES, 1974 AND 1975.

DESIGN LOADS :

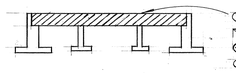
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MATERIAL (EXCEPT AS OTHERWISE NOTED ON PLANS) :

1. CONCRETE : 28-DAY CONCRETE STRENGTHS
   - SUPERSTRUCTURE - NON PRESTRESSED (COLUMN, ABUTMENT).... f'_c = 3,000 PSI
   - SUPERSTRUCTURE - POST TENSIONED (GIRDERS, SLABS, PIER CAPS) .. f'_c = 5,000 PSI
   - PIER (SEE SKETCH THIS SHEET)..... f'_c = 3,000 PSI
   - PIER FOOTINGS ..... f'_c = 3,000 PSI
   - ABUTMENTS, WINGWALLS, RETAINING WALLS, AND OTHER FOOTINGS ..... f'_c = 3,000 PSI
   - CULVERTS AND OTHER CONCRETE STRUCTURES..... f'_c = 3,000 PSI
2. REINFORCING STEEL FOR CAST-IN-PLACE CONCRETE : ASTM A615, GRADE 40 EXCEPT #14 & #18 BARS WHICH SHALL BE GRADE 60. #18 BARS ARE USED IN PIERS
3. PRESTRESSING STRANDS : 270 KSI ULTIMATE STRENGTH, ½-INCH DIAMETER, 7 WIRE STRESS-RELIEVED STRANDS.
4. SEE SPECIAL PROVISIONS FOR ADMIXTURE IN CONCRETE.
5. ALL STRUCTURAL STEEL SHALL CONFORM TO ASTM A36 AND BE HOT DIPPED GALVANIZED AFTER FABRICATION.
6. ALL ANCHOR BOLTS AND NUTS FOR BASE OF LIGHTING STANDARD AND OVERHEAD SIGN POSTS SHALL CONFORM TO ASTM A-307

FOUNDATION :

1. ALLOWABLE FOUNDATION PRESSURE
   - KAHAUIKI BOX CULVERT (BRIDGE)..... 2,000 PSF
   - RETAINING WALLS ON SPREAD FOOTING ..... 4,000 PSF
2. ALLOWABLE PILE CAPACITY ..... 50 TONS



CAST-IN-PLACE POST-TENSIONED GIRDER (f'_c = 5000 PSI CONCRETE)

CONSTRUCTION METHODS :

1. SEE STANDARD SPECIFICATIONS FOR ROAD AND BRIDGE CONSTRUCTION (HAWAII 1976) AND SPECIAL PROVISIONS.
2. ALL FOOTINGS, EXCEPT THOSE SUPPORTED ON PILES, SHALL BE EXCAVATED AND POURED NEAT AGAINST UNDISTURBED GROUND. IN CASE OF OVER EXCAVATION, SPACE BETWEEN FOOTING AND GROUND SHALL BE FILLED WITH CONCRETE AT THE CONTRACTOR'S EXPENSE AND AS DIRECTED BY THE ENGINEER. THE MINIMUM QUALITY OF THE FILL CONCRETE SHALL BE CLASS D.
3. IN GENERAL, TOP OF CONCRETE DECK OF STRUCTURE SHALL BE CONSTRUCTED TO FOLLOW THE FINISH ROADWAY VERTICAL AND HORIZONTAL CURVES AND GRADES.
4. GIRDER CONCRETE SEATS AND CREEP BLOCKS SHALL BE POURED MONOLITHICALLY WITH THE ABUTMENTS AND PIER CAP. TOP SURFACES OF CONCRETE SEATS SHALL HAVE HARD STEEL TROWEL FINISH.
5. SEE PLANS & ELEVATIONS FOR SPECIAL SURFACE FINISH.
6. CONTRACTOR SHALL VERIFY LOCATION OF EXISTING UTILITIES BEFORE DRIVING PILES.

CONSTRUCTION METHODS : (CONT.)

7. EXCEPT AS OTHERWISE NOTED, ALL VERTICAL DIMENSIONS ARE MEASURED PLUMB.
8. BACKFILL BEHIND ABUTMENT TO SHELF LEVEL SHALL BE COMPLETE IN PLACE BEFORE SUPERSTRUCTURE POUR.
9. GUIDES, TEMPLATES OR LATERAL BRACING SHALL BE REQUIRED FOR PILES DRIVEN ON EMBANKMENT SIDE SLOPES TO KEEP PROPER ALIGNMENT.
10. SPLICES FOR PILES, IF REQUIRED, SHALL BE LOCATED A MAXIMUM OF 50 FEET FROM THE BOTTOM OF PILE CAP.
11. VERTICAL PIER BARS SHALL BE ARRANGED IN SUCH A MANNER AS TO AVOID INTERFERENCE WITH PIER CAP REINFORCING AND/OR POST TENSIONING DUCTS.
12. FOR LOCATION OF RAIL LIGHTING, SEE HIGHWAY LIGHTING DRAWINGS. RAIL LIGHT MOUNTING SHALL BE AS PER MANUFACTURER'S RECOMMENDATION, AND SHALL BE APPROVED BY THE ENGINEER.
13. SEE SHEET S-27 FOR POST TENSION NOTES.
14. TEST PILES SHALL BE CAST 10 FEET LONGER THAN THE LENGTHS COMPUTED FROM THE TIP ELEVATION AND CUTOFF ELEVATION

GENERAL :

1. ALL ITEMS NOTED INCIDENTAL WILL NOT BE PAID FOR SEPARATELY. ALL BEARING PADS AND PREMOLDED JOINT FILLER SHALL BE INCIDENTAL TO CONCRETE.
2. THE CONTRACTOR SHALL VERIFY THE LOCATIONS OF ALL EXISTING UTILITY LINES AND NOTIFY THE RESPECTIVE OWNERS BEFORE COMMENCING WITH WORK. REFER TO UTILITY PLAN FOR VARIOUS ADDITIONAL CONDUITS IN DECK AND PIER CAP.
3. THE CONTRACTOR SHALL FURNISH SHOP PLACEMENT AND DETAIL DRAWINGS FOR ALL STRUCTURAL STEEL WORK.
4. MINIMUM COVER FOR REINFORCING BARS (UNLESS NOTED OTHERWISE ON PLANS) :
   - SLABS : TOP BARS : ..... 1½"
     BOTTOM BARS : ..... 1¼"
   - ABUTMENTS, WINGWALLS AND RETAINING WALLS : ..... 2"
   - CONCRETE CAST AGAINST AND PERMANENTLY EXPOSED TO EARTH : ..... 3"
   - BOX CULVERTS : TOP SLAB : 1½"
     WALLS & INSIDE FACE
     BOTTOM SLAB : ..... 2"
   - BOX GIRDERS : .....1¼" TO STIRRUP FOR OUTSIDE FACES
     .....1" TO STIRRUP FOR INSIDE FACES
   - COLUMNS AND PIERS : .....2" TO TIES

SYMBOLS AND ABBREVIATIONS, CONT.

B. B.C.JT.	BARRIER CONSTRUCTION JOINT	G. G-I	GIRDER NUMBER	P. PL	PLATE
B.E.JT.	BARRIER EXPANSION JOINT	GD.,GRD.	GRADE OR GROUND	PT	POINT
B.F.	BOTH FACES	GRP	GROUTED RUBBLE PAVING	P.I.	POINT OF INTERSECTION
B.F.E.	BOTTOM FOOTING ELEVATION			P.J.F.	PREMOLDED JOINT FILLER
B,BOT,BOTT.	BOTTOM	H. H	HIGH OR HINGED		
BPCE	BOTTOM PILE CAP ELEVATION	HORIZ.	HORIZONTAL	R. R	RADIUS
				REF.	REFERENCE
C. ℄	CENTER LINE	I. I.B.	INBOUND	REIN.	REINFORCEMENT
CL.,CLR.	CLEAR	INT.	INTERIOR	REQ'D.	REQUIRED
COL.	COLUMN			RT.	RIGHT
CONT.	CONTINUOUS	J. JT.	JOINT		
CONSTR.JT.	CONSTRUCTION JOINT			S. SCHED.	SCHEDULE
		L. LT.	LEFT OR LIGHT	SECT.	SECTION
D. DET.	DETAIL	LG.,L	LONG	SHT.	SHEET
D.,DIA.,Φ	DIAMETER	LONGIT.	LONGITUDINAL	S.E.	SUPERELEVATION
DO	DITTO			SP.,SPC	SPACES
		M. MAX.	MAXIMUM	℄	STATION LINE
E. EA.	EACH	MIN.	MINIMUM	ST.	STREET
E.F.	EACH FACE			SPCS.	SPECIFICATION
E.W.	EACH WAY	N. N.F.	NEAR FACE		
E.P.	EDGE OF PAVEMENT	No.,#	NUMBER		
EL.,ELEV.	ELEVATION	NTS	NOT TO SCALE		
EQ.	EQUAL				
EXP.,E	EXPANSION	O. O.B.	OUTBOUND		
EXT.	EXTERIOR	O.C.,℄	ON CENTERS		
		OP'NG.	OPENING		
F. F	FIXED	℄S	OFF SET		
F.F.	FAR FACE				
FIN.	FINISH				
FTG.	FOOTING				

S. STD.	STANDARD	T. T.P.	TURNING POINT	W. W.	WIDE
STA.	STATION	T.	TOP	W.P.	WORKING POINT
STIRR.	STIRRUP	TRANS.	TRANSVERSE	W.W.F.	WELDED WIRE FABRIC.
STR.	STRAIGHT	TYP.	TYPICAL		
SYMM.	SYMMETRICAL				
SIM.	SIMILAR	V. VERT.	VERTICAL		

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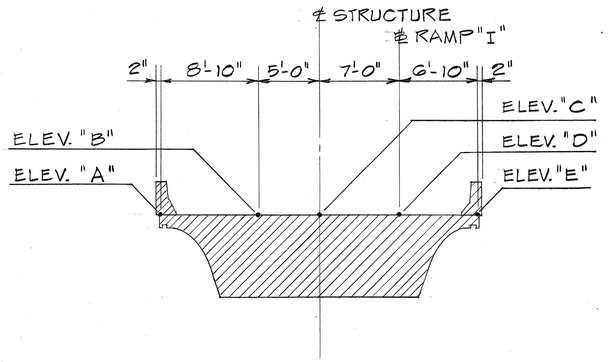
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GENERAL STRUCTURAL NOTES

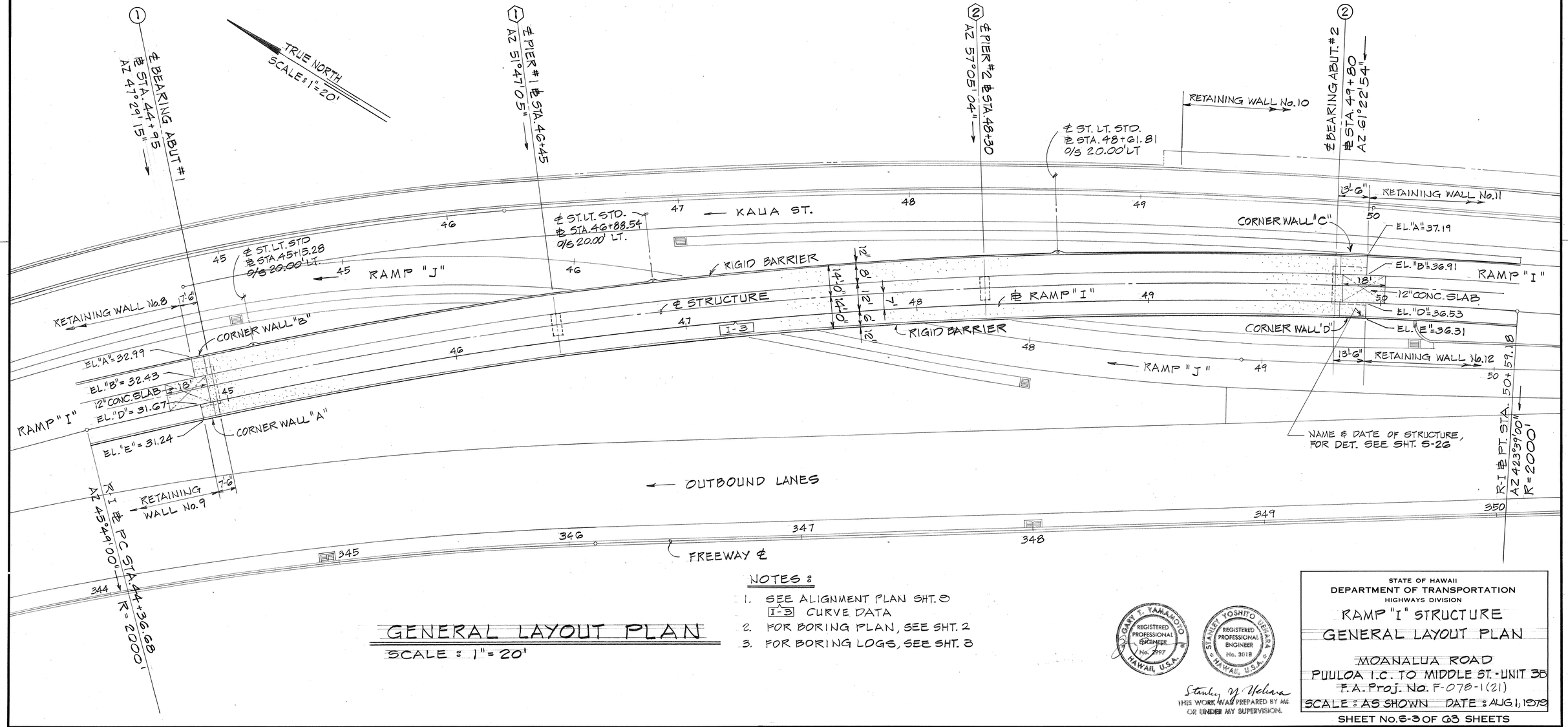
MOANALUA ROAD
PUULOA I.C. TO MIDDLE ST.-UNIT 3B
F.A. Proj. No. F-078-1(21)
SCALE : NONE DATE : AUG 1, 1979
SHEET No. S-2 OF 63 SHEETS

ORIGINAL PLAN	SURVEY PLOTTED BY	DATE
	DRAWN BY	
	TRACED BY	
NOTE BOOK	DESIGNED BY	
No.	QUANTITIES BY	
	CHECKED BY	



STATION	ELEV."A"	ELEV."B"	ELEV."C"	ELEV."D"	ELEV."E"	STATION	ELEV."A"	ELEV."B"	ELEV."C"	ELEV."D"	ELEV."E"	STATION	ELEV."A"	ELEV."B"	ELEV."C"	ELEV."D"	ELEV."E"
44+95	33.40	32.85	32.54	32.10	31.67	46+50	38.92	38.61	38.44	38.19	37.95	48+30	39.60	39.29	39.12	38.87	38.63
45+00	33.65	33.10	32.80	32.37	31.95	46+75	39.43	39.21	38.95	38.70	38.46	48+50	39.31	39.00	38.83	38.58	38.34
45+25	34.82	34.33	34.06	33.67	33.29	47+00	39.80	39.49	39.32	39.07	38.83	48+75	38.96	38.65	38.48	38.23	37.99
45+50	35.84	35.42	35.16	34.84	34.51	47+25	40.04	39.73	39.56	39.31	39.07	49+00	38.60	38.29	38.12	37.87	37.63
45+75	36.75	36.38	36.17	35.88	35.59	47+50	40.14	39.83	39.66	39.41	39.17	49+25	38.24	37.93	37.76	37.51	37.27
46+00	37.56	37.23	37.04	36.78	36.52	47+75	40.12	39.81	39.64	39.39	39.15	49+50	37.88	37.57	37.40	37.15	36.91
46+25	38.29	37.97	37.80	37.55	37.31	48+00	39.96	39.65	39.48	39.23	38.99	49+75	37.51	37.21	37.04	36.80	36.57
46+45	38.80	38.49	38.32	38.07	37.83	48+25	39.67	39.36	39.19	38.94	38.70	49+80	37.43	37.13	36.96	36.73	36.50

FED. ROAD DIST. NO.	STATE	FED. AID PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
HAWAII	HAW.	F-078-1(21)	1980	1G2	234



GENERAL LAYOUT PLAN

SCALE : 1" = 20'

NOTES :

1. SEE ALIGNMENT PLAN SHT. 5
   I-3 CURVE DATA
2. FOR BORING PLAN, SEE SHT. 2
3. FOR BORING LOGS, SEE SHT. 3

ORIGINAL PLAN	SURVEY PLOTTED BY:	DATE
	DRAWN BY:	
	TRACED BY:	
NOTE BOOK	DESIGNED BY:	
	QUANTITIES BY:	
No.	CHECKED BY:	

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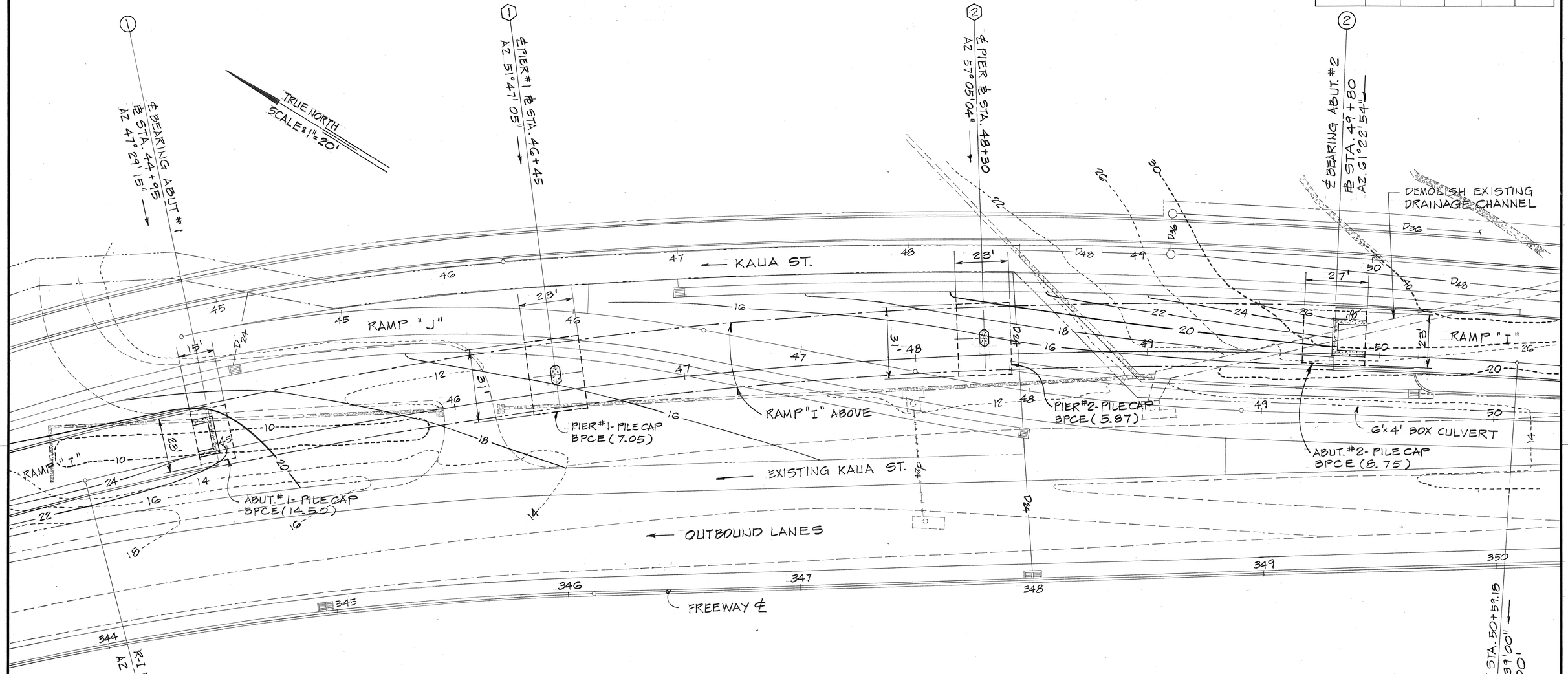
STATE OF HAWAII
DEPARTMENT OF TRANSPORTATION
HIGHWAYS DIVISION

RAMP "I" STRUCTURE
GENERAL LAYOUT PLAN

MOANALUA ROAD
PUULOA I.C. TO MIDDLE ST. - UNIT 3B
F.A. Proj. No. F-078-1(21)
SCALE : AS SHOWN DATE : AUG. 1, 1979

SHEET No. S-3 OF G3 SHEETS

FED. ROAD DIST. NO.	STATE	FED. AID PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
HAWAII	HAW.	F-078-1(21)	1980	163	234



FOUNDATION LAYOUT PLAN

SCALE: 1"=20'

REFERENCE DRAWINGS

ABUTMENT #1 SECTION	SHT. S-12
ABUTMENT #2 SECTION	SHT. S-13
PIERS #1 & #2 DETAILS	SHT. S-16
PROOF DRILLING FOR ABUTMENT #2	SHT. 38

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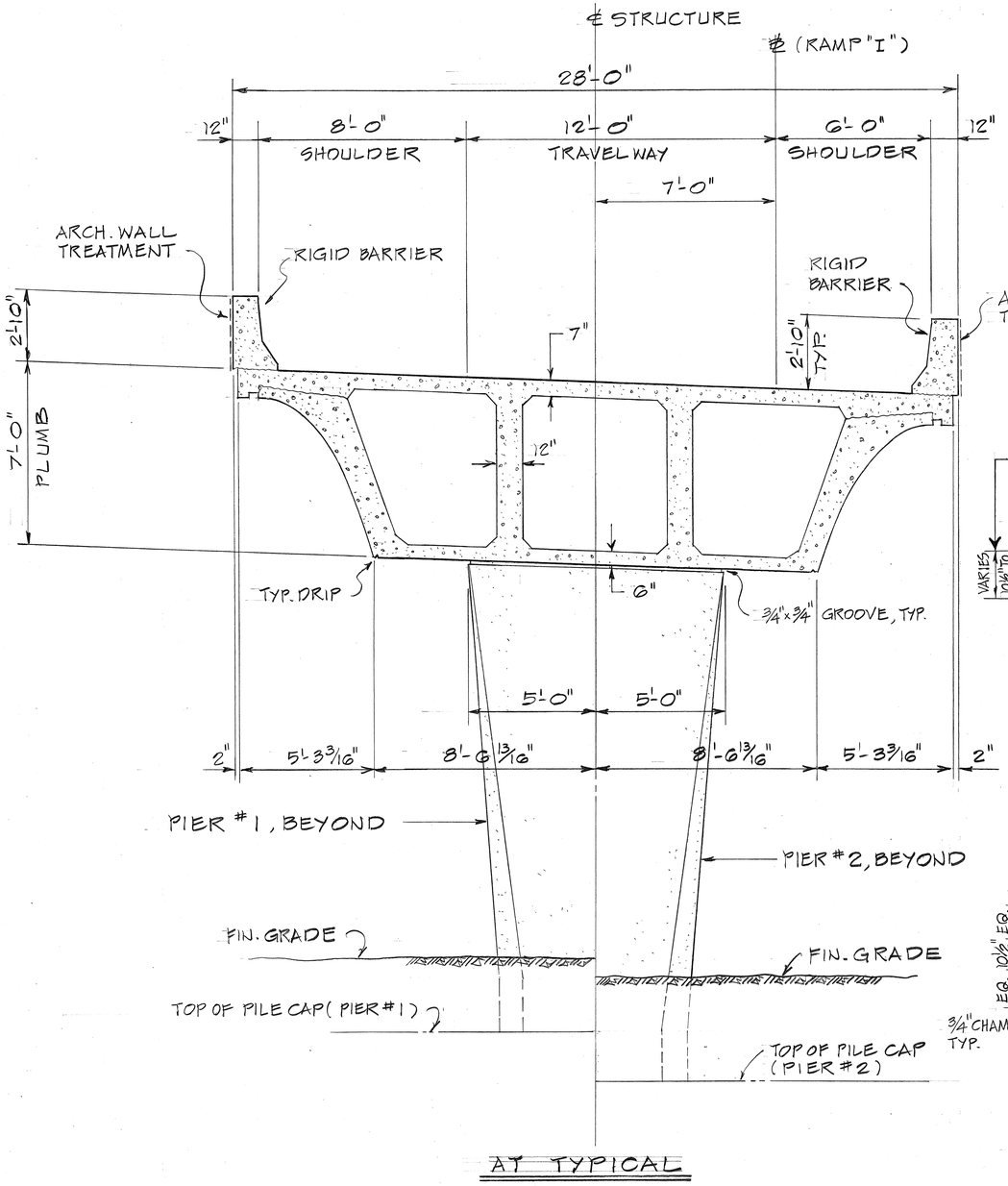
RAMP "I" STRUCTURE
FOUNDATION LAYOUT PLAN

MOANALUA ROAD
PUULOA I.C. TO MIDDLE ST.-UNIT 3B
F.A. Proj. No. F-078-1(21)
SCALE: AS SHOWN DATE: AUG. 1, 1979

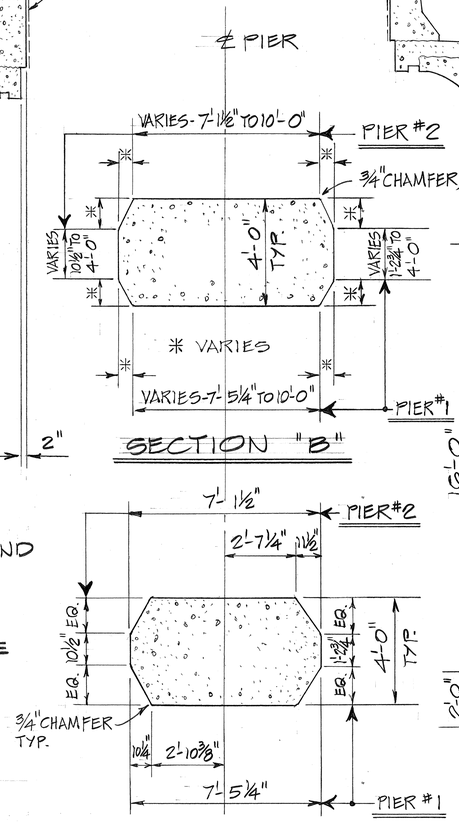
SHEET No. S-4 OF 63 SHEETS

ORIGINAL PLAN
NOTE BOOK
No.
SURVEY PLOTTED BY
DRAWN BY
TRACED BY
DESIGNED BY
QUANTITIES BY
CHECKED BY
DATE

FED. ROAD DIST. NO.	STATE	FED. AID PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
HAWAII	HAW.	F-078-1(21)	1980	164	234

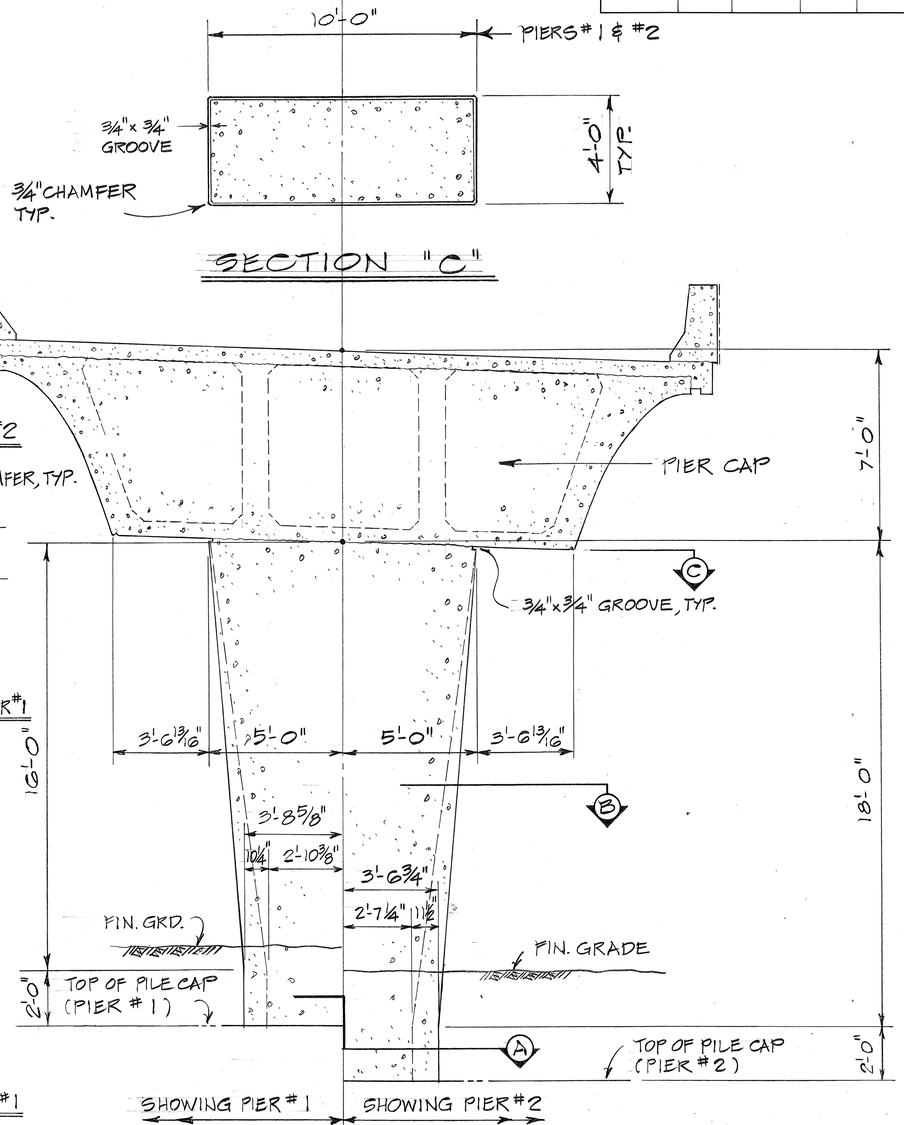


AT TYPICAL



SECTION "B"

SECTION "A"



AT PIER

NOTES:
1. HORIZONTAL DIMENSIONS SHOWN ARE AT RIGHT ANGLES TO ℄ OF STRUCTURE.
2. TOP OF PIER ELEVATIONS, SEE SHT. S-16

TYPICAL CROSS SECTIONS

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

ORIGINAL PLAN | NOTE BOOK | No.
SURVEY PLOTTED BY | DATE
DRAWN BY
TRACED BY
DESIGNED BY
QUANTITIES BY
CHECKED BY

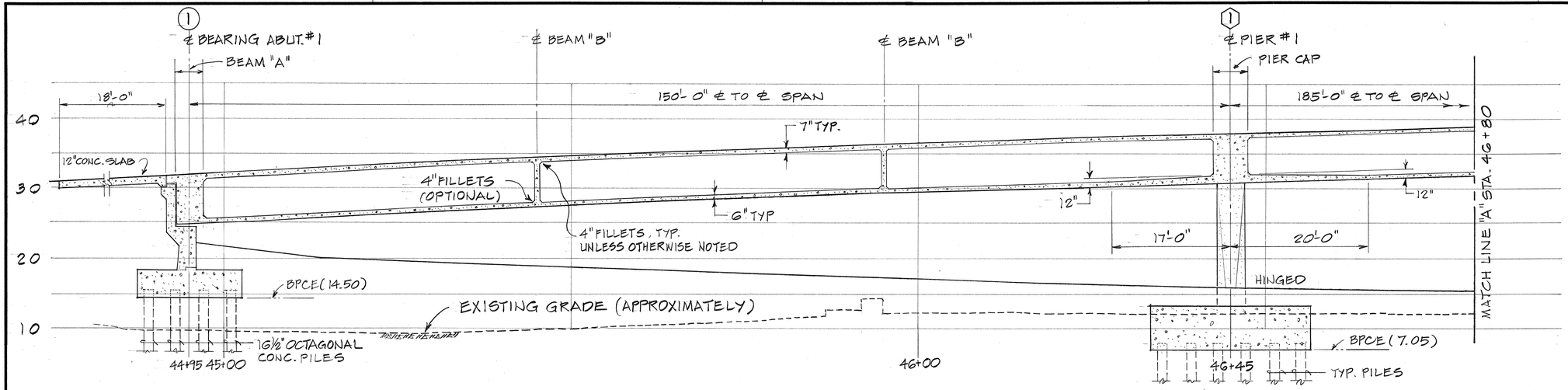
GARY T. YAMAMOTO — REGISTERED PROFESSIONAL ENGINEER — No. 2997 — HAWAII, U.S.A.

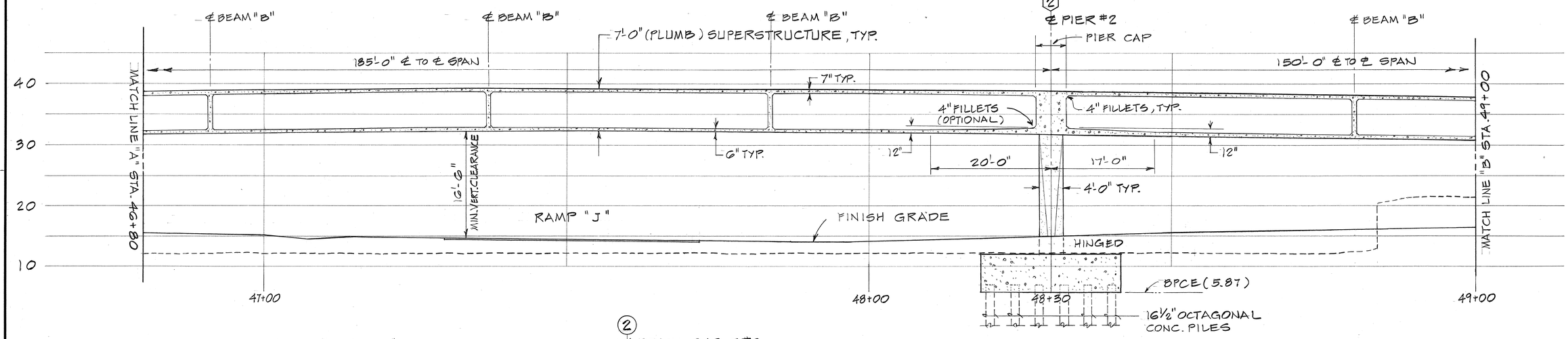
STANLEY YOSHITO UHARA — REGISTERED PROFESSIONAL ENGINEER — No. 3018 — HAWAII, U.S.A.

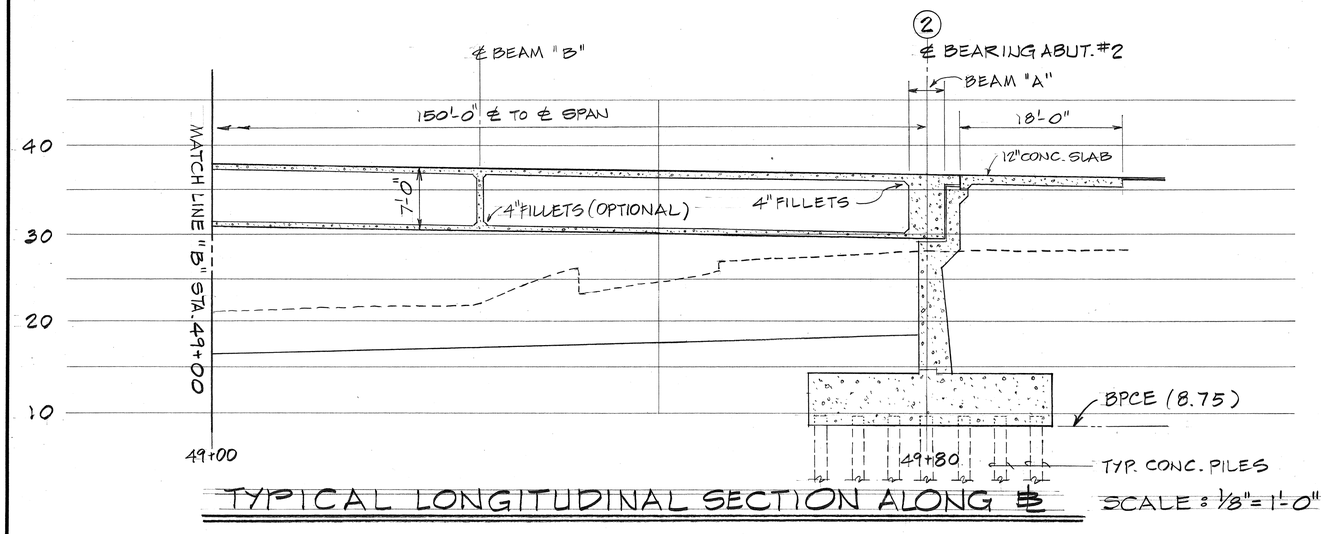
Stanley Y. Uehara
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STATE OF HAWAII
DEPARTMENT OF TRANSPORTATION
HIGHWAYS DIVISION
RAMP "I" STRUCTURE
TYPICAL CROSS SECTIONS
MOANALUA ROAD
PUULOA I.C. TO MIDDLE ST. - UNIT 3B
F.A. Proj No. F-078-1(21)
SCALE: AS SHOWN DATE: AUG 1, 1979
SHEET No. S-5 OF 63 SHEETS

FED. ROAD DIST. NO.	STATE	FED. AID PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
HAWAII	HAW.	F-078-1(21)	1980	165	284







TYPICAL LONGITUDINAL SECTION ALONG ℄

SCALE: 1/8" = 1'-0"

REFERENCE DRAWINGS

ABUTMENT #1 SECTION ..... SHT. S-12
ABUTMENT #2 SECTION ..... SHT. S-13
PIERS #1 & #2 DETAILS ..... SHT. S-16

GARY I. YAMASHIRO REGISTERED PROFESSIONAL ENGINEER No. 2997 HAWAII, U.S.A.

STANLEY YOSHITO UEHARA REGISTERED PROFESSIONAL ENGINEER No. 2018 HAWAII, U.S.A.

Stanley Y. Uehara

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STATE OF HAWAII
DEPARTMENT OF TRANSPORTATION
HIGHWAYS DIVISION

RAMP "I" STRUCTURE
TYPICAL LONGITUDINAL SECTION ALONG ℄
MOANALUA ROAD
PUULOA I.C. TO MIDDLE ST. - UNIT 3B
F.A. Proj. No. F-078-1(21)

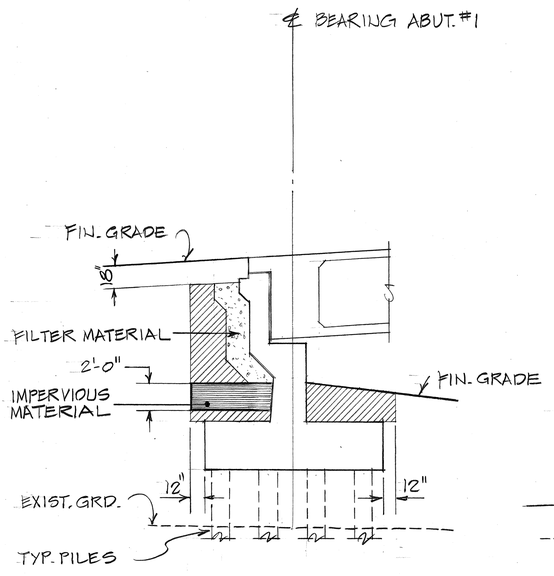
SCALE: AS SHOWN DATE: AUG 1, 1979

SHEET NO. S-6 OF 63 SHEETS

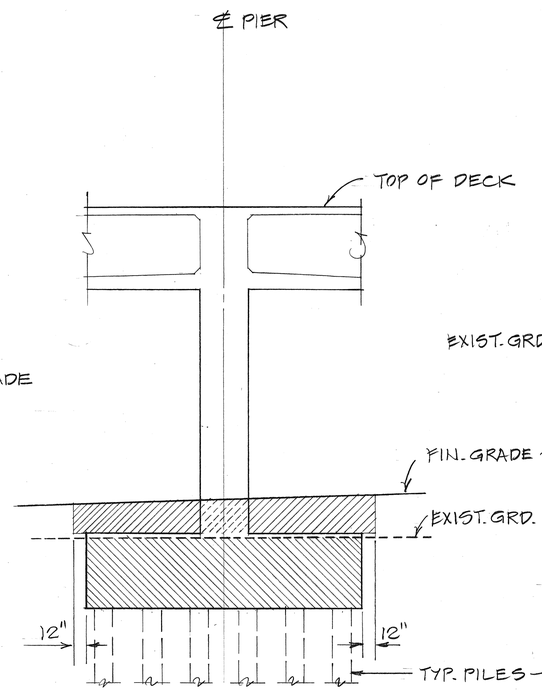
ORIGINAL PLAN | NOTE BOOK | No.

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

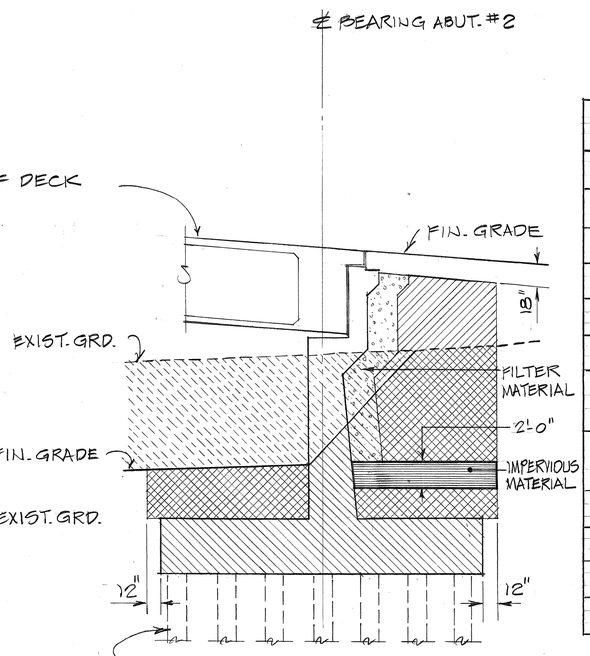
FED. ROAD DIST. NO.	STATE	FED. AID PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
HAWAII	HAW.	F-078-1(21)	1980	166	234



ABUTMENT #1



PIERS #1 & #2



ABUTMENT #2

ESTIMATED QUANTITIES (RAMP "I" STRUCTURE)

ITEM No.	ITEM	UNIT	QUANTITIES
206.6004	STRUCTURE EXCAVATION FOR BRIDGES	Cu. Yd.	621
206.7211	STRUCTURE BACKFILL FOR BRIDGES	Cu. Yd.	577
206.8200	FILTER MATERIAL	Cu. Yd.	50
503.1800	CONCRETE IN RAMP "I" STRUCTURE	L.S	(285 Cu. Yd)
503.1801	CONCRETE IN FOOTING FOR RAMP "I" STRUCTURE	L.S	(504 Cu. Yd)
504.8511	POST TENSIONING OPERATIONS FOR CAST-IN-PLACE STRUCTURE - RAMP "I" STRUCTURE	L.S.	(106,502 lbs)
504.9201	CONCRETE FOR POST-TENSIONED CAST- IN- PLACE STRUCTURE - RAMP "I" STRUCTURE	L.S.	(1,101 Cu. Yd)
505.0430	PRECAST, PRESTRESSED CONCRETE PILES, FURNISHED	Lin. Ft.	11,743
505.4300	PRECAST, PRESTRESSED CONCRETE PILES, DRIVEN	Lin. Ft.	11,176
507.7000	CONCRETE BRIDGE PARAPET AND END POST	Lin. Ft.	1,012
602.0081	REINFORCING STEEL IN RAMP "I" STRUCTURE	L.S.	(382,000 lbs)

LEGEND :

- STRUCTURE EXCAVATION
- STRUCTURE BACK FILL
- ROAD WAY EXCAVATION

NOTE :

IF NO ROADWAY EXCAVATION IS INVOLVED AT THE WALL OR THE PIER, STRUCTURE EXCAVATION WILL BE MEASURED FROM EXISTING GROUND.

TYPICAL STRUCTURE EXCAVATION AND BACKFILL DETAILS

NOT TO SCALE

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

ORIGINAL PLAN
NOTE BOOK
No.

GARY T. YAMAMOTO — REGISTERED PROFESSIONAL ENGINEER No. 2997 — HAWAII, U.S.A.

STANLEY YOSHITO UCHIARA — REGISTERED PROFESSIONAL ENGINEER No. 3018 — HAWAII, U.S.A.

Stanley Y. Uchiara
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DATE	REVISION
4/8/81	REVISED QUANTITY FOR ITEM NO. 503.1801

STATE OF HAWAII
DEPARTMENT OF TRANSPORTATION
HIGHWAYS DIVISION

RAMP "I" STRUCTURE

TYPICAL STRUCTURE EXCAVATION AND BACKFILL DETAILS AND ESTIMATED QUANTITIES

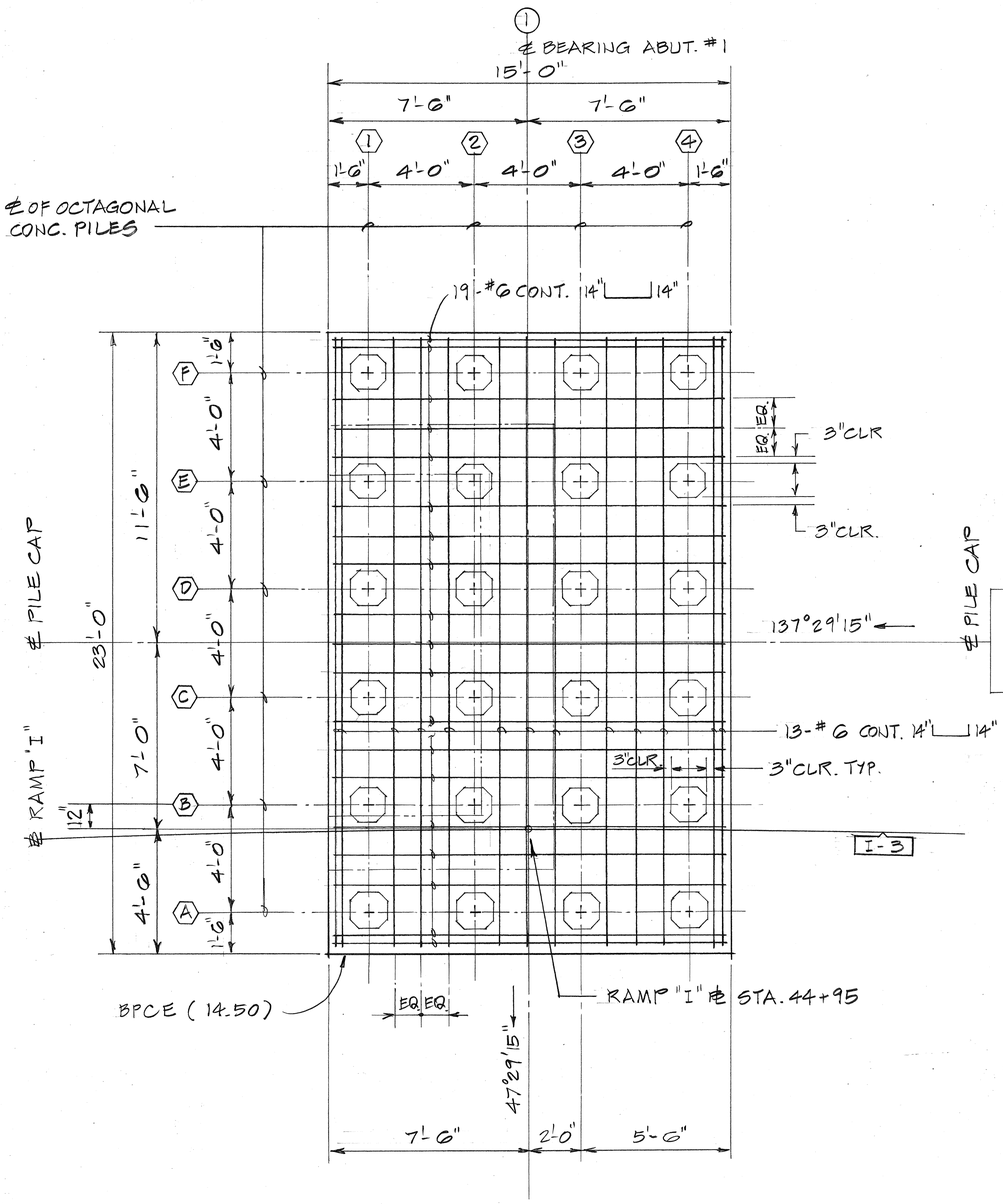
MOANALUA ROAD
PUULOA I.C. TO MIDDLE ST.-UNIT 3B
F.A. Proj No. F-078-1(21)

SCALE : AS SHOWN DATE : AUG. 1, 1979

SHEET No. 5-7 OF 63 SHEETS

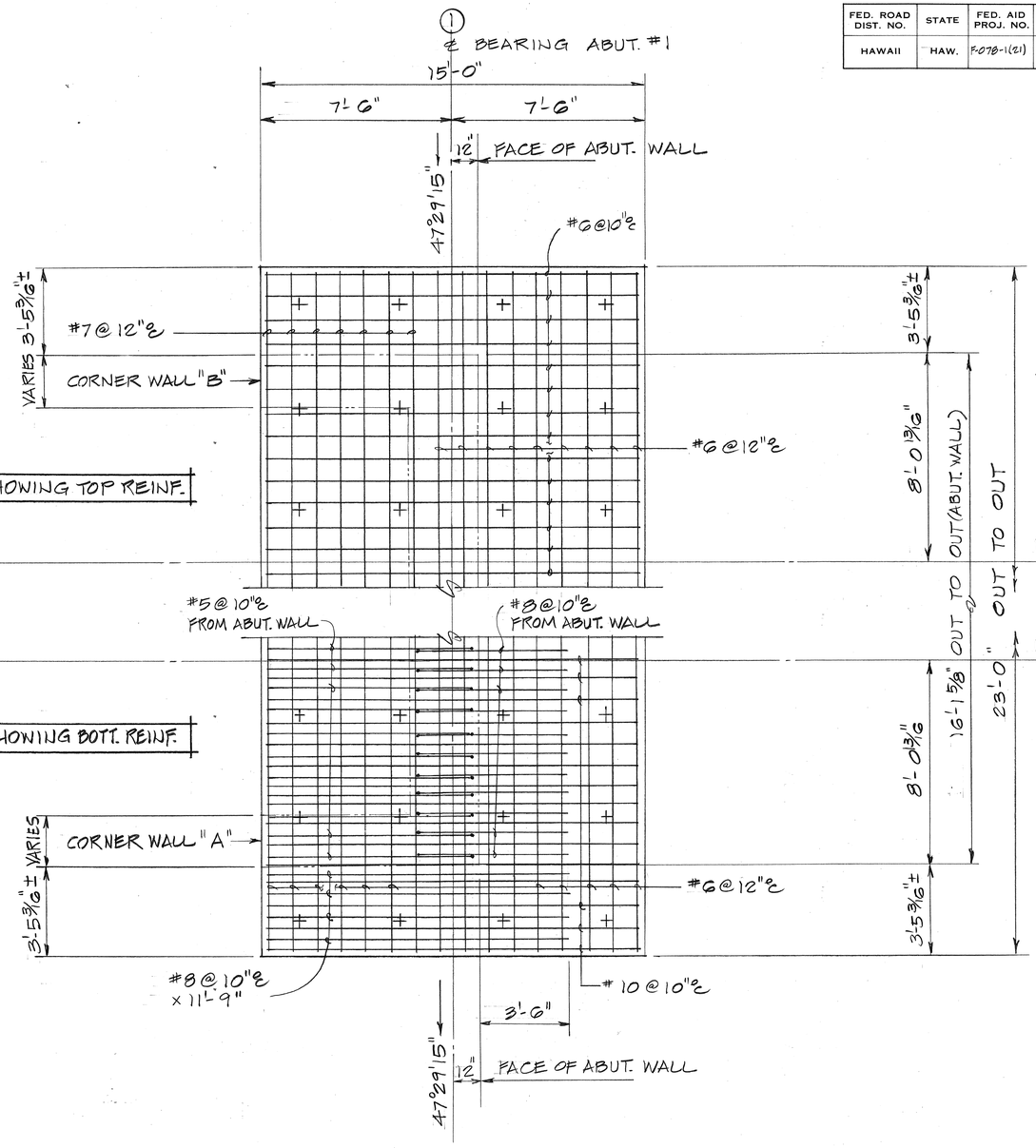
ADD 166

FED. ROAD DIST. NO.	STATE	FED. AID PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
HAWAII	HAW.	F-078-1(21)	1980	167	234



ABUTMENT #1 - PILE CAP FRAMING PLAN

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



ABUTMENT #1 - PILE CAP REINFORCING PLAN

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

PILE TIP ELEVATION : -85.00 TYP.
(FOR ALL PILES - 24 TOTAL)
ONE TEST PILE FOR ABUTMENT #1 SHALL BE DRIVEN FOR LENGTH AND SHALL BE CAST 10 FEET LONGER THAN REQ'D. TO REACH THE RECOMMENDED PILE TIP ELEV. (TO BE DONE UNDER SUPERVISION OF THE ENGINEER)

REFERENCE DRAWINGS

ABUTMENT SECTION ..... SHT. S-12
16½" OCTAGONAL CONC. PILES ..... SHTS. S-G2 & S-G3

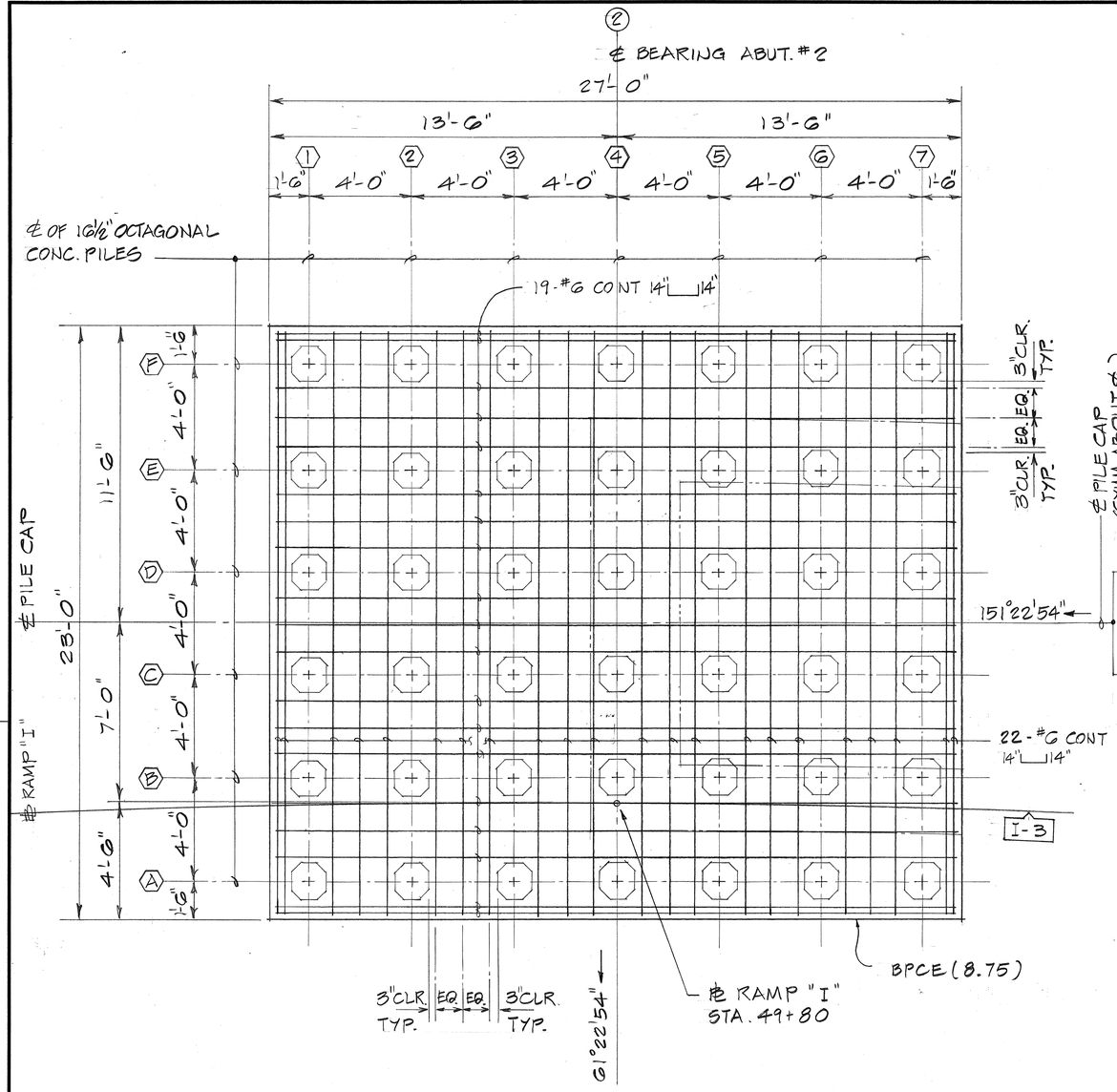
ORIGINAL PLAN
SURVEY PLOTTED BY
DRAWN BY
TRACED BY
DESIGNED BY
QUANTITIES BY
CHECKED BY
DATE
NOTE BOOK
No.

GARY T. YAMAMOTO — REGISTERED PROFESSIONAL ENGINEER No. 5997 — HAWAII, U.S.A.
STANLEY YOSHITO UCHARA — REGISTERED PROFESSIONAL ENGINEER No. 3018 — HAWAII, U.S.A.

Stanley Y. Uchara
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STATE OF HAWAII
DEPARTMENT OF TRANSPORTATION
HIGHWAYS DIVISION
RAMP "I" STRUCTURE
ABUTMENT #1 - PILE CAP FRAMING AND REINFORCING PLANS
MOANALUA ROAD
PUULOA I.C. TO MIDDLE ST. - UNIT 3B
F.A. Proj. No. F-078-1(21)
SCALE : AS SHOWN DATE : AUG 1, 1979
SHEET No. S-8 OF 63 SHEETS

FED. ROAD DIST. NO.	STATE	FED. AID PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
HAWAII	HAW.	F-078-1(21)	1980	168	284



ABUTMENT #2 - PILE CAP FRAMING PLAN

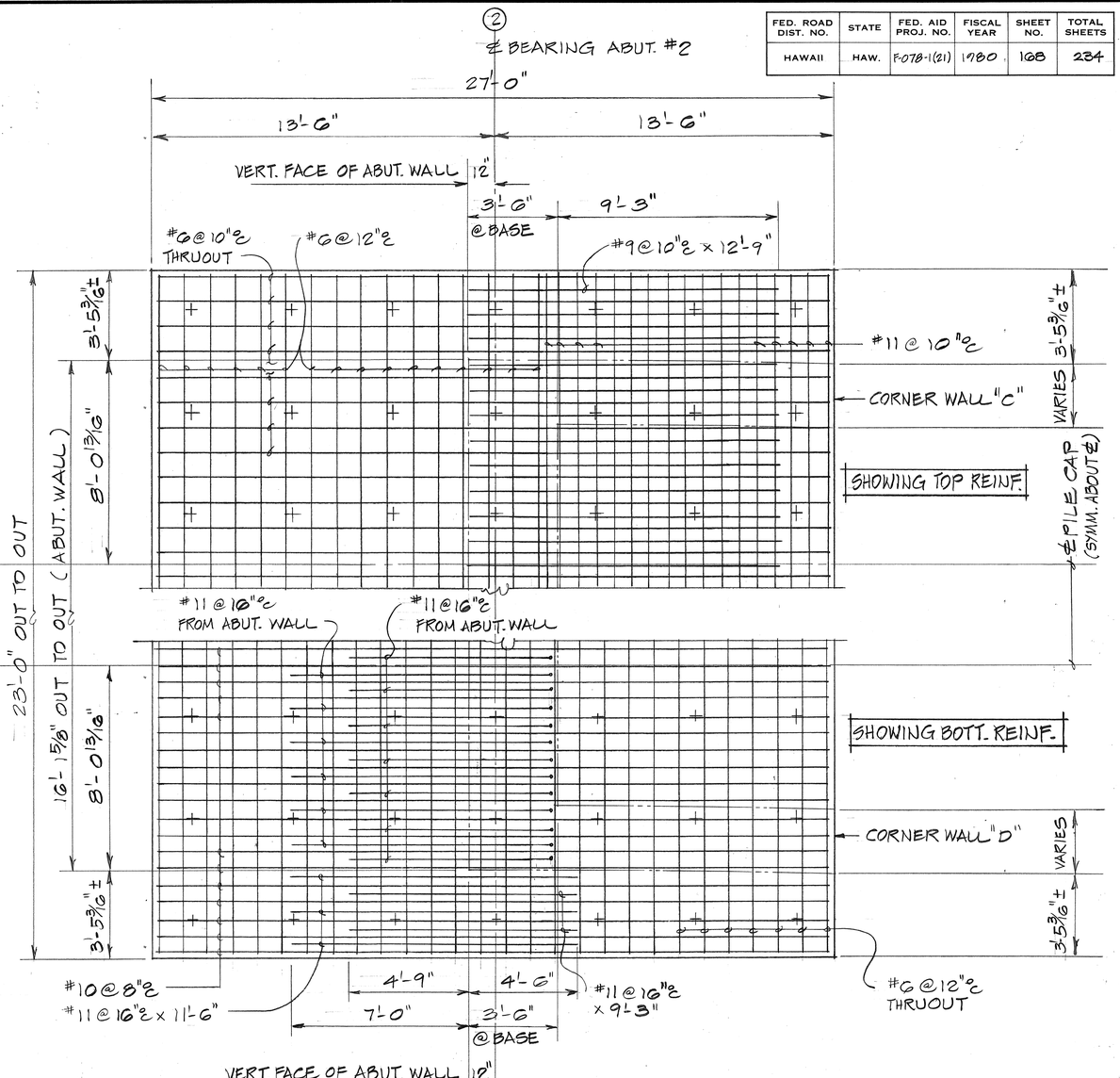
SCALE : 3/8" = 1'-0"

PILE TIP ELEVATION : - 60.00 TYP.
(FOR ALL PILES - 42 TOTAL)

TWO TEST PILES FOR ABUTMENT #2 SHALL BE DRIVEN FOR LENGTH AND SHALL BE CAST 10 FEET LONGER THAN REQ'D. TO REACH THE RECOMMENDED PILE TIP ELEV. (TO BE DONE UNDER SUPERVISION OF THE ENGINEER)

REFERENCE DRAWINGS

ABUTMENT SECTION ..... SHT. S-13
16½" OCTAGONAL CONC. PILES ..... SHTS. S-G2 & S-G3



ABUTMENT #2 - PILE CAP REINFORCING PLAN

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

ORIGINAL PLAN | SURVEY PLOTTED BY | DRAWN BY | TRACED BY | DESIGNED BY | QUANTITIES BY | CHECKED BY | DATE | NOTE BOOK | No.

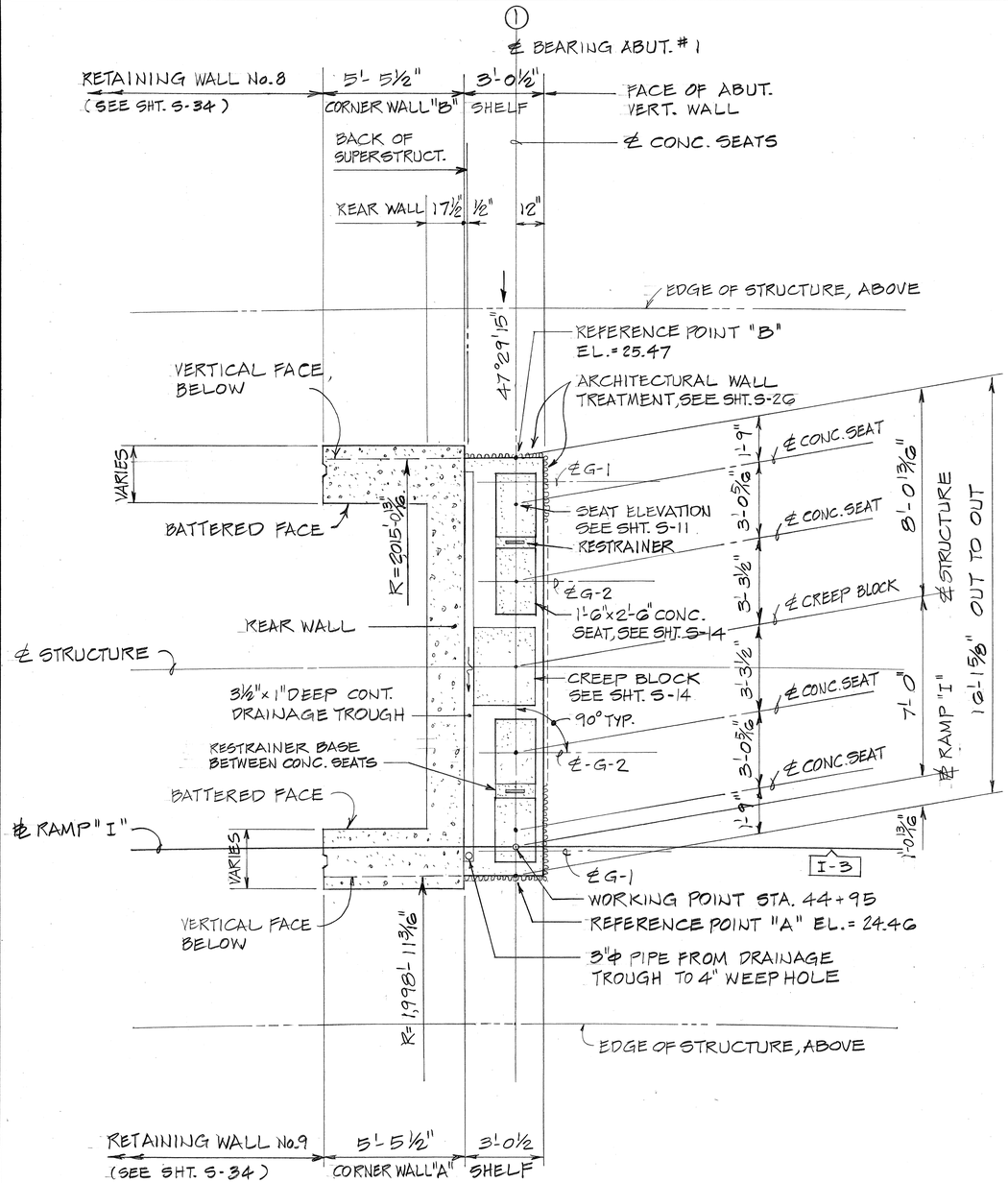
STATE OF HAWAII
DEPARTMENT OF TRANSPORTATION
HIGHWAYS DIVISION
RAMP "I" STRUCTURE
ABUTMENT #2 - PILE CAP FRAMING AND REINFORCING PLANS
MOANALUA ROAD
PUULOA I.C. TO MIDDLE ST. - UNIT 3B
F.A. Proj. No. F-078-1(21)
SCALE : AS SHOWN DATE : AUG 1, 1979

REGISTERED PROFESSIONAL ENGINEER No. 2997 HAWAII, U.S.A. — RAY I. YAMAMOTO
REGISTERED PROFESSIONAL ENGINEER No. 3018 HAWAII, U.S.A. — STANLEY YOSHITO UCHIHARA

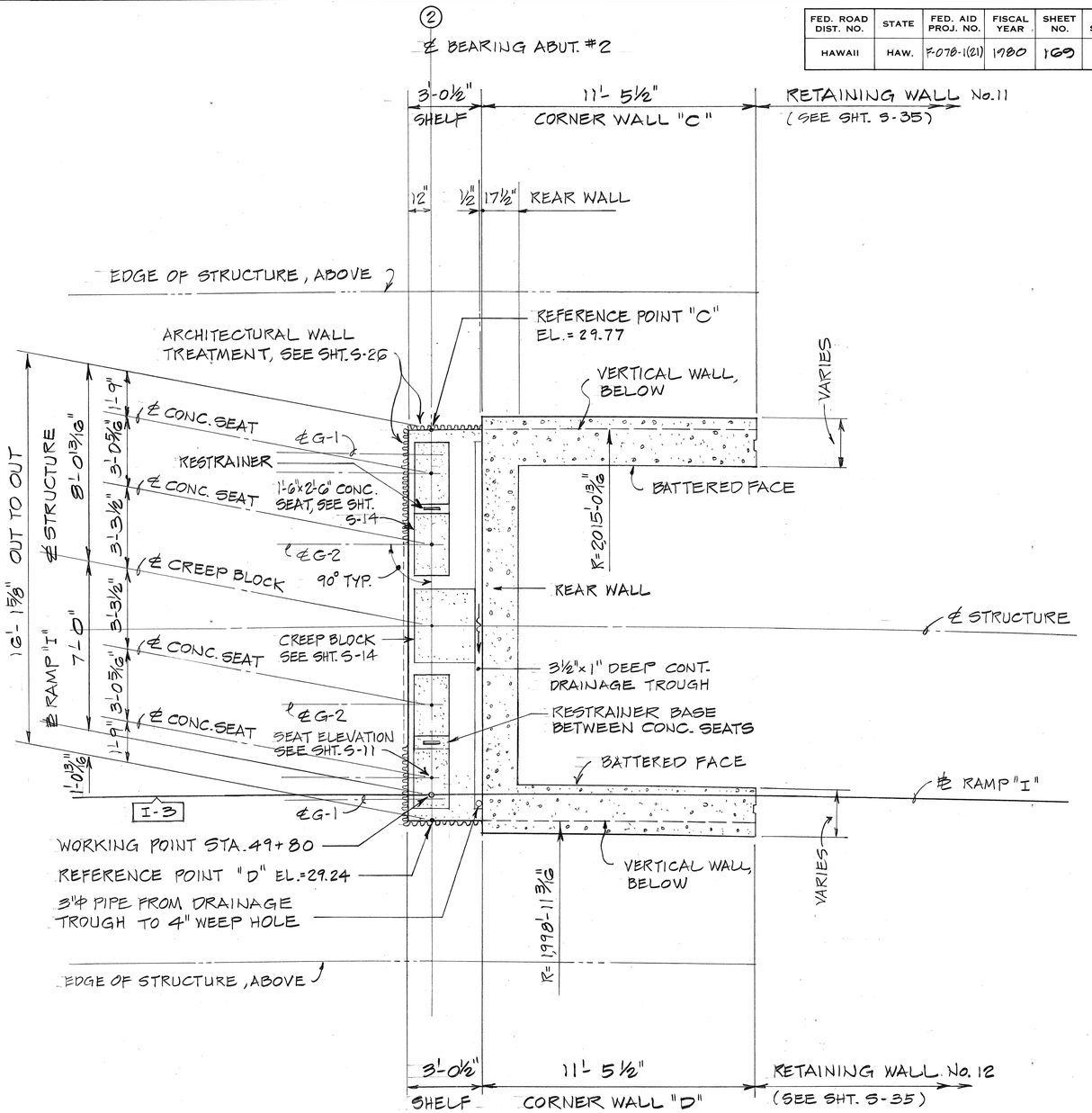
Stanley Y. Uchihara
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SHEET NO. S-9 OF G3 SHEETS

FED. ROAD DIST. NO.	STATE	FED. AID PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
HAWAII	HAW.	F-078-1(21)	1980	169	234



ABUTMENT # 1



ABUTMENT # 2

REFERENCE DRAWINGS

ABUTMENT SECTIONS .....SHTS. S-12 & S-13

ABUTMENT PLANS AT SHELF

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

ORIGINAL PLAN | SURVEY PLOTTED BY | TRACED BY | DESIGNED BY | QUANTITIES BY | CHECKED BY | DATE | NOTE BOOK | No.

GARY T. YAMAMOTO REGISTERED PROFESSIONAL ENGINEER No. 2997 HAWAII, U.S.A.

STANLEY YOSHITO UCHARA REGISTERED PROFESSIONAL ENGINEER No. 3018 HAWAII, U.S.A.

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STATE OF HAWAII
DEPARTMENT OF TRANSPORTATION
HIGHWAYS DIVISION

RAMP "I" STRUCTURE

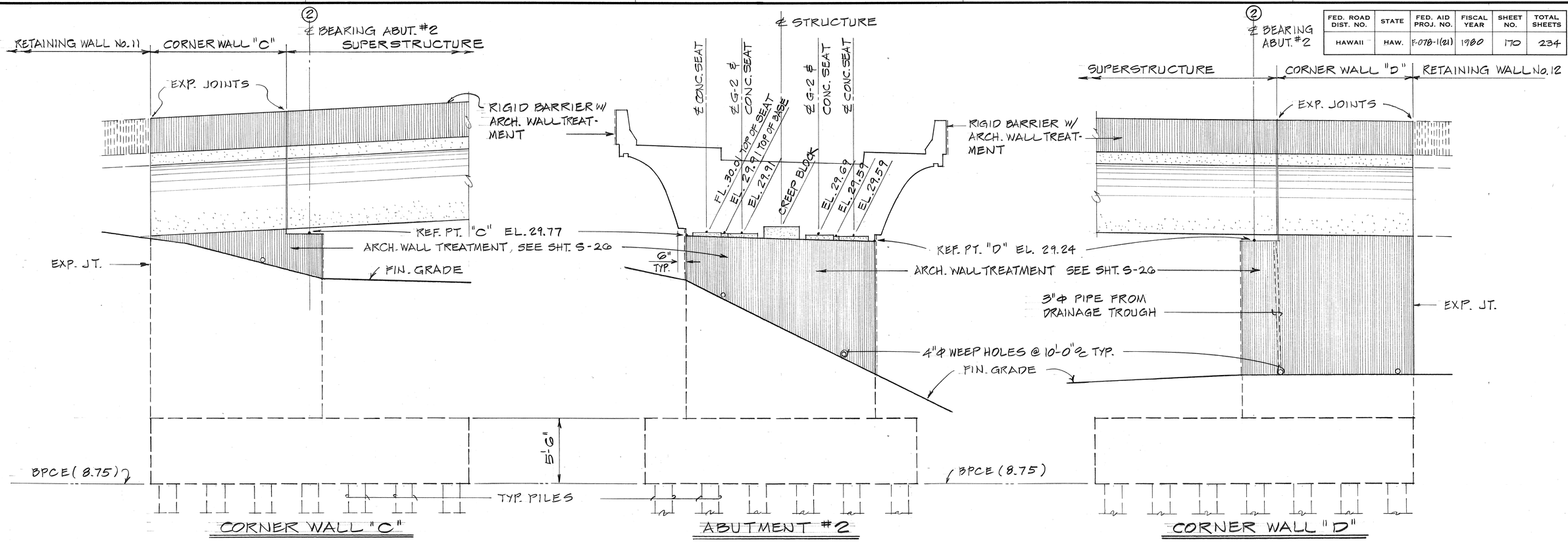
ABUTMENT PLANS AT SHELF

MOANALUA ROAD
PUULOA I.C. TO MIDDLE ST. - UNIT 3B
F.A. Proj. No. F-078-1(21)

SCALE: AS SHOWN DATE: AUG. 1, 1979

SHEET No. S-10 OF 63 SHEETS

FED. ROAD DIST. NO.	STATE	FED. AID PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
HAWAII	HAW.	F-078-1(21)	1980	170	234



ABUTMENTS & CORNER WALLS - ELEVATIONS

SCALE: 1/4"=1'-0"

SURVEY PLOTTED BY
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QUANTITIES BY
CHECKED BY
DATE
ORIGINAL PLAN
NOTE BOOK
No.

REGISTERED PROFESSIONAL ENGINEER No. 2994 HAWAII, U.S.A. — GARY T. YAMAMOTO

REGISTERED PROFESSIONAL ENGINEER No. 3018 HAWAII, U.S.A. — STANLEY YOSHITO UCHARA

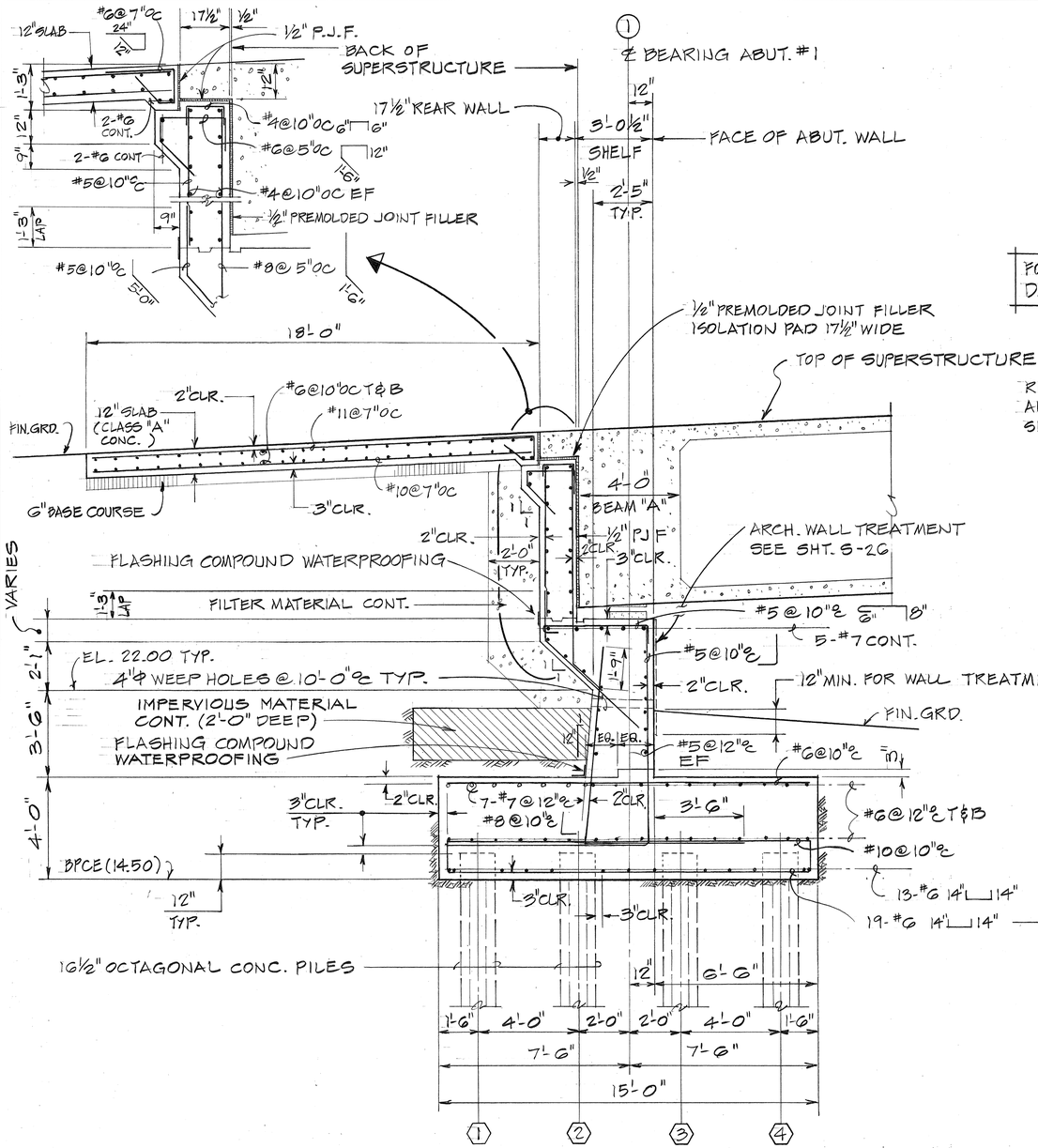
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STATE OF HAWAII
DEPARTMENT OF TRANSPORTATION
HIGHWAYS DIVISION

RAMP "I" STRUCTURE
ABUTMENTS & CORNER WALLS - ELEVATIONS
MOANALUA ROAD
PUULOA I.C. TO MIDDLE ST. - UNIT 3B
F.A. Proj. No. F-078-1(21)
SCALE: AS SHOWN DATE: AUG 1, 1979

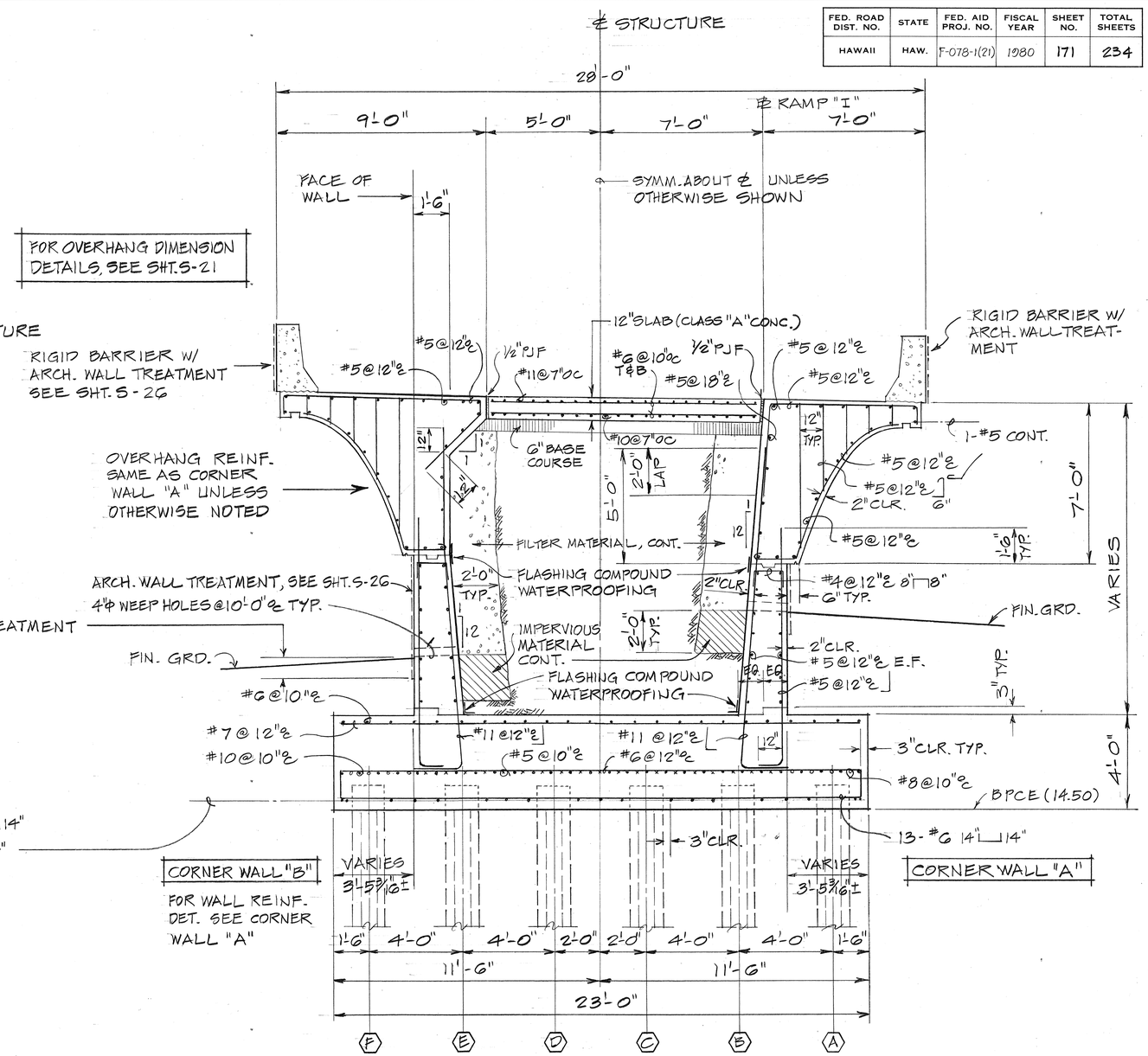
SHEET No. S-11 OF 63 SHEETS

FED. ROAD DIST. NO.	STATE	FED. AID PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
HAWAII	HAW.	F-078-1(21)	1980	171	234



AT ABUTMENT

FOR OVERHANG DIMENSION DETAILS, SEE SHT. S-21



CORNER WALL "B"

FOR WALL REINF. DET. SEE CORNER WALL "A"

CORNER WALL "A"

AT CORNER WALLS "A" & "B"

ORIGINAL PLAN | SURVEY PLOTTED BY | DRAWN BY | TRACED BY | DESIGNED BY | QUANTITIES BY | CHECKED BY | DATE | NOTE BOOK | No.

REFERENCE DRAWINGS

STRUCTURE EXCAVATION & BACKFILL DETAILS ..... SHT. S-7

16½" OCTAGONAL CONC. PILES ..... SHTS. S-62 & S-63.

TYPICAL SECTIONS - ABUTMENT #1

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

GARY I. YAMAMOTO REGISTERED PROFESSIONAL ENGINEER No. 2997 HAWAII, U.S.A.

STANLEY YOSHITO UEHARA REGISTERED PROFESSIONAL ENGINEER No. 3018 HAWAII, U.S.A.

Stanley Y. Uehara

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STATE OF HAWAII
DEPARTMENT OF TRANSPORTATION
HIGHWAYS DIVISION

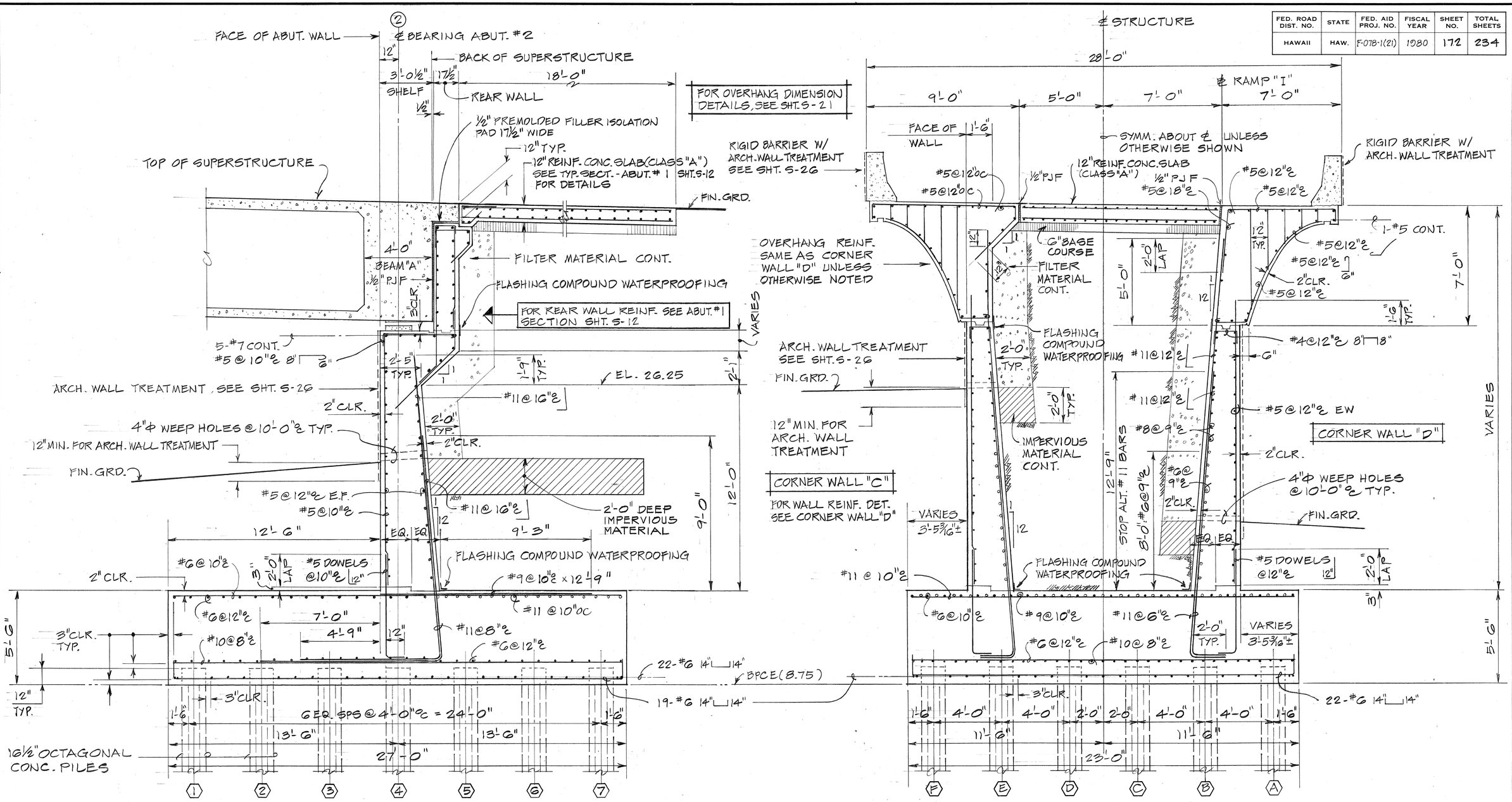
RAMP "I" STRUCTURE

TYPICAL SECTIONS-ABUTMENT #1

MOANALUA ROAD
PUULOA I.C. TO MIDDLE ST.-UNIT 3B
F.A. PROJ. NO. F-078-1(21)
SCALE : AS SHOWN DATE : AUG. 1, 1979

SHEET NO. S-12 OF 63 SHEETS

FED. ROAD DIST. NO.	STATE	FED. AID PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
HAWAII	HAW.	F-078-1(21)	1980	172	234



REFERENCE DRAWINGS

STRUCTURE EXCAVATION & BACKFILL DETAILS ..... SHT. S-7

16½" OCTAGONAL CONC. PILES ..... SHTS. S-62 & S-63

TYPICAL SECTIONS - ABUTMENT #2

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

ORIGINAL PLAN	SURVEY PLOTTED BY	DATE
	DRAWN BY	
	TRACED BY	
NOTE BOOK	DESIGNED BY	
	QUANTITIES BY	
No.	CHECKED BY	

GARY T. YAMAMOTO — REGISTERED PROFESSIONAL ENGINEER — No. 2967 — HAWAII, U.S.A.

STANLEY YOSHITO UEHARA — REGISTERED PROFESSIONAL ENGINEER — No. 3018 — HAWAII, U.S.A.

Stanley Y. Uehara

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STATE OF HAWAII
DEPARTMENT OF TRANSPORTATION
HIGHWAYS DIVISION

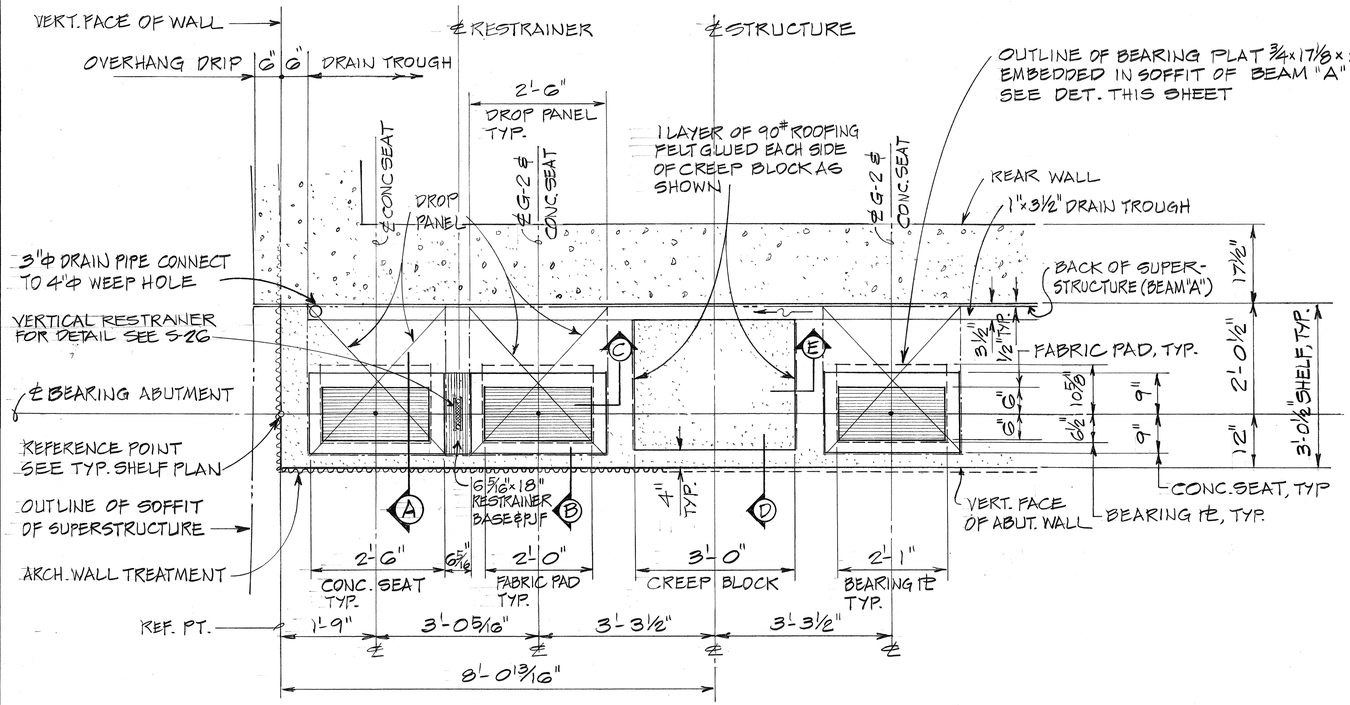
RAMP "I" STRUCTURE
TYPICAL SECTIONS - ABUTMENT #2

MOANALUA ROAD
PUULOA I.C. TO MIDDLE ST. - UNIT 3B
F.A. Proj. No. F-078-1-(21)
SCALE : AS SHOWN DATE : AUG. 1, 1979

SHEET No. S-13 OF 63 SHEETS

172

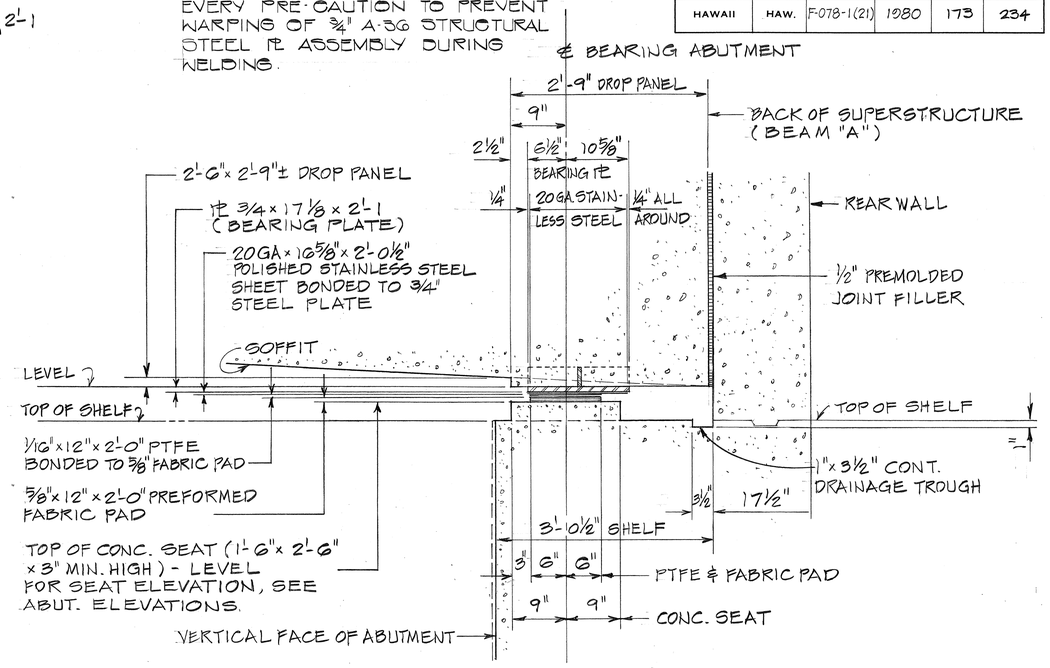
FED. ROAD DIST. NO.	STATE	FED. AID PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
HAWAII	HAW.	F-078-1(21)	1980	173	234



PARTIAL ENLARGED ABUTMENT SHELF PLAN

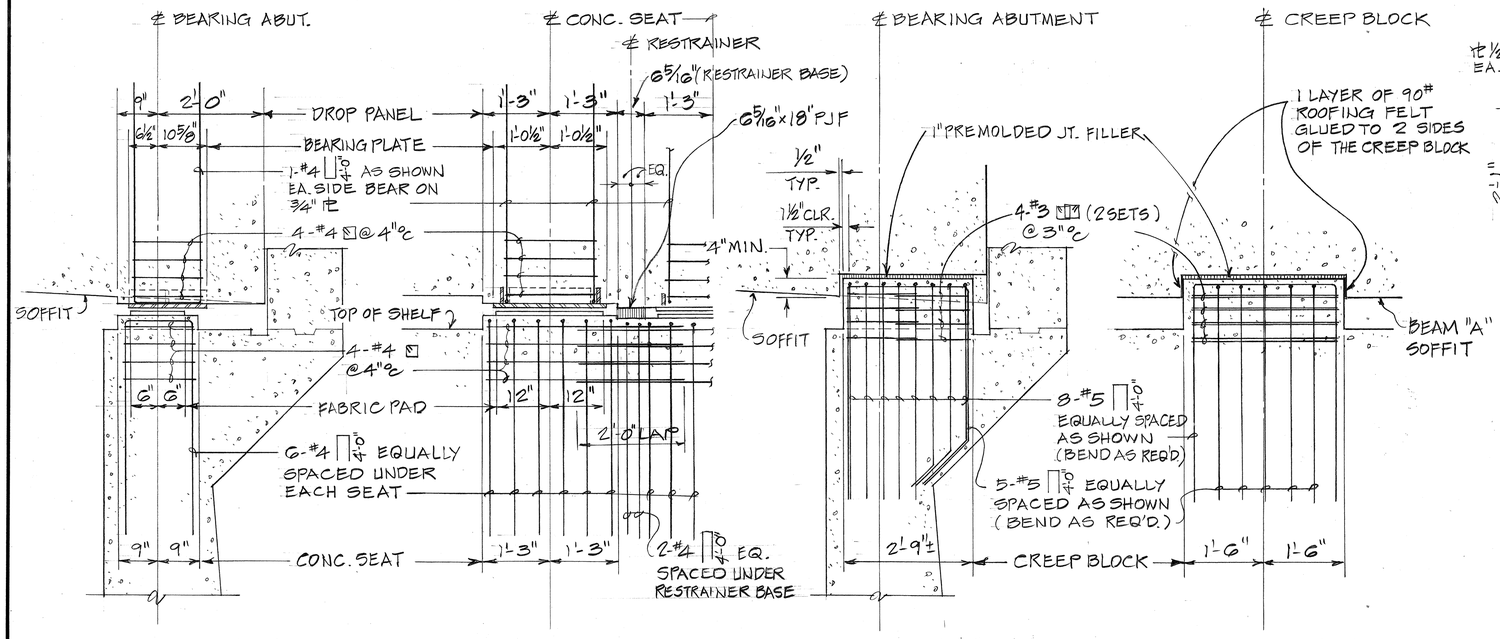
SCALE : 3/4" = 1'-0"

NOTE : CONTRACTOR SHALL EXCERCISE EVERY PRE-CAUTION TO PREVENT WARPING OF 3/4" A-36 STRUCTURAL STEEL ℄ ASSEMBLY DURING WELDING.



SECTIONAL DETAIL "A"-"A"

SCALE : 1" = 1'-0"



SECTION "B"-"B"

SCALE : 3/4" = 1'-0"

SECTION "C"-"C"

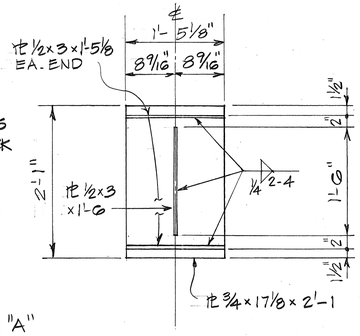
SCALE : 3/4" = 1'-0"

SECTION "D"-"D"

SCALE : 3/4" = 1'-0"

SECTION "E"-"E"

SCALE : 3/4" = 1'-0"



HOT DIPPED GALVANIZED, TYP.

BEARING PLATE

SCALE : 1" = 1'-0"

NOTES :

1. BEARING ℄ & PREFORMED FABRIC PAD LOCATIONS ARE CRITICAL & SHALL BE PLACED AS SHOWN CONTRACTOR SHALL TAKE THE NECESSARY STEPS TO INSURE THE CORRECT POSITION OF THE BEARING ASSEMBLY AT ALL TIMES DURING CONSTRUCTION.
2. PREFORMED FABRIC PAD SHALL BE BONDED TO THE ABUTMENT CONC. SEAT.
3. TOP OF CONCRETE SEAT SHALL BE FINISHED LEVEL & SMOOTH WITH A STEEL TROWEL.
4. CONCRETE LIMIT STOP SHALL BE PLACED ONLY AFTER ALL POST-TENSIONING IS COMPLETED & SHORING FOR SUPERSTRUCTURE COMPLETELY REMOVED.
5. CONCRETE BOX GIRDER SHALL BE POURED NEAT TO CREEP BLOCK FACES (2 SIDES) W/ROOFING FELT.
6. FLASHING COMPOUND WATERPROOFING SHALL BE CONTINUOUS FULL WIDTH OF SUPERSTRUCTURE BETWEEN BEAM "A" & ABUTMENT SHELF.
7. BACKFILL BEHIND ABUTMENT TO SHELF LEVEL BEFORE LOCATING BEARINGS.

ORIGINAL PLAN
SURVEY PLOTTED BY:
DRAWN BY:
TRACED BY:
NOTE BOOK
DESIGNED BY:
QUANTITIES BY:
CHECKED BY:
DATE:
No.

STANLEY T. YAMASHIRO REGISTERED PROFESSIONAL ENGINEER No. 3997 HAWAII, U.S.A.

STANLEY YOSHITO UEHARA REGISTERED PROFESSIONAL ENGINEER No. 3018 HAWAII, U.S.A.

Stanley Y. Uehara
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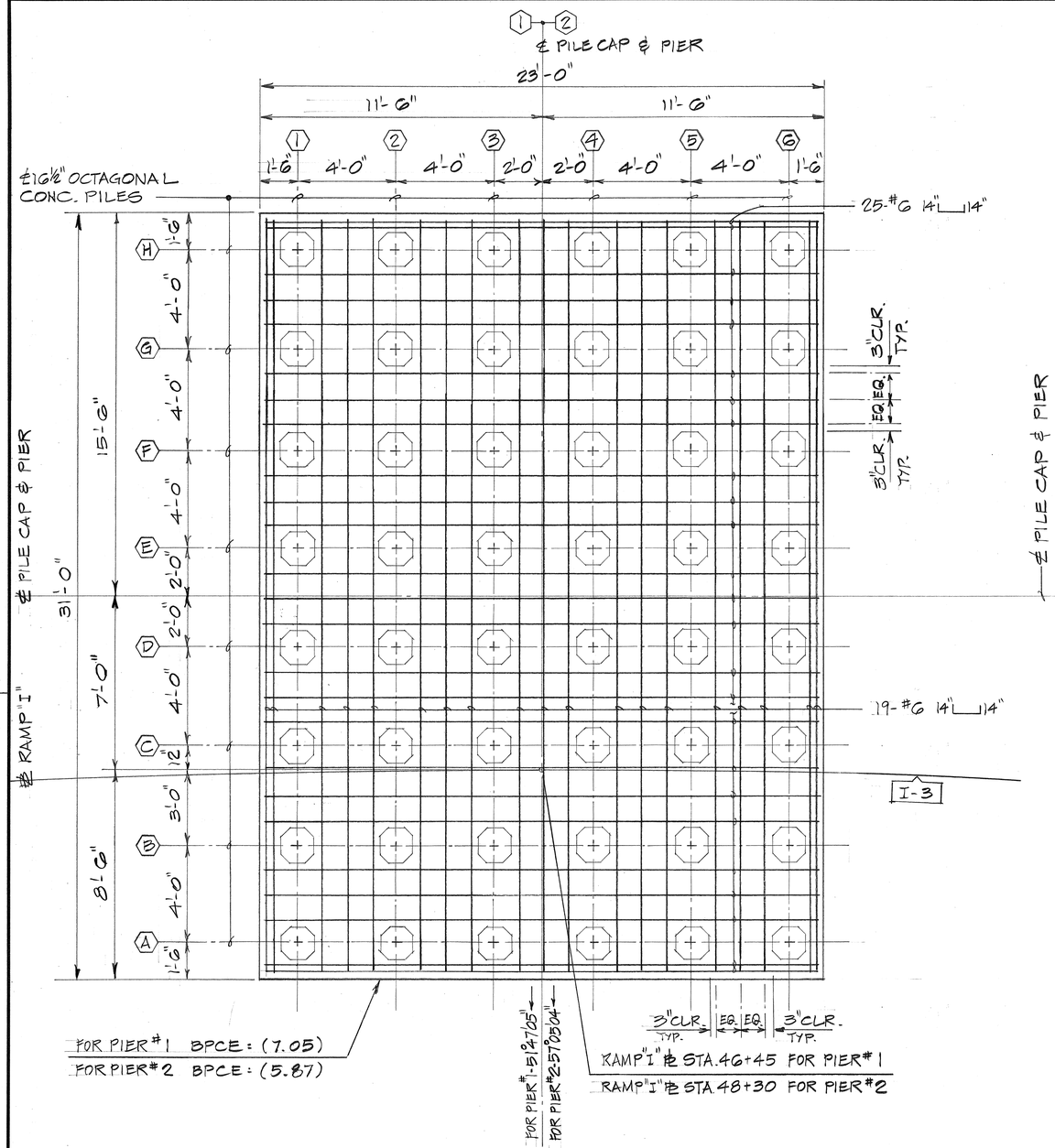
STATE OF HAWAII
DEPARTMENT OF TRANSPORTATION
HIGHWAYS DIVISION

RAMP "I" STRUCTURE

ABUTMENT SHELF-TYPICAL DETAILS

MOANALUA ROAD
PUULOA I.C. TO MIDDLE ST.-UNIT 3B
F.A. Proj. No. F-078-1(21)
SCALE : AS SHOWN DATE : AUG 1, 1979

SHEET No. S-14 OF 63 SHEETS



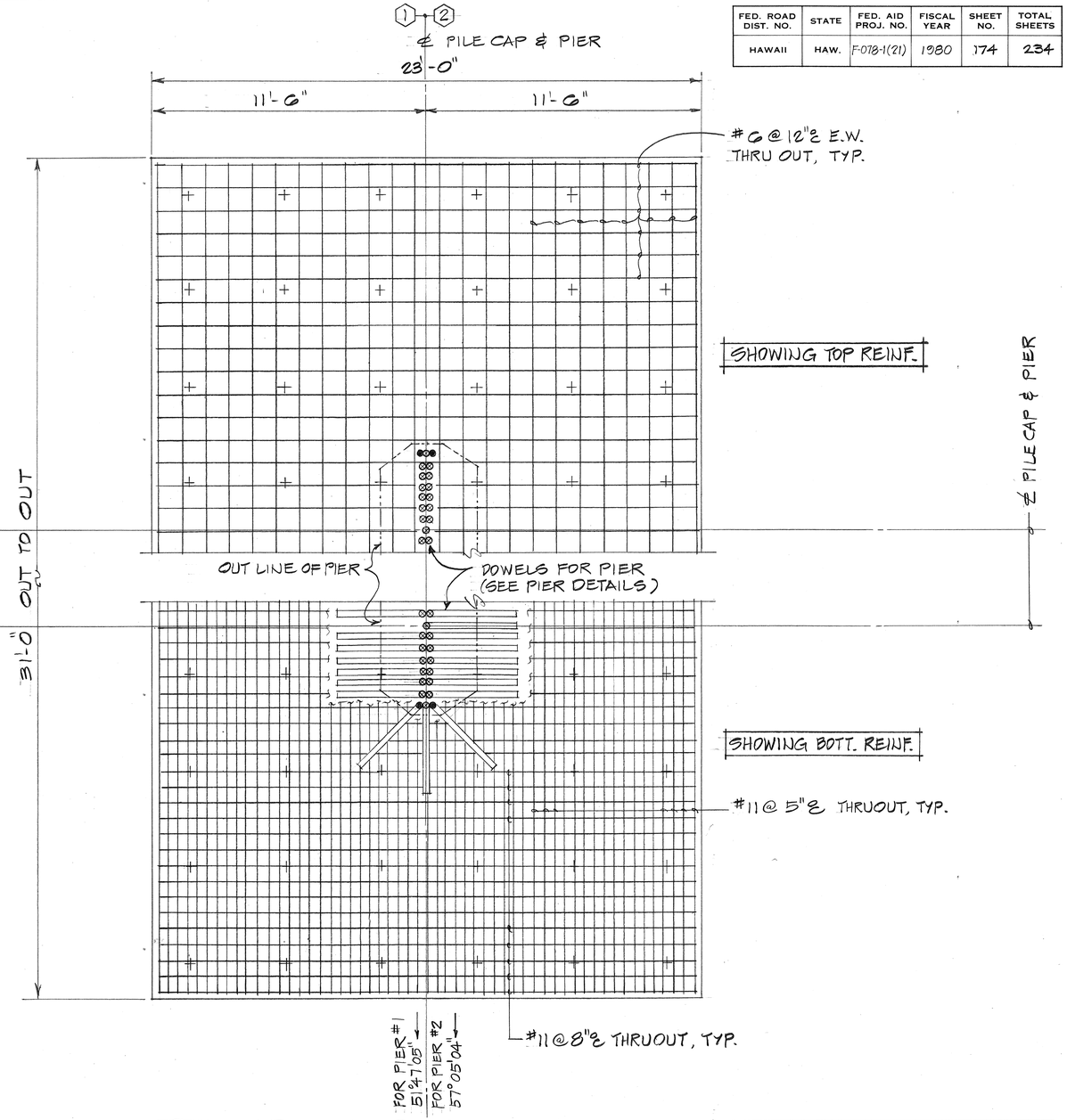
PILE CAP FRAMING PLAN

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

PILE TIP ELEVATION

FOR PIER #1 -50.00 (48 TOTAL)
FOR PIER #2 -60.00 (48 TOTAL)

TWO TEST PILES FOR PIER #1 AND FOR PIER #2 SHALL BE DRIVEN FOR LENGTH AND SHALL BE CAST 10 FEET LONGER THAN REQUIRED TO REACH THE RECOMMENDED PILE TIP ELEV. (TO BE DONE UNDER SUPERVISION OF THE ENGINEER)



PILE CAP REINFORCING PLAN

REFERENCE DRAWINGS

PIER DETAILS ..... SHT. S-16
16½" OCTAGONAL CONC. PILES ..... SHTS. S-62 & S-63

DANY T. YAMAMOTO REGISTERED PROFESSIONAL ENGINEER No. 2697 HAWAII, U.S.A.
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FED. ROAD DIST. NO.	STATE	FED. AID PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
HAWAII	HAW.	F-078-1(21)	1980	174	234

STATE OF HAWAII
DEPARTMENT OF TRANSPORTATION
HIGHWAYS DIVISION
RAMP "I" STRUCTURE
PIERS #1 AND #2
PILE CAP FRAMING AND REINFORCING PLANS
MOANALUA ROAD
PUULOA I.C. TO MIDDLE ST.-UNIT 3B
F.A. Proj. No. F-078-1(21)
SCALE: AS SHOWN DATE: AUG 1, 1979
SHEET NO. S-15 OF 63 SHEETS

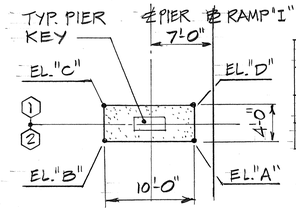
ORIGINAL PLAN
SURVEY PLOTTED BY
DRAWN BY
TRACED BY
DESIGNED BY
NOTE BOOK
QUANTITIES BY
CHECKED BY
DATE
No.

FED. ROAD DIST. NO.	STATE	FED. AID PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
HAWAII	HAW.	F-078-1(21)	1980	175	234

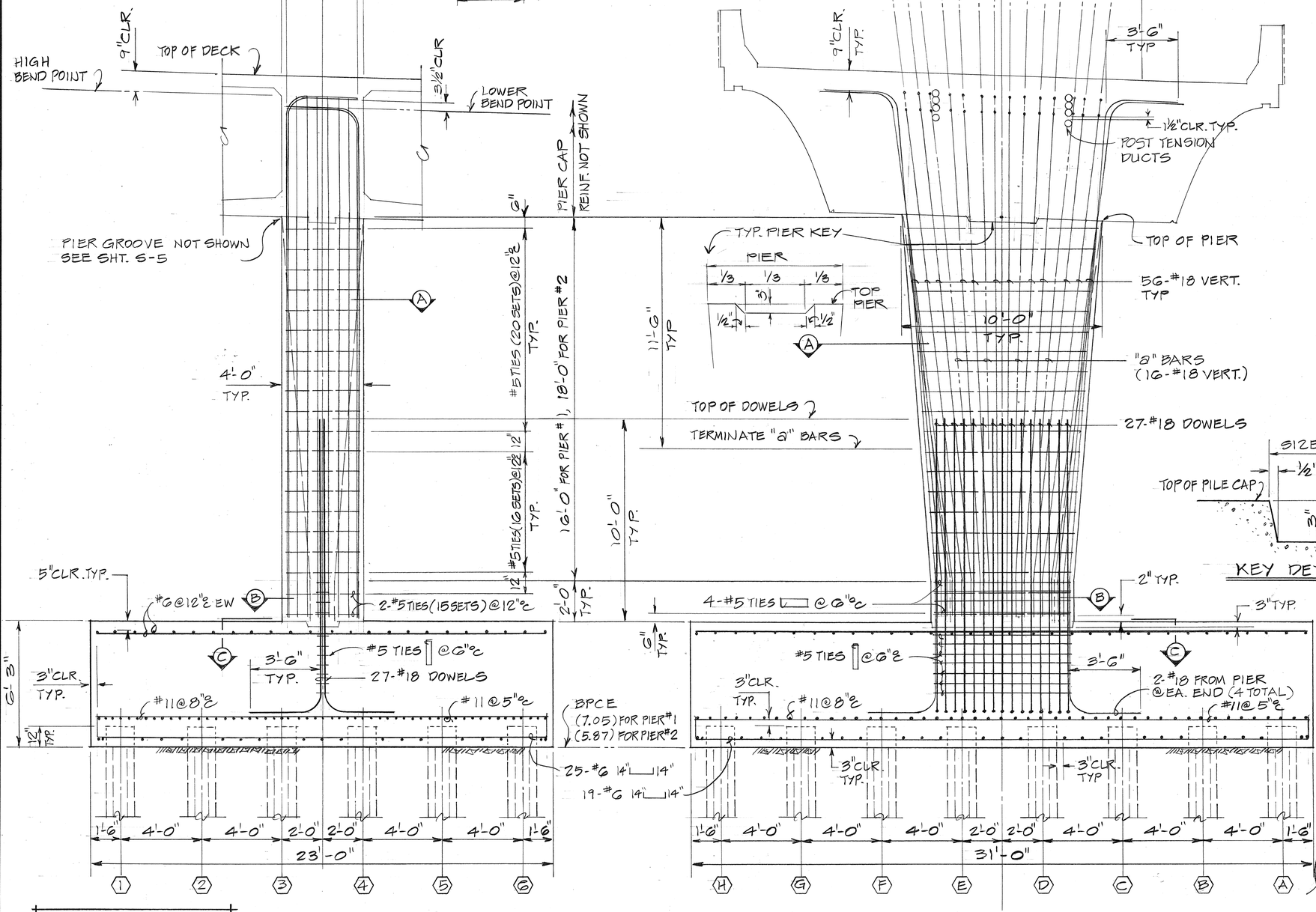
REFERENCE DRAWINGS

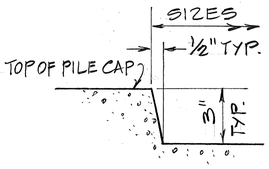
STRUCTURAL EXCAVATION & BACKFILL DETAILS ..... SHT. S-7

16½" OCTAGONAL CONC. PILES ..... SHTS. S-62 & S-63



TOP OF PIER ELEVATION				
	EL. "A"	EL. "B"	EL. "C"	EL. "D"
PIER #1	31.09	31.44	31.54	31.19
PIER #2	31.96	32.31	32.26	31.91



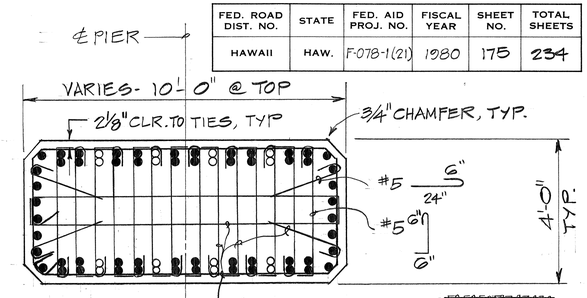


KEY DET.

NOTE:
FOR PIER DIMENSIONS, SEE SHT. S-5

TYPICAL SECTIONS

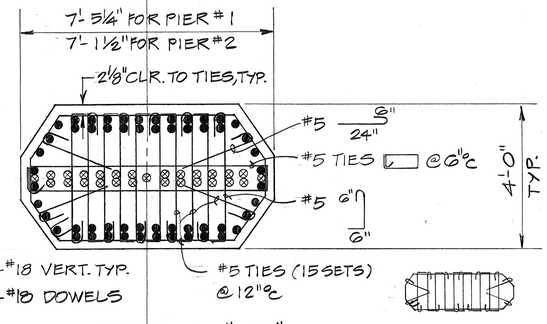
SCALE: 3/8" = 1'-0"



- 5G-#18 VERT. TYP.
- 16-#18 VERT. ("a" BARS)

SECTION "A"

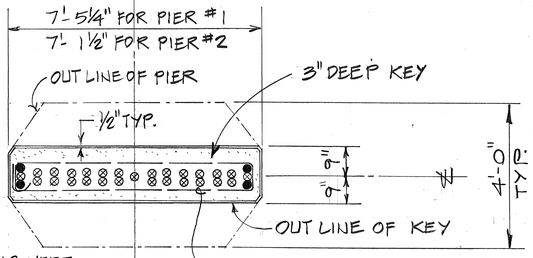
SCALE: ½"=1'-0"



- 5G-#18 VERT. TYP.
- ⊗ 27-#18 DOWELS

SECTION "B"

SCALE: ½"=1'-0"



- 4-#18 VERT. FROM PIER
- ⊗ 27-#18 DOWELS

SECTION "C"

SCALE: ½"=1'-0"

SURVEY PLOTTED BY
DRAWN BY
TRACED BY
DESIGNED BY
QUANTITIES BY
CHECKED BY
DATE
ORIGINAL PLAN
NOTE BOOK
No.

DARY T. YAMAMOTO REGISTERED PROFESSIONAL ENGINEER No. 4997 HAWAII, U.S.A.

STANLEY YOSHITO UCHIDA REGISTERED PROFESSIONAL ENGINEER No. 3018 HAWAII, U.S.A.

Stanley Y. Uchida
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STATE OF HAWAII
DEPARTMENT OF TRANSPORTATION
HIGHWAYS DIVISION

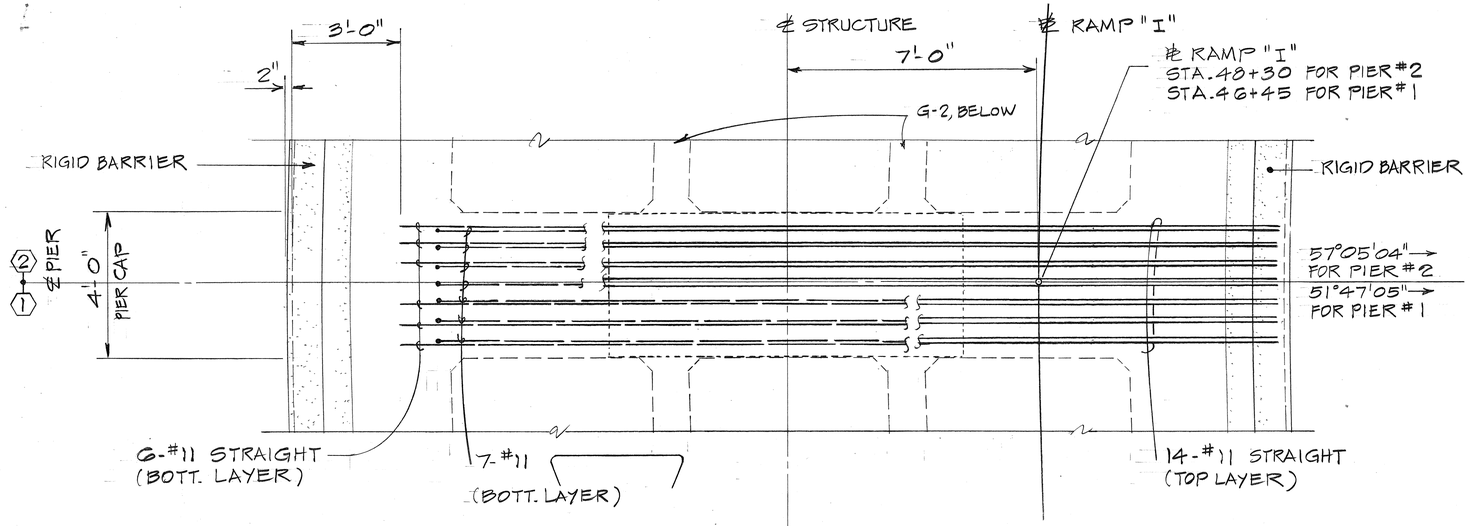
RAMP "I" STRUCTURE

PIERS #1 AND #2 DETAILS

MOANALUA ROAD
PUULOA I.C. TO MIDDLE ST. - UNIT 3B
F.A. Proj. No. F-078-1(21)
SCALE: AS SHOWN DATE: AUG. 1, 1979

SHEET NO. S-16 OF 63 SHEETS

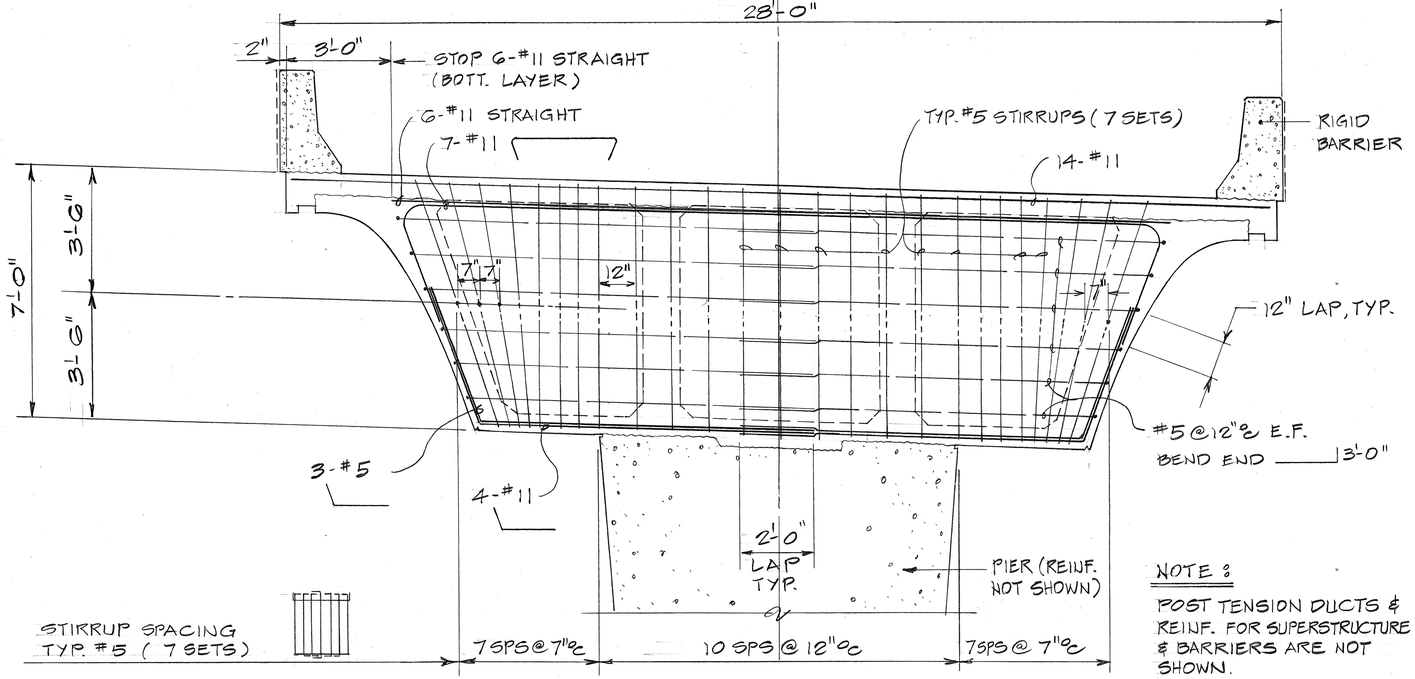
FED. ROAD DIST. NO.	STATE	FED. AID PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
HAWAII	HAW.	F-078-1(21)	1980	176	234



TYP. #5 STIRRUPS NOT SHOWN

PIER CAP PLAN (SHOWING TOP REINFORCING ONLY)

SCALE : 1/2"=1'-0"

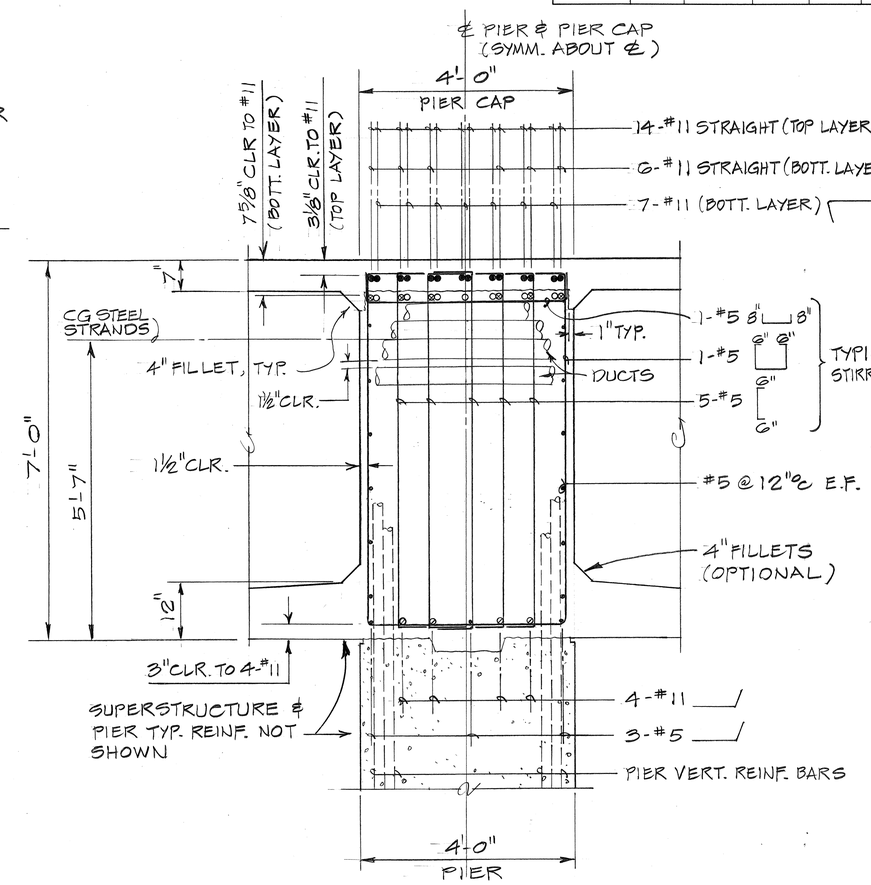


NOTE :

POST TENSION DUCTS & REINF. FOR SUPERSTRUCTURE & BARRIERS ARE NOT SHOWN.

PIER CAP ELEVATION (LOOKING ABUT. #2)

SCALE : 1/2"=1'-0"



PIER CAP SECTION

SCALE : 3/4"=1'-0"

REFERENCE DRAWINGS

PIER DETAILS ..... SHT. S-16
TYP. BOX GIRDER SECTION ..... SHT. S-21

SURVEY PLOTTED BY
DRAWN BY
TRACED BY
DESIGNED BY
QUANTITIES BY
CHECKED BY
DATE
ORIGINAL PLAN
NOTE BOOK
No.

GARY T. YAMAMOTO — REGISTERED PROFESSIONAL ENGINEER No. 2997 — HAWAII, U.S.A.

STANLEY YOSHITO UMEHARA — REGISTERED PROFESSIONAL ENGINEER No. 3018 — HAWAII, U.S.A.

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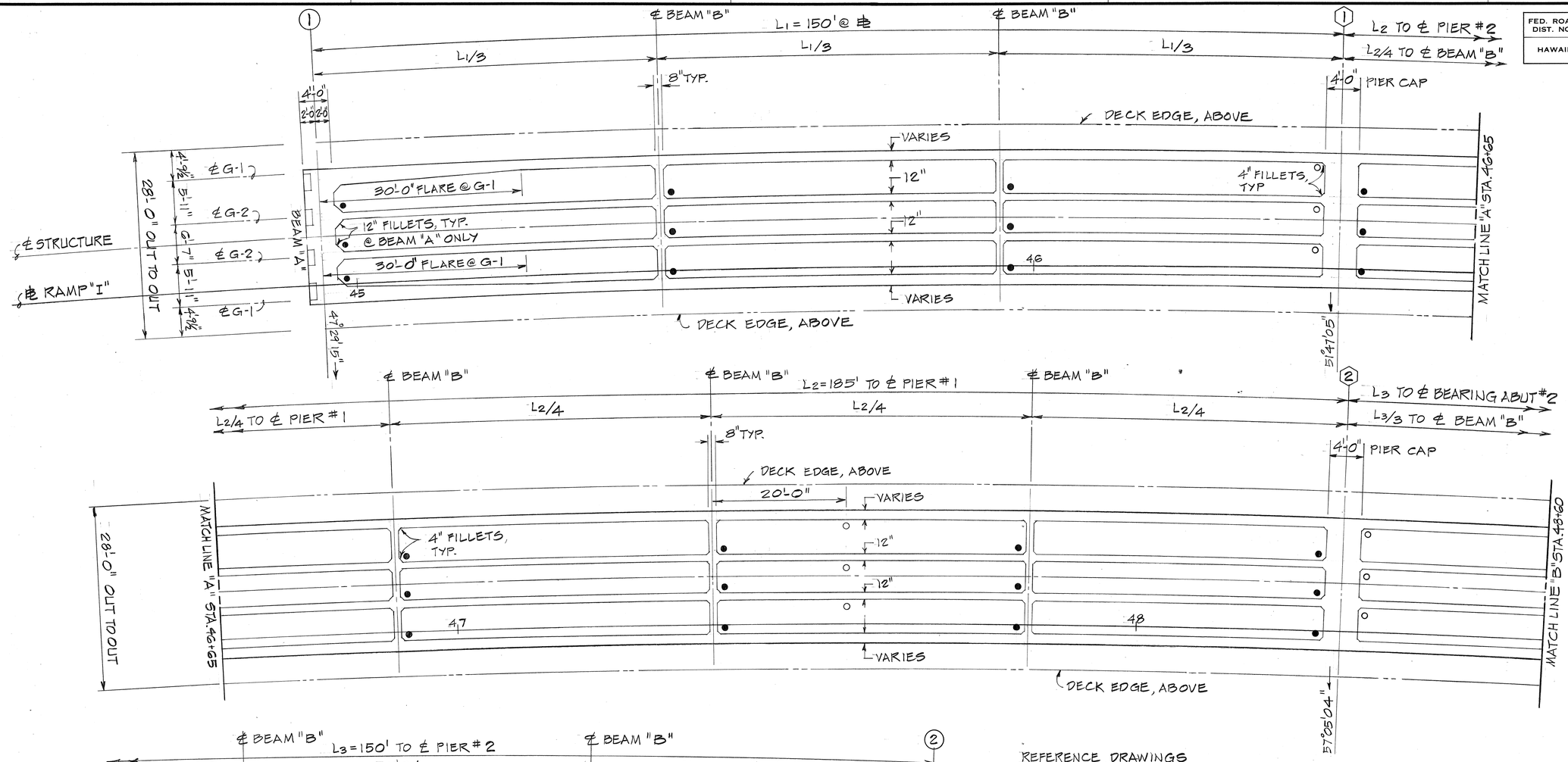
STATE OF HAWAII
DEPARTMENT OF TRANSPORTATION
HIGHWAYS DIVISION

RAMP "I" STRUCTURE
PIER CAP DETAILS

MOANALUA ROAD
PUULOA I.C. TO MIDDLE ST. - UNIT 3B
F.A. Proj. No. F-078-1(21)
SCALE : AS SHOWN DATE : AUG 1, 1979

SHEET NO. S-17 OF 63 SHEETS

FED. ROAD DIST. NO.	STATE	FED. AID PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
HAWAII	HAW.	F-078-1(21)	1980	177	234



REFERENCE DRAWINGS

POST TENSIONING	SHT. S-27
BOX GIRDER SECTION	SHT. S-21
BEAM "A" & "B"	SHT. S-23
PIER CAP	SHT. S-17

LEGEND :

- ● 3"Φ DRAIN (NON-RUSTING MATERIAL)
- ○ 3"Φ VENT (NON-RUSTING MATERIAL)

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DEPARTMENT OF TRANSPORTATION
HIGHWAYS DIVISION

RAMP "I" STRUCTURE
DECK FRAMING PLAN

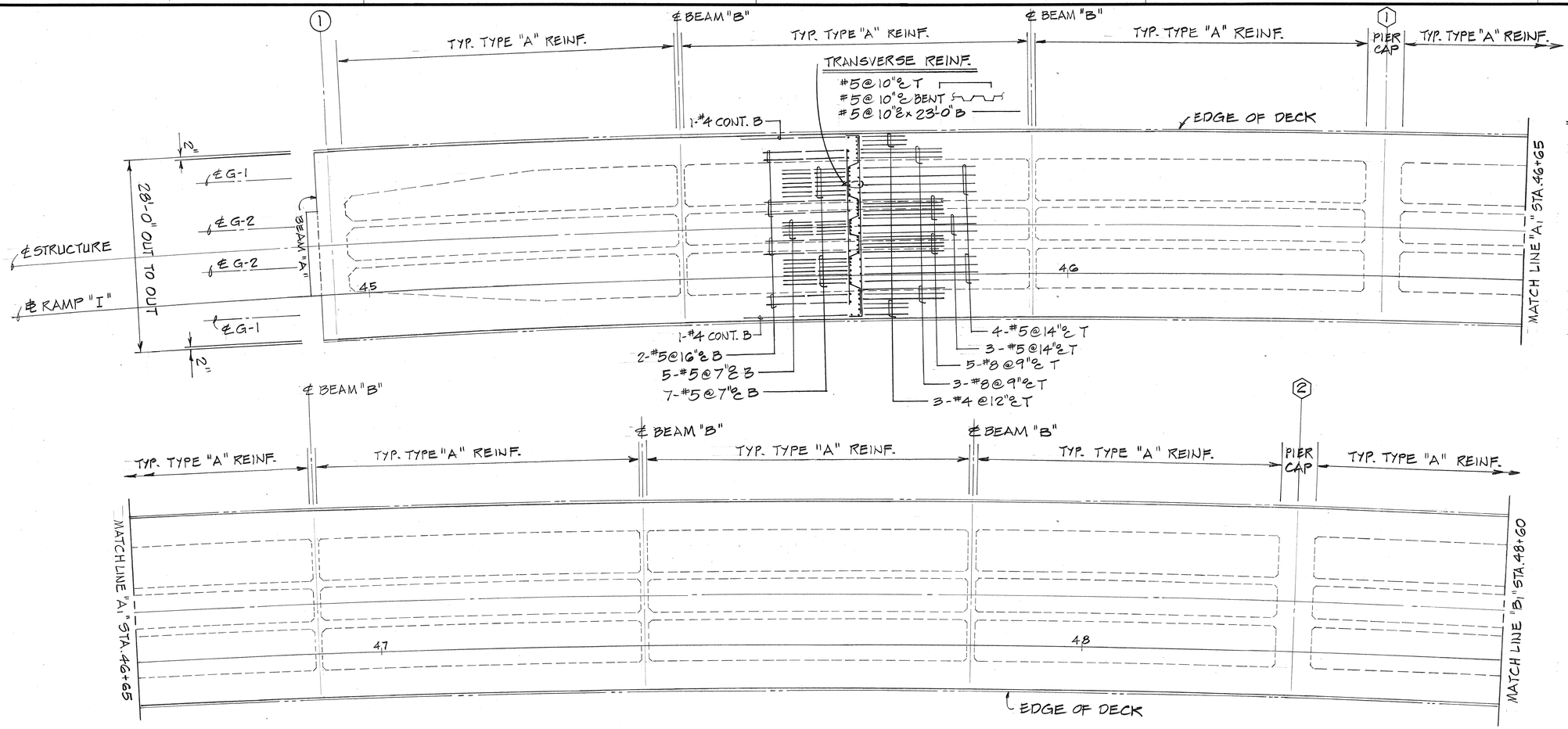
MOANALUA ROAD
PUULOA I.C. TO MIDDLE ST.-UNIT 3B
F.A. Proj. No. F-078-1(21)
SCALE : AS SHOWN DATE : AUG 1, 1979

SHEET No. S-18 OF 63 SHEETS

DECK FRAMING PLAN (SHOWING 3'-6" ABOVE GIRDER SOFFIT)

SCALE : 1/8" = 1'-0"

ORIGINAL PLAN	SURVEY PLOTTED BY	DATE
	DRAWN BY	
NOTE BOOK	TRACED BY	
	DESIGNED BY	
No.	QUANTITIES BY	
	CHECKED BY	



FED. ROAD DIST. NO.	STATE	FED. AID PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
HAWAII	HAW.	F-078-1(21)	1980	178	234

NOTES :

1. SPLICES FOR CONT. #8 BARS SHALL BE STAGGERED @ 10'-0"℄ MIN. DO NOT SPLICE WITHIN 10'-0" OF ℄ PIER OR ℄ ABUTMENT BEARING. ONLY ONE BAR SHALL BE SPLICED AT ANY ONE POINT PER GIRDER.
2. DO NOT SPLICE CONT. #5 OR #4 BARS (LONGIT.) WITHIN 10'-0" FROM ℄ ABUTMENT BEARING.
3. #5 TRANSVERSE BARS SHALL BE PLACED RADIAL TO CENTER LINE OF STRUCTURE.

REFERENCE DRAWINGS

POST TENSIONING	SHT. S-27
BOX GIRDER SECTION	SHT. S-21
BEAMS "A" & "B"	SHT. S-23
PIER CAP	SHT. S-17

ORIGINAL PLAN	SURVEY PLOTTED BY	DATE
	DRAWN BY	
NOTE BOOK	TRACED BY	
	DESIGNED BY	
No.	QUANTITIES BY	
	CHECKED BY	

TOP SLAB REINFORCING PLAN

SCALE : 1/8" = 1'-0"

TOMMY T. YAMAMOTO REGISTERED PROFESSIONAL ENGINEER No. 2927 HAWAII, U.S.A.

STANLEY YOSHITO UEHARA REGISTERED PROFESSIONAL ENGINEER No. 3018 HAWAII, U.S.A.

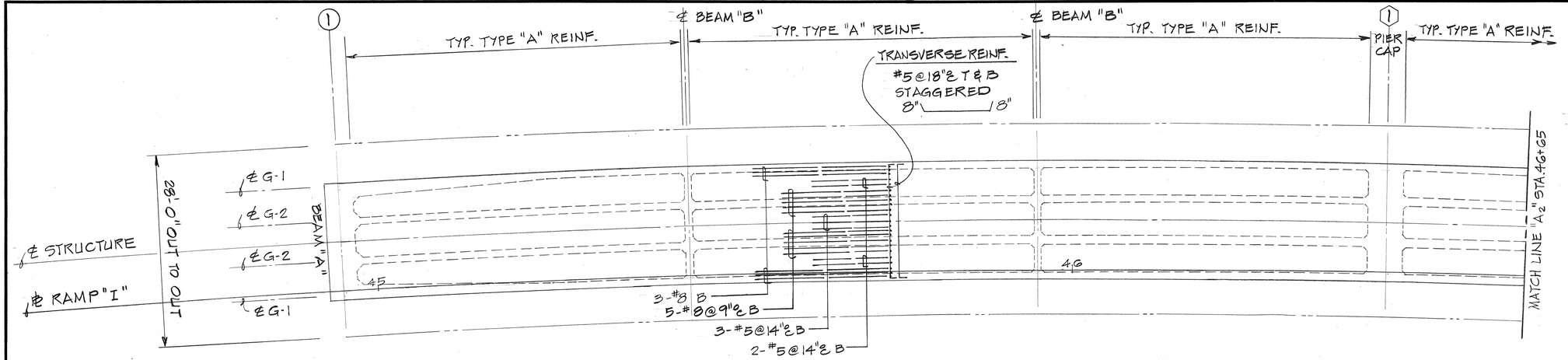
Stanley Y. Uehara
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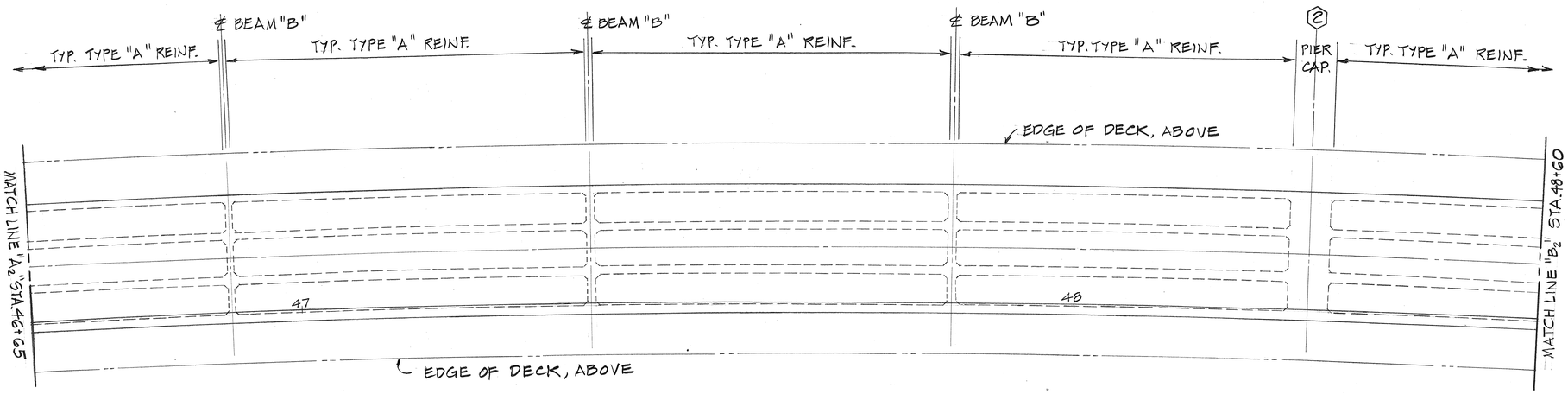
STATE OF HAWAII
DEPARTMENT OF TRANSPORTATION
HIGHWAYS DIVISION

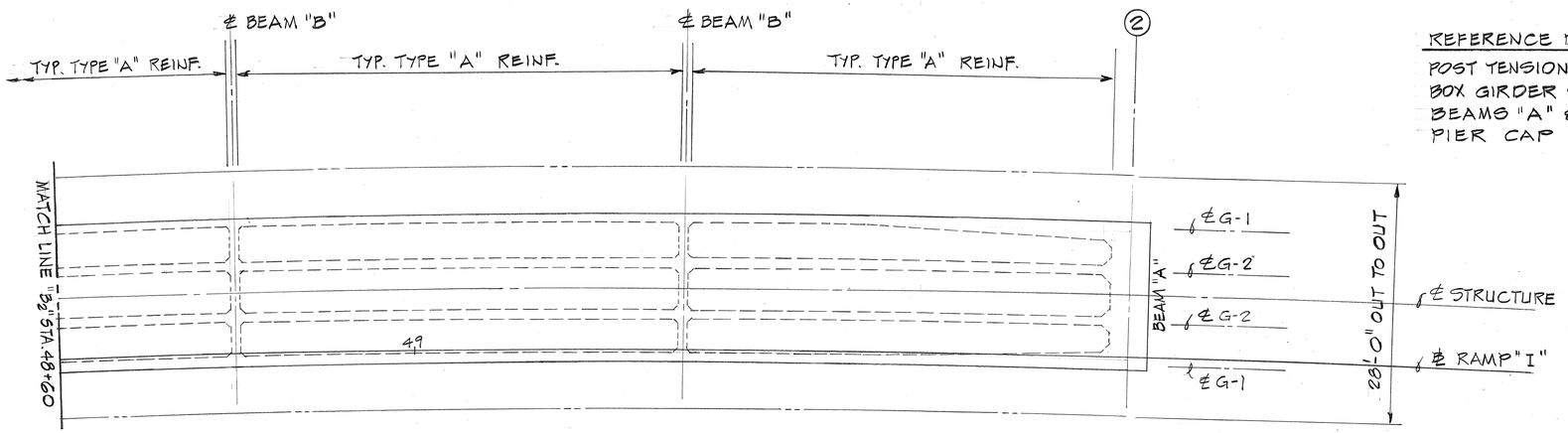
RAMP "I" STRUCTURE
TOP SLAB REINFORCING PLAN

MOANALUA ROAD
PUULOA I.C. TO MIDDLE ST.-UNIT 3B
F.A. Proj. No. F-078-1(21)
SCALE : AS SHOWN DATE : AUG 1, 1979

SHEET No. S-18 OF 63 SHEETS







BOTTOM SLAB REINFORCING PLAN

SCALE : 1/8" = 1'-0"

FED. ROAD DIST. NO.	STATE	FED. AID PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
HAWAII	HAW.	F-078-1(21)	1980	178	284

NOTES :

1. SPLICES FOR CONT. # 8 BARS SHALL BE STAGGERED @ 10'-0" ℄ MIN. DO NOT SPLICE WITH IN 10'-0" ON EITHER SIDE OF MIDSPAN. ONLY ONE BAR SHALL BE SPLICED AT ANY POINT PER GIRDER.
2. DO NOT SPLICE CONT. #5 BARS (LONGIT.) WITHIN 10'-0" FROM ℄ ABUTMENT BEARING.
3. #4 TRANSVERSE BARS SHALL BE PLACED RADIAL TO CENTER LINE OF STRUCTURE.

REFERENCE DRAWINGS

POST TENSIONING	SHT. S-27
BOX GIRDER SECTION	SHT. S-21
BEAMS "A" & "B"	SHT. S-23
PIER CAP	SHT. S-17

ORIGINAL PLAN
NOTE BOOK
No.
SURVEY PLOTTED BY
DRAWN BY
TRACED BY
DESIGNED BY
QUANTITIES BY
CHECKED BY
DATE

GARY T. YAMAMOTO — REGISTERED PROFESSIONAL ENGINEER — No. 2997 — HAWAII, U.S.A.

STANLEY YOSHIRO UBARA — REGISTERED PROFESSIONAL ENGINEER — No. 3018 — HAWAII, U.S.A.

Stanley Y. Ubara

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STATE OF HAWAII
DEPARTMENT OF TRANSPORTATION
HIGHWAYS DIVISION

RAMP "I" STRUCTURE

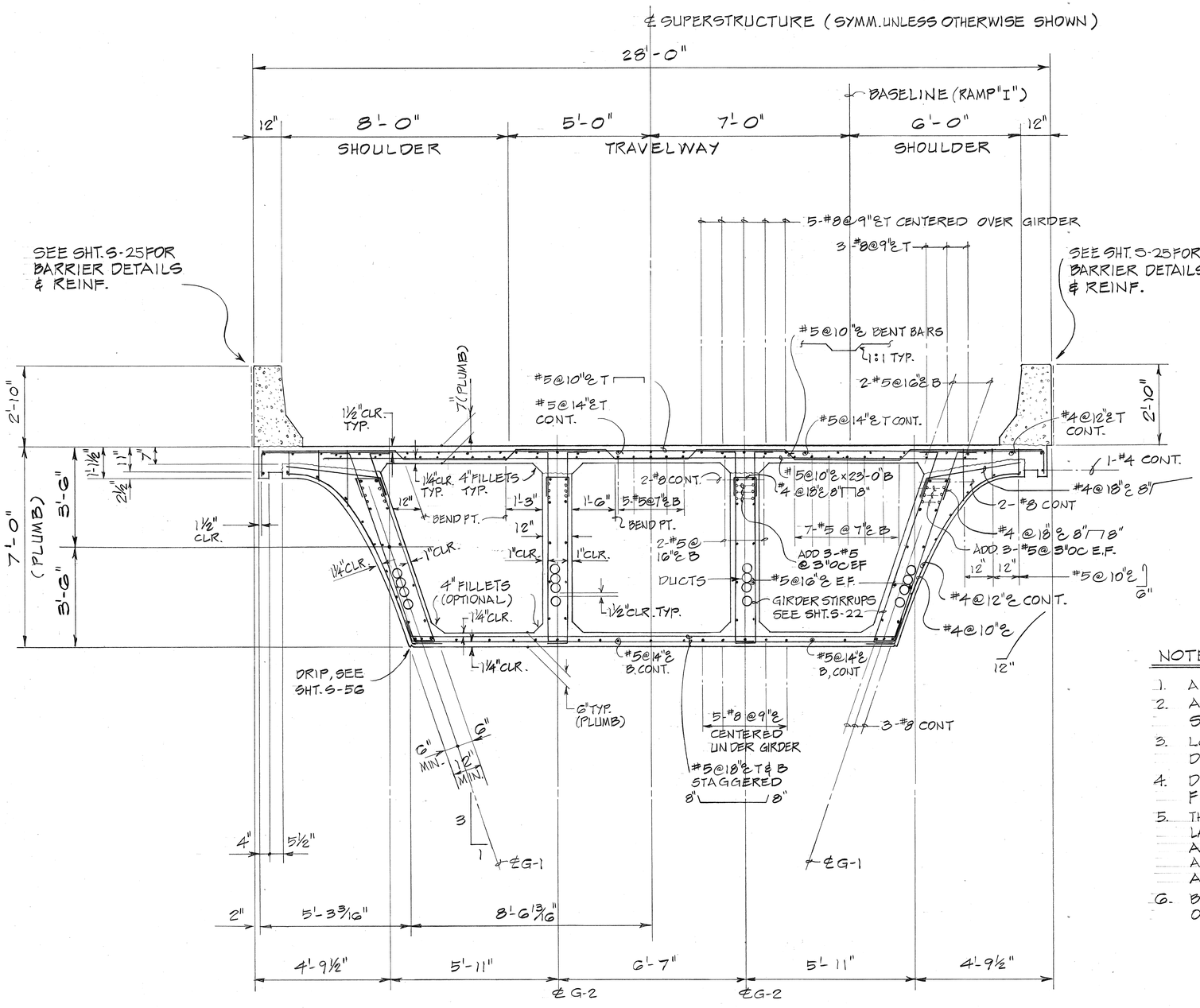
BOTTOM SLAB REINFORCING PLAN

MOANALUA ROAD
PUULOA I.C. TO MIDDLE ST.-UNIT 3B
F.A. Proj. No. F-078-1(21)

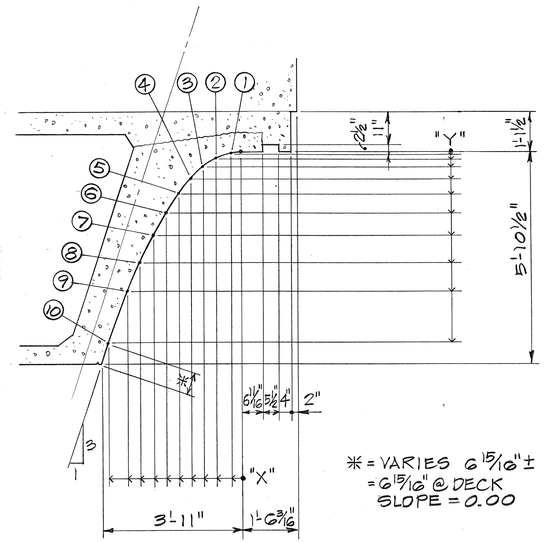
SCALE : AS SHOWN DATE : AUG 1, 1979

SHEET No. S-20 OF 63 SHEETS

FED. ROAD DIST. NO.	STATE	FED. AID PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
HAWAII	HAW.	F-078-1(21)	1980	180	234



	"X"	"Y"
①	4¼"	½"
②	8½"	2⅜"
③	12¾"	5¼"
④	17"	9¼"
⑤	21¼"	14⅜"
⑥	25½"	20¾"
⑦	29¾"	28¼"
⑧	34"	36⅜"
⑨	38¼"	46¾"
⑩	44¾"	63⅜"



* = VARIES 6 15/16" ± = 6 15/16" @ DECK SLOPE = 0.00

PARABOLA DETAIL

NOT TO SCALE

REFERENCE DRAWINGS

POST TENSIONING ..... SHT. S-27
STIRRUP SIZES & SPACING ..... SHT. S-22
TOP SLAB REINF. FRAMING PLAN ..... SHT. S-15
BOTTOM SLAB REINF. FRAMING PLAN ..... SHT. S-20

NOTES :

1. ALL VERTICAL DIMENSIONS ARE MEASURED PLUMB.
2. ALL TRANSVERSE SLAB REINF. SHALL BE PLACED RADIAL TO CENTER LINE OF STRUCTURE (BAR SPACINGS ARE MEASURED AT OUTSIDE RADIAL.)
3. LONGITUDINAL DECK REINF. ON CURVE SHALL FOLLOW CURVATURE OF DECK EDGE.
4. DECK SLOPE NOT SHOWN, SEE GENERAL LAYOUT PLAN SHT. S-3 FOR FINISH ELEVATIONS.
5. THE ENTIRE SURFACE OF THE JOINT SHALL BE THOROUGHLY CLEANED OF SURFACE LAITANCE, CURING COMPOUND AND OTHER MATERIAL FOREIGN TO THE CONC. AND CLEAN AGGREGATE BE EXPOSED BY ABRASIVE BLAST CLEANING AFTER THE CURING PERIOD OR IMMEDIATELY BEFORE PLACING CONC. AT THE JOINT.
6. BOX GIRDER STEM BOTTOM FILLETS MAY BE DELETED AT THE OPTION OF THE CONTRACTOR.

LOOKING ABUTMENT # 2

TYPICAL POST TENSIONED BOX GIRDER SECTION

SCALE : 1/2" = 1'-0"

HORIZONTAL DIMENSIONS SHOWN ARE AT RIGHT ANGLES TO ℄ OF STRUCTURE

SURVEY PLOTTED BY ____ DATE ____
DRAWN BY ____
TRACED BY ____
DESIGNED BY ____
QUANTITIES BY ____
CHECKED BY ____
ORIGINAL PLAN
NOTE BOOK
No. ____

GARY I. YAMAMOTO REGISTERED PROFESSIONAL ENGINEER No. 2997 HAWAII, U.S.A.

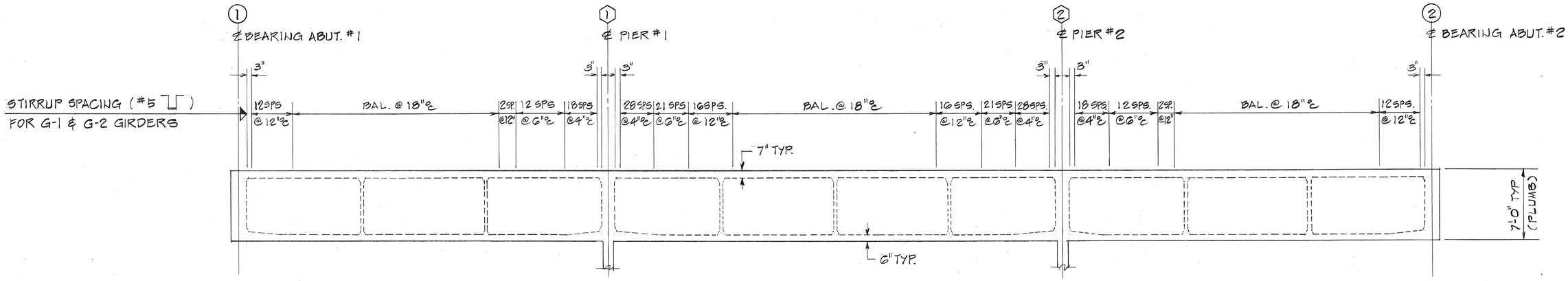
STANLEY YOSHIRO SEBASAKA REGISTERED PROFESSIONAL ENGINEER No. 3018 HAWAII, U.S.A.

Stanley Y. Sebasaka
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STATE OF HAWAII
DEPARTMENT OF TRANSPORTATION
HIGHWAYS DIVISION
RAMP "I" STRUCTURE
TYPICAL POST TENSIONED BOX GIRDER SECTION AND PARABOLA DETAIL
MOANALUA ROAD
PUULOA I.C. TO MIDDLE ST. - UNIT 3B
F.A. Proj. No. F-078-1(21)
SCALE : AS SHOWN DATE : AUG 1, 1979

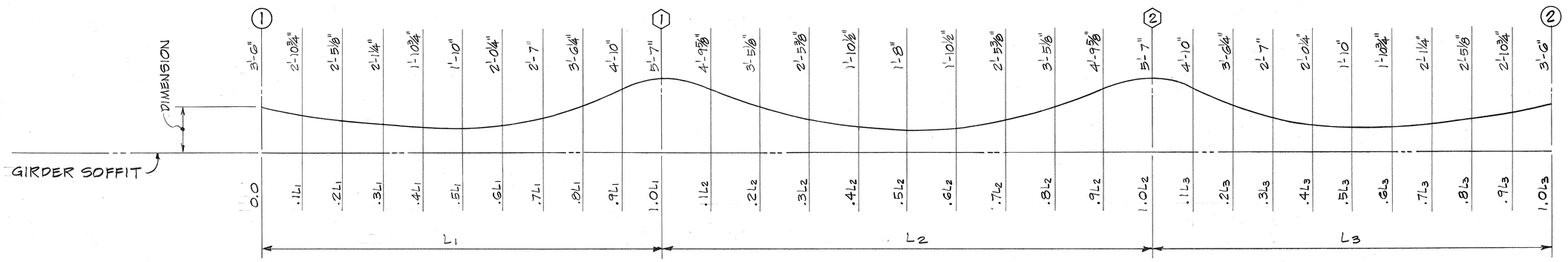
SHEET No. S-21 OF 65 SHEETS

FED. ROAD DIST. NO.	STATE	FED. AID PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
HAWAII	HAW.	F-078-1(21)	1980	181	234



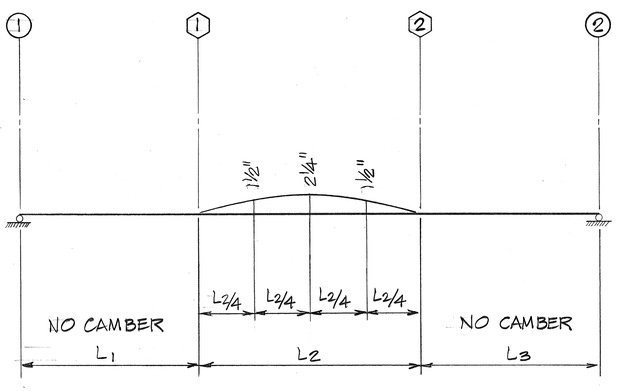
GIRDER ELEVATION - STIRRUP SIZE & SPACING

NOT TO SCALE



CENTER OF GRAVITY OF POST TENSION FORCES

NOT TO SCALE



CAMBER DIAGRAM

NOT TO SCALE

NOTES :

1. EACH GIRDER STEM SHALL CONTAIN THE NUMBER AND SPACING OF STIRRUPS AS SHOWN, ABOVE.
2. ALL STIRRUPS SHALL BE #5 ⊓ (8" 8" 8")
3. ALL POST TENSION DUCTS IN EACH STEM SHALL BE PLACED TO SATISFY THE LOCATIONS SHOWN FOR THE C.G. OF POST TENSION FORCES.

SPECIAL POST TENSION NOTES :

1. ALL STRANDS SHALL BE POST TENSIONED FROM ABUTMENT #1 AND ABUTMENT #2.
2. EFFECTIVE POST TENSION FORCE AFTER ALL LOSSES IN EACH GIRDER INCLUDING FRAME EFFECTS SHALL BE :

LOCATION	ABUT. #1 0.0L1	0.4 L1	PIER #1 1.0 L1	0.5L2	PIER #2 1.0L2	0.6L3	ABUT. #2 1.0L3
EFFECTIVE FORCE KIPS/ GIRDER	2,127	2,205	2,119	1,943	2,119	2,205	2,127

3. PRESTRESS LOSSES DUE TO FRAME EFFECTS :
   65.2 KIPS/GIRDER PIER #1
   65.6 KIPS/GIRDER PIER #2

GARY I. YAMAMOTO REGISTERED PROFESSIONAL ENGINEER No. 2997 HAWAII, U.S.A.

STANLEY YOSHITO UCHIDA REGISTERED PROFESSIONAL ENGINEER No. 3018 HAWAII, U.S.A.

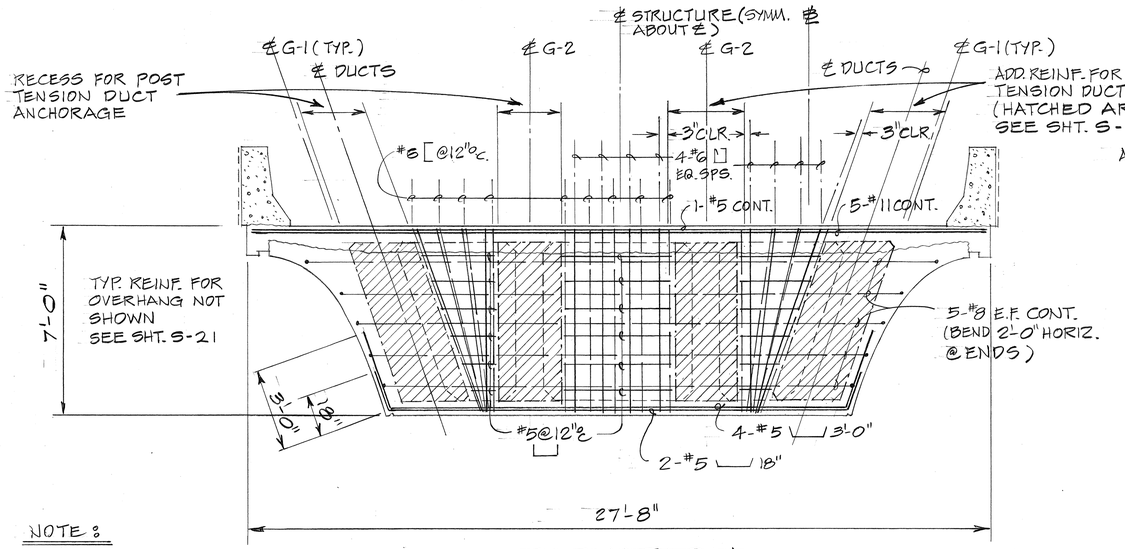
Stanley Y. Uchida
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STATE OF HAWAII
DEPARTMENT OF TRANSPORTATION
HIGHWAYS DIVISION
RAMP "I" STRUCTURE
GIRDER ELEVATION, CENTER OF GRAVITY OF POST TENSION FORCES AND CAMBER DIAGRAM
MOANALUA ROAD
PUULOA I.C. TO MIDDLE ST.-UNIT 3D
F.A. Proj. No. F-078-1(21)
SCALE : AS SHOWN DATE : AUG 1, 1979

SHEET No. S-22 OF 63 SHEETS

ORIGINAL PLAN | NOTE BOOK | No. | DATE
SURVEY PLOTTED BY
DRAWN BY
TRACED BY
DESIGNED BY
QUANTITIES BY
CHECKED BY

FED. ROAD DIST. NO.	STATE	FED. AID PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
HAWAII	HAW.	F-078-1(21)	1980	182	234

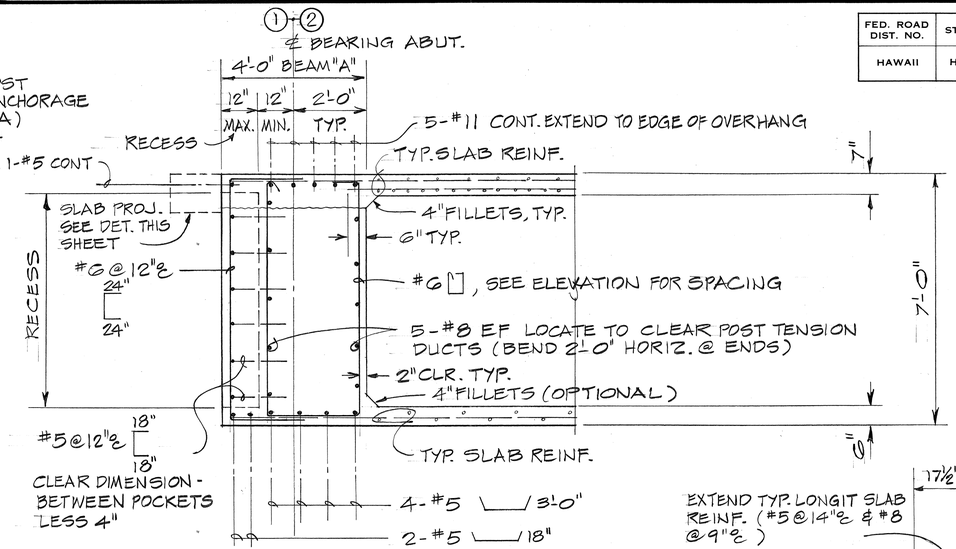


NOTE:

SEE "NOTE", BELOW

ELEVATION

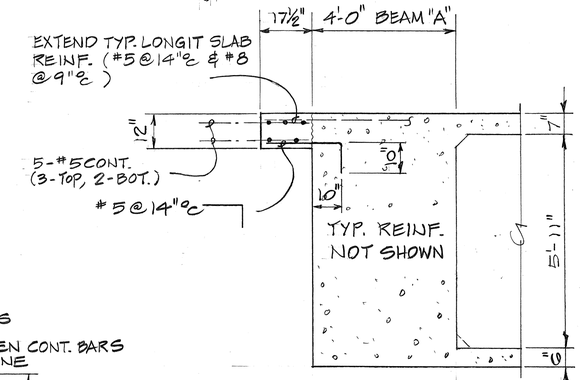
SCALE: 3/8"=1'-0"



SECTION

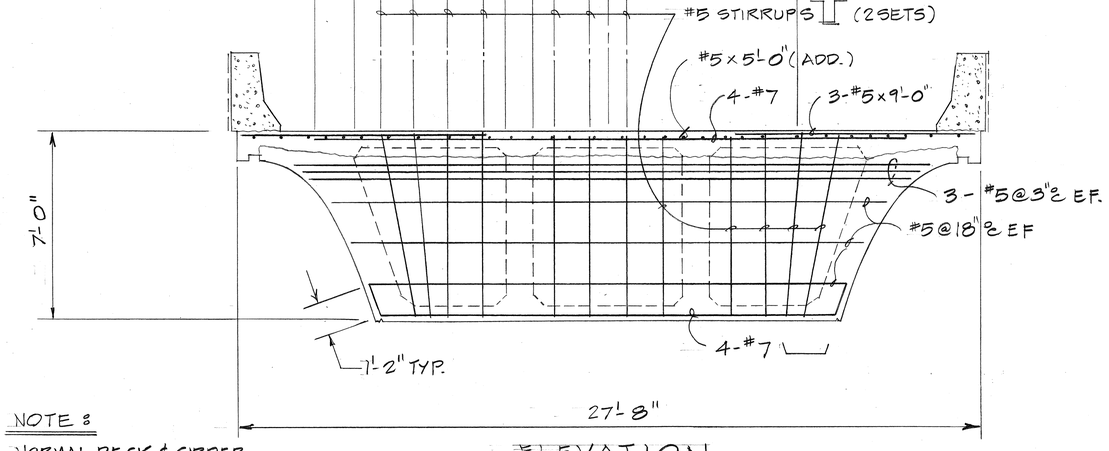
SCALE: 1/2"=1'-0"

TYPICAL BEAM "A" DETAILS



SLAB PROJECTION DETAIL

SCALE: 1/2"=1'-0"

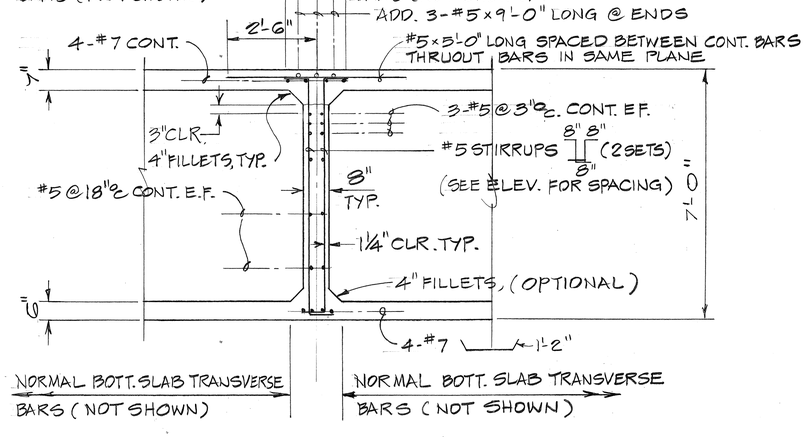


NOTE:

NORMAL DECK & GIRDER REINFORCING BARS NOT SHOWN.

ELEVATION

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



SECTION

SCALE: 1/2"=1'-0"

TYPICAL BEAM "B" DETAILS

REFERENCE DRAWING

TYP. BOX GIRDER SECTION ..... SHT. S-21

ORIGINAL PLAN	SURVEY PLOTTED BY	DATE
	DRAWN BY	
NOTE BOOK	TRACED BY	
	DESIGNED BY	
No.	QUANTITIES BY	
	CHECKED BY	

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DEPARTMENT OF TRANSPORTATION
HIGHWAYS DIVISION

RAMP "I" STRUCTURE

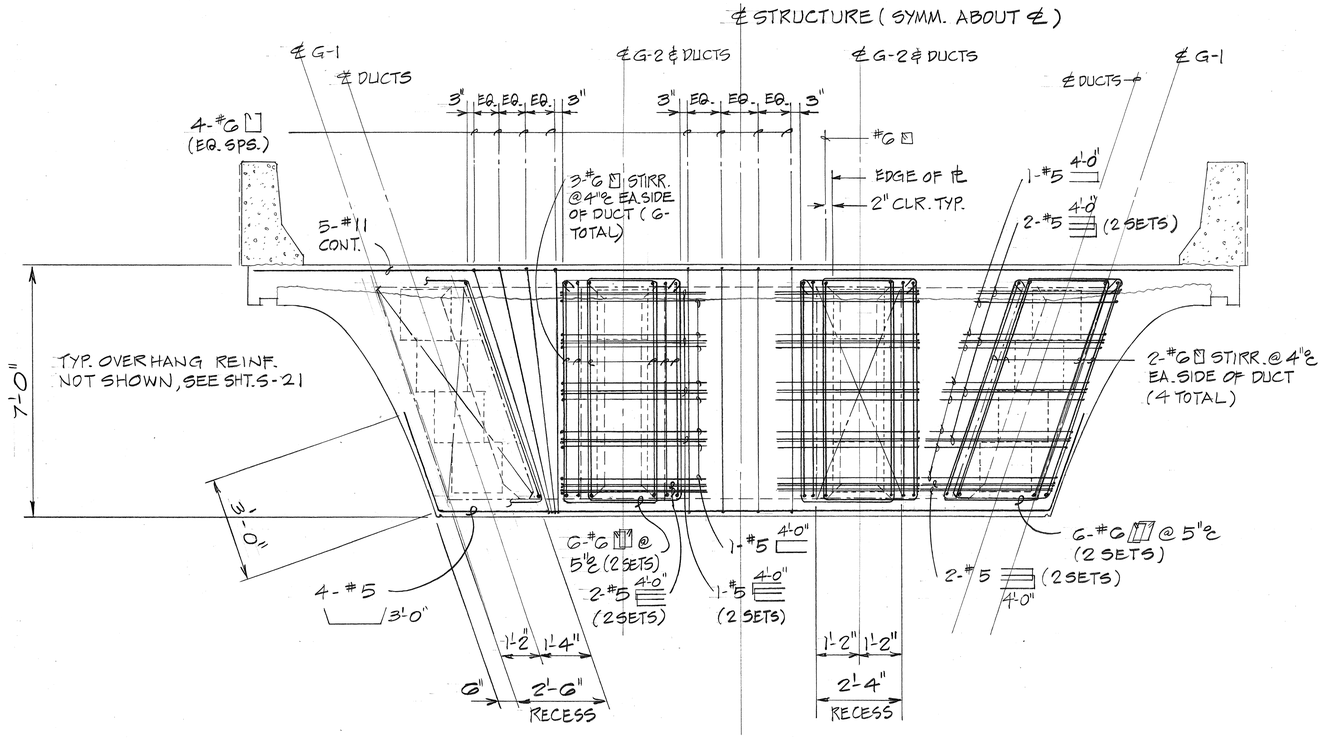
TYPICAL BEAMS "A" AND "B" DETAILS

MOANALUA ROAD
PUULOA I.C. TO MIDDLE ST. - UNIT 3B
F.A. Proj No. F-078-1(21)

SCALE: AS SHOWN DATE: AUG 1, 1979

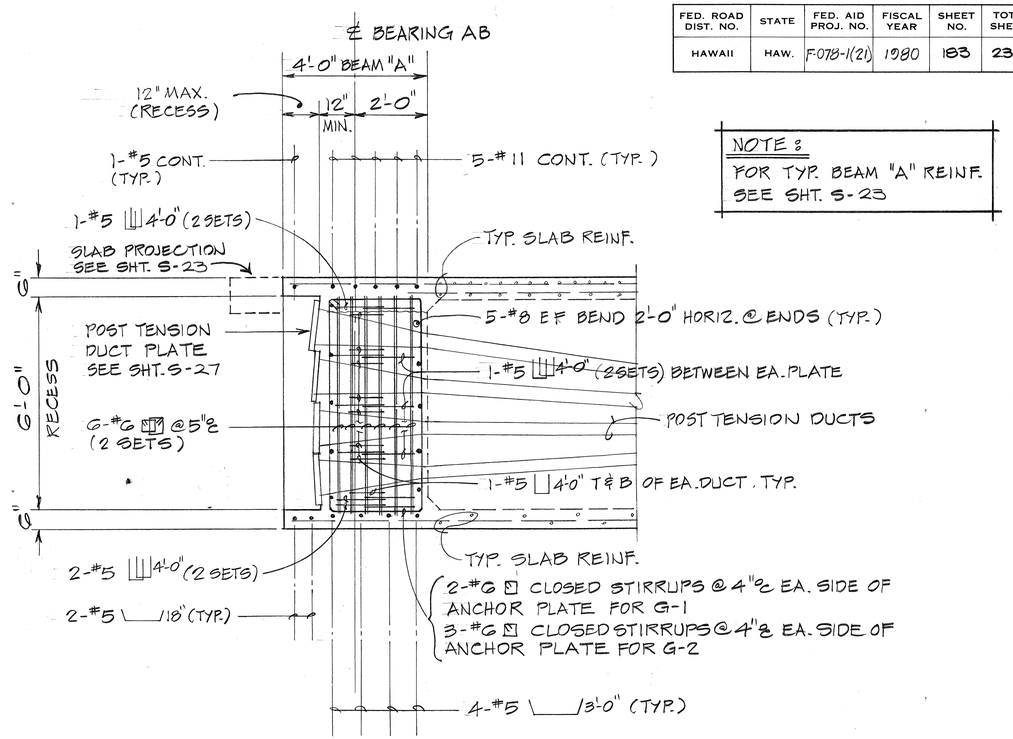
SHEET No. S-23 OF 63 SHEETS

FED. ROAD DIST. NO.	STATE	FED. AID PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
HAWAII	HAW.	F-078-1(21)	1980	183	234



BEAM "A" REINF. DET. AT POST TENSION DUCT ANCHORAGE - ELEVATION

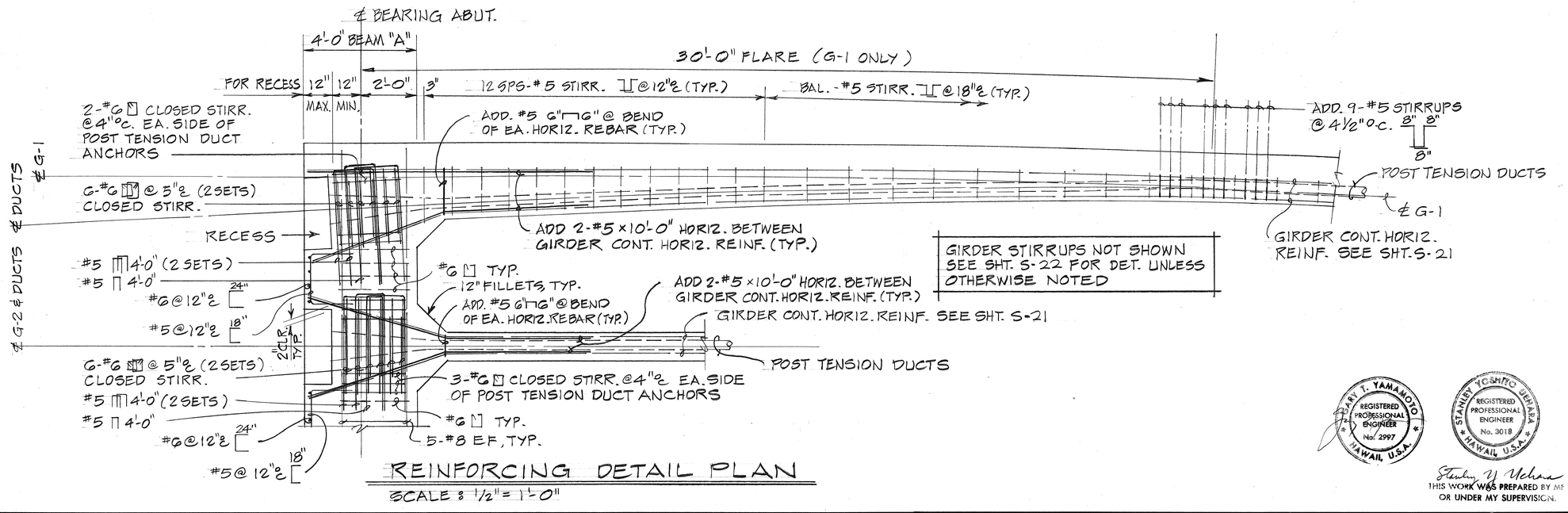
SCALE : 1/2" = 1'-0"



NOTE :
FOR TYP. BEAM "A" REINF. SEE SHT. S-23

BEAM "A" SECTION AT GIRDERS

SCALE : 1/2" = 1'-0"



GIRDER STIRRUPS NOT SHOWN SEE SHT. S-22 FOR DET. UNLESS OTHERWISE NOTED

REINFORCING DETAIL PLAN

SCALE : 1/2" = 1'-0"

SURVEY PLOTTED BY
DRAWN BY
DESIGNED BY
QUANTITIES BY
CHECKED BY
DATE
ORIGINAL PLAN
NOTE BOOK
No.

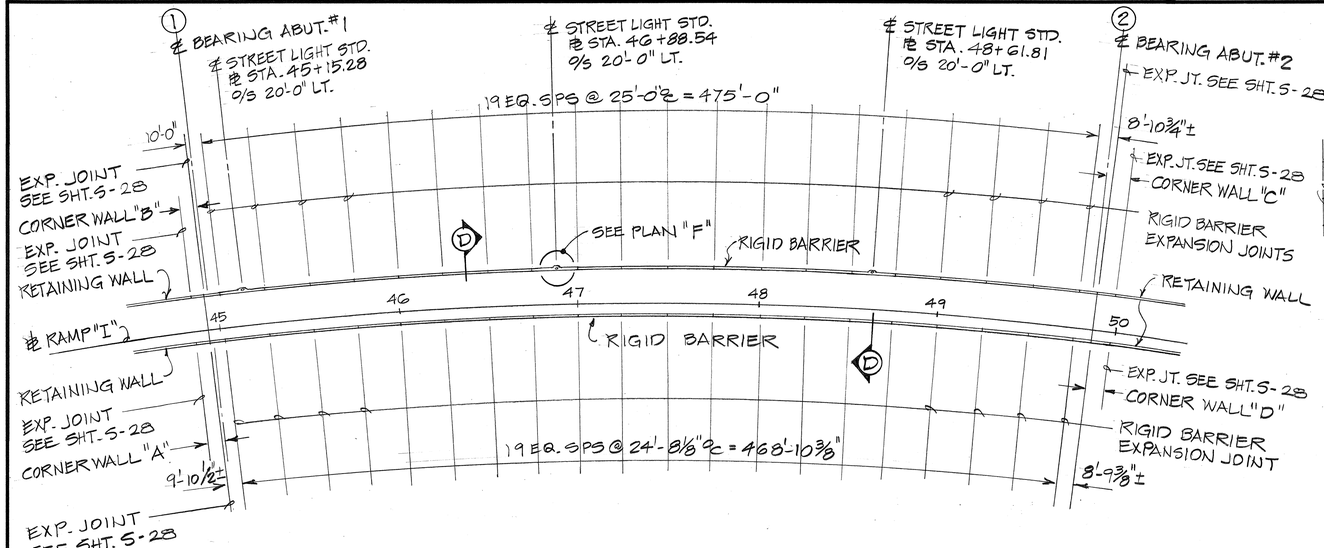
GARY T. YAMAMOTO
REGISTERED PROFESSIONAL ENGINEER
No. 2997
HAWAII, U.S.A.

STANLEY YOSHITO UEHARA
REGISTERED PROFESSIONAL ENGINEER
No. 3018
HAWAII, U.S.A.

Stanley Y. Uehara
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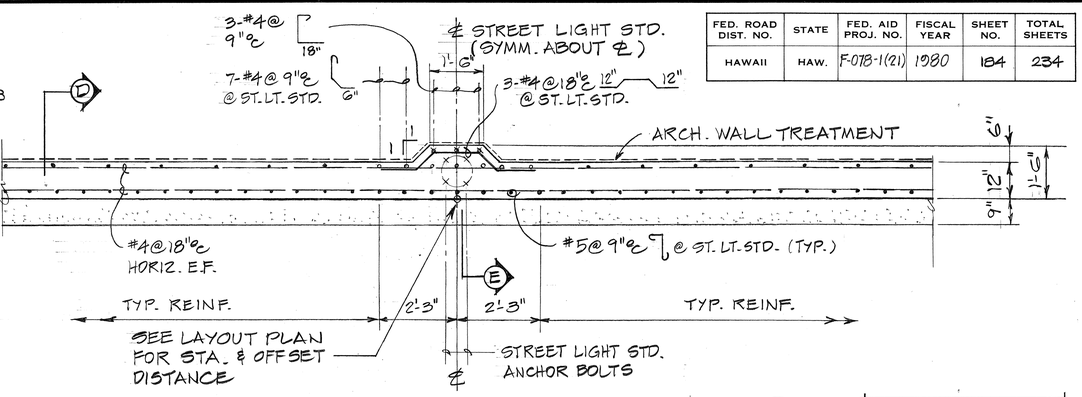
STATE OF HAWAII
DEPARTMENT OF TRANSPORTATION
HIGHWAYS DIVISION
RAMP "I" STRUCTURE
REINFORCING DETAILS
FOR BEAM "A" AT GIRDERS
MOANALUA ROAD
PUULOA I.C. TO MIDDLE ST. - UNIT 3B
F.A. Proj. No. F-078-1(21)
SCALE : AS SHOWN DATE : AUG 1, 1979
SHEET No. S-24 OF 63 SHEETS

FED. ROAD DIST. NO.	STATE	FED. AID PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
HAWAII	HAW.	F-078-1(21)	1980	184	234



RIGID BARRIER LAYOUT PLAN

SCALE: 1" = 40'

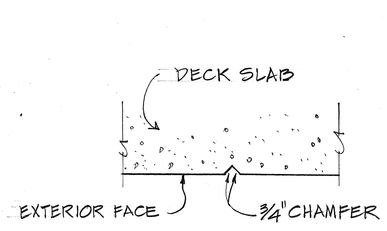


PLAN - STREET LIGHT STANDARD (F)

SCALE: ½" = 1'-0"

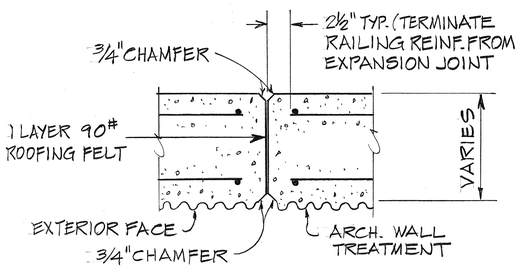
NOTE:
FOR HIGHWAY LIGHTING STANDARD MOUNTING DETAILS, SEE ELEC. DRAWINGS

CONDUITS NOT SHOWN, SEE UTILITY DRAWINGS



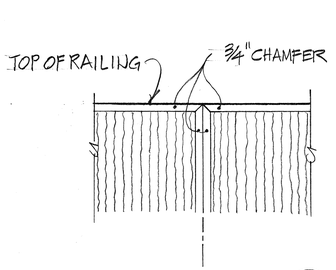
SECTION (A)

SCALE: 1½" = 1'-0"



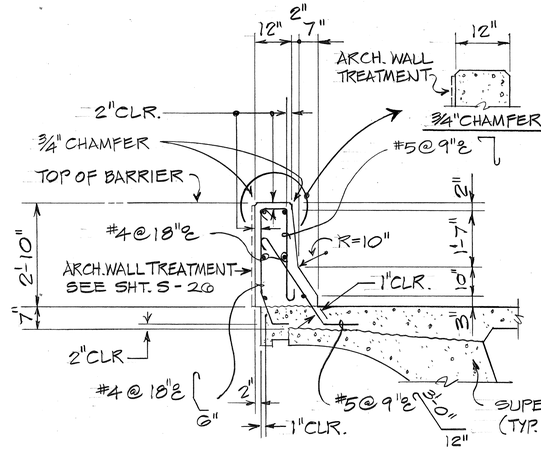
SECTION (B)

SCALE: 1½" = 1'-0"



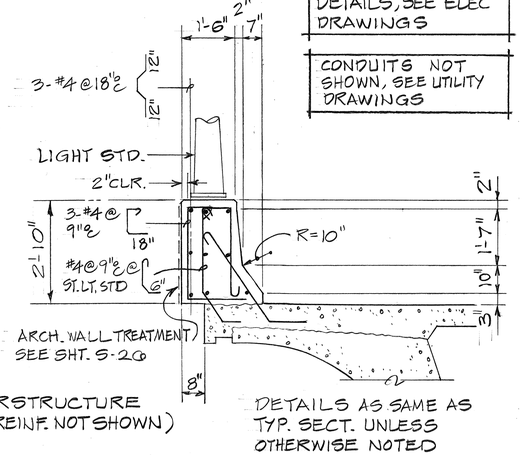
ELEVATION (C)

SCALE: 1½" = 1'-0"



TYPICAL SECTION (D)

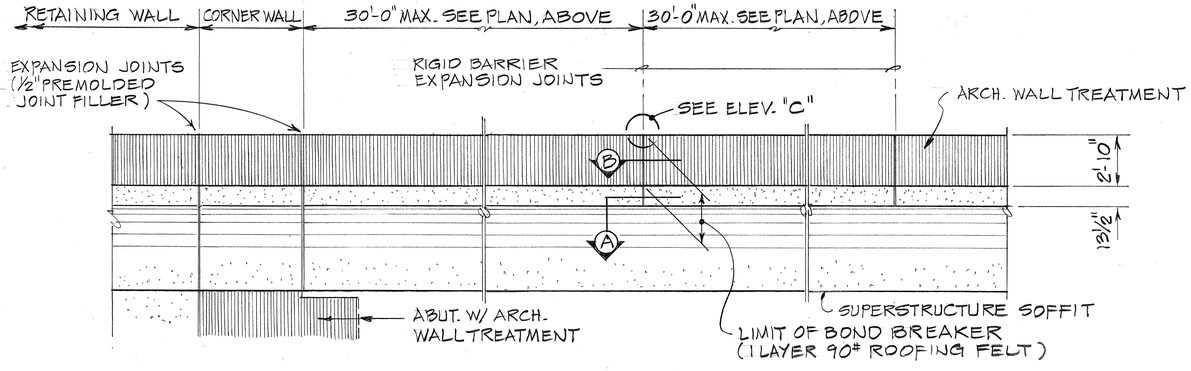
SCALE: ½" = 1'-0"



AT STREET LIGHT STANDARD

SECTION (E)

SCALE: ½" = 1'-0"



ELEVATION - RIGID BARRIER

SCALE: ¼" = 1'-0"

ORIGINAL PLAN	SURVEY PLOTTED BY	DATE
	DRAWN BY	
NOTE BOOK	TRACED BY	
	DESIGNED BY	
No.	QUANTITIES BY	
	CHECKED BY	

STATE OF HAWAII
DEPARTMENT OF TRANSPORTATION
HIGHWAYS DIVISION

RAMP "I" STRUCTURE

RIGID BARRIER DETAILS

MOANALUA ROAD
PUULOA I.C. TO MIDDLE ST. - UNIT 3B
F.A. Proj. No. F-078-1(21)

SCALE: AS SHOWN DATE: AUG 1, 1979

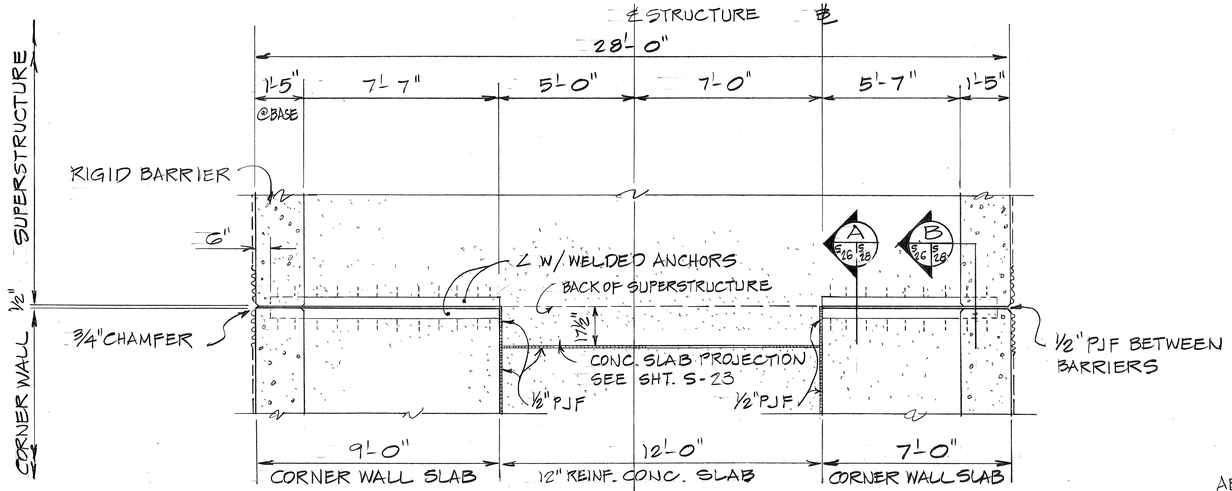
SHEET No. S-25 OF 63 SHEETS

GARY I. YAMAMOTO — REGISTERED PROFESSIONAL ENGINEER — No. 2997 — HAWAII, U.S.A.

STANLEY YOSHITO UCHARA — REGISTERED PROFESSIONAL ENGINEER — No. 3018 — HAWAII, U.S.A.

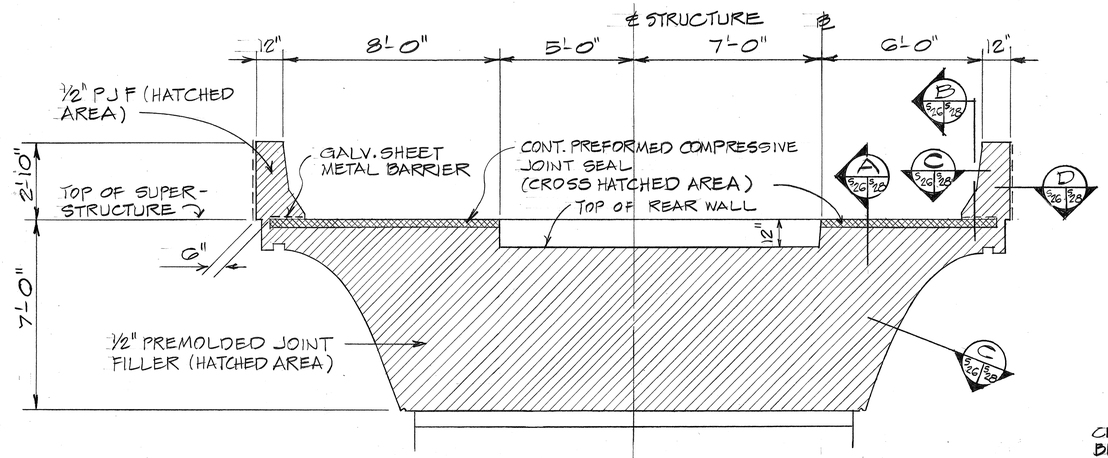
Stanley Y. Uchara
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FED. ROAD DIST. NO.	STATE	FED. AID PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
HAWAII	HAW.	F-078-1(21)	1980	185	234



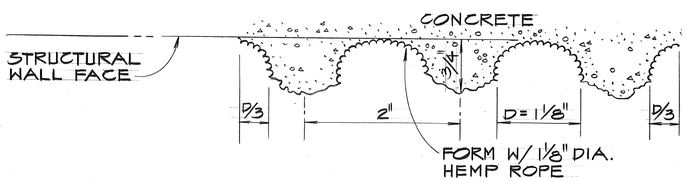
PLAN - EXPANSION JOINT @ ABUTMENT

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



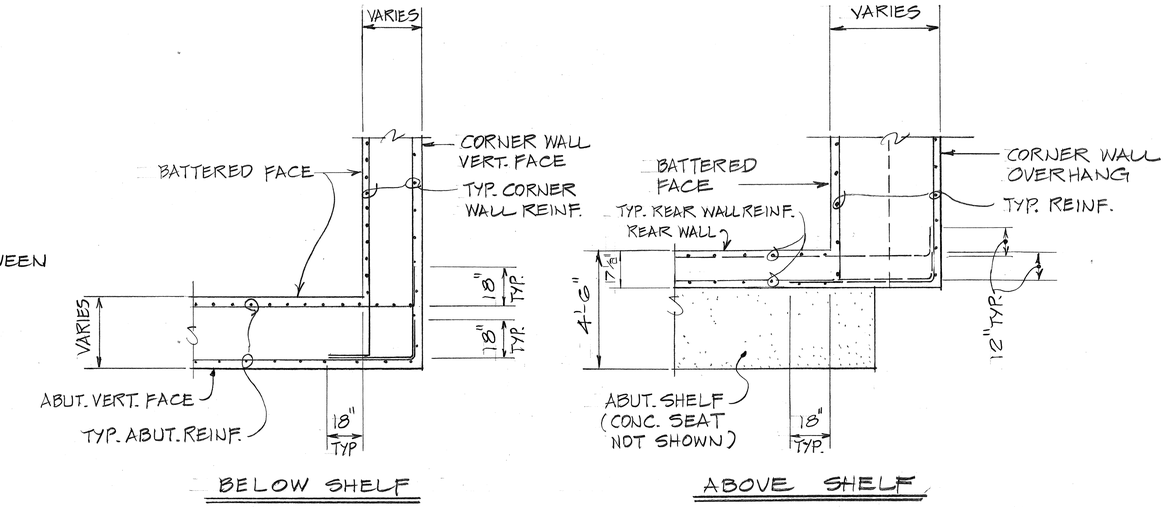
ELEVATION - EXPANSION JOINT @ ABUTMENT

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



FRACTURED ROPE TYPE ARCHITECTURAL WALL TREATMENT DETAIL

NOT TO SCALE



TYP. WALL CORNER REINF. DETAILS

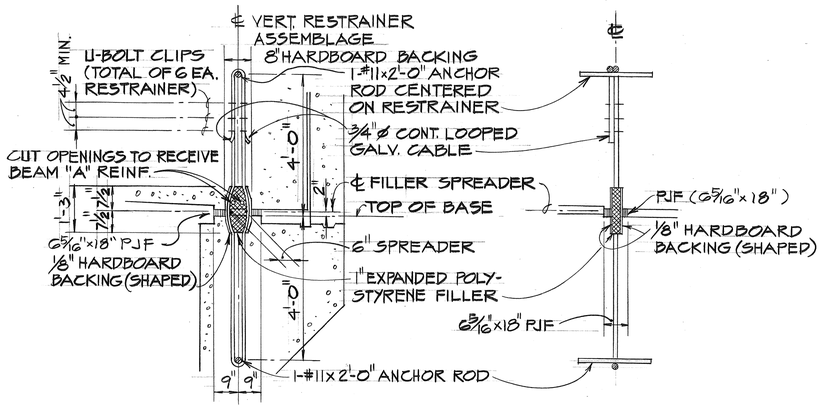
NOT TO SCALE

NAME OF STRUCTURE
19 -

NOTES:

1. FOR LETTER SIZE & DETAILS SEE STANDARD DETAILS SHT. S-56
2. DATE SHOWN SHALL BE THE YEAR STRUCTURE IS COMPLETED.

NAME AND DATE OF STRUCTURE



NOTE:

RESTRAINER ASSEMBLAGE SHALL BE INCIDENTAL TO CONCRETE RESTRAINER ASSEMBLAGE SHALL BE SECURELY HELD IN PLACE WHILE PLACING CONCRETE.

RESTRAINER DETAIL

SCALE: 1/2" = 1'-0"

GARY T. YAMAMOTO REGISTERED PROFESSIONAL ENGINEER No. 7997 HAWAII, U.S.A.

STANLEY TOSHIO UCHIDA REGISTERED PROFESSIONAL ENGINEER No. 3018 HAWAII, U.S.A.

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STATE OF HAWAII
DEPARTMENT OF TRANSPORTATION
HIGHWAYS DIVISION

RAMP "I" STRUCTURE

EXPANSION JOINT DETAILS AT ABUTMENT AND MISCELLANEOUS DETAILS

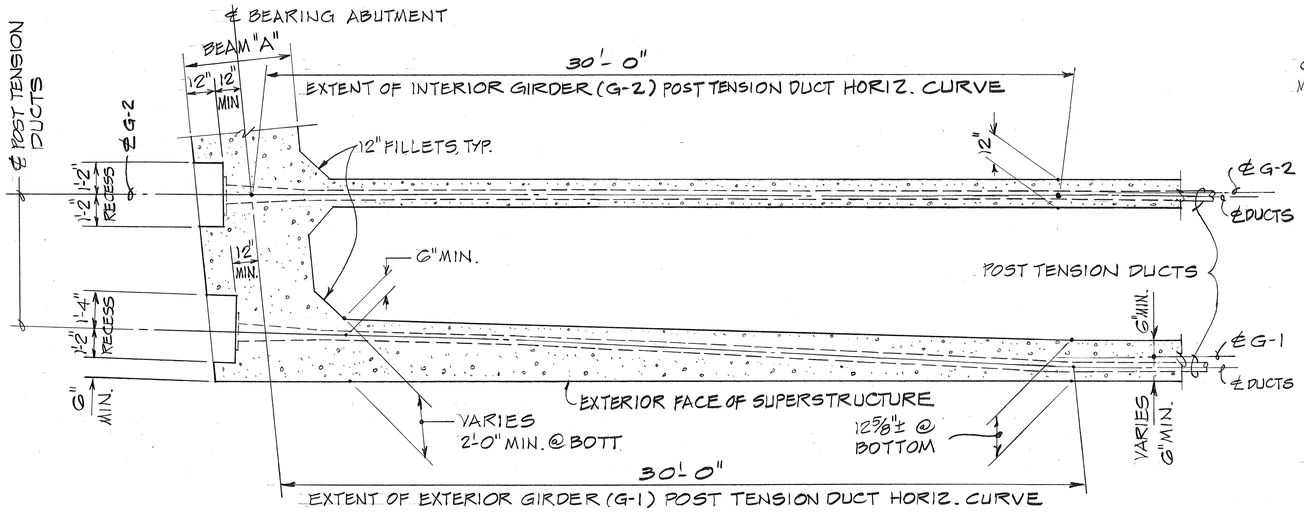
MOANALUA ROAD
PUULOA I.C. TO MIDDLE ST.-UNIT 3B
F.A. Proj. No. F-078-1(21)

SCALE : AS SHOWN DATE : AUG. 1, 1979

SHEET NO. S-16 OF 63 SHEETS

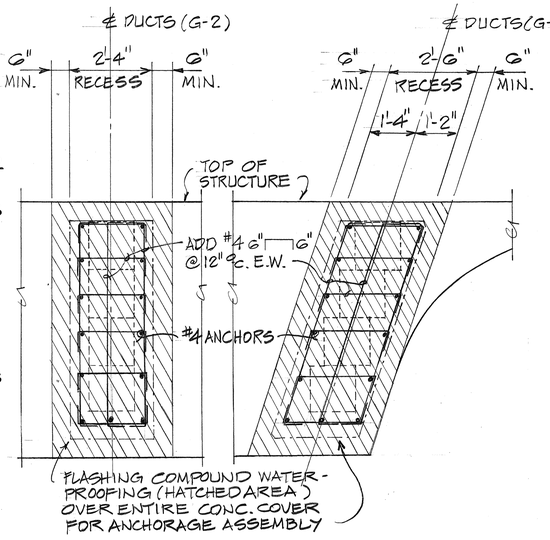
ORIGINAL PLAN | SURVEY PLOTTED BY | DRAWN BY | TRACED BY | DESIGNED BY | QUANTITIES BY | CHECKED BY | DATE | NOTE BOOK | No.

FED. ROAD DIST. NO.	STATE	FED. AID PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
HAWAII	HAW.	F-078-1(21)	1980	186	234

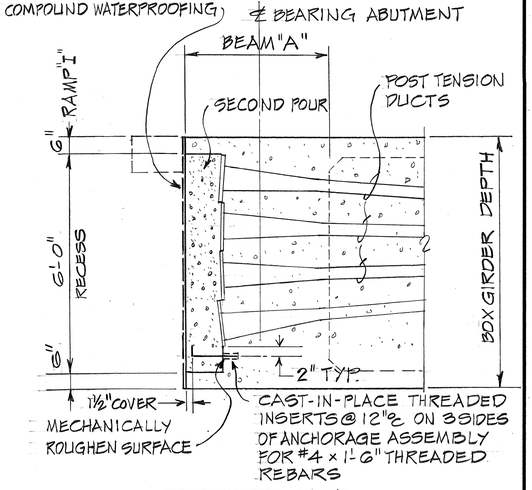


PLAN - POST TENSION DUCT LAYOUT IN EXTERIOR & INTERIOR GIRDER

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



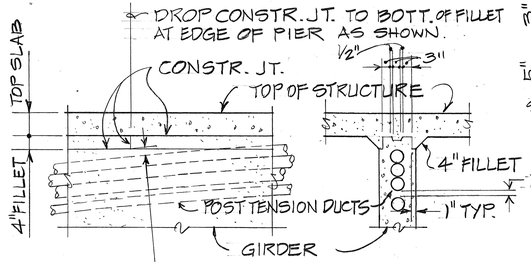
ELEVATIONS



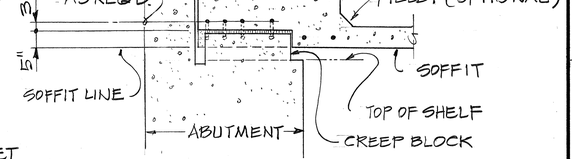
SECTION

POST TENSION DUCT ANCHORAGE GROUTING DETAILS

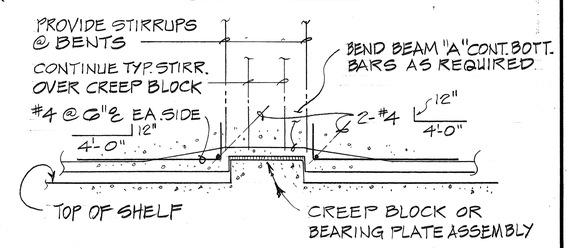
NOT TO SCALE



ELEVATION



SECTION



ELEVATION

TYP. DET. @ CREEP BLOCK & BEARING PLATE

NOT TO SCALE

NOTE :

FOR DETAILS NOT SHOWN, SEE STANDARD DETAIL SHEETS

STEM CONSTRUCTION JOINT DET.

NOT TO SCALE

POST TENSION NOTES :

1. SEE SPECS. FOR OTHER POST TENSION REQUIREMENTS.
2. ALL DUCTS SHALL BE RIGID FERROUS METAL GALVANIZED, MORTAR TIGHT AND SHALL BE SECURELY ANCHORED AT ALL TIMES DURING CONSTRUCTION TO PREVENT ANY DAMAGE. CONTRACTOR SHALL EXERCISE THE MAXIMUM AMOUNT OF CARE DURING PLACEMENT OF DUCTS, REINFORCING & CONCRETE IN ORDER TO PROTECT THE DUCTS FROM DAMAGE.
3. ½" ℄ 270 K STRANDS SHALL BE USED FOR POST TENSIONING.
4. ALL STRAND SHALL BE PLACED AND TENSIONED AFTER THE SUPERSTRUCTURE CONCRETE HAS ATTAINED A COMPRESSIVE STRENGTH EQUAL TO 4,000 PSI & A MINIMUM OF 10 DAYS MUST HAVE ELAPSED SINCE ITS LAST PLACEMENT.
5. CONTRACTOR SHALL TAKE STEPS NECESSARY TO ALLOW THE SUPERSTRUCTURE TO CONTRACT DURING TENSIONING OPERATIONS. DURING TENSIONING OPERATIONS THE BOX GIRDER SOFFIT FORMS WILL BE SUBJECT TO THE SAME COMPRESSIVE FORCE AS THE CONC. BOX GIRDER UNLESS COMPRESSIBLE JOINTS &/OR BOND BREAKERS ARE PROVIDED TO RELIEVE THIS FORCE.
6. ALL DUCTS SHALL BE CLEANED OUT BEFORE PLACING STRANDS.
7. THE MAXIMUM JACKING STRESS (ACTUAL) FOR ALL STRANDS SHALL BE 75% OF ULTIMATE
8. STRANDS SHALL BE END ANCHORED AT A MAXIMUM EQUIVALENT ANCHOR SET OF ½".
9. THE SEQUENCE OF POST TENSIONING SHALL BE DETERMINED BY THE CONTRACTOR AND SHALL BE APPROVED BY THE ENGINEER.
10. NO TENSIONING OR GROUTING SHALL BE PERFORMED IN THE ABSENCE OF THE ENGINEER.
11. AFTER ALL POST TENSION OPERATIONS & TESTING ARE COMPLETED. ALL DUCTS SHALL BE GROUTED IN ACCORDANCE WITH THE SPECIFICATIONS.
12. AFTER GROUTING IS COMPLETED, THE ANCHORAGE ASSEMBLY SHALL BE REINFORCED & PROTECTED AS SHOWN.

ANCHORAGE ASSEMBLY PROTECTION NOTES :

1. AFTER ALL POST TENSION WORK IS COMPLETED, CLEAN POST TENSION HARDWARE AS REQUIRED IN ORDER TO PROVIDE GOOD BONDING SURFACE.
2. BEND DOWELS AND PLACE ADDED REINFORCING AS SHOWN.
3. PAINT ENTIRE ANCHORAGE ASSEMBLY (INCLUDING POST TENSION HARDWARE) WITH TWO COMPONENT EPOXY. (COST INCIDENTAL TO CONCRETE)
4. JUST BEFORE NEW CONCRETE IS PLACED AGAINST POST TENSION ANCHOR PLATES, APPLY A NEW COAT OF EPOXY FOR BOND WITH CONCRETE.
5. 7 DAYS AFTER PLACING CONCRETE OVER ANCHORAGE ASSEMBLY PLACE WATERPROOFING MEMBRANE AS SHOWN.

POST TENSION DESIGN NOTES :

1. DESIGN IS BASED ON K=.0002 (FRICTION WOBBLE COEFFICIENT) & μ=0.25 (CURVATURE FRICTION COEFFICIENT)
2. MINIMUM CONCRETE COMPRESSIVE STRENGTH AT 28 DAYS FOR THE CONCRETE BOX GIRDER SHALL BE 5,000 PSI.
3. PRESTRESS LOSSES (EXCEPT FRICTION AND ANCHOR SET) IS BASED ON AN ASSUMED LOSS OF 33,000 PSI.

NOTES FOR POST TENSION DUCT LAYOUT :

1. ALL POST TENSION BEARING ℄'S SHALL BE PERPENDICULAR (HORIZONTALLY & VERTICALLY) TO THEIR RESPECTIVE POST TENSION DUCT AXES.
2. DUCTS IN EXTERIOR GIRDER (G-1) SHALL BE OFFSET AT ABUTMENTS AND SHALL BE PLACED IN A SMOOTH HORIZONTAL CURVE AS SHOWN, UNLESS INDICATED OTHERWISE ON THE PLANS.

SPECIAL POST TENSION NOTE

SEE SHT. S-22 FOR RAMP "I" STRUCTURE

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

DANIEL Y. YAMAMOTO REGISTERED PROFESSIONAL ENGINEER No. 2997 HAWAII, U.S.A.

STANLEY YOSHITO UCHARA REGISTERED PROFESSIONAL ENGINEER No. 3018 HAWAII, U.S.A.

Stanley Y. Uchara
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STATE OF HAWAII
DEPARTMENT OF TRANSPORTATION
HIGHWAYS DIVISION

TYPICAL DETAIL

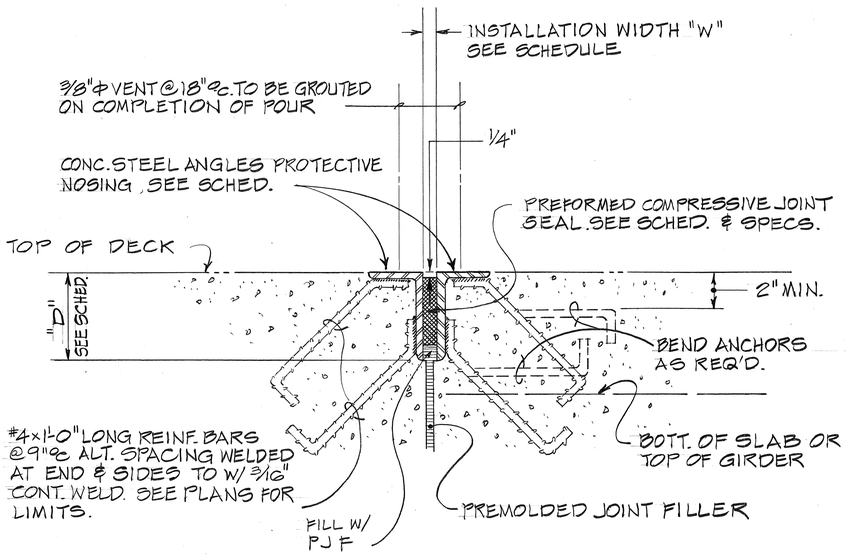
TYPICAL POST TENSION DUCT LAYOUT, DETAILS AND NOTES AT BEAM "A"

MOANALUA ROAD
PUULOA I.C. TO MIDDLE ST. - UNIT 3B
F.A. Proj. No. F-078-1(21)

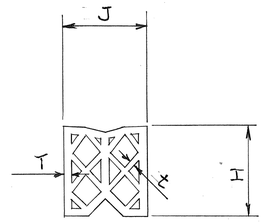
SCALE : AS SHOWN DATE : AUG., 1979

SHEET NO. S-27 OF 65 SHEETS

FED. ROAD DIST. NO.	STATE	FED. AID PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
HAWAII	HAW.	F-078-1(21)	1980	187	234



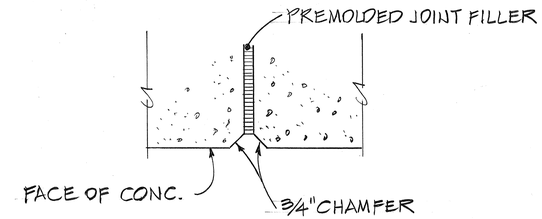
SECTION
SCALE : 3" = 1'-0"
A S 26 28



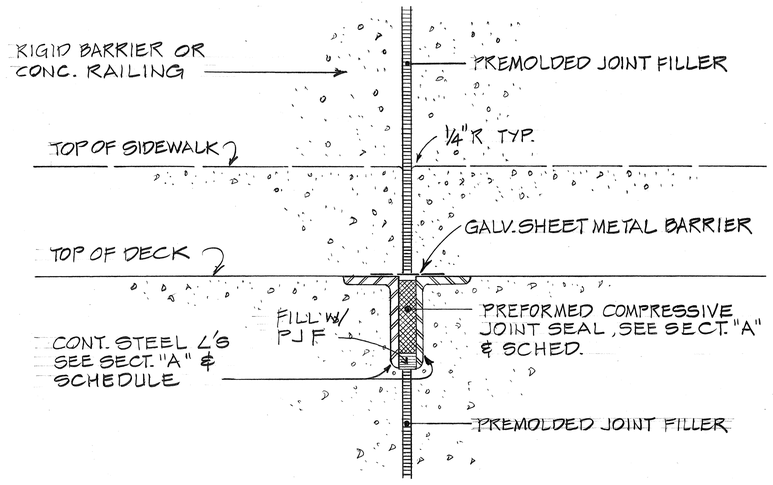
JOINT SEALER
SECTION

EXPANSION JOINT SEALER SCHEDULE

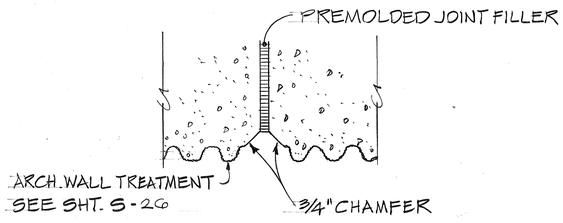
LOCATION	INSTALLATION WIDTH (W)	JOINT SEALER DIMENSION				STEEL ANGLE PROTECTIVE NOSING	GROOVE DIMENSION "D"
		J	H	THICKNESS T	THICKNESS t		
RAMP "I" STRUCTURE ABUTMENT #1	2 1/4"	4"	4 3/8"	1/4"	3/16"	L 3 1/2 x G x 3/8 (LLV)	5"
RAMP "I" STRUCTURE ABUTMENT #2	2 1/4"	4"	4 3/8"	1/4"	3/16"	L 3 1/2 x G x 3/8 (LLV)	5"



SECTION
SCALE : 3" = 1'-0"
C S 26 28



SECTION
SCALE : 3" = 1'-0"
B S 26 28



SECTION
SCALE : 3" = 1'-0"
D S 26 28

NOTES :

1. STEEL ANGLE PROTECTIVE NOSING ASSEMBLAGE SHALL BE HOT DIPPED GALVANIZED AFTER FABRICATION.
2. STEEL ANGLE PROTECTIVE NOSING ASSEMBLAGE AND JOINT SEALER INCIDENTAL TO CONCRETE.
3. INSTALLATION WIDTH (W) IS THE WIDTH OF THE OPENING AT INSTALLATION OF THE JOINT SEALER.

GARY T. YAMAMOTO REGISTERED PROFESSIONAL ENGINEER No. 2897 HAWAII, U.S.A.

STANLEY YOSHITO UEMURA REGISTERED PROFESSIONAL ENGINEER No. 3018 HAWAII, U.S.A.

Sterling Y. Uehara
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DEPARTMENT OF TRANSPORTATION
HIGHWAYS DIVISION

TYPICAL DETAIL

EXPANSION JOINT PREFORMED COMPRESSIVE JOINT SEALER WATERPROOFING DETAILS

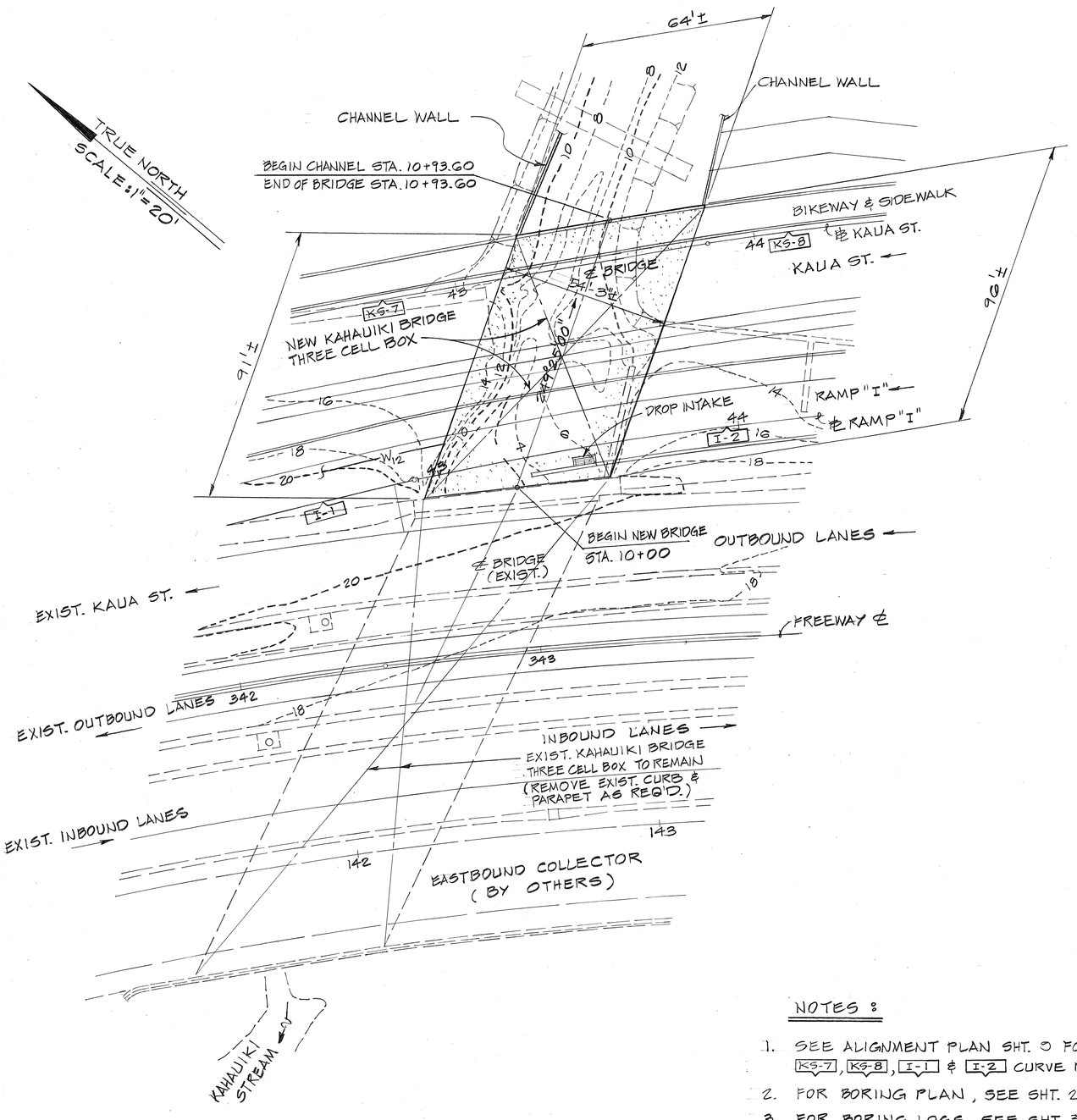
MOANALUA ROAD
PUULOA I.C. TO MIDDLE ST. - UNIT 3B
F.A. Proj. No. F-078-1(21)

SCALE : AS SHOWN DATE : AUG 1, 1979

SHEET NO. S-28 OF 63 SHEETS

ORIGINAL PLAN
NOTE BOOK No.
SURVEY PLOTTED BY DATE
DRAWN BY
TRACED BY
DESIGNED BY
QUANTITIES BY
CHECKED BY

FED. ROAD DIST. NO.	STATE	FED. AID PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
HAWAII	HAW.	F-078-1(21)	1980	188	234

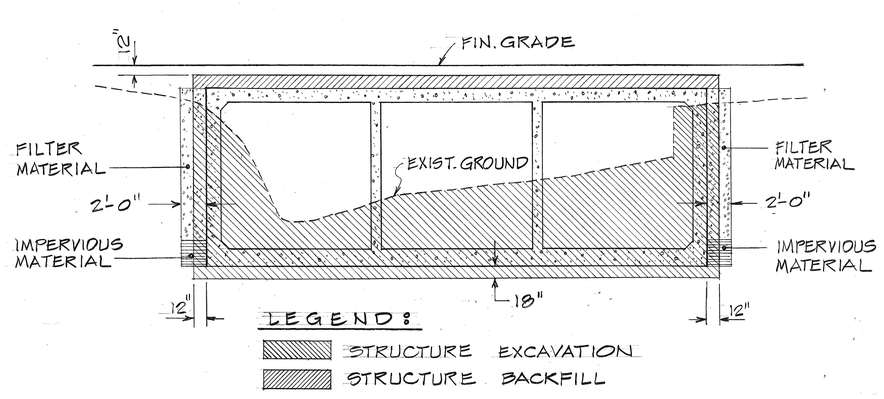


GENERAL LAYOUT PLAN

SCALE: 1" = 20'

ESTIMATED QUANTITIES KAHAUIKI BRIDGE THREE CELL BOX

ITEM No.	ITEM	UNIT	QUANTITIES
206.6005	STRUCTURE EXCAVATION FOR BRIDGES	Cu.Yd.	1,743
206.7211	STRUCTURE BACKFILL FOR BRIDGES	Cu.Yd.	431
206.8200	FILTER MATERIAL	Cu.Yd.	232
503.1092	CONCRETE IN KAHAUIKI BRIDGE	L.S.	(925 Cu.Yd.)
602.0091	REINFORCING STEEL IN KAHAUIKI BRIDGE	L.S.	(154,100 lbs)
603.0012	BED COURSE MATERIAL - #2 ROCK	Cu.Yd.	102
603.0013	BED COURSE MATERIAL - 12"℄ MIN. ROCK	Cu.Yd.	203



TYPICAL STRUCTURE EXCAVATION & BACKFILL DETAIL

NOT TO SCALE

NOTES:

1. SEE ALIGNMENT PLAN SHT. 5 FOR KS-7, KS-8, I-1 & I-2 CURVE DATA.
2. FOR BORING PLAN, SEE SHT. 2
3. FOR BORING LOGS, SEE SHT. 3
4. FOR DROP INTAKE, SEE DET. D 3/4/83

DATE	REVISION
4/8/81	CHANGED ITEM NOS. 206.6000 TO 206.6005 & 206.8000 TO 206.8200

GARY T. YAMAMOTO — REGISTERED PROFESSIONAL ENGINEER — No. 2997 — HAWAII, U.S.A.

STANLEY YOSHITO UEHARA — REGISTERED PROFESSIONAL ENGINEER — No. 3018 — HAWAII, U.S.A.

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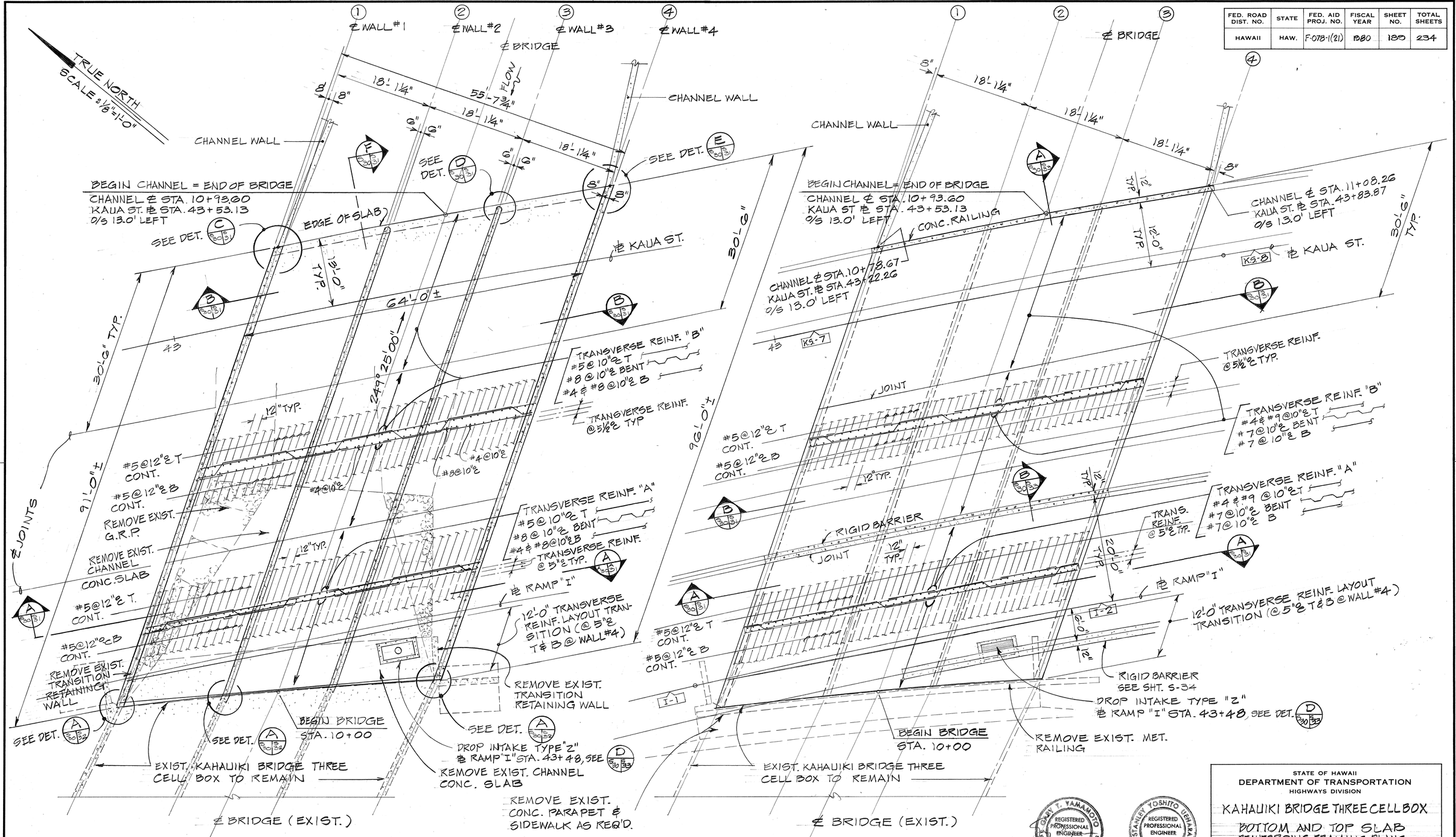
KAHAUIKI BRIDGE THREE CELL BOX
GENERAL LAYOUT PLAN, ESTIMATED QUANTITIES AND TYPICAL STRUCTURE EXCAVATION & BACKFILL DETAIL
MOANALUA ROAD
PUULOA I.C. TO MIDDLE ST. - UNIT 3B
F.A. Proj. No. F-078-1 (21)
SCALE: AS SHOWN DATE: AUG 1, 1979

SHEET NO. 5-2 OF 63 SHEETS

ORIGINAL PLAN
SURVEY PLOTTED BY
DRAWN BY
TRACED BY
DESIGNED BY
NOTE BOOK
QUANTITIES BY
CHECKED BY
DATE
No.

ADD 188

FED. ROAD DIST. NO.	STATE	FED. AID PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
HAWAII	HAW.	F-078-1(21)	1980	188	234



BOTTOM SLAB REINFORCING FRAMING PLAN

SCALE: 1/8"=1'-0"

TOP SLAB REINFORCING FRAMING PLAN

SCALE: 1/8"=1'-0"

ORIGINAL PLAN | SURVEY PLOTTED BY | DRAWN BY | TRACED BY | DESIGNED BY | QUANTITIES BY | CHECKED BY | DATE
NOTE BOOK | No.

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STANLEY YOSHITO UEHARA — REGISTERED PROFESSIONAL ENGINEER — No. 3018 — HAWAII, U.S.A.

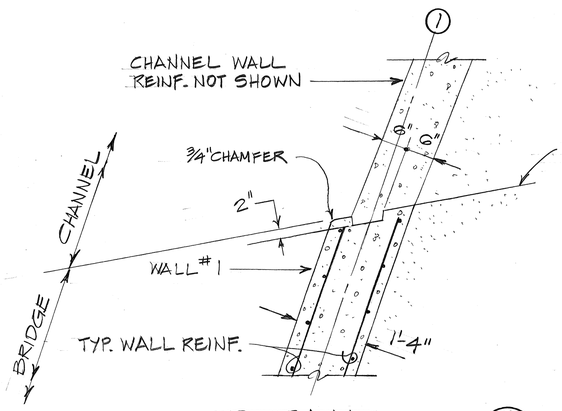
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DEPARTMENT OF TRANSPORTATION
HIGHWAYS DIVISION

KAHAUIKI BRIDGE THREE CELL BOX
BOTTOM AND TOP SLAB REINFORCING FRAMING PLANS
MOANALUA ROAD
PUULOA I.C. TO MIDDLE ST. - UNIT 3B
F.A. Proj. No. F-078-1(21)
SCALE: AS SHOWN DATE: AUG 1, 1979

SHEET NO. S-30 OF 63 SHEETS

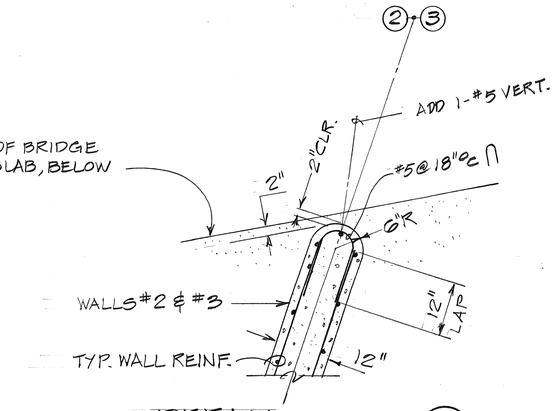
FED. ROAD DIST. NO.	STATE	FED. AID PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
HAWAII	HAW.	F-078-1(21)	1980	150	234



DETAIL

SCALE: 3/4"=1'-0"

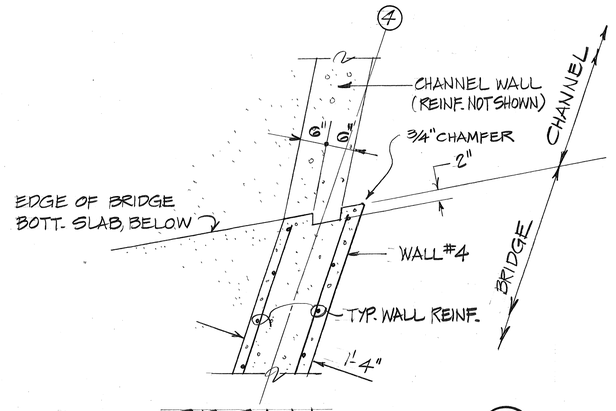
C



DETAIL

SCALE: 3/4"=1'-0"

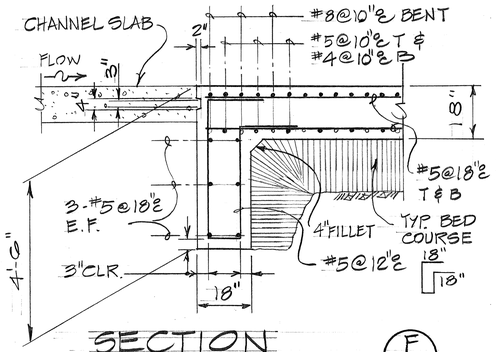
D



DETAIL

SCALE: 3/4"=1'-0"

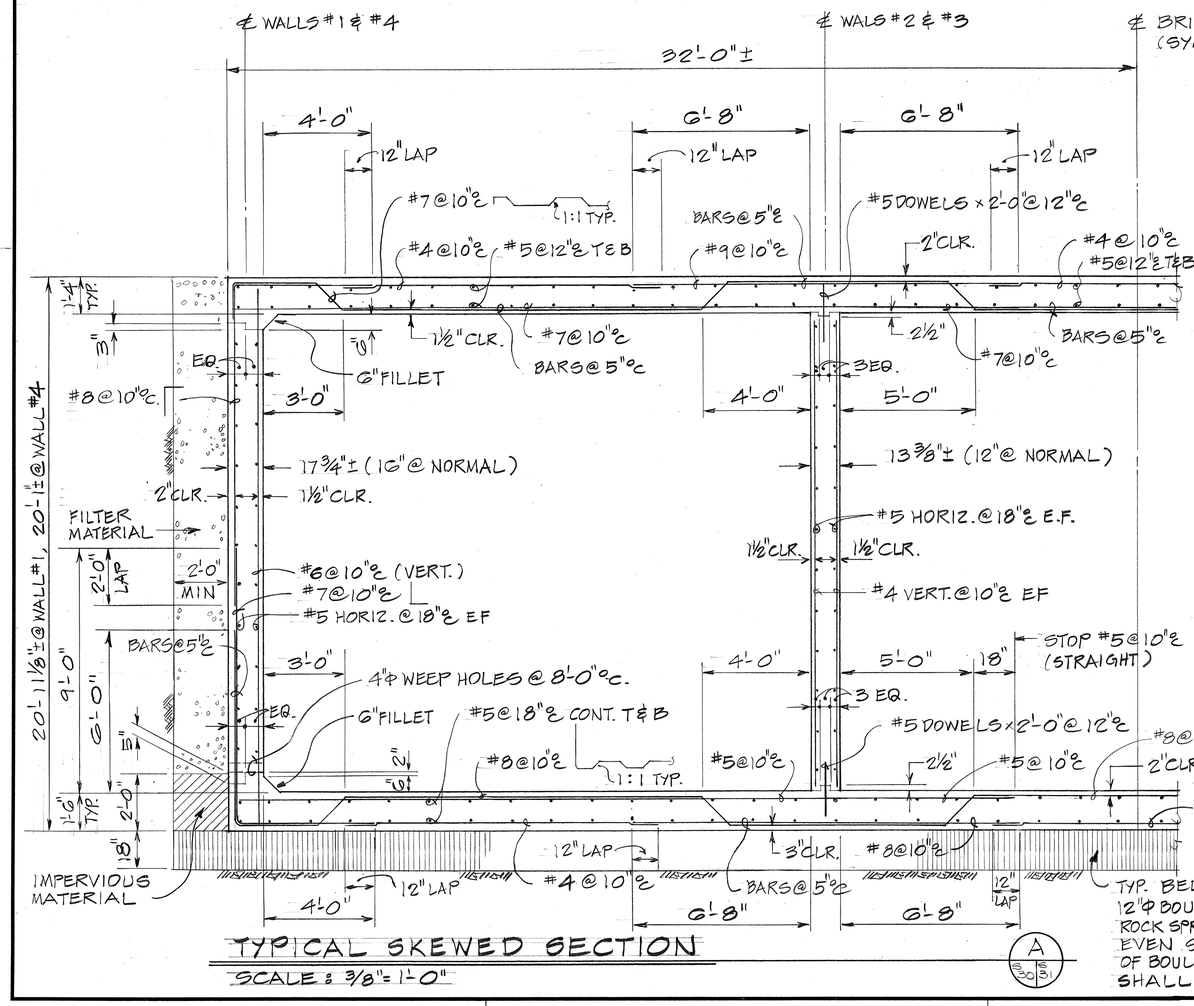
E



SECTION

SCALE: 1/2"=1'-0"

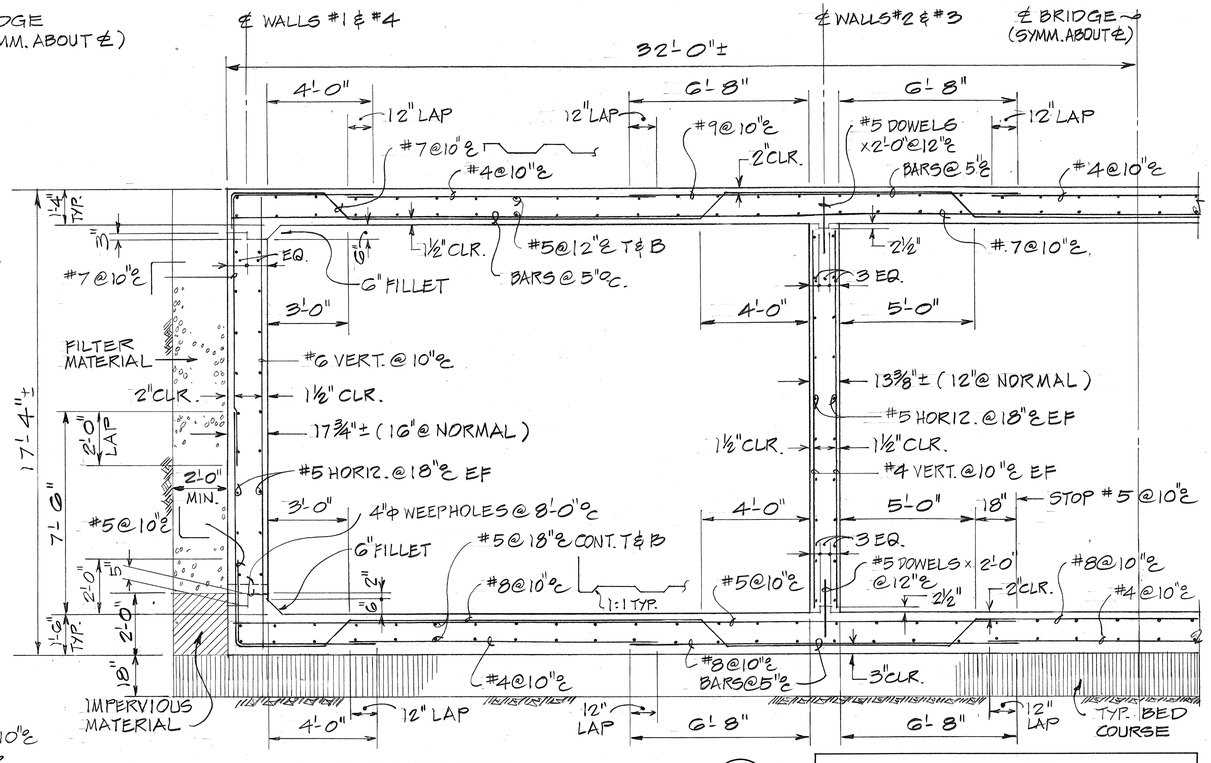
F



TYPICAL SKEWED SECTION

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

A



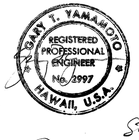
TYPICAL SKEWED SECTION

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

B

SURVEY PLOTTED BY
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DESIGNED BY
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NOTE BOOK
No.





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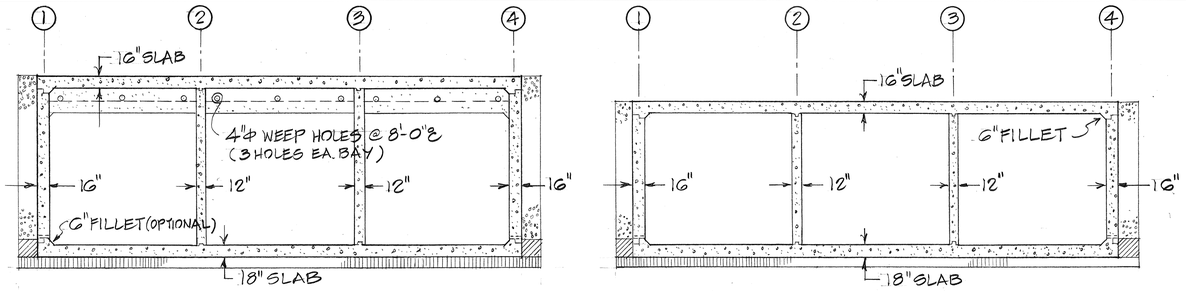
KAHAUIKI BRIDGE THREE CELL BOX

TYPICAL SKEWED SECTIONS AND DETAILS

MOANALUA ROAD
PUULOA I.C. TO MIDDLE ST.-UNIT 3B
F.A. Proj. No. F-078-1(21)
SCALE: AS SHOWN DATE: AUG 1, 1979

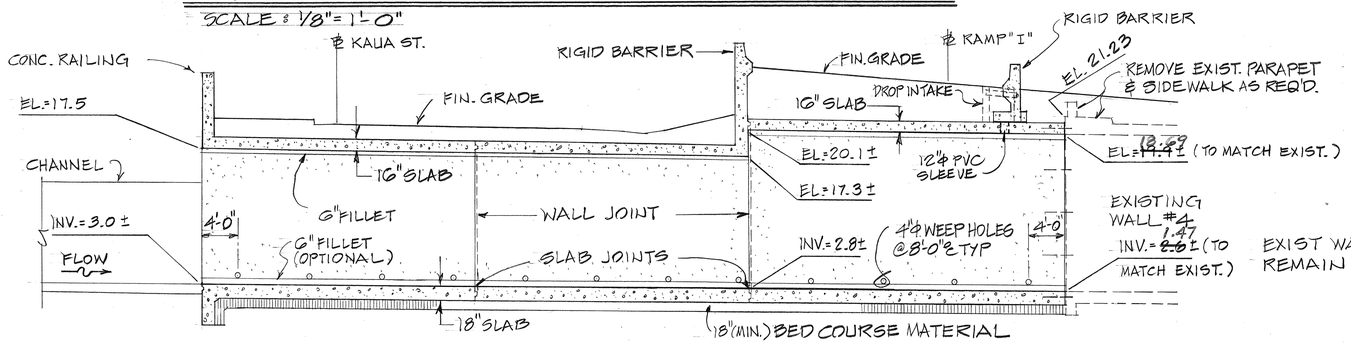
SHEET NO. S-31 OF 63 SHEETS

FED. ROAD DIST. NO.	STATE	FED. AID PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
HAWAII	HAW.	F-078-1(21)	1980	191	234



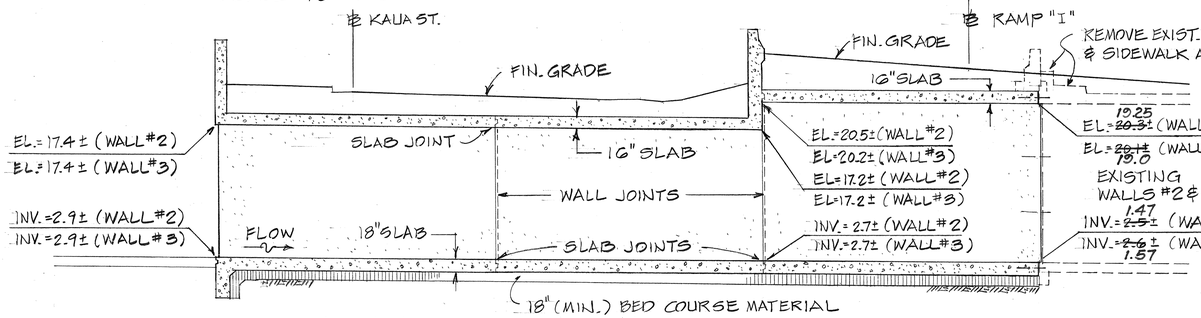
NORMAL SECTIONS - LOOKING UPSTREAM

SCALE: 1/8"=1'-0"



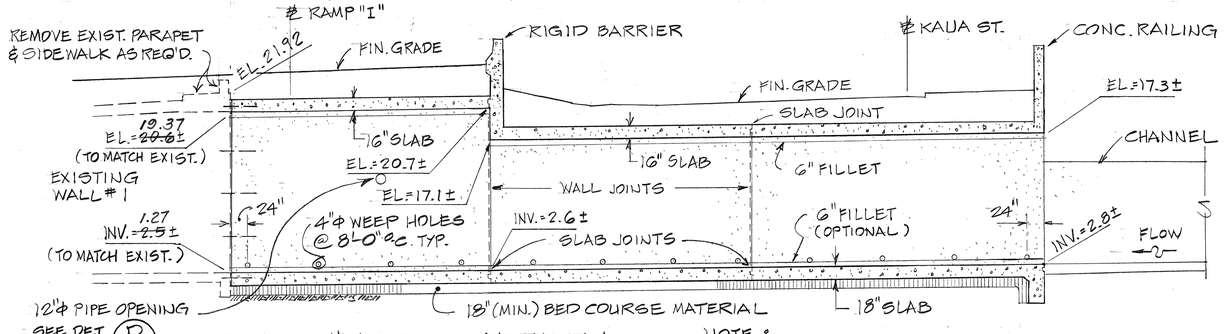
WALL #4 ELEVATION

SCALE: 1/8"=1'-0"



WALLS #2 & #3 ELEVATION

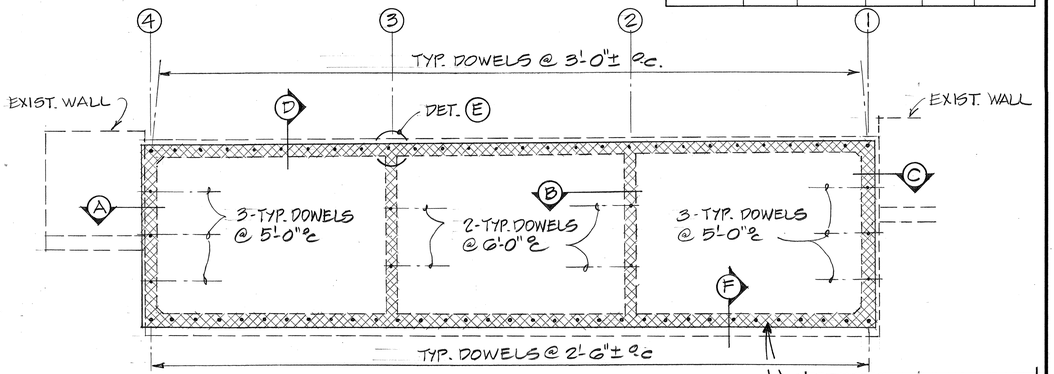
SCALE: 1/8"=1'-0"



WALL #1 ELEVATION

SCALE: 1/8"=1'-0"

NOTE:
CONTRACTOR SHALL VERIFY ELEVATIONS SHOWN AT THE CONNECTION BETWEEN THE NEW AND EXISTING KAHAUIKI BRIDGE THREE CELL BOX.

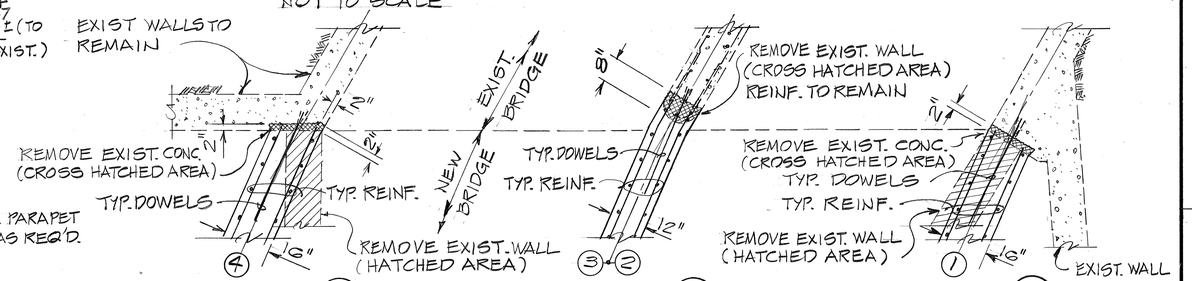


TYP. DOWEL - THREADED #6 x 3'-0" LONG W/ 3/4" EXPANSION SHIELD (EMBED 3 1/4" IN EXIST. STRUCTURE)

COAT EXIST. CONC. AT JOINTED FACE WITH EPOXY BONDING COMPOUND (CROSS HATCHED AREA)

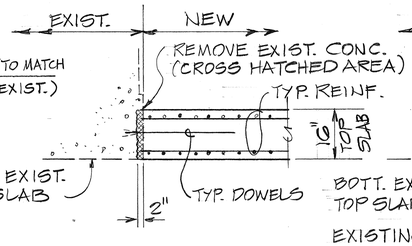
TYPICAL DOWEL LAYOUT ELEVATION

NOT TO SCALE



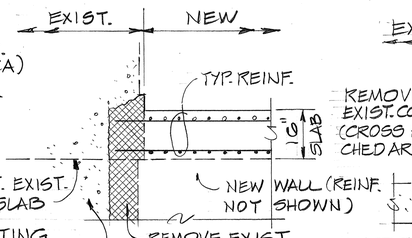
DETAIL A

SCALE: 1/2"=1'-0"



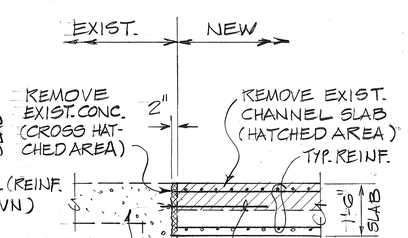
DETAIL B

SCALE: 1/2"=1'-0"



DETAIL C

SCALE: 1/2"=1'-0"



DETAIL D

SCALE: 1/2"=1'-0"

DETAIL E

SCALE: 1/2"=1'-0"

DETAIL F

SCALE: 1/2"=1'-0"

CONNECTION DETAILS TO EXIST. BRIDGE

A
S30 S32

SCALE: AS SHOWN

NOTE: IN REMOVING EXISTING CONC., SAW CUT AT LEAST TO EXPOSURE OF EXISTING REBARS.

GARY T. YAMAMOTO REGISTERED PROFESSIONAL ENGINEER No. 2997 HAWAII, U.S.A.

STANLEY YOSHITO NEHARA REGISTERED PROFESSIONAL ENGINEER No. 3018 HAWAII, U.S.A.

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HIGHWAYS DIVISION

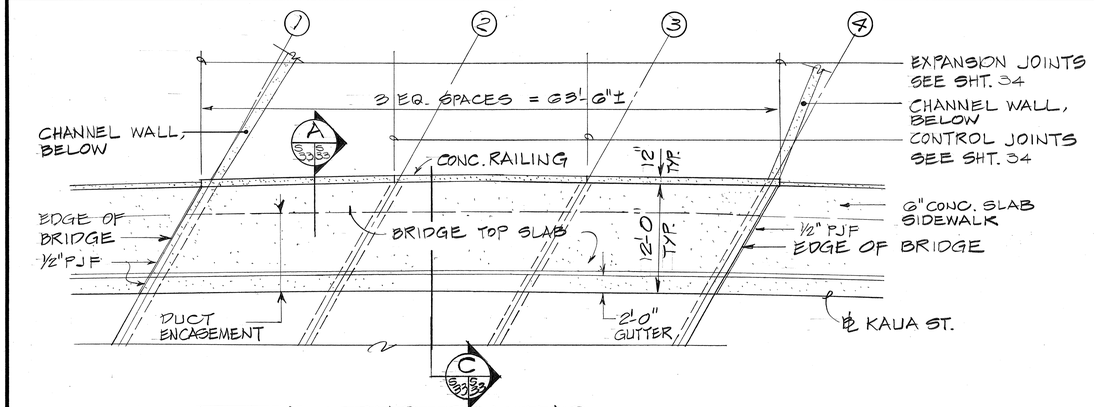
KAHAUIKI BRIDGE THREE CELLBOX

WALL ELEVATIONS, NORMAL SECTIONS AND CONNECTION DETAILS TO EXIST. BRIDGE

MOANALUA ROAD
PUULOA I.C. TO MIDDLE ST.-UNIT 3B
F.A. Proj. No. F-078-1(21)
SCALE: AS SHOWN DATE: AUG 1, 1979

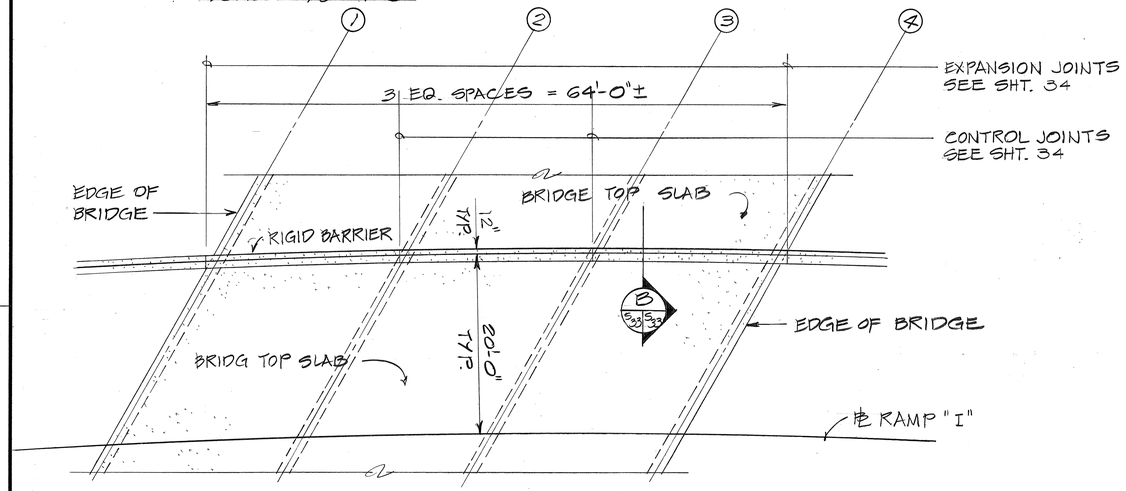
SHEET NO. 5 OF 63 SHEETS

SURVEY PLOTTED BY:
DRAWN BY:
TRACED BY:
DESIGNED BY:
QUANTITIES BY:
CHECKED BY:
DATE:
ORIGINAL PLAN
NOTE BOOK
No.



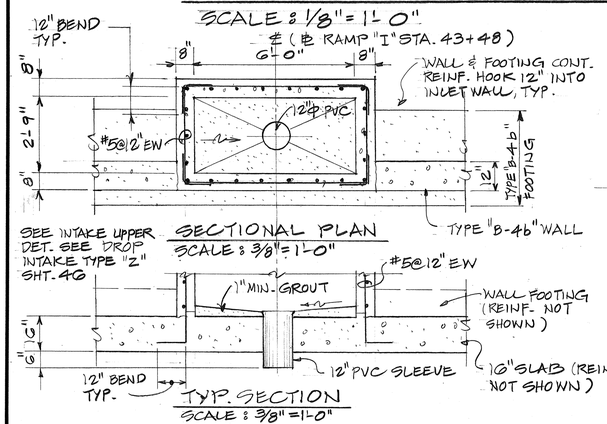
PLAN - CONC. RAILING

SCALE : 1/8" = 1'-0"



PLAN - RIGID BARRIER

SCALE : 1/8" = 1'-0"

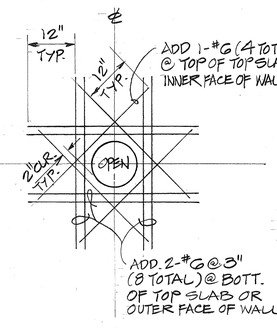


SECTIONAL PLAN

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

TYP. SECTION

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



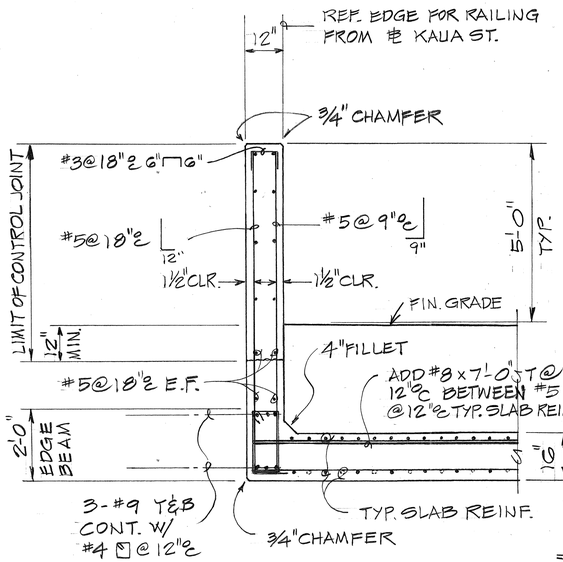
ADD. REINF. @ PIPE OPENING

NOT TO SCALE

DROP INTAKE @ KAHAUIKI BRIDGE

SCALE : AS SHOWN

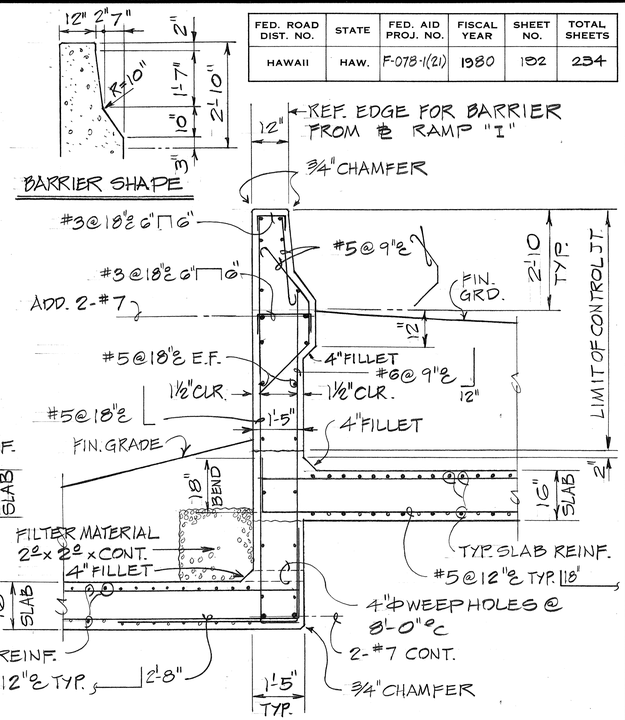
S-30, S-32 (D, S33, S33)



SECTION

SCALE : ½" = 1'-0"

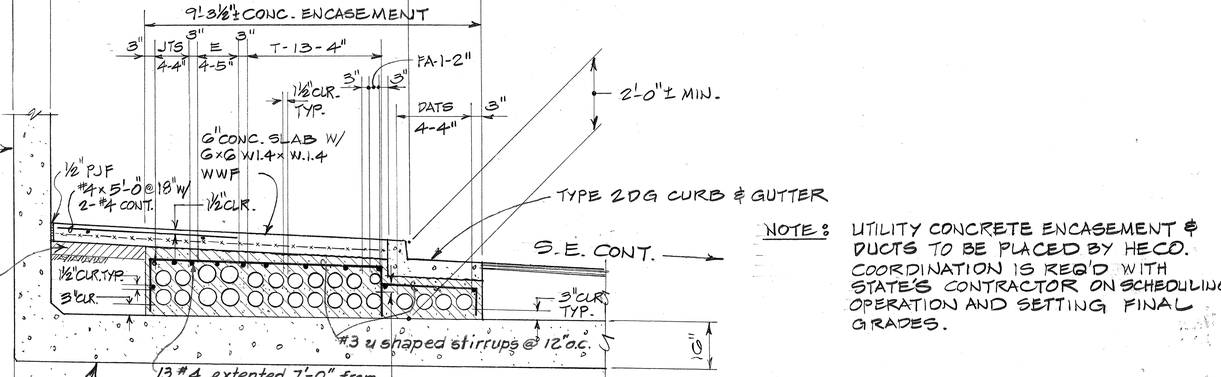
A S33 S33 — S-30



SECTION

SCALE : ½" = 1'-0"

B S33 S33 — S-30



NOTE : UTILITY CONCRETE ENCASEMENT & DUCTS TO BE PLACED BY HECO. COORDINATION IS REQ'D WITH STATE'S CONTRACTOR ON SCHEDULING OPERATION AND SETTING FINAL GRADES.

SECTION

SCALE : "G"

C S33 S33

FED. ROAD DIST. NO.	STATE	FED. AID PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
HAWAII	HAW.	F-078-1(21)	1980	192	234

ORIGINAL PLAN | NOTE BOOK | NO.

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

GARY T. YAMAMOTO — REGISTERED PROFESSIONAL ENGINEER — No. 2997 — HAWAII, U.S.A.

STANLEY YOSHITO UEHARA — REGISTERED PROFESSIONAL ENGINEER — No. 3018 — HAWAII, U.S.A.

Stanley Y. Uehara

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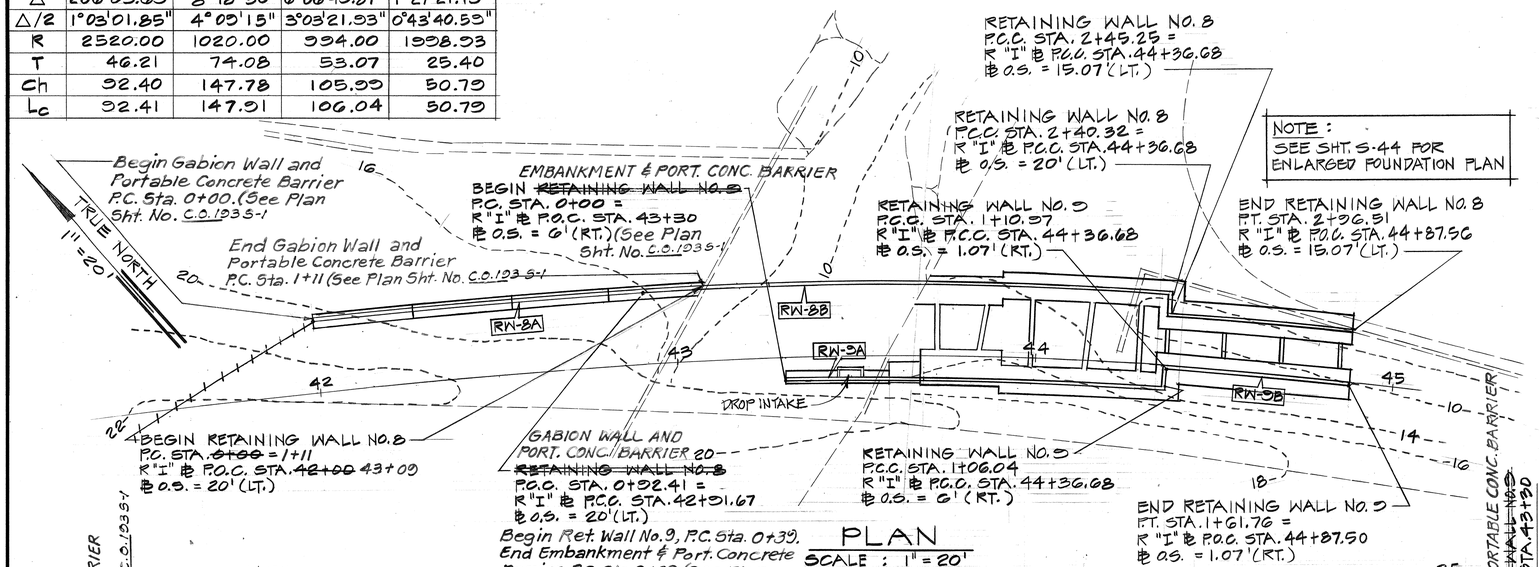
STATE OF HAWAII
DEPARTMENT OF TRANSPORTATION
HIGHWAYS DIVISION

KAHAUIKI BRIDGE THREE CELL BOX
CONC. RAILING, RIGID BARRIER AND MISCELLANEOUS DETAILS
MOANALUA ROAD
PUULOA I.C. TO MIDDLE ST. - UNIT 3B
F.A. Proj. No. F-078-1(21)
SCALE : AS SHOWN DATE : AUG 1, 1979

SHEET NO. S-33 OF 63 SHEETS

	RW-8A	RW-8B	RW-9A	RW-9B
Δ	206°03.60"	8°18'30"	6°06'43.87"	1°27'21.15"
Δ/2	1°03'01.85"	4°09'15"	3°03'21.93"	0°43'40.53"
R	2520.00	1020.00	994.00	1998.93
T	46.21	74.08	53.07	25.40
Ch	92.40	147.78	105.99	50.79
Lc	92.41	147.91	106.04	50.79

FED. ROAD DIST. NO.	STATE	FED. AID PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
HAWAII	HAW.	F-078-1(21)	1980	193	234



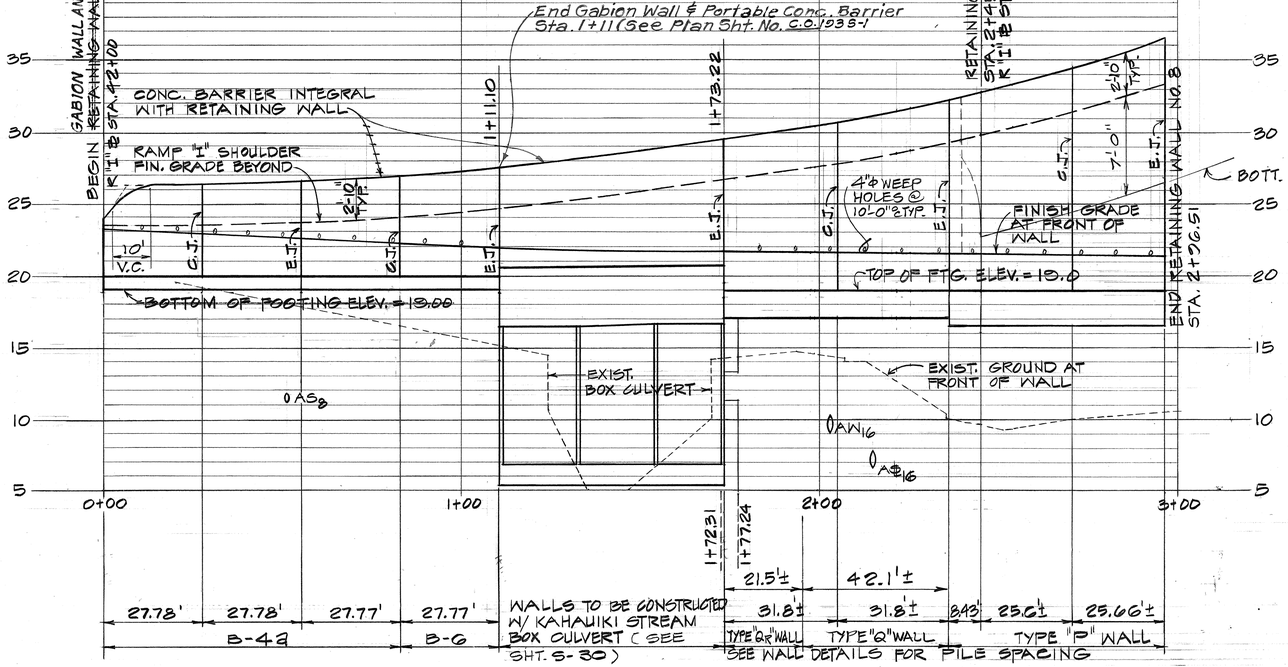
PLAN
SCALE : 1" = 20'

NOTE

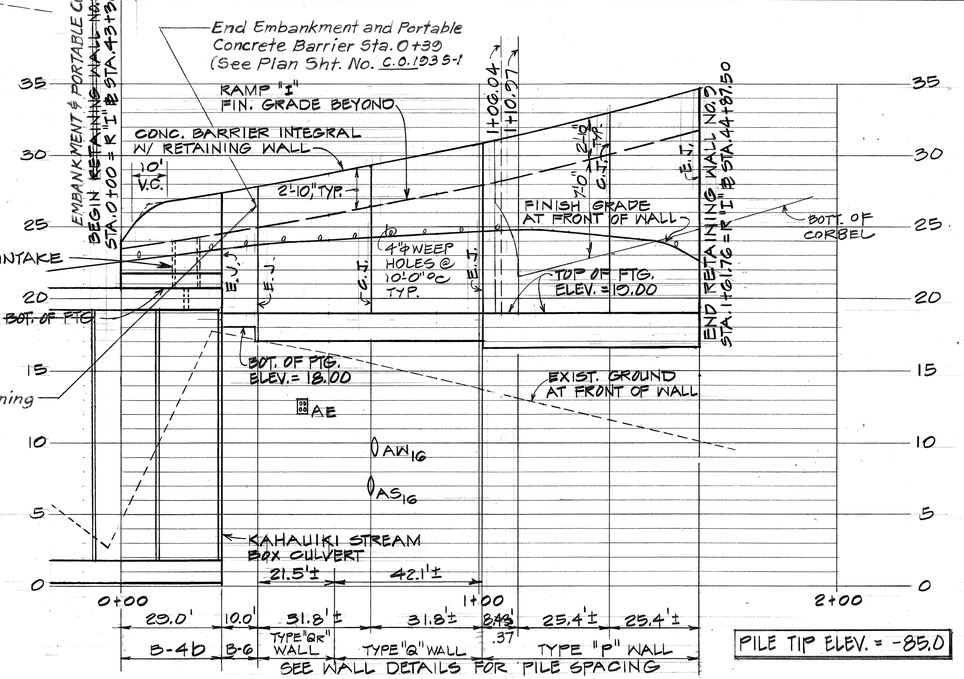
1. CONTRACTOR SHALL VERIFY LOCATION OF EXISTING UTILITIES BEFORE DRIVING PILES.

ESTIMATED QUANTITIES FOR RETAINING WALL NOS 8 & 9

ITEM NO.	ITEM	UNIT	QUANTITIES WALL NO. 8	QUANTITIES WALL NO. 9
206.5000	STRUCTURE EXCAVATION FOR RETAINING WALLS	cu.Yd.	2	0
206.7250	STRUCTURE BACKFILL FOR RETAINING WALLS	cu.Yd.	34	869
206.8300	FILTER MATERIAL FOR RETAINING WALLS	cu.Yd.	0	129
503.1054	CONCRETE IN RETAINING WALL NO. 8	L.S.	(202 cu.Yd.)	—
503.1055	CONCRETE IN RETAINING WALL NO. 9	L.S.	—	(300 cu.Yd.)
505.0430	PRECAST, PRESTRESSED CONC. PILES, FURNISHED	Lin. Ft.	2110	3150
505.4300	PRECAST PRESTRESSED CONC. PILES, DRIVEN	Lin. Ft.	2040	3045
602.0054	REINFORCING STEEL IN RETAINING WALL NO. 8	L.S.	(20,385 lbs)	—
602.0055	REINFORCING STEEL IN RETAINING WALL NO. 9	L.S.	—	(29,653 lbs)



PROFILE ~ RETAINING WALL NO. 8



PROFILE ~ RETAINING WALL NO. 9

REFERENCE DRAWINGS

TYPE "B" WALL DETAILS ..... SHT. S-39
TYPE "P" WALL DETAILS ..... SHT. S-44
TYPE "Q" WALL DETAILS ..... SHT. S-45
TYPE "QR" WALL DETAILS ..... SHT. S-45

SCALES

HORIZ.: 1" = 20'
VERT. : 1" = 5'

GARY T. TAKAMOTO REGISTERED PROFESSIONAL ENGINEER No. 3997 HAWAII, U.S.A.

WILBERT T. TAKAMIYA REGISTERED PROFESSIONAL ENGINEER No. 1684 HAWAII, U.S.A.

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STATE OF HAWAII
DEPARTMENT OF TRANSPORTATION
HIGHWAYS DIVISION

PLAN AND PROFILES RETAINING WALLS NO. 8 & 9

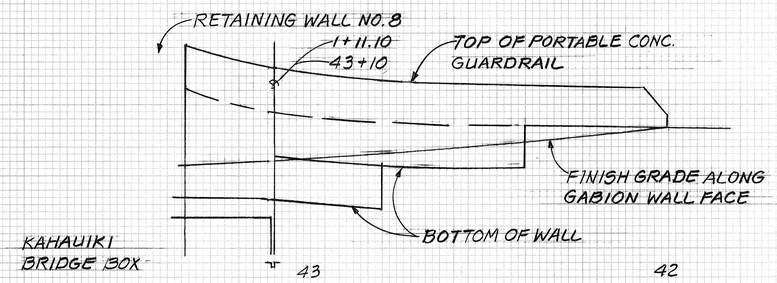
MOANALUA ROAD
PUULOA I.C. TO MIDDLE ST. - UNIT 3B
F.A. Proj. No. F-078-1(21)

SCALE: AS SHOWN DATE: AUG 1, 1979

SHEET NO. 534 OF 63 SHEETS

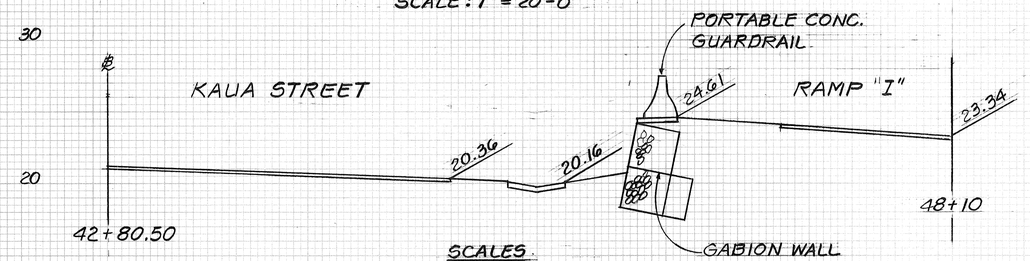
ORIGINAL PLAN	SURVEY PLOTTED BY	DRAWN BY	TRACED BY	DESIGNED BY	QUANTITIES BY	CHECKED BY	DATE
NOTE BOOK							
No.							

FED. ROAD DIST. NO.	STATE	FED. AID PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
HAWAII	HAW.	F-078-1(21)	1980	C0193 5-1	234

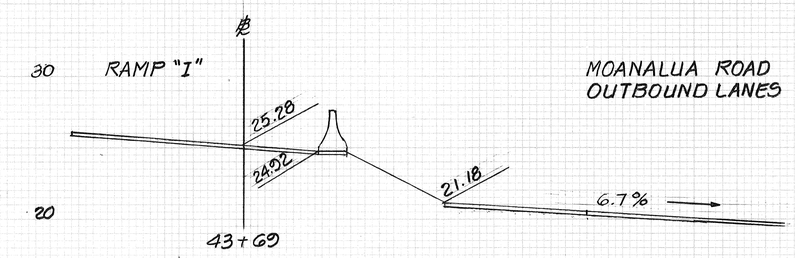


GABION WALL PROFILE

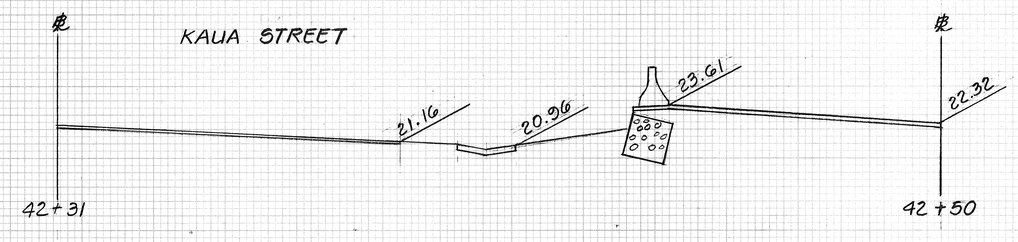
SCALE : 1" = 20'-0"

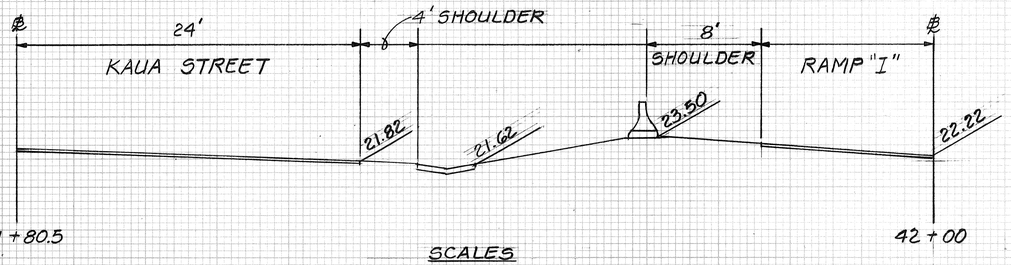


SCALES
HORIZ. : 1" = 5'-0"
VERT. : 1" = 5'-0"

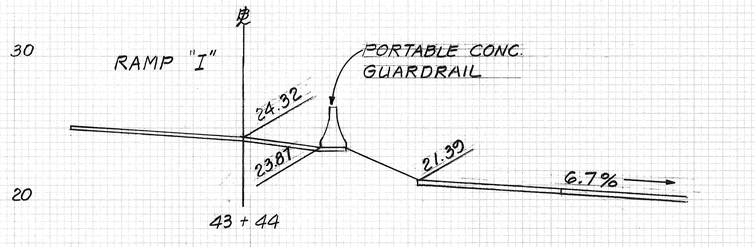


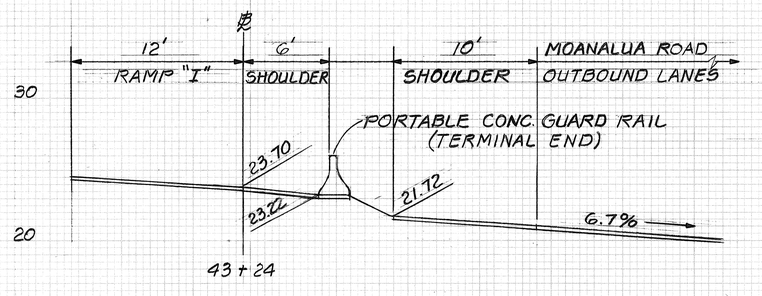
SCALES
HORIZ. : 1" = 5'-0"
VERT. : 1" = 5'-0"





SCALES
HORIZ. : 1" = 5'-0"
VERT. : 1" = 5'-0"





SCALES
HORIZ. : 1" = 5'-0"
VERT. : 1" = 5'-0"

THIS TRACING PREPARED DURING "AS-BUILT" POSTING

NOTE: To replace footing & wall for Retaining Wall No. 8 Stas. 0+00 to 1+11 and Retaining Wall No. 9 Stas. 0+00 to 0+39

STATE OF HAWAII
DEPARTMENT OF TRANSPORTATION
HIGHWAYS DIVISION

EMBANKING, GABION WALL & PORTABLE CONCRETE BARRIER

MOANALUA ROAD
PUULOA I.C. TO MIDDLE STREET - UNIT 3B
F.A. PROJ. NO. F-078-1(21)
SCALE : AS SHOWN DATE : APRIL, 1986
SHEET No. 334A OF 63 SHEETS

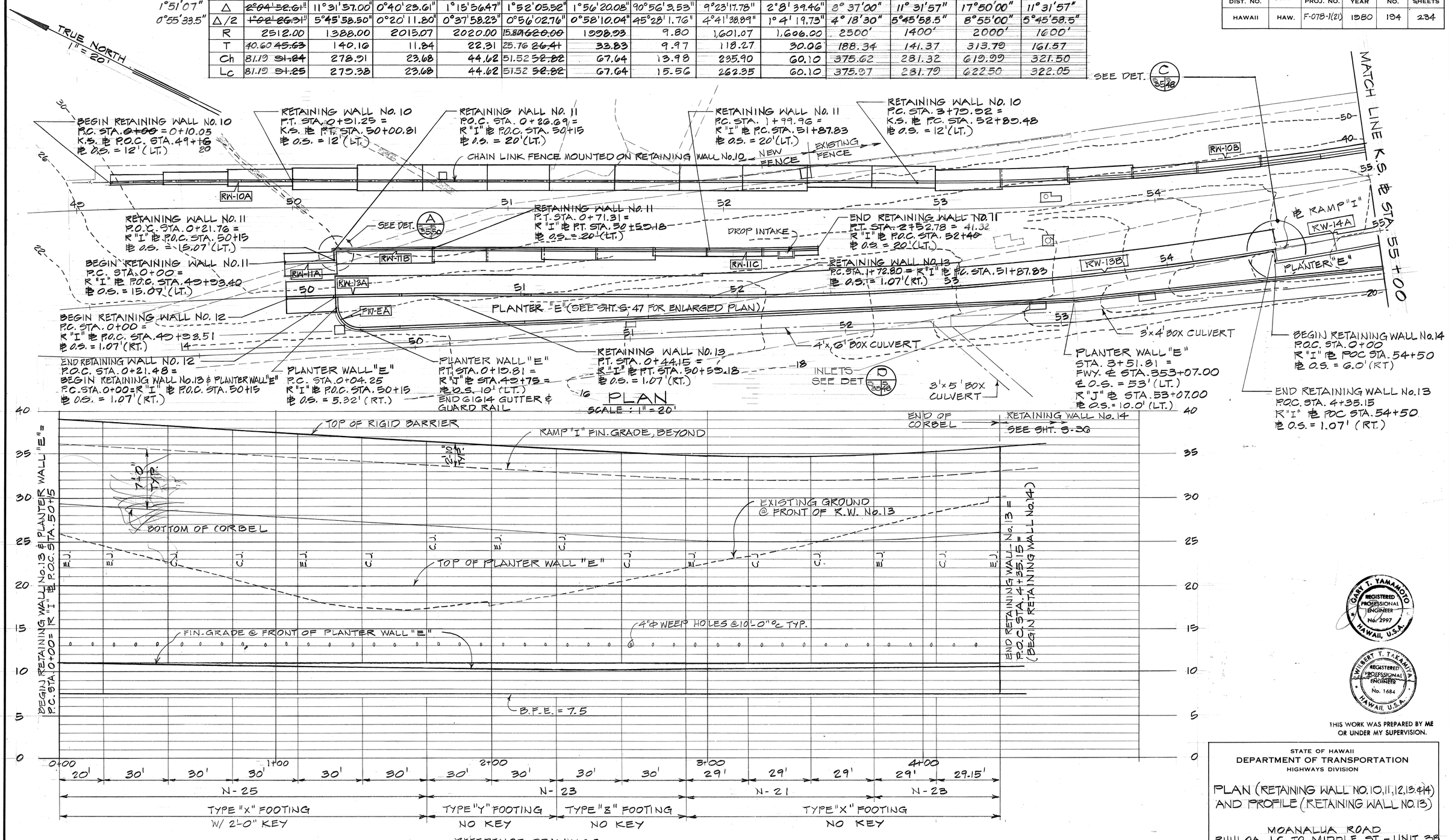
C.O. 193S-1

FINAL SURVEY: SURVEYED, PLOTTED, TRACED, NOTE BOOK, AREAS, NO., BY, DATE, AREAS CHECKED

ORIGINAL SURVEY: SURVEYED, PLOTTED, TRACED, NOTE BOOK, AREAS, NO., AREAS CHECKED

	RW-10A	RW-10B	RW-HA	RW-11B	RW-11C	RW-13A	PW-E A	RW-13B	RW-14A	K.S.-9	K.S.-10	I-3	I-4
1°51'07" △	~~2°04'52.61"~~	11°31'57.00"	0°40'23.61"	1°15'36.47"	1°52'05.52"	1°56'20.08"	90°56'3.53"	9°23'17.78"	2°8'39.46"	8° 37'00"	11° 31'57"	17°50'00"	11°31'57"
0°55'33.5" △/2	~~1°02'26.31"~~	5°45'58.50"	0°20'11.80"	0°37'58.23"	0°56'02.76"	0°58'10.04"	45°28'1.76"	4°41'38.89"	1°4'19.73"	4° 18'30"	5°45'58.5"	8°55'00"	5°45'58.5"
R	2512.00	1388.00	2015.07	2020.00	~~15.80~~ 620.00	1998.93	9.80	1,601.07	1,606.00	2500'	1400'	2000'	1600'
T	40.60 ~~45.63~~	140.16	11.84	22.31	25.76 ~~26.41~~	33.83	9.97	118.27	30.06	188.34	141.37	313.79	161.57
Ch	81.19 ~~91.24~~	278.31	23.68	44.62	51.52 ~~52.82~~	67.64	13.98	235.90	60.10	375.62	281.32	619.99	321.50
Lc	81.19 ~~91.25~~	279.38	23.68	44.62	51.52 ~~52.82~~	67.64	15.56	262.35	60.10	375.97	281.79	622.50	322.05

FED. ROAD DIST. NO.	STATE	FED. AID PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
HAWAII	HAW.	F-078-1(21)	1980	194	234



PROFILE - RETAINING WALL No. 13

SCALES: HORIZ. 1"=20'
VERT. 1"= 5'

REFERENCE DRAWINGS

RETAINING WALL No.10	PLAN	SHTS. S-35 & S-36
	PROFILE	SHT. S-37
RETAINING WALL No.11	PLAN	SHT. S-35
	PROFILE	SHT. S-38
RETAINING WALL No.12	PLAN	SHT. S-35
	PROFILE	SHT. S-38
RETAINING WALL No.13	PLAN	SHT. S-35
	PROFILE	SHT. S-35
RETAINING WALL No.14	PLAN	SHTS. S-35 & S-36
	PROFILE	SHT. S-36
PLANTER WALL "E"	PLAN	SHTS. S-35 & S-36
TYPE "N" WALL DETAILS		SHT. S-43

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

GARY T. YAMAMOTO REGISTERED PROFESSIONAL ENGINEER No. 2997 HAWAII, U.S.A.

WILBERT T. TAKAMIYA REGISTERED PROFESSIONAL ENGINEER No. 1684 HAWAII, U.S.A.

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STATE OF HAWAII
DEPARTMENT OF TRANSPORTATION
HIGHWAYS DIVISION

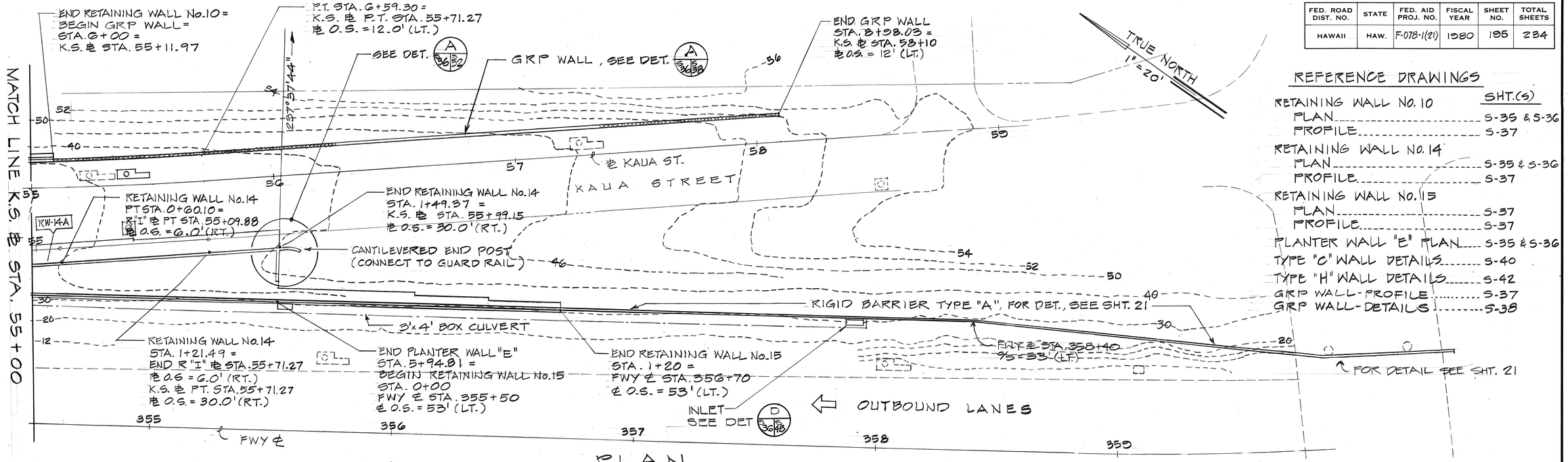
PLAN (RETAINING WALL NO.10,11,12,13&14) AND PROFILE (RETAINING WALL NO.13)

MOANALUA ROAD
PUULOA I.C. TO MIDDLE ST. - UNIT 3B
F.A. Proj. No. F-078-1(21)

SCALE: AS SHOWN DATE: AUG 1, 1979

SHEET NO. S-35 OF 63 SHEETS

FED. ROAD DIST. NO.	STATE	FED. AID PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
HAWAII	HAW.	F-078-1(21)	1980	195	234

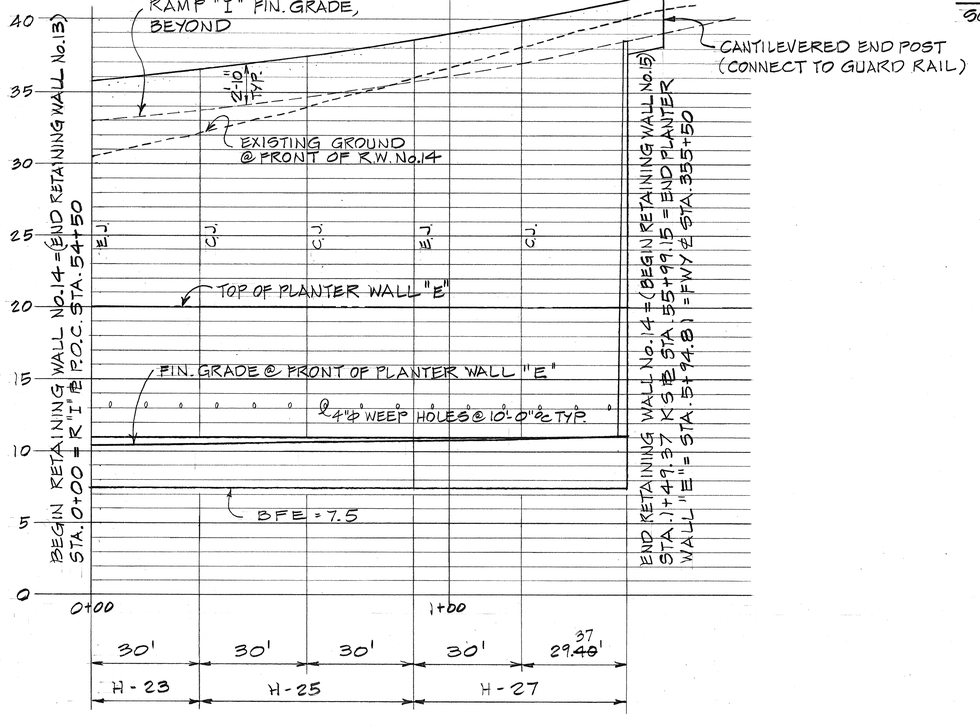


PLAN

SCALE: 1" = 20'

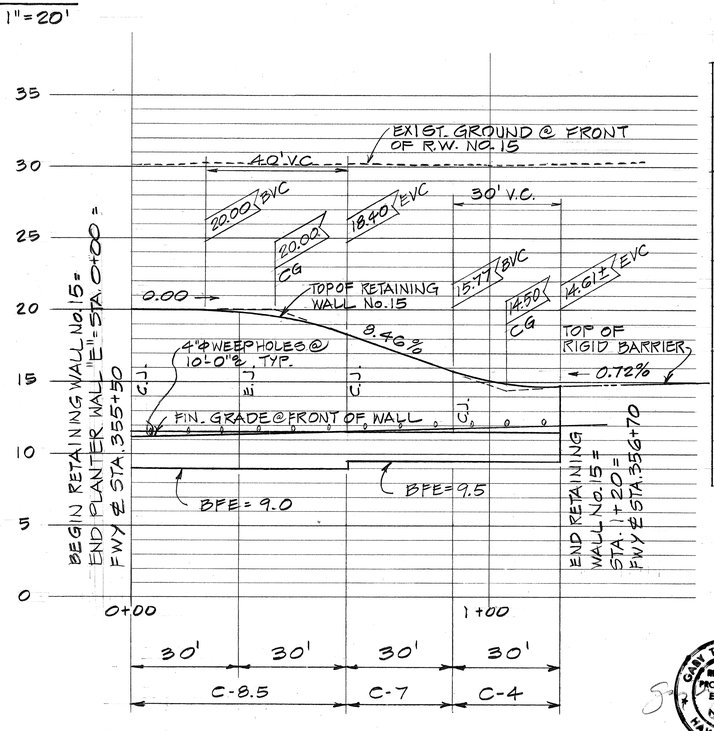
REFERENCE DRAWINGS

	SHT.(S)
RETAINING WALL No. 10	
PLAN	S-35 & S-36
PROFILE	S-37
RETAINING WALL No. 14	
PLAN	S-35 & S-36
PROFILE	S-37
RETAINING WALL No. 15	
PLAN	S-37
PROFILE	S-37
PLANTER WALL "E" PLAN	S-35 & S-36
TYPE "C" WALL DETAILS	S-40
TYPE "H" WALL DETAILS	S-42
GRP WALL-PROFILE	S-37
GRP WALL-DETAILS	S-38



PROFILE - RETAINING WALL No. 14

SCALES: HORIZ. 1" = 20'
VERT. 1" = 5'



PROFILE - RETAINING WALL No. 15

SCALES: HORIZ. 1" = 20'
VERT. 1" = 5'

ESTIMATED QUANTITIES FOR RETAINING WALL NOS 14 & 15

ITEM NO.	ITEM	UNIT	QUANTITIES	
			WALL No. 14	WALL No. 15
206.5000	STRUCTURE EXCAVATION FOR RETAINING WALLS	Cu.Yd.	2057	154
206.7250	STRUCTURE BACKFILL FOR RETAINING WALLS	Cu.Yd.	786	117
206.8300	FILTER MATERIAL FOR RETAINING WALLS	Cu.Yd.	248	53
503.1060	CONCRETE IN RETAINING WALL No. 14	L.S.	(780 cu.Yd.)	——
503.1061	CONCRETE IN RETAINING WALL No. 15	L.S.	——	(88 cu.Yd.)
602.0060	REINFORCING STEEL IN RETAINING WALL No. 14	L.S.	(76837 lbs.)	——
602.0061	REINFORCING STEEL IN RETAINING WALL No. 15	L.S.	——	(3720 lbs.)

GARY T. YAMAMOTO REGISTERED PROFESSIONAL ENGINEER No. 2997 HAWAII, U.S.A.

HERBERT T. TAKAHATA REGISTERED PROFESSIONAL ENGINEER No. 1684 HAWAII, U.S.A.

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STATE OF HAWAII
DEPARTMENT OF TRANSPORTATION
HIGHWAYS DIVISION

PLAN/ RETAINING WALL NO 10, 14 & 15 & PROFILES (RETAINING WALL NO 14 & 15)

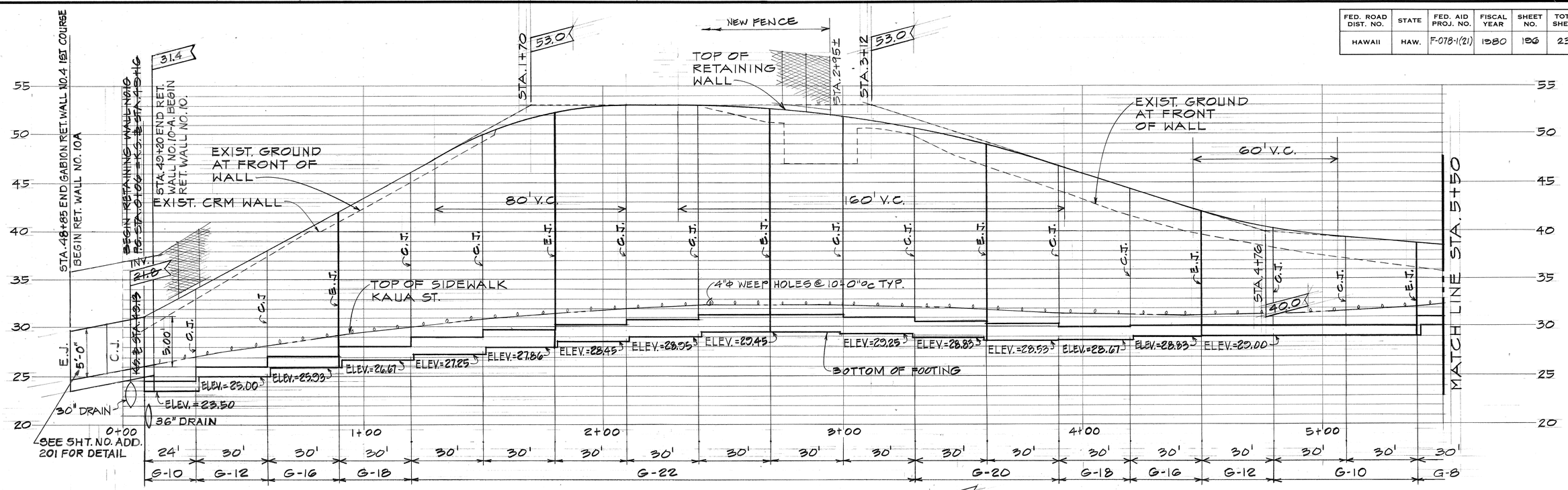
MOANALUA ROAD
PUULOA I.C. TO MIDDLE ST. - UNIT 3B
F.A. Proj. No. F-078-1(21)

SCALE: AS SHOWN DATE: AUG 1, 1979

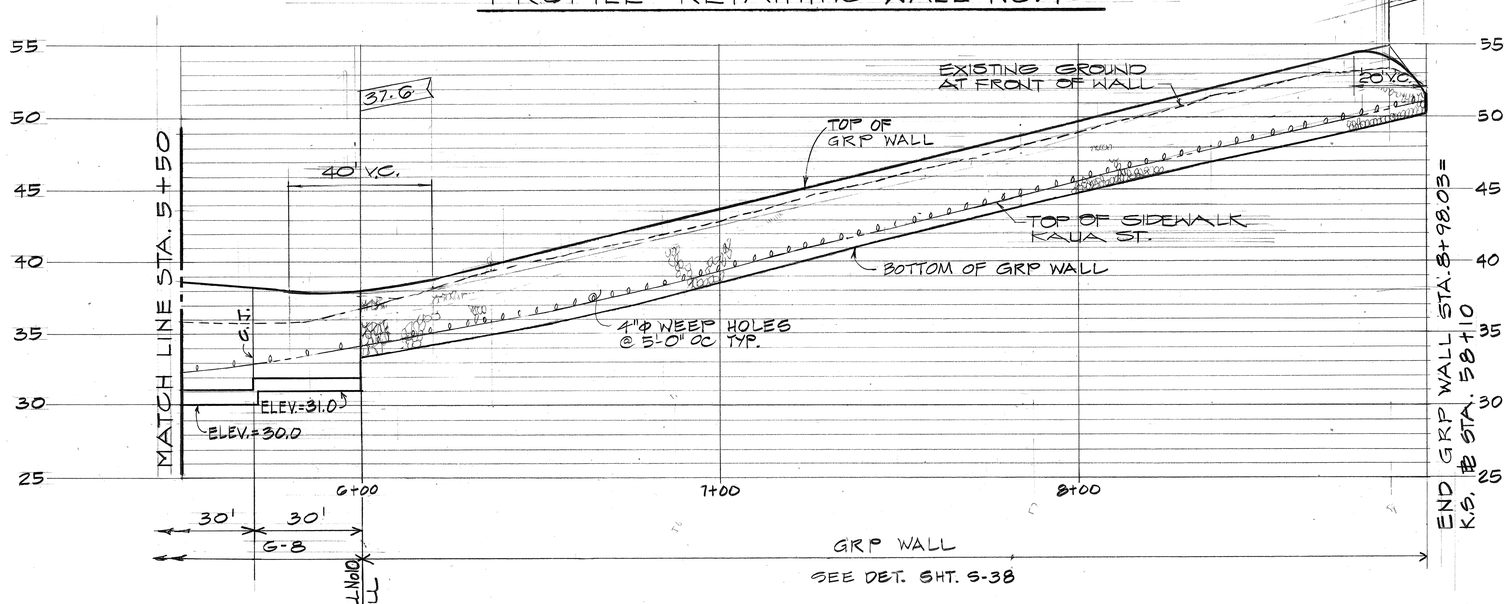
SHEET NO. S-36 OF 63 SHEETS

ORIGINAL PLAN	SURVEY PLOTTED BY	DATE
	DRAWN BY	
	TRACED BY	
NOTE BOOK	DESIGNED BY	
	QUANTITIES BY	
No.	CHECKED BY	

FED. ROAD DIST. NO.	STATE	FED. AID PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
HAWAII	HAW.	F-078-1(21)	1980	196	234



PROFILE - RETAINING WALL NO. 10



PROFILE - RETAINING WALL NO. 10 (PARTIAL) & GROUTED RUBBLE PAVING (GRP) WALL

SCALES:
HORIZ: 1" = 20'
VERT : 1" = 5'

REFERENCE DRAWINGS

RETAINING WALL NO. 10 - PLAN ..... SHTS. S-35 & S-36
TYPE "G" WALL DETAILS ..... SHT. S-41
GRP WALL - PLAN ..... SHT. S-36

ESTIMATED QUANTITIES FOR RETAINING WALL NO. 10

ITEM NO.	ITEM	UNIT	QUANTITIES
206.5000	STRUCTURE EXCAVATION FOR RETAINING WALLS	Cu.Yd.	1,602
206.7250	STRUCTURE BACKFILL FOR RETAINING WALLS	Cu.Yd.	1,762
206.8300	FILTER MATERIAL FOR RETAINING WALLS	Cu.Yd.	395
503.1056	CONCRETE IN RETAINING WALL NO. 10	L.S.	(655 Cu.Yd.)
602.0056	REINFORCING STEEL IN RETAINING WALL NO. 10	L.S.	(58,554 lbs)
612.0100	GROUTED RUBBLE PAVING	Cu.Yd.	55

GARY T. YAMAMOTO — REGISTERED PROFESSIONAL ENGINEER — No. 4997 — HAWAII, U.S.A.

WILBERT T. TAKAHIRA — REGISTERED PROFESSIONAL ENGINEER — No. 1684 — HAWAII, U.S.A.

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STATE OF HAWAII
DEPARTMENT OF TRANSPORTATION
HIGHWAYS DIVISION

PROFILE
RETAINING WALL NO. 10

MOANALUA ROAD
PUULOA I.C. TO MIDDLE ST. - UNIT 3B
F.A. Proj. No. F-078-1(21)

SCALE: AS SHOWN DATE: AUG 1, 1979

SHEET NO. S37 OF 63 SHEETS

ORIGINAL PLAN
NOTE BOOK
No.
DATE
SURVEY PLOTTED BY
DRAWN BY
TRACED BY
DESIGNED BY
QUANTITIES BY
CHECKED BY

FED. ROAD DIST. NO.	STATE	FED. AID PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
HAWAII	HAW.	F-078-1(21)	1980	197	234

ESTIMATED QUANTITIES FOR PLANTER "E"

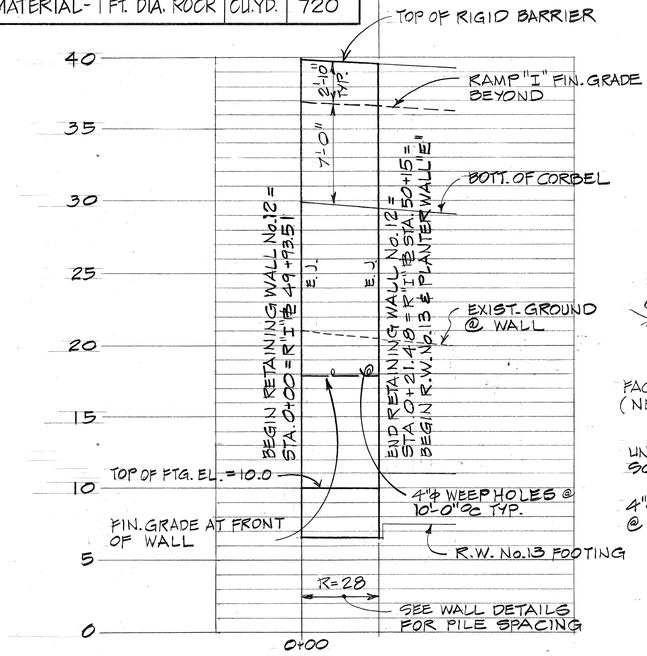
ITEM No.	ITEM	UNIT	QUANTITIES
503.1065	CONCRETE IN PLANTER "E"	L.S.	(195 cu.yd.)
602.0065	REINFORCING STEEL IN PLANTER "E"	L.S.	(34,487 lbs)

ITEM NO.	ITEM	UNIT	QUANT.
603.0012	BED COURSE MATERIAL-#2 ROCK	CU.YD.	360
603.0013	BED COURSE MATERIAL-1 FT. DIA. ROCK	CU.YD.	720

ESTIMATED QUANTITIES FOR RETAINING WALL NOS 11, 12 & 13

ITEM NO.	ITEM	UNIT	QUANTITIES		
			WALL NO.11	WALL NO.12	WALL No.13
206.5000	STRUCTURE EXCAVATION FOR RETAINING WALLS	Cu.Yd.	293	128	4010
206.7250	STRUCTURE BACKFILL FOR RETAINING WALLS	Cu.Yd.	196	115	2387
206.8300	FILTER MATERIAL FOR RETAINING WALLS	Cu.Yd.	60	40	657
503.1057	CONCRETE IN RETAINING WALL NO. 11	L.S.	(260 Cu.Yd.)	——	——
503.1058	CONCRETE IN RETAINING WALL NO.12	L.S.	——	(120 Cu.Yd.)	——
503.1059	CONCRETE IN RETAINING WALL NO. 13	L.S.	——	——	(2,262Cu.Yd.)
505.0430	PRECAST, PRESTRESSED CONC. PILES, FURNISHED	Lin. Ft.	441	1416	——
505.4300	PRECAST, PRESTRESSED CONC. PILES, DRIVEN	Lin. Ft.	423	1346	——
602.0057	REINFORCING STEEL IN RETAINING WALL No.11	L.S.	(18,754 lbs.)	——	——
602.0058	REINFORCING STEEL IN RETAINING WALL NO.12	L.S.	——	(15,272 lbs.)	——
602.0059	REINFORCING STEEL IN RETAINING WALL NO.13	L.S.	——	——	(245986lbs.)

RETAINING WALL No.13

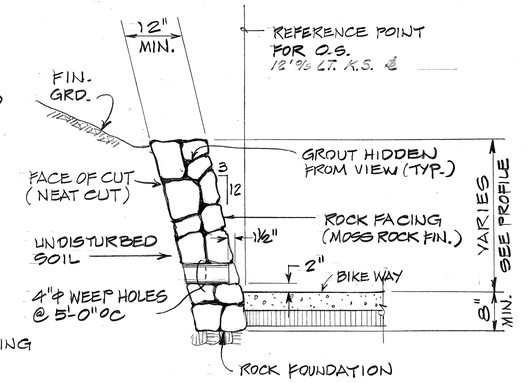


PILE TIP ELEV. = -60.0

PROFILE ~ RETAINING WALL No.12

REFERENCE DRAWINGS

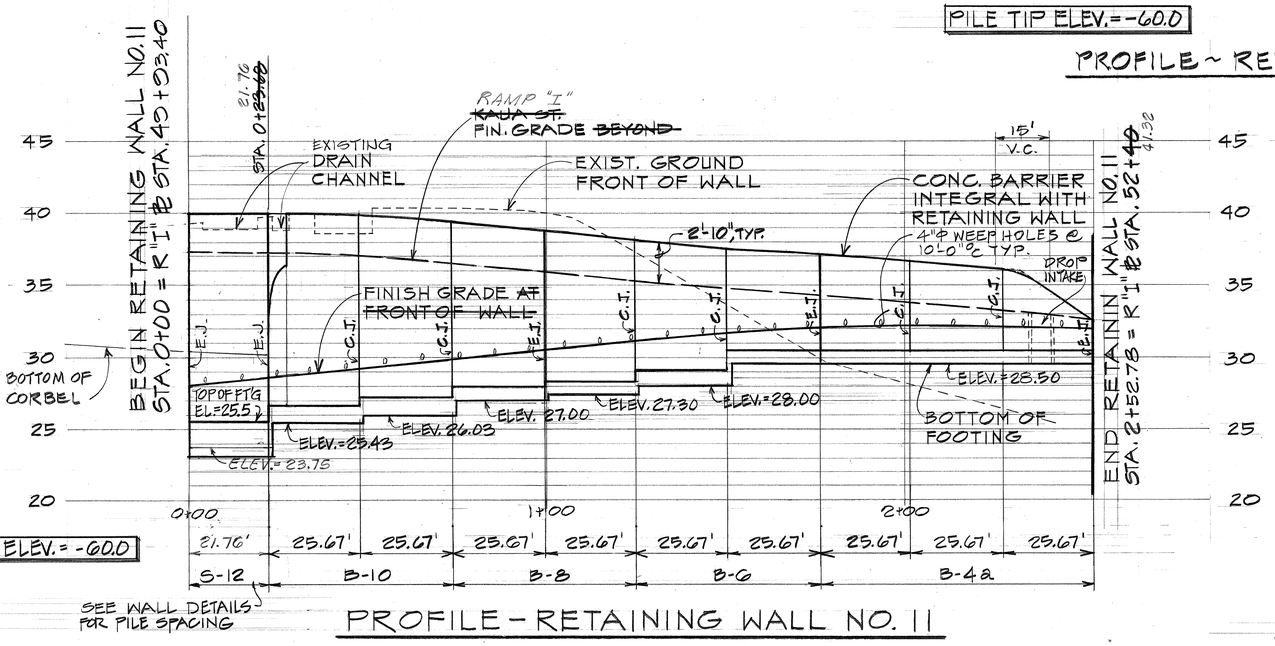
RETAINING WALL No.11 PLAN ..... SHT. S-35
RETAINING WALL No.12 PLAN ..... SHT. S-35
TYPE "B" WALL DETAILS ..... SHT. S-39
TYPES "R" & "S" WALL DETAILS ..... SHT. S-46



K.S. ℄ STA. 55+11.97 to 58+10
(WALL STA. 6+00 TO 8+98.03)

GRP WALL DETAIL

NOT TO SCALE



PILE TIP ELEV. = -60.0

SEE WALL DETAILS FOR PILE SPACING

PROFILE - RETAINING WALL NO. 11

SCALES:
HORIZ: 1" = 20'
VERT: 1" = 5'

THIS WORK WAS PREPARED BY ME OR UNDER MY SUPERVISION.

GARY T. YAMAMOTO — REGISTERED PROFESSIONAL ENGINEER — No. 3997 — HAWAII, U.S.A.

LAWRENCE T. T. KAMIYA — REGISTERED PROFESSIONAL ENGINEER — No. 1684 — HAWAII, U.S.A.

DATE	REVISION
4/8/81	ADDED ITEMS TO SUMMARY FOR PLANTER "E".

STATE OF HAWAII
DEPARTMENT OF TRANSPORTATION
HIGHWAYS DIVISION

PROFILES
RETAINING WALLS 11 & 12

MOANALUA ROAD
PUULOA I.C. TO MIDDLE ST. - UNIT 3B
F.A. Proj. No. F-078-1(21)

SCALE: AS SHOWN DATE: AUG 1, 1979

SHEET No. S-38 OF 63 SHEETS

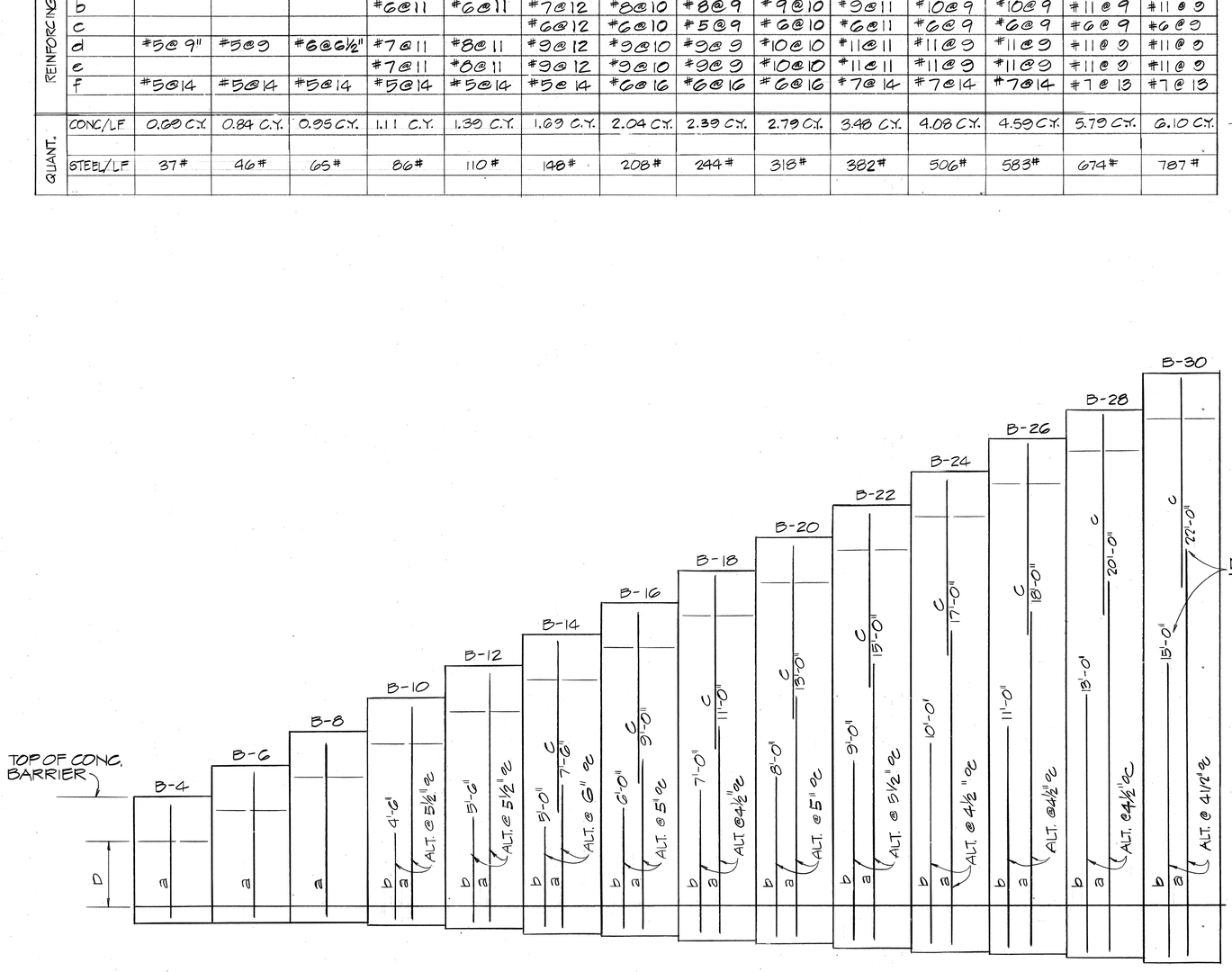
ORIGINAL PLAN	SURVEY PLOTTED BY	DATE
	DRAWN BY	
NOTE BOOK	TRACED BY	
	DESIGNED BY	
No.	QUANTITIES BY	
	CHECKED BY	

ADD 197

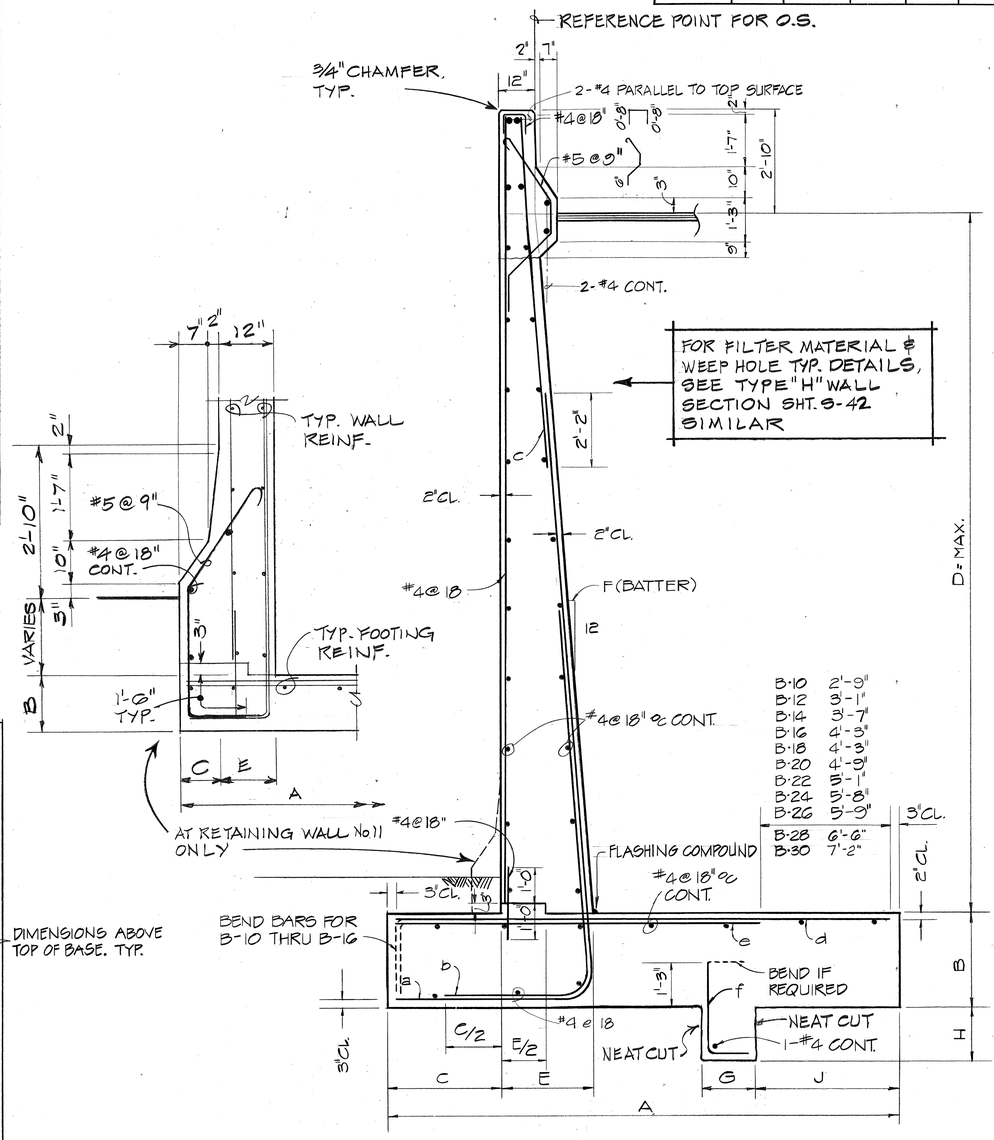
FED. ROAD DIST. NO.	STATE	FED. AID PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
HAWAII	HAW.	F-078-1(21)	1980	198	234

SCHEDULE OF RETAINING WALLS - TYPE B

MARK			B-4a / B-4b	B-6	B-8	B-10	B-12	B-14	B-16	B-18	B-20	B-22	B-24	B-26	B-28	B-30
DIMENSIONS	BASE	A	3'-9"	5'-9"	6'-9"	7'-9"	8'-7"	10'-0"	12'-2"	12'-11"	14'-7"	16'-7"	18'-7"	20'-4"	22'-4"	24'-4"
		B	12"	12"	12"	14"	17"	21"	23"	26"	29"	32"	36"	38"	43"	48"
		C	9"	9"	9"	9"	6"	9"	1'-9"	2'-3"	2'-9"	3'-6"	4'-3"	5'-9"	6'-6"	8'-3"
	STEM	D	4'-0"	6'-0"	8'-0"	10'-0	12'-0"	14'-0"	16'-0"	18'-0"	20'-0"	22'-0"	24'-0"	26'-0"	28'-0"	30'-0"
		E	12"	12"	12"	12"	VARIES	VARIES	VARIES	VARIES	VARIES	VARIES	VARIES	VARIES	VARIES	VARIES
		F	0	0	0	0	3/8 : 12	3/8 : 12	3/8 : 12	1/2 : 12	1/2 : 2	3/4 : 12	3/4 : 12	3/4 : 12	7/8 : 12	7/8 : 12
	KEY	G	1'-0" / NONE	1'-0"	1'-0"	1'-0"	1'-0"	1'-0"	1'-3"	1'-3"	1'-3"	1'-6"	1'-6"	1'-6"	1'-9"	1'-9"
		H	1'-0" / NONE	1'-0"	1'-0"	1'-0"	1'-0"	1'-0"	1'-3"	1'-3"	1'-3"	1'-6"	1'-6"	1'-6"	1'-9"	1'-9"
		J	6" / NONE	10"	1'-6"	1'-10"	2'-2"	2'-10"	3'-4"	3'-8"	4'-0"	4'-8"	5'-4"	6'-0"	6'-6"	7'-2"
REINFORCING	a bars		#6@18	#6@18	#6@13	#6@11	#6@11	#7@12	#8@10	#8@9	#9@10	#9@11	#10@9	#10@9	#10@9	#10@9
	b					#6@11	#6@11	#7@12	#8@10	#8@9	#9@10	#9@11	#10@9	#10@9	#11@9	#11@9
	c							#6@12	#6@10	#5@9	#6@10	#6@11	#6@9	#6@9	#6@9	#6@9
	d		#5@9"	#5@9	#6@6½"	#7@11	#8@11	#9@12	#9@10	#9@9	#10@10	#11@11	#11@9	#11@9	#11@9	#11@9
	e					#7@11	#8@11	#9@12	#9@10	#9@9	#10@10	#11@11	#11@9	#11@9	#11@9	#11@9
	f		#5@14	#5@14	#5@14	#5@14	#5@14	#5@14	#6@16	#6@16	#6@16	#7@14	#7@14	#7@14	#7@13	#7@13
QUANT.	CONC/LF		0.60 C.Y.	0.84 C.Y.	0.95 C.Y.	1.11 C.Y.	1.39 C.Y.	1.69 C.Y.	2.04 C.Y.	2.39 C.Y.	2.79 C.Y.	3.48 C.Y.	4.08 C.Y.	4.59 C.Y.	5.79 C.Y.	6.10 C.Y.
	STEEL/LF		37#	46#	65#	86#	110#	148#	208#	244#	318#	382#	506#	583#	674#	787#



WALL ELEVATION SHOWING VERTICAL REINFORCING (BARS a, b, and c)



WALL SECTION
NO SCALE

ORIGINAL PLAN	SURVEY PLOTTED BY	DATE
	DRAWN BY	"
NOTE BOOK	TRACED BY	"
	DESIGNED BY	"
No.	QUANTITIES BY	"
	CHECKED BY	"

STATE OF HAWAII
DEPARTMENT OF TRANSPORTATION
HIGHWAYS DIVISION

TYPE B WALL DETAILS

MOANALUA ROAD
PUULOA I.C. TO MIDDLE ST. - UNIT 3B
F.A. Proj. No. F-078-1(21)

SCALE: AS SHOWN DATE: AUG 1, 1979

SHEET No. S-33 OF 63 SHEETS

GARY T. YAMAMOTO REGISTERED PROFESSIONAL ENGINEER No. 8999 HAWAII, U.S.A.

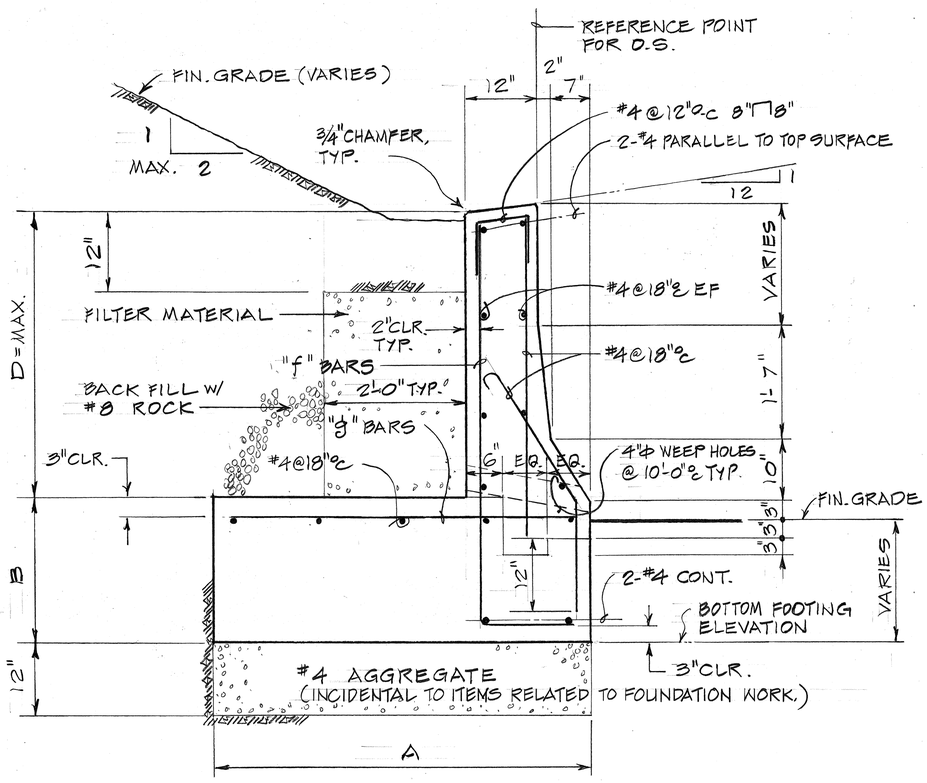
LESLIE T. TAKAHASHI REGISTERED PROFESSIONAL ENGINEER No. 1684 HAWAII, U.S.A.

THIS WORK WAS PREPARED BY ME OR UNDER MY SUPERVISION.

FED. ROAD DIST. NO.	STATE	FED. AID PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
HAWAII	HAW.	F-078-1(21)	1980	199	234

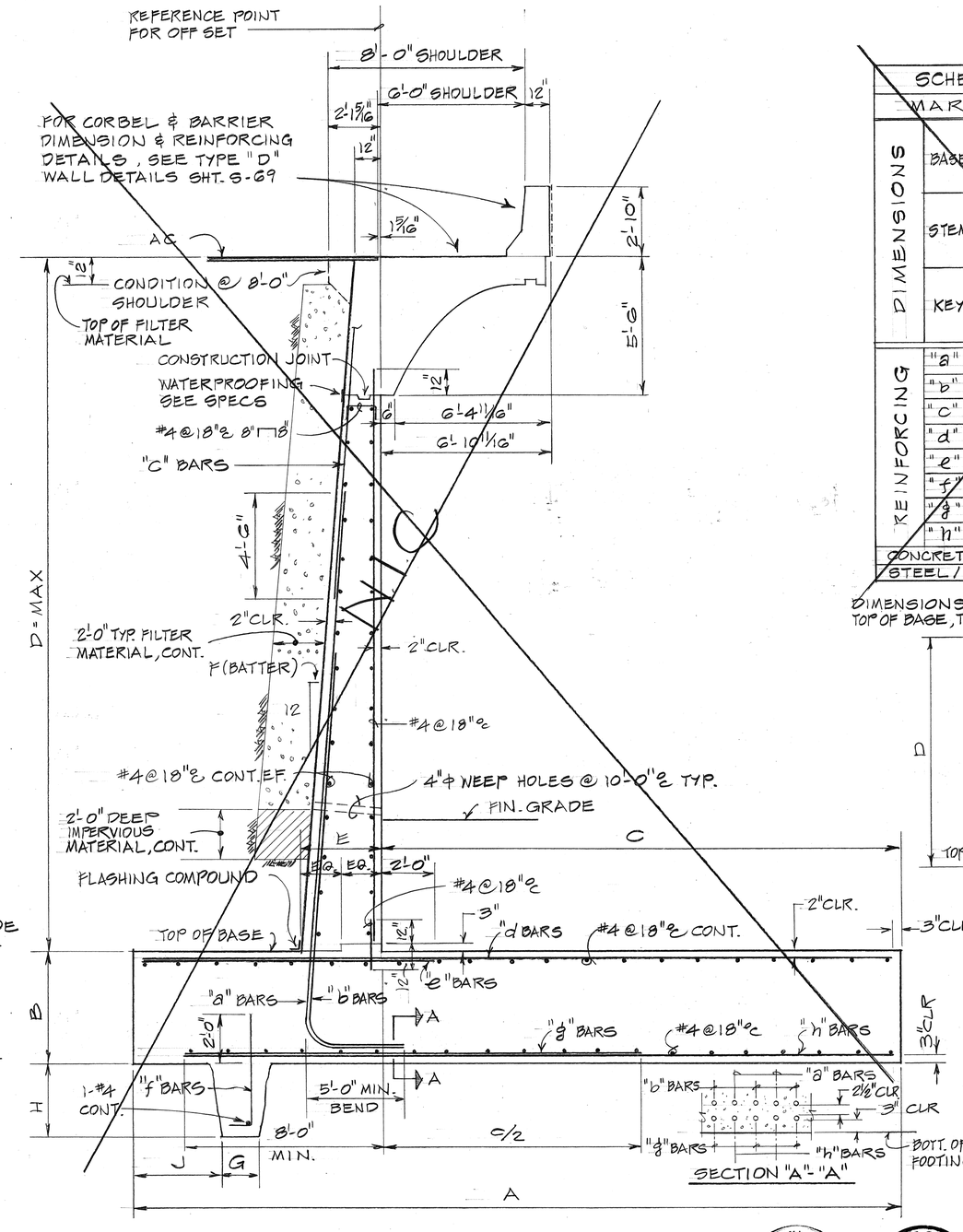
SCHEDULE OF RETAINING WALLS-TYPE "C"

	C-8.5	C-7	C-4
A	6'-3"	5'-3"	3'-9"
B	2'-6"	2'-0"	2'-0"
D	8'-6"	7'-0"	4'-0"
"f" BARS	#5 @ 12" ℄c	#4 @ 12" ℄c	#4 @ 18" ℄c
"g" BARS	#5 @ 12" ℄c	#4 @ 12" ℄c	#4 @ 18" ℄c
CONCRETE/LF.	0.91 C.Y.	0.67 C.Y.	0.44 C.Y.
STEEL/LF	39#	28#	18#



TYPE "C" WALL SECTION

NOT TO SCALE

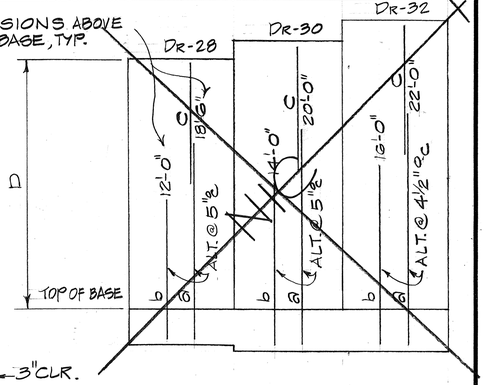


TYPE "Dr" WALL SECTION

NOT TO SCALE

SCHEDULE OF RETAINING WALLS-TYPE "DR"

MARK		DR-28	DR-30	DR-32
DIMENSIONS	A	31'-0"	32'-0"	35'-0"
	B BASE	4'-6"	5'-0"	5'-0"
	C	21'-0"	20'-0"	22'-0"
	D	28'-0"	30'-0"	32'-0"
	E STEM	VARIES	VARIES	VARIES
	F	1:12	1:12	1:12
	G	1'-6"	1'-6"	1'-6"
	H KEY	3'-0"	3'-0"	3'-0"
	J	3'-6"	5'-6"	6'-0"
REINFORCING	"a" BARS	#11@10"	#11@10"	#11@9"
	"b" BARS	#11@10"	#11@10"	#11@9"
	"c" BARS	#9@10"	#9@10"	#9@9"
	"d" BARS	#9@10"	#8@10"	#9@9"
	"e" BARS	—	#8@10"	#9@9"
	"f" BARS	#5@10"	#5@10"	#5@9"
	"g" BARS	#11@10"	#11@10"	#11@9"
	"h" BARS	#11@10"	#11@10"	#11@9"
CONCRETE/LF		8.27 C.Y.	9.29 C.Y.	10.11 C.Y.
STEEL/LF		940#	985#	1,195#



DATE	REVISION
4/8/81	ADDED NOTE AFTER 4" AGGREGATE.

STATE OF HAWAII
DEPARTMENT OF TRANSPORTATION
HIGHWAYS DIVISION

TYPE "C" WALL DETAILS

MOANALUA ROAD
PUULOA I.C. TO MIDDLE ST. - UNIT 3B
F.A. Proj. No. F-078-1(21)

SCALE: AS SHOWN DATE: AUG 1, 1979

SHEET No. S-400 OF 63 SHEETS

GARY T. YAMAMOTO — REGISTERED PROFESSIONAL ENGINEER — No. 3997 — HAWAII, U.S.A.

WILBERT T. TAKAMIYA — REGISTERED PROFESSIONAL ENGINEER — No. 1684 — HAWAII, U.S.A.

THIS WORK WAS PREPARED BY ME OR UNDER MY SUPERVISION.

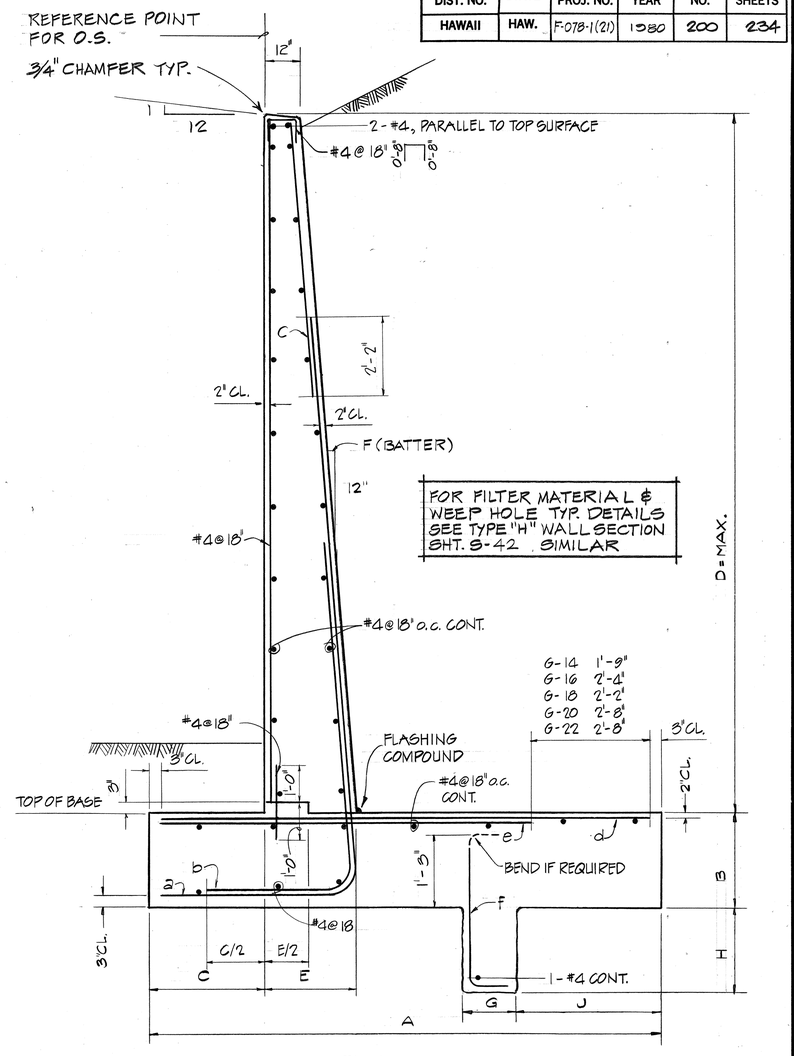
ORIGINAL PLAN | SURVEY PLOTTED BY | DRAWN BY | TRACED BY | DESIGNED BY | QUANTITIES BY | CHECKED BY | DATE | NOTE BOOK | No.

ADD 199

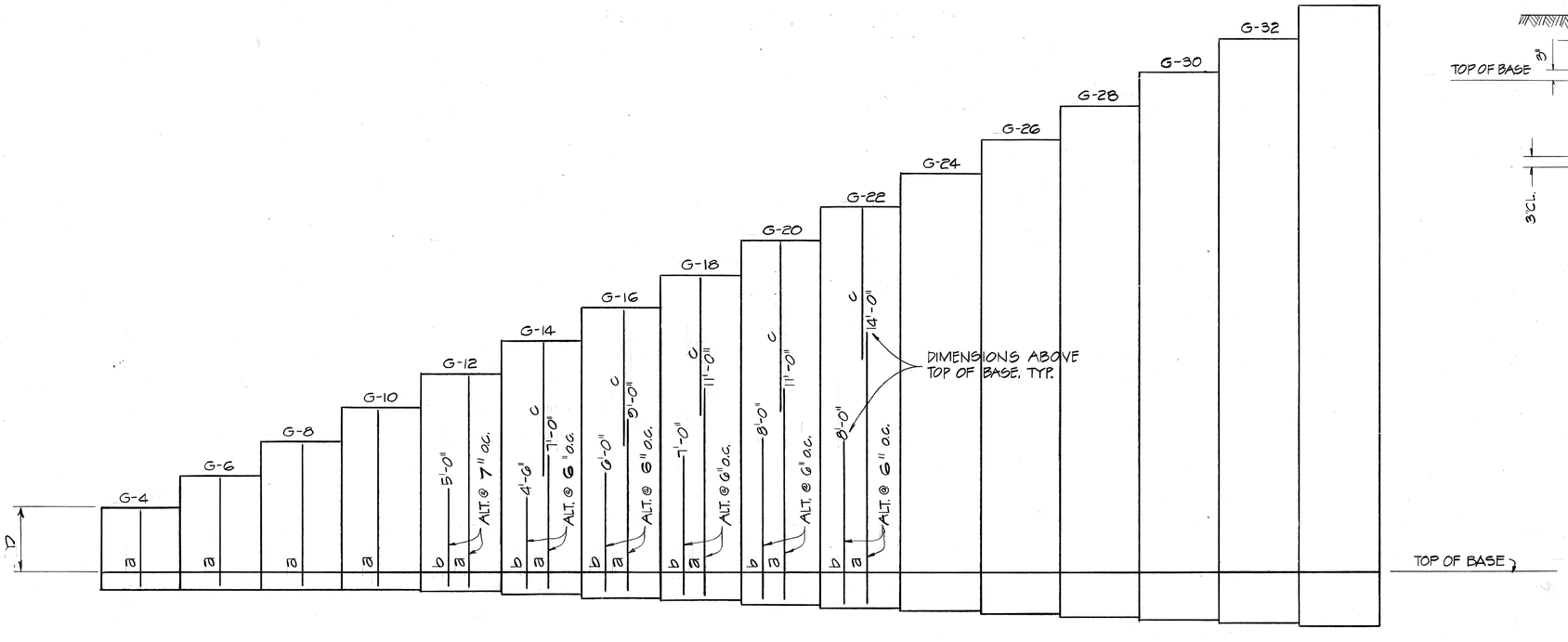
FED. ROAD DIST. NO.	STATE	FED. AID PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
HAWAII	HAW.	F-078-1(21)	1980	200	234

SCHEDULE OF RETAINING WALLS - TYPE G

MARK			G-4	G-6	G-8	G-10	G-12	G-14	G-16	G-18	G-20	G-22	G-24	G-26	G-28	G-30	G-32	G-34
DIMENSIONS	BASE	A	2'-0"	3'-0"	4'-0"	5'-0"	6'-0"	7'-3"	7'-11"	9'-10"	10'-3"	11'-9"						
		B	12"	12"	12"	12"	12"	12"	14"	16"	20"	21"						
		C	1'-0"	1'-0"	1'-0"	1'-0"	1'-0"	2'-3"	1'-9"	3'-6"	2'-9"	4'-0"						
	STEM	D	4'-0"	6'-0"	8'-0"	10'-0"	12'-0"	14'-0"	16'-0"	18'-0"	20'-0"	22'-0"						
		E	12"	12"	12"	12"	12"	12"	VARIES	VARIES	VARIES	VARIES						
		F	0	0	0	0	0	0	3/8 : 12	3/8 : 12	3/8 : 12	1/2 : 12						
	KEY	G	1'-0"	1'-0"	1'-0"	1'-0"	1'-0"	1'-0"	1'-0"	1'-0"	1'-3"	1'-3"						
		H	1'-0"	1'-0"	1'-0"	1'-0"	1'-0"	1'-0"	1'-0"	1'-0"	1'-3"	1'-3"						
		J	0	6"	10"	1'-2"	1'-6"	1'-10"	2'-2"	2'-6"	3'-0"	3'-8"						
REINFORCING	a BARS		#6 @ 18	#6 @ 16	#6 @ 13	#5 @ 10	#6 @ 14	#7 @ 12	#7 @ 12	#7 @ 12	#8 @ 12	#9 @ 12						
	b						#6 @ 14	#7 @ 12	#7 @ 12	#7 @ 12	#8 @ 12	#9 @ 12						
	c							#6 @ 12	#6 @ 12	#6 @ 12	#6 @ 12	#6 @ 12						
	d			#4 @ 8	#5 @ 13	#5 @ 10	#6 @ 7	#6 @ 12	#7 @ 12	#7 @ 12	#8 @ 12	#8 @ 12						
	e							#6 @ 12	#7 @ 12	#7 @ 12	#8 @ 12	#8 @ 12						
	f		#5 @ 14	#5 @ 14	#5 @ 14	#5 @ 14	#5 @ 14	#5 @ 14	#5 @ 14	#5 @ 14	#6 @ 16	#6 @ 16						
QUANT.	CONC/LF		0.37 C.Y.	0.48 C.Y.	0.59 C.Y.	0.70 C.Y.	0.82 C.Y.	0.94 C.Y.	1.23 C.Y.	1.49 C.Y.	1.80 C.Y.	2.03 C.Y.						
	STEEL/LF		23#	30#	37#	47#	65#	88#	94#	140#	173#	212#						



WALL SECTION
NO SCALE



WALL ELEVATION SHOWING VERTICAL REINFORCING

ORIGINAL PLAN	SURVEY PLOTTED BY	DATE
	DRAWN BY	"
	TRACED BY	"
	DESIGNED BY	"
NOTE BOOK	QUANTITIES BY	"
No.	CHECKED BY	"

GARY T. YAMAMOTO REGISTERED PROFESSIONAL ENGINEER No. 2997 HAWAII, U.S.A.

WALDOT T. TAKAMIYA REGISTERED PROFESSIONAL ENGINEER No. 1684 HAWAII, U.S.A.

THIS WORK WAS PREPARED BY ME OR UNDER MY SUPERVISION.

DATE	REVISION
4/8/81	REVISED BELOW FOOTING OF WALL SECTION DETAIL.

STATE OF HAWAII
DEPARTMENT OF TRANSPORTATION
HIGHWAYS DIVISION

TYPE G WALL DETAILS

MOANALUA ROAD
PUULOA I.C. TO MIDDLE ST. - UNIT 3B
F.A. Proj. No. F-078-1(21)

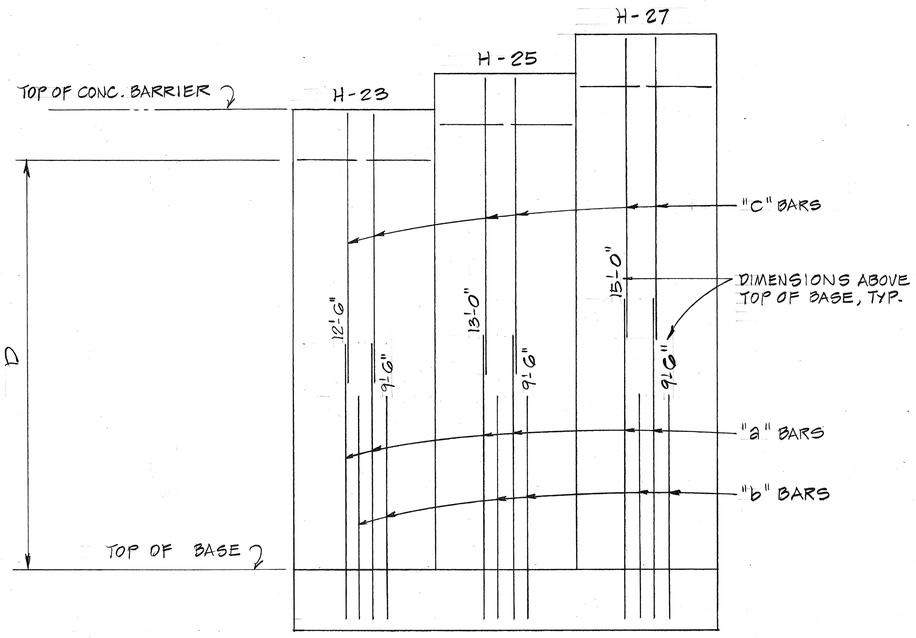
SCALE: AS SHOWN DATE: AUG 1, 1979

SHEET No. S-41 OF 63 SHEETS

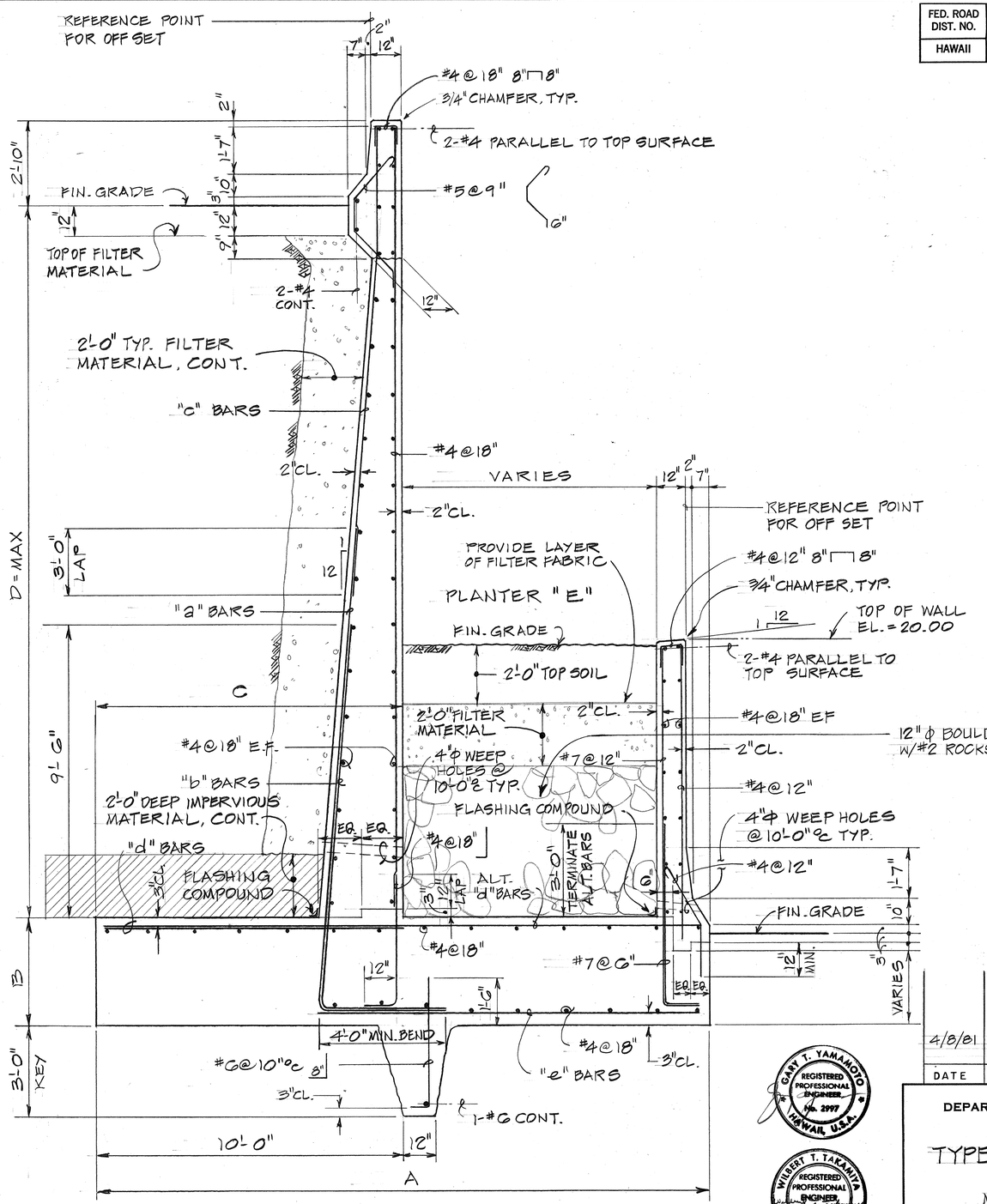
ADD 200

FED. ROAD DIST. NO.	STATE	FED. AID PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
HAWAII	HAW.	F-078-1(21)	1980	201	234

SCHEDULE OF RETAINING WALL - TYPE H			
	H-23	H-25	H-27
A	VARIES	VARIES	VARIES
B	3'-6"	3'-6"	3'-6"
C	10'-0"	9'-0"	8'-0"
D	23'-0"	25'-0"	27'-0"
"a" BARS	#8@9"	#9@10"	#10@10"
"b" BARS	#8@9"	#9@10"	#10@10"
"c" BARS	#6@9"	#7@10"	#7@10"
"d" BARS	#7@4½	#7@5"	#6@5"
"e" BARS	#10@9"	#9@5"	#10@5"
CONCRETE/LF. (IN WALLS ONLY)	2.11 C.Y.	2.34 C.Y.	2.57 C.Y.
STEEL/LF. (IN WALLS ONLY)	272#	307#	360#



WALL ELEVATION SHOWING VERTICAL REINFORCING



WALL SECTION
NOT TO SCALE

ORIGINAL PLAN	SURVEY PLOTTED BY	DATE
	DRAWN BY	"
NOTE BOOK	TRACED BY	"
No.	DESIGNED BY	"
	QUANTITIES BY	"
	CHECKED BY	

GARY T. YAMAMOTO REGISTERED PROFESSIONAL ENGINEER No. 2997 HAWAII, U.S.A.

WILBERT T. TAKAMIYA REGISTERED PROFESSIONAL ENGINEER No. 1684 HAWAII, U.S.A.

THIS WORK WAS PREPARED BY ME OR UNDER MY SUPERVISION.

DATE	REVISION
4/8/81	REVISED 12" ϕ BOULDERS (ONE MAN ROCK) W/#2 ROCKS.

STATE OF HAWAII
DEPARTMENT OF TRANSPORTATION
HIGHWAYS DIVISION

TYPE H WALL DETAILS

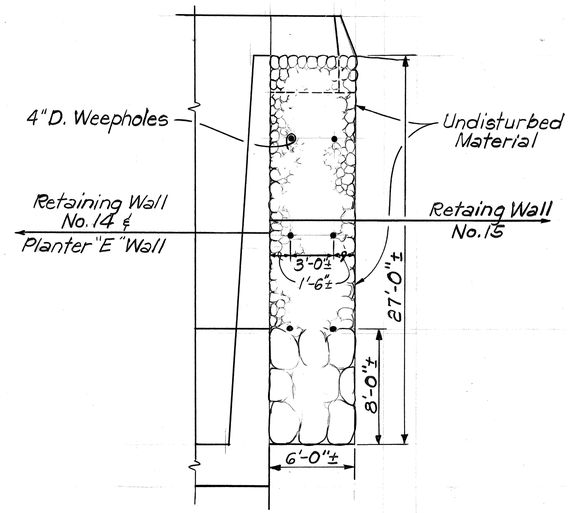
MOANALUA ROAD
PUULOA I.C. TO MIDDLE ST. - UNIT 3B
F.A. Proj. No. F-078-1(21)

SCALE: AS SHOWN DATE: AUG 1, 1979

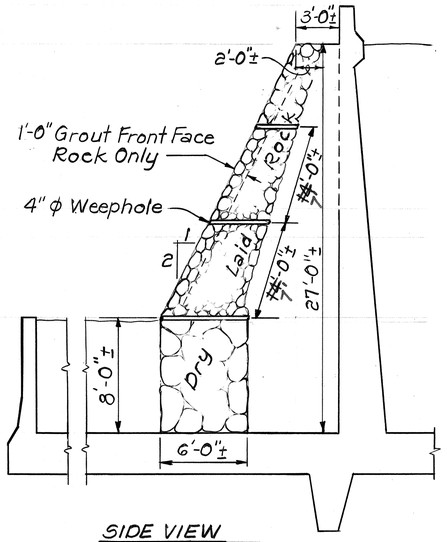
SHEET No. 6-42 OF 63 SHEETS

ADD 201

FED. ROAD DIST. NO.	STATE	FED. AID PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
HAWAII	HAW.	FAP 078-1(21)	1980	C.O. 201 S-1	234



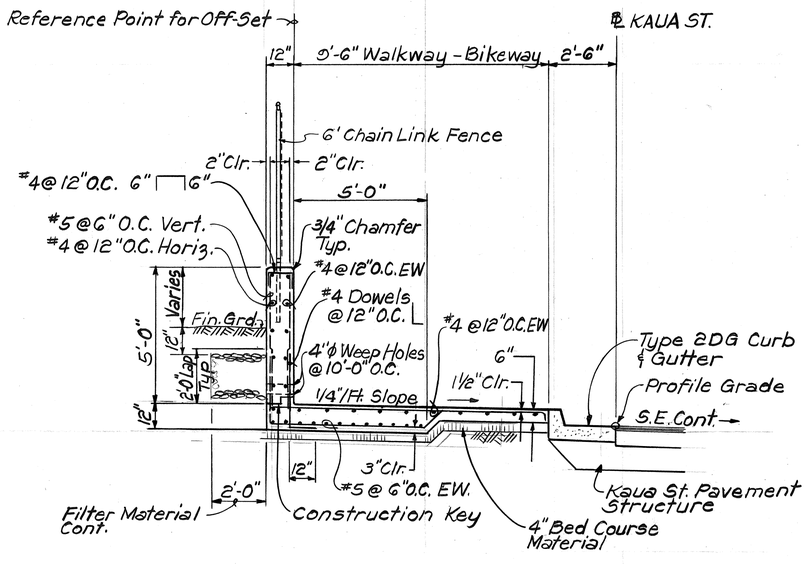
FRONT VIEW
Not To Scale



SIDE VIEW
Not To Scale

GROUTED RUBBLE SLOPE PROTECTION WITH ROCK FOOTING AT MOANALUA ROAD

Outbound Station 355+50± Left



RETAINING WALL NO. 10-A

KAUA ST. ℄ Sta. 48+85 To Sta. 49+20

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

ORIGINAL PLAN	SURVEY PLOTTED BY	DATE
	DRAWN BY	
NOTE BOOK	TRACED BY	
	DESIGN BY	
No.	QUANTITIES BY	
	CHECKED BY	

THIS TRACING PREPARED DURING "AS-BUILT" POSTINGS

STATE OF HAWAII
DEPARTMENT OF TRANSPORTATION
HIGHWAYS DIVISION

TYPE 10-A RETAINING WALL AND GROUTED RUBBLE SLOPE DETAILS

MOANALUA ROAD

Puuloa I.C. to Middle St - Unit 3B

F.A. Proj. No. 078-1(21)

Scale: As Noted Date: Aug. 1986

SHEET No. S-42 OF 63 SHEETS

C.O. 201 S-1

FED. ROAD DIST. NO.	STATE	FED. AID PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
HAWAII	HAW.	F-078-1(21)	1980	202	234

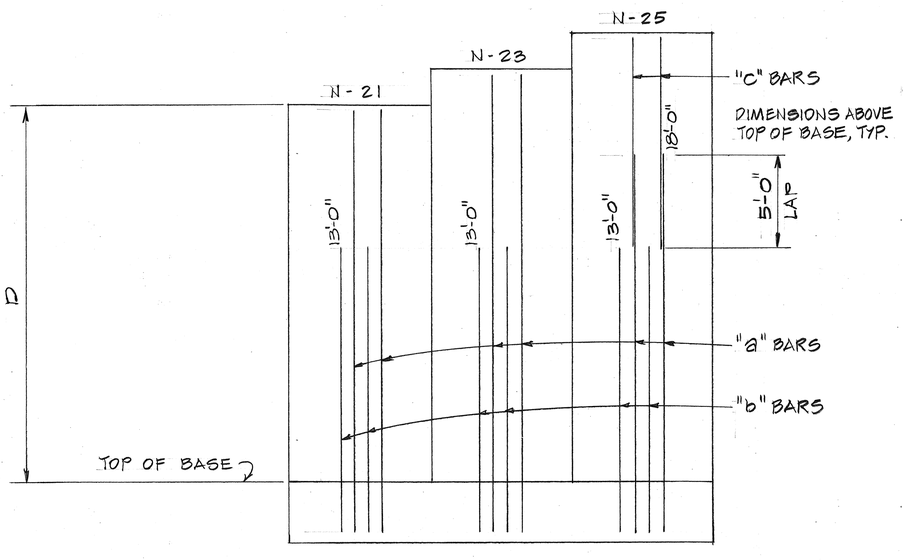
SCHEDULE OF RETAINING WALL - TYPE N

	N - 21	N - 23	N-25
D	21'-0"	23'-0"	25'-0"
"a" BARS	#9 @ 10"	#9 @ 9"	#10 @ 10"
"b" BARS	#9 @ 10"	#9 @ 9"	#10 @ 10"
"C" BARS	—	—	#9 @ 10"
CONCRETE/LF (IN WALLS ONLY)	2.40 C.Y.	2.62 C.Y.	2.84 C.Y.
STEEL / LF (IN WALLS ONLY)	348#	414#	440#

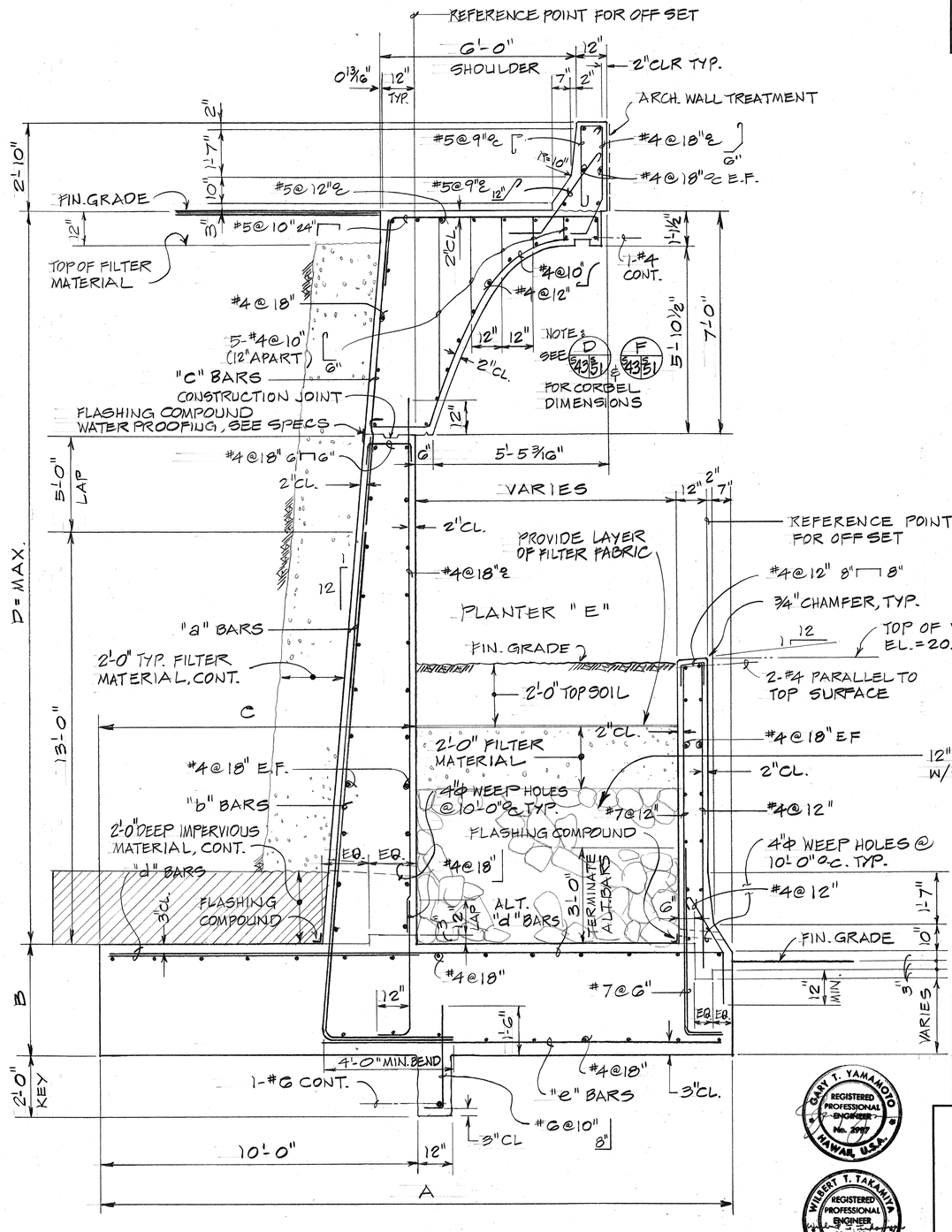
FOOTING SCHEDULE OF RETAINING WALL-TYPE N

	TYPE "X"	TYPY "Y"	TYPE "Z"
A	VARIES	VARIES	VARIES
B	3'-6"	3'-6"	3'-6"
C	10'-0"	11'-0"	12'-0"
"d" BARS	#8 @ 5"	#8 @ 4½"	#9 @ 5"
"e" BARS	#8 @ 5"	#8 @ 4½"	#9 @ 5"

FOR LIMITS OF FOOTING TYPES, SEE PROFILE - RETAINING WALL No. 13 SHT. S-35



WALL ELEVATION SHOWING VERTICAL REINFORCING



WALL SECTION

NOT TO SCALE

DATE	REVISION
4/8/81	REVISED 12" ϕ BOULDERS (ONE MAN ROCK) W/#2 ROCKS.

STATE OF HAWAII
DEPARTMENT OF TRANSPORTATION
HIGHWAYS DIVISION

TYPE N WALL DETAILS

MOANALUA ROAD
PUULOA I.C. TO MIDDLE ST. - UNIT 3B
F.A. Proj. No. F-078-1(21)

SCALE: AS SHOWN DATE: AUG 1, 1979

SHEET No. S-43 OF 63 SHEETS

GARY T. YAMAMOTO REGISTERED PROFESSIONAL ENGINEER No. 2997 HAWAII, U.S.A.

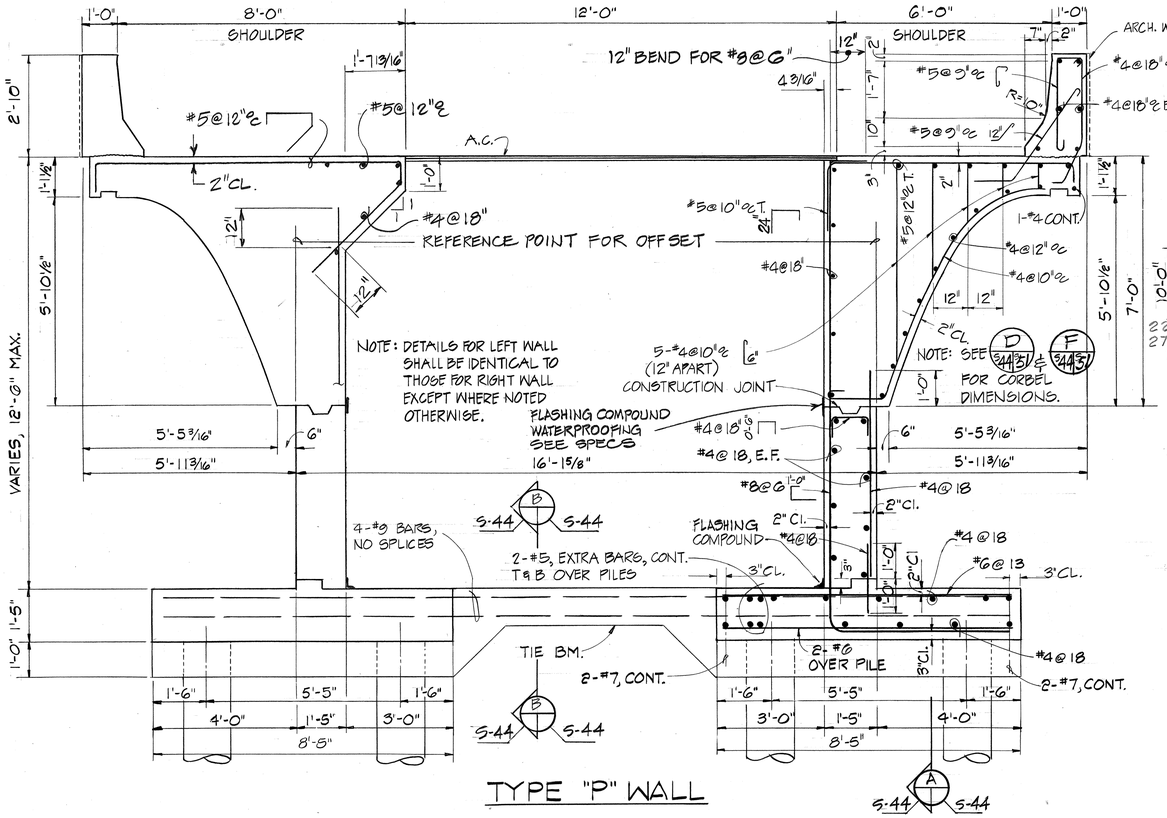
WILBERT T. TAKAMIYA REGISTERED PROFESSIONAL ENGINEER No. 1684 HAWAII, U.S.A.

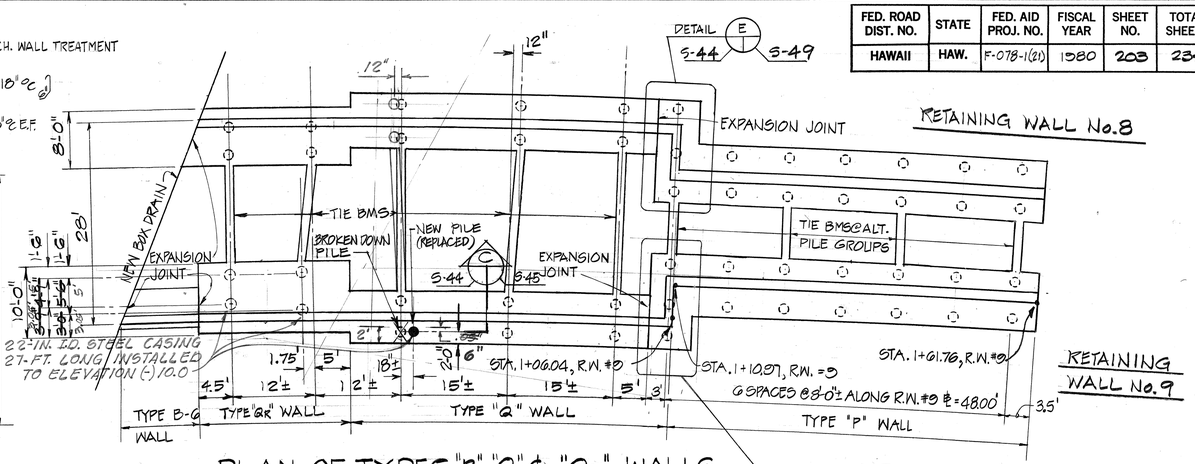
THIS WORK WAS PREPARED BY ME OR UNDER MY SUPERVISION.

ORIGINAL PLAN	SURVEY PLOTTED BY	DATE
	DRAWN BY	"
NOTE BOOK	TRACED BY	"
	DESIGNED BY	"
No.	QUANTITIES BY	"
	CHECKED BY	"

ADD 202

FED. ROAD DIST. NO.	STATE	FED. AID PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
HAWAII	HAW.	F-078-1(21)	1980	203	234

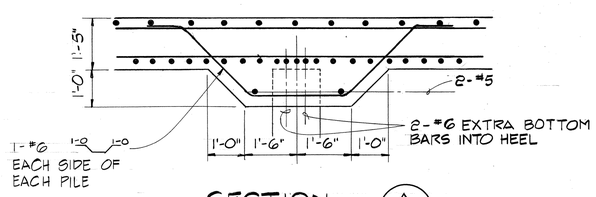




PLAN OF TYPES "P", "Q" & "QR" WALLS

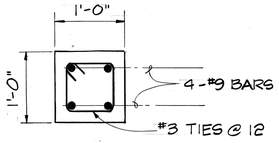
SCALE: 1"=10'

FOR WALL PROFILES (RETAINING WALLS No.8 & No.9) SEE SHEET S-34



SECTION A

SCALE: 1/2"=1'-0"



SECTION B

SCALE: 1"=1'-0"

NOTE:

FOR FILTER MATERIAL & WEEP HOLE DETAILS SEE TYPE "H" WALL SECTION SHT. S-42, SIMILAR

ESTIMATED QUANTITIES PER LINEAR FOOT OF TYPE "P" WALL

STEM & BASE: CONC. = 4.40 C.Y.
STEEL = 426 #

PILE CAP & TIE BM.: CONC. = 0.19 C.Y.
STEEL = 49 #

REFERENCE DRAWINGS

RETAINING WALLS No.8 & No.9 PLAN & PROFILE ..... SHT. S-34
TYPE "B" WALL DETAILS ..... SHT. S-39
TYPES "Q" & "QR" WALL DETAILS ..... SHT. S-45

DATE	REVISION
8/31/82	REVISED PILE CAP & PILE LOCATION FOR TYPE "Q" WALL
2/9/82	REVISED PILE CAP & PILE LOCATION FOR TYPE "Q" & "QR" WALLS

SURVEY PLOTTED BY
DRAWN BY
TRACED BY
DESIGNED BY
QUANTITIES BY
CHECKED BY
DATE
ORIGINAL PLAN
NOTE BOOK
No.

STATE OF HAWAII
DEPARTMENT OF TRANSPORTATION
HIGHWAYS DIVISION

TYPE P WALL DETAILS

MOANALUA ROAD
PUULOA I.C. TO MIDDLE ST. - UNIT 3B
F.A. Proj. No. F-078-1(21)

SCALE: AS SHOWN DATE: AUG 1, 1979

SHEET No. S-44 OF 68 SHEETS

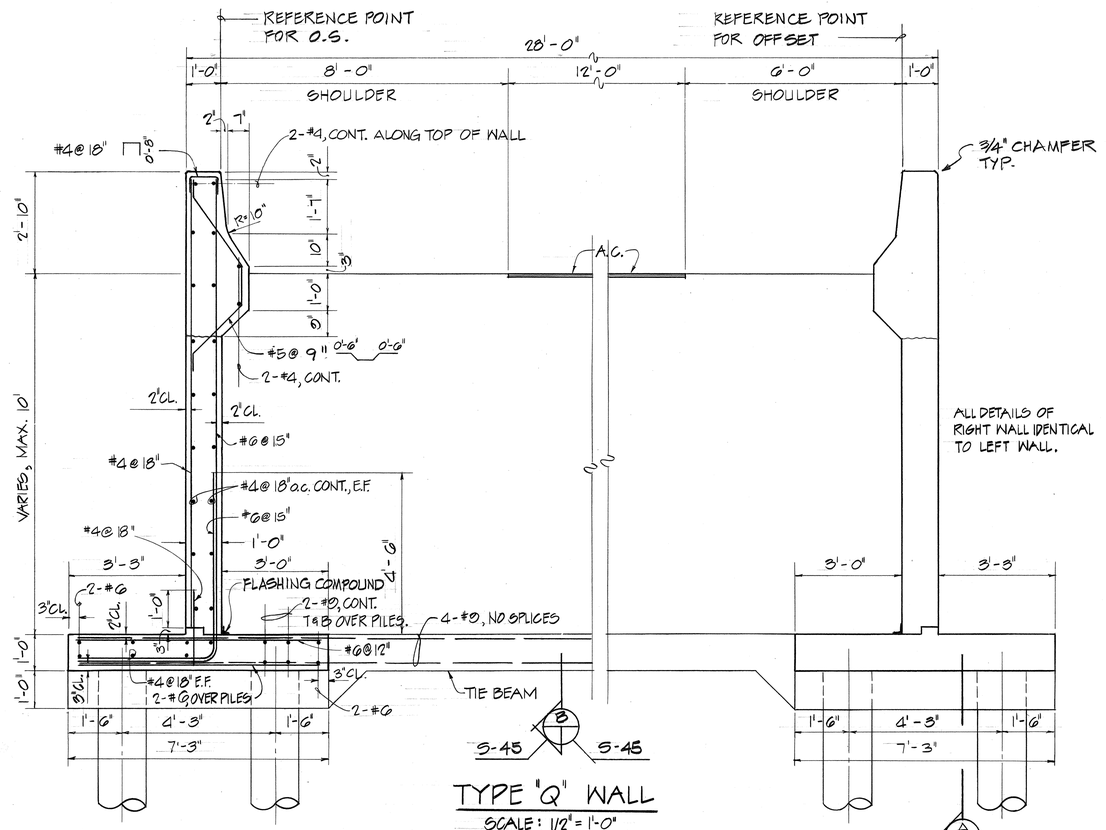
GARY T. TAMAMOTO REGISTERED PROFESSIONAL ENGINEER No. 3097 HAWAII, U.S.A.

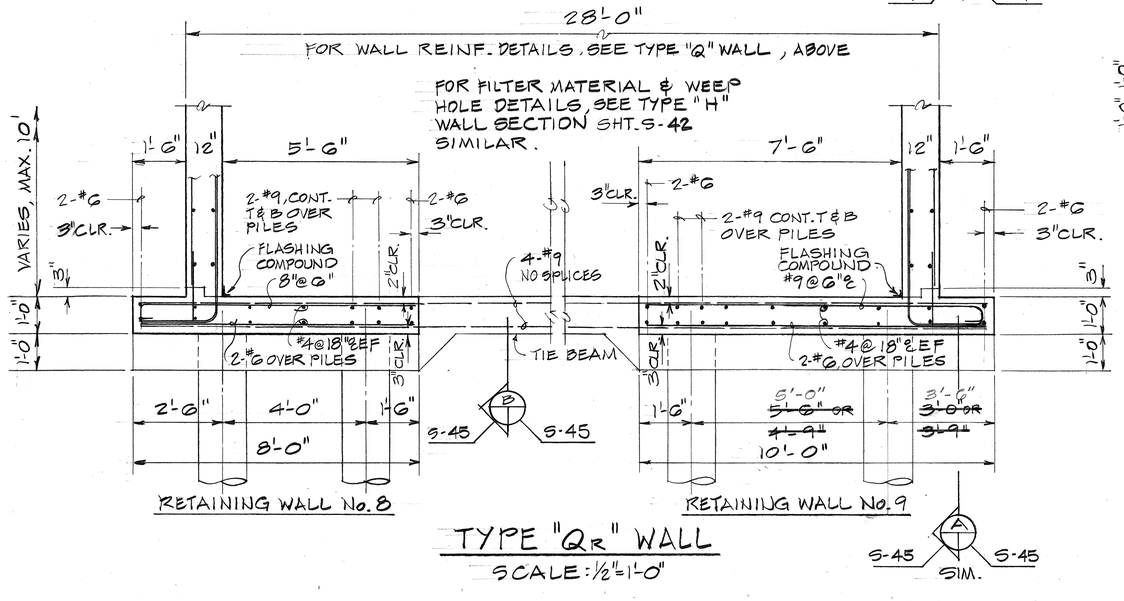
ROBERT T. TAKASHIA REGISTERED PROFESSIONAL ENGINEER No. 1684 HAWAII, U.S.A.

THIS WORK WAS PREPARED BY ME OR UNDER MY SUPERVISION.

C.O. 203

FED. ROAD DIST. NO.	STATE	FED. AID PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
HAWAII	HAW.	F-078-1(21)	1980	204	234





DATE	REVISION
8/31/82	ADD PILE CAP SECTION "C"
2/9/82	REVISED PILE CAP & PILE LOCATION FOR TYPE "QR" WALL

STATE OF HAWAII
DEPARTMENT OF TRANSPORTATION
HIGHWAYS DIVISION

TYPE Q & TYPE QR WALL DETAILS

MOANALUA ROAD
PUULOA I.C. TO MIDDLE ST. - UNIT 3B
F.A. Proj. No. F-078-1(21)

SCALE: AS SHOWN DATE: AUG 1, 1979

SHEET No. S 45 OF 63 SHEETS

GARY T. YAMAMOTO REGISTERED PROFESSIONAL ENGINEER No. 7997 HAWAII, U.S.A.

HOWARD T. TAKAHATA REGISTERED PROFESSIONAL ENGINEER No. 1684 HAWAII, U.S.A.

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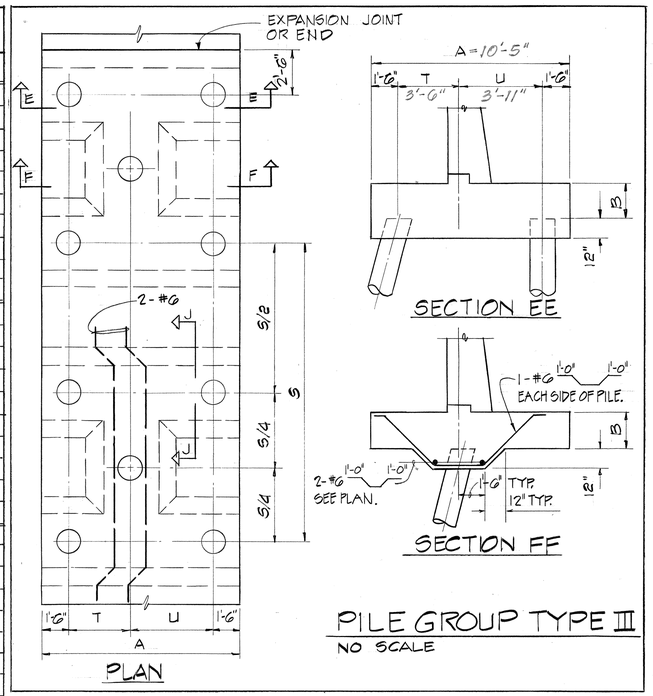
ORIGINAL PLAN | SURVEY PLOTTED BY | DRAWN BY | TRACED BY | DESIGNED BY | QUANTITIES BY | CHECKED BY | DATE
NOTE BOOK | No.

C.O. 204

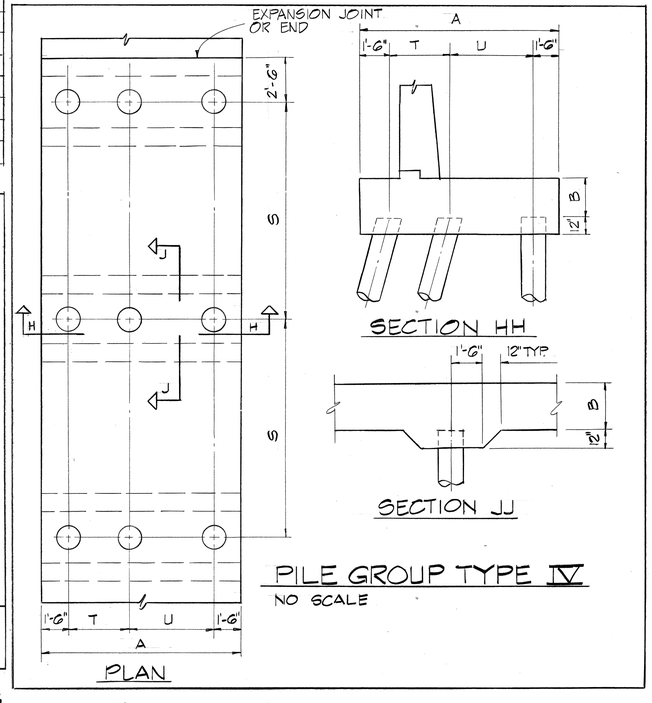
FED. ROAD DIST. NO.	STATE	FED. AID PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
HAWAII	HAW.	F-078-1(21)	1980	205	234

SCHEDULE OF RETAINING WALLS - TYPE R (TYPE S SIMILAR)

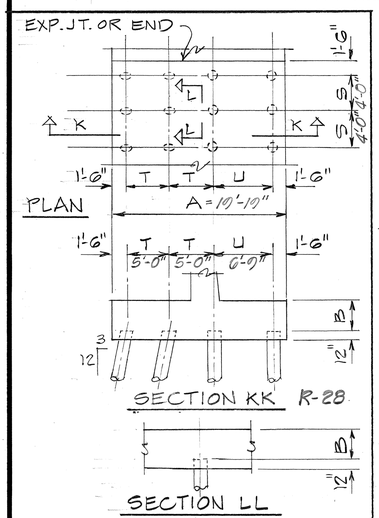
MARK			R-6	R-8	R-10	R-12	R-14	R-16	R-18	R-20	R-28
DIMENSIONS	BASE	A				~~10'-5"~~	11'-3"	12'-2"	13'-1"	14'-4"	19'-9"
		B				17"	18"	22"	24"	27"	40"
		C				~~4'-6"~~	4'-9"	4'-6"	5'-3"	6'-3"	8'-9"
	STEM	D				12'-0"	14'-0"	16'-0"	18'-0"	20'-0"	28'-0"
		E				VARIES	VARIES	VARIES	VARIES	VARIES	VARIES
		F				1/2 : 12	1/2 : 12	1/2 : 12	3/4 : 12	3/4 : 12	1 : 12
	PILES	TYPE				III	IV	IV	IV	IV	V
		S				18'-0"	9'-6"	7'-6"	6'-6"	6'-0"	4'-0"
		T				3'-6"	4'-0"	4'-6"	5'-0"	5'-6"	5'-0"
		U				3'-11"	4'-3"	4'-8"	5'-1"	5'-10"	6'-9"
REINFORCING		2 BARS				# 9 @ 8 1/2"	# 9 @ 10"	# 9 @ 10"	# 9 @ 10"	# 9 @ 10"	#11 @ 10"
		b					# 6 @ 10"	# 7 @ 10"	# 7 @ 10"	# 9 @ 10"	#11 @ 10"
		C									#9 @ 10"
		d				# 7 @ 13"	#7 @ 12"	# 8 @ 12"	# 8 @ 12"	# 8 @ 12"	#9 @ 13"
		e				# 7 @ 13"	# 7 @ 12"	# 8 @ 12"	# 8 @ 12"	# 8 @ 12"	#9 @ 13"
		g				1 - # 7	1 - # 7	1 - # 9	1 - # 8	1 - # 7	1 - # 6
		h				2 - # 8	2 - # 9	2 - # 8	2 - # 7	2 - # 7	2 - # 6
		J				2 - # 8	2 - # 9	2 - # 8	2 - # 7	2 - # 7	2 - # 6
TYPE R QUANTITIES	STEM & BASE	CONC./LF				2.17 C.Y.	2.36 C.Y.	2.69 C.Y.	3.08 C.Y.	3.47 C.Y.	4.87 C.Y.
		STEEL/LF				213#	253#	294#	329#	413#	643#
	PILE CAP	CONC./LF				0.21 C.Y.	0.35 C.Y.	0.24 C.Y.	0.30 C.Y.	0.35 C.Y.	0.73 C.Y.
		STEEL/LF				19#	18#	29#	33#	35#	68#
			S-6	S-8	S-10	S-12	S-14	S-16	S-18	S-20	
TYPE S QUANTITIES	STEM & BASE	CONC./LF				2.25 C.Y.	2.44 C.Y.	2.76 C.Y.	3.16 C.Y.	3.54 C.Y.	
		STEEL/LF				234#	274#	316#	351#	435#	
	PILE CAP	CONC./LF				0.21 C.Y.	0.35 C.Y.	0.24 C.Y.	0.30 C.Y.	0.35 C.Y.	
		STEEL/LF				19#	18#	29#	33#	35#	



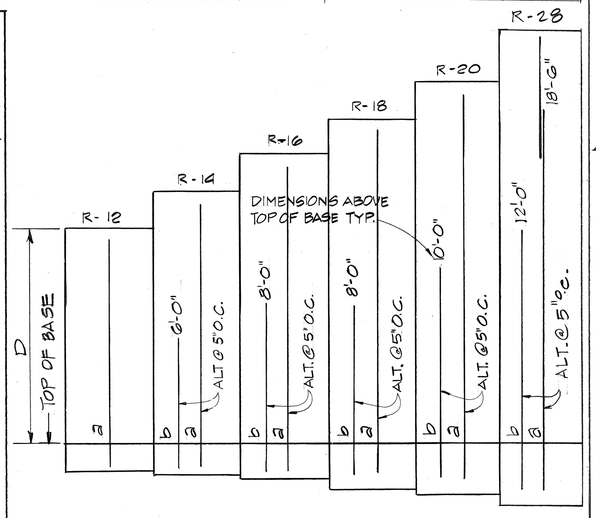
PILE GROUP TYPE III
NO SCALE



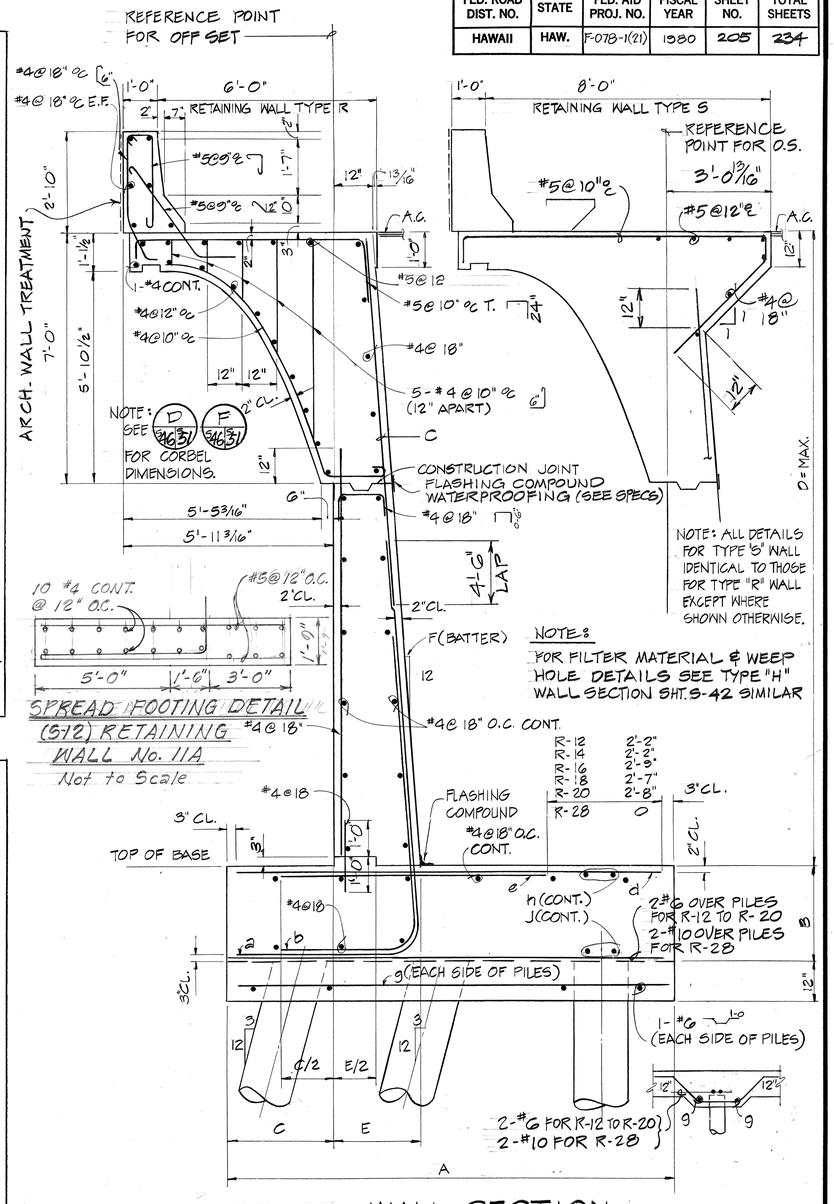
PILE GROUP TYPE IV
NO SCALE



PILE GROUP TYPE V
NO SCALE



WALL ELEVATION SHOWING VERT. REINFORCING



WALL SECTION
NO SCALE

GARY T. YAMAMOTO REGISTERED PROFESSIONAL ENGINEER No. 2997 HAWAII, U.S.A.

HERBERT T. TAKAMIYA REGISTERED PROFESSIONAL ENGINEER No. 1684 HAWAII, U.S.A.

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STATE OF HAWAII
DEPARTMENT OF TRANSPORTATION
HIGHWAYS DIVISION

TYPE R & TYPE S WALL DETAILS

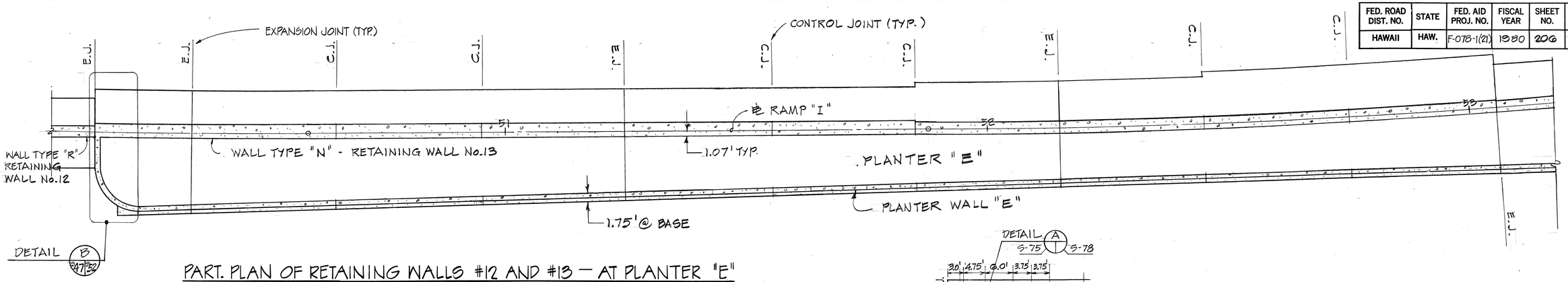
MOANALUA ROAD
PUULOA I.C. TO MIDDLE ST. - UNIT 3B
F.A. Proj. No. F-078-1(21)

SCALE: AS SHOWN DATE: AUG. 1979

SHEET NO. S-46 OF 63 SHEETS

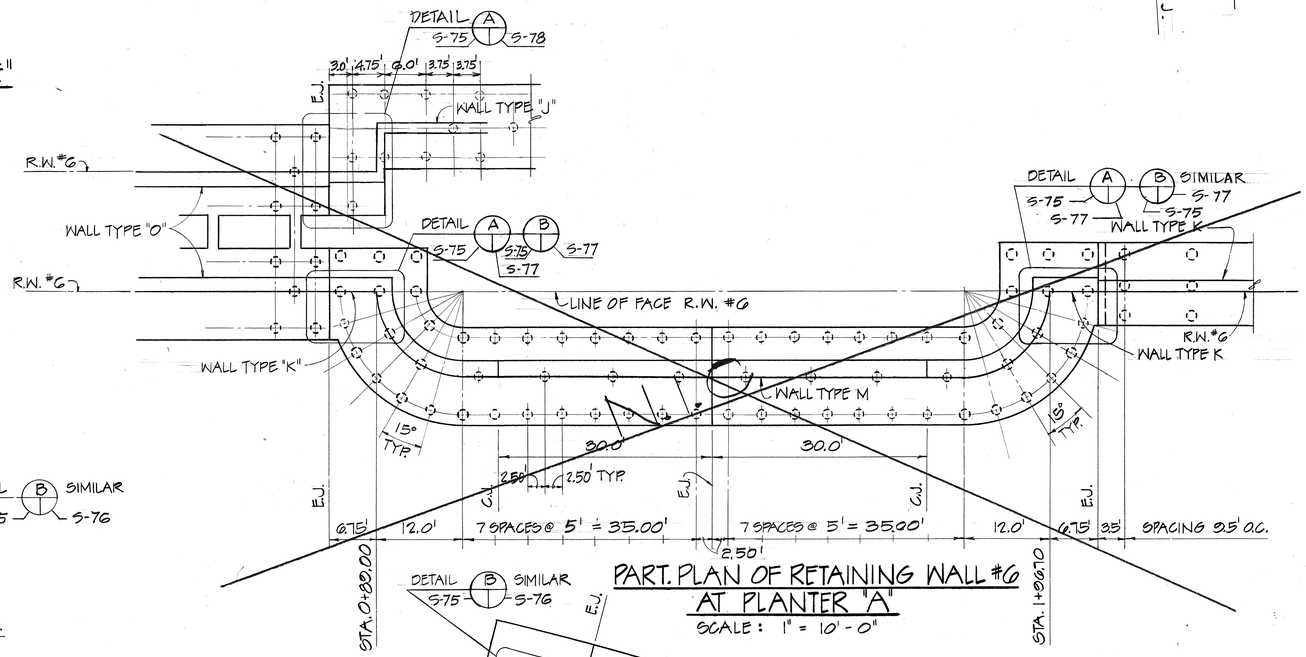
ORIGINAL PLAN
SURVEY PLOTTED BY
DRAWN BY
TRACED BY
DESIGNED BY
QUANTITIES BY
CHECKED BY
DATE
NOTE BOOK
No.

FED. ROAD DIST. NO.	STATE	FED. AID PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
HAWAII	HAW.	F-078-1(21)	1980	206	234



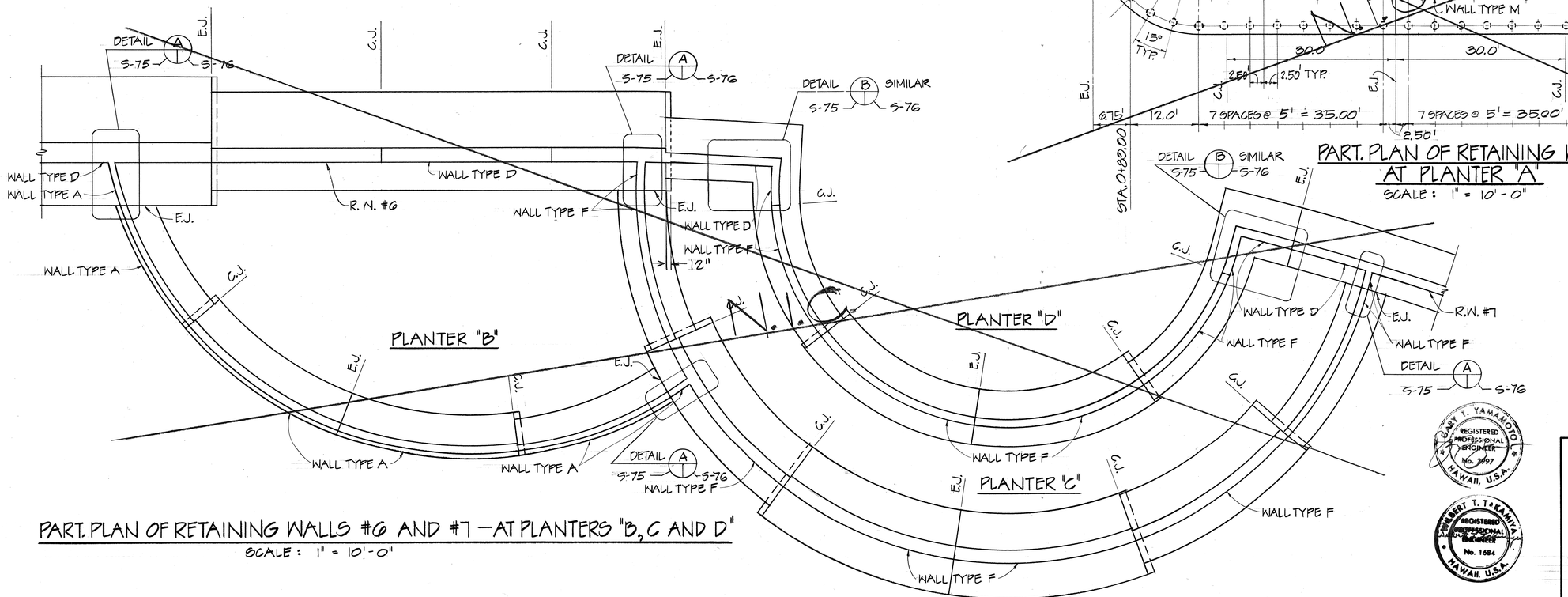
PART. PLAN OF RETAINING WALLS #12 AND #13 — AT PLANTER "E"

SCALE: 1" = 10'-0"



PART. PLAN OF RETAINING WALL #6 AT PLANTER "A"

SCALE: 1" = 10'-0"



PART. PLAN OF RETAINING WALLS #6 AND #7 — AT PLANTERS "B, C AND D"

SCALE: 1" = 10'-0"

ORIGINAL PLAN	SURVEY PLOTTED BY	DATE
	DRAWN BY	"
NOTE BOOK	TRACED BY	"
	DESIGNED BY	"
No.	QUANTITIES BY	"
	CHECKED BY	"

STATE OF HAWAII
DEPARTMENT OF TRANSPORTATION
HIGHWAYS DIVISION

TYPICAL WALL DETAILS

MOANALUA ROAD
PUULOA I.C. TO MIDDLE ST. - UNIT 3B
F.A. Proj. No. F-078-1(21)

SCALE: AS SHOWN DATE: AUG 1, 1979

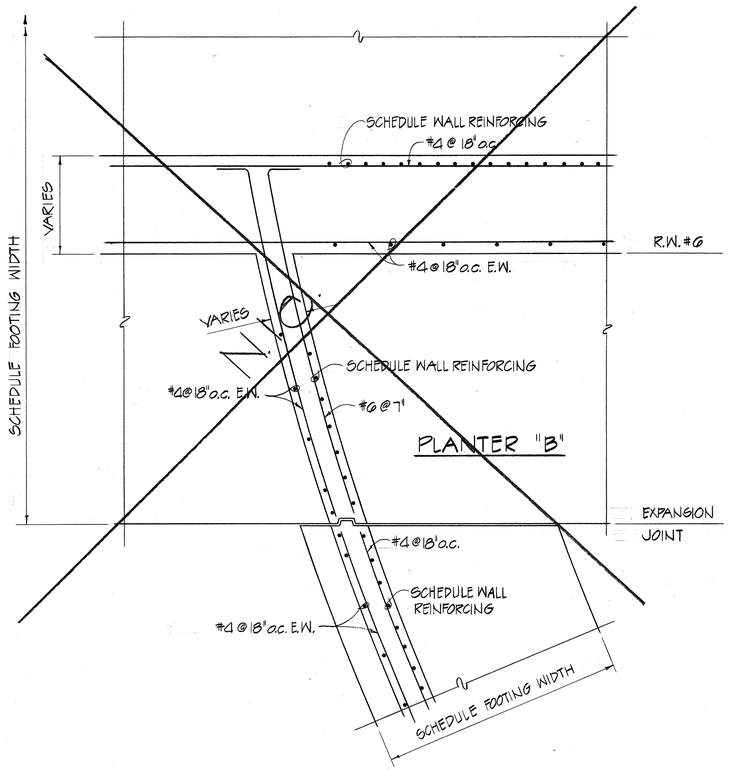
SHEET No. S-47 OF 63 SHEETS

GARY T. YAMAMOTO REGISTERED PROFESSIONAL ENGINEER No. 3997 HAWAII, U.S.A.

HERBERT T. TAKAHIRA REGISTERED PROFESSIONAL ENGINEER No. 1684 HAWAII, U.S.A.

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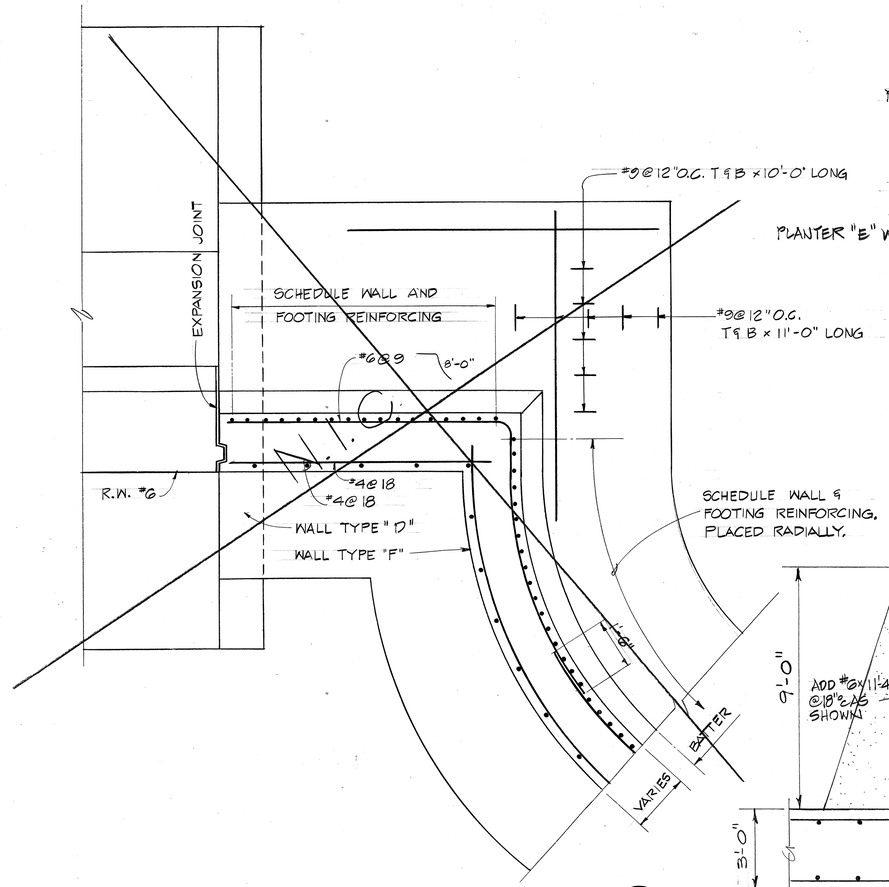
FED. ROAD DIST. NO.	STATE	FED. AID PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
HAWAII	HAW.	F-078-1(21)	1980	207	234

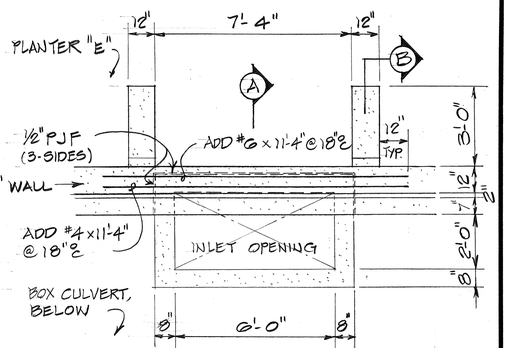


WALL INTERSECTION DETAILS (A)

S-65 5645'76

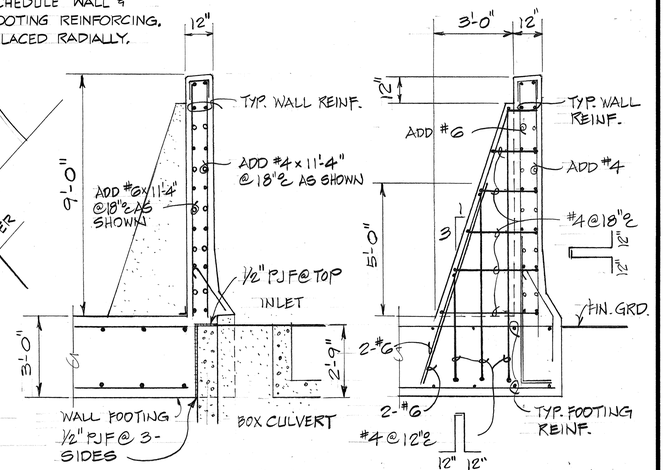
RETAINING WALL #6 AND PLANTER "B"
RETAINING WALLS #6 & #7 AND PLANTER "C" - SIMILAR
PLANTER "B" AND PLANTER "C" - SIMILAR





PLAN

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



SECTION "A"

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

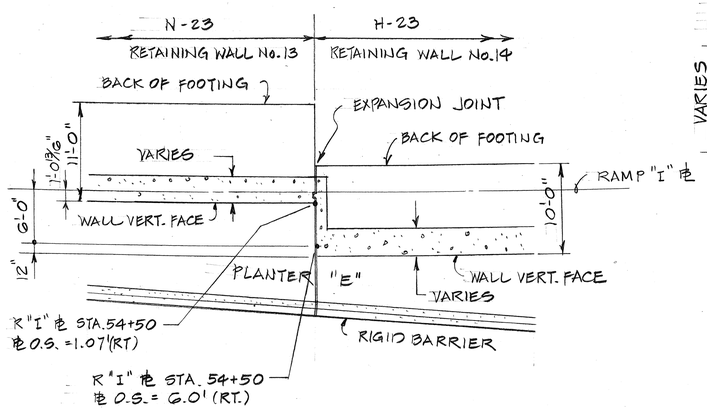
SECTION "B"

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

WALL INTERSECTION DETAILS (B)

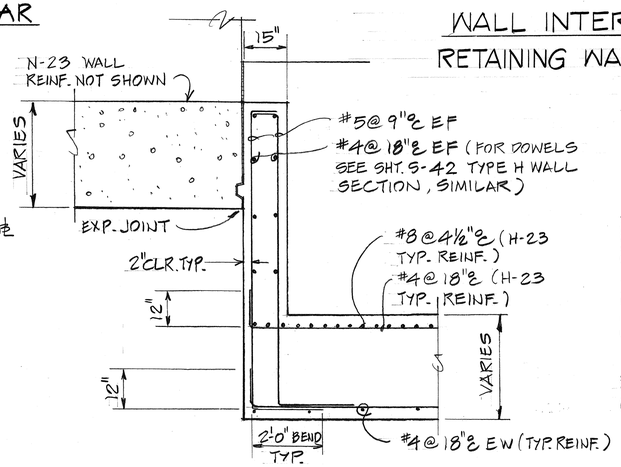
S-64 5676

RETAINING WALL #6 AND PLANTER "D"



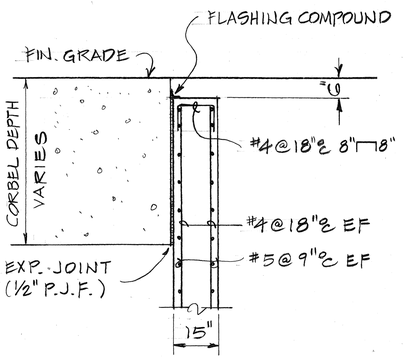
PLAN

SCALE : 1/8" = 1'-0"



ENLARGED PLAN

SCALE : 1/2" = 1'-0"



WALL SECTION @ TOP

SCALE : 1/2" = 1'-0"

WALL INTERSECTION DETAILS (B)

RETAINING WALL #6 AND PLANTER "E" WALL AT INLET

SCALE : AS SHOWN

S-36

WALL DETAILS AT R.W. No. 13 AND R.W. No. 14 (C)

S-35 5648

SCALE AS SHOWN

GARY T. YAMAMOTO REGISTERED PROFESSIONAL ENGINEER No. 3997 HAWAII, U.S.A.

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STATE OF HAWAII
DEPARTMENT OF TRANSPORTATION
HIGHWAYS DIVISION

TYPICAL WALL DETAILS

MOANALUA ROAD
PUULOA I.C. TO MIDDLE ST. - UNIT 3B
F.A. Proj. No. F-078-1(21)

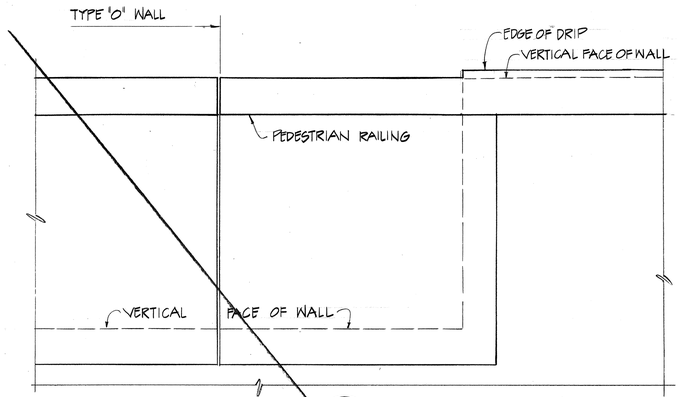
SCALE : AS SHOWN DATE : AUG 1, 1979

SHEET No. S-48 OF 63 SHEETS

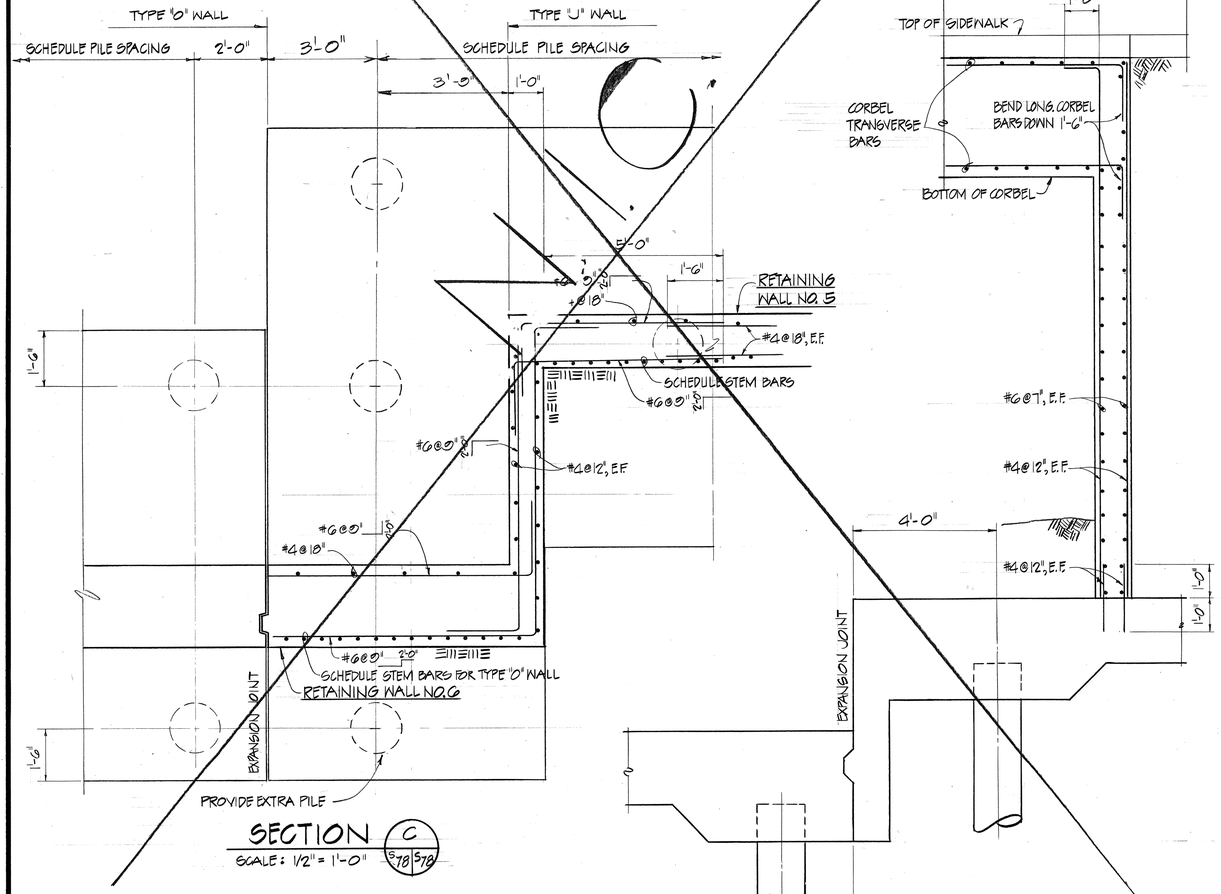
ORIGINAL PLAN | SURVEY PLOTTED BY | DRAWN BY | TRACED BY | DESIGNED BY | QUANTITIES BY | CHECKED BY | DATE | NOTE BOOK | No.

207

FED. ROAD DIST. NO.	STATE	FED. AID PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
HAWAII	HAW.	F-078-1(21)	1980	208	234

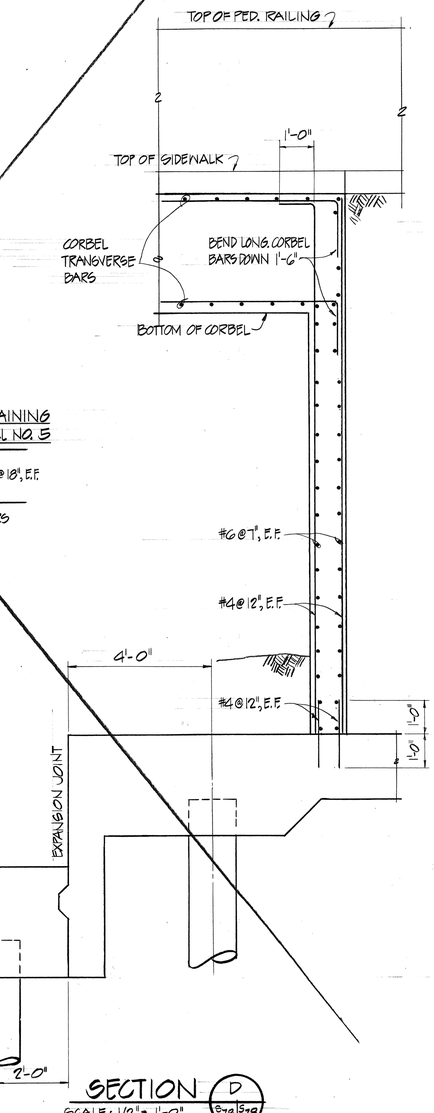


PLAN (B) S7/8 S7/8
SCALE: 1/2" = 1'-0"

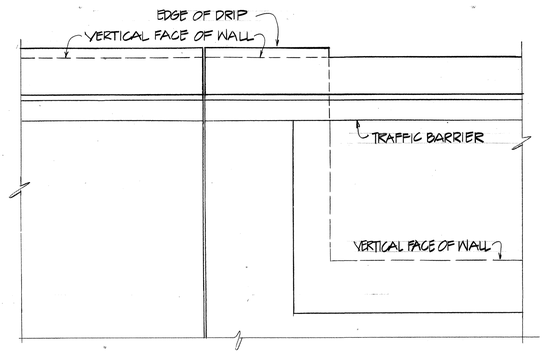


SECTION (C) S7/8 S7/8
SCALE: 1/2" = 1'-0"

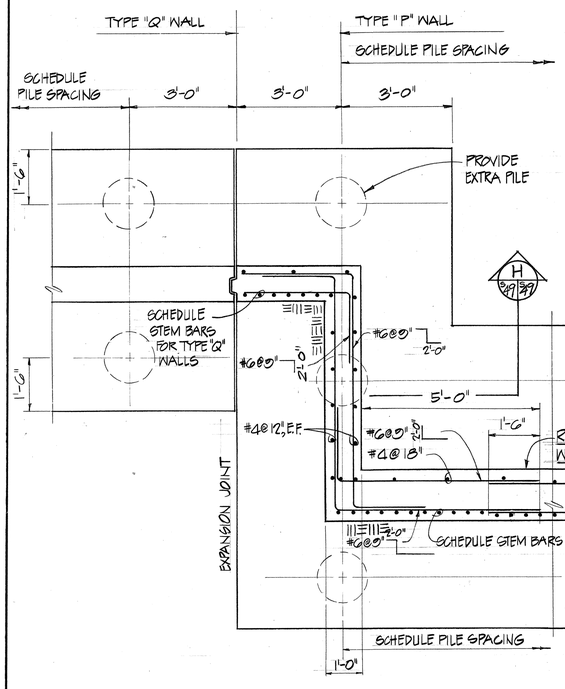
DETAIL (A) S6/3 S7/8



SECTION (D) S7/8 S7/8
SCALE: 1/2" = 1'-0"

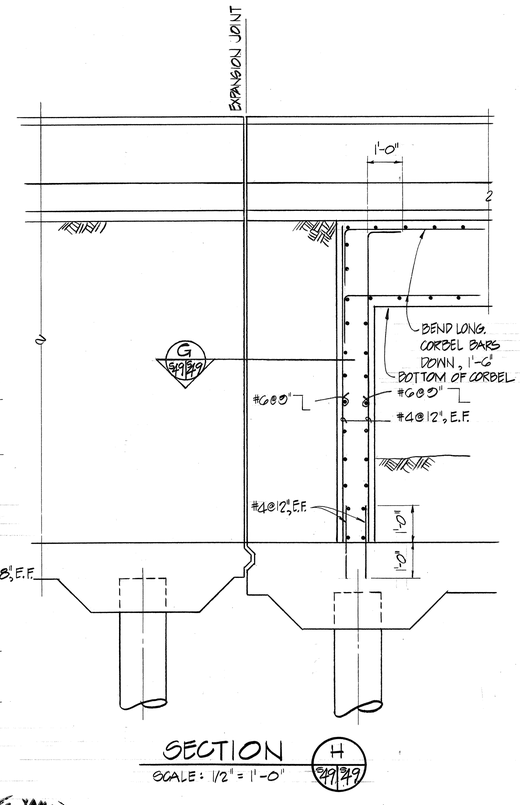


PLAN (F) S9/9 S9/9
SCALE: 1/2" = 1'-0"



SECTION (G) S9/9 S9/9
SCALE: 1/2" = 1'-0"

DETAIL (E) S11/8 S9/9



SECTION (H) S9/9 S9/9
SCALE: 1/2" = 1'-0"

ORIGINAL PLAN	SURVEY PLOTTED BY	DATE
	DRAWN BY	
NOTE BOOK	TRACED BY	
	DESIGNED BY	
	QUANTITIES BY	
No.	CHECKED BY	

GARY T. YAMAMOTO
REGISTERED PROFESSIONAL ENGINEER
No. 2997
HAWAII, U.S.A.

WILBERT T. TAKAHIRA
REGISTERED PROFESSIONAL ENGINEER
No. 1684
HAWAII, U.S.A.

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STATE OF HAWAII
DEPARTMENT OF TRANSPORTATION
HIGHWAYS DIVISION

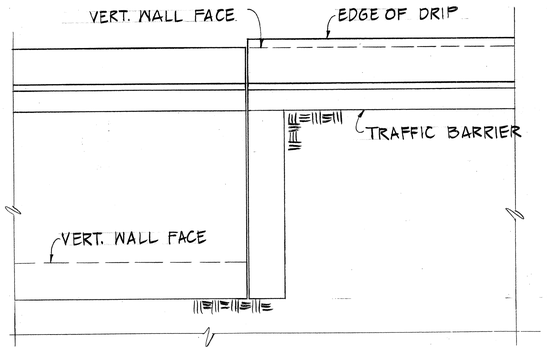
TYPICAL WALL DETAILS

MOANALUA ROAD
PUULOA I.C. TO MIDDLE ST. - UNIT 3B
F.A. Proj. No. F-078-1(21)

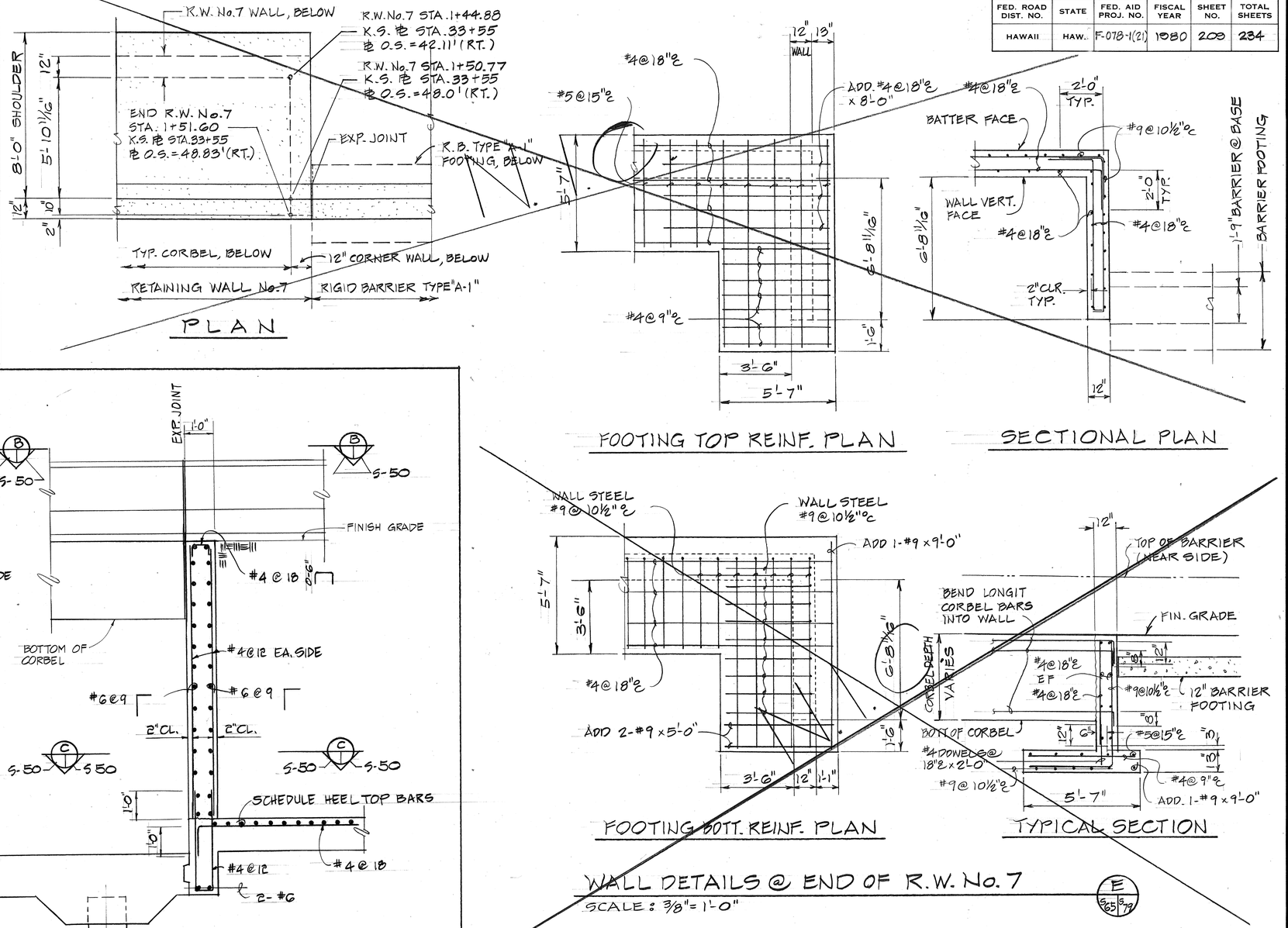
SCALE: AS SHOWN DATE: AUG 1, 1979

SHEET NO. S-49 OF 63 SHEETS

FED. ROAD DIST. NO.	STATE	FED. AID PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
HAWAII	HAW.	F-078-1(21)	1980	200	234



PLAN
SCALE: 1/2" = 1'-0"
B S-50 S-50

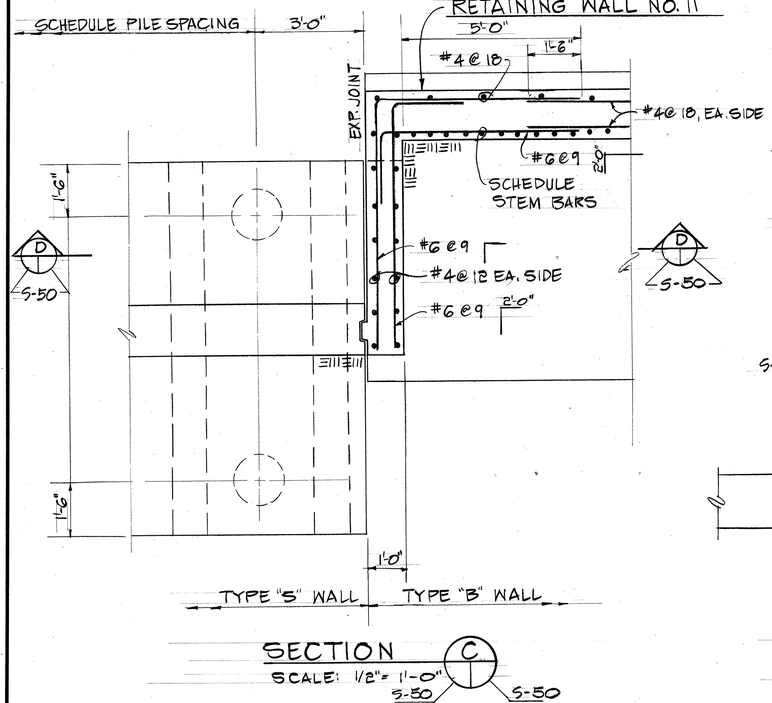


PLAN

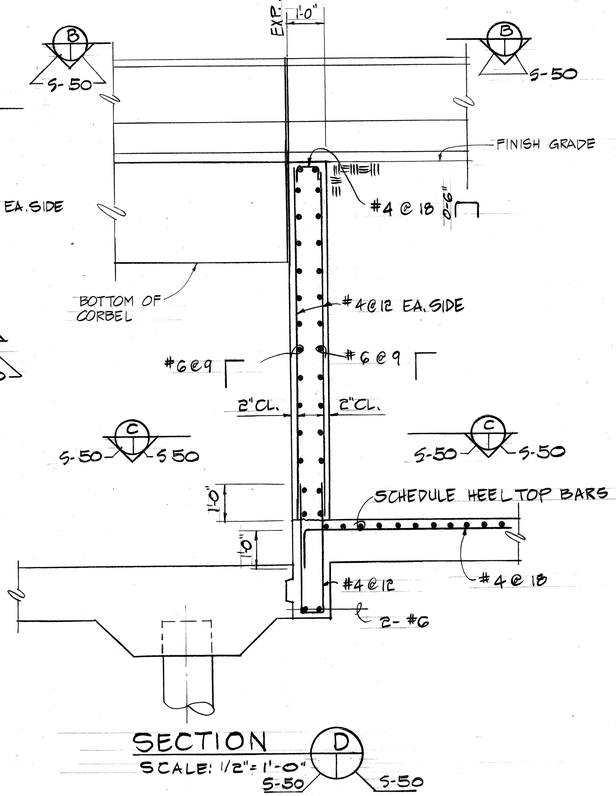
FOOTING TOP REINF. PLAN

SECTIONAL PLAN

SCHEDULE PILE SPACING 3'-0"



SECTION C
SCALE: 1/2" = 1'-0"
S-50 S-50



SECTION D
SCALE: 1/2" = 1'-0"
S-50 S-50

DETAIL A S-35 S-50

FOOTING BOTT. REINF. PLAN

TYPICAL SECTION

WALL DETAILS @ END OF R.W. No. 7
SCALE: 3/8" = 1'-0"
E S65 S79

ORIGINAL PLAN
SURVEY PLOTTED BY
DRAWN BY
TRACED BY
DESIGNED BY
QUANTITIES BY
CHECKED BY
DATE
NOTE BOOK
No.

GARY T. YAMAMOTO REGISTERED PROFESSIONAL ENGINEER No. 2997 HAWAII, U.S.A.

ROBERT T. TAKAHIA REGISTERED PROFESSIONAL ENGINEER No. 1484 HAWAII, U.S.A.

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STATE OF HAWAII
DEPARTMENT OF TRANSPORTATION
HIGHWAYS DIVISION

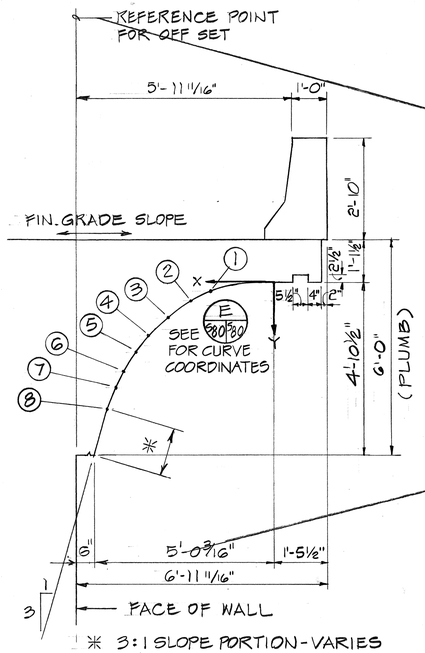
TYPICAL WALL DETAILS

MOANALUA ROAD
PUULOA I.C. TO MIDDLE ST. - UNIT 3B
F.A. Proj. No. F-078-1(21)

SCALE: AS SHOWN DATE: AUG 1, 1979

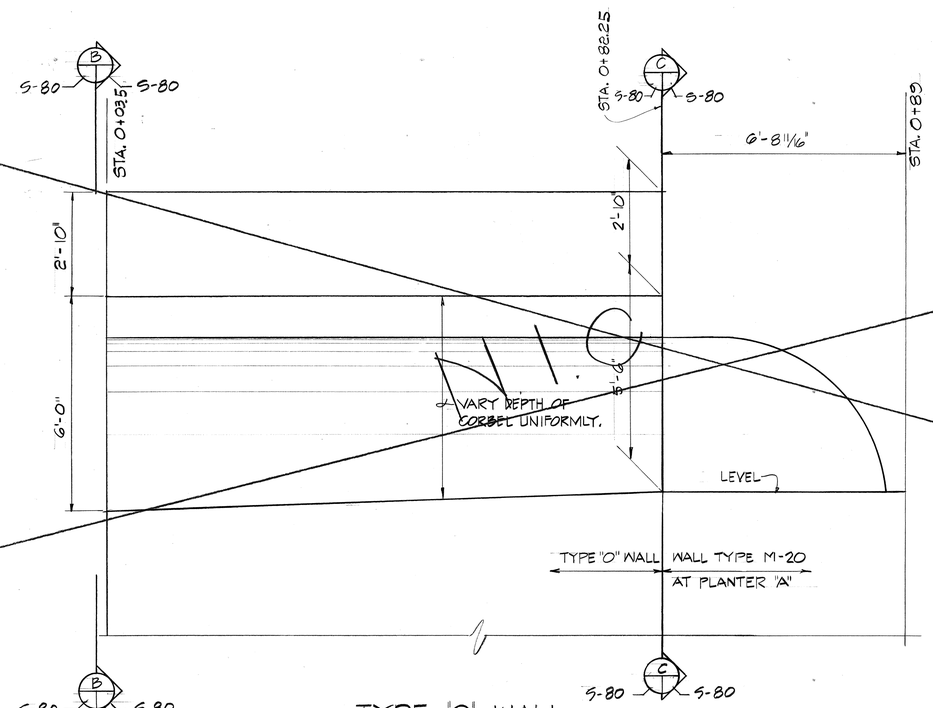
SHEET No. S-500F 63 SHEETS

FED. ROAD DIST. NO.	STATE	FED. AID PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
HAWAII	HAW.	F-078-1(21)	1980	210	234



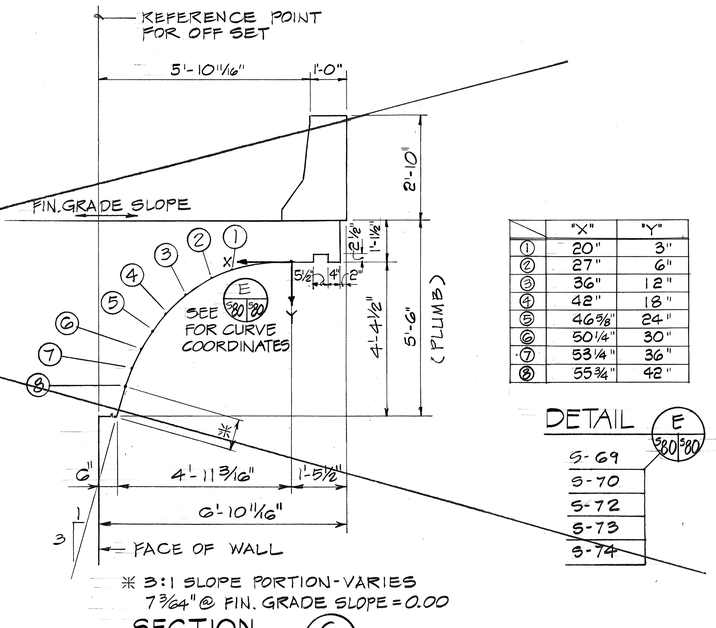
* 3:1 SLOPE PORTION - VARIES 13 1/64" @ FIN. GRADE SLOPE = 0.00

SECTION B S-80 S-80
SCALE: 1/2" = 1'-0"



TYPE "O" WALL
TRANSITION ELEVATION OF RIGHT WALL A S-63 S-80

SCALES: HORIZ. 1/8" = 1'-0"
VERT. 1/2" = 1'-0"



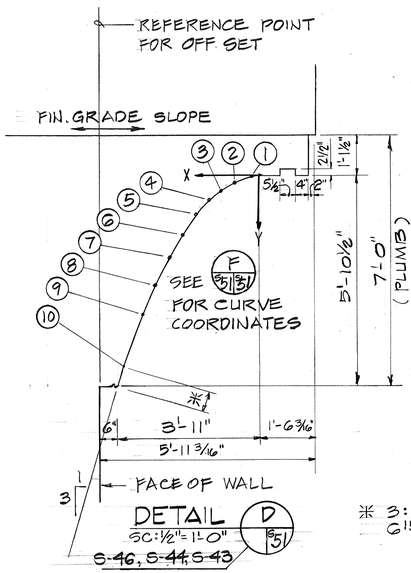
* 3:1 SLOPE PORTION - VARIES 7 3/64" @ FIN. GRADE SLOPE = 0.00

SECTION C S-80 S-80
SCALE: 1/2" = 1'-0"

	"X"	"Y"
①	20"	3"
②	27"	6"
③	36"	12"
④	42"	18"
⑤	46 9/16"	24"
⑥	50 1/4"	30"
⑦	53 1/4"	36"
⑧	55 3/4"	42"

DETAIL E S-80 S-80

S-69
S-70
S-72
S-73
S-74

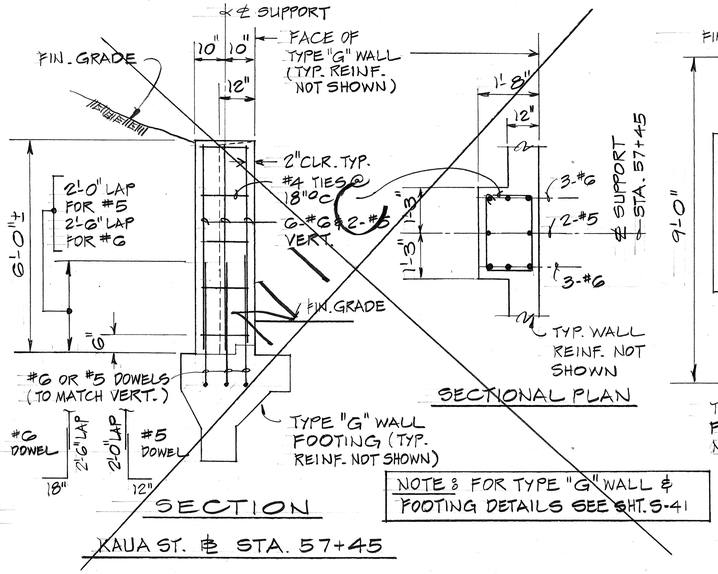


DETAIL D S-51
S-46, S-44, S-43

* 3:1 SLOPE PORTION - VARIES 6 15/16" @ FIN. GRADE SLOPE = 0.00

	"X"	"Y"
①	4 1/4"	0 1/2"
②	8 1/2"	2 3/8"
③	12 3/4"	5 1/4"
④	17"	9 1/4"
⑤	21 1/2"	14 3/8"
⑥	25 1/2"	20 3/4"
⑦	29 3/4"	28 1/4"
⑧	34"	36 7/8"
⑨	38 1/4"	46 3/4"
⑩	44 3/4"	63 7/8"

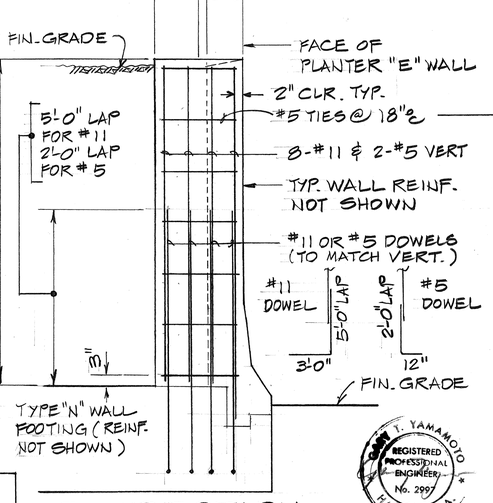
DETAIL F S-51 S-51
S-46, S-44, S-43



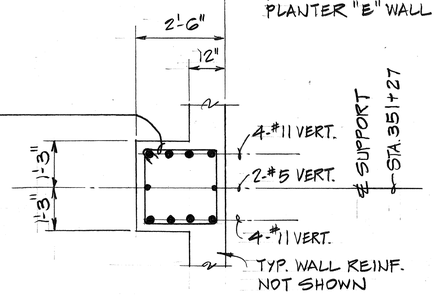
SECTIONAL PLAN

SECTION
KAUA ST. ℄ STA. 57+45

NOTE: FOR TYPE "G" WALL & FOOTING DETAILS SEE SHT. S-41



SECTION
FWY O.B. STA. 351+27



SECTIONAL PLAN

NOTE: FOR TYPE "N" WALL FOOTING & PLANTER "E" WALL DETAILS SEE SHT. S-43

OVERHEAD SIGN SUPPORT BASE DETAILS

SCALE: 1/2" = 1'-0" (FOR LOCATION PLAN, SEE SHT. 76) G S-51 S-51

ORIGINAL PLAN	SURVEY PLOTTED BY	DATE
	DRAWN BY	"
	TRACED BY	"
NOTE BOOK	DESIGNED BY	"
	QUANTITIES BY	"
No.	CHECKED BY	"

K. Y. YAMAMOTO REGISTERED PROFESSIONAL ENGINEER No. 2997 HAWAII, U.S.A.

HERBERT Y. TAKAMIYA REGISTERED PROFESSIONAL ENGINEER No. 1684 HAWAII, U.S.A.

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STATE OF HAWAII
DEPARTMENT OF TRANSPORTATION
HIGHWAYS DIVISION

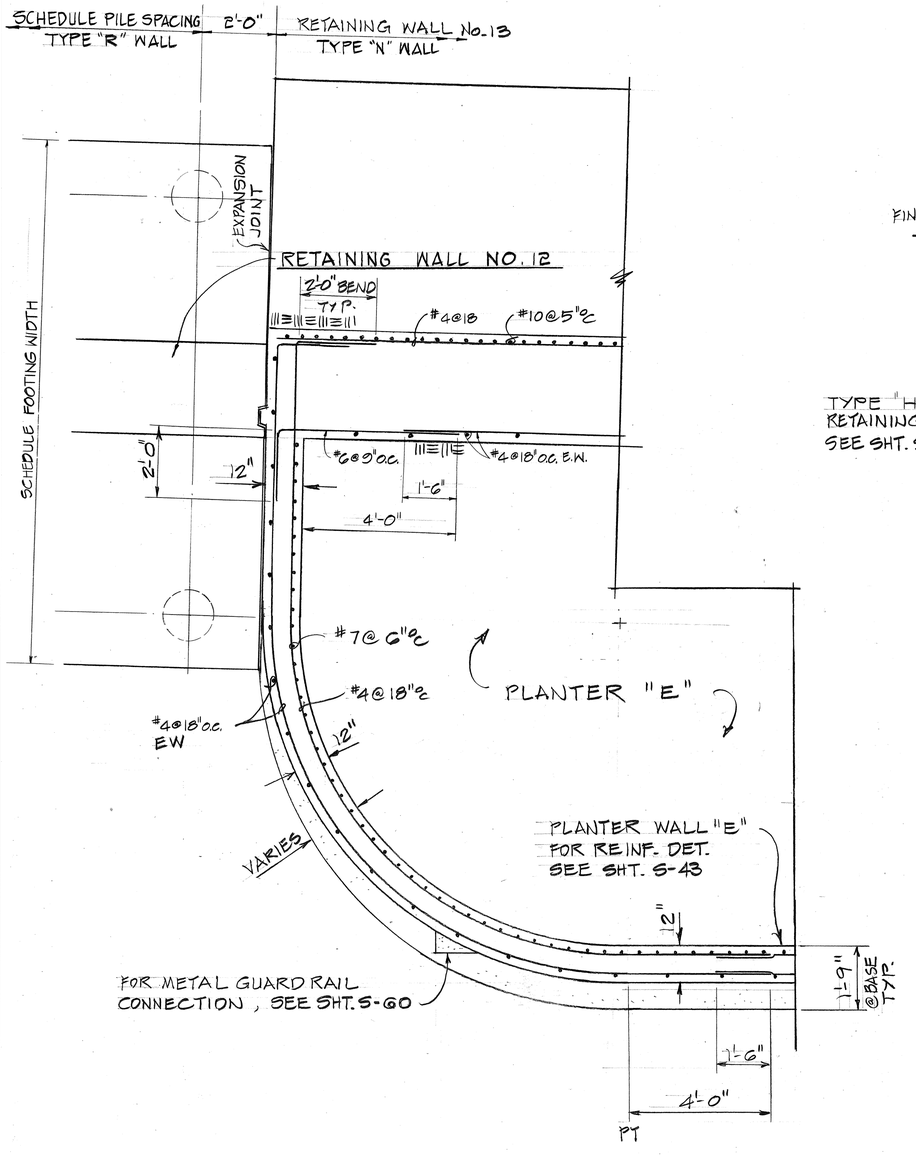
TYPICAL WALL DETAILS

MOANALUA ROAD
PUULOA I.C. TO MIDDLE ST. - UNIT 3B
F.A. Proj. No. F-078-1(21)

SCALE: AS SHOWN DATE: AUG 1, 1979

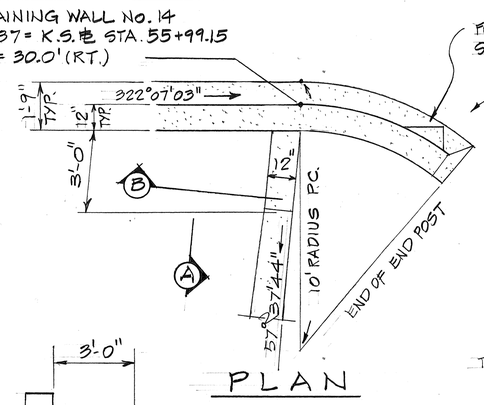
SHEET NO. 551 OF 63 SHEETS

FED. ROAD DIST. NO.	STATE	FED. AID PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
HAWAII	HAW.	F-078-1(21)	1980	211	234



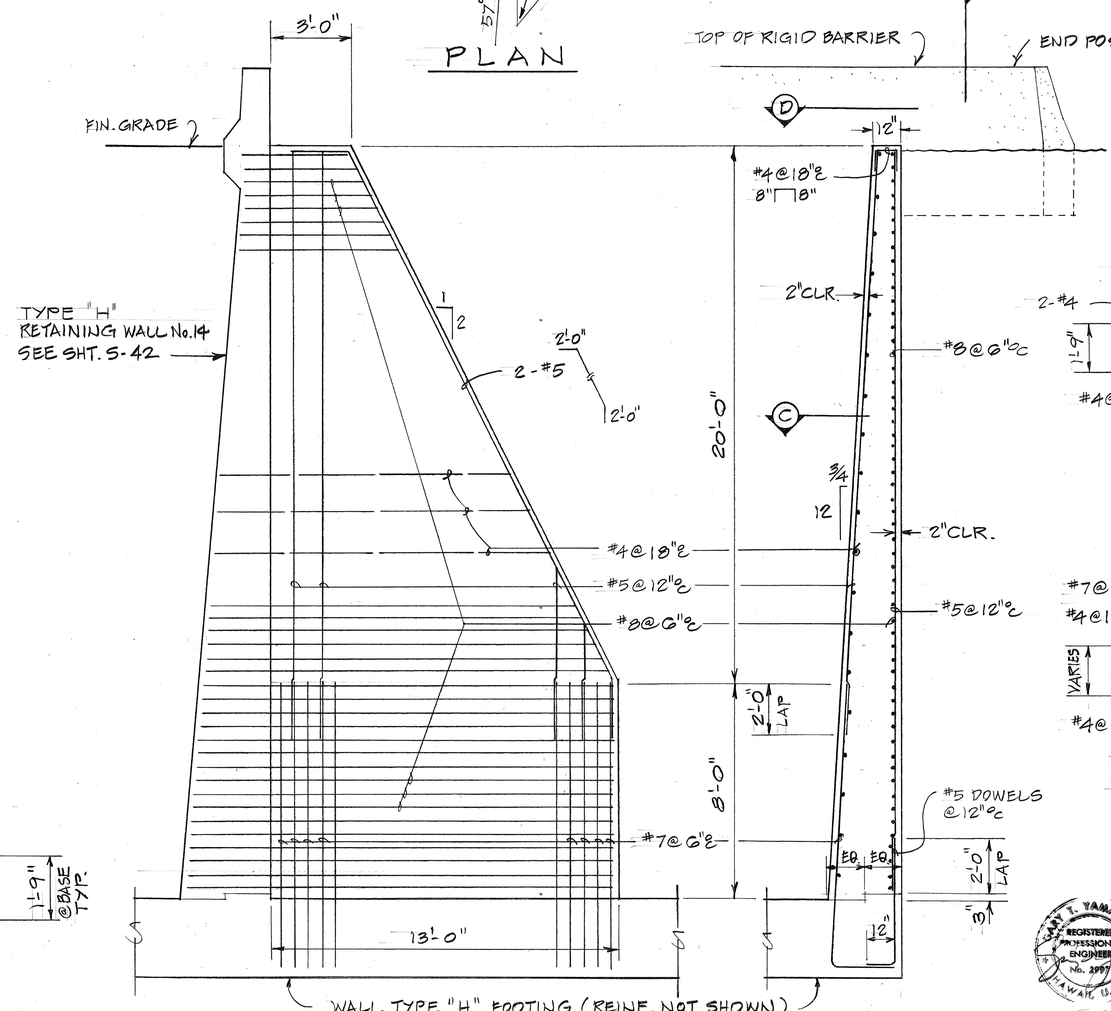
DETAIL B
SCALE: 1/2"=1'-0"
S1 | S2

END RETAINING WALL No. 14
STA. 1+49.37 = K.S. ℄ STA. 55+99.15
℄ O.S. = 30.0' (RT.)



CURVE DATA
Δ = 40°06'25"
R = 10'-0"
Lc = 7'-0"

PLAN

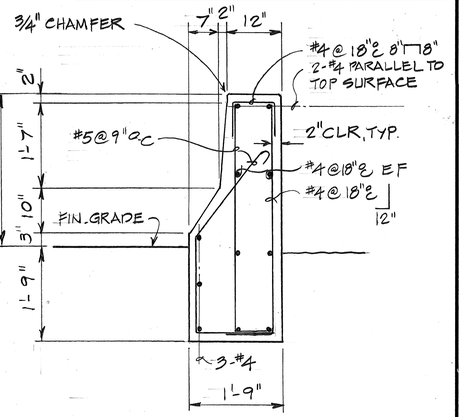


NOTE: FOR TYPE "H" WALL & FOOTING DETAILS SEE SHT. S-42

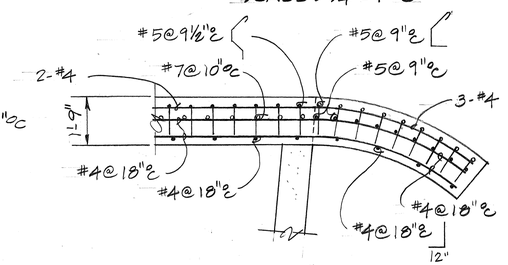
ELEVATION "A"

SECTION "B"

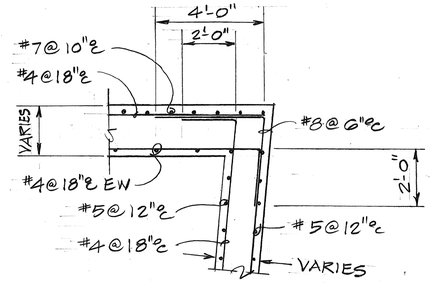
DETAILS AT END OF RETAINING WALL No. 14
SCALE: 3/8"=1'-0"
A
S30 | S32



SECTION "E"
SCALE: 3/4"=1'-0"



SECTION "D"



SECTION "C"

ORIGINAL PLAN
SURVEY PLOTTED BY: DATE
DRAWN BY:
TRACED BY:
DESIGNED BY:
QUANTITIES BY:
CHECKED BY:
NOTE BOOK
No.

GARY T. YAMAMOTO REGISTERED PROFESSIONAL ENGINEER No. 2997 HAWAII, U.S.A.

ROBERT T. TAKAMIYA REGISTERED PROFESSIONAL ENGINEER No. 1684 HAWAII, U.S.A.

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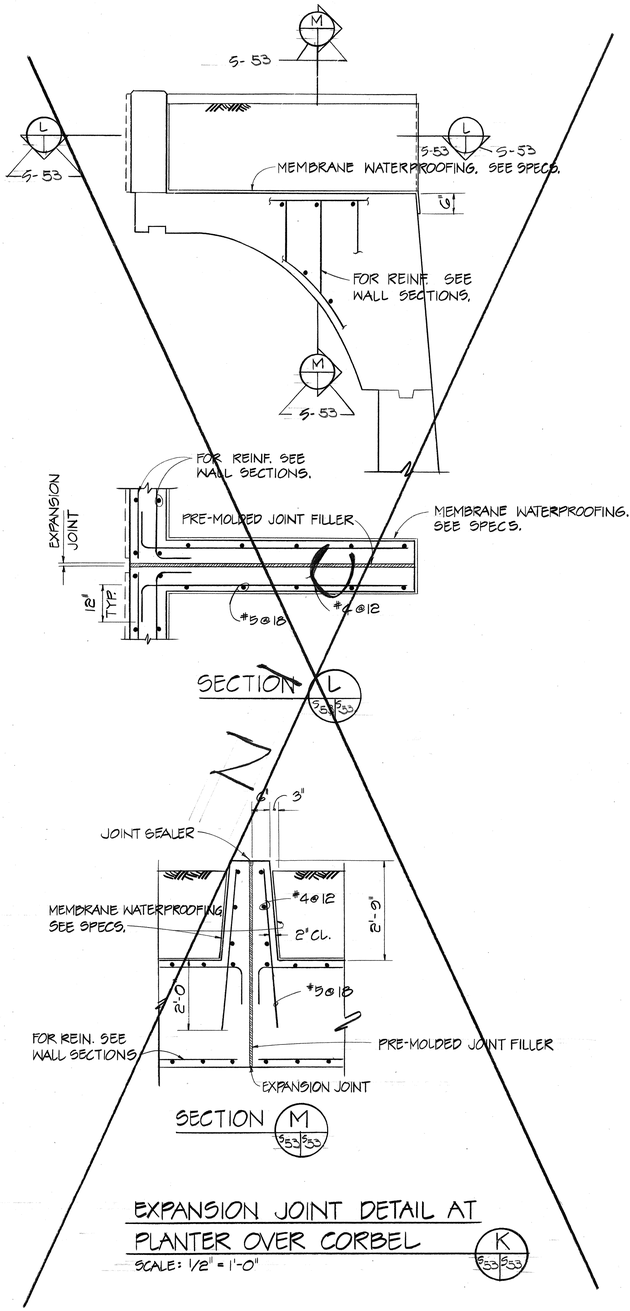
STATE OF HAWAII
DEPARTMENT OF TRANSPORTATION
HIGHWAYS DIVISION

TYPICAL WALL DETAILS

MOANALUA ROAD
PUULOA I.C. TO MIDDLE ST. - UNIT 3B
F.A. Proj. No. F-078-1(21)

SCALE: AS SHOWN DATE: AUG 1, 1979
SHEET No. S-52 OF 63 SHEETS

FED. ROAD DIST. NO.	STATE	FED. AID PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
HAWAII	HAW.	F-078-1(21)	1980	212	234

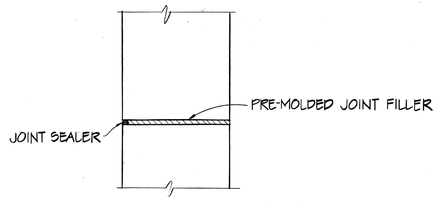


SECTION L (S-53 | S-53)

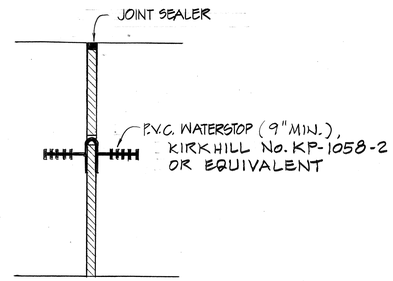
SECTION M (S-53 | S-53)

EXPANSION JOINT DETAIL AT PLANTER OVER CORBEL (K S-53 | S-53)

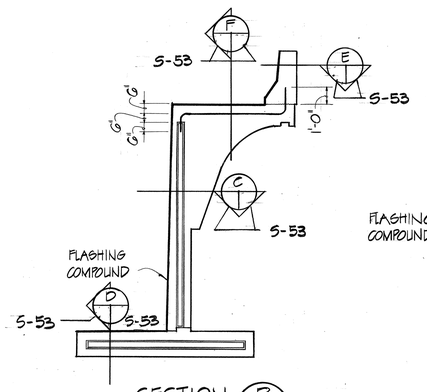
SCALE: 1/2" = 1'-0"



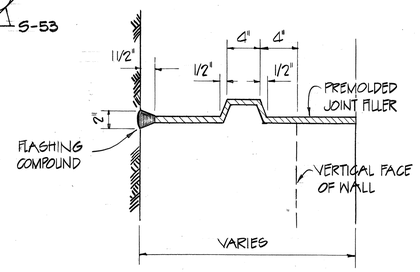
SECTION E (S-53 | S-53)



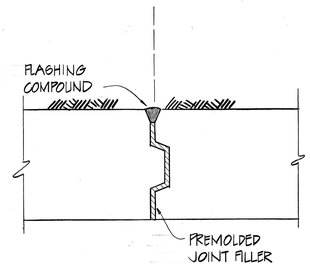
SECTION F (S-53 | S-53)



SECTION B (S-53 | S-53)

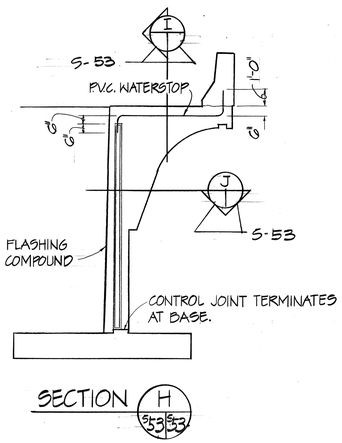


SECTION C (S-53 | S-53)

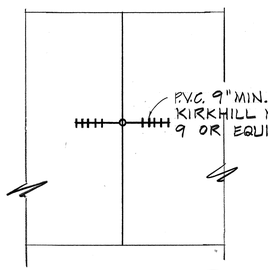


SECTION D (S-53 | S-53)

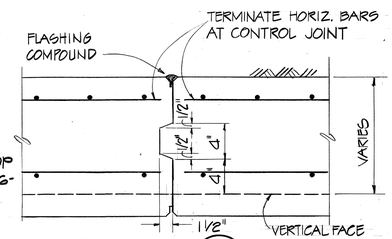
EXPANSION JOINT DETAILS AT CORBELS (A S-53 | S-53)



SECTION H (S-53 | S-53)

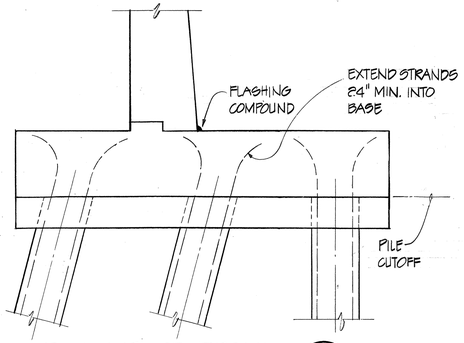


SECTION I (S-53 | S-53)



SECTION J (S-53 | S-53)
NO SCALE

CONTROL JOINT DETAIL AT CORBELS (G S-53 | S-53)



PILE CUTOFF DETAIL (N S-53 | S-53)

T. YAMAMOTO REGISTERED PROFESSIONAL ENGINEER No. 2997 HAWAII, U.S.A.

HERBERT T. TAKAMIYA REGISTERED PROFESSIONAL ENGINEER No. 1684 HAWAII, U.S.A.

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STATE OF HAWAII
DEPARTMENT OF TRANSPORTATION
HIGHWAYS DIVISION

TYPICAL WALL DETAILS

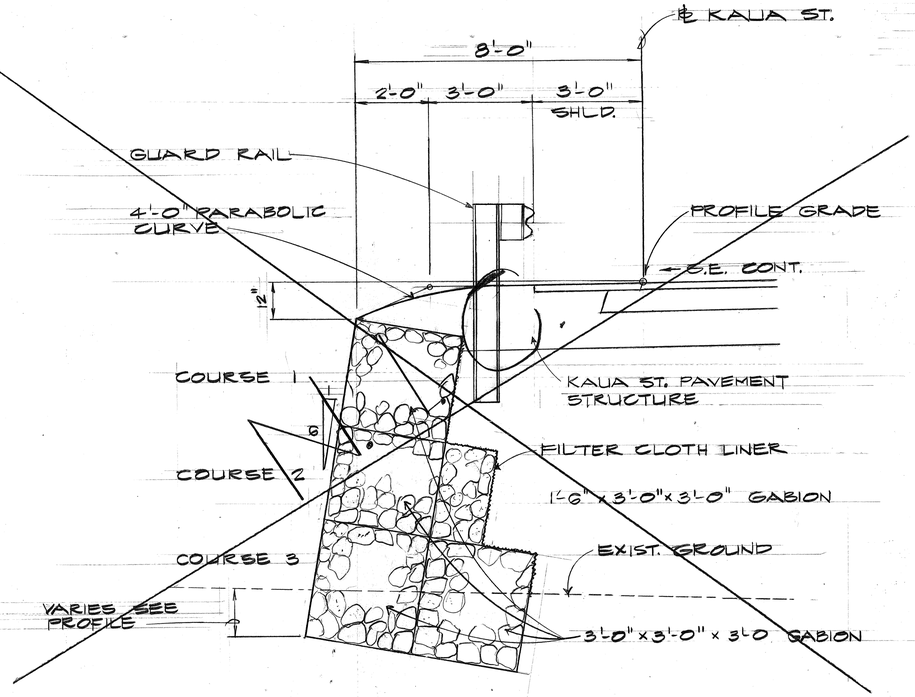
MOANALUA ROAD
PUULOA I.C. TO MIDDLE ST. - UNIT 3B
F.A. Proj. No. F-078-1(21)

SCALE: AS SHOWN DATE: AUG 1, 1979

SHEET No. 53 OF 63 SHEETS

ORIGINAL PLAN	SURVEY PLOTTED BY	DATE
	DRAWN BY	"
	TRACED BY	"
NOTE BOOK	DESIGNED BY	"
	QUANTITIES BY	"
No.	CHECKED BY	"

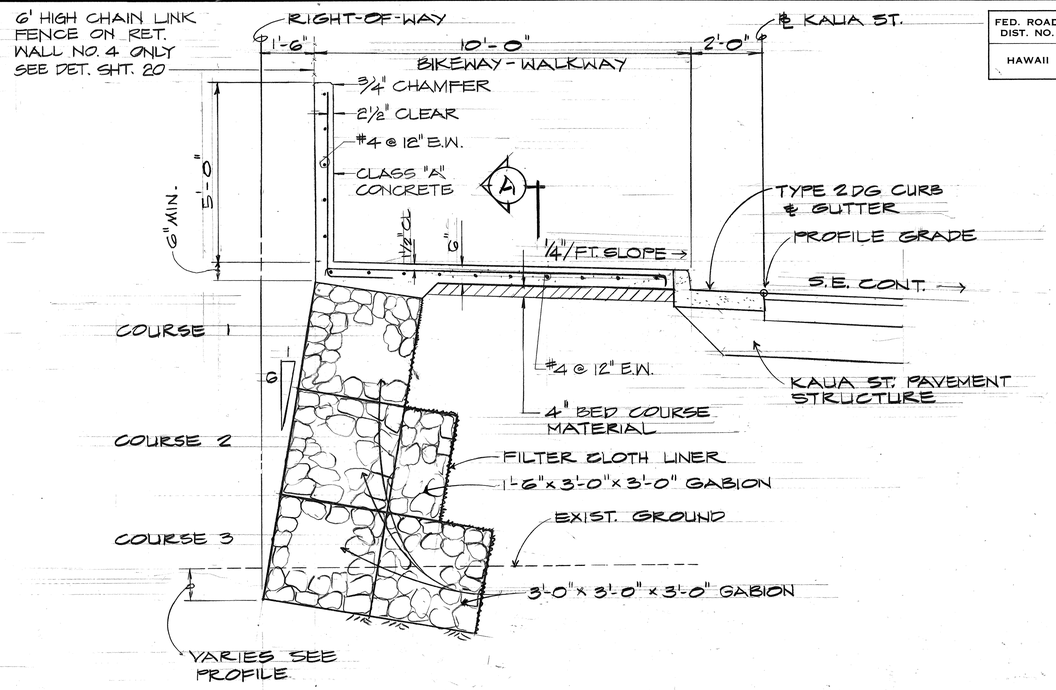
FED. ROAD DIST. NO.	STATE	FED. AID PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
HAWAII	HAW.	F-078-1(21)	1980	213	234



TYPICAL SECTION

GABION RETAINING WALL NOS. 1 & 2

SCALE: 1/2" = 1'-0"



TYPICAL SECTION

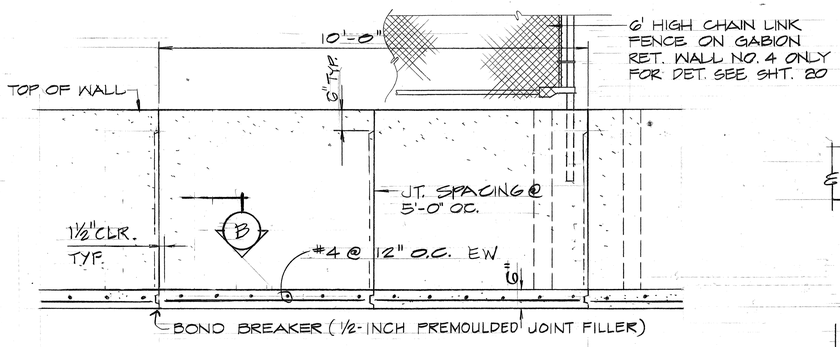
SCALE: 1/2" = 1'-0"

ESTIMATED QUANTITIES FOR GABION RETAINING WALLS					
			QUANTITIES		
ITEM No.	ITEM	UNIT	GABION R.W. #3	GABION R.W. #4	TOTAL
206.5100	STRUCTURE EXCAVATION FOR GABION RETAINING WALLS	Cu.Yd.	(420)	(258)	678
651.0100	GABION STRUCTURE	Cu.Yd.	(873)	(668)	1,541

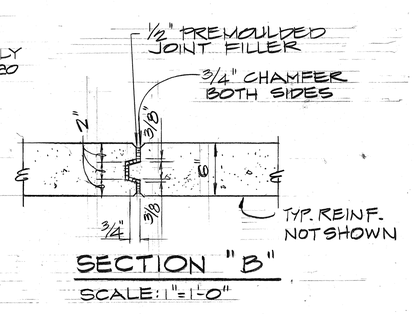
REFERENCE DRAWINGS

GABION RETAINING WALL No. 3
- PLAN ..... SHTS. 14 & 15
- PROFILE ..... SHTS. 5-55

GABION RETAINING WALL No. 4
- PLAN ..... SHT. 16
- PROFILE ..... SHT. 5-55



SECTION "A"



SECTION "B"

SCALE: 1" = 1'-0"

CONC. BIKEWAY - WALKWAY ON GABION WALL
GABION RETAINING WALL NOS. 3 & 4

NOTE: LIMIT OF REINF. CONC. SIDEWALK,
K.S. STA. 36+59.29 TO 43+21,
K.S. STA. 43+85 TO 48+30.

DATE	REVISION
1/4/83	ADDED 6' HIGH CHAIN LINK FENCE AND REVISED GABION RET. WALL NO. 4
4/8/81	ADDED TYPE OF BOND BREAKER.
3/25/81	ADDED NOTE

GARY T. YAMAMOTO — REGISTERED PROFESSIONAL ENGINEER — No. 2997 — HAWAII, U.S.A.

WILBERT T. TAKAMIYA — REGISTERED PROFESSIONAL ENGINEER — No. 1684 — HAWAII, U.S.A.

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STATE OF HAWAII
DEPARTMENT OF TRANSPORTATION
HIGHWAYS DIVISION

GABION RETAINING WALL DETAILS

MOANALUA ROAD
PUULOA I.C. TO MIDDLE ST. - UNIT 3B
F.A. Proj. No. F-078-1(21)

SCALE: AS SHOWN DATE: AUG 1, 1979

SHEET No. 5-54 OF 63 SHEETS

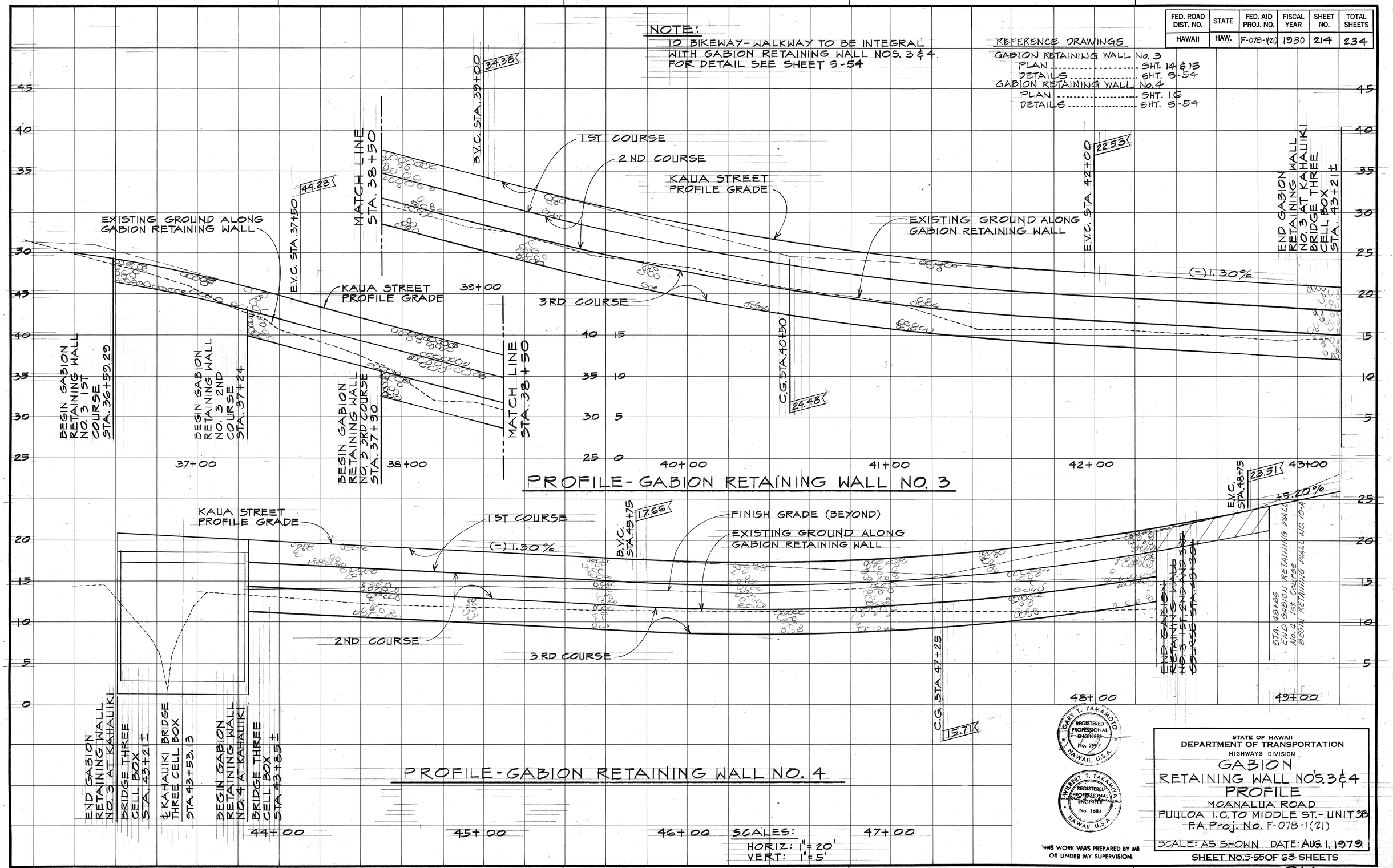
ORIGINAL PLAN | SURVEY PLOTTED BY | DRAWN BY | TRACED BY | DESIGNED BY | QUANTITIES BY | CHECKED BY | DATE | NOTE BOOK | No.

CO ADD 213

FED. ROAD DIST. NO.	STATE	FED. AID PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
HAWAII	HAW.	F-078-1(21)	1980	214	234

NOTE:
10' BIKEWAY-WALKWAY TO BE INTEGRAL WITH GABION RETAINING WALL NOS. 3 & 4. FOR DETAIL SEE SHEET S-54

REFERENCE DRAWINGS
GABION RETAINING WALL No. 3
PLAN ..... SHT. 14 & 15
DETAILS ..... SHT. S-54
GABION RETAINING WALL No. 4
PLAN ..... SHT. 16
DETAILS ..... SHT. S-54



SCALES:
HORIZ: 1" = 20'
VERT: 1" = 5'

ORIGINAL PLAN	SURVEY PLOTTED BY	DATE
	DRAWN BY	"
	TRACED BY	"
NOTE BOOK	DESIGNED BY	"
No.	QUANTITIES BY	"
	CHECKED BY	"

GARY T. YAMAMOTO REGISTERED PROFESSIONAL ENGINEER No. 2997 HAWAII, U.S.A.

WILBERT T. TAKAMIYA REGISTERED PROFESSIONAL ENGINEER No. 1684 HAWAII U.S.A.

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STATE OF HAWAII
DEPARTMENT OF TRANSPORTATION
HIGHWAYS DIVISION

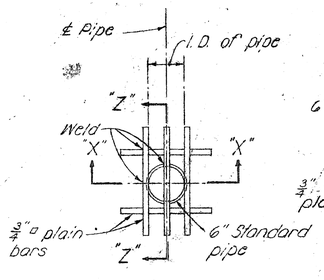
GABION RETAINING WALL NO'S. 3 & 4 PROFILE

MOANALUA ROAD
PUULOA I.C. TO MIDDLE ST. - UNIT 3B
F.A. Proj. No. F-078-1(21)

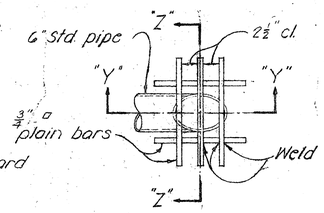
SCALE: AS SHOWN DATE: AUG. 1, 1979

SHEET No. S-55 OF 63 SHEETS

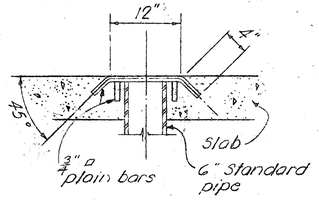
FED. ROAD DIST. NO.	STATE	FED. AID PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
HAWAII	HAW.	F-019-1(10)	1980	215	263



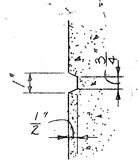
PLAN



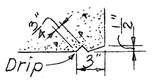
PLAN



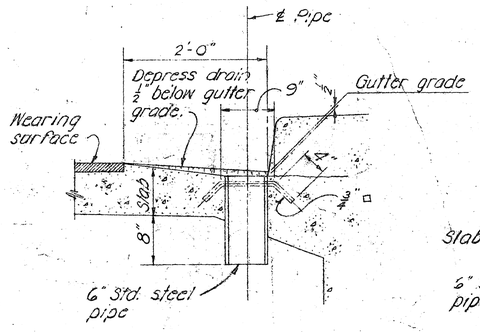
SECTION "Z-Z"



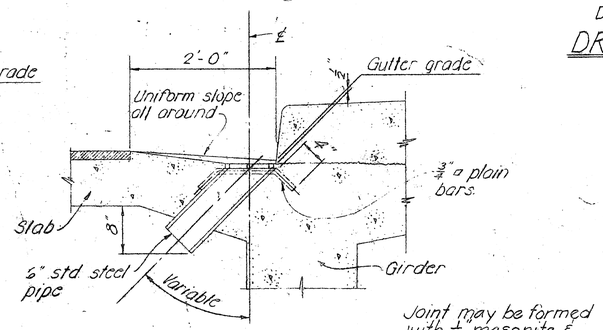
TYPICAL CONCRETE GROOVE DETAIL



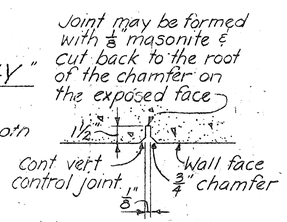
DRIP DETAIL



SECTION "X-X"

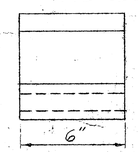


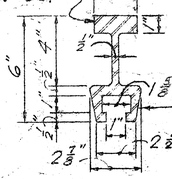
SECTION "Y-Y"



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

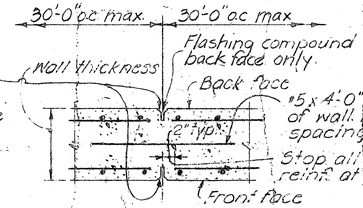




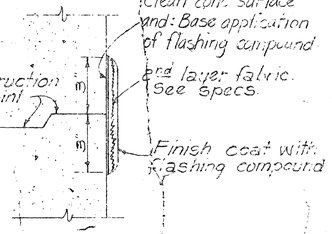
Contractor to take proper precautions to prevent the concrete from flowing into the opening of the inserts.

INSERT DETAIL

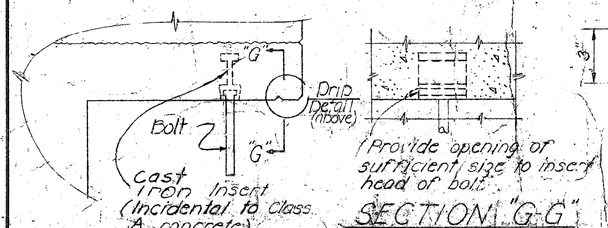
Vert. control joint on each face of wall to top of footing. See above detail and as directed by the Engineer



CONTROL JOINT DETAILS



TYP FLASHING COMPOUND WATERPROOFING DETAIL



SECTION "G-G"

DETAIL of PIPE HANGERS & INSERTS

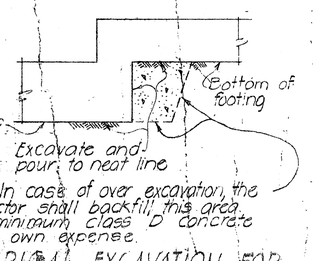
NAME DATE

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



Note! In case of over excavation, the contractor shall backfill this area with minimum class D concrete at his own expense.

TYPICAL EXCAVATION FOR CONTINUOUS FOOTING STEP-UP

GENERAL NOTES

1 - All concrete shall be Class A unless otherwise noted.
2 - Reinforcing shall be detailed in accordance with A.C.I. Manual of Standard Practice for Detailing Reinforced Concrete Highway Structures unless otherwise noted.
3 - Clearance for reinforcing bars shall be as follows, unless otherwise noted:
a - 1½" For stirrups of beams & pier caps.
b - 2" for ties of columns.
c - 2" for formed walls.
d - 3" For footings.
4 - Minimum spacing between parallel bars shall be 2½ times the diameter of bars, but in no case shall the clear distance between the bars be less than 1½ times the maximum size of the coarse aggregate.
5 - All dimensions relating to reinforcing are to centers of bars unless otherwise noted.
6 - 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.
7 - Vertical column bars shall be arranged in such a manner as to miss pier cap bars above as directed by the Engineer.
8 - Except as otherwise noted on drawings, all exterior corners & re-entrant angles in concrete work shall be chamfered ¾"x ¾".
9 - Concrete seats receiving steel plates, leadplates 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.
10 - 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.
11 - 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 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.
12 - Gothic letters and figures approximating dimensions shown will be acceptable, if approved by the Engineer.
13 - 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.
14 - 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.

APPROVAL RECOMMENDED:
Paul T. Yamashita — BRIDGE DESIGN ENGINEER — 1-23-70 DATE

APPROVED
Paul T. Yamashita — For ASSISTANT CHIEF, ENGINEERING — 1-28-70 DATE

NO.	REVISION	APPROVED BY	DATE

STATE OF HAWAII
DEPARTMENT OF TRANSPORTATION
HIGHWAYS DIVISION

STANDARD DETAILS
NOTES AND MISCELLANEOUS DETAILS

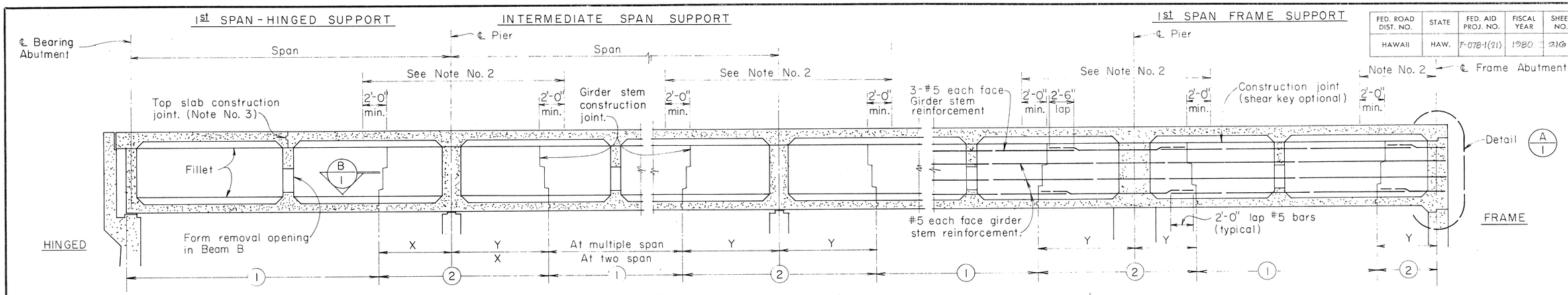
Date: October 1969

SHEET No. 56 OF 68 SHEETS DB-100

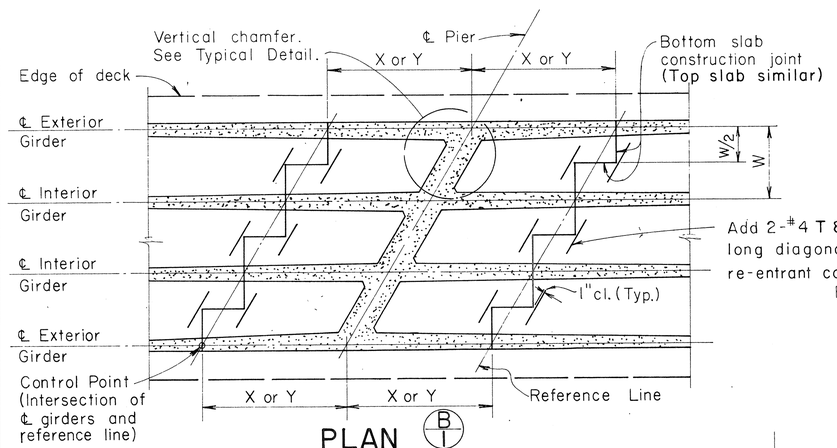
ORIGINAL PLAN	SURVEY PLOTTED BY	DATE
	DRAWN BY	
	TRACED BY	
NOTE BOOK	DESIGNED BY	
No.	QUANTITIES BY	
	CHECKED BY	

PRINTED ON NO. 1000R CLEARPRINT

FED. ROAD DIST. NO.	STATE	FED. AID PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
HAWAII	HAW.	F-078-1(21)	1980	216	234

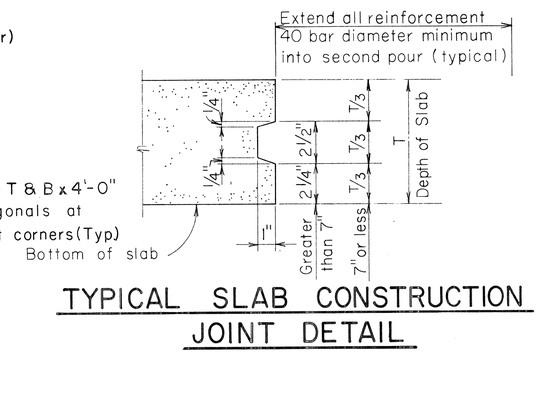


PLACING DIAGRAM

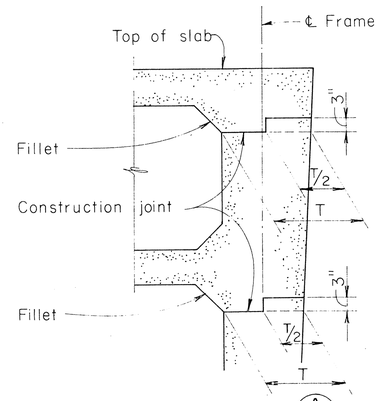


PLAN (B/1)

CONSTRUCTION JOINT - BRIDGES ON SKEW



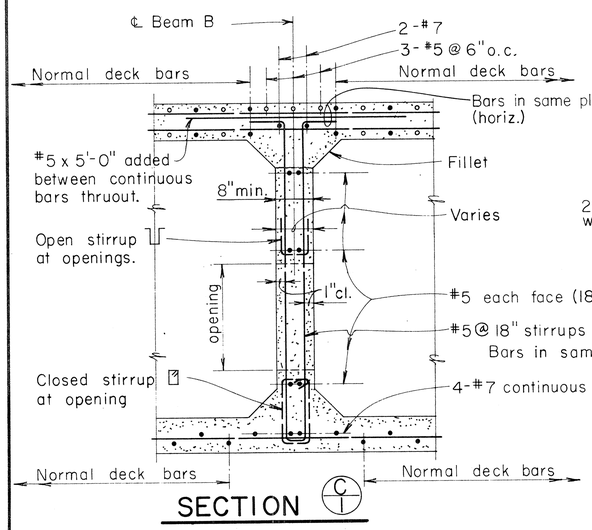
TYPICAL SLAB CONSTRUCTION JOINT DETAIL



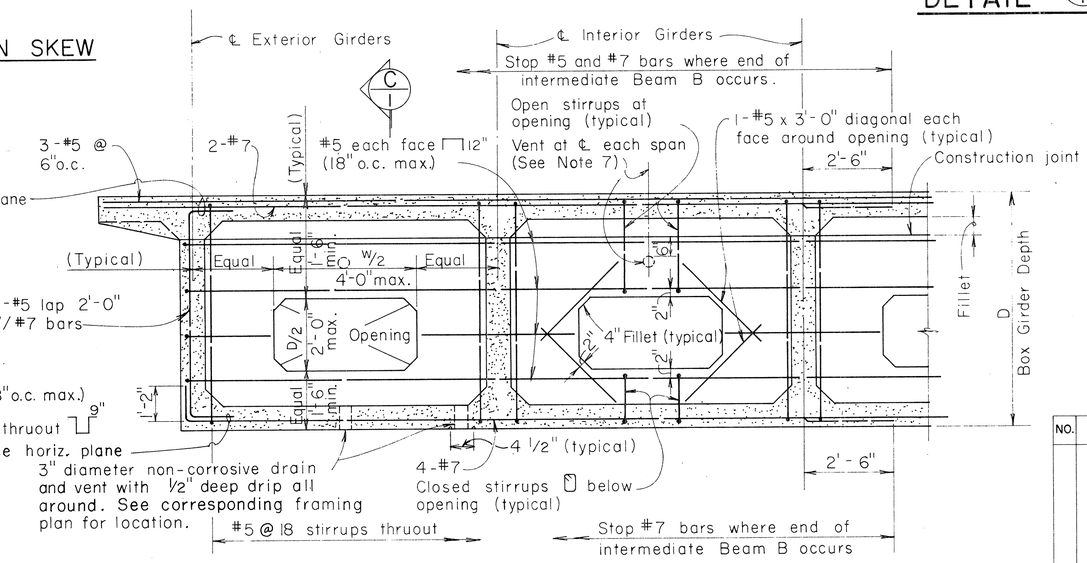
DETAIL (A/1)

NOTES:

1. Numbers ① and ② indicate sequence of placing bottom slab and girder stem concrete. ② may be placed with ① when approved by the Engineer provided that the ① sections adjoining the ② sections are placed in this pour. For any deviation from the above, the contractor shall submit a diagram to the Engineer for approval.
2. No top slab construction joint or form removal opening shall be located in the region over the piers as noted, nor in the supporting section of a hinged span.
3. When top slab is not poured continuously, and top slab forms are not removed, construction joint in top slab shall be located over an intermediate diaphragm.
4. Top slab concrete shall be placed separately from the stem. Top slab concrete may be placed continuously or in parts as approved by the Engineer, providing pour is not in conflict with the above notes.
5. Dimension X = 1/4 span. Y = 1/5 span.
6. No lapping of main bars shall be permitted at construction joints.
7. If the Contractor elects to leave top slab forms in place, form removal opening shall be omitted and replaced by 3" vent. Vertical shorings left in place for the top slab formwork, shall not be located within the center half of each top slab span.



SECTION (C/1)



EXTERIOR SPAN — INTERIOR SPAN

TYPICAL BEAM B DETAILS

APPROVAL RECOMMENDED:
Warren K. Yamamoto — 6-1-76
BRIDGE DESIGN ENGINEER — DATE

APPROVED
Herbert Matsuda — 6-2-76
ASSISTANT CHIEF, ENGINEERING — DATE

NO.	REVISION	APPROVED BY	DATE

STATE OF HAWAII
DEPARTMENT OF TRANSPORTATION
HIGHWAYS DIVISION

STANDARD DETAILS
CONCRETE BOX GIRDER

Not To Scale — Date: May 1976

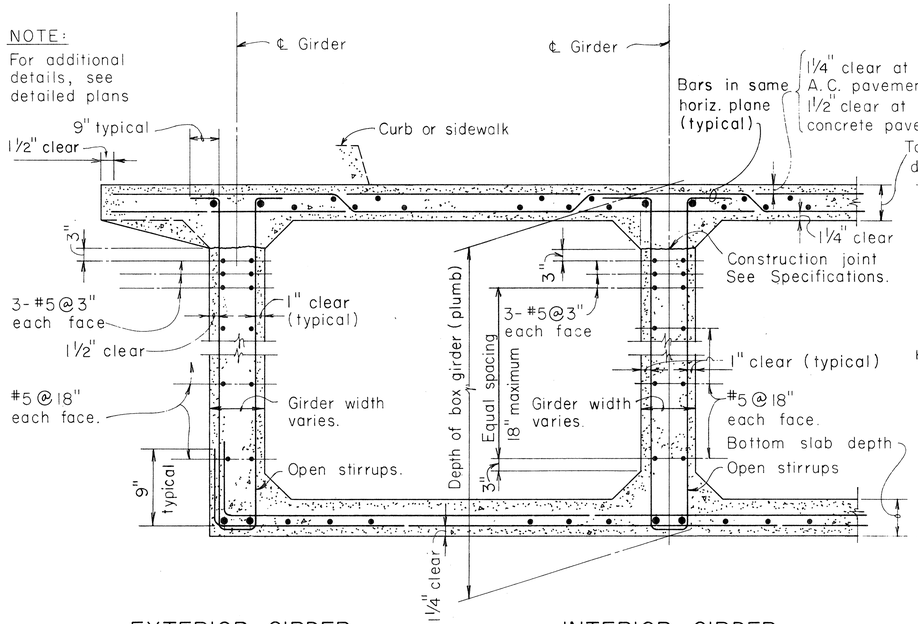
SHEET No. 5-57 OF 63 SHEETS DB-101-1

216

ORIGINAL PLAN | SURVEY PLOTTED BY | DRAWN BY | TRACED BY | DESIGNED BY | QUANTITIES BY | CHECKED BY | DATE | NOTE BOOK | No.

FED. ROAD DIST. NO.	STATE	FED. AID PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
HAWAII	HAW.	F-078-1(21)	1980	217	234

NOTE:
For additional details, see detailed plans

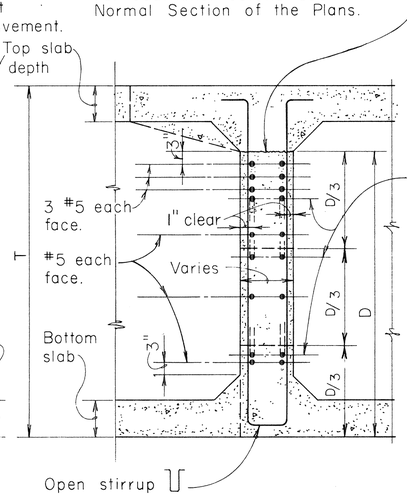


EXTERIOR GIRDER

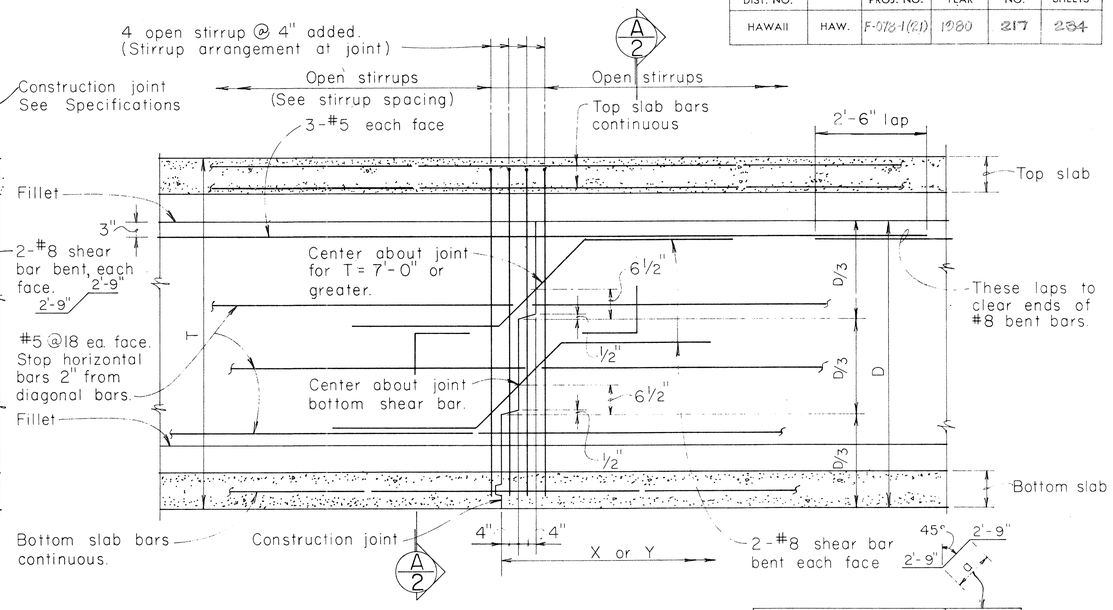
INTERIOR GIRDER

TYPICAL NORMAL BOX GIRDER SECTION

NOTE:
D = Depth of girder stem to bottom of slab.
For additional details see Normal Section of the Plans.

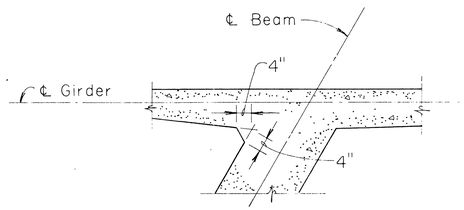


SECTION (A/2)

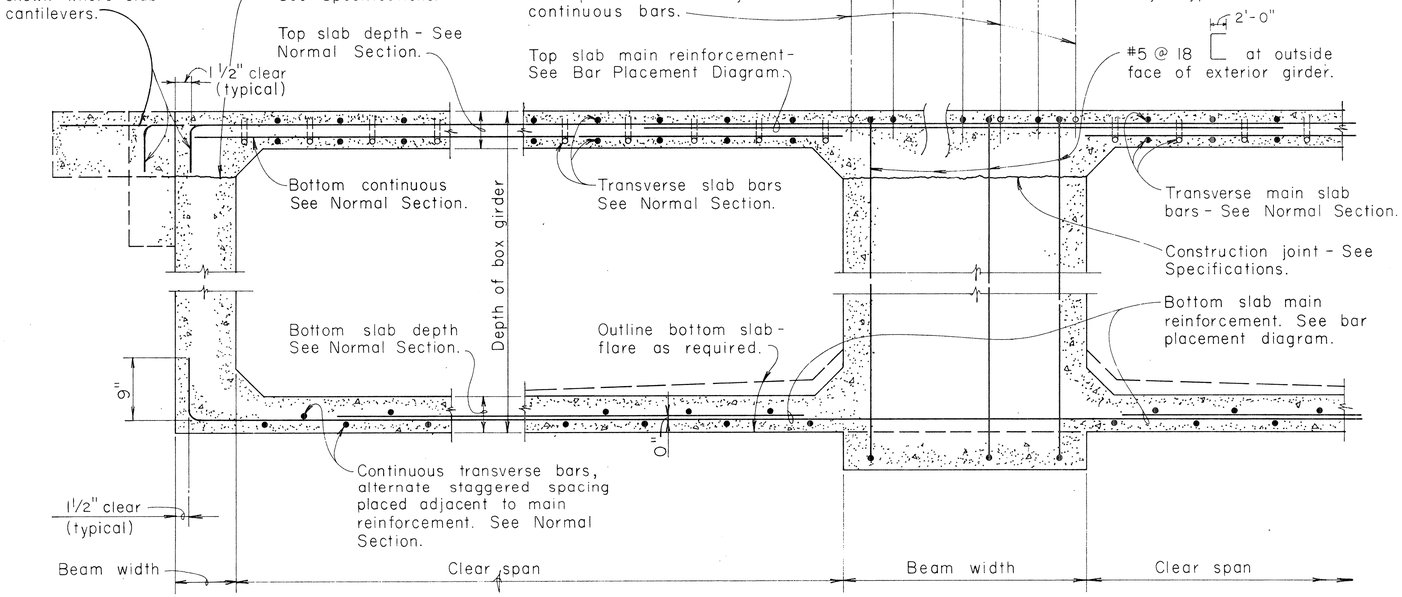


Depth T	a
4'-11" and smaller	1'-9"
5'-0" to 5'-11"	2'-0"
6'-0" to 6'-11"	2'-3"
7'-0" and greater	3'-0"

GIRDER STEM CONSTRUCTION JOINT



TYPICAL DETAIL OF VERTICAL CHAMFER AT ACUTE INTERSECTION OF SKEWED CONCRETE MEMBER



AT NON-CONTINUOUS END

AT CONTINUOUS SUPPORT

TYPICAL LONGITUDINAL DECK SECTION ALONG GIRDER AT NORMAL OR RADIAL SUPPORTS

ORIGINAL PLAN
SURVEY PLOTTED BY
DRAWN BY
TRACED BY
DESIGNED BY
NOTE BOOK
QUANTITIES BY
CHECKED BY
DATE
No.

APPROVAL RECOMMENDED:
Clarence K. Yamamoto — 6-1-76
BRIDGE DESIGN ENGINEER — DATE

APPROVED
Herbert D. Terrell — 6-2-76
ASSISTANT CHIEF, ENGINEERING — DATE

NO.	REVISION	APPROVED BY	DATE

STATE OF HAWAII
DEPARTMENT OF TRANSPORTATION
HIGHWAYS DIVISION

STANDARD DETAILS

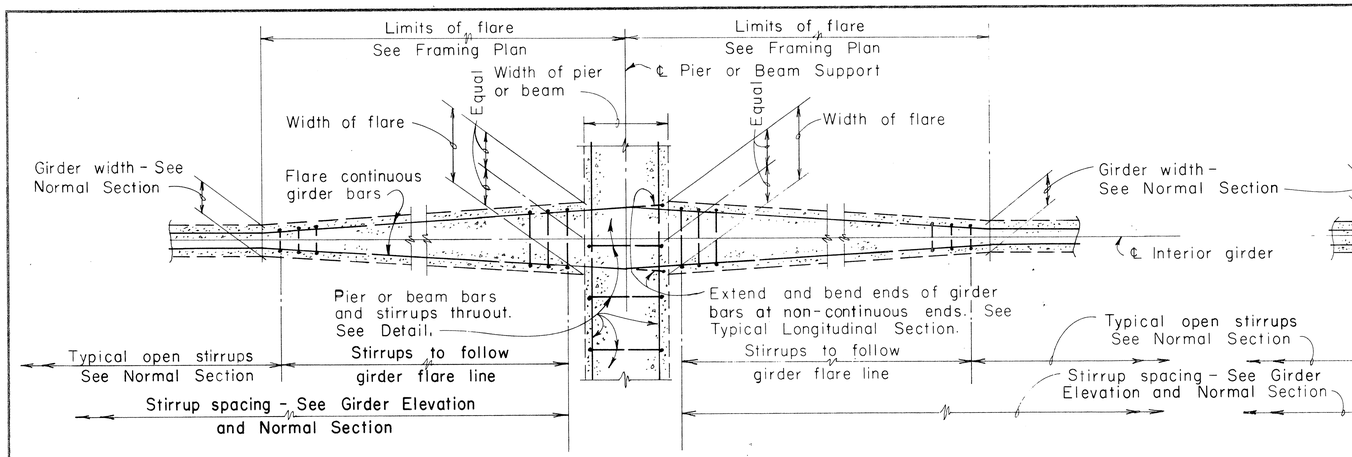
CONCRETE BOX GIRDER

Not To Scale — Date: May 1976

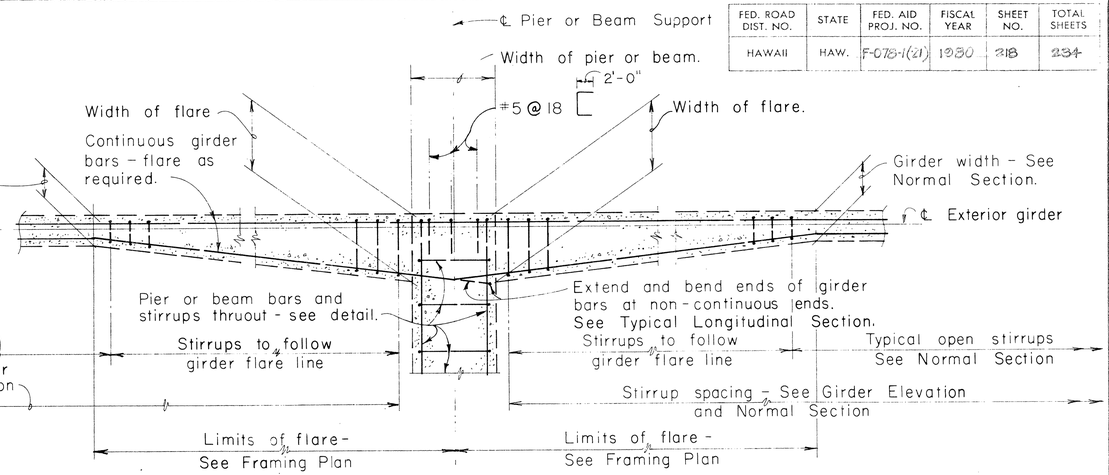
SHEET No. 58 OF 63 SHEETS DB-101-2

217

FED. ROAD DIST. NO.	STATE	FED. AID PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
HAWAII	HAW.	F-078-1(21)	1980	318	234

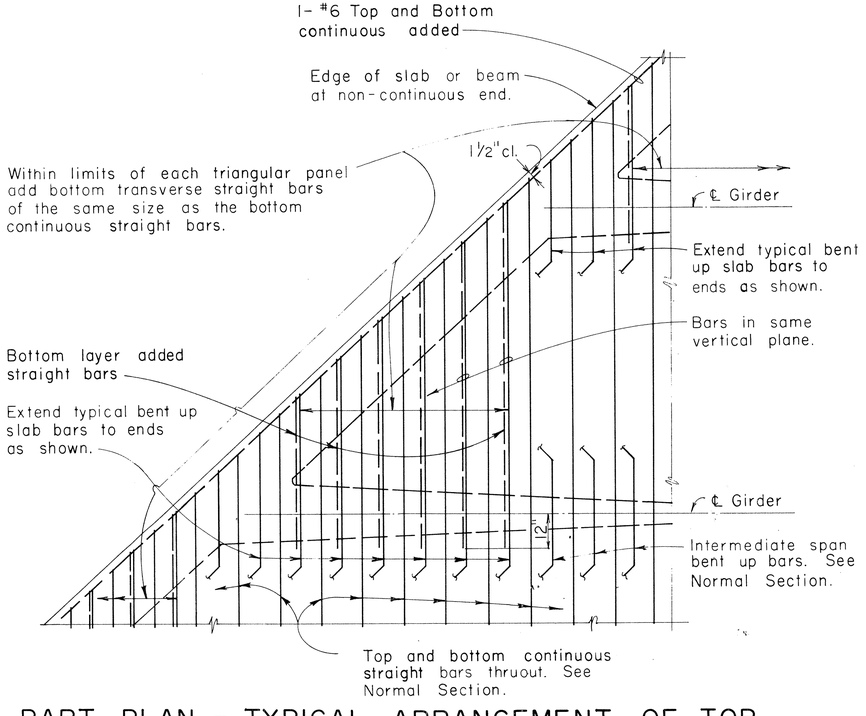


INTERIOR GIRDER

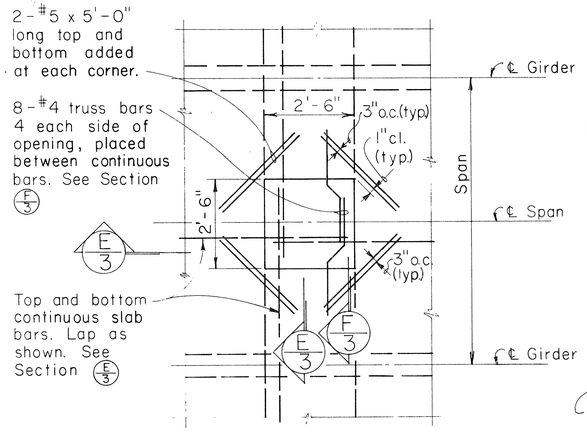


EXTERIOR GIRDER

TYPICAL DETAILS OF GIRDER FLARE AT NORMAL OR RADIAL SUPPORTS - CONTINUOUS ENDS AS SHOWN
(NON-CONTINUOUS ENDS SIMILAR EXCEPT AS OTHERWISE NOTED)



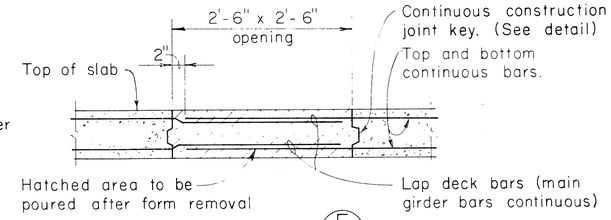
PART PLAN - TYPICAL ARRANGEMENT OF TOP SLAB REINFORCEMENT AT SKEWED ENDS



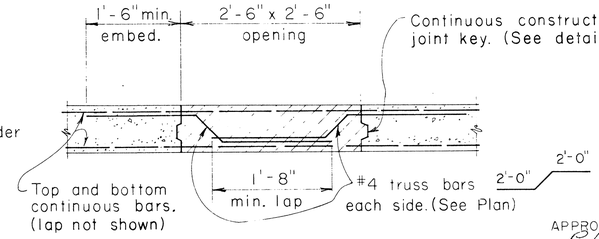
NOTES

1. Final location of opening shall be determined by the Engineer.
2. Form removal opening at top slab shall not be located where main girder bars occur.
3. Form removal opening may extend from edge of deck.

PART PLAN - DECK SHOWING FORM REMOVAL OPENING



SECTION E/3



SECTION F/3

APPROVAL RECOMMENDED
Clarence K. Yamamoto — 6-1-76
BRIDGE DESIGN ENGINEER — DATE

APPROVED
Herbert Richards — 6-3-76
ASSISTANT CHIEF, ENGINEERING — DATE

NO.	REVISION	APPROVED BY	DATE

STATE OF HAWAII
DEPARTMENT OF TRANSPORTATION
HIGHWAYS DIVISION

STANDARD DETAILS
CONCRETE BOX GIRDER

Not To Scale: Date: May 1976

SHEET No. 3-58 OF 63 SHEETS DB-101-3

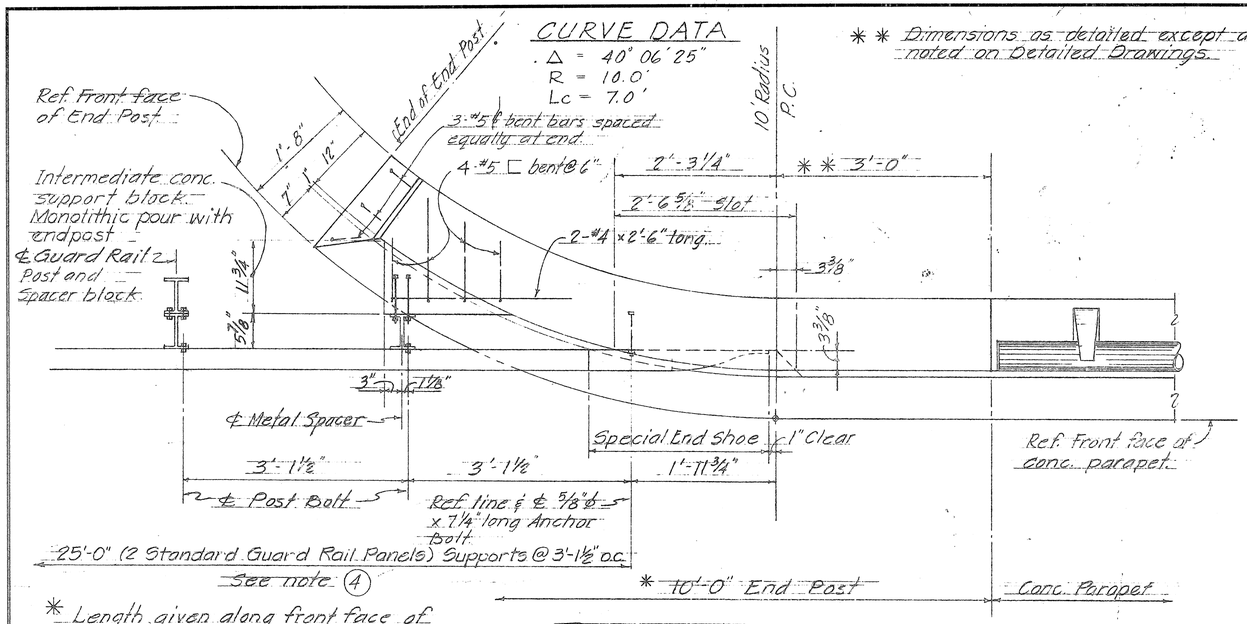
ORIGINAL PLANS
SURVEY PLOTTED BY — DATE
DRAWN BY "
TRACED BY "
DESIGNED BY "
QUANTITIES BY "
NOTE BOOK CHECKED BY "
No.

FED. ROAD DIST. NO.	STATE	FED. AID PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
HAWAII	HAW.	[illegible]	1971	213	221

CURVE DATA

$\Delta = 40^\circ 06' 25''$
R = 10.0'
Lc = 7.0'

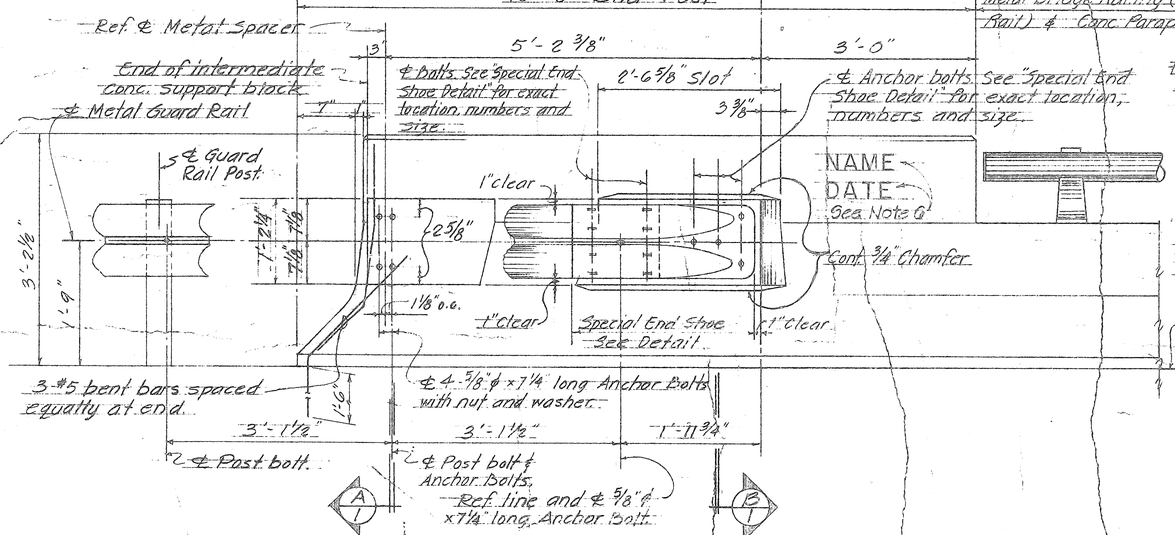
** Dimensions as detailed except as otherwise noted on Detailed Drawings.



PLAN

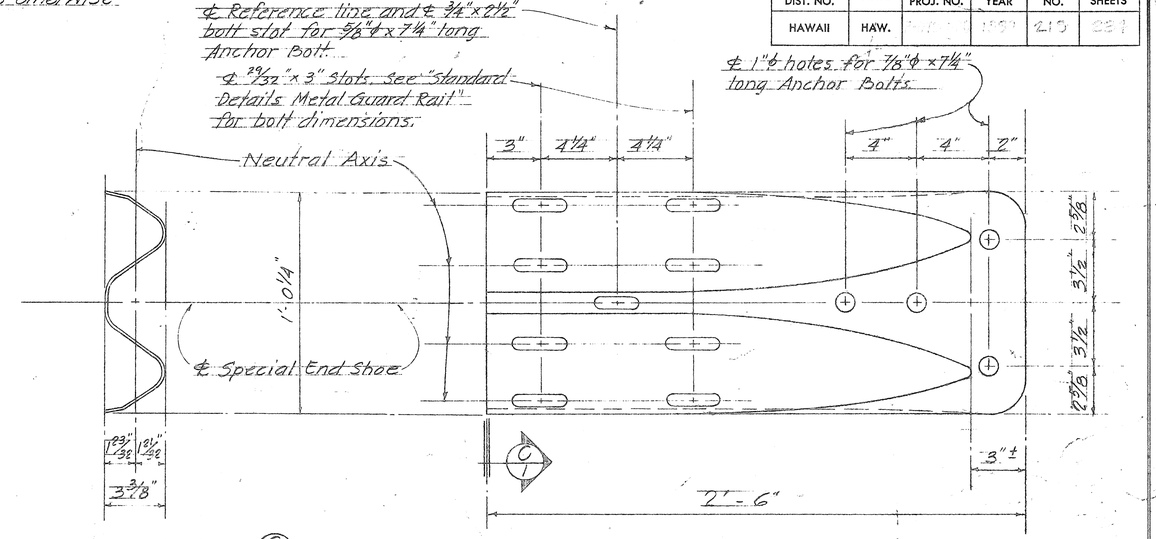
Scale: 1" = 1'-0"

* Length given along front face of parapet and end post.



ELEVATION

Scale: 1" = 1'-0"

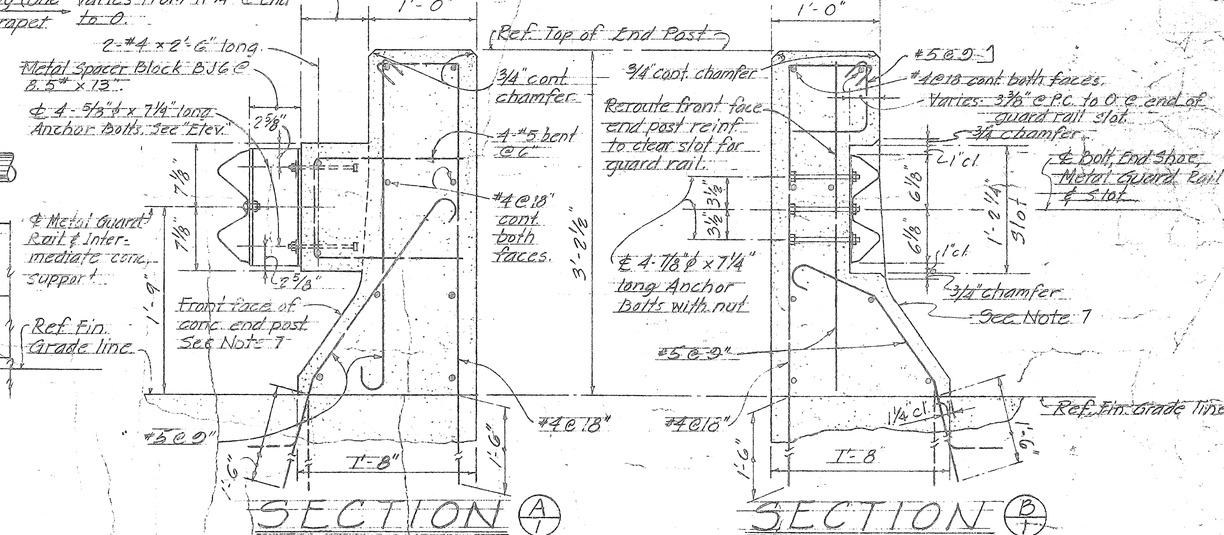


SECTION C/1

ELEVATION

SPECIAL END SHOE DETAILS

Scale: 3" = 1'-0"



SECTION A/1

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

SECTION B/1

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

NOTES:

1. All Anchor Bolts shall be High Strength bolts conforming to the requirements of ASTM A325.
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 AASHO 180.
4. First 25'-0" of guard rail adjoining "Special End Shoe" shall be galvanized steel.
5. Anchor Bolt length given from under bolt head.
6. Place name of structure as shown. For location, see "Plan" on Contract Drawing. Date shown will be year structure is completed. Letter size and detail see standard Drawing DB-100.
7. Front face of End Post to match front face of typical conc. parapet.

NO.	REVISION	APPROVED BY	DATE
1	Note 4 revised, 3'-1 1/2" post spacing extended to 25'-0" Note 6.7 added.	[illegible]	[illegible]

APPROVAL RECOMMENDED: Paul T. Yamashita, BRIDGE DESIGN ENGINEER — 1-23-70 DATE

APPROVED: Paul T. Yamashita, for ASSISTANT CHIEF, ENGINEERING — 1-24-70 DATE

STATE OF HAWAII
DEPARTMENT OF TRANSPORTATION
HIGHWAYS DIVISION

STANDARD DETAILS

METAL GUARD RAIL CONNECTION
ONE RAIL COMBINATION TYPE END POST

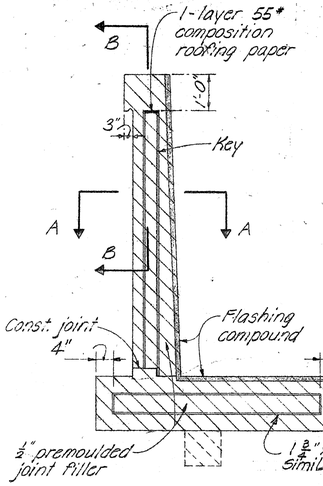
Scale: As shown Date

SHEET No. 3 OF 4 SHEETS DB-205

ORIGINAL PLAN	SURVEY PLOTTED BY	DATE
	DRAWN BY	"
NOTE BOOK	TRACED BY	"
	DESIGNED BY	"
No.	QUANTITIES BY	"
	CHECKED BY	"

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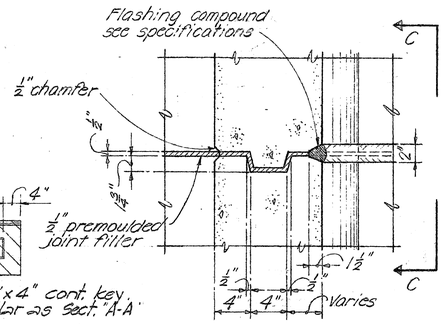
FED. ROAD DIST. NO.	STATE	FED. AID PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
HAWAII	HAW.	F-078-1(11)	1980	220	234



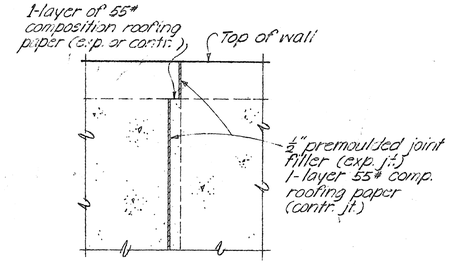
JOINT ELEVATION

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

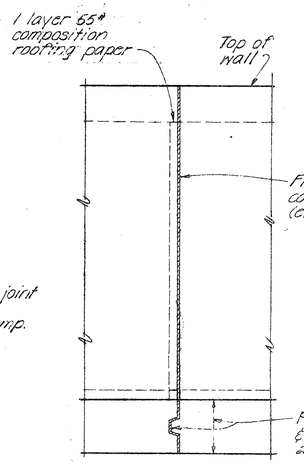
For alternate contraction joint and control joint details - See Standard Details. Sht #DB-100



SECTION A-A

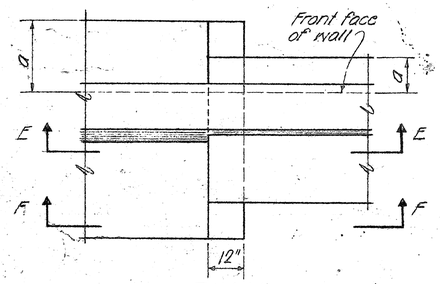


SECTION B-B

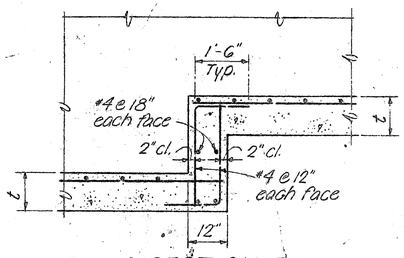


SECTION C-C

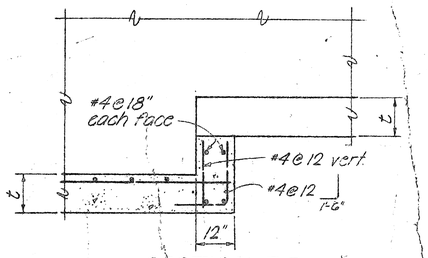
TYPICAL EXPANSION JOINT DETAILS No Scale



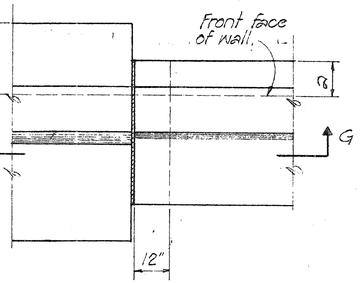
PLAN



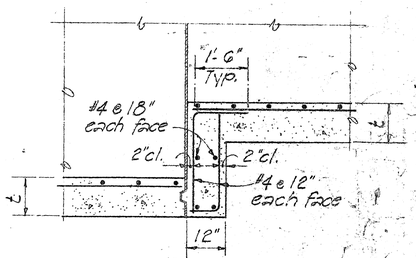
SECTION E-E
AT CONTINUOUS FOOTING



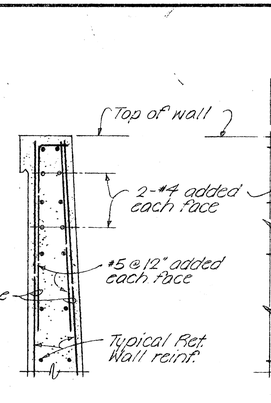
SECTION F-F



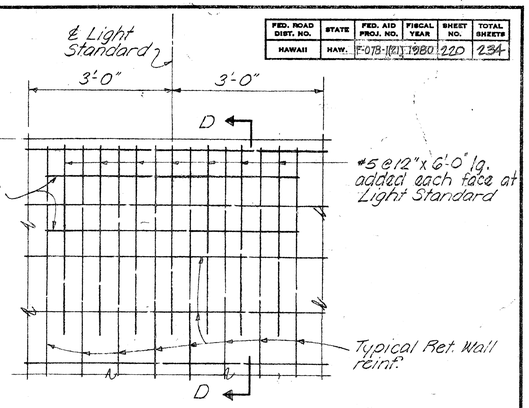
PLAN
AT EXPANSION JOINT



SECTION G-G



SECTION D-D

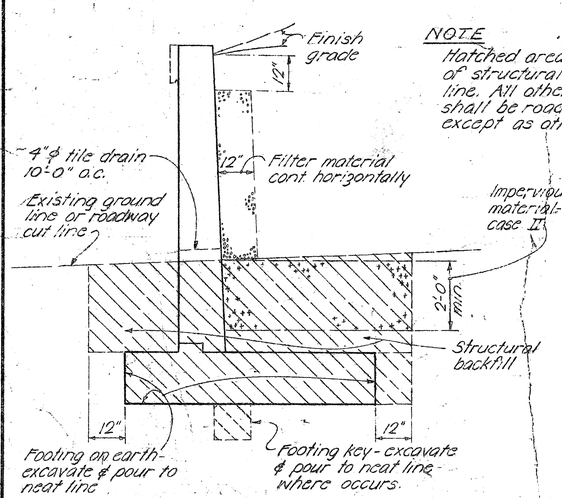


ELEVATION

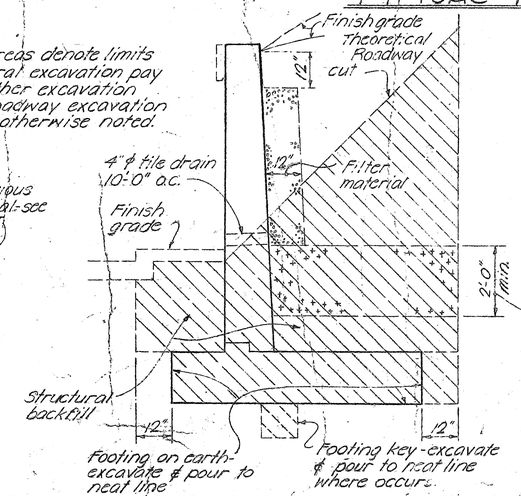
TYPICAL ADDED REINFORCEMENT
AT LIGHT STANDARD BASE No Scale

TYPICAL FOOTING STEP-UP 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 I



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.

STRUCTURAL EXCAVATION & DRAINAGE DETAILS No Scale

APPROVAL RECOMMENDED:
Paul T. Yamashita 1-23-70
BRIDGE DESIGN ENGINEER DATE

APPROVED
Paul T. Yamashita 1-24-70
For ASSISTANT CHIEF, ENGINEERING DATE

NO	REVISION	APPROVED BY	DATE
⚠1	Change note: spacing of joints.	H.F.	9.4.72

STATE OF HAWAII
DEPARTMENT OF TRANSPORTATION
HIGHWAYS DIVISION

STANDARD DETAILS
RETAINING WALL TYPE T-1

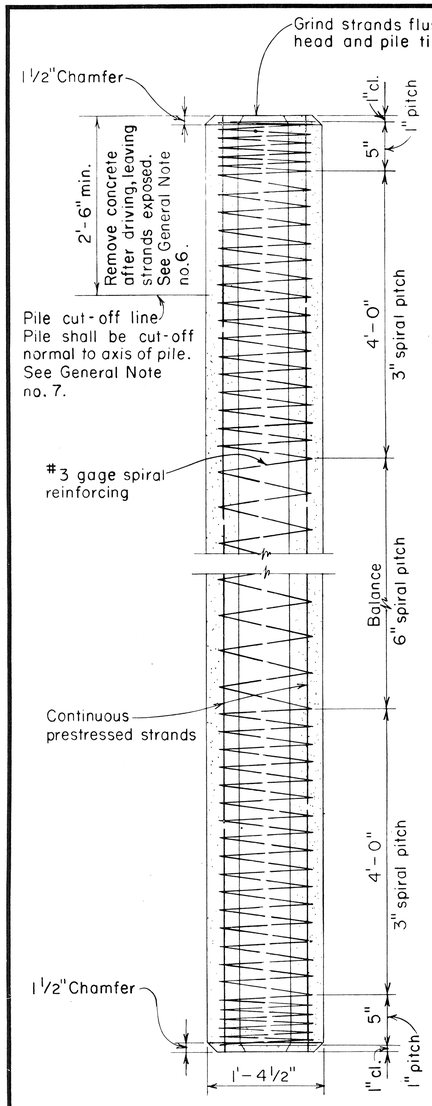
SCALE AS NOTED DATE

SHEET No. S-61 OF 63 SHEETS DB-207-2

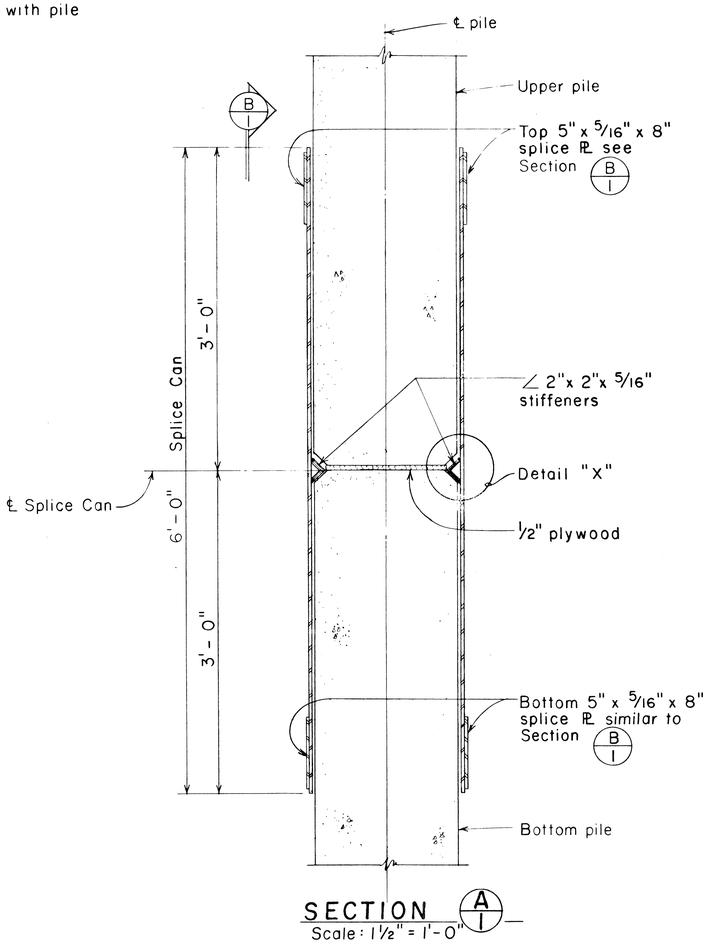
ORIGINAL PLAN	SURVEY PLOTTED BY	DATE
	DRAWN BY	
	TRACED BY	
NOTE BOOK	DESIGNED BY	
	QUANTITIES BY	
No.	CHECKED BY	

PRINTED ON NO. 1000R CLEARPRINT

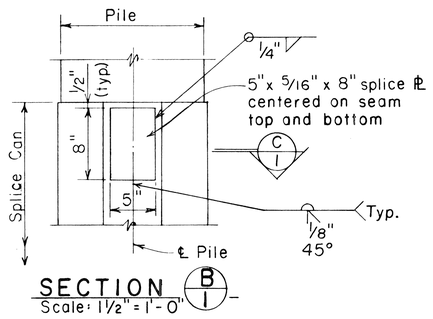
FED. ROAD DIST. NO.	STATE	FED. AID PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
HAWAII	HAW.	F-078-1(21)	1980	221	234



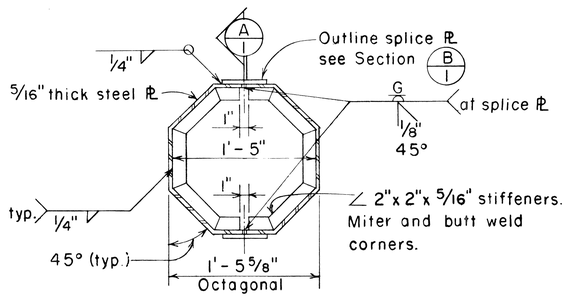
ELEVATION



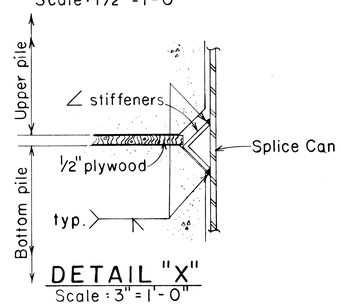
SECTION A/1
Scale: 1 1/2" = 1'-0"



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

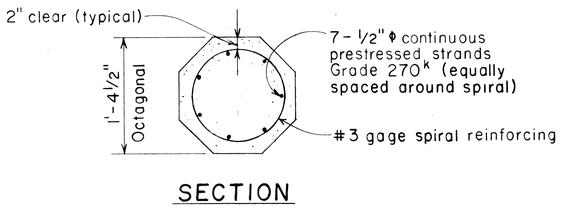


SECTION C/1
Scale: 1 1/2" = 1'-0"



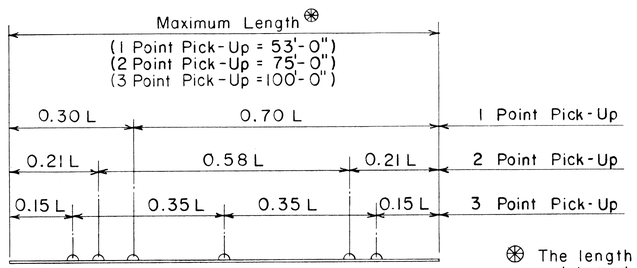
DETAIL "X"
Scale: 3" = 1'-0"

TYPICAL PILE SPLICE DETAILS



SECTION

TYPICAL PILE DETAILS
(Not to scale)



⊛ The length "L" is the distance end to end of pile.

PILE PICK-UP POINTS
Not to scale

GENERAL NOTES

1. Concrete strengths:
   a. Typical pile: 28 day compressive strength f'_c = 5000 psi.
   b. Pile build-up with driving: 28 day compressive strength f'_c = 5000 psi.
   c. Pile build-up without driving: Identical 28 day f'_c as footing or pile cap.
2. Reinforcing steel shall conform to the following ASTM specifications:
   a. Bar reinforcement: ASTM A615 Grade 40
   b. Spiral reinforcement: ASTM A82
   c. Prestressing strand: ASTM A416 Grade 270
3. Splice can:
   a. Structural steel shall conform to ASTM A36
   b. All welding shall meet the requirements of Section 501 of the Standard Specification.
   c. No measurement for payment shall be made for the splice can as it shall be considered incidental to the driving of the pile.
4. The minimum working force in the prestressing steel shall be 165 kips.
5. Piles accepted by the Engineer shall be of sound concrete. Damaged piles shall be replaced or repaired by the Contractor at his expense as directed by the Engineer.
6. Work of cutting off prestress concrete piles or concrete pile build-ups shall be performed in such a manner as to avoid spalling or damaging the pile below cut-off. Damaged portions shall be removed and pile cut-off elevation lowered as required by the Engineer.
7. Top of pile at cut-off line shall be prepared as required for construction joints in Section 503 of the Standard Specifications.
8. Pile splice shall not be permitted except for pile length in excess of 100 feet unless otherwise approved by Engineer.
9. The in-place length of pile above the splice shall be approximately 50% of the total length of pile driven, unless location of splice is indicated in the plans or specifications.
10. Build-ups may be driven after the concrete attains a compressive strength of 4000 psi., but not earlier than 7 days after the concrete is poured.

APPROVAL RECOMMENDED:
Clarence M. Yamamoto — 8-13-80
BRIDGE DESIGN ENGINEER — DATE

APPROVED:
ASSISTANT CHIEF, ENGINEERING — DATE

NO.	REVISION	APPROVED BY	DATE

STATE OF HAWAII
DEPARTMENT OF TRANSPORTATION
HIGHWAYS DIVISION

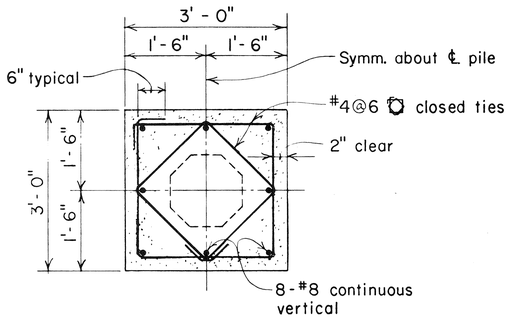
STANDARD DETAILS
PRESTRESSED CONCRETE PILES

Scale: As Noted — Date: August 1980

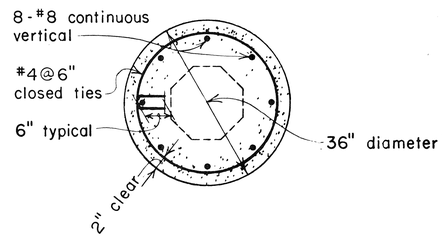
SHEET NO. 5-62 OF 63 SHEETS DB-300-1

ORIGINAL PLAN	SURVEY PLOTTED BY	DATE:
	DRAWN BY	
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NOTE BOOK	DESIGNED BY	
	QUANTITIES BY	
No.	CHECKED BY	

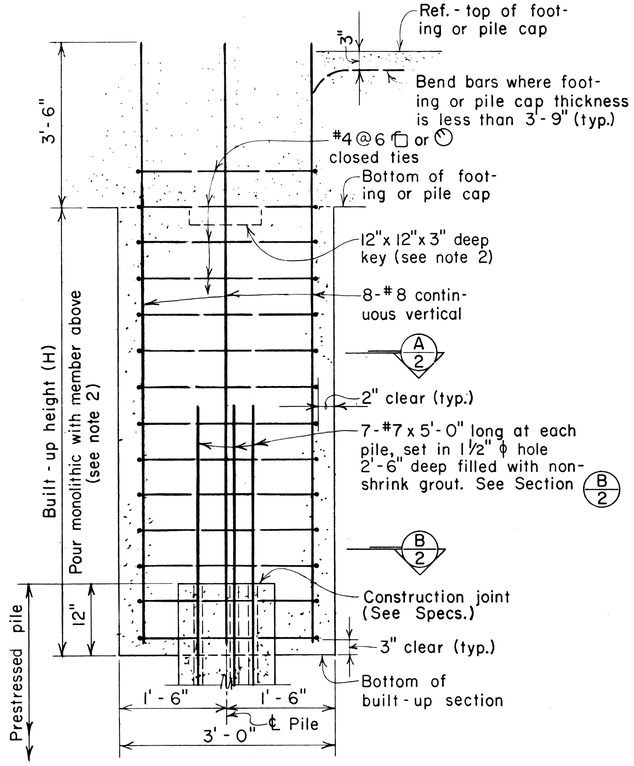
FED. ROAD DIST. NO.	STATE	FED. AID PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
HAWAII	HAW.	F-078-1(21)	1980	222	234



SQUARE BUILD - UP

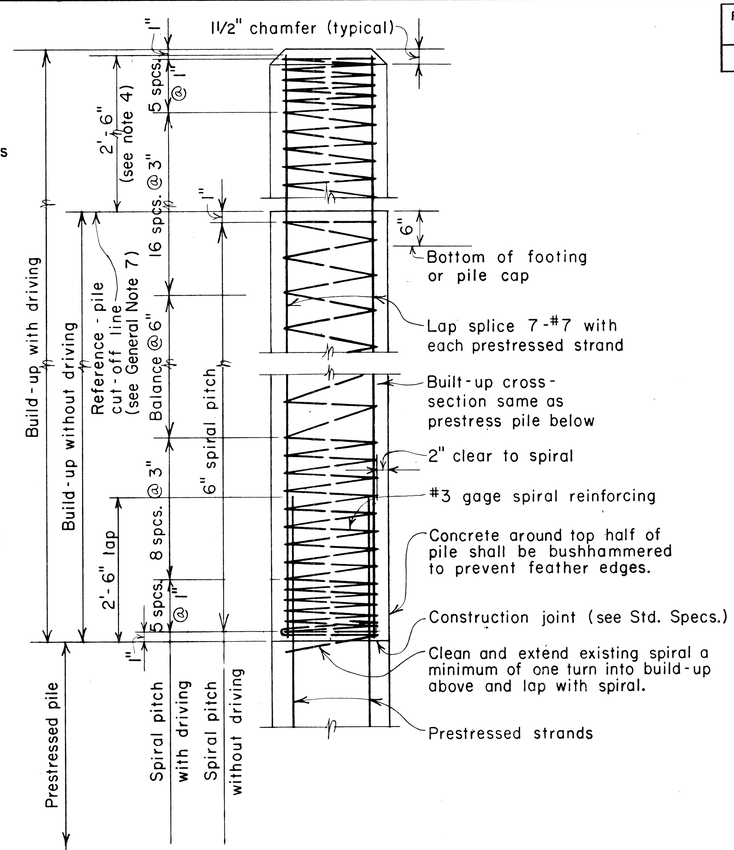


CIRCULAR BUILD - UP



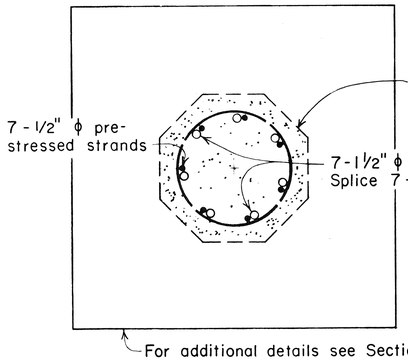
ALTERNATE PILE BUILD-UP DETAIL

Not to scale



TYPICAL PILE BUILD-UP DETAIL

Not to scale



SECTION B/2

Scale : 1½" = 1'- 0"

SECTION A/2

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

NOTES:

1. Selection of pile build-up type without driving to be determined by the Engineer.
2. When the built-up height (H) exceeds 4'-0", the built-up section shall be poured separately from the main body of the footing or pile cap.
3. Pile build-ups may be omitted for pile heads embedded at least 4" into footing, provided at least 90% of the pile in each footing have the minimum embedment into footing as shown in contract plans and #7 bars are spliced to strands as shown in Section B/2.
4. For built-up pile with driving, remove concrete after driving, leaving reinforcement exposed. See General Note no. 6.
5. Circular build-up section may be used only when approved by the Engineer.
6. Alternate pile build-up detail shall apply only to pile build-up without driving.

APPROVAL RECOMMENDED:

Clarence K. Yamamoto 8-13-80

BRIDGE DESIGN ENGINEER — DATE

APPROVED:

ASSISTANT CHIEF, ENGINEERING — DATE

NO.	REVISION	APPROVED BY	DATE

STATE OF HAWAII
DEPARTMENT OF TRANSPORTATION
HIGHWAYS DIVISION

STANDARD DETAILS
PRESTRESSED CONCRETE PILES

Scale : As Noted Date : August 1980

SHEET NO. 5-63 OF 63 SHEETS DB-300-2

222

ORIGINAL PLAN
NOTE BOOK
No.
SURVEY PLOTTED BY
DRAWN BY
TRACED BY
DESIGNED BY
QUANTITIES BY
CHECKED BY
DATE