

FED. ROAD DIST. NO.	STATE	FED. AID PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
HAWAII	HAW.	F-051-1(4)	1984	41	65

ESTIMATED QUANTITIES

ITEM NO.	ITEM	UNIT	QUANTITY
206,5000	STRUCTURE EXCAVATION FOR RETAINING WALLS.	C.Y.	800
206,6100	STRUCTURE EXCAVATION FOR HANAMAULU VIADUCT.	C.Y.	5845
206,7000	STRUCTURE BACKFILL.	C.Y.	175
206,8000	FILTER MATERIAL.	C.Y.	60
503,1050	CONCRETE IN RETAINING WALLS.	L.S.	(79 C.Y.)
503,1051	CONCRETE IN RETAINING WALL FOOTINGS.	L.S.	(201 C.Y.)
503,1600	CONCRETE IN HANAMAULU VIADUCT.	L.S.	(1005 C.Y.)
503,1610	CONCRETE IN FOOTINGS FOR HANAMAULU VIADUCT.	L.S.	(1440 C.Y.)
504,8510	POST-TENSIONING OPERATION FOR HANAMAULU VIADUCT.	NIC	L.S. (293080 Lbs)
505,0001	PILE DRIVING EQUIPMENT EXPENSE.	L.S.	(Not to exceed \$8000.00.)
505,0020	TEST PILES, DRIVEN.	L.F.	1240
505,0300	PRECAST, PRESTRESSED CONCRETE PILES, FURNISHED.	L.F.	20811
505,3000	PRECAST, PRESTRESSED CONCRETE PILES, DRIVEN.	L.F.	18495
505,6000	PREDRILLED HOLES FOR PRECAST CONCRETE PILES.	L.F.	1073
506,0300	P.T.F.E. AND STAINLESS STEEL BEARING AND EXPANSION PLATES IN HANAMAULU VIADUCT.	S.F.	150
507,3600	METAL RAILING	L.F.	2404
507,6000	CONCRETE RAILING AND END POST.	L.F.	2444
511,0100	DECK EXPANSION JOINT.	L.F.	170
602,0050	REINFORCING STEEL IN RETAINING WALLS.	L.S.	(24614 Lbs)
602,0051	REINFORCING STEEL IN RETAINING WALL FOOTINGS.	L.S.	(19862 Lbs)
602,0600	REINFORCING STEEL IN HANAMAULU VIADUCT.	L.S.	(612850 Lbs)
602,0610	REINFORCING STEEL IN FOOTINGS.	L.S.	165383 Lbs.
611,0100	HAND LAID RIP RAP	C.Y.	415

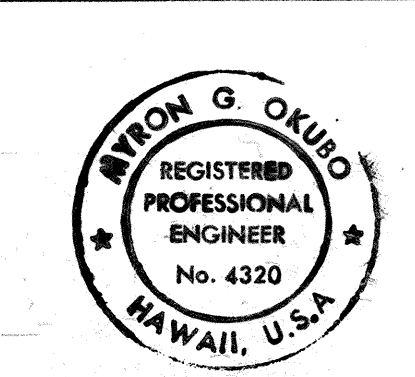
INDEX TO DRAWINGS

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S-3	BRIDGE ELEVATION.
S-4	BRIDGE FOUNDATION PLAN AND BORING LOCATION.
S-5	CONCRETE TYPE LIMIT.
S-6	LIHUE AND KAPAA ABUTMENTS PLAN AND ELEVATION.
S-7	ABUTMENT PLANS, SECTIONS AND DETAILS.
S-8	ABUTMENT SECTIONS.
S-9	ABUTMENT ELEVATIONS AND SECTIONS.
S-10	LIHUE AND KAPAA ABUTMENTS, ELEVATIONS, BEARING SEATS.
S-11	ABUTMENT BEARING DETAILS. NIC
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S-27	HINGE - SECTIONS AND DETAILS.
S-28	HINGE - SECTIONS AND DETAILS.
S-29	HINGE - SECTIONS AND DETAILS.
S-30	HINGE - SECTIONS AND DETAILS.
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PHASE #2 SUPERSTRUCTURE NIC.	

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

NIC



THIS WORK WAS PREPARED BY ME OR UNDER MY SUPERVISION.
Mypsa Okubo
Signature

1-25-85	Revised Quantities for Item No. 602.0600 Per C.O. No. 1.
12-31-84	Revised Quantities for Item Nos 206,5000, 206,8000, 602.0600, & 611.0100 Per Addendum No. 1.
DATE	REVISION
STATE OF HAWAII DEPARTMENT OF TRANSPORTATION LAND TRANSPORTATION FACILITIES DIVISION INDEX TO DRAWINGS & ESTIMATED QUANTITIES HANAMAULU VIADUCT HANAMAULU-AHUKINI CUTOFF ROAD Ahukini Road to Kauai Hardwoods PROJECT NO. F-051-1(4)	
SCALE: NONE DATE: SEPT., 1984 SHEET NO. 5-1 OF 541 SHEETS	

C.O. ADD. 41

GENERAL NOTES

DESIGN SPECIFICATIONS

AASHTO Standard Specifications for Highway Bridges 12th Edition. (1977) with Interim Specifications Bridges (1978 and 1980, 1981, 1982) And Standard Specifications for Road and Bridge Construction (Hawaii 1976) and Special Provisions.

DESIGN LOADS

Live load HS 20-44 Seismic Coefficient $C=0.04$
Concrete normal weight 160 pcf. Thermal rise of 10°F. Fall of 20°F
Weight of 1 1/2" Future A.C. wearing surface included in design.

DESIGN STRESSES

- Reinforcing Steel:
Grade 60 $f_y = 60,000$ psi $f_s = 24,000$ psi.
Grade 40 $f_y = 40,000$ psi $f_s = 20,000$ psi.
- Concrete:
Class A $f'_c = 3,000$ psi $f_c = 1200$ psi
4500 psi $f'_c = 4,500$ psi $f_c = 1800$ psi.

MATERIALS:

- All concrete shall be Class "A" except as follows:
a) Pier Shafts, Pier Footings ----- $f'_c = 4500$ psi @ 28 days.
b) Prestressed Precast Piles ----- $f'_c = 6500$ psi @ 28 days.
- Reinforcing Steel:
Pier Shaft Vertical and Pier Footing Reinf. shall be ASTM A615, Grade 60.
Other: ASTM A615 Grade 40.
- Prestressing Steel: 1/2" 7 wire stress relieved strands $f_s = 270$ ksi, conforming to ASTM A416.
- Steel shapes and plates shall be ASTM A36 unless otherwise shown. All exposed steel shall be galvanized after fabrication. Shop drawings shall be submitted for all Structural Steel work.

CONSTRUCTION METHODS

- See Standard Specifications for Road and Bridge Construction (Hawaii 1976) and Special Provisions.
- Footings for Piers 1 and 6 shall be excavated and poured neat against undisturbed ground. In the event of over excavation, the space between footing and ground shall be filled with concrete at the Contractor's expense, and as directed by the Engineer. The concrete fill shall be a minimum quality of Class "D".
- Except as noted otherwise all vertical dimensions are measured plumb.
- The following cover requirements for reinforcing steel shall be observed unless noted otherwise.
a) Piers ----- 3" to ties.
b) Retaining walls and abutments ----- 2"
c) Concrete cast against and exposed to earth ----- 3"
d) Piles ----- 2" to spiral.
- All reinforcing steel shall be securely tied at intersections and splice locations, so as to maintain proper location during placement of concrete.
- The Contractor shall verify the location of any existing utility lines before commencing work.
- The Contractor shall be responsible for the methods of construction used and the safety of workmen during construction, including the use of falsework, bracing and temporary supports used.
- Reinforcing Steel which extend into Phase #2 Superstructure portions of work and will be exposed to the elements shall be wrapped with burlap then coated with asphalt, as directed by the Engineer. Labor and materials required to protect exposed reinforcing steel shall be considered incidental to Reinforcing Steel in Retaining Walls or Reinforcing Steel in Hanamaulu Viaduct.

FOUNDATION NOTES:

- A report titled "Structural Foundation Report on Hanamaulu Stream Bridge" dated August 1981 has been prepared by the Department of Transportation, Highways Division, Material Testing and Research Branch, Geotechnical Engineering Section. A copy of this report is available for review at the Department of Transportation.
- Index test piles shall be driven at each abutment footing and at footings for Piers #2, #3 and #4 as indicated on the plans. The location of test piles is subject to relocation by the Engineer.
- Piles longer than 100' may be spliced in accordance with the details on sheet 540. Only one splice shall be used in any pile. Length of each section of pile shall be such that the splice is located within the middle third of the total pile length.
- Allowable pile capacities, excluding drag loads.
100 Tons at Abutments.
75 Tons at Piers #2, #3 and #4.
150 Tons at Pier #5
- Allowable soil bearing
8000 psf at Pier #1.
12000 psf at Pier #6.
- Test Piles shall be furnished 14 ft. longer than regular piles.

FED. ROAD DIST. NO.	STATE	FED. AID PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
HAWAII	HAW.	F-051-1(4)	1984	42	65

SYMBOLS AND ABBREVIATIONS

- Detail or section designation
Sht. no. detail or section is shown.
- Boring location and designation
- Deck drain

A	G	Q
Abt. Abutment	Grd. Ground	
Abut. Abutment	Ga. Gage.	
& and		R
@ at	H Horiz. Horizontal	Rd. Road
B		R/W. Right of way
Bal. balance	I	R.R. Rail road
Base line		Reinf. Reinforcing
Bot. Bottom		R. Radius
Brg. Bearing		Reqd. Required
C	J	Ref. Reference
C Centerline	Jt. Joint	
Cfs Cubic feet per second.		S
Clr. clear	K	Sta. Station
Cont. continue	Ksi Kips per square inch.	Sht. Sheet
Constr. construction		Symm. Symmetrical
Col. Column	L	sect. section
conc. concrete	Longit. Longitudinal	Sp. Space
C.G. Center of Gravity	L.F. Lineal Foot	Stirr. Stirrup
C.Y. Cubic yard.	L.S. Lump sum.	Sim. Similar
	M	Std. standard
	Min. Minimum	S.F. Square Foot
D	Max. Maximum	T
Det. Detail	M.S.L. Mean Sea level	Typ. Typical
Dia. Diameter		T.G. Top of grating
D.H. Drain hole		Thk. Thick
		T.S. Structural tube.
E	N	T & B Top & Bottom.
Exist. Existing	No. Number	V
El., Elev. Elevation	N.T.S. Not to scale.	Vert. Vertical
E.W. Each way	N.I.C. Not in contract	V. Vent hole
E.F. Each face		W
Ea. Each	O	Wt. with
Eq. Equal	oc. On center	Wt. Weight
Exp. Expansion.		
F	P	Y
Fin. Finish	Pl. Plate	Yrs. years
Ft. Foot	pcf = pounds per cubic foot.	
	psf = pounds per square foot.	
	psi = pounds per square inch.	

Deleted by Contract Change Order No. 7.

DATE	.....
SURVEY PLOTTED BY	.....
DESIGNED BY	.....
NOTED BY	.....
CHECKED BY	.....
ORIGINAL PLAN	.....
NOTE BOOK	.....
NO.	.....

12-31-84	Revised "Construction Methods 4) a) 2" to 3" Per Addendum No. 1.	THIS WORK WAS PREPARED BY ME OR UNDER MY SUPERVISION. <i>Myron Okubo</i> Signature	STATE OF HAWAII DEPARTMENT OF TRANSPORTATION LAND TRANSPORTATION FACILITIES DIVISION GENERAL SYMBOLS, NOTES & ABBREVIATIONS HANAMAULU VIADUCT HANAMAULU-AHUKINI CUTOFF ROAD Ahukini Road to Kauai Hardwoods PROJECT NO. F-051-1(4) SCALE: NONE DATE: SEPT. 1984 SHEET NO. 5-2 OF 5-41 SHEETS
DATE	REVISION		

ADD. 42

Bridge Name and Date of completion on face of end post. See Sht. S-36 and DB-205.
(Bridge Name to be shown. "HANAMAULU VIADUCT")

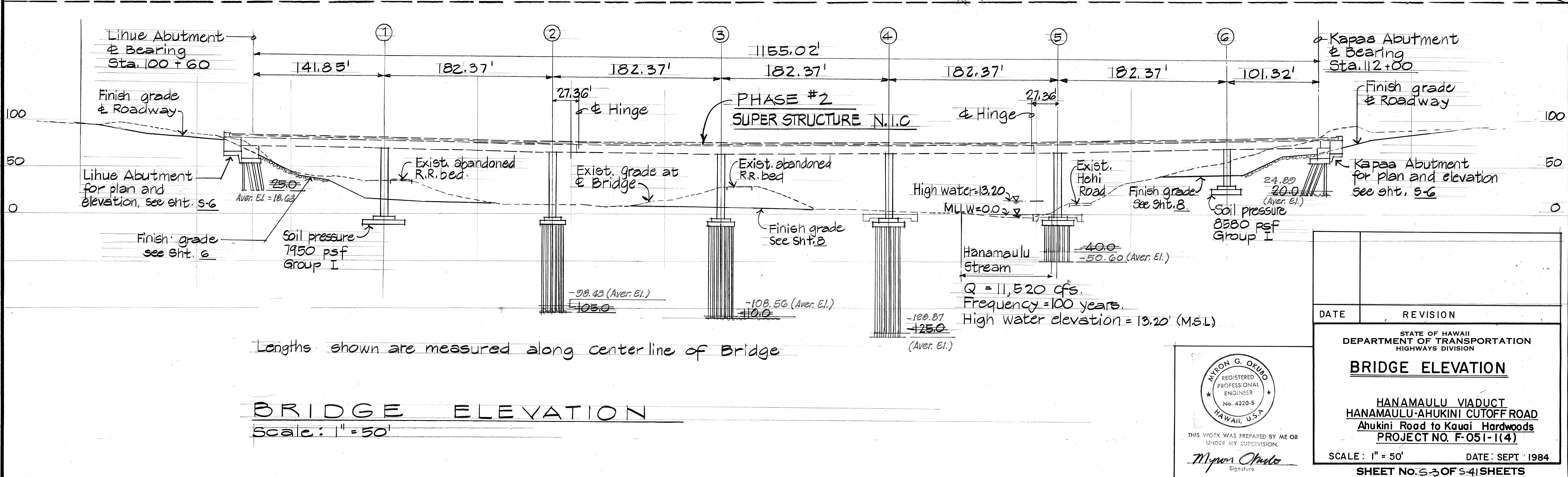
Base line Curve Data
 $A = 66^{\circ}43'00''$
 $\Delta/2 = 33^{\circ}21'30''$
 $R = 2,200'$
 $T = 1448.34'$
 $Ch = 2419.44'$
 $Lc = 2561.74'$

Stationing is measured along Baseline.

BRIDGE PLAN
 Scale: 1" = 50'
PHASE #2 SUPERSTRUCTURE, N.I.C.

FED. ROAD DIST. NO.	STATE	FED. AID PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
HAWAII	HAW.	F-051-1(4)	1984	43	65

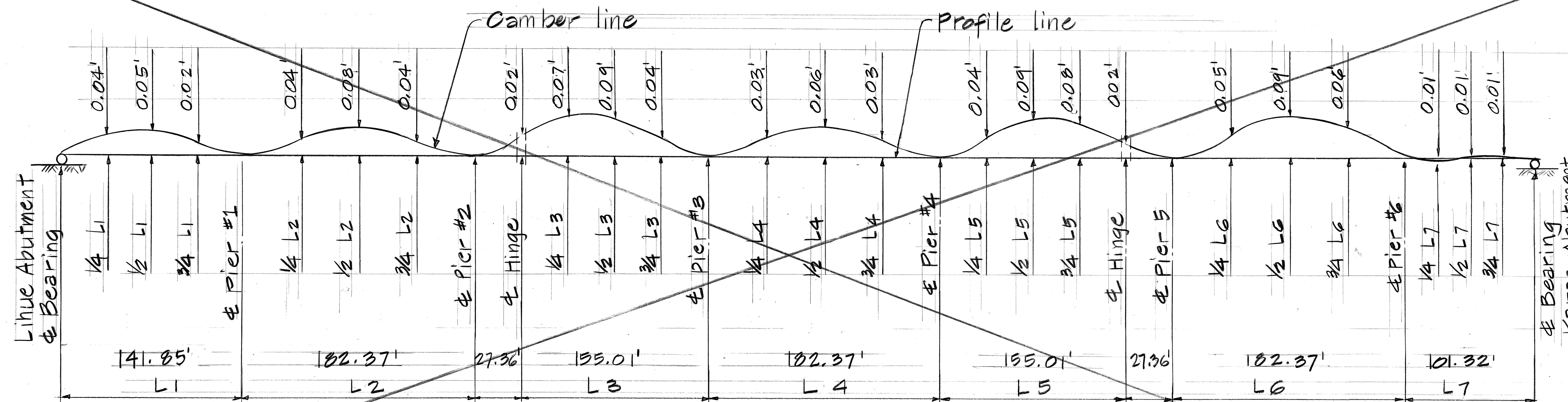
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FED. ROAD DIST. NO.	STATE	FED. AID PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
HAWAII	HAW.	F-051-1(4)	1984	45	65

CONSTRUCTION NOTES

- The superstructure shall be constructed as a continuous frame between hinges. A frame is defined as a part of the structure between hinges, or between a hinge and abutment.
- The Contractor shall submit a construction camber diagram based on his prestressing sequence for approval by the Engineer. Camber shall be checked at intermediate construction steps. Camber adjustments, methods, and supporting calculations shall be furnished by the Contractor.
- Camber diagram shown here, does not include allowance for falsework settlement. Camber diagram shown here is for initial dead load only, and does not include allowance for any other factors such as creep, shrinkage, post-tensioning, falsework settlement, etc.
- The Contractor shall take steps necessary to allow superstructure to contract during tensioning operations. During tensioning operations, the box girder soffit forms will be subject to the same compressive force as the concrete box girder unless compressible joints and/or bond breakers are provided to relieve this force.
- The Lihue and Kapaa end frames shall be constructed before the interior frame. Should the Contractor elect to post-tension the Lihue or Kapaa end frames before post-tensioning the interior frame, a force simulating the interior frame support reaction equal to 915 Kips shall be placed at the hinge bearing. The method and materials used to simulate the support reaction shall be submitted to the Engineer for approval.



Dimensions are along center line of bridge.

INITIAL DEAD LOAD CAMBER DIAGRAM

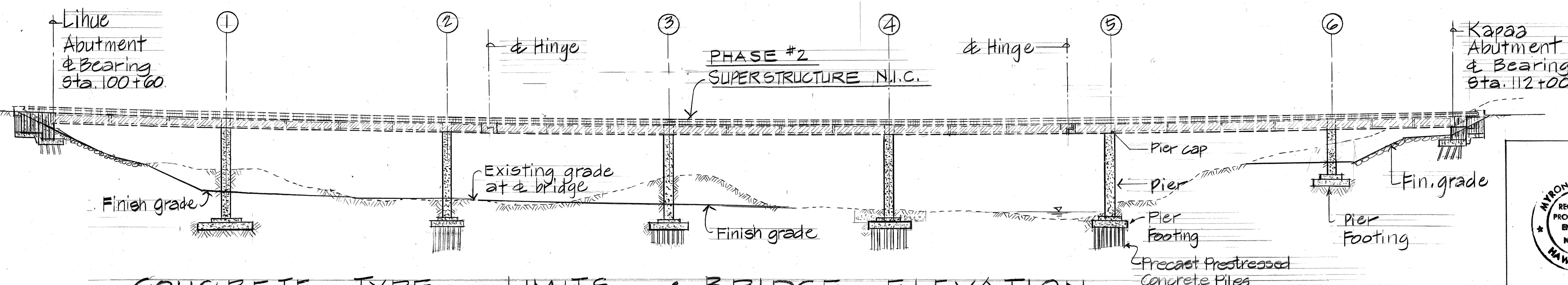
No scale.

PHASE #2
SUPERSTRUCTURE N.I.C.

CAST IN PLACE CONCRETE TYPE LOCATION (f'c @ 28 DAYS)

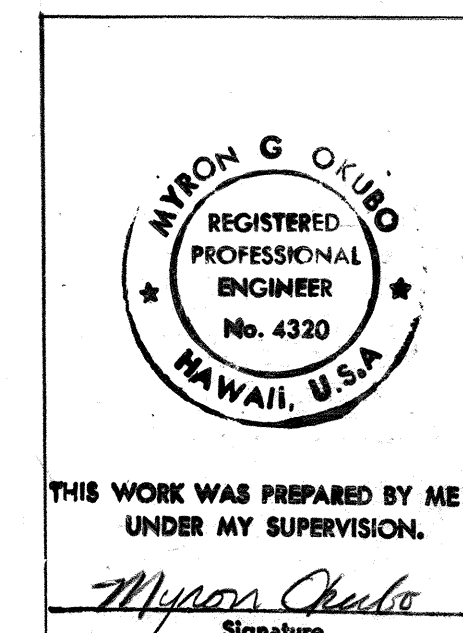
Symbol Description

- Bridge superstructure (Girders, Deck, Soffit, Pier caps, excluding N.I.C. barrier railings) f'c = 5000 psi.
- Abutments, Retaining walls and footings for abutments and retaining walls, Class 'A'.
- Pier Shafts and Pier Footings f'c = 4500 psi.



CONCRETE TYPE LIMITS BRIDGE ELEVATION

Scale: 1" = 50'



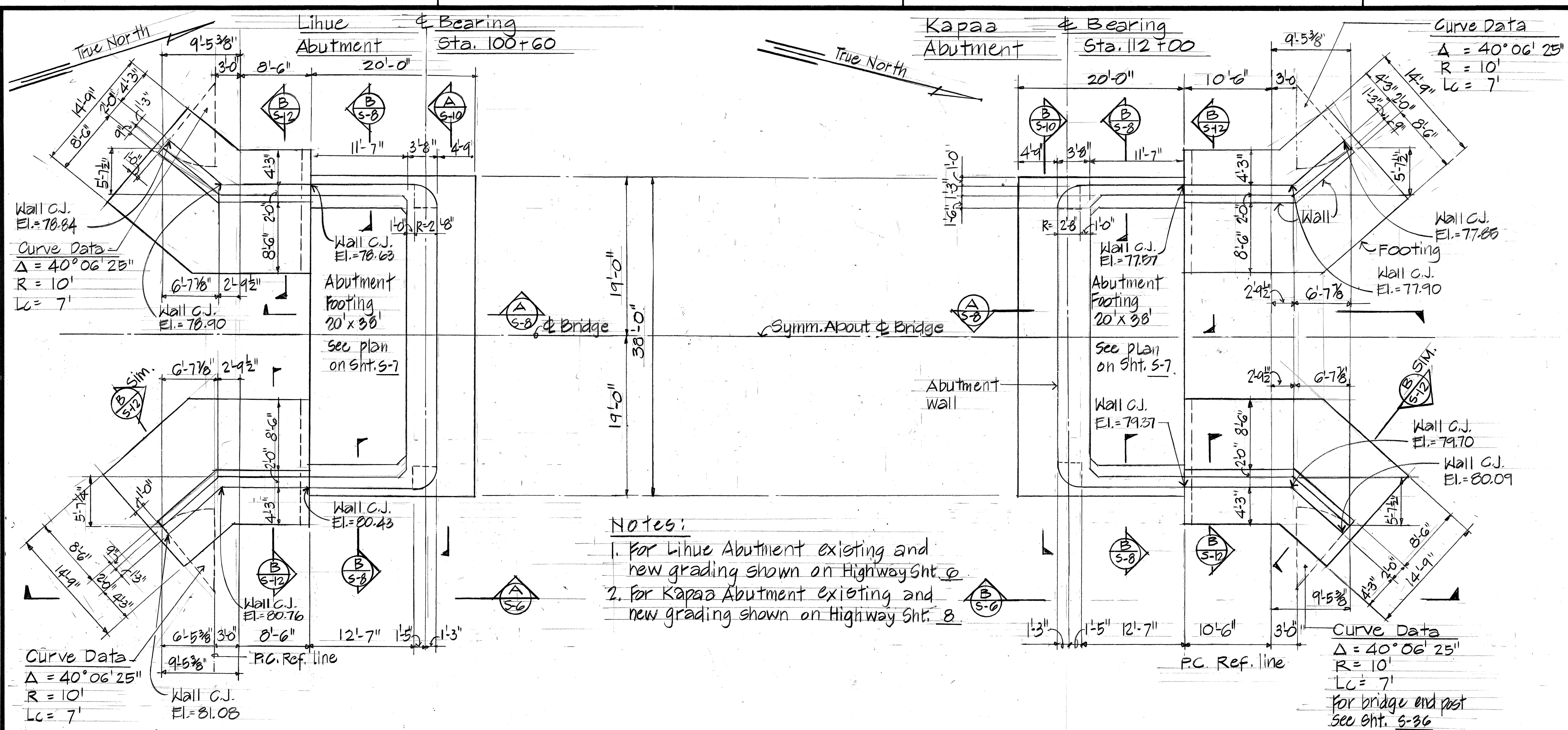
DATE	REVISION

STATE OF HAWAII
DEPARTMENT OF TRANSPORTATION
LAND TRANSPORTATION FACILITIES DIVISION
CONCRETE TYPE LIMITS

HANAMAULU VIADUCT
HANAMAULU-AHUKINI CUTOFF ROAD
Ahukini Road to Kauai Hardwoods
PROJECT NO. F-051-1(4)

SCALE: 1" = 50' DATE: SEPT. 1984
SHEET NO. 5-5 OF 5-41 SHEETS

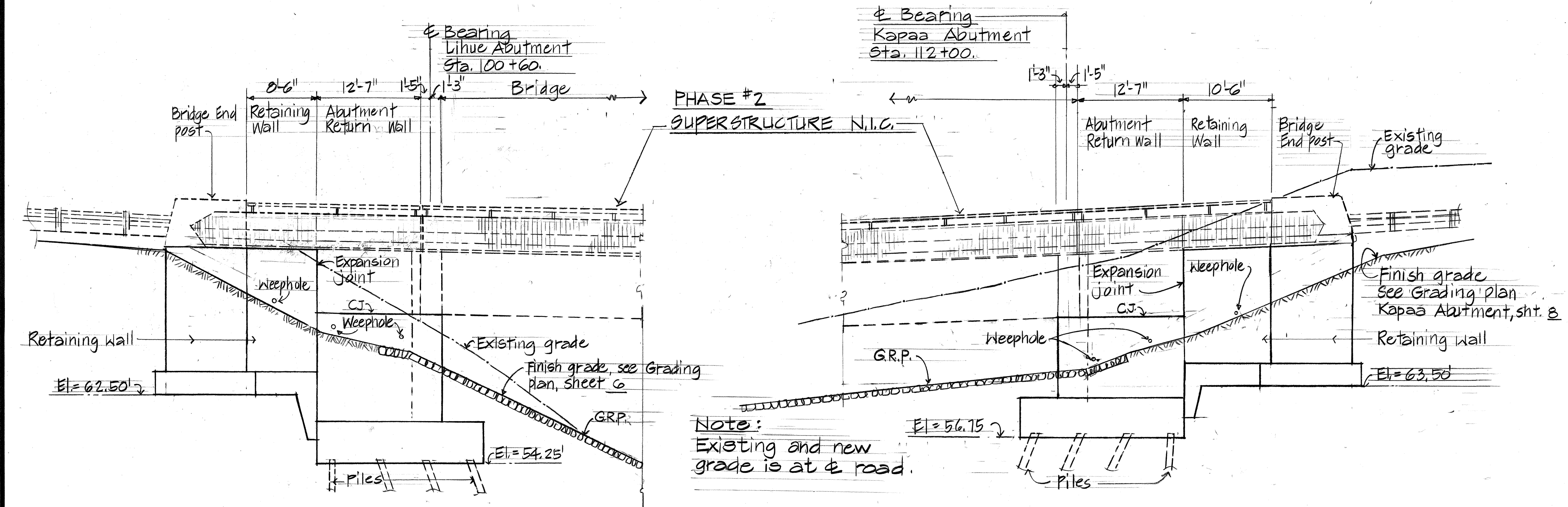
FED. ROAD DIST. NO.	STATE	FED. AID PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
HAWAII	HAW.	F-051-1(4)	1984	46	65



LIHUE ABUTMENT PLAN
Scale: 1/8" = 1'-0"

KAPAA ABUTMENT PLAN
Scale: 1/8" = 1'-0"

- Notes:**
1. For Lihue Abutment existing and new grading shown on Highway Sht. 6
 2. For Kapaa Abutment existing and new grading shown on Highway Sht. 8



LIHUE ABUTMENT - EAST ELEVATION
Scale: 1/8" = 1'-0"

KAPAA ABUTMENT - EAST ELEVATION
Scale: 1/8" = 1'-0"

Note:
Existing and new grade is at & road.

DATE	_____
ORIGINAL PLAN	_____
REVISION	_____
NOTES	_____
CHECKED BY	_____



Construction of this project will be under my supervision,
Myron Okubo

DATE	REVISION

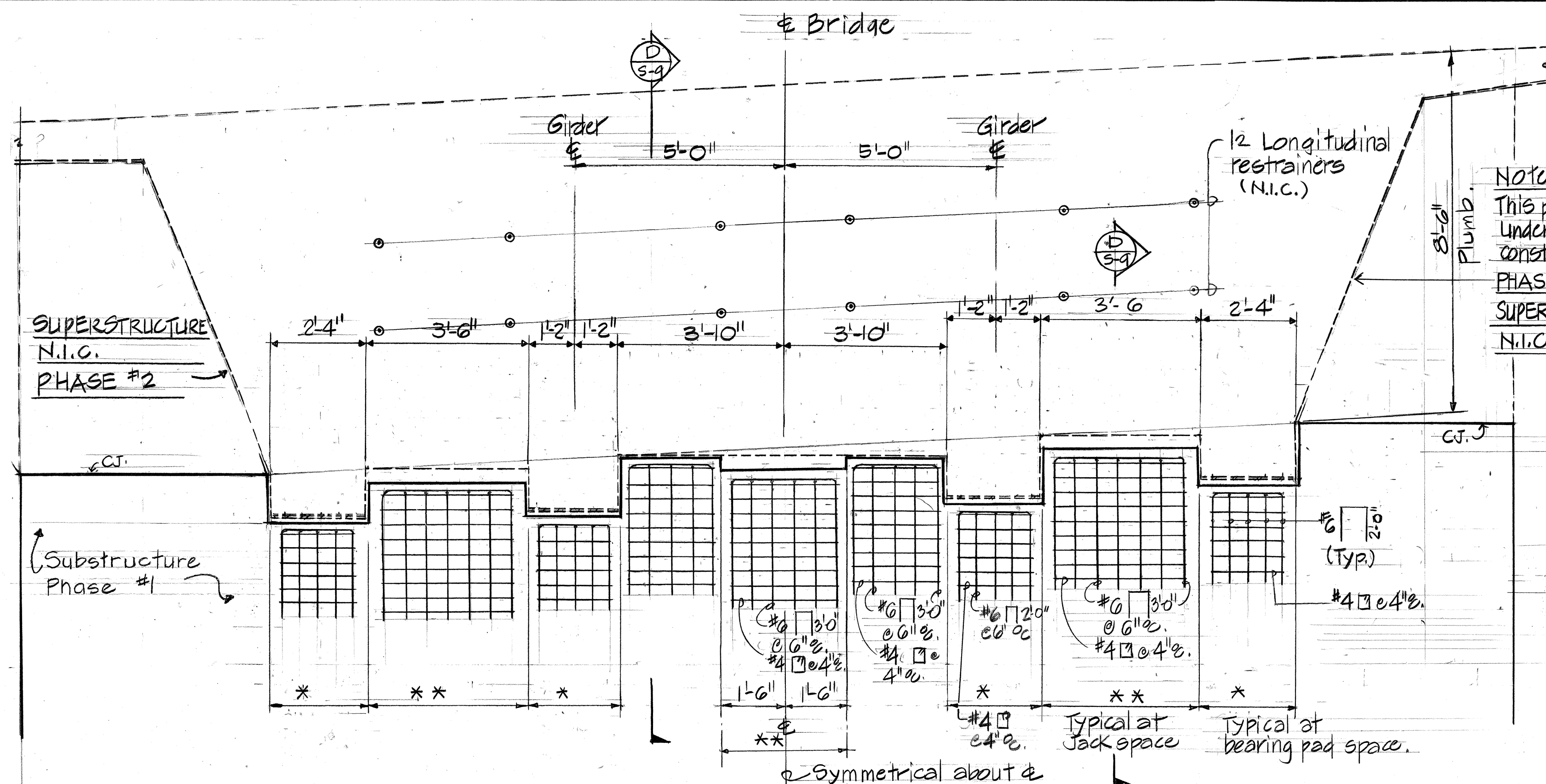
STATE OF HAWAII
DEPARTMENT OF TRANSPORTATION
HIGHWAYS DIVISION

**LIHUE AND KAPAA ABUTMENTS
PLAN AND ELEVATION**

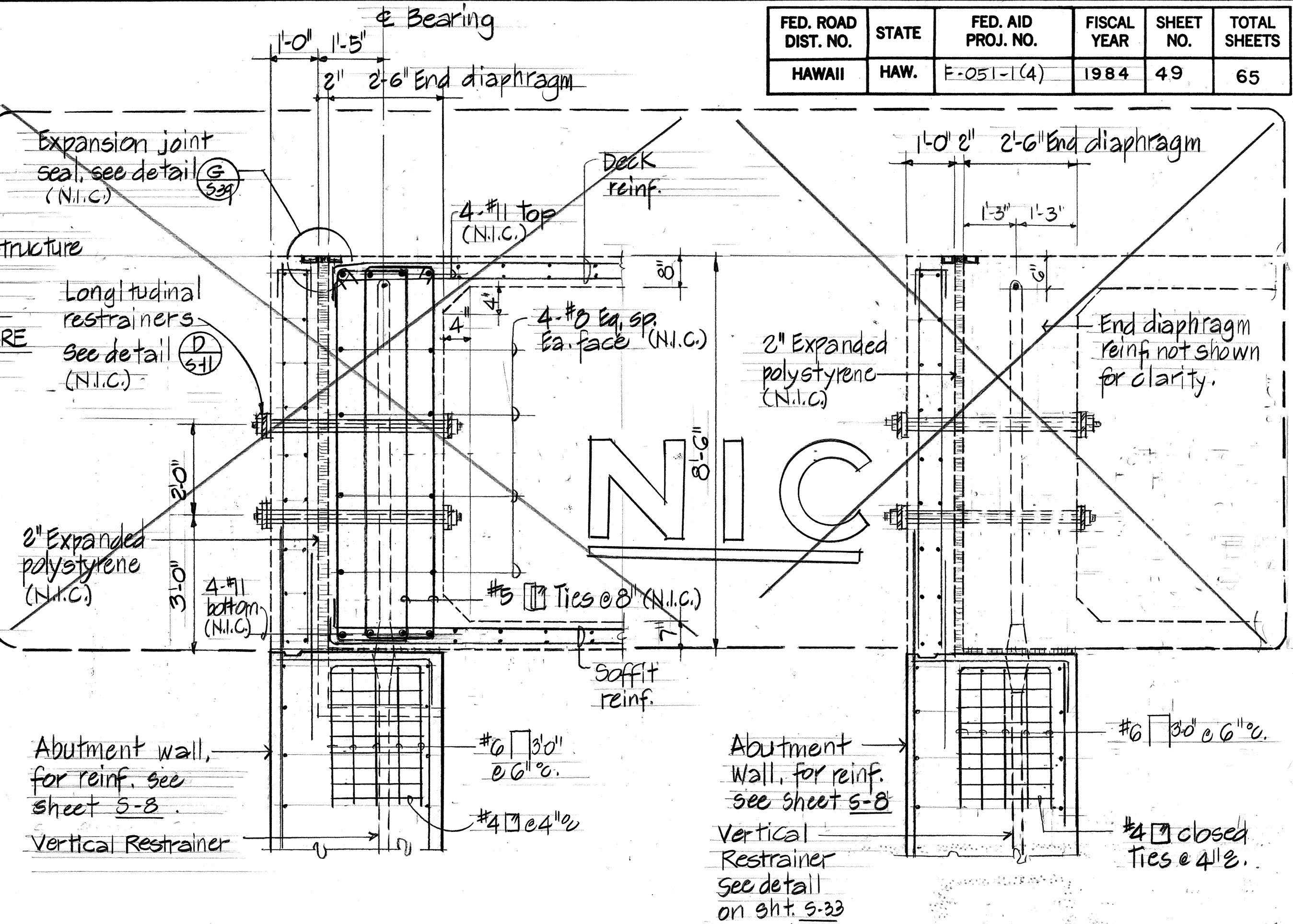
HANAMAULU VIADUCT
HANAMAULU-AHUKINI CUTOFF ROAD
Ahukini Road to Kaula Hardwoods
PROJECT NO. F-051-1(4)

SCALE: 1/8" = 1'-0" DATE: SEPT., 1984
SHEET NO. 5-6 OF 5-41 SHEETS

FED. ROAD DIST. NO.	STATE	FED. AID PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
HAWAII	HAW.	F-051-1(4)	1984	49	65



NOTE:
This portion
under superstructure
construction
PHASE #2
SUPERSTRUCTURE
N.I.C.



ADDED REINFORCING IN ABUTMENT

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

* Slide bearing space.

** Space provided for use of Flat Jacks during maintenance operation.

SECTION

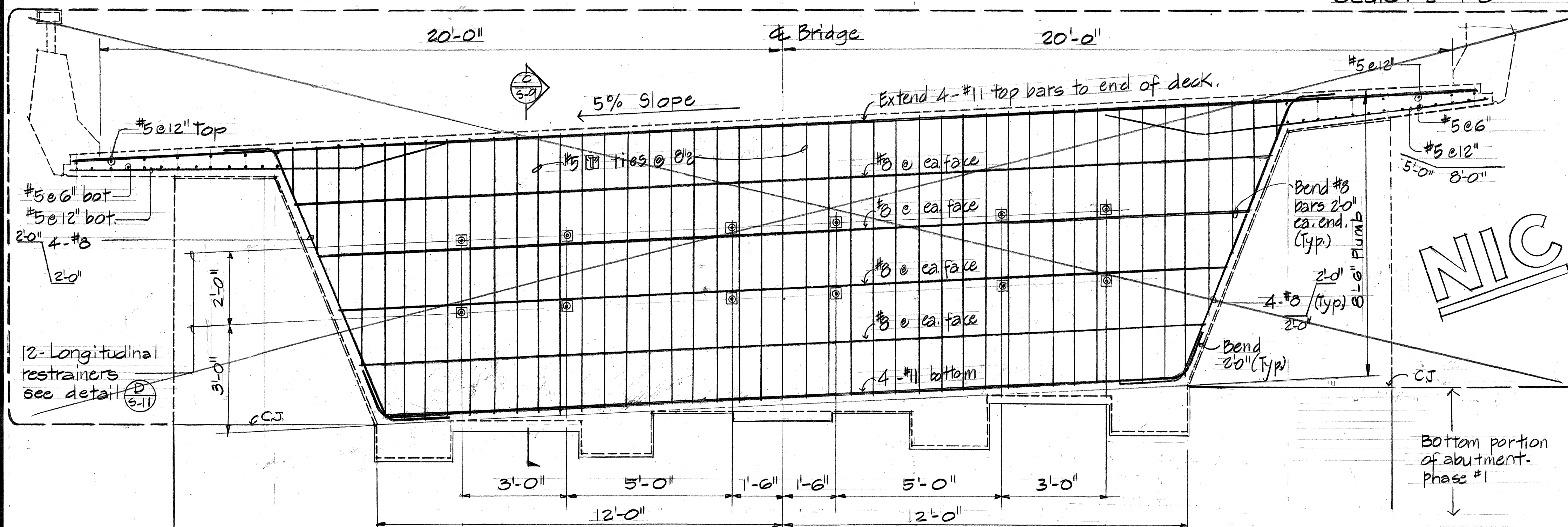
Scale: 1/2" = 1'-0"

SECTION

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

Notes:

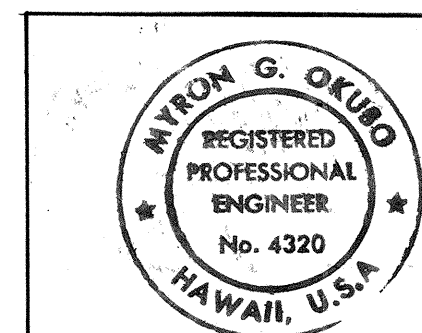
- 1) For Post-tensioning Anchorage at Abutment, see sheet 5-24.
- 2) For General Notes see sheet 5-2.



Note: Added reinforcing at diaphragm and at abutment wall not shown for clarity.

REINFORCING AT END DIAPHRAGM

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

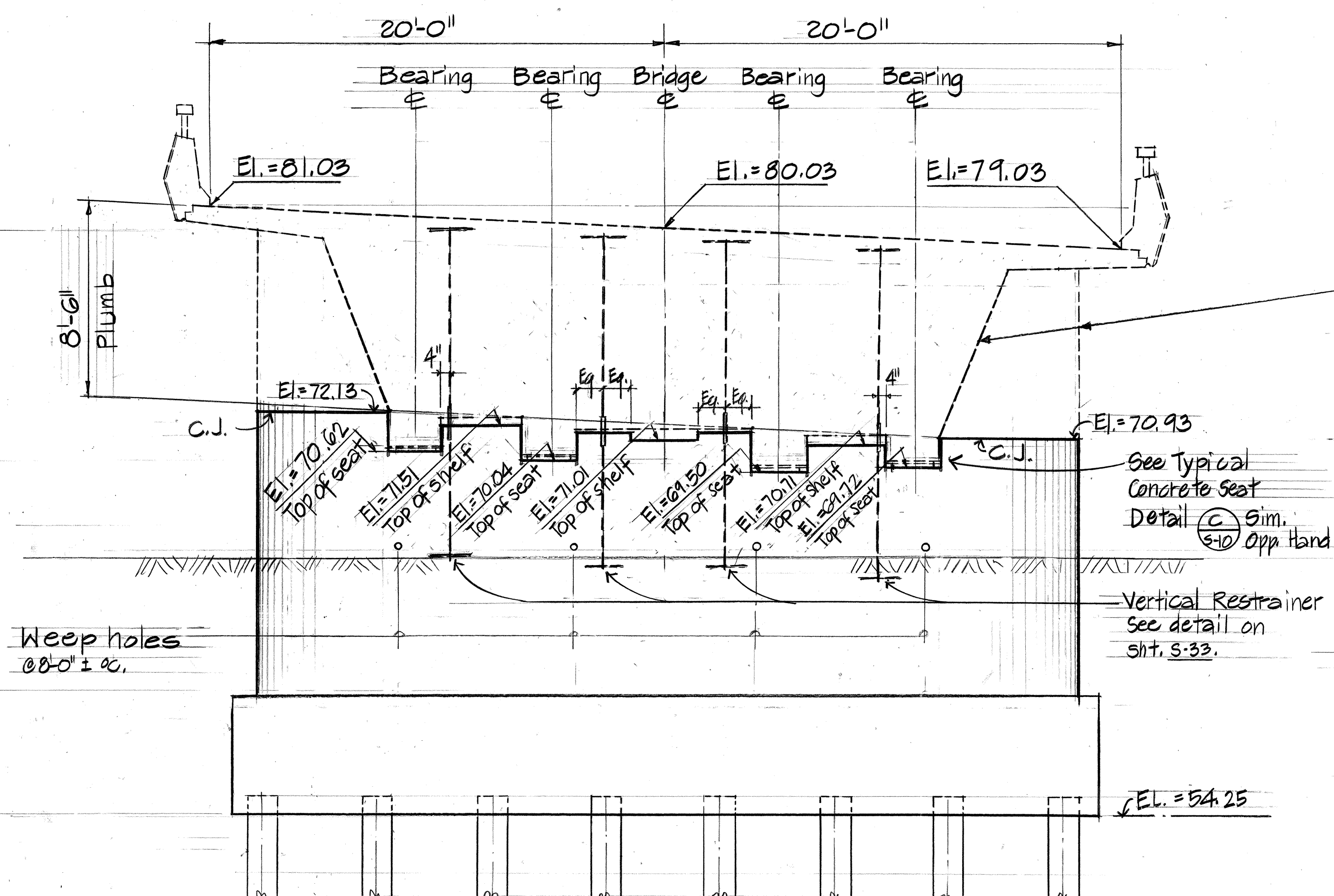


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UNDER MY SUPERVISION
Myron Okubo
Signature

12-31-84	Deleted reference to Sheet 5-11 on Detail (B) Per Addendum No. 1.
DATE	REVISION
STATE OF HAWAII DEPARTMENT OF TRANSPORTATION HIGHWAYS DIVISION ABUTMENT ELEVATIONS AND SECTIONS HANAMAULU VIADUCT HANAMAULU-AHUKINI CUTOFF ROAD Ahukini Road to Kauai Hardwoods PROJECT NO. F-051-1(4)	
SCALE: AS SHOWN DATE: SEPT. 1984 SHEET No. 5-9 OF 5-41 SHEETS	

FED. ROAD DIST. NO.	STATE	FED. AID PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
HAWAII	HAW.	F-051-1(4)	1984	50	65

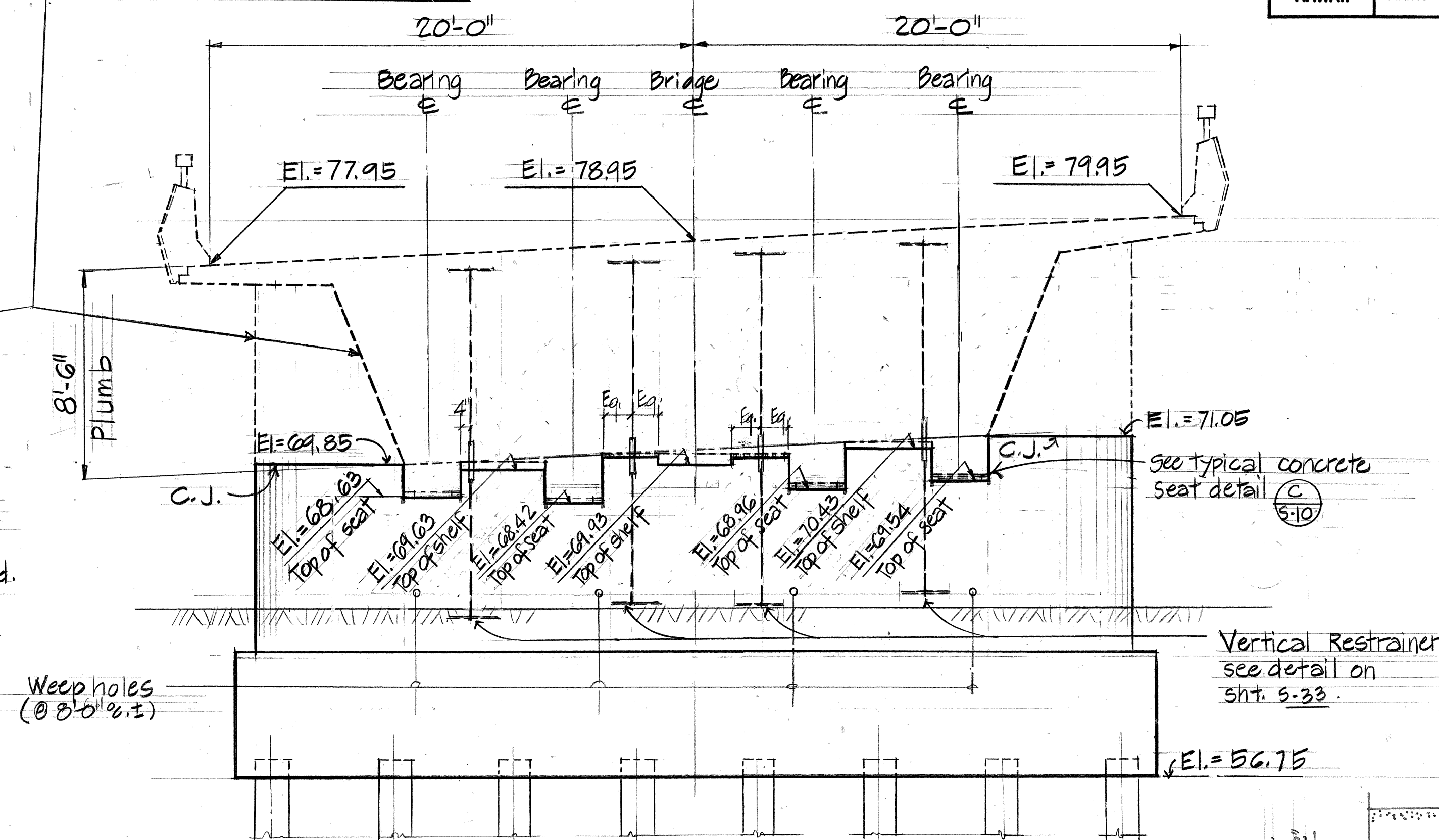
PHASE #2 SUPERSTRUCTURE N.I.C.



LIHUE ABUTMENT ELEVATION

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

(A) S-10



KAPAA ABUTMENT ELEVATION

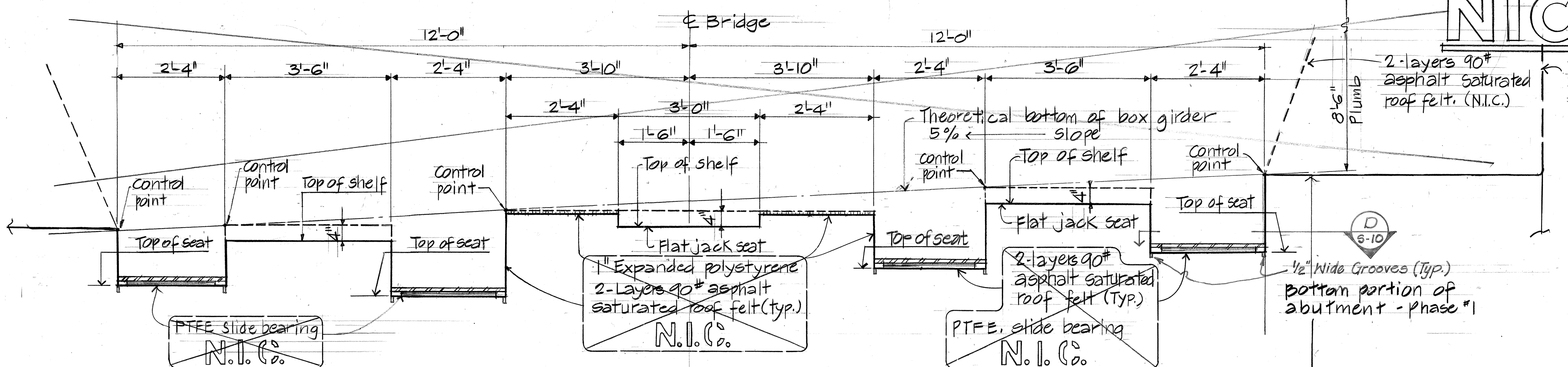
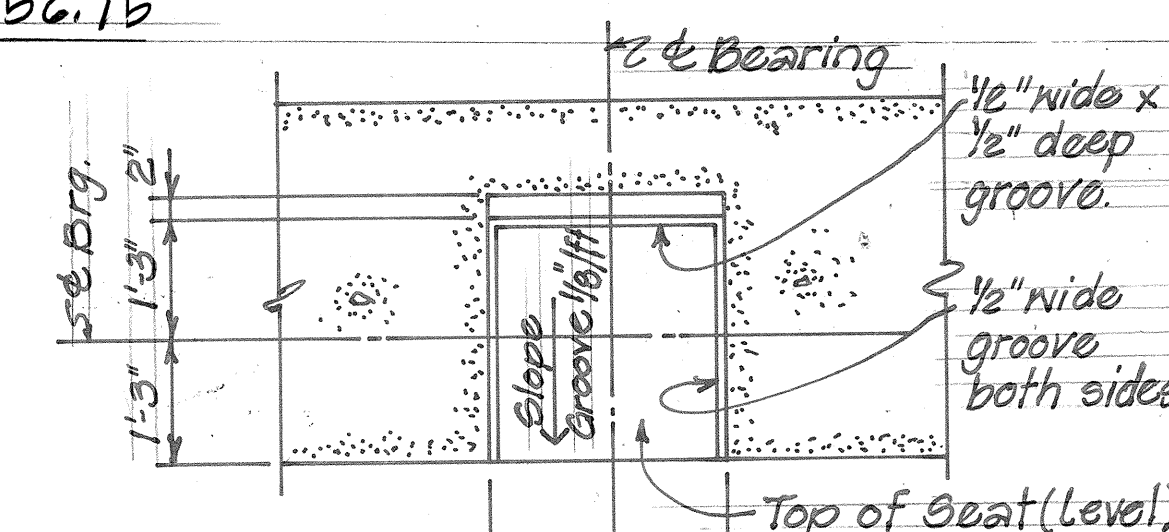
Scale: 1/4" = 1'-0"

(B) S-10

PLAN

Scale 1/2" = 1'-0"

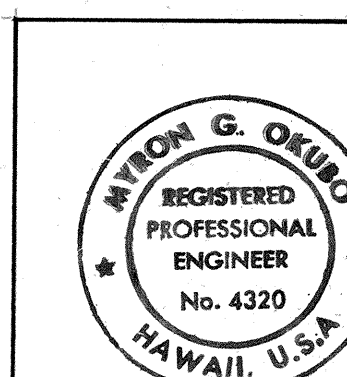
(D) S-10



TYPICAL CONCRETE SEAT - DETAIL

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

(C) S-10



THIS WORK WAS PREPARED BY ME OR UNDER MY SUPERVISION.
Myron G. Okubo
Signature

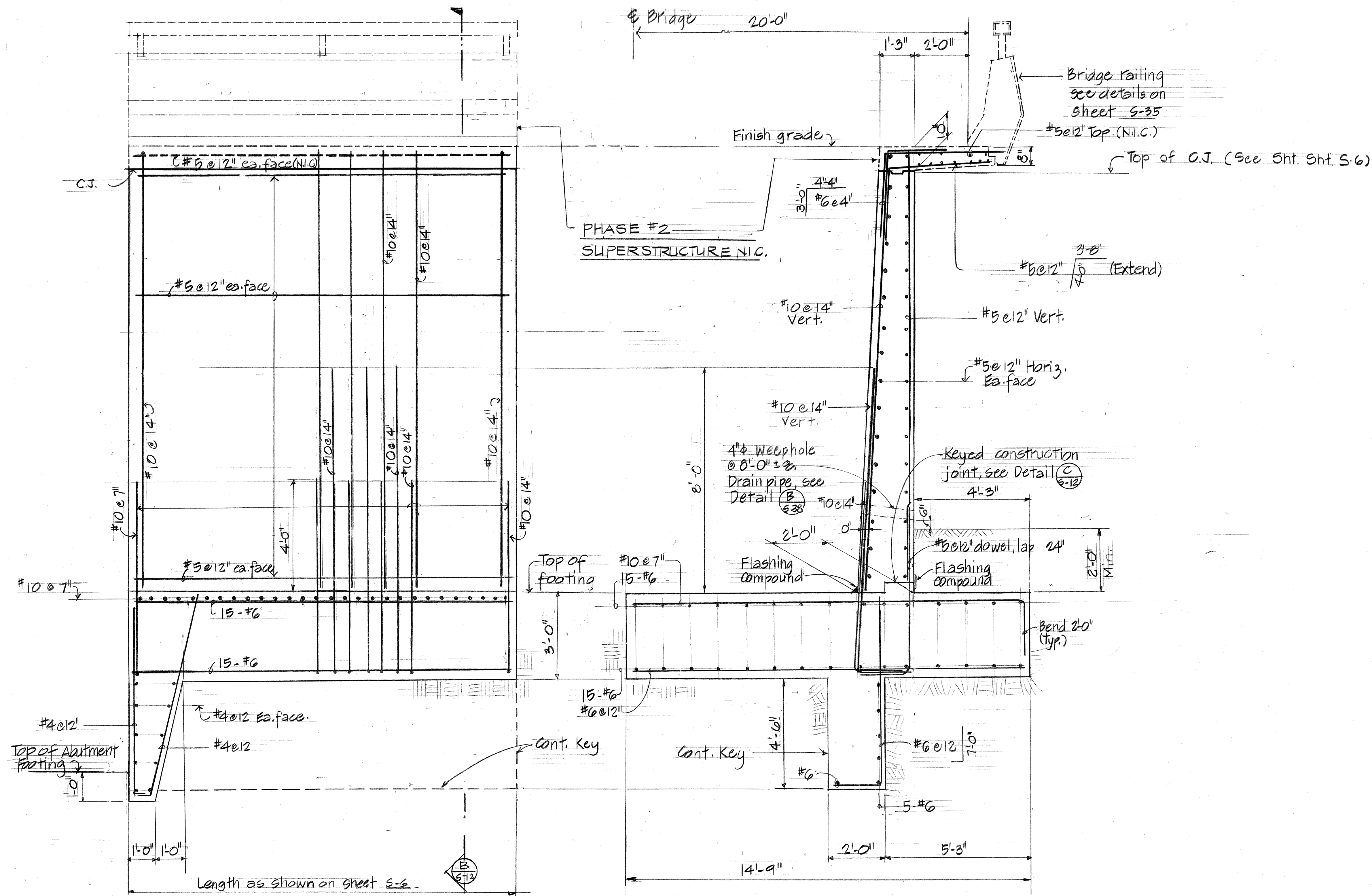
DATE	REVISION
12-31-84	Added Elev. to Lt. & Rt. Construction Joints on Details (A) & (B) Per Addendum No. 1. S-10 S-10
STATE OF HAWAII DEPARTMENT OF TRANSPORTATION HIGHWAYS DIVISION LIHUE AND KAPAA ABUTMENTS, ELEVATIONS, BEARING SEATS HANAMAULU VIADUCT HANAMAULU-AHUKINI CUTOFF ROAD Ahukini Road to Kauai Hardwoods PROJECT NO. F-051-1(4) SCALE: AS SHOWN DATE: SEPT, 1984 SHEET No. S-10 OF 5-41 SHEETS	

ADD. 50

PHASE 1a

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

FED. ROAD DIST. NO.	STATE	FED. AID PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
HAWAII	HAW.	F-051-1(4)	1984	51	65



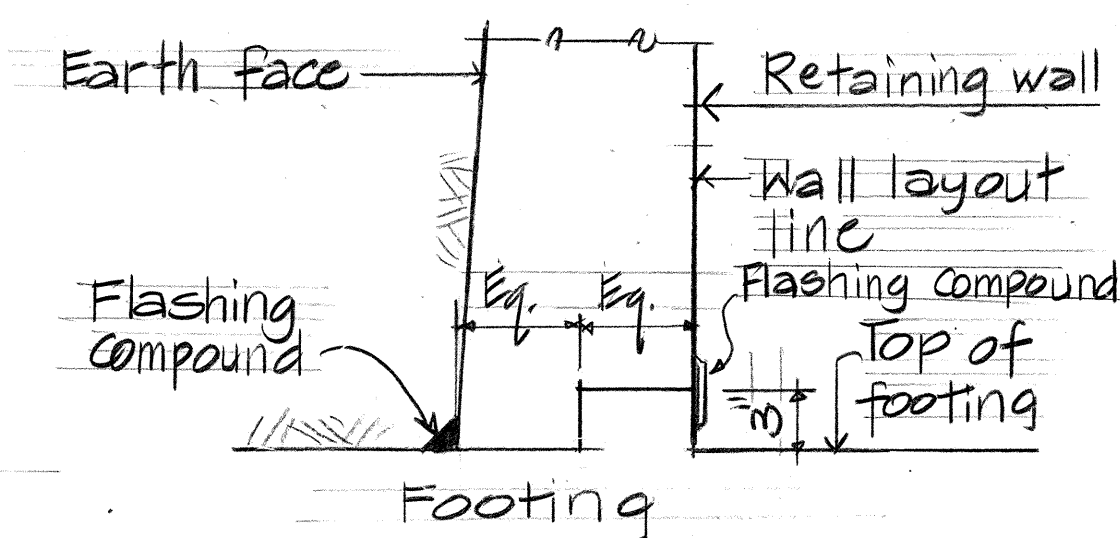
EARTH FACE ELEVATION (A)
Scale: 1/2" = 1'-0"

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

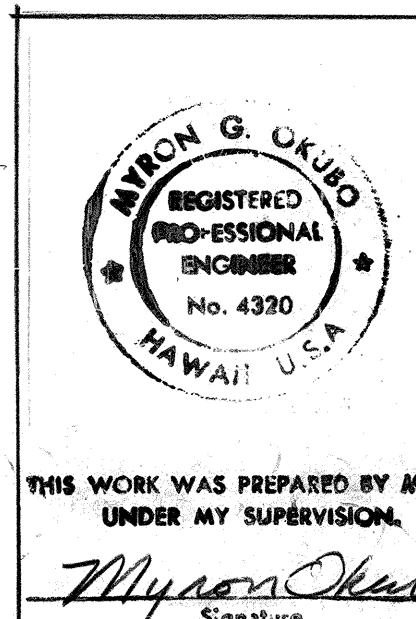
RETAINING WALL

Design Criteria

Allowable soil bearing pressure 4000 psf
Equivalent fluid pressure (Active) 45 psf.
Friction factor (sliding) 0.4
Unit weight of back fill 130 pcf
Equivalent fluid pressure (passive) 220 pcf acting on Key only.



KEYED JOINT DETAIL (C)
N.T.S.

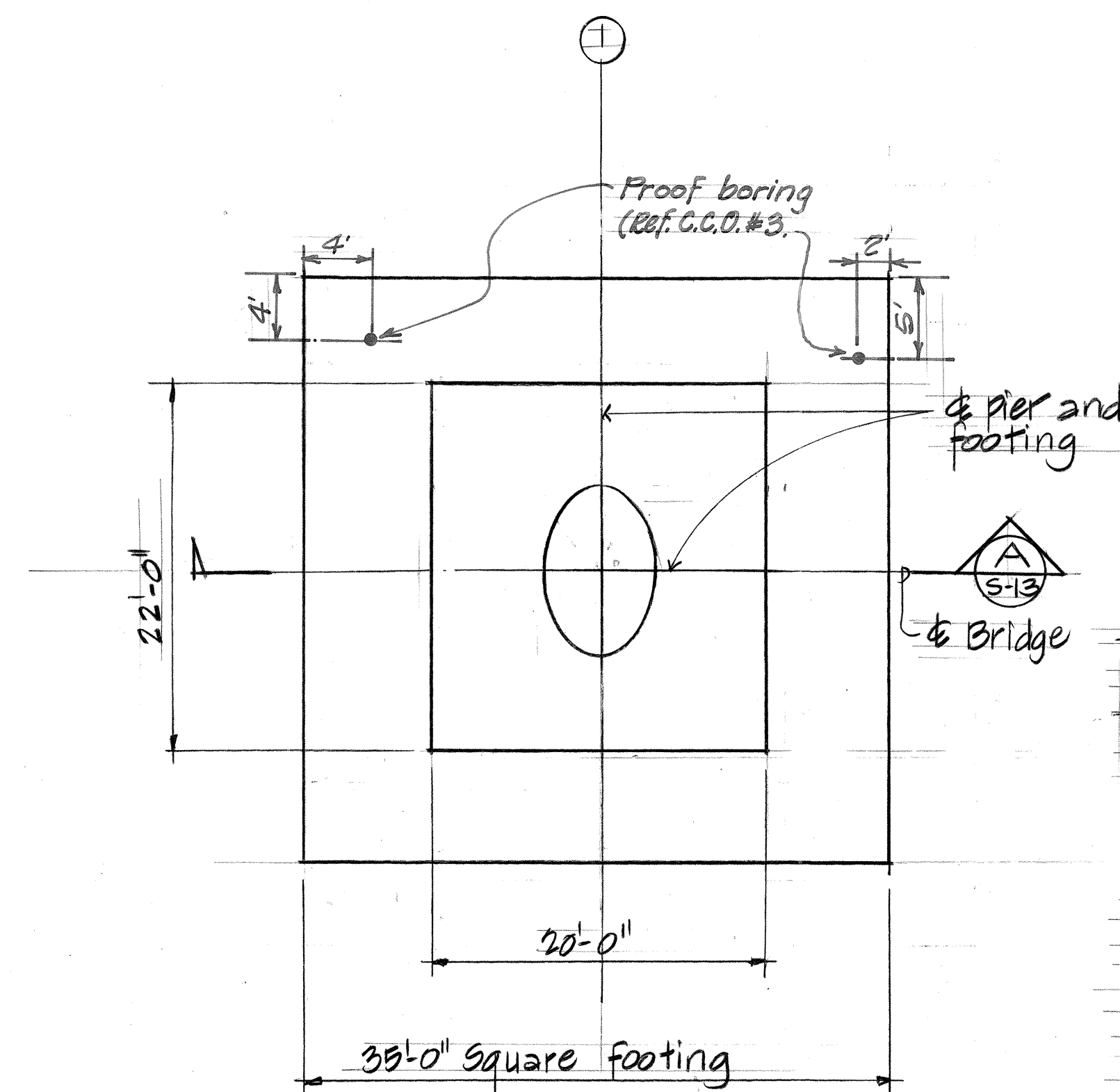


DATE	REVISION

STATE OF HAWAII
DEPARTMENT OF TRANSPORTATION
LAND TRANSPORTATION FACILITIES DIVISION
RETAINING WALL
SECTIONS & DETAILS
HANAMAULU VIADUCT
Hanamaulu-Ahukini Cutoff Road
PROJECT NO. F051-1(4)
SCALE: AS SHOWN DATE: SEPT., 1984
SHEET NO. 51 OF 64 SHEETS

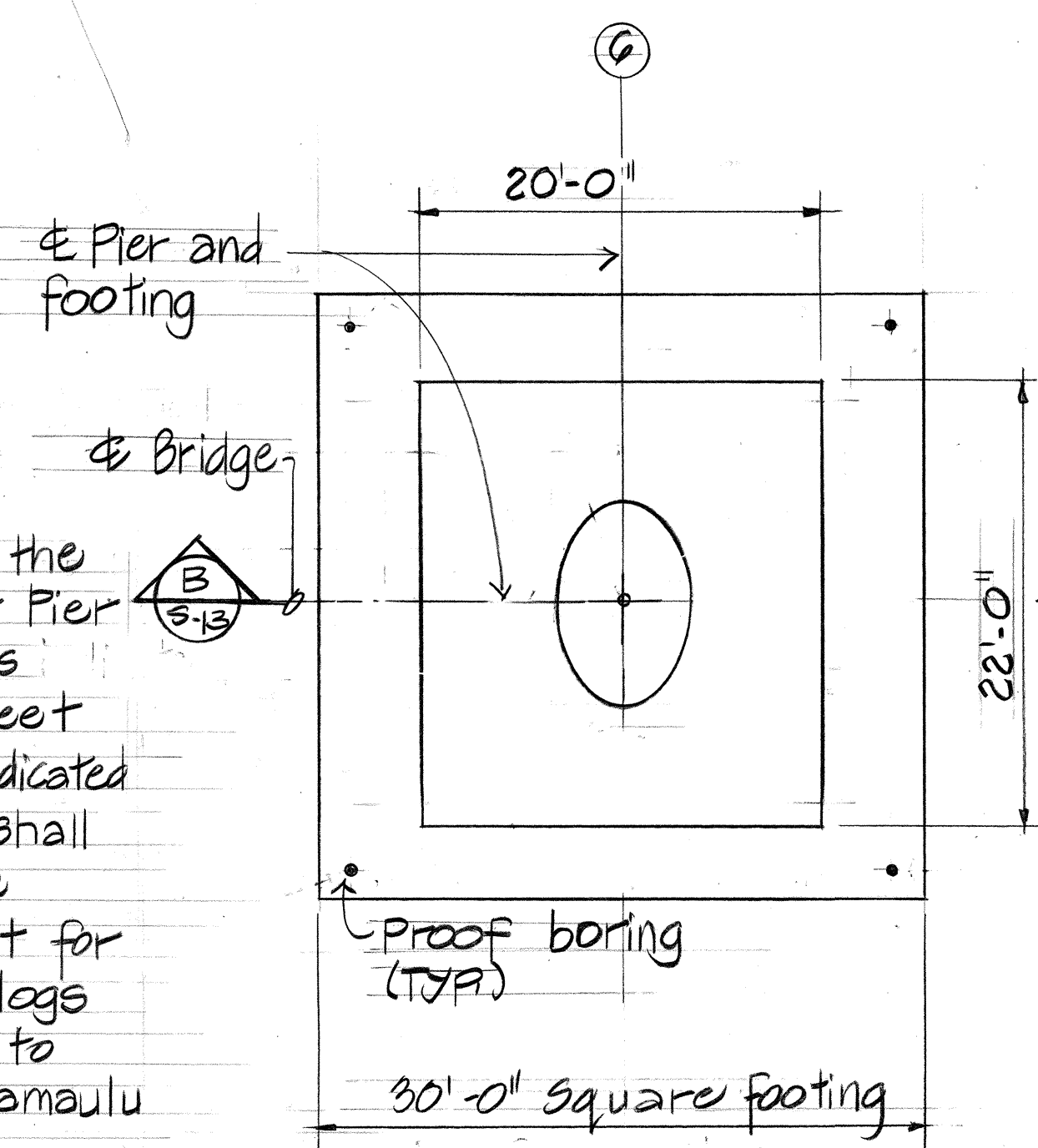
ORIGINAL PLAN	DATE
DRAWN BY	
CHECKED BY	
NOTED BY	
QUANTITIES BY	
CHECKED BY	
No.	

FED. ROAD DIST. NO.	STATE	FED. AID PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
HAWAII	HAW.	F-051-1(4)	1984	52	65

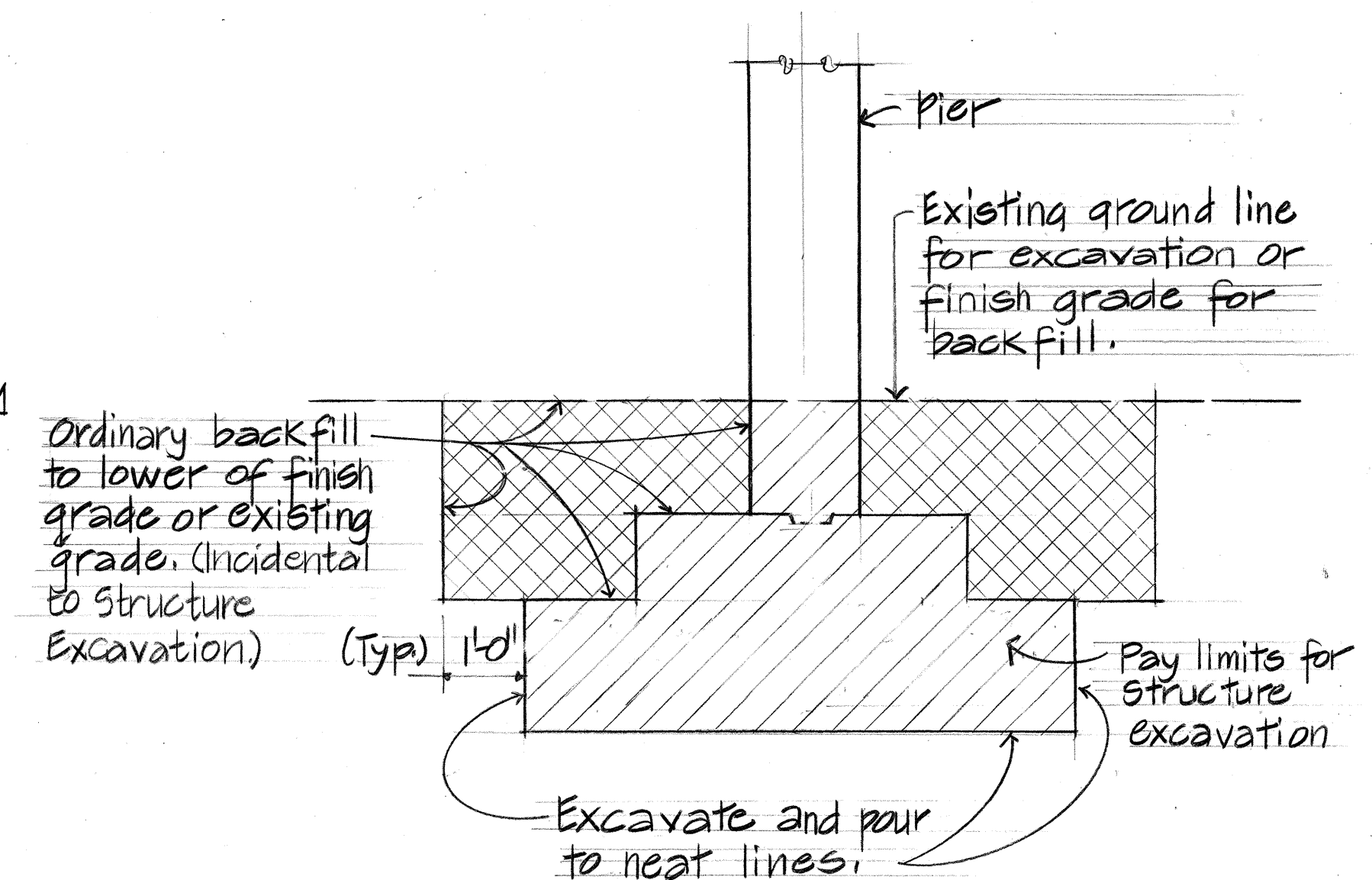


PIER #1 FOOTING - PLAN
Scale: 1/8" = 1'-0"

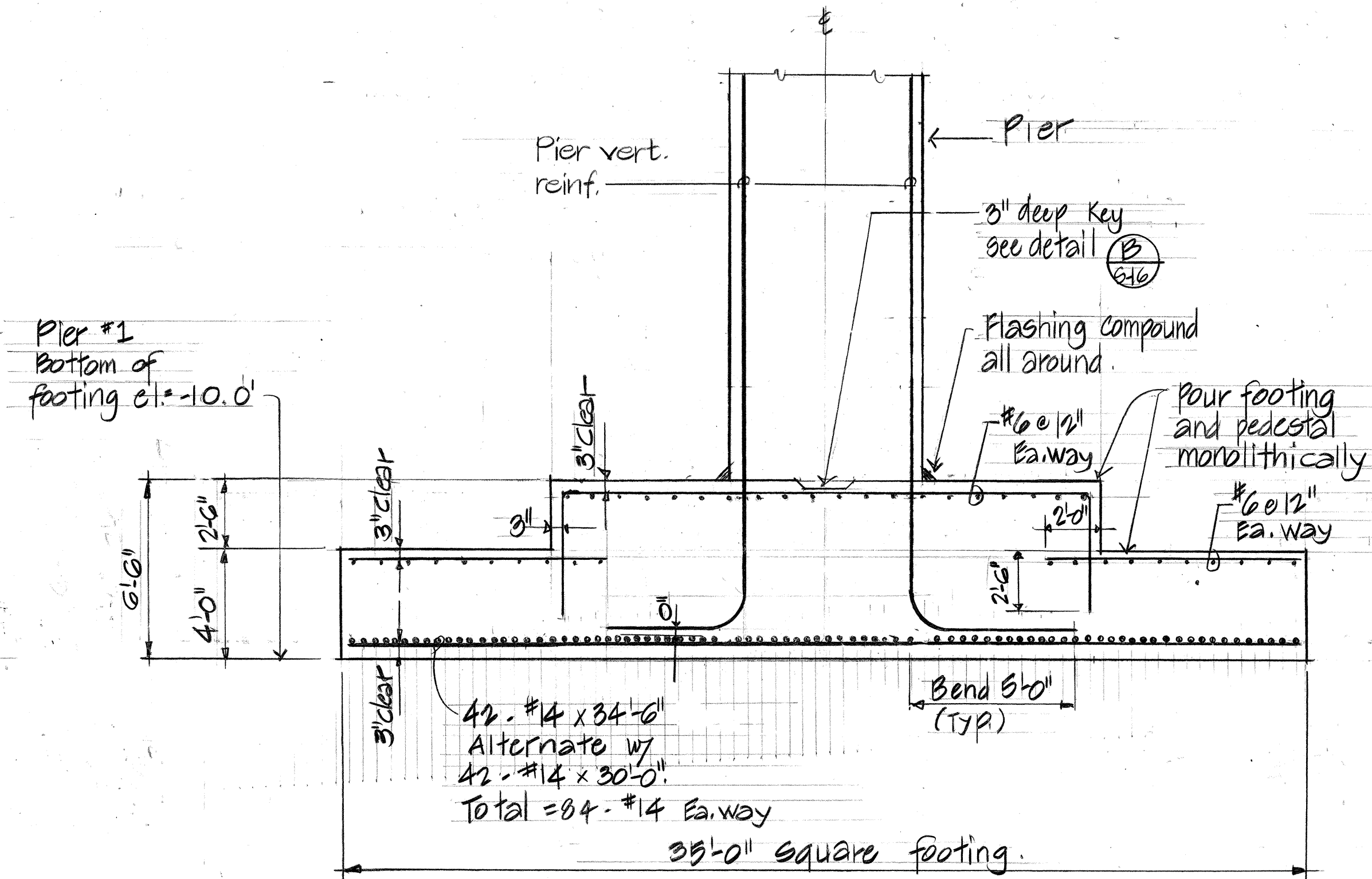
Note:
The Contractor shall verify the subsurface condition for Pier #6 by proof drilling four holes indicated to a depth of 10 feet below the bottom of footing indicated on the plans. The contractor shall submit the boring logs to the Engineer for review. Payment for obtaining proof borings and logs shall be considered incidental to "Concrete in Footings for Hanamaulu Viaduct."



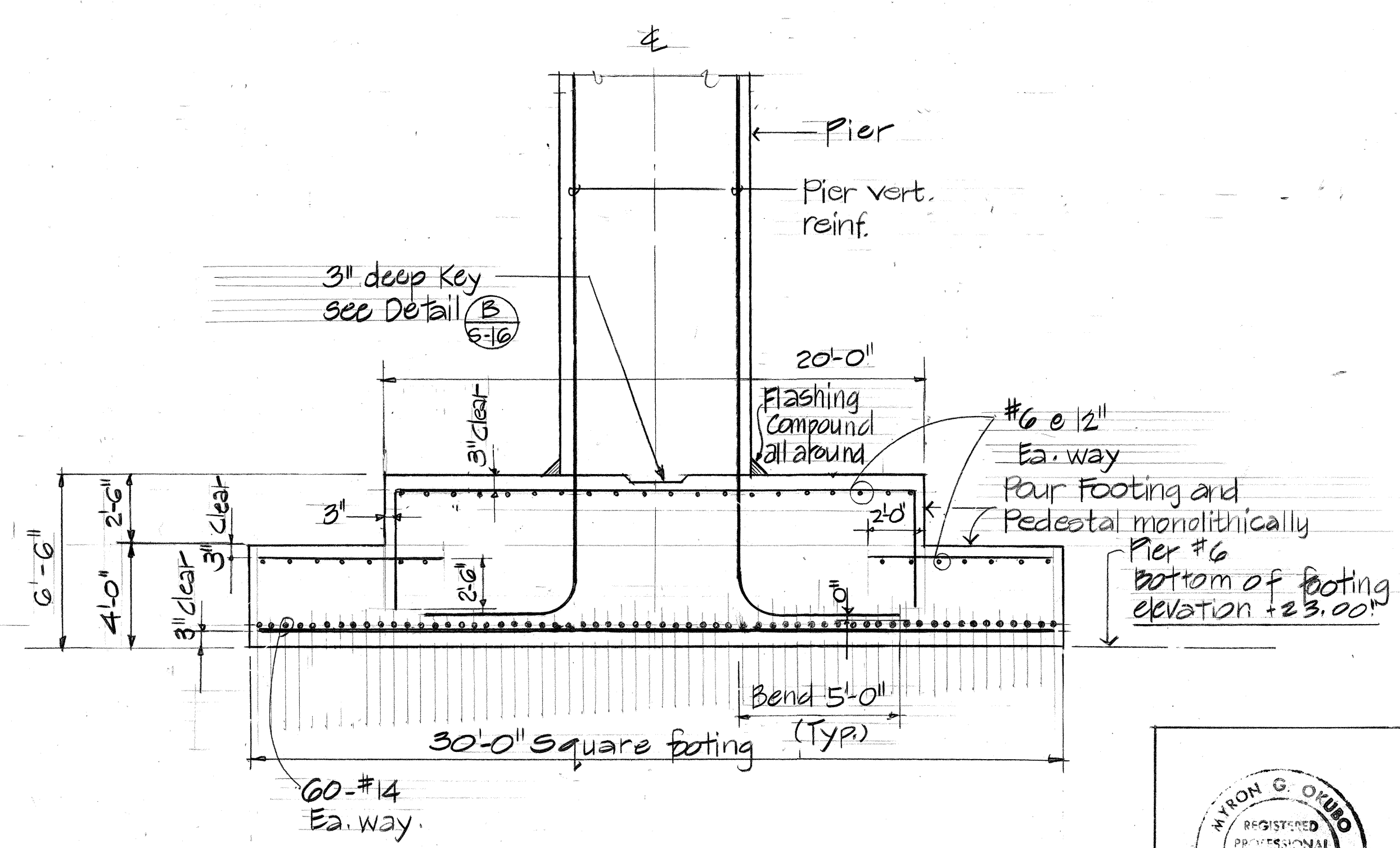
PIER #6 FOOTING - PLAN
Scale: 1/8" = 1'-0"



**SPREAD FOOTING
STRUCTURE EXCAVATION
AND BACK FILL DETAILS**
No Scale:



PIER #1 FOOTING - SECTION A
Scale: 1/4" = 1'-0"



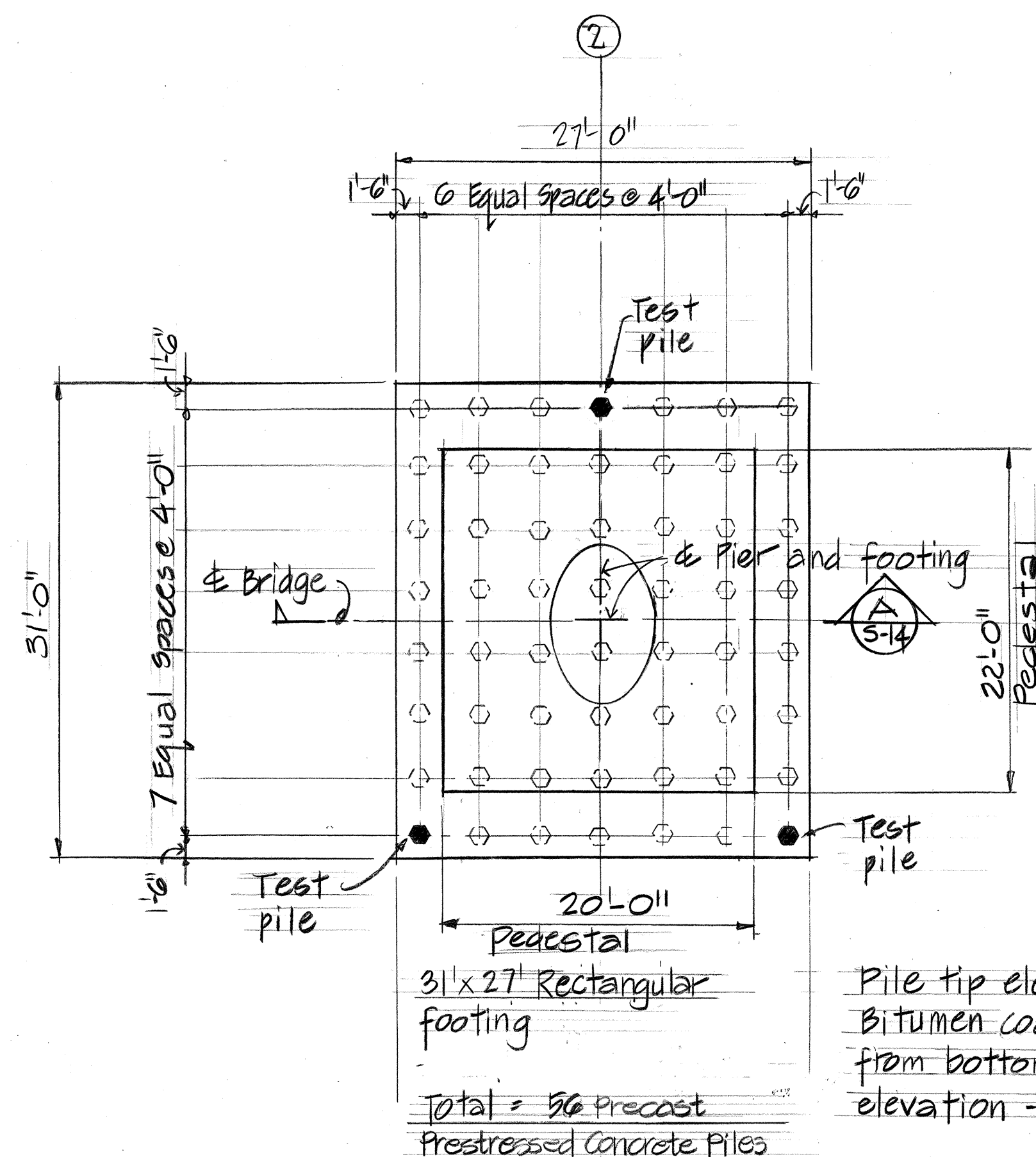
PIER #6 FOOTING - SECTION B
Scale: 1/4" = 1'-0"

THIS WORK WAS PREPARED BY ME OR UNDER MY SUPERVISION
Myron G. Orsini
Signature

DATE	REVISION

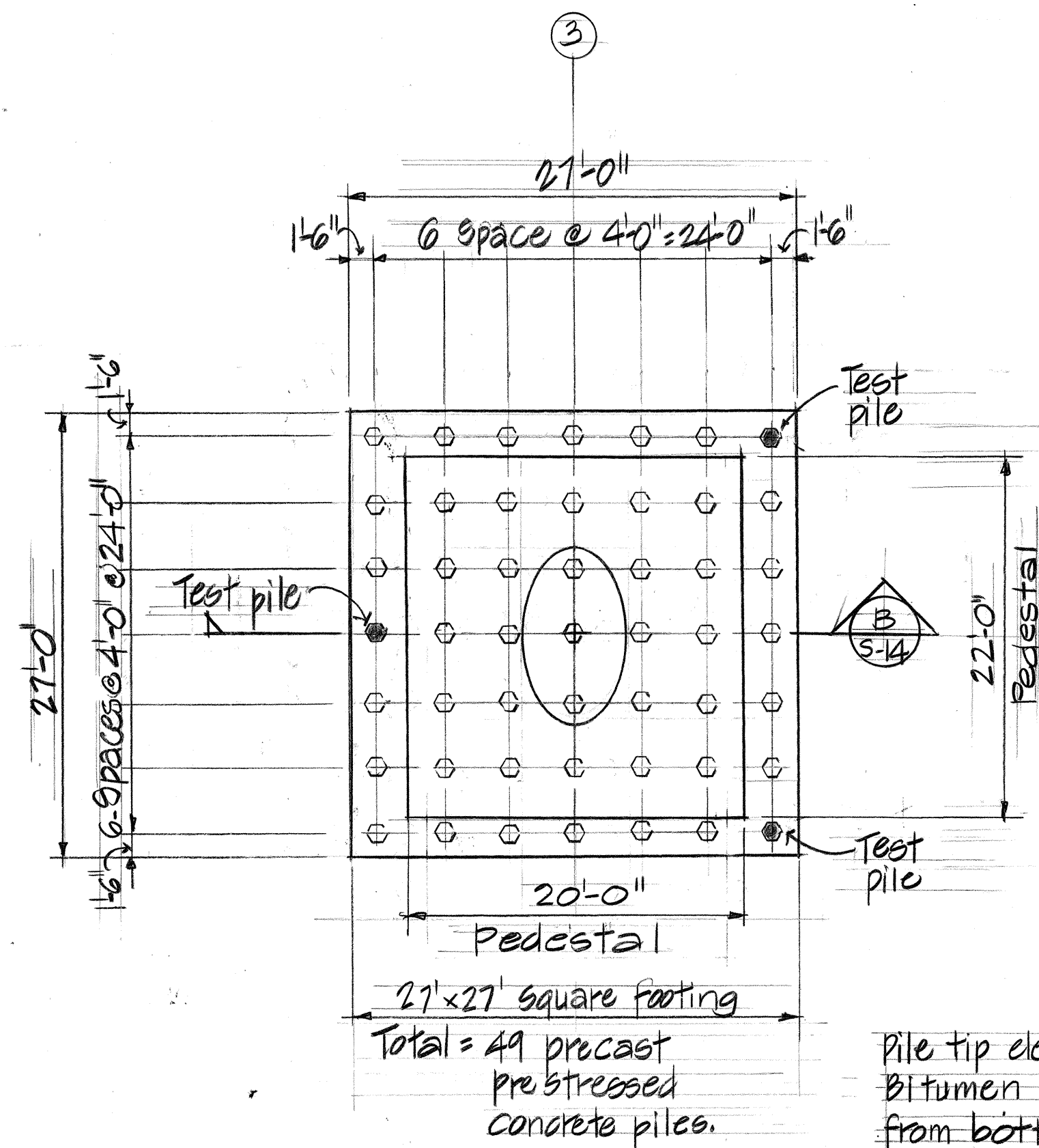
STATE OF HAWAII
DEPARTMENT OF TRANSPORTATION
LAND TRANSPORTATION FACILITIES DIVISION
**PIER #1 & PIER #6 FOOTING
PLAN AND SECTION**
HANAMAULU VIADUCT
HANAMAULU-AHUKINI CUTOFF ROAD
Ahukini Road to Kauai Hardwoods
PROJECT NO. F-051-1(4)
SCALE: AS SHOWN DATE: SEPT, 1984
SHEET NO. 5-13 OF 5-41 SHEETS

FED. ROAD DIST. NO.	STATE	FED. AID PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
HAWAII	HAW.	F-051-1(4)	1984	53	65



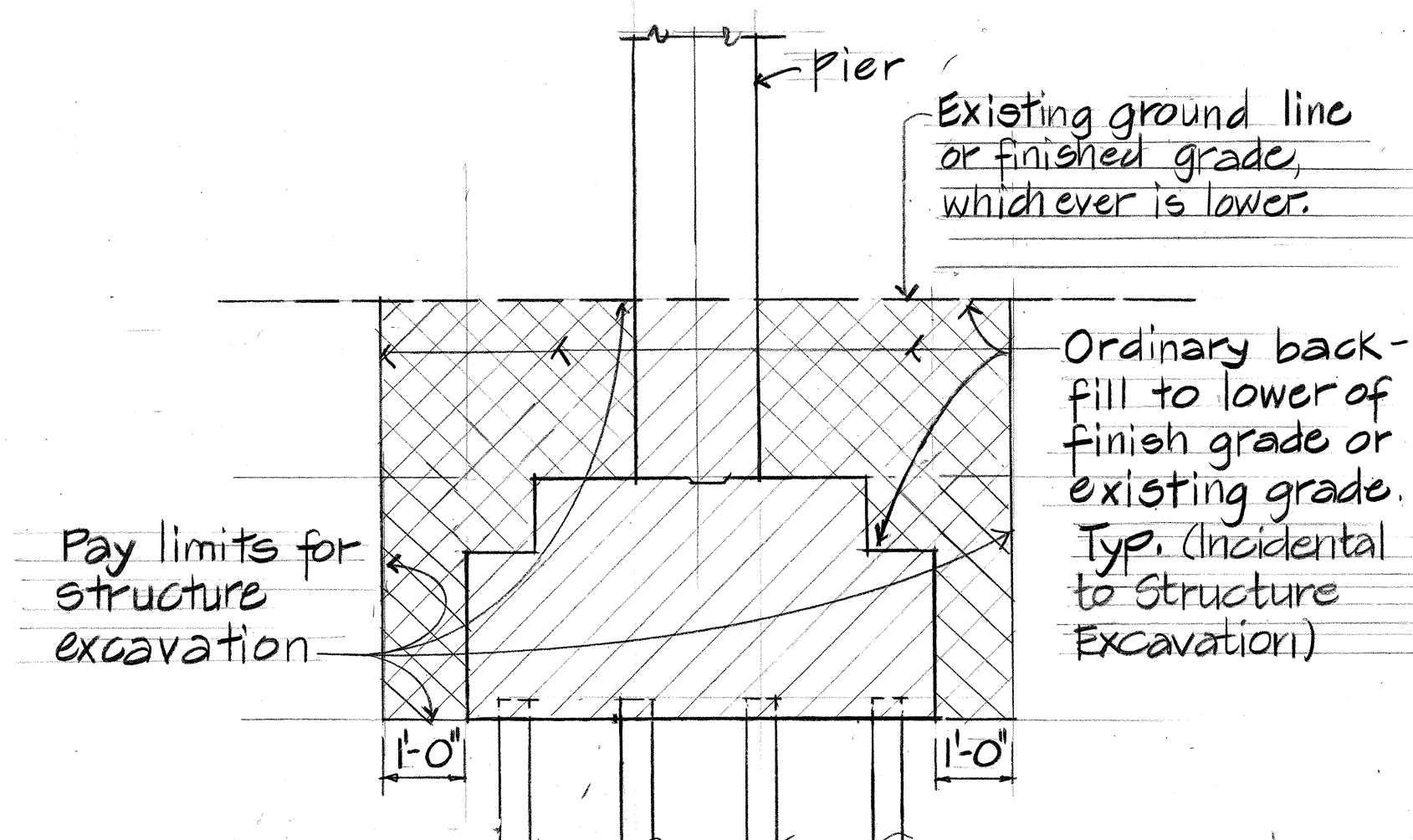
PIER #2 FOOTING - PLAN

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



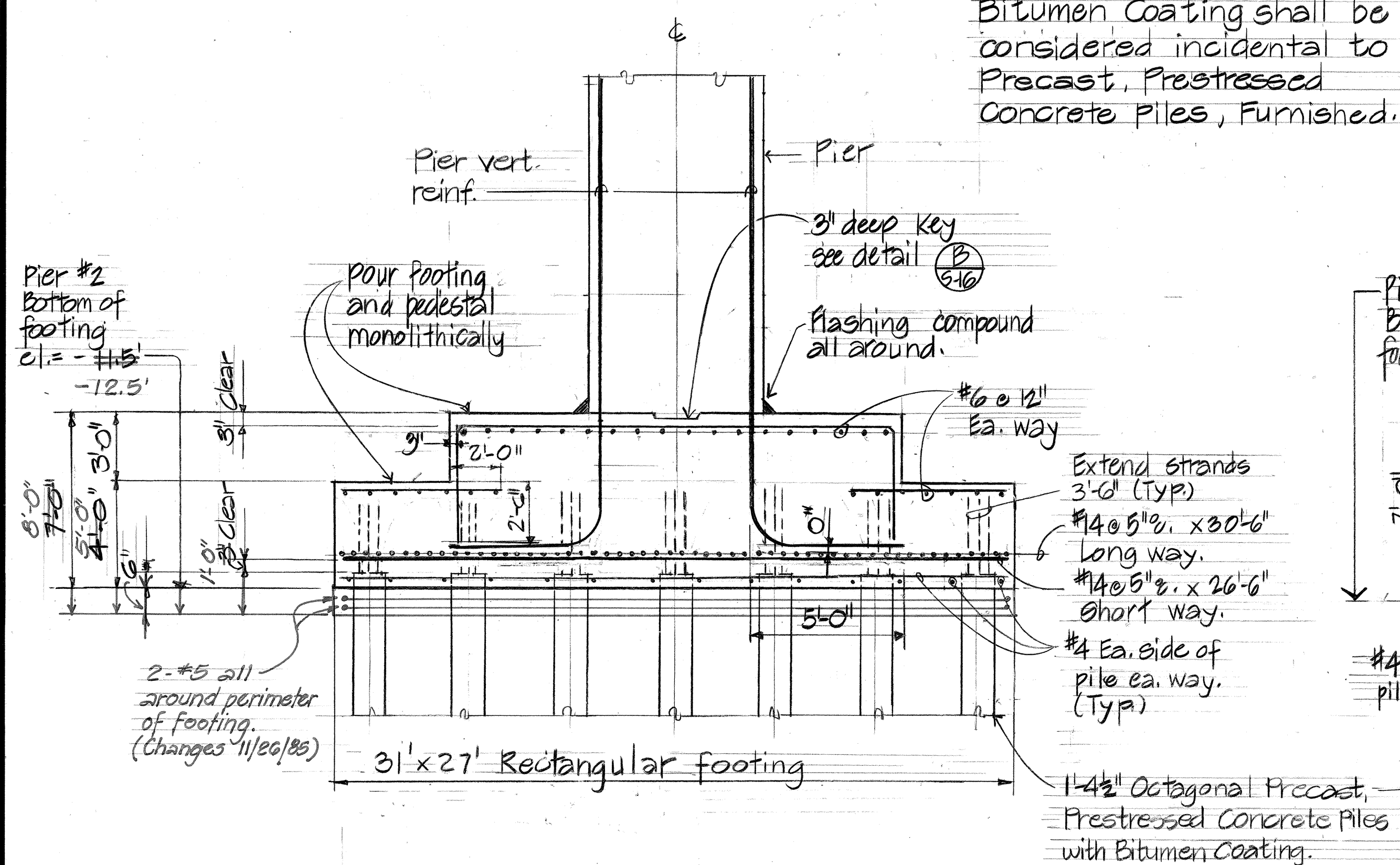
PIER #3 FOOTING - PLAN

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



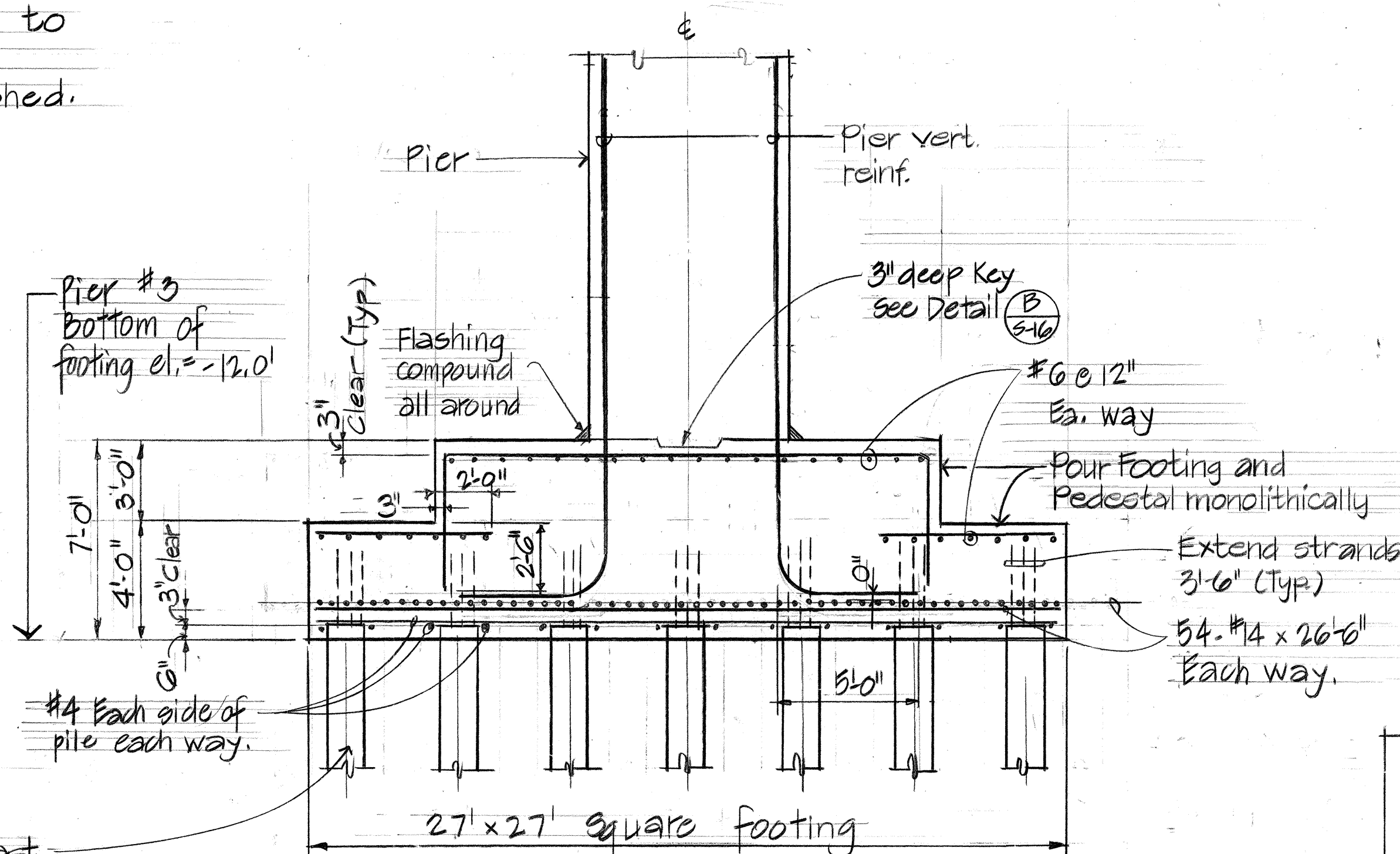
PILE FOOTING
STRUCTURE EXCAVATION
AND BACKFILL DETAIL

No scale.



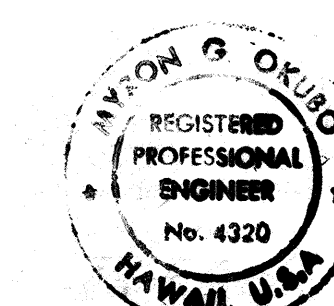
PIER #2 FOOTING - SECTION

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



PIER #3 FOOTING - SECTION

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



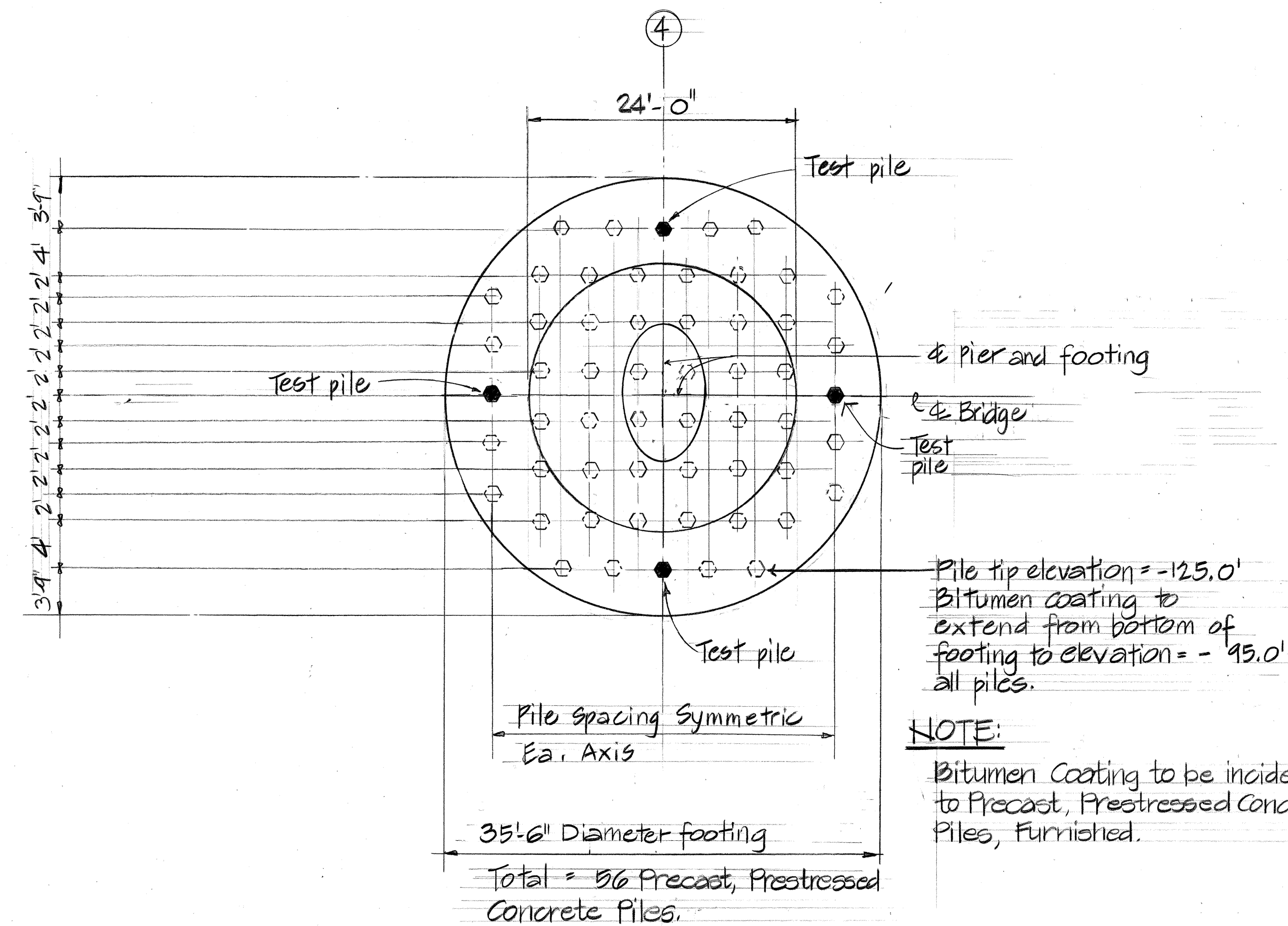
THIS WORK WAS PREPARED BY ME OR
UNDER MY SUPERVISION.
Myron Okubo
Signature

DATE REVISION

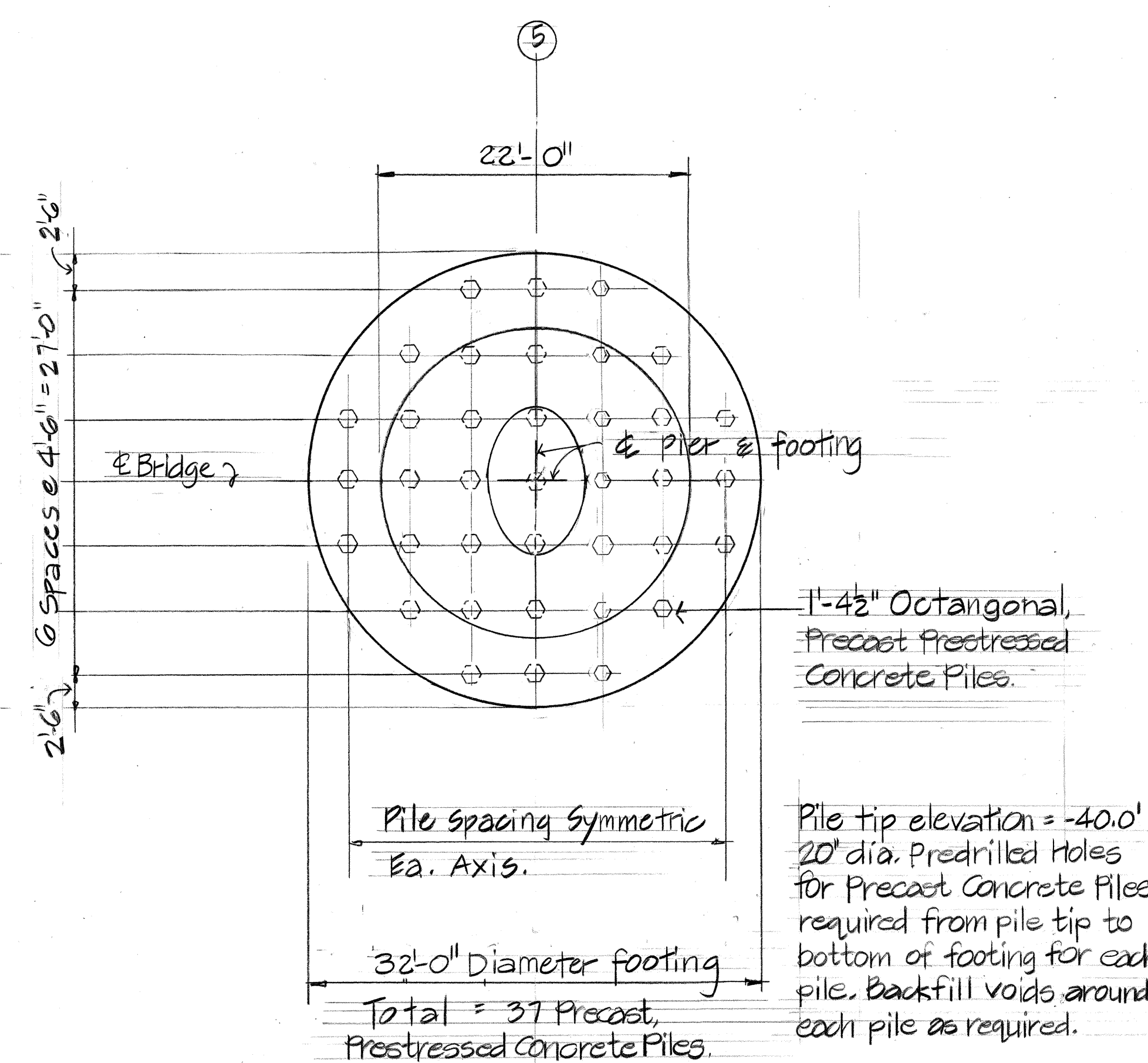
STATE OF HAWAII
DEPARTMENT OF TRANSPORTATION
LAND TRANSPORTATION FACILITIES DIVISION
**PIER #2 & PIER #3 FOOTING
PLAN AND SECTION**
HANAMAULU VIADUCT
HANAMAULU-AHUKINI CUTOFF ROAD
Ahukini Road to Kauai Hardwoods
PROJECT NO. F-051-1(4)

SCALE: AS SHOWN DATE: SEPT, 1984
SHEET NO. 5-14 OF 5-41 SHEETS

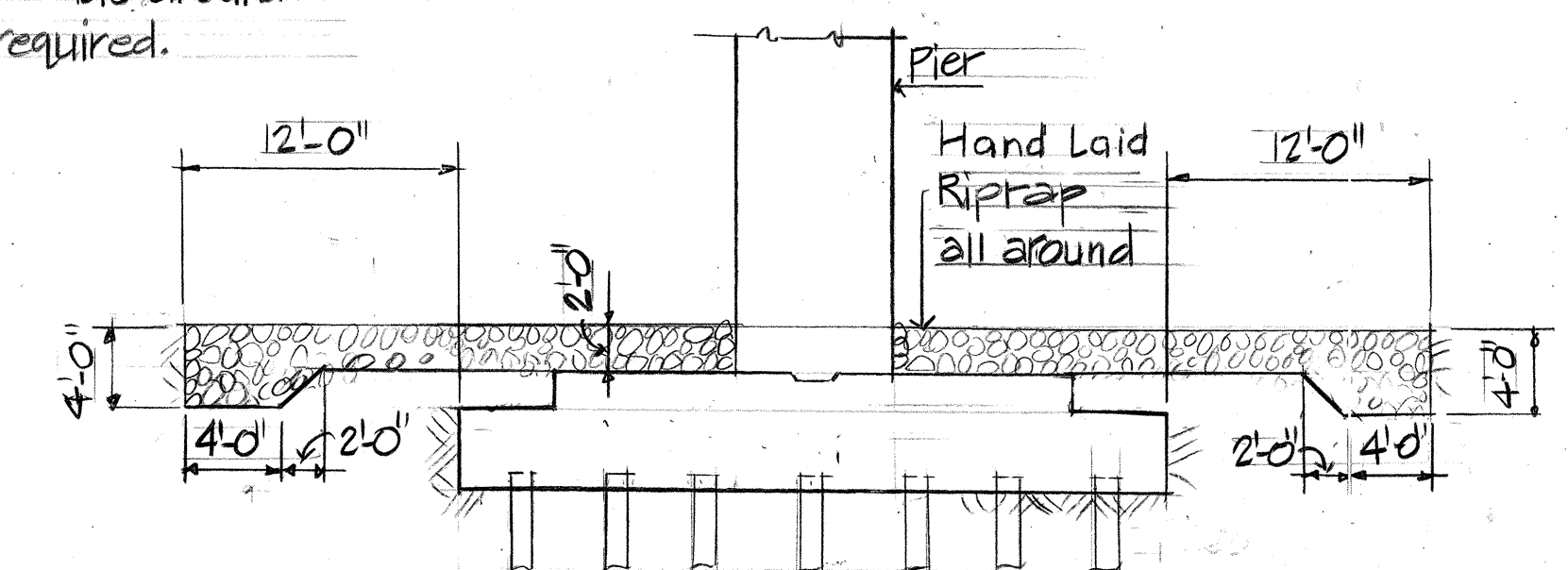
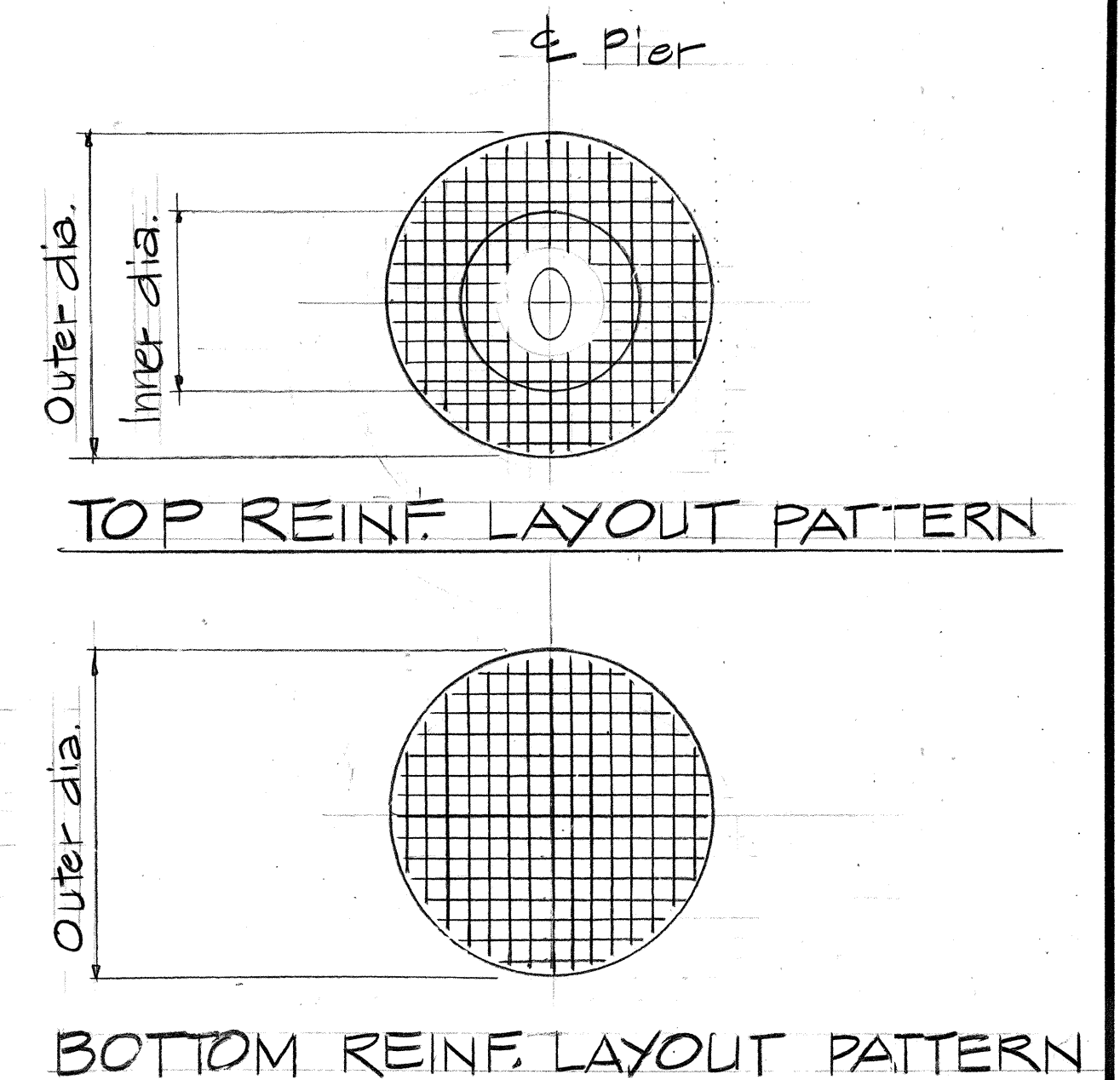
FED. ROAD DIST. NO.	STATE	FED. AID PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
HAWAII	HAW.	F-051-1(4)	1984	54	65



PIER #4 FOOTING - PLAN

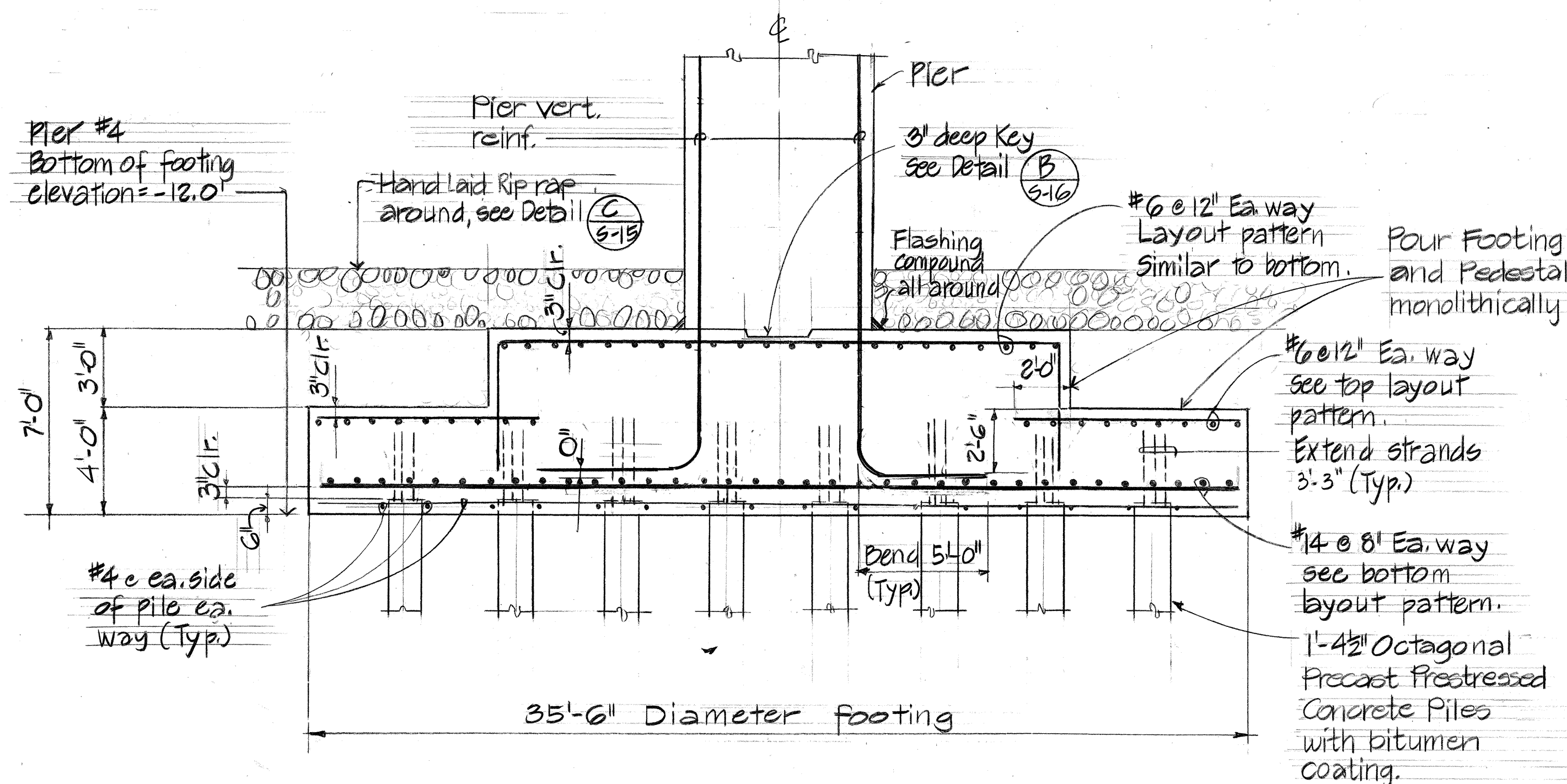
$$\text{Scale: } \|B\| = \|-0\|$$


PIER #5 FOOTING PLAN

$$bca \in \mathcal{V}_8 = \mathcal{V}_0$$


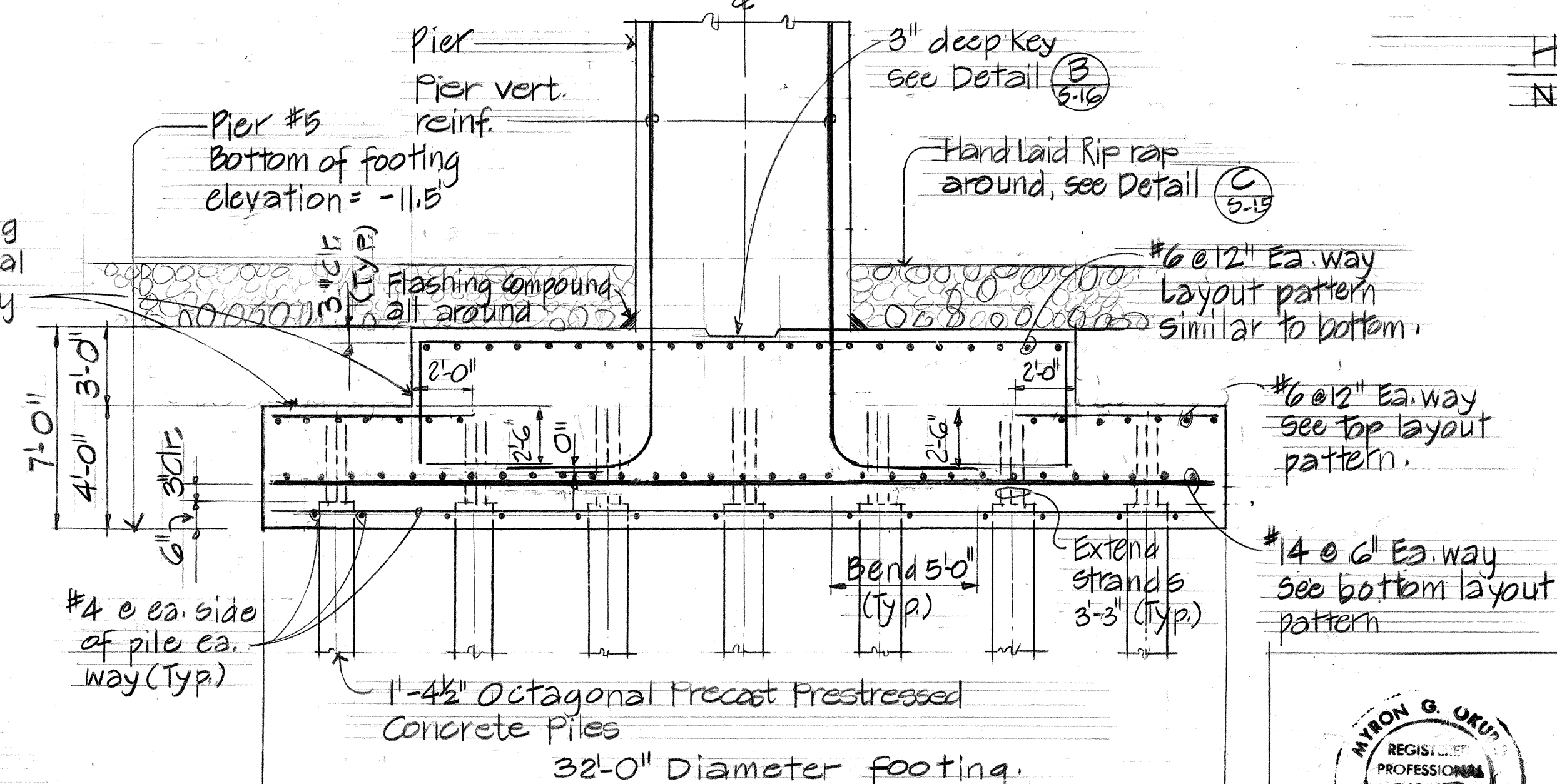
HAND LAD RIP RAP DETAIL
N.T.S.

C
S-15



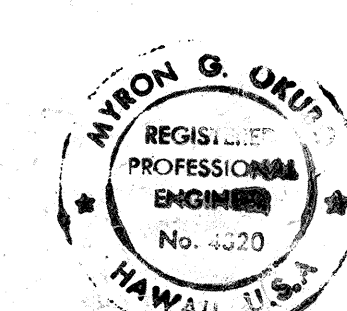
PIER #4 FOOTING - SECTION

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



PIER #5 FOOTING - SECTION

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

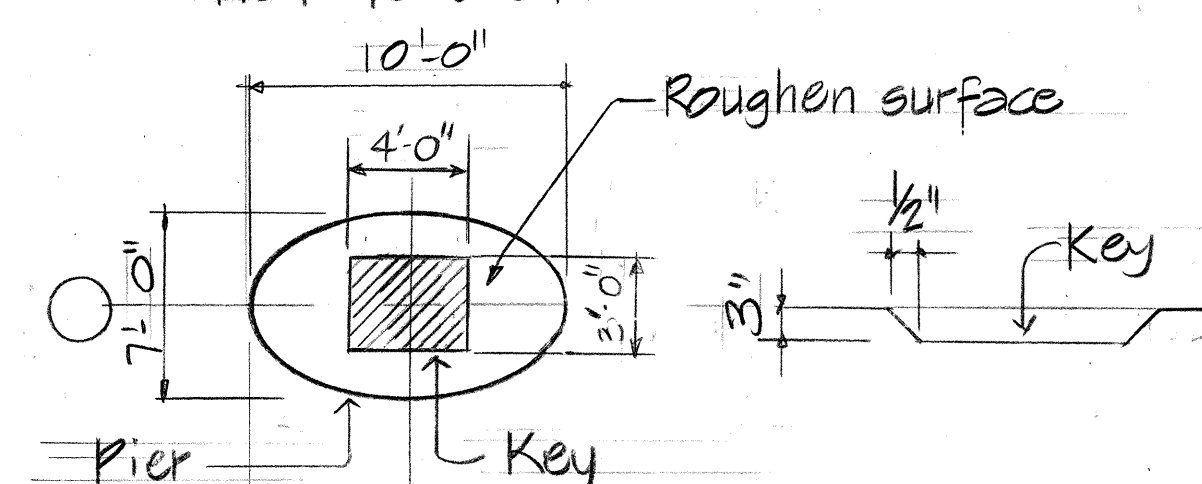
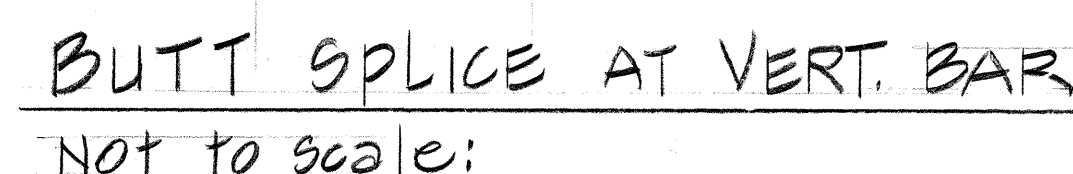
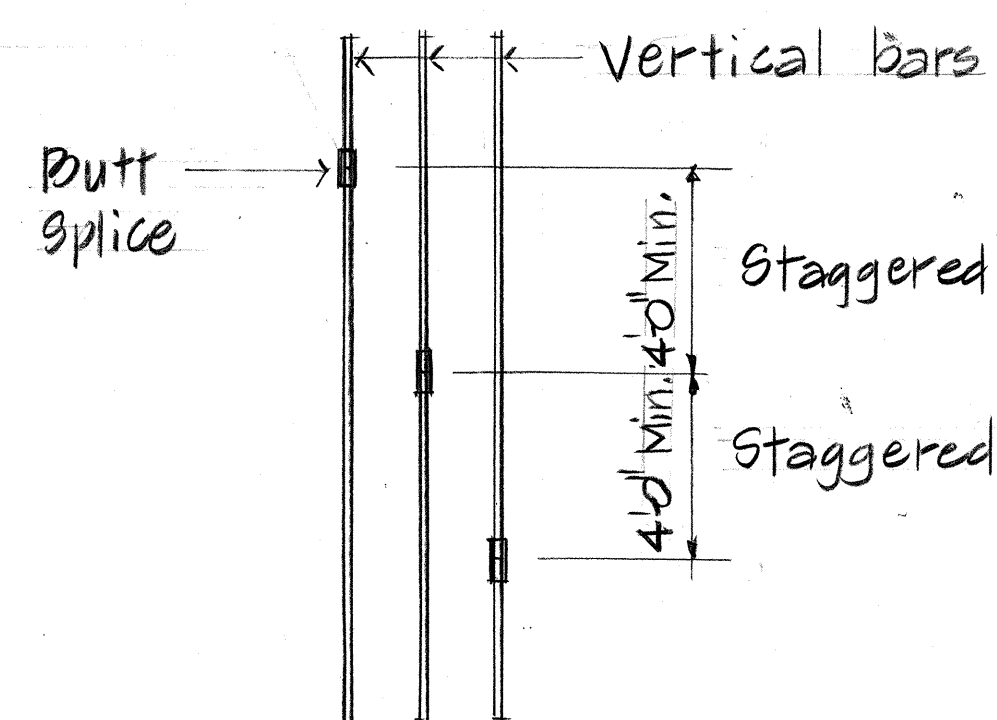


THIS WORK WAS PREPARED BY _____
UNDER MY SUPERVISION _____
Myron Okubo
Signature _____

DATE	REVISION
STATE OF HAWAII DEPARTMENT OF TRANSPORTATION LAND TRANSPORTATION FACILITIES DIVISION <u>PIER #4 & PIER #5 FOOTING</u> <u>PLAN AND SECTION</u> HANAMAULU VIADUCT HANAMAULU-AHUKINI CUTOFF ROAD Ahukini Road to Kauai Hardwoods <u>PROJECT NO. F-051-(4)</u> SCALE: AS SHOWN DATE: SEPT., 1984 SHEET NO. 15 OF 34 SHEETS	

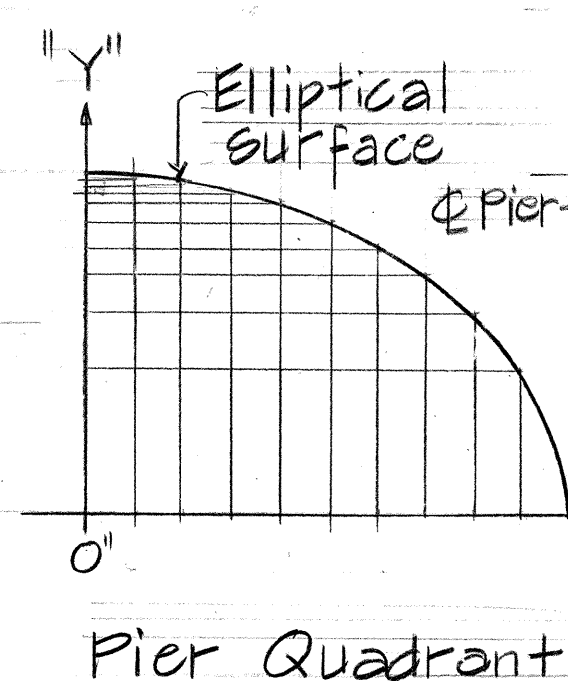
1. Lap splices shall not be used for vertical reinforcing.
Butt splices shall develop not less than 90% of the specified ultimate tensile strength of the bar.
2. All pier ties shall conform to ASTM A615 grade 40.
3. All pier concrete shall have $f'_c = 4500$ psi, see specifications and sheet S-5.
4. All pier cross sections shall be elliptical.
5. All pier vertical reinf. shall conform to ASTM A615 grade 60.
6. Extend and hook all vertical reinf. into pier cap as noted on sheet S-21.
7. Extend vertical reinf. with standard hook as required.
8. See General Notes, Sheet S-2 for exposed reinf.

PIER SCHEDULE				
PIER		TOP OF PIER ELEV.	VERTICAL REINF.	
NO	STATION		TOP	BOTTOM
1	102+00	68.26	60-#18	70-#18
2	103+80	69.08	80-#18	80-#18
3	105+60	63.47	60-#18	80-#18
4	107+40	63.43	60-#18	80-#18
5	109+20	64.96	80-#18	80-#18
6	111+00	68.06	60-#18	60-#18



TYPICAL KEY DETAIL
Not to scale:

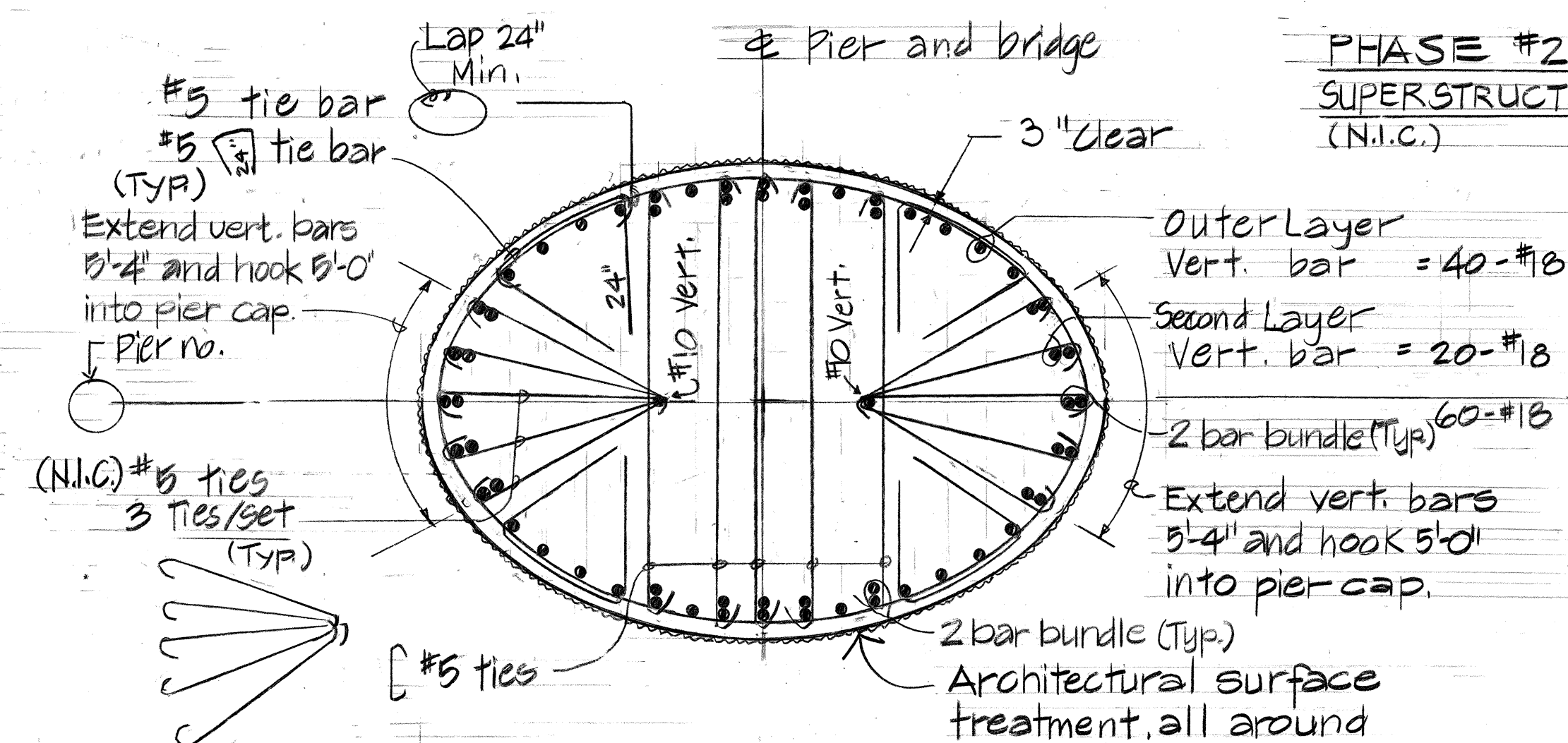
<u>Pier Coordinates</u>	
<u>From Center</u>	
<u>"X"</u>	<u>"Y"</u>
0"	42"
6"	41.8"
12"	41.2"
18"	40.1"
24"	38.8"
30"	36.4"
36"	33.6"
42"	30.0"
48"	25.2"
54"	18.3"
60"	0.0"



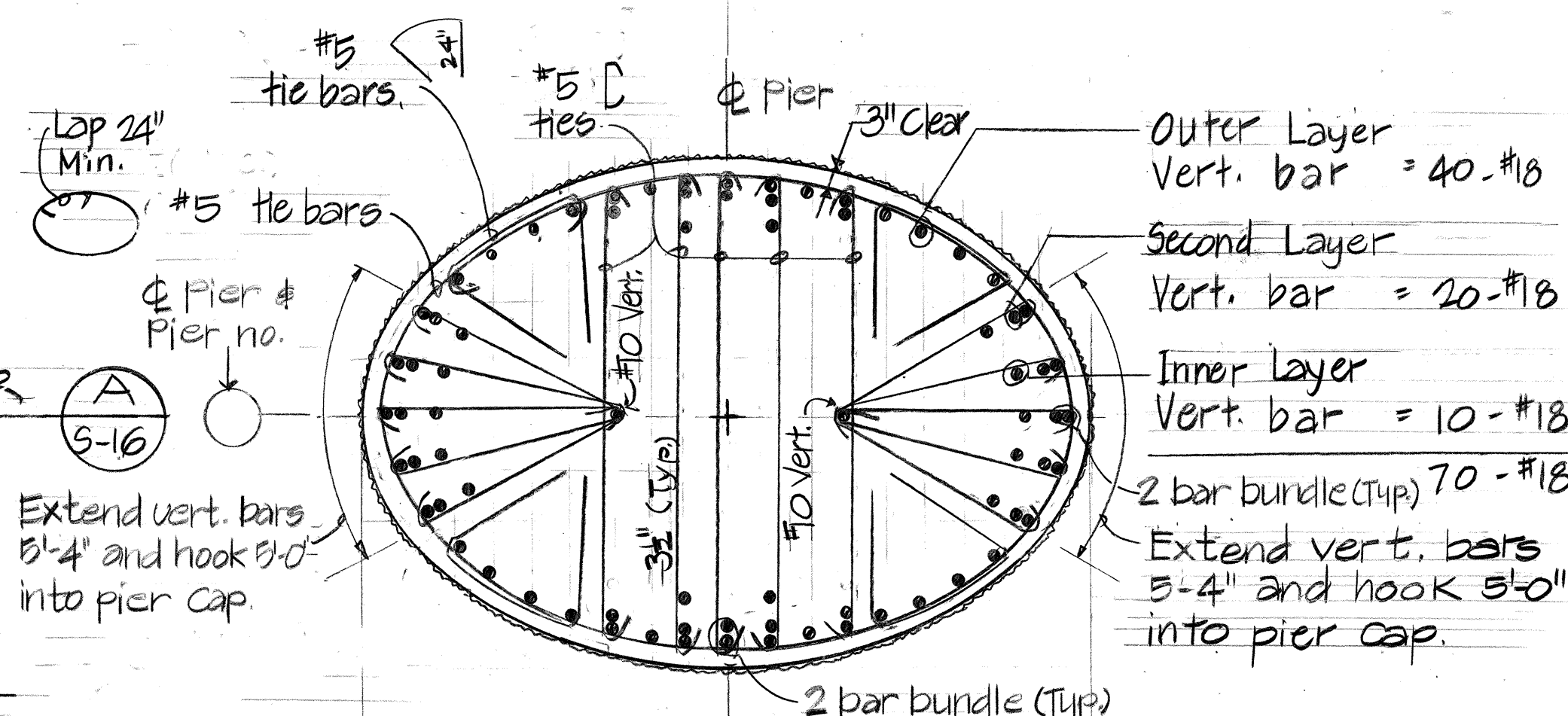
Dimensions do not include thickness of architectural surface treatment.

PIER SHAPE DETAIL

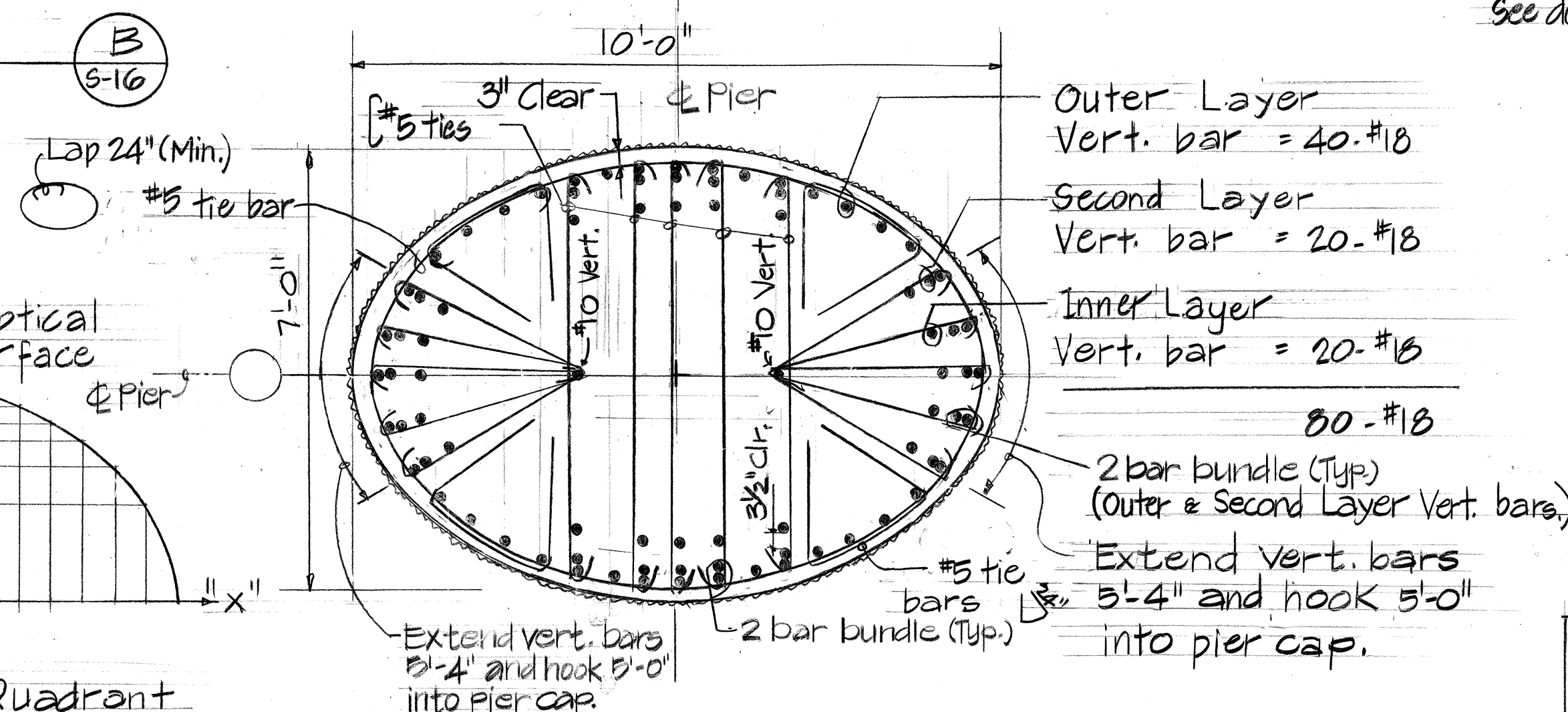
Not to scale:



PIER SECTION - ^{PIER FACE} 60-#8 VERT

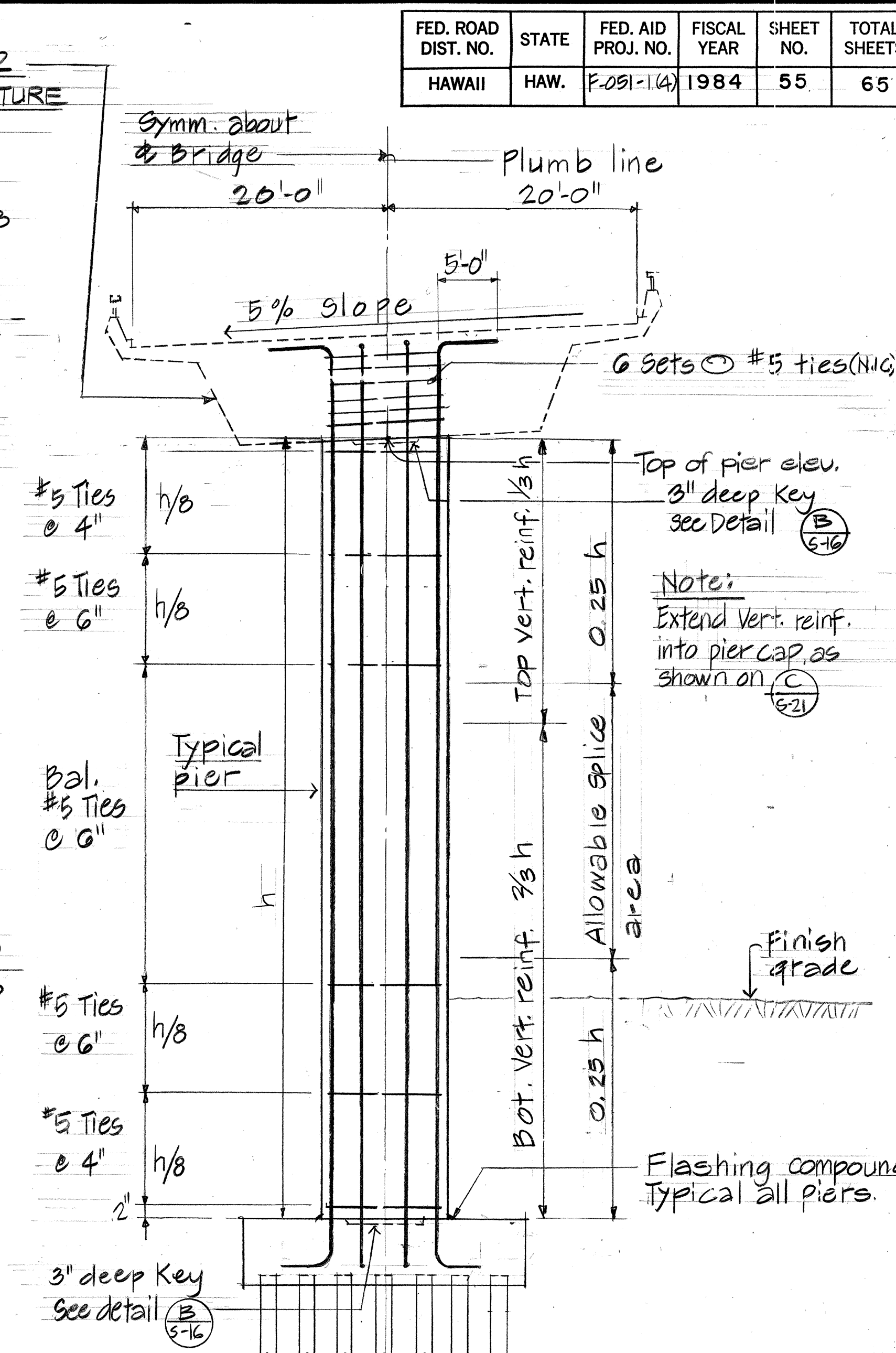


PIER SECTION - 70-#18 VERT.



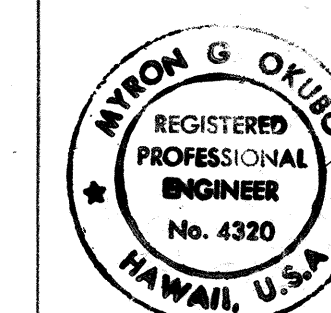
PIER SECTION - 80 - #18 VERT

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



TYPICAL PIER DETAIL (E)
Not to scale: (S16)

1-25-85	Revised Pier shaft tie spacing from 12" to 6" in Detail E/S 16
12/31/84	Revised D/S 16
DATE	REVISION



THIS WORK WAS PREPARED BY ME
UNDER MY SUPERVISION

Myron Okubo
Signature

STATE OF HAWAII
DEPARTMENT OF TRANSPORTATION
LAND TRANSPORTATION FACILITIES DIVISION
PIER SCHEDULE, NOTES,
SECTIONS AND DETAILS
HANAMAULU VIADUCT
HANAMAULU-AHUKINI CUTOFF ROAD
Ahukini Road to Kaula Handwinds
PROJECT NO. F-051-1(4)

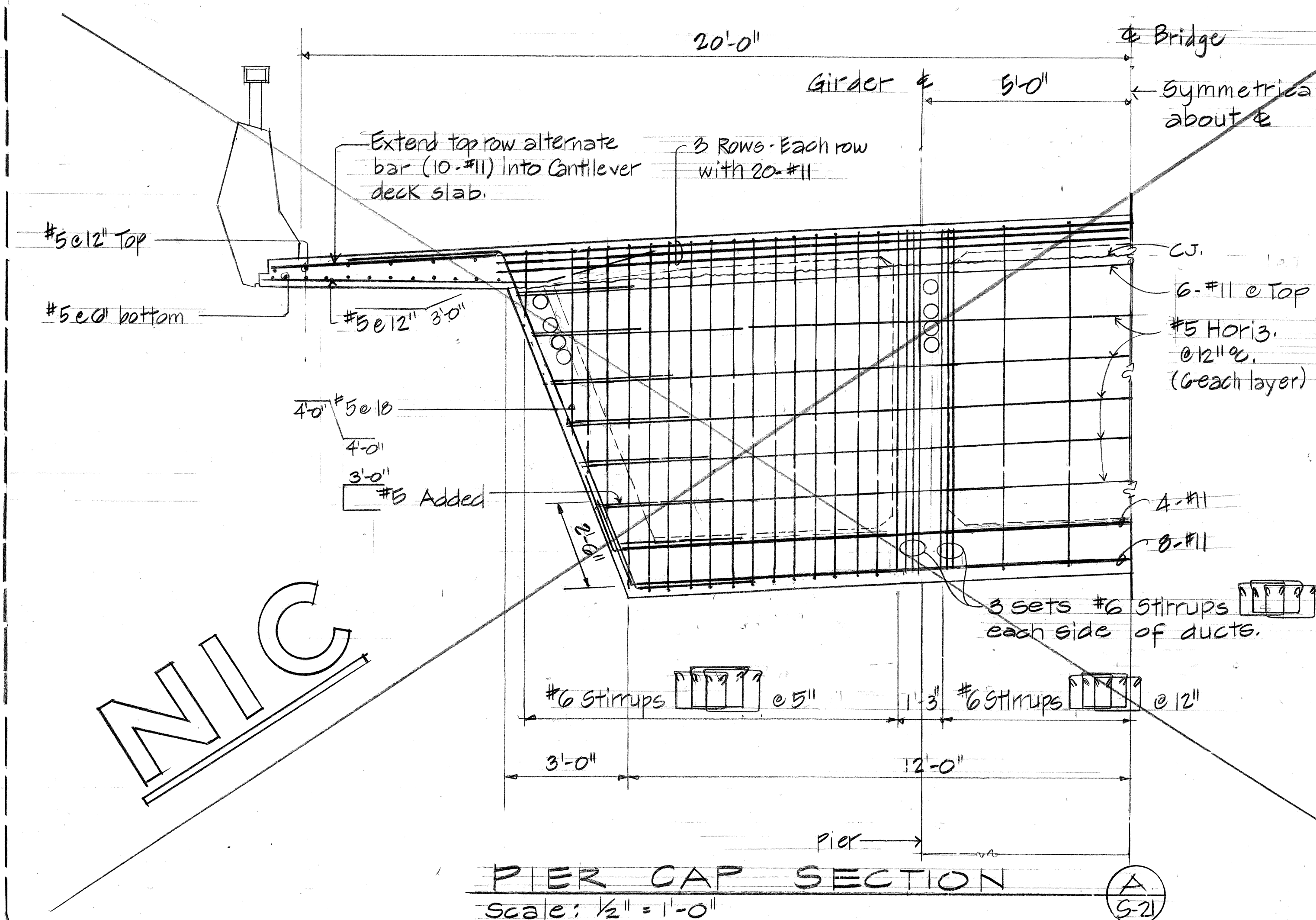
SCALE: AS SHOWN DATE: SEPT., 1984

SHEET No. 5-6 OF 54 SHEETS

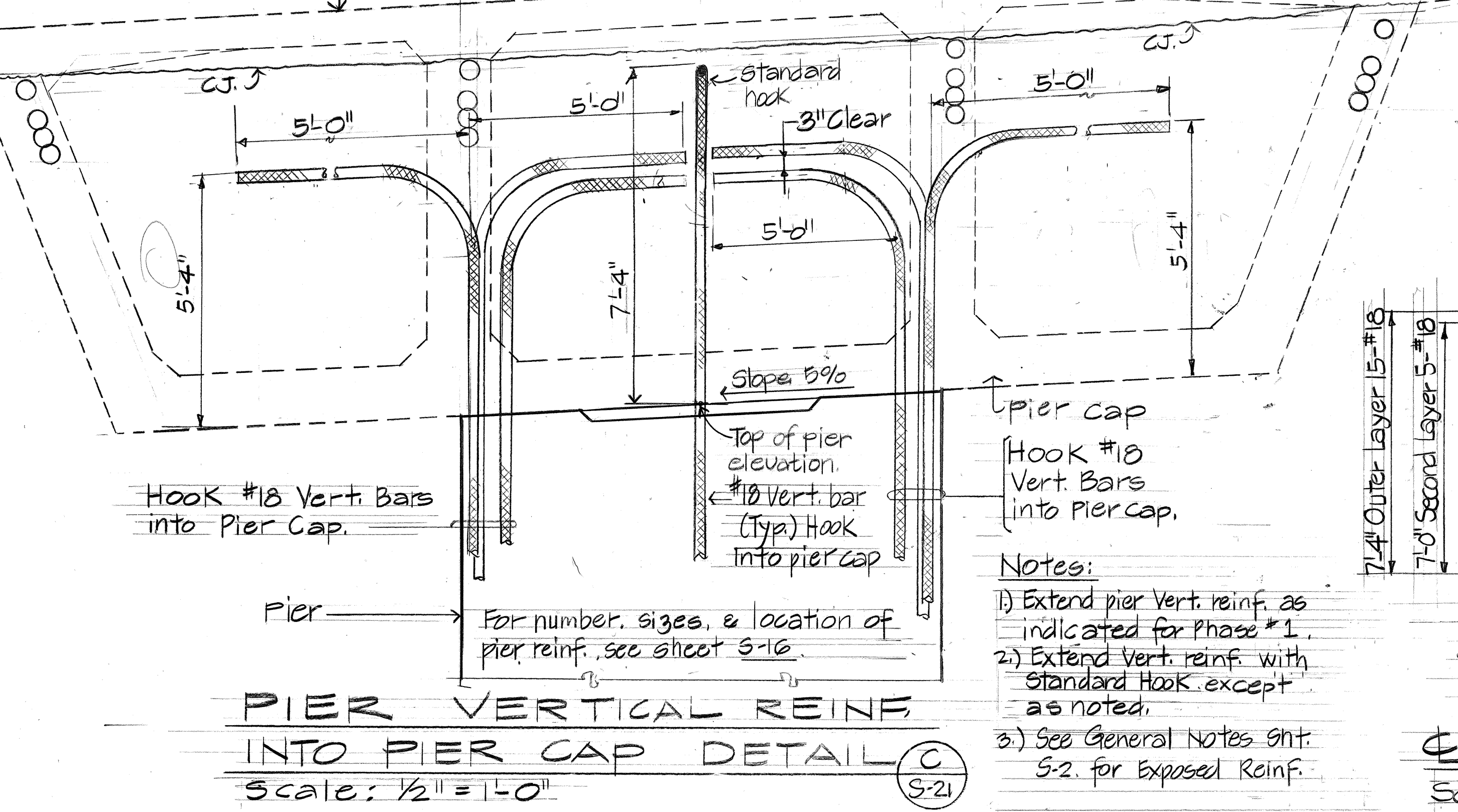
FED. ROAD DIST. NO.	STATE	FED. AID PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEET
HAWAII	HAW.	F-091-1(4)	1984	55	65

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

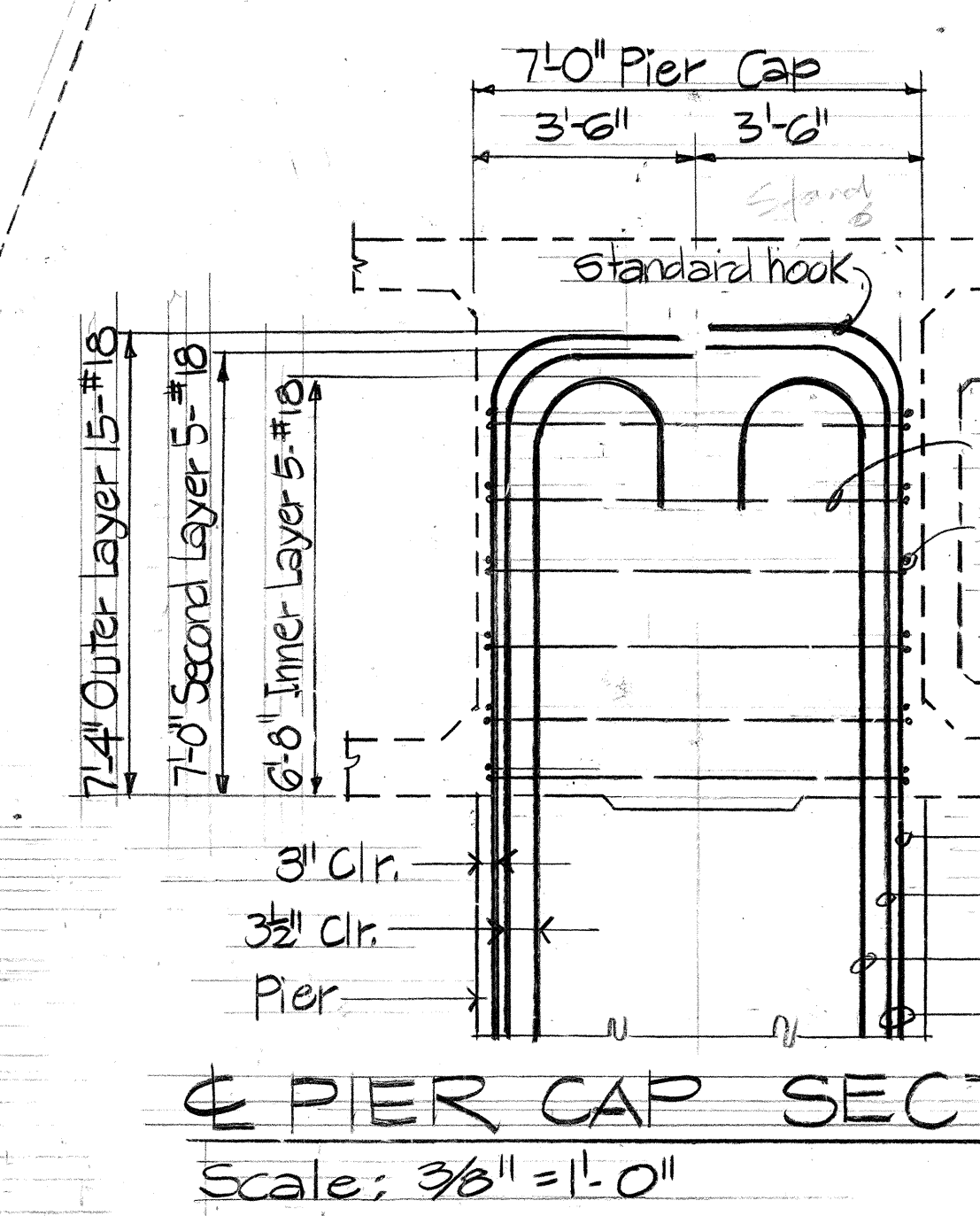
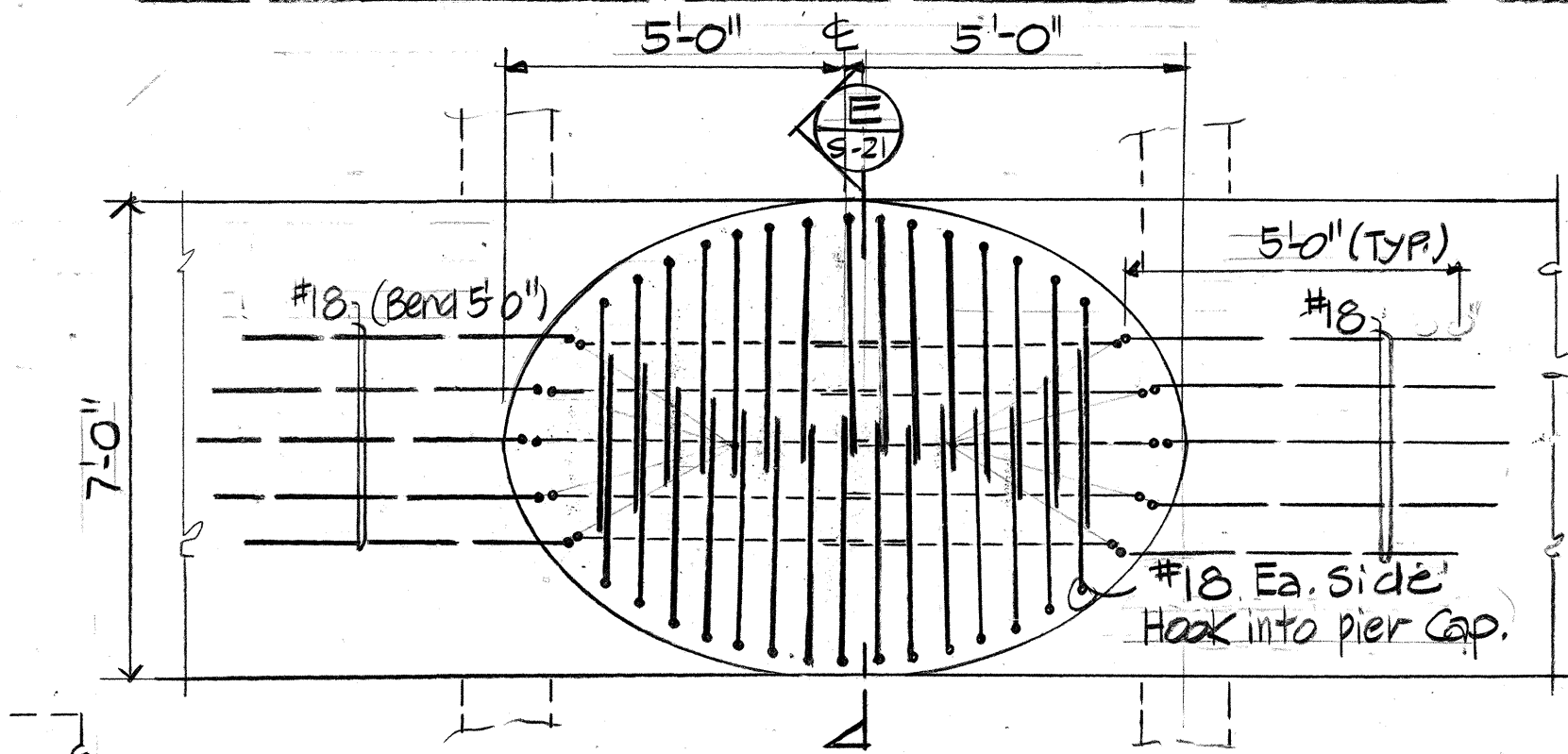
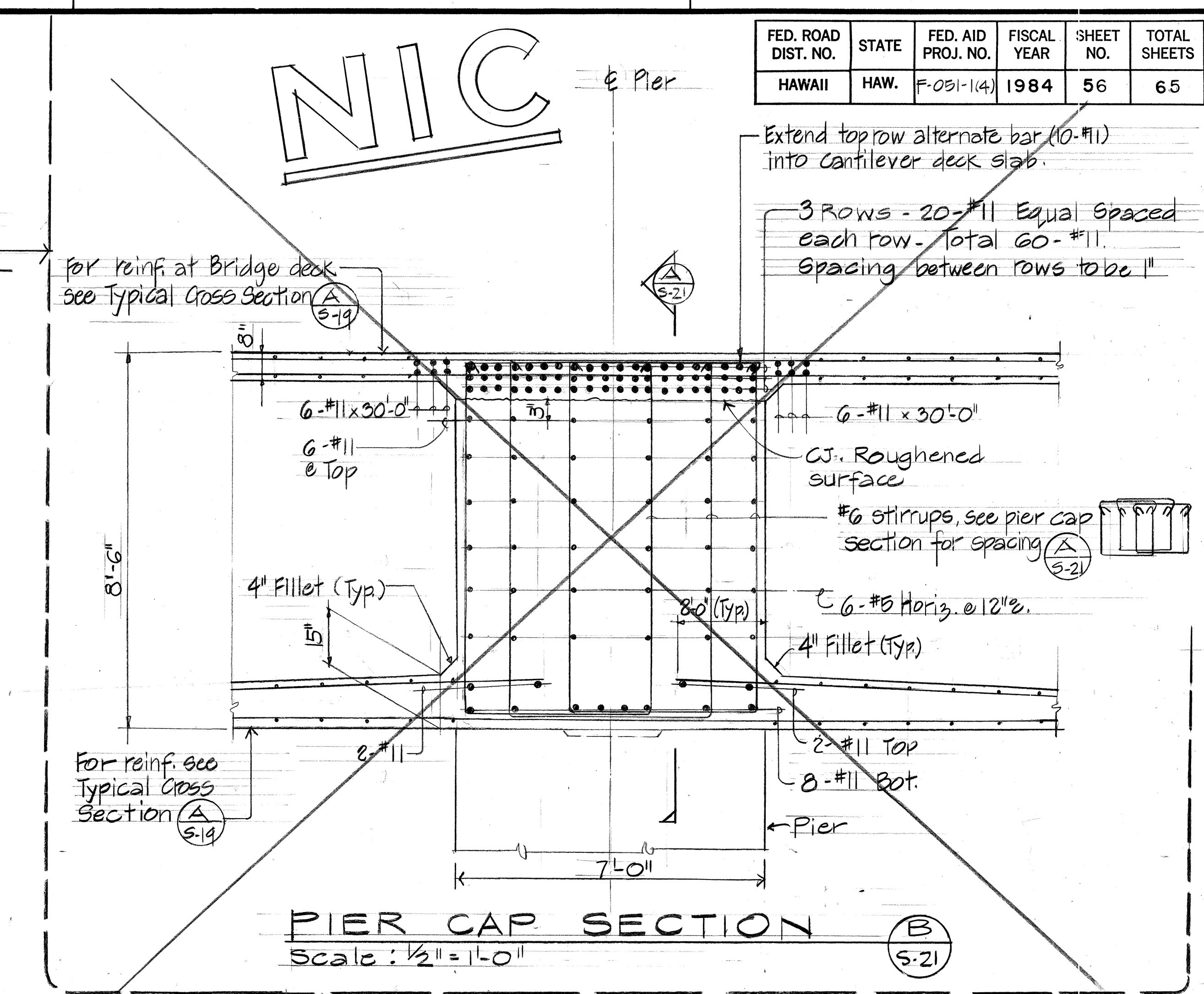
FED. ROAD DIST. NO.	STATE	FED. AID PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
HAWAII	HAW.	F-051-1(4)	1984	56	65



PHASE #2 (N.I.C.)
SUPERSTRUCTURE



- Notes:
- 1) Extend pier Vert. reinf. as indicated for Phase #1.
 - 2) Extend vert. reinf. with Standard Hook except as noted.
 - 3) See General Notes ght. S-2 for Exposed Reinf.



PIER VERTICAL REINF INTO PIER CAP PLAN
Scale: 3/8" = 1'-0"

REGISTERED PROFESSIONAL ENGINEER
No. 4320
HAWAII, U.S.A.
Myron Okada
Signature

DATE	REVISION
12/31/84	Details D/S-21 & E/S-21 Added.

STATE OF HAWAII
DEPARTMENT OF TRANSPORTATION
LAND TRANSPORTATION FACILITIES DIVISION
PIER CAP SECTIONS

HANAMAULU VIADUCT
HANAMAULU-AHUKINI CUTOFF ROAD
Ahukini Road to Kauai Hardwoods
PROJECT NO. F-051-1(4)
SCALE: 1/2" = 1'-0" DATE: SEPT, 1984
SHEET NO. S-21 OF S-41 SHEETS

Swaged fitting and stud.

5x6" 3/8" 1 1/2" 3/8"

2" P.V.C. pipe in concrete area

1/4" Elastomeric bearing pad

3/4" ϕ cable

1" ϕ x 8" stud (threaded entire length) peen threads.

2 1/4" Expanded polystyrene

1" x 6" steel plate, see Detail

Swaged fitting and stud.

1/4" dia.

5/8"

2 3/4" 1"

6"

Nut

Washer

Washer and nut

C 6-33

LONGITUDINAL HINGE RESTRAINER CABLE UNIT DETAIL

N.T.S.

2-#6 3'-0" Top & Bottom

2" Hole with round bar, threaded each end

1/2" A325 or 1/3" prestressing steel

#4 ties @ 6"

one nut and one jam nut

1" x 6" x 6" steel plate

2 1/2" Expanded polystyrene

one nut and one jam nut

washer

1" x 6" x 6" steel plate

4" Elastomeric bearing pad

NIC

EQUALIZING BOLT DETAIL

FED. ROAD DIST. NO.	STATE	FED. AID PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
HAWAII	HAW.	F-051-14	1984	57	65

Two technical drawings of a Restraint Anchor Plate Detail. The left drawing is a plan view showing a 6x1 inch thick plate with 2x6 inch restraints and 1/4 inch expanded polystyrene. The right drawing is a section view showing the plate, restraints, and polystyrene. Both drawings are crossed out with a large X.

Left Drawing (Plan View):

- Dimensions: 6" x 1" thick plate, 2" x 6" restraints, 1/4" expanded polystyrene.
- Labels: 6" x 1" thick plate, 2" x 6" restraints, 1/4" expanded polystyrene.

Right Drawing (Section View):

- Dimensions: 2" x 6" restraints, 1/4" expanded polystyrene, 1" x 6" restrainer anchor plate, washer and nut.
- Labels: 2" x 6" restraints, 1/4" expanded polystyrene, 1" x 6" restrainer anchor plate, washer and nut.

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

Scale: 1" = 1'-0"

Notes:

1. Grease restrainer cables and encase cables within 2" P.V.C. ducts. Fill P.V.C. duct with grease under pressure. All joints in P.V.C. shall be sealed water tight as approved by the Engineer.
2. Torque nuts so that steel plates bear snugly against polystyrene and that gap provided by polystyrene is maintained.
3. Steel parts for longitudinal Restrainers and Equalizing Bolts shall be galvanized.
4. Contractor shall submit shop drawings for Vertical Restrainers.
5. Vertical Restrainers are considered incidental to Concrete in Hanamantulu Viaduct.

[illegible]

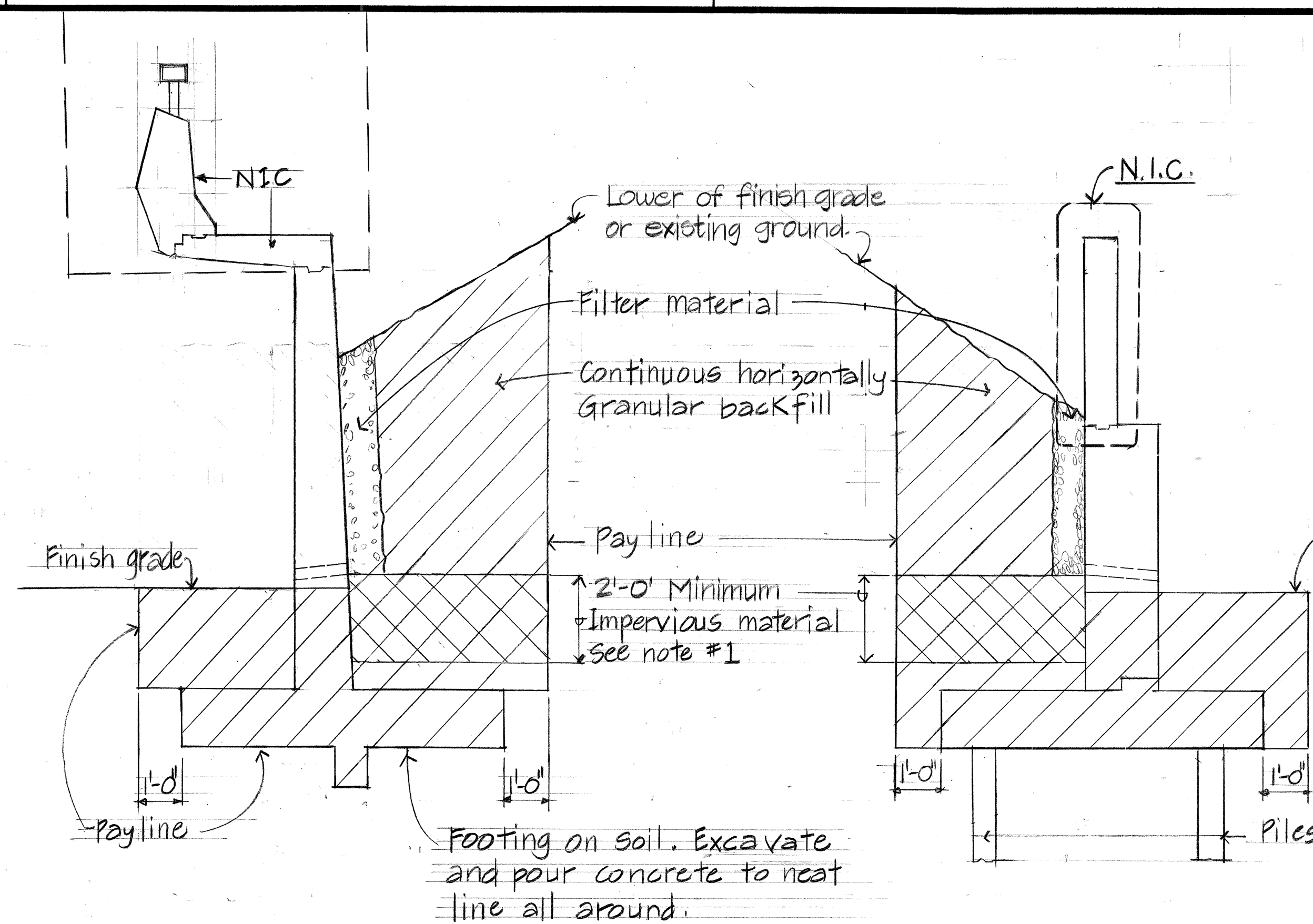
Note: All steel parts shall be galvanized



DATE	REVISION
STATE OF HAWAII DEPARTMENT OF TRANSPORTATION LAND TRANSPORTATION FACILITIES DIVISION <u>RESTRAINER DETAILS</u>	
<u>HANAMAULU VIADUCT</u> <u>HANAMAULU-AHUKINI CUTOFF ROAD</u> <u>Ahukini Road to Kauai Hardwoods</u> <u>PROJECT NO. F-05 I-I(4)</u>	
SCALE: AS SHOWN	DATE: SEPT., 1984
SHEET NO. 5-33 OF 5-41 SHEETS	

NOTES:

- Impervious material as selected by the Engineer shall be incidental to structure excavation. The sub-grade 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 when used in embankment area.
- Hatched areas denotes limits of structure excavation pay line. All other excavation shall be roadway excavation except as otherwise noted.

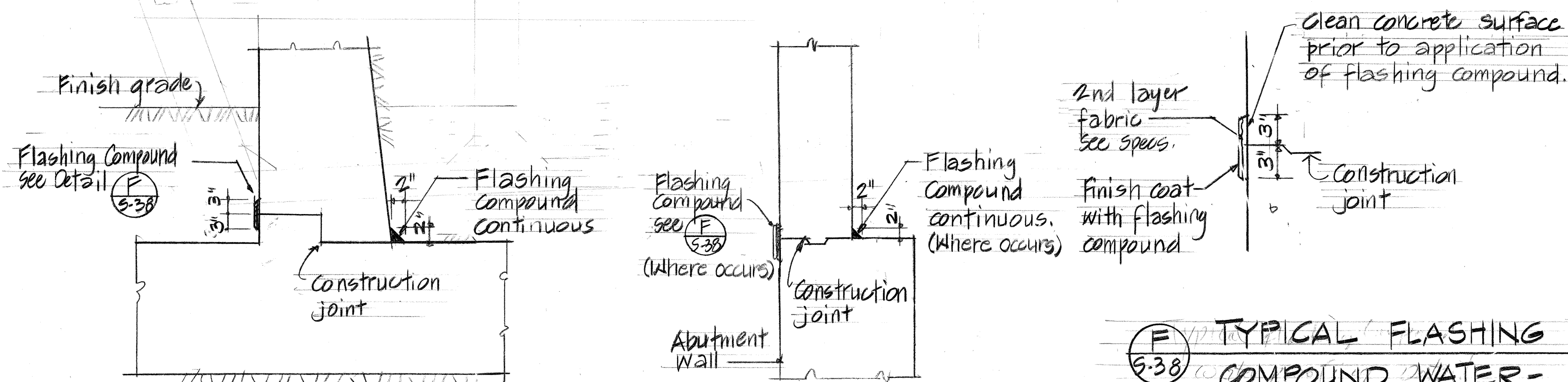


AT RETAINING WALL

AT ABUTMENT WALL

STRUCTURE EXCAVATION PAYLINE AND BACK FILL DETAILS

N.T.S.



D FLASHING COMPOUND @ WALL
FOOTING CONSTRUCTION JOINT

N.T.S.

E FLASHING COMPOUND @
WALL CONSTRUCTION JOINT

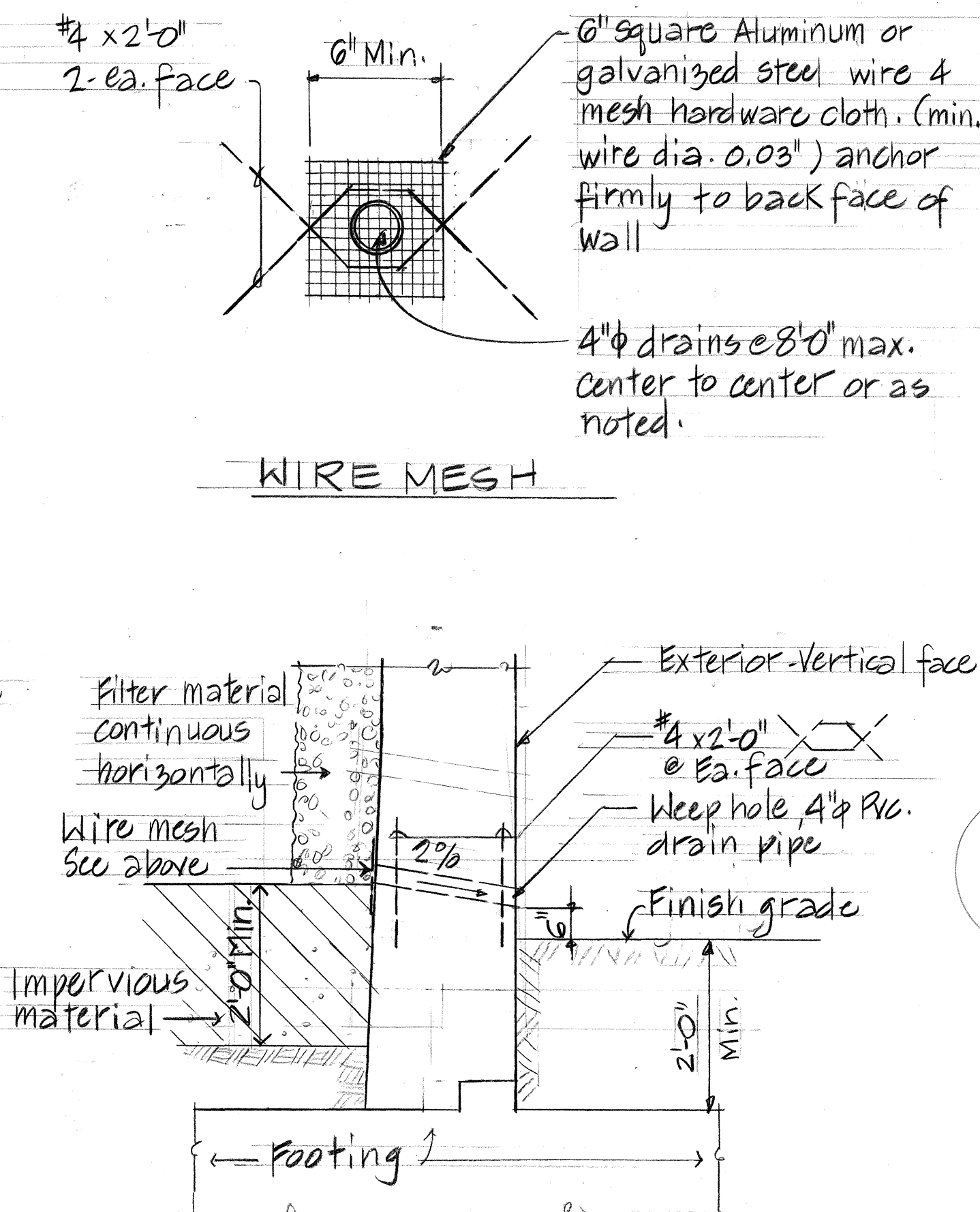
N.T.S.

F TYPICAL FLASHING
COMPOUND WATER-
PROOFING DETAIL

N.T.S.

G TYPICAL DETAIL
JOINT SEALER @
EXPANSION JOINT

N.T.S.

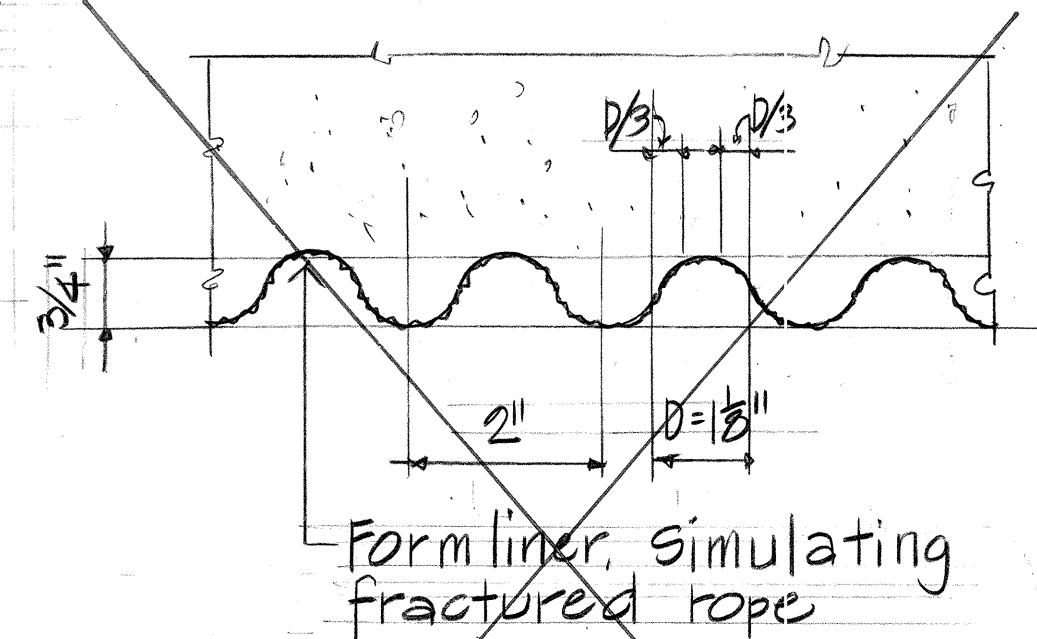


WEEP HOLE DETAIL

N.T.S.

5-38

FED. ROAD DIST. NO.	STATE	FED. AID PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
HAWAII	HAW.	F051-1(4)	1984	59	65

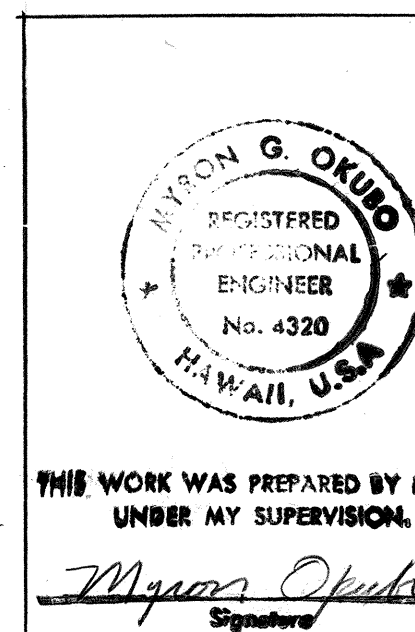


FRACTURED ROPE
ARCHITECTURAL SURFACE
TREATMENT DETAIL

No scale

Deleted by Contract
Change Order No. 2.

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

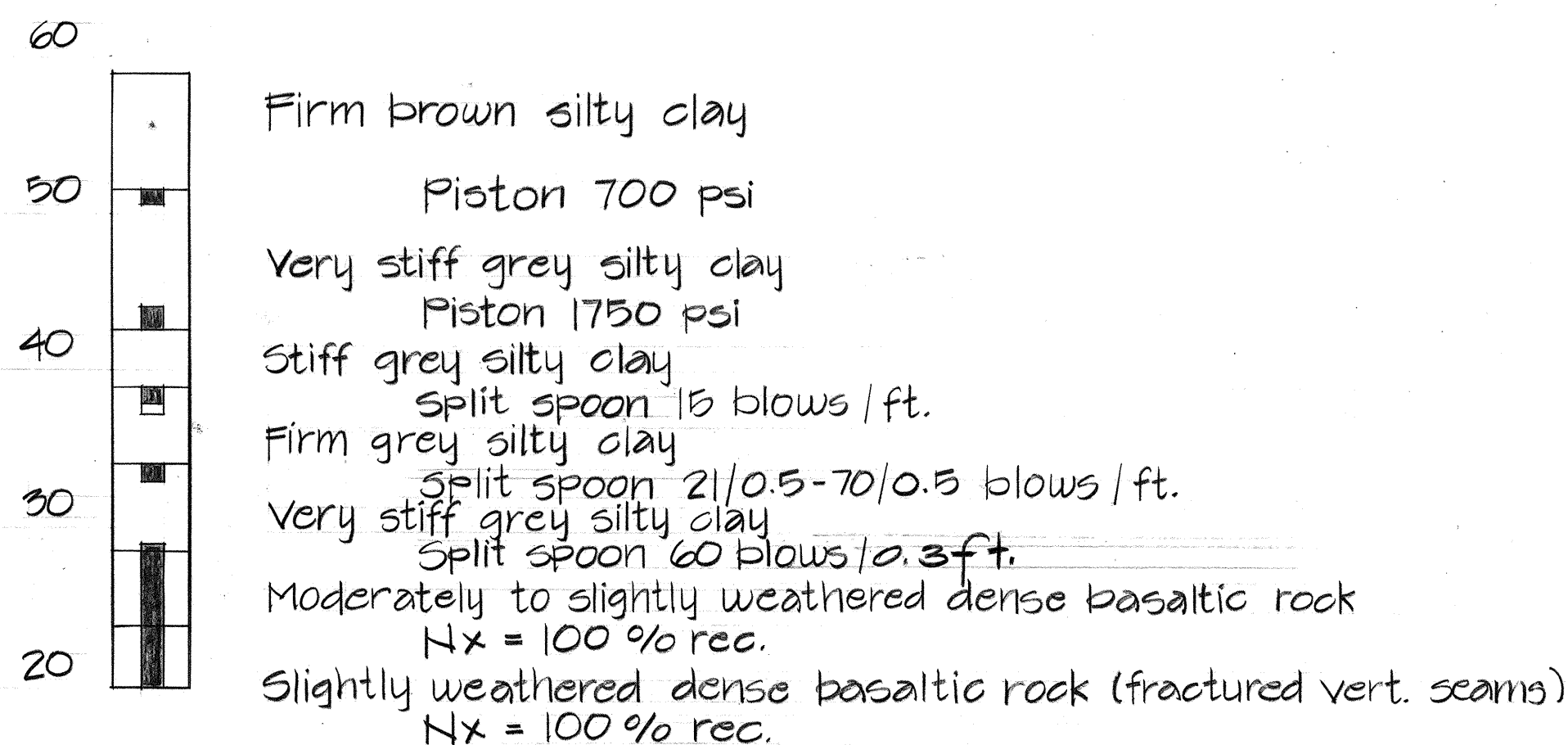


THIS WORK WAS PREPARED BY ME OR
UNDER MY SUPERVISION.
M. G. Okubo
Signature

DATE	REVISION
STATE OF HAWAII DEPARTMENT OF TRANSPORTATION LAND TRANSPORTATION FACILITIES DIVISION MISCELLANEOUS DETAILS	
HANAMAULU VIADUCT HANAMAULU-AHUKINI CUTOFF ROAD Ahukini Road to Kauai Hardwoods PROJECT NO. F-051-1(4)	
SCALE: AS SHOWN	DATE: SEPT., 1984
SHEET NO. 5-38 OF 5-41 SHEETS	

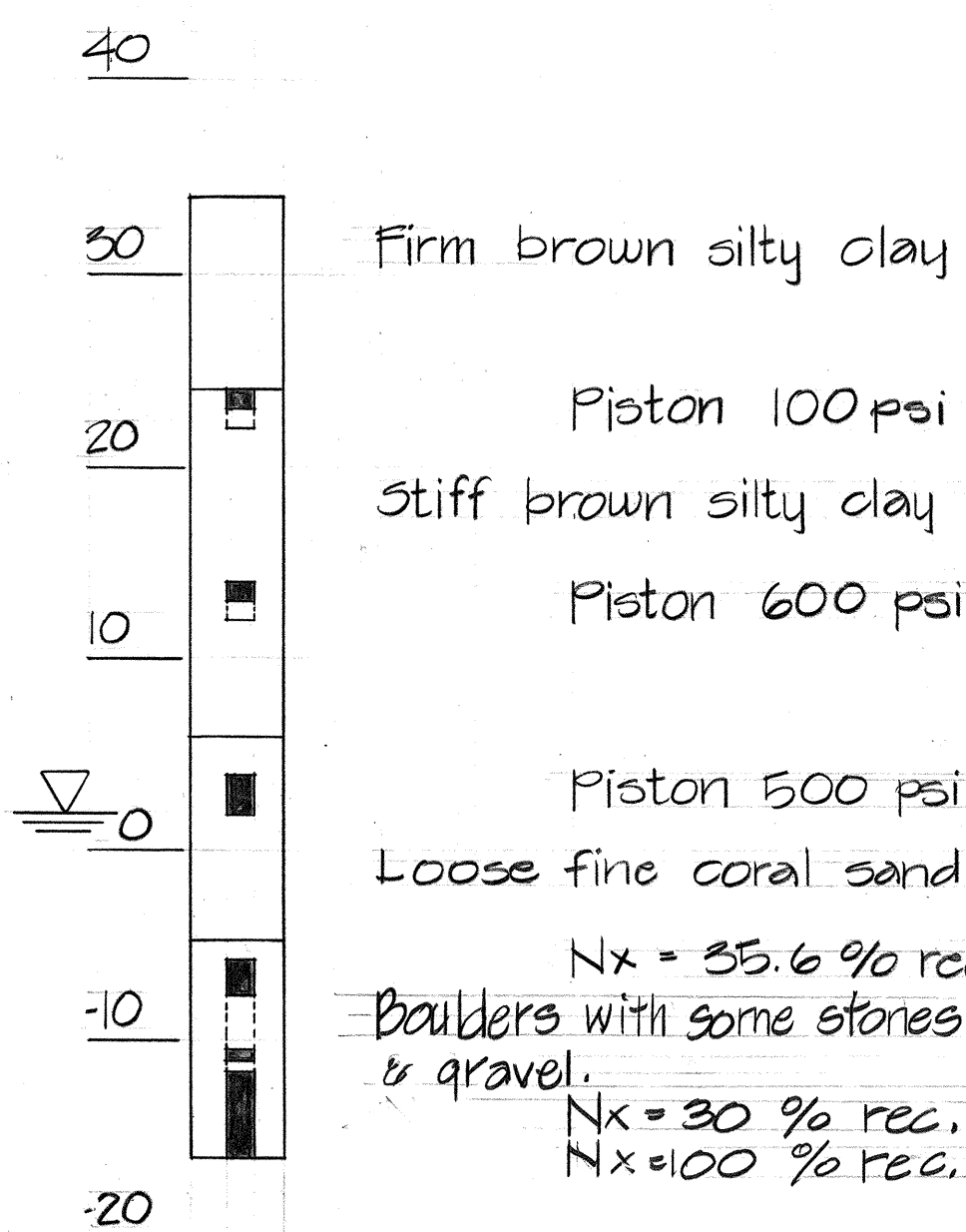
BORING HSB-A1

Elevation 58.93
Station 100+60
Jan. 23, 1981



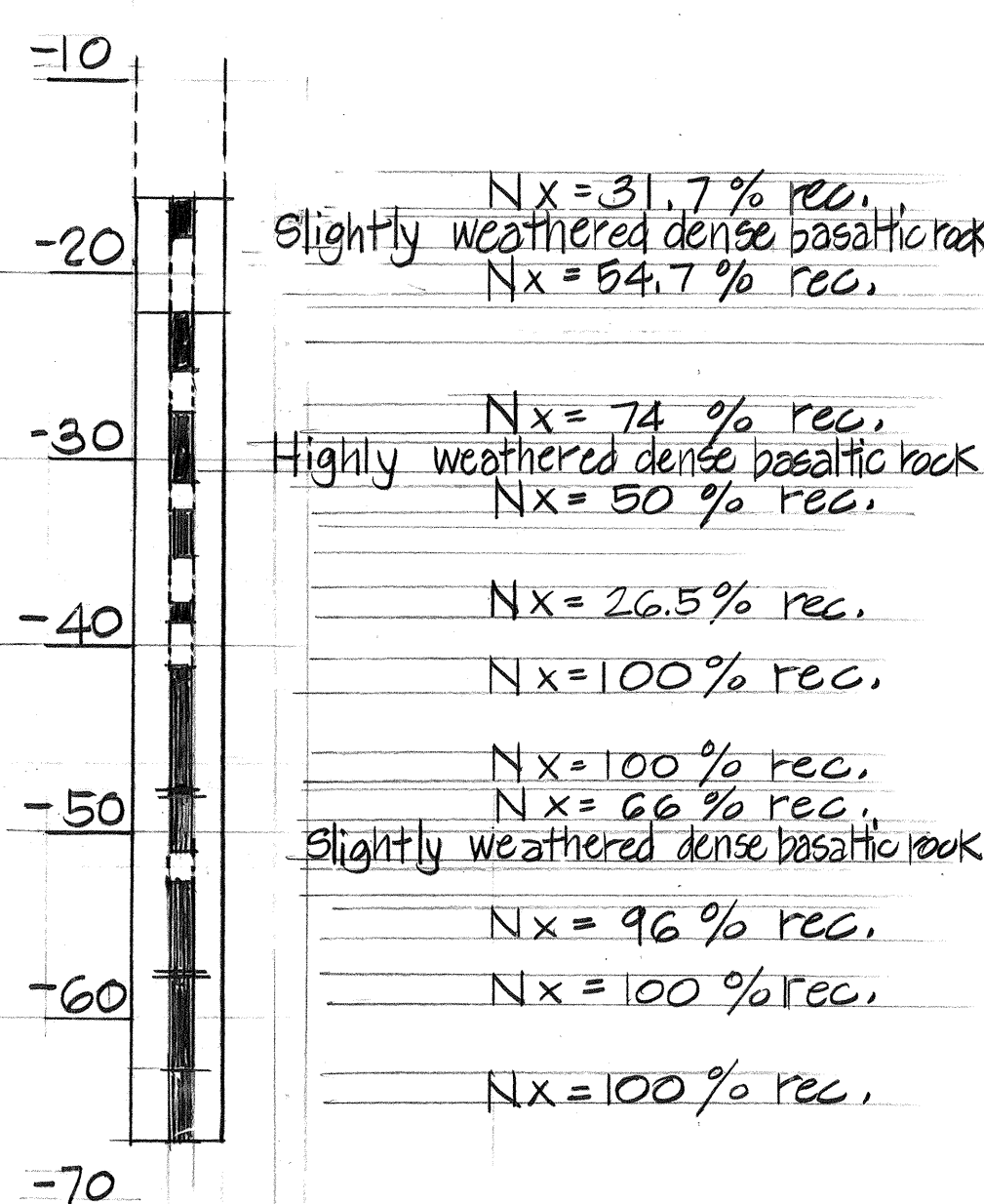
BORING HSB-1

Elevation 33.90
Station 102+00
Jan. 26, 1981



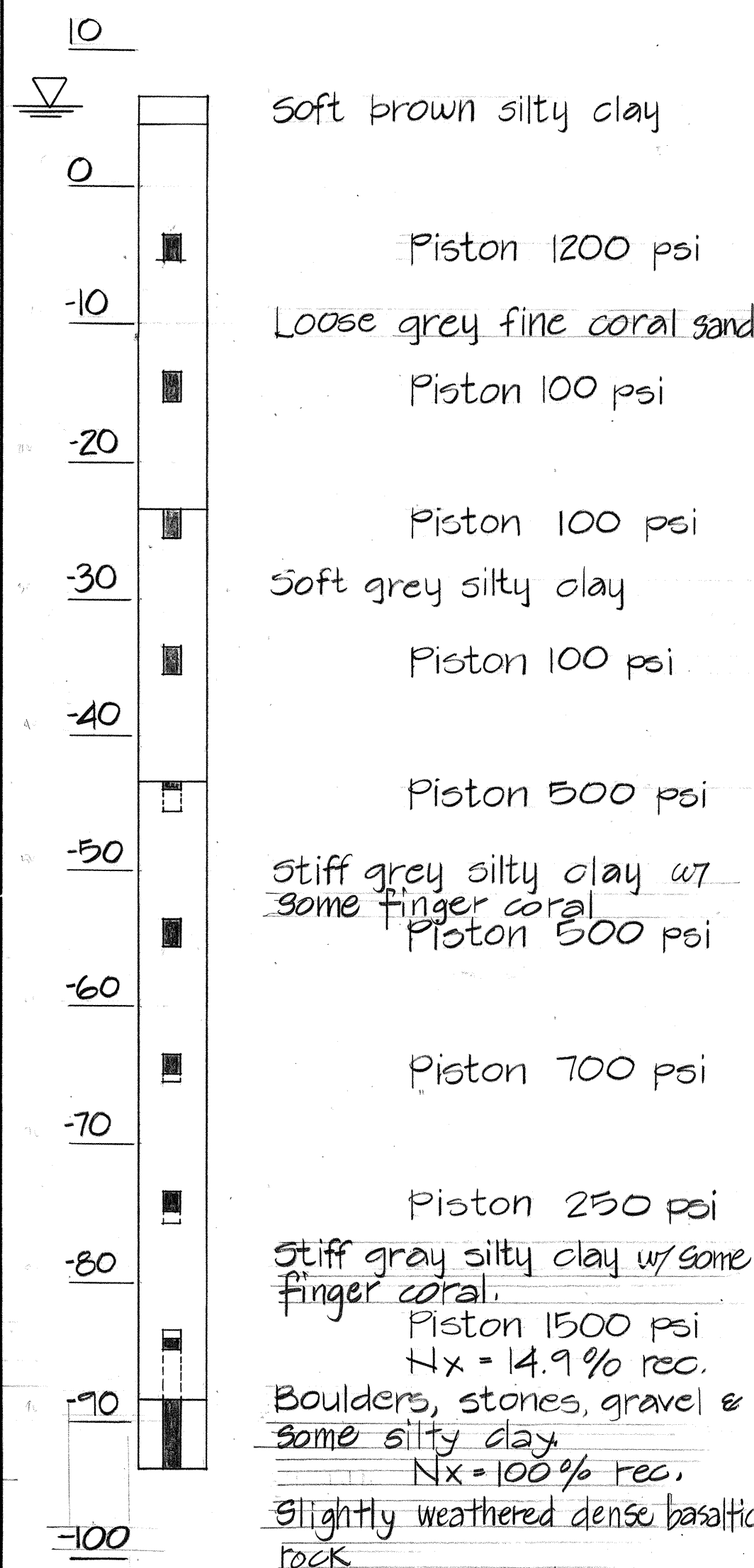
BORING HSB-1A-100

Elevation 34.49
Station 102+00
Aug. 29, 1982 (Proj. No. DP-051-1(6))
V = 6.99



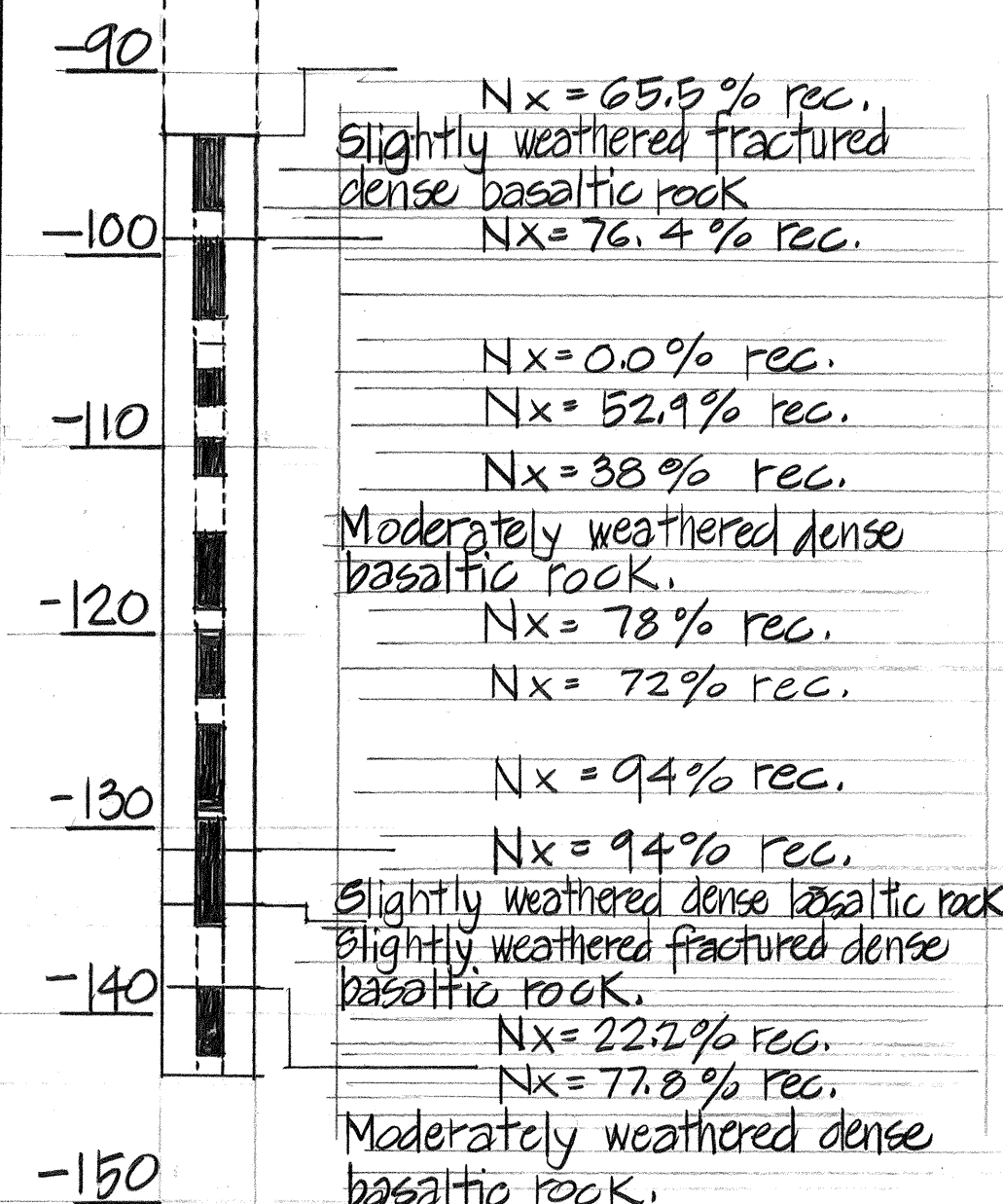
BORING HSB-2

Elevation 6.48
Station 103+80
Jan. 29, 1981



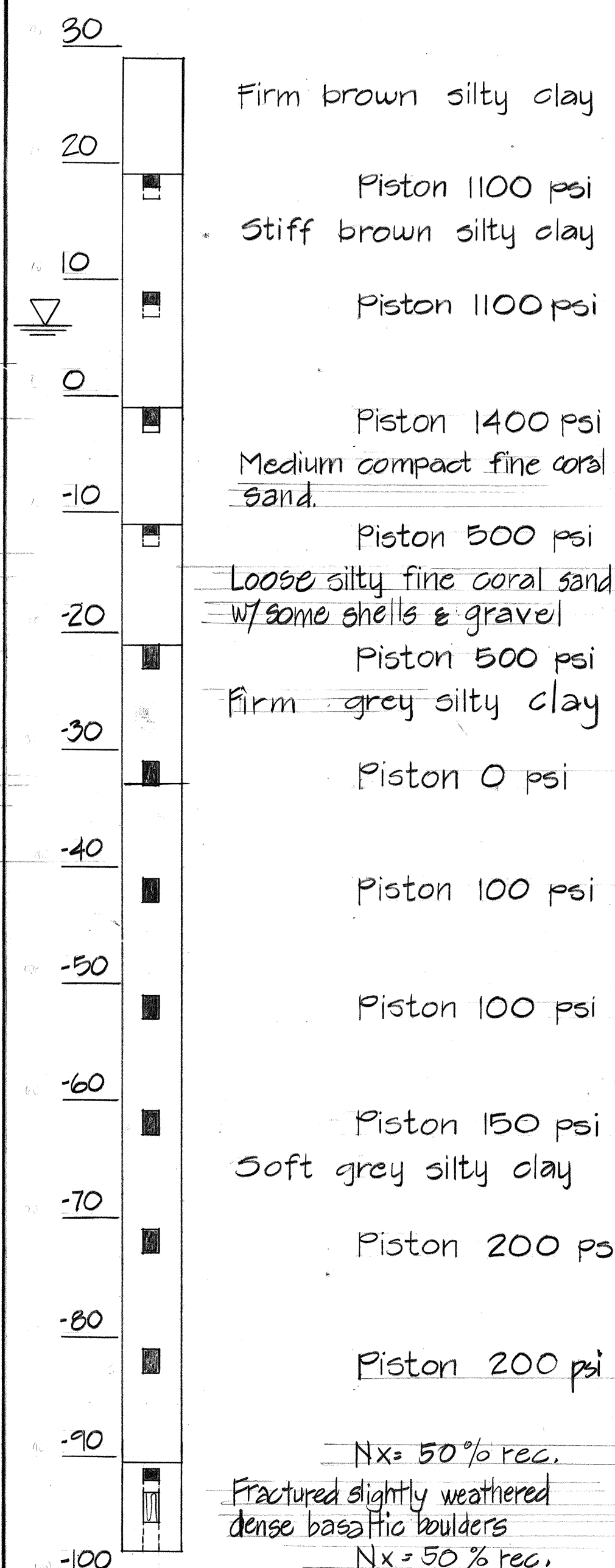
BORING HSB-2A-150

Elevation 7.40
Station 103+80
Aug. 25, 1982 (Proj. No. DP-051-1(6))
V = 4.70



BORING HSB-3

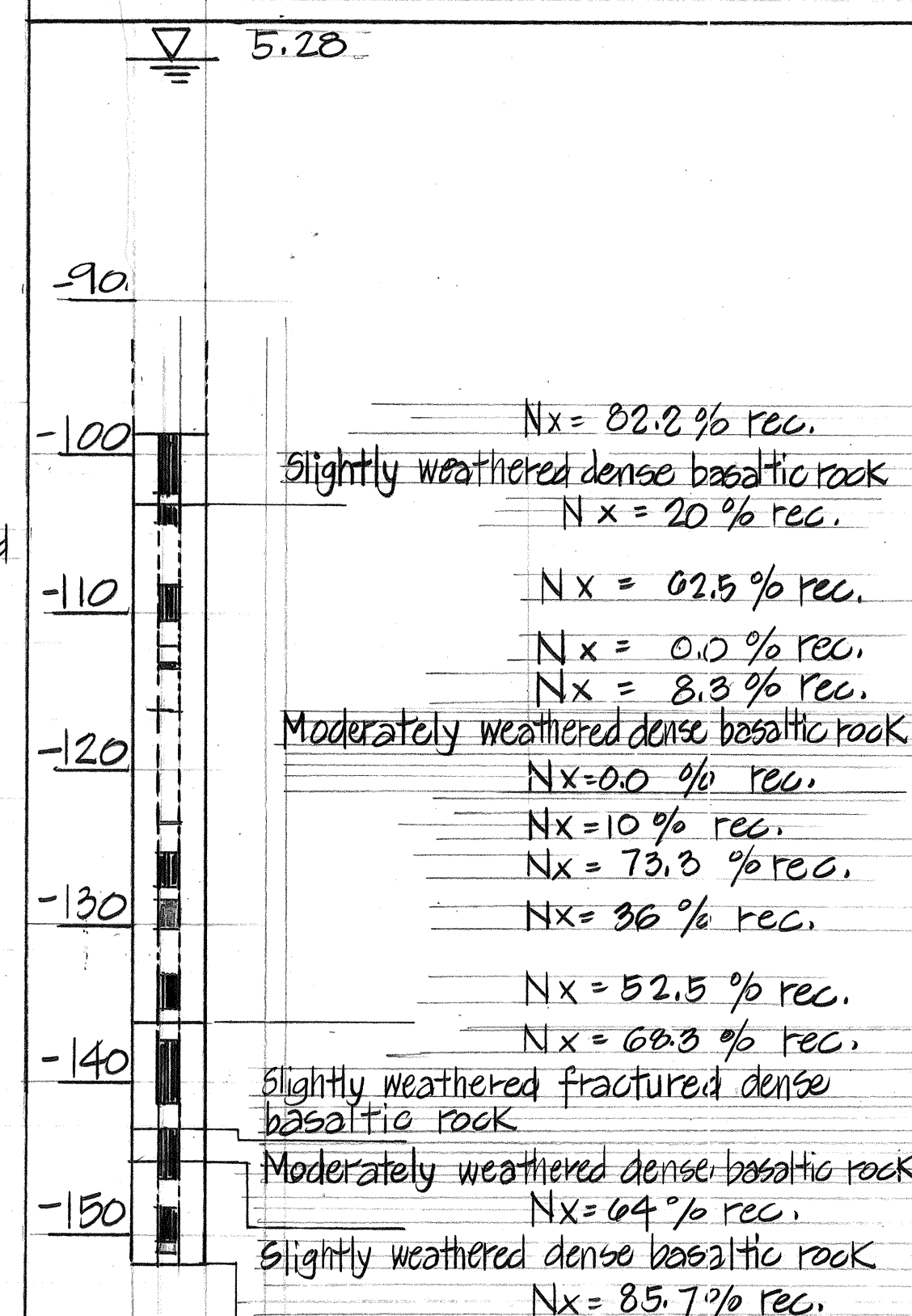
Elevation 28.94
Station 105+60
Jan. 28, 1981



FED. ROAD DIST. NO.	STATE	FED. AID PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
HAWAII	HAW.	F-051-1(4)	1984	62	65

BORING HSB-3A-180

Elevation 28.78
Station 105+60
Aug. 18, 1982 (Proj. No. DP-051-1(6))
V = 5.28



DATE	REVISION

STATE OF HAWAII
DEPARTMENT OF TRANSPORTATION
LAND TRANSPORTATION FACILITIES DIVISION
**BORING LOGS: HSB-A1,
HSB-1, HSB-2, HSB-3**
HANAMAULU VIADUCT
HANAMAULU-AHUKINI CUTOFF ROAD
Ahukini Road to Kauai Hardwoods
PROJECT NO. F-051-1(4)
SCALE: NONE DATE: SEPT, 1984
SHEET NO. 31 OF 3 SHEETS

DATE	REVISION

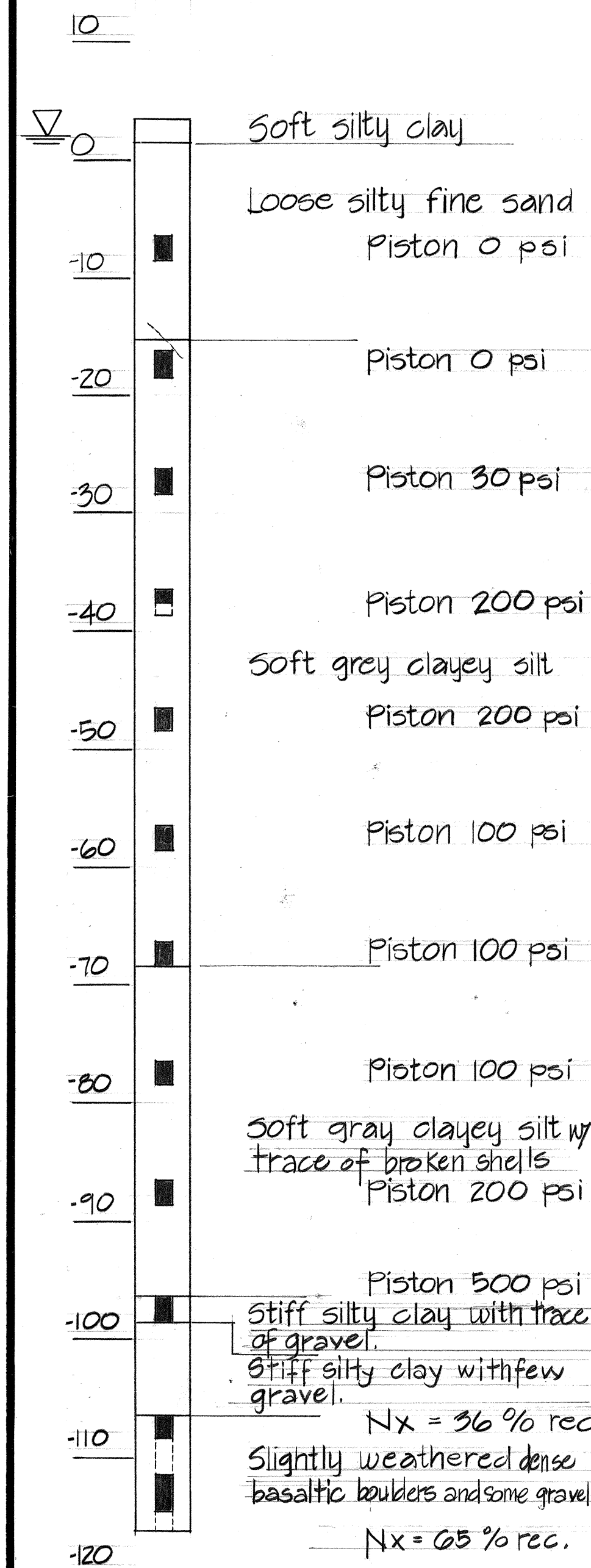
SURVEY PLOTTED BY
DRAWN BY
DESIGNED BY
CHECKED BY
NOTE BOOK
No.

BORING HSB-4

Elevation 3.57
Station 107+40
Jan. 21, 1981

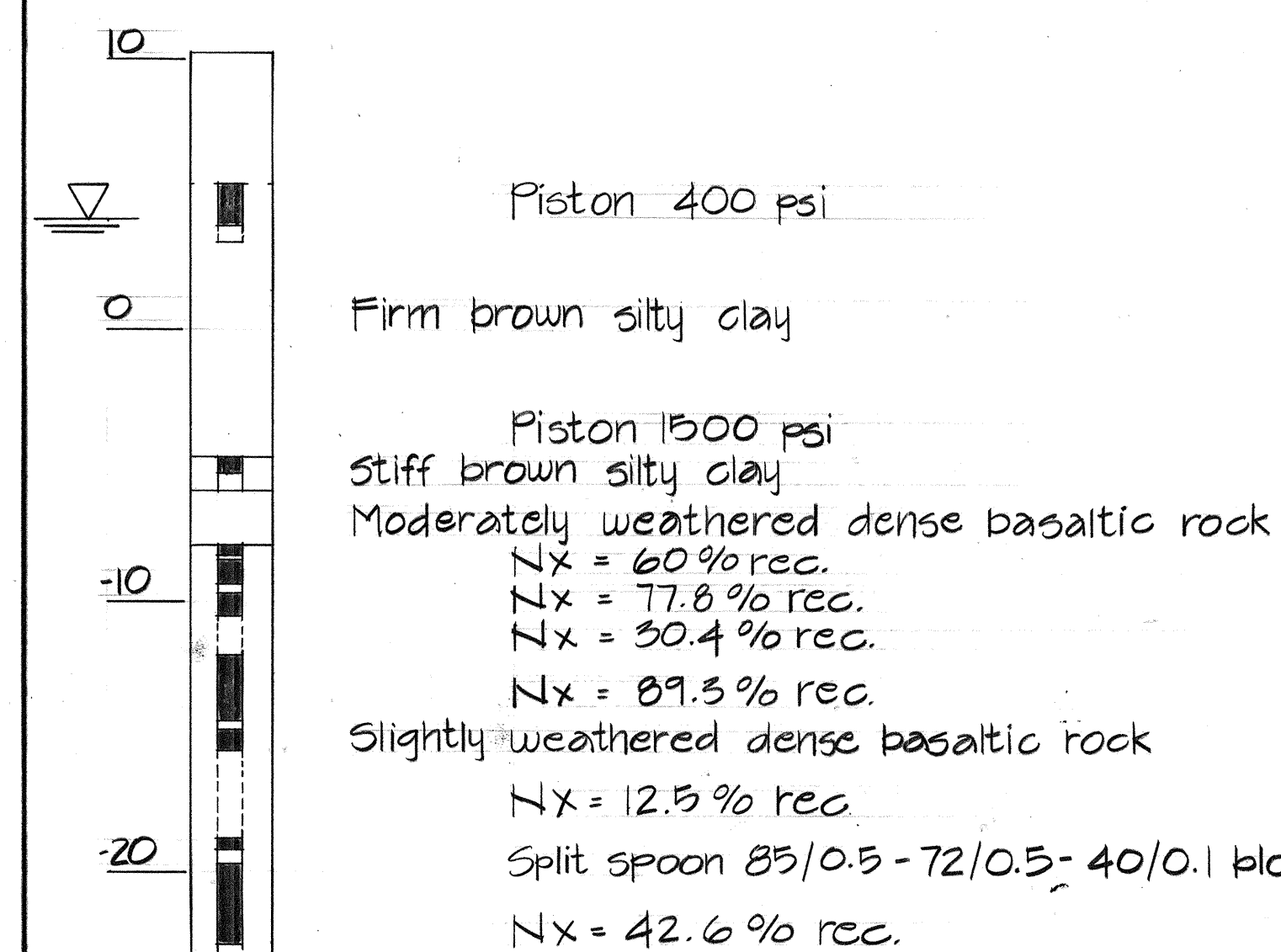
BORING-4A-170

Elevation 3.82
Station 107+40
Aug. 27, 1982 (Proj. No. DP-051-1(6))



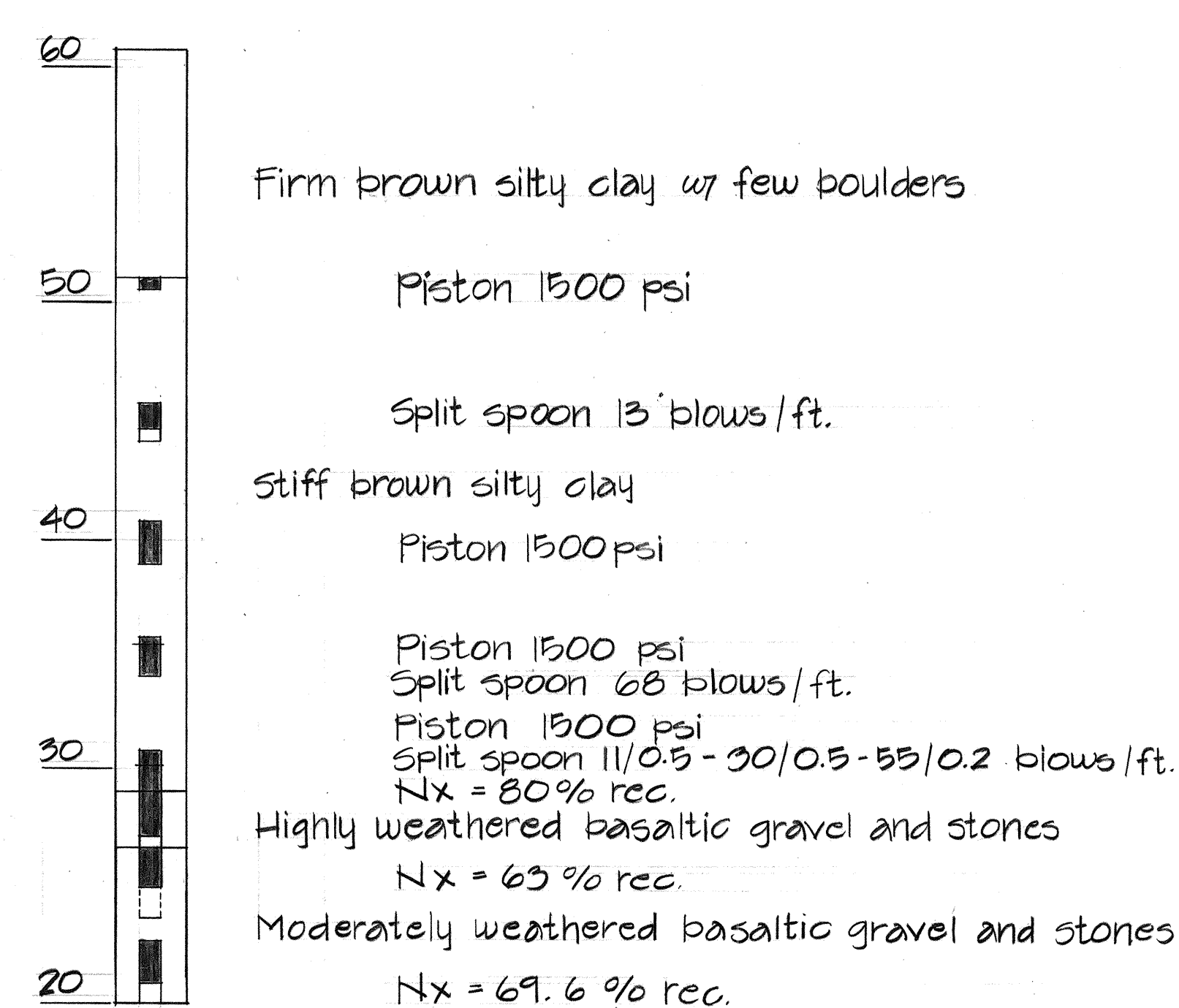
BORING HSB-5

Elevation 10.3
Station 109+29
Feb. 6, 1981



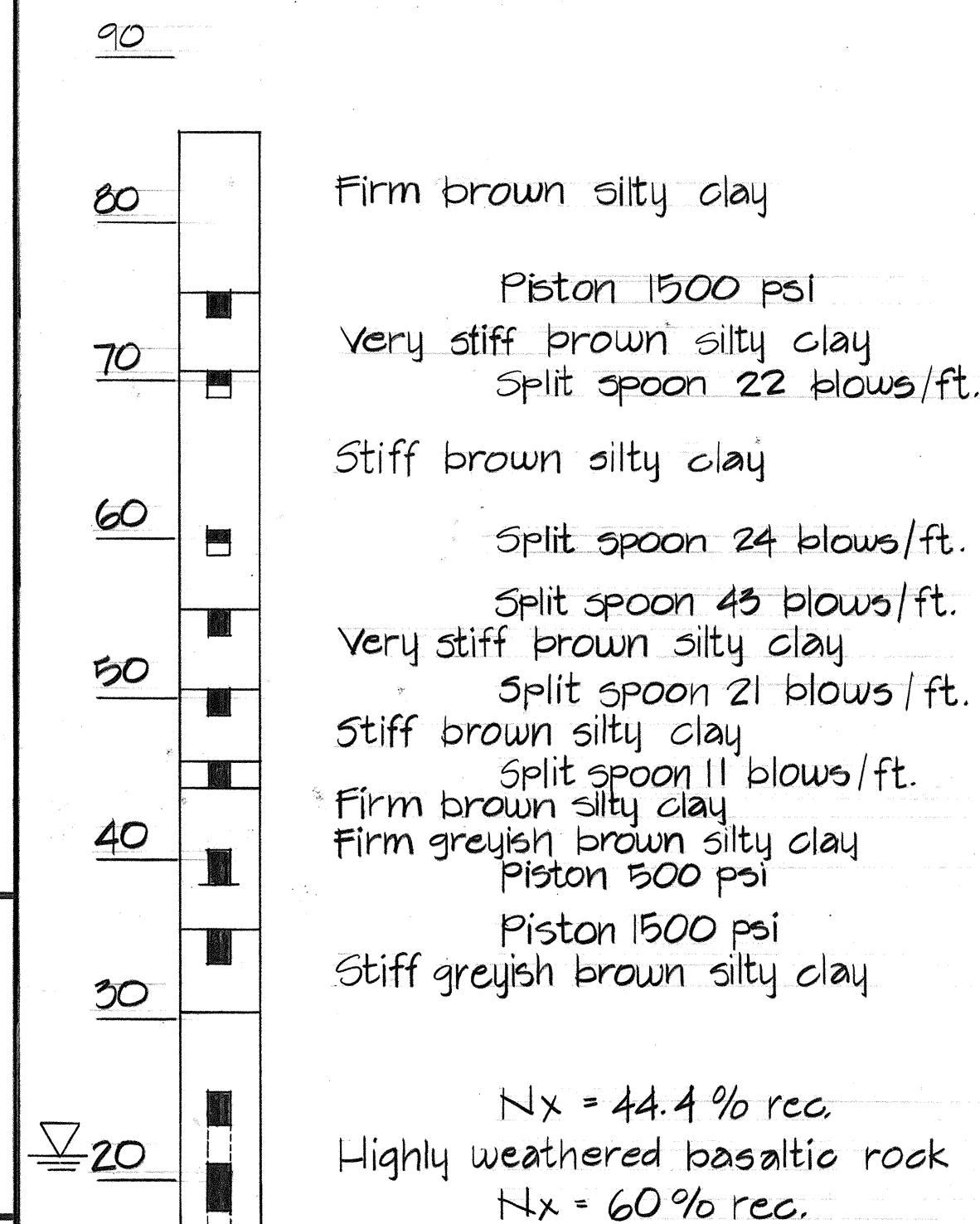
BORING HSB-6

Elevation 60.07
Station 111+00 7 1/2 Rt.
Feb. 4, 1981



BORING HSB-A2

Elevation 85.45
Station 112+00
Feb. 3, 1981



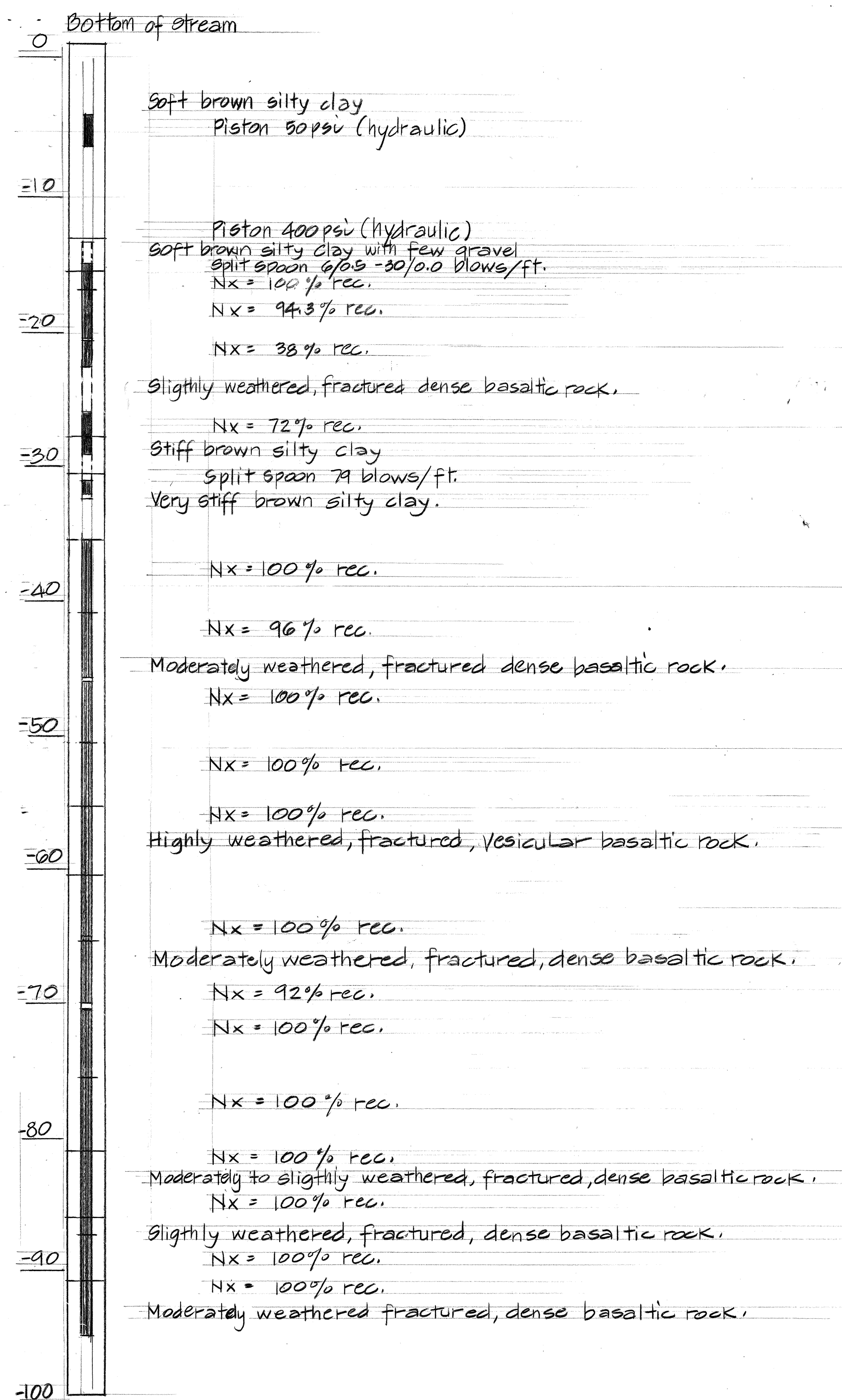
FED. ROAD DIST. NO.	STATE	FED. AID PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
HAWAII	HAW.	F-051-1(4)	1984	63	65

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

DATE	REVISION
STATE OF HAWAII DEPARTMENT OF TRANSPORTATION LAND TRANSPORTATION FACILITIES DIVISION BORING LOGS: HSB-A2, HSB-4, HSB-5, HSB-6 HANAMAULU VIADUCT HANAMAULU-AHUKINI CUTOFF ROAD Ahukini Road to Kauai Hardwoods PROJECT NO. F-051-1(4)	
SCALE: NONE	DATE: SEPT, 1984
SHEET NO. 63 OF 65 SHEETS	

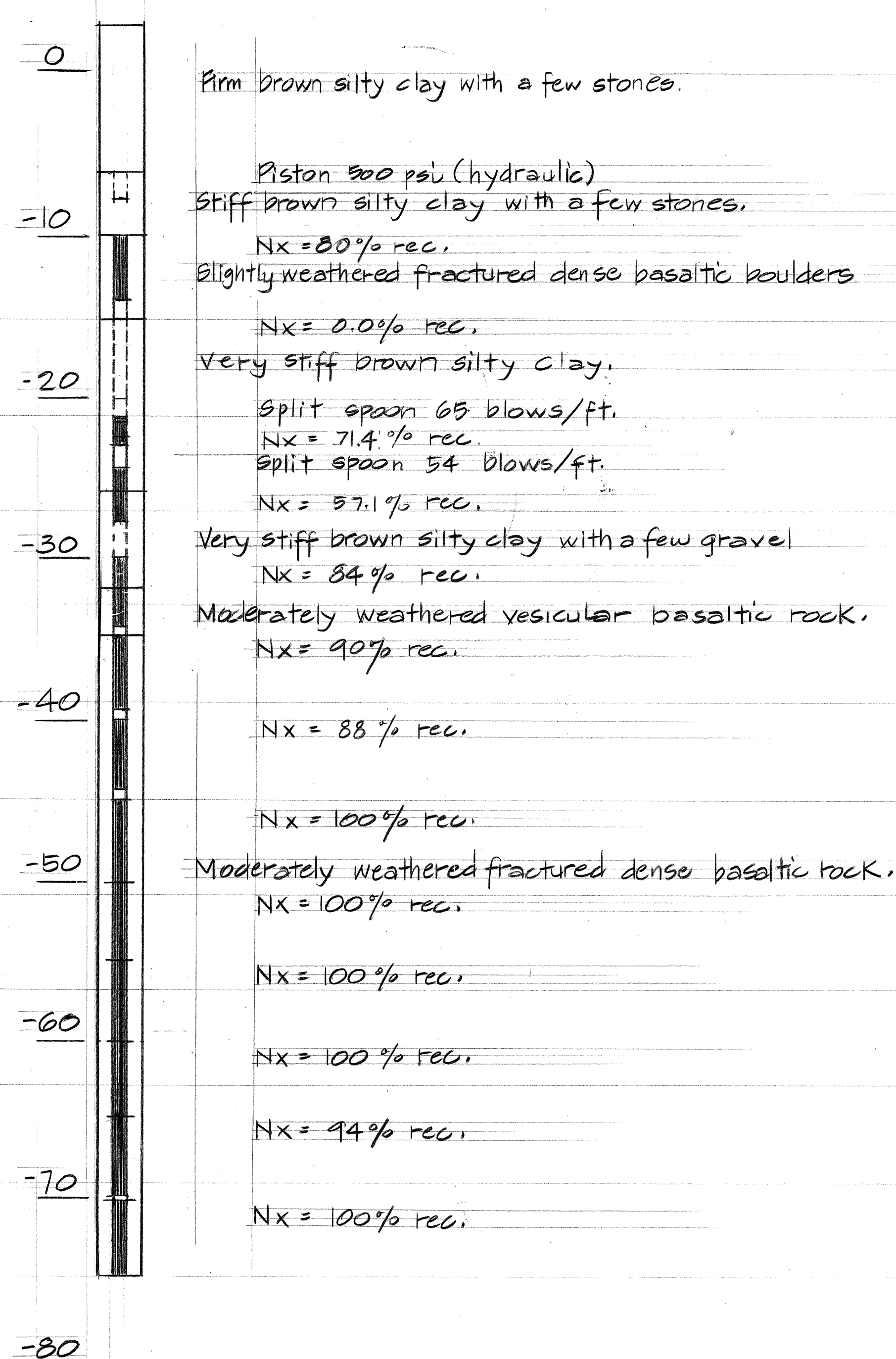
BORING HSB-5A -100

Elevation = 0.89
Station = 109+00
July 17, 1981



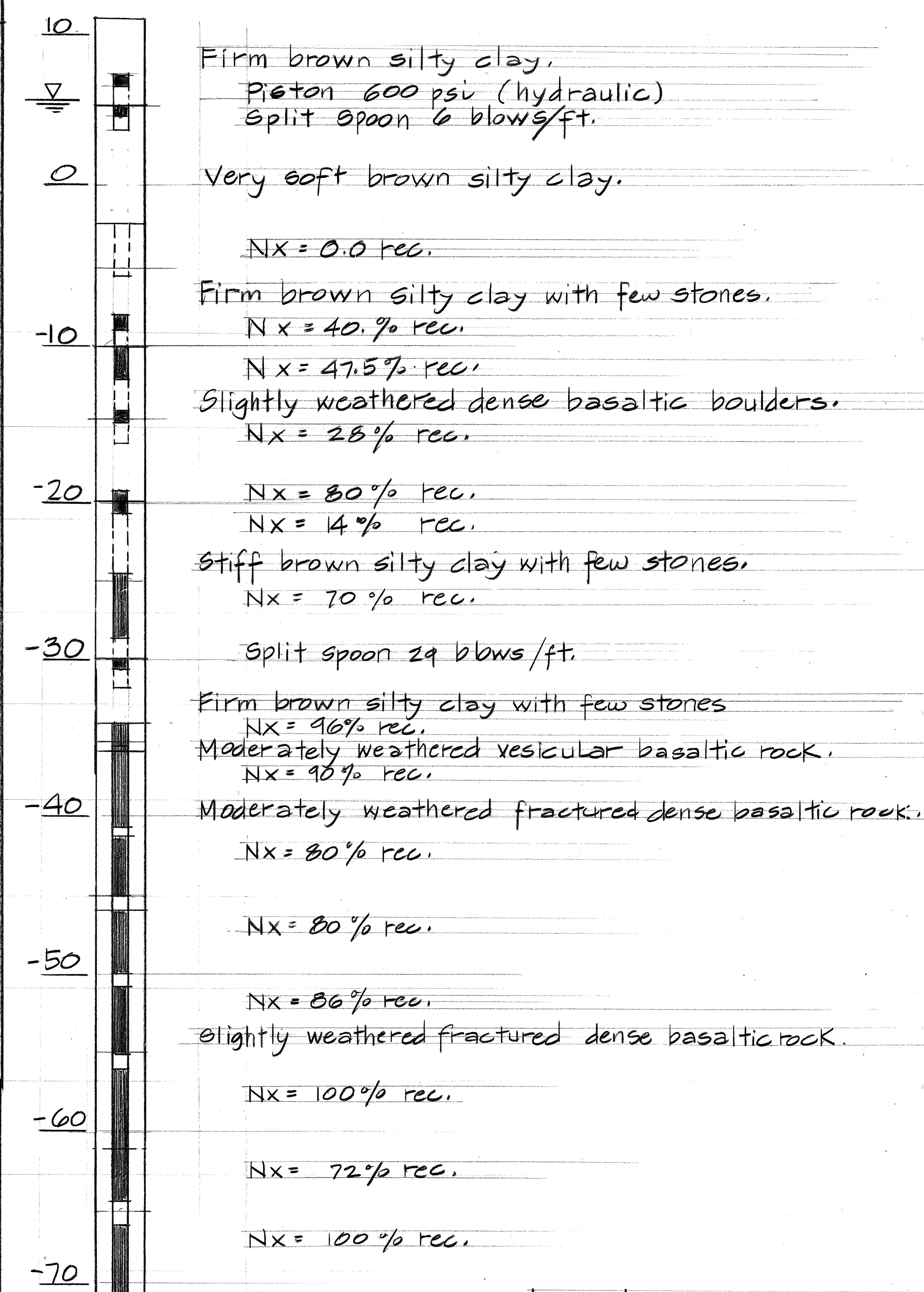
BORING HSB-5B -100

Elevation = 2.91
Station = 109+20 (20' 9/8 left)
July 28, 1981



BORING HSB-5C -100

Elevation = 10.88
Station = 109+20 (20' 9/8 right) Aug. 4, 1981



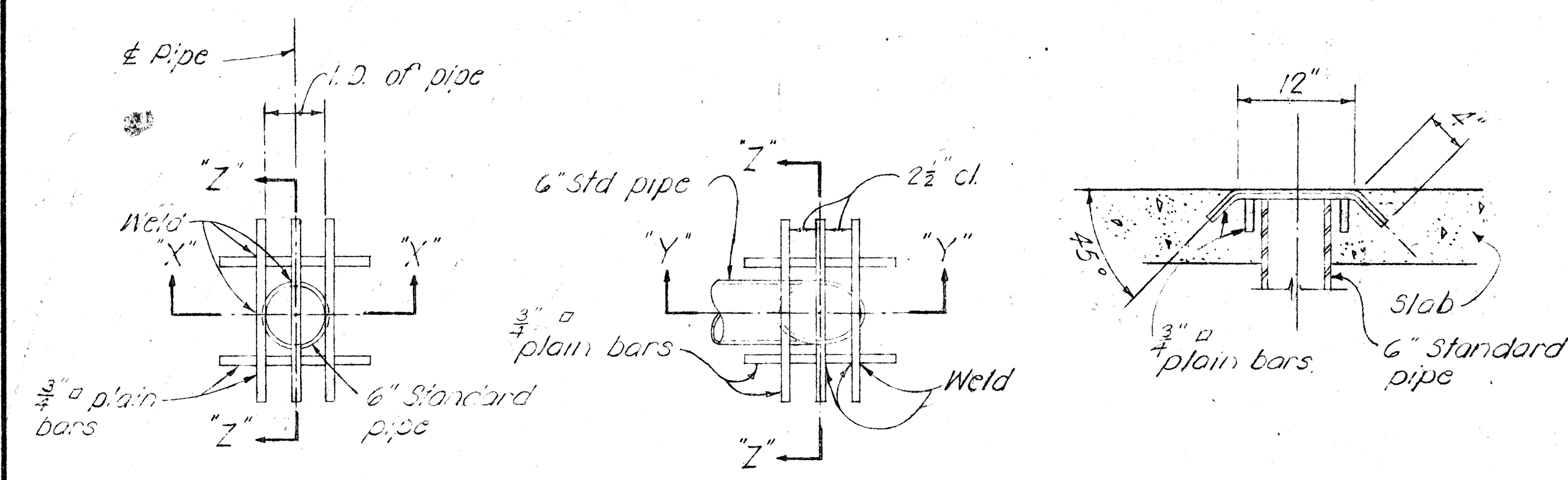
FED. ROAD DIST. NO.	STATE	FED. AID PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
HAWAII	HAW.	F.051-1(4)	1984	54	65

DATE	DATE
DESIGNED BY	DESIGNED BY
NOTED BY	NOTED BY
CHECKED BY	CHECKED BY
ORIGINAL	ORIGINAL

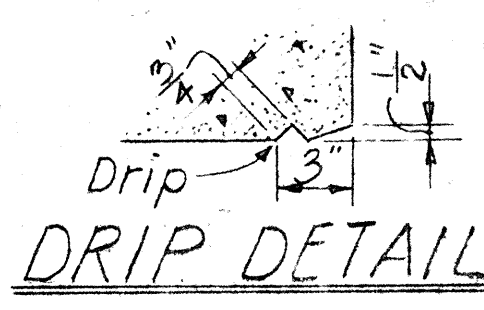
DATE	REVISION
STATE OF HAWAII DEPARTMENT OF TRANSPORTATION LAND TRANSPORTATION FACILITIES DIVISION BORING LOGS: HSB-5A-100, HSB-5B-100, HSB-5C-100 HANAMAULU VIADUCT HANAMAULU-AHUKINI CUTOFF ROAD Ahukini Road to Kauai Hardwoods PROJECT NO. F-051-1(4) SCALE: NONE DATE: SEPT., 1984 SHEET NO. 3 OF 3 SHEETS	

GENERAL NOTES

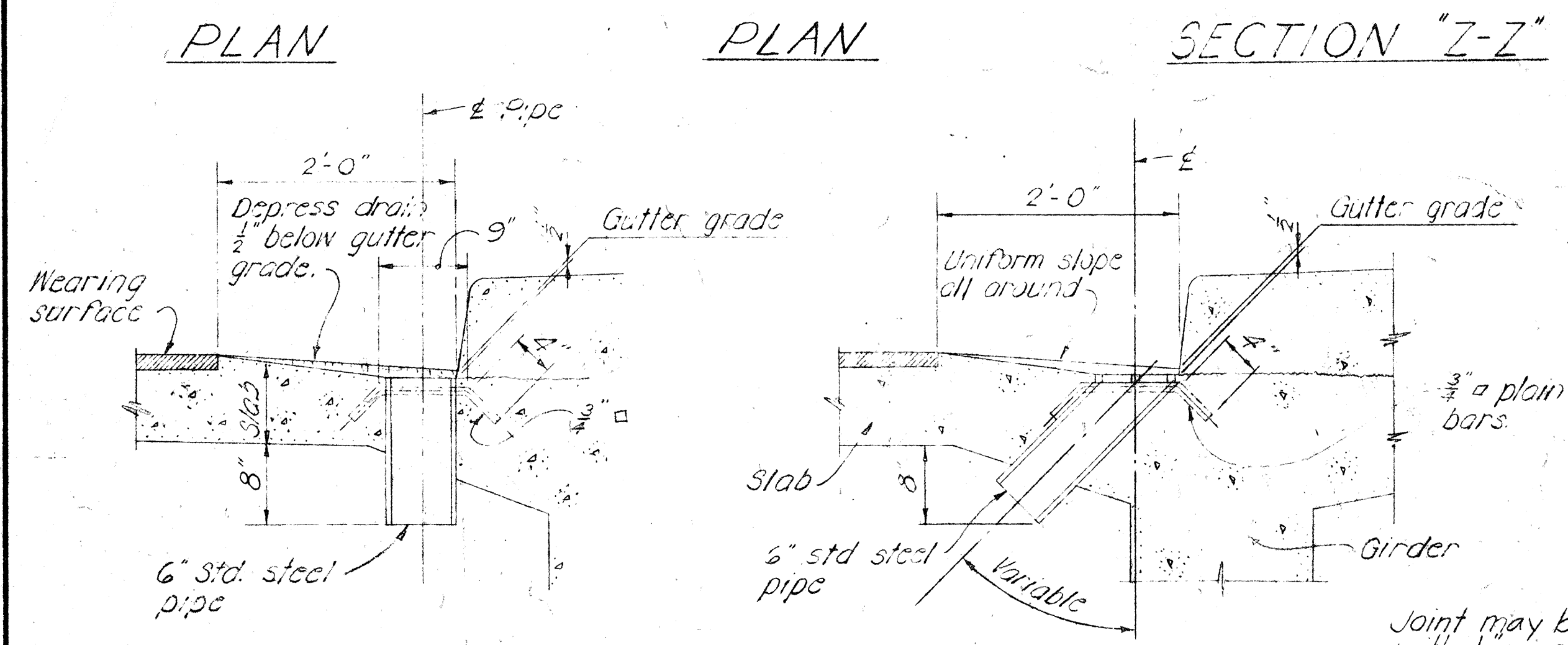
- All concrete shall be Class A unless otherwise noted.
- Reinforcing shall be detailed in accordance with A.C.I. Manual of Standard Practice for Detailing Reinforced Concrete Highway Structures unless otherwise noted.
- Clearance for reinforcing bars shall be as follows unless otherwise noted:
 - 1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



TYPICAL CONCRETE GROOVE DETAIL

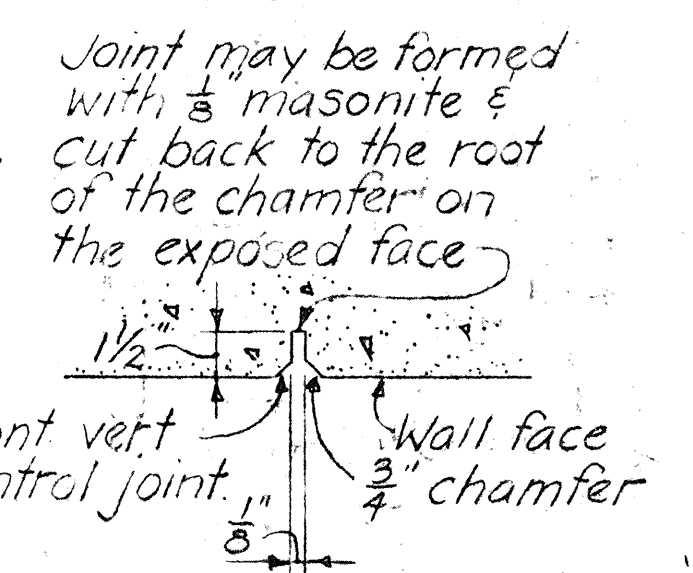


DRIP DETAIL



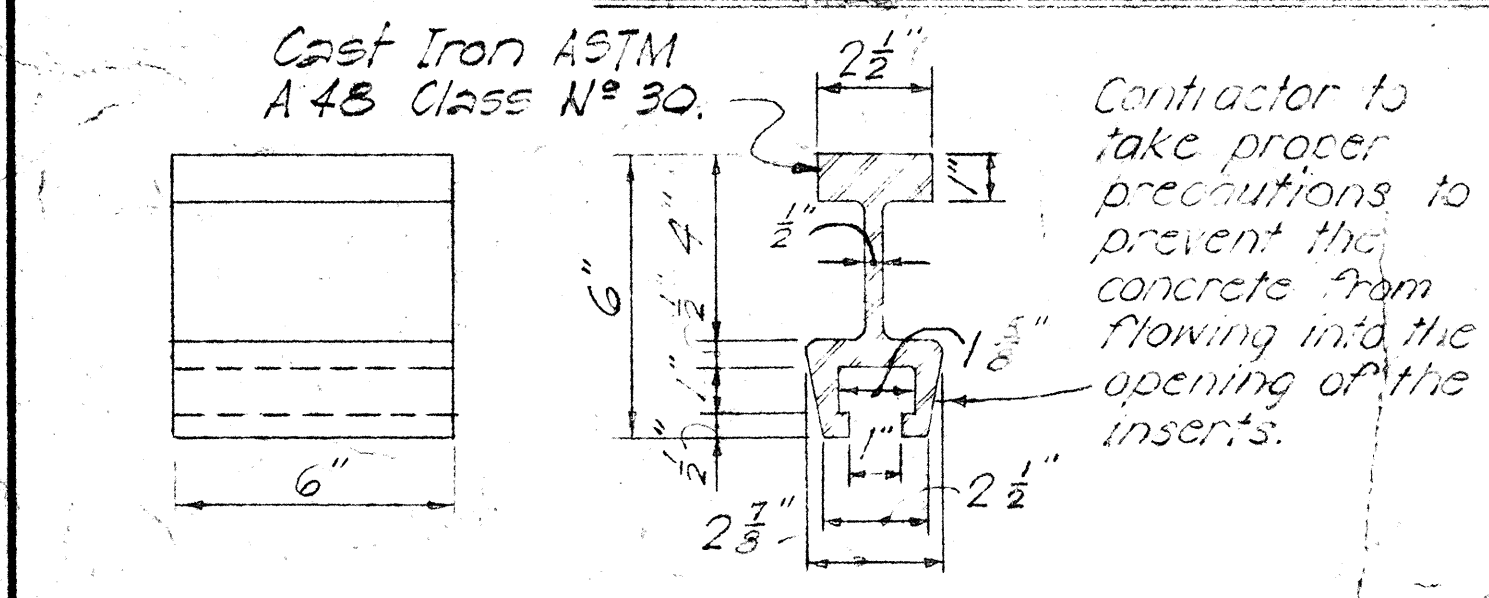
TYPICAL DRAINAGE DETAILS

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



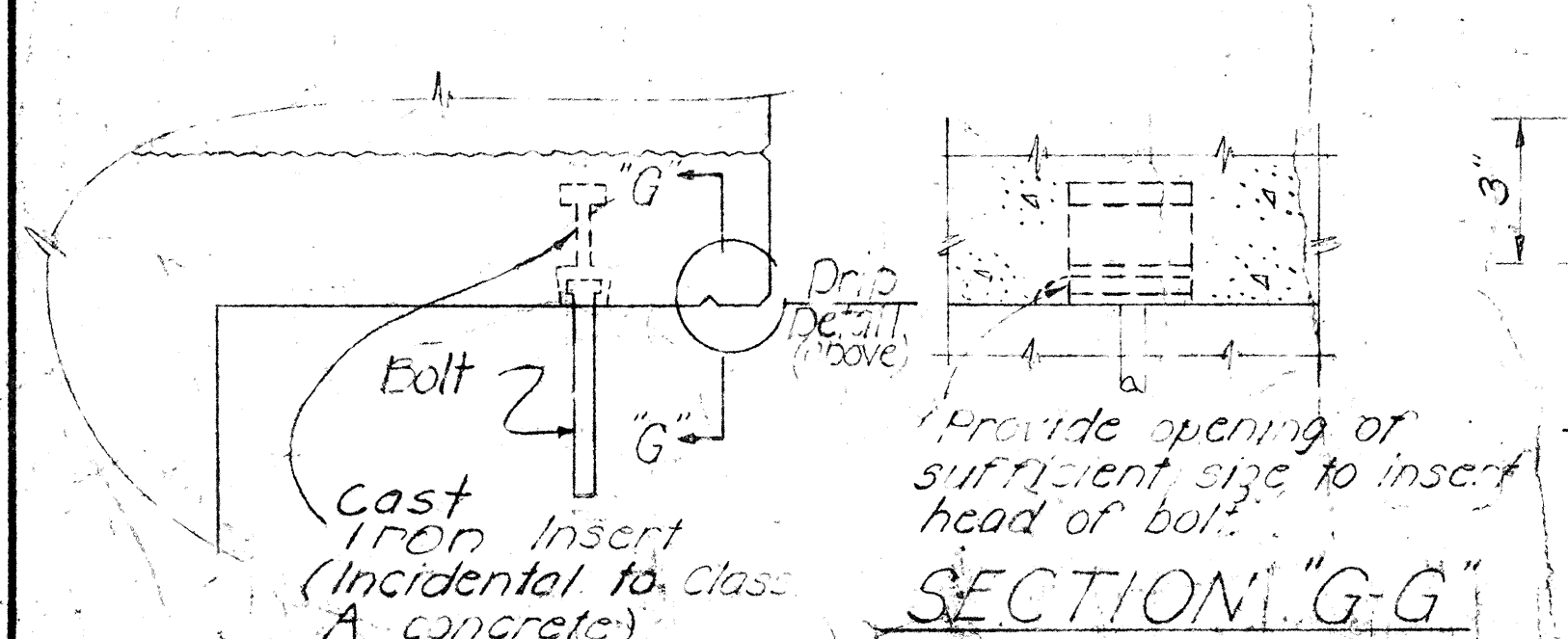
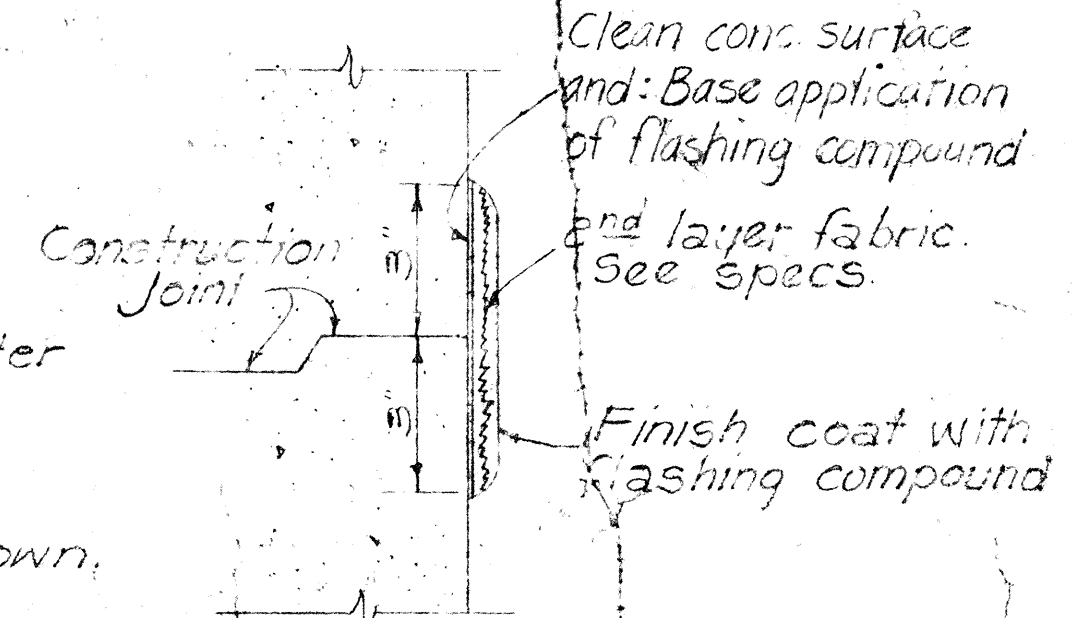
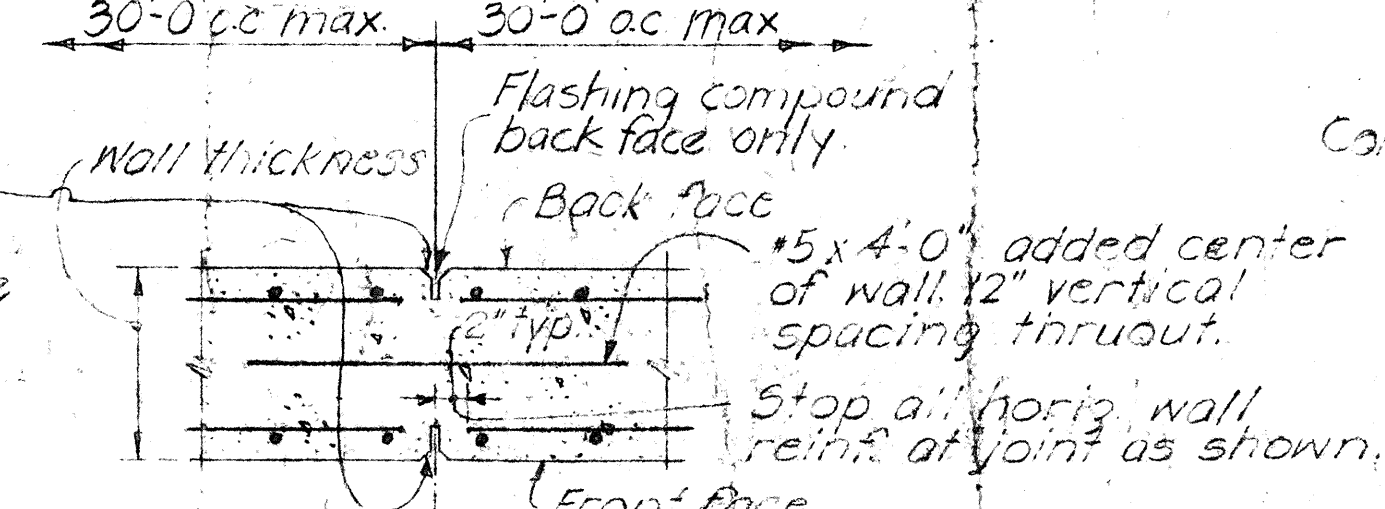
CONTROL JOINT DETAILS

TYP. FLASHING COMPOUND WATERPROOFING DETAIL

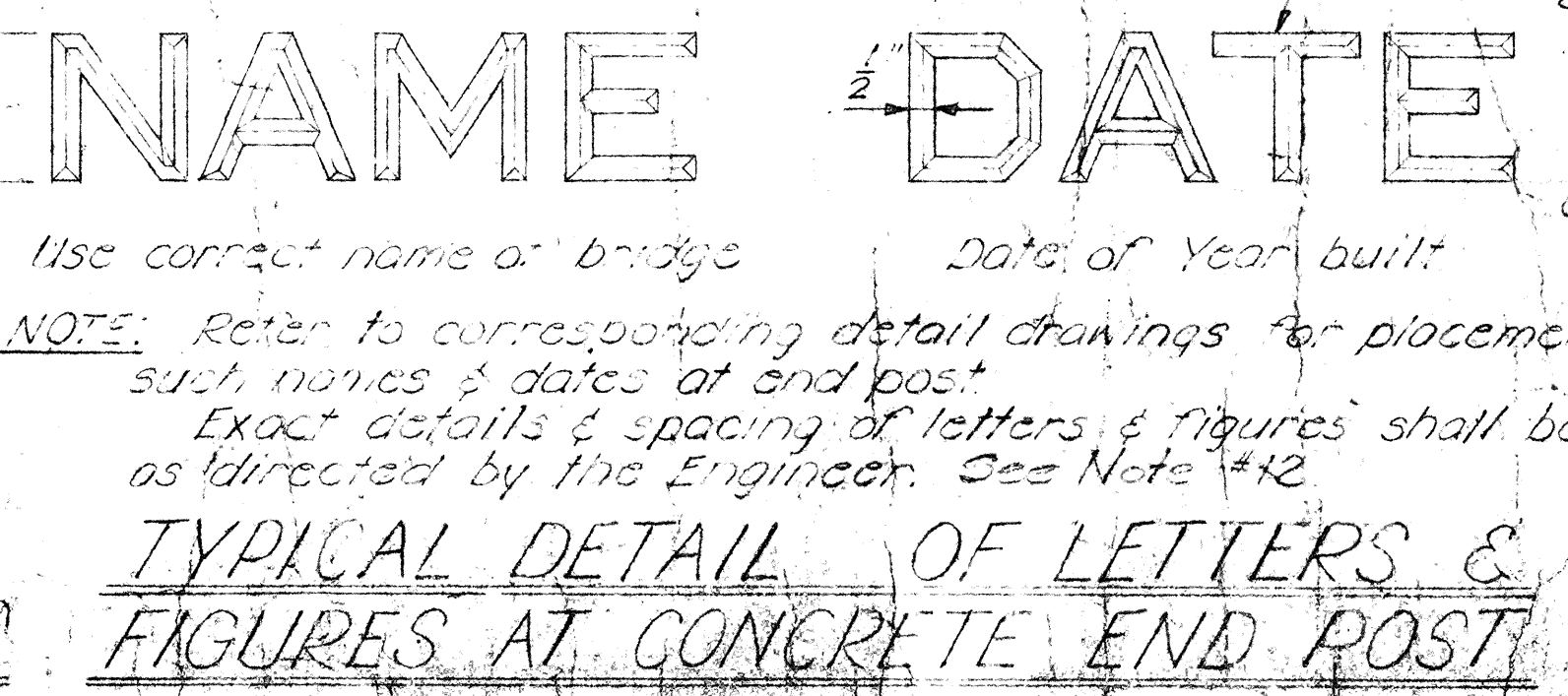


INSERT DETAIL

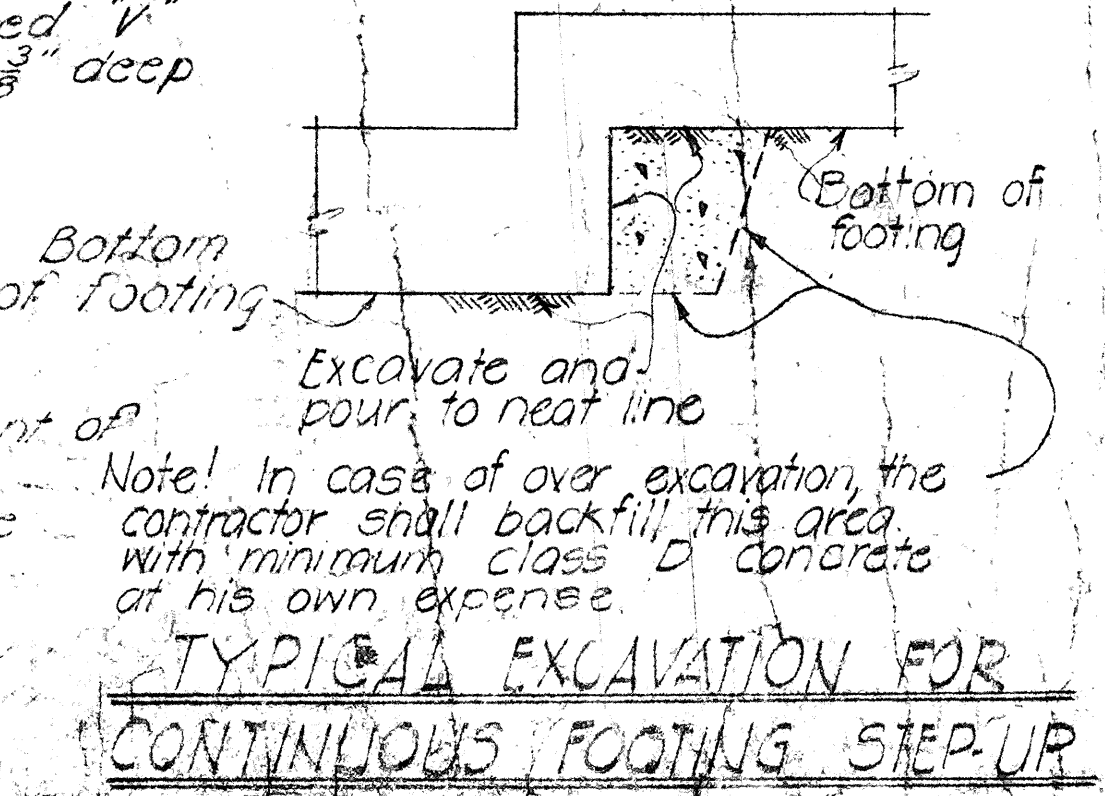
Contractor to take proper precautions to prevent the concrete from flowing into the opening of the inserts.



DETAIL OF PIPE HANGERS & INSERTS



TYPICAL DETAIL OF LETTERS & FIGURES AT CONCRETE END POST



TYPICAL EXCAVATION FOR CONTINUOUS FOOTING STEP-UP

APPROVAL RECOMMENDED:
 Paul T. Yamashita
 BRIDGE DESIGN ENGINEER
 1-23-76
 DATE

APPROVED
 Paul T. Yamashita
 ASSISTANT CHIEF, ENGINEERING
 1-28-76
 DATE

NO.	REVISION	APPROVED BY	DATE

STATE OF HAWAII
 DEPARTMENT OF TRANSPORTATION
 HIGHWAYS DIVISION
 STANDARD DETAILS
 NOTES AND MISCELLANEOUS
 DETAILS
 Date: October 1983
 SHEET NO. OF SHEETS 65 OF 100

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