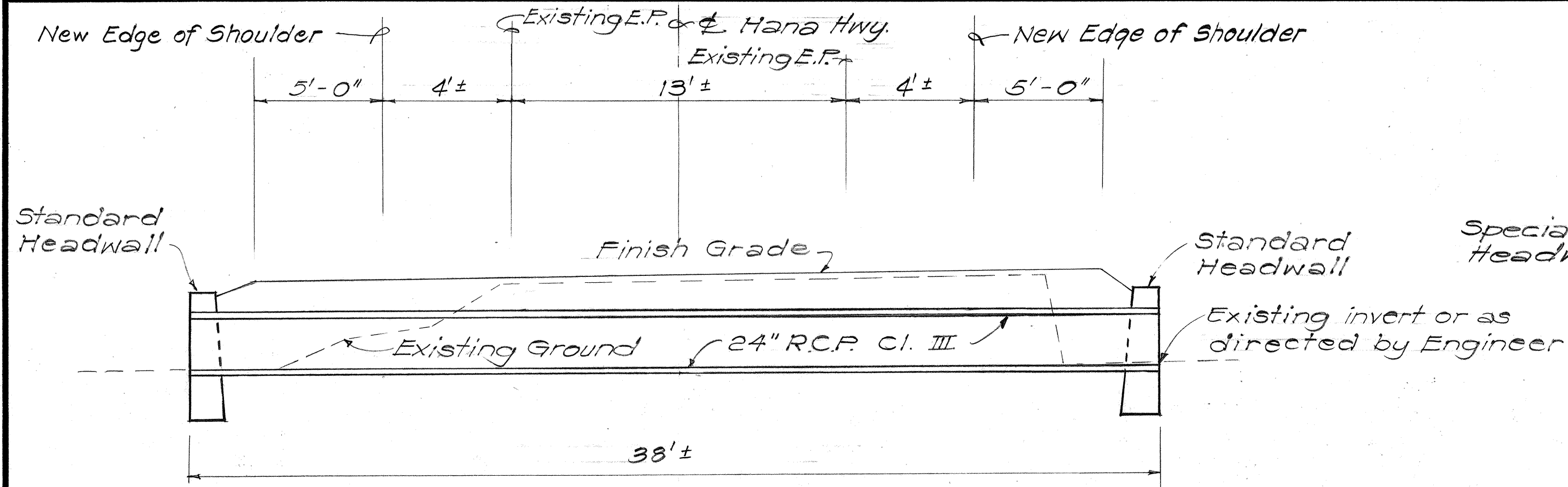
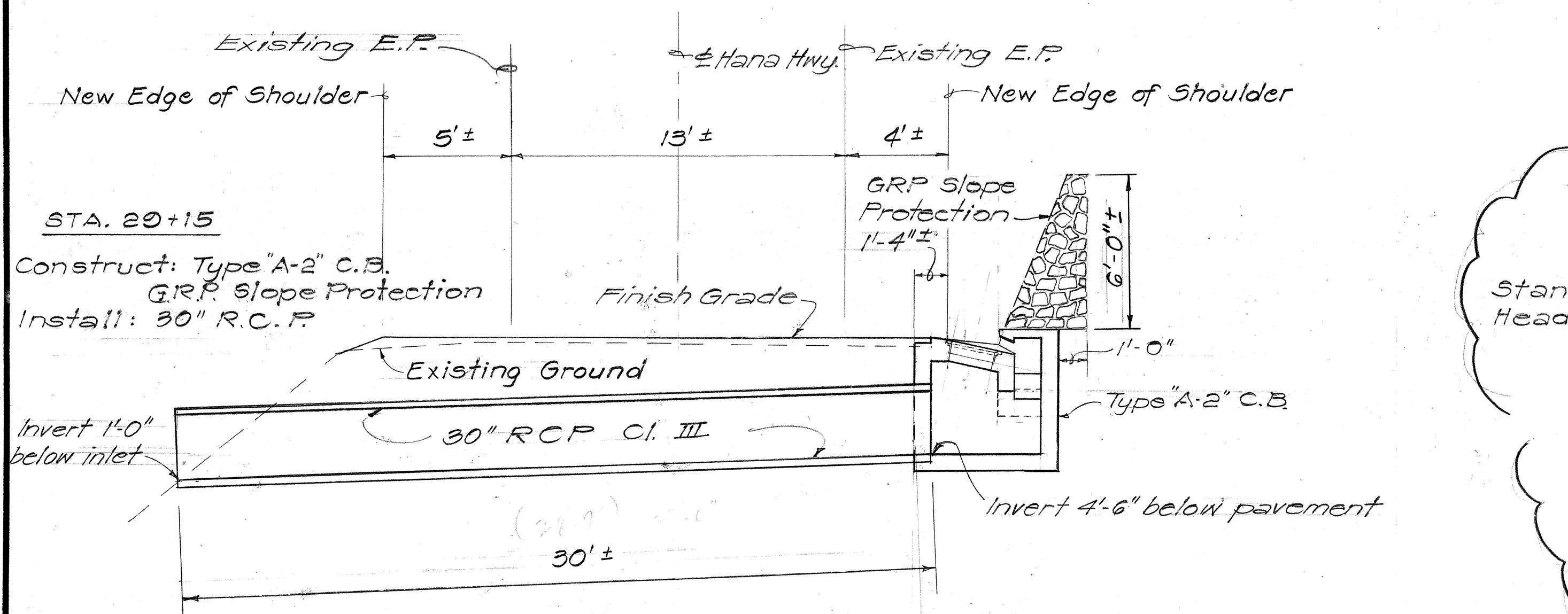


FED. ROAD DIST. NO.	STATE	PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
HAWAII	HAW.	360A-01-80	1980	15	33



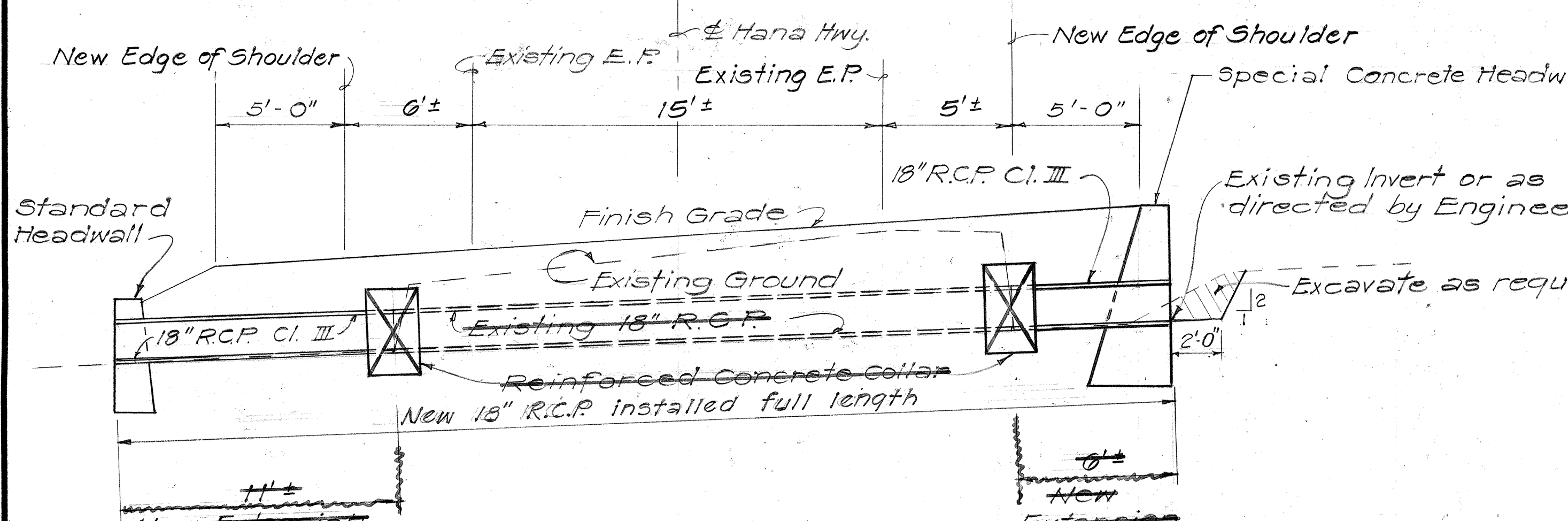
STA. 2+80±
Construct: 2-Std. Headwalls
Install: 24" R.C.P.

STA. 2+80±



STA. 29+15±

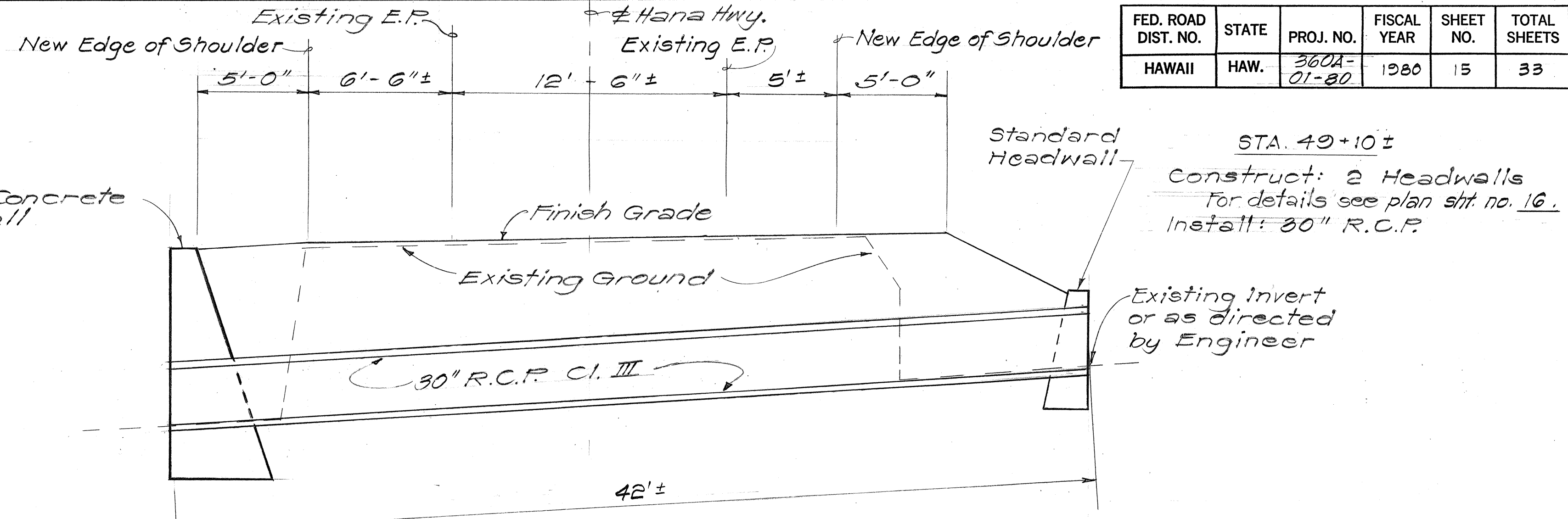
Construct: Type "A-2" C.B.
GRP Slope Protection
Install: 30" R.C.P.



STA. 37+30±

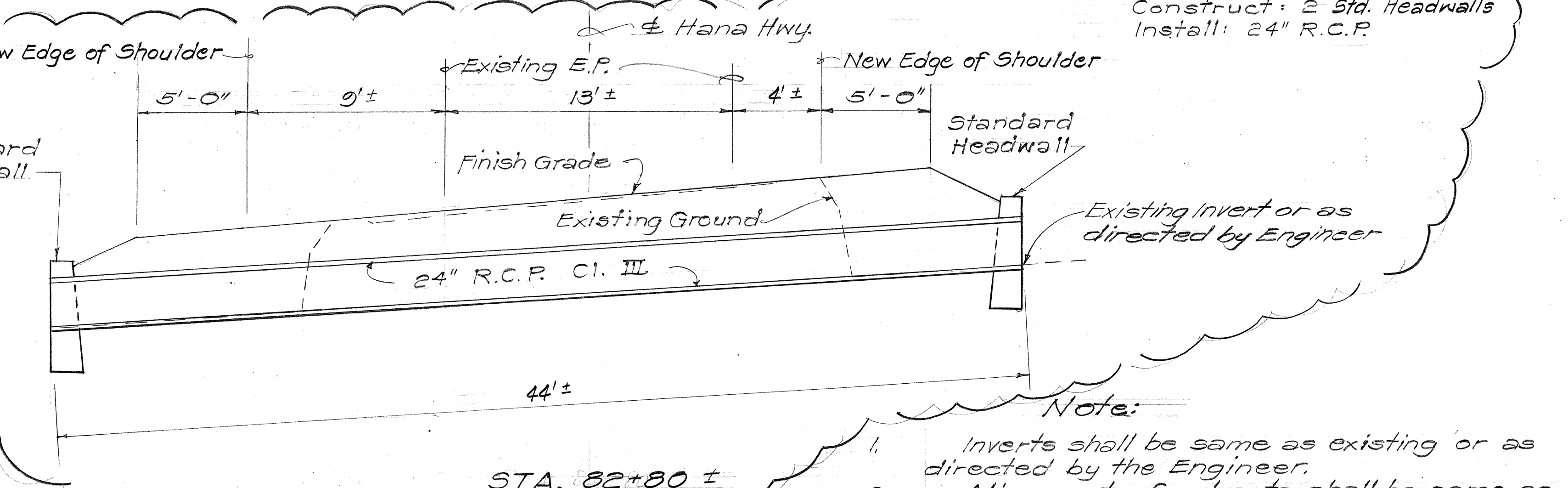
Construct: 2 Headwalls
2-Reinf. Conc. Collars
For details see plan sht. no. 16.
Install: 18" R.C.P.

STA. 37+30±



STA. 49+10±
Construct: 2 Headwalls
For details see plan sht. no. 16.
Install: 30" R.C.P.

STA. 49+10±



STA. 82+80±

(NOT IN CONTRACT)

ESTIMATED QUANTITIES									
	Structure	Excavation	Class A	Class B	Reinforcing	Type A C.I.	Frame & Cover	18" Reinf. Conc.	24" Reinf. Conc.
	C.Y.	C.Y.	C.Y.	C.Y.	Lbs.	Ea.	L.F.	L.F.	L.F.
STA. 2+80±	21.0			3.0	84				38
STA. 29+15±	35.0	9.0			270	1			30
STA. 37+30±	11.0			4.5	66				
STA. 49+10±	50.0			13.0	161				42
STA. 82+80±	23.0			3.0	84				44

(NOT IN CONTRACT)

- Note:
- Inverts shall be same as existing or as directed by the Engineer.
 - Alignment of culverts shall be same as existing or as directed by the Engineer.
 - Contractor shall demolish and remove existing culverts as required.
 - The entrance condition of the culvert shall be graded to the satisfaction of the Engineer. Above work shall be considered incidental to the various contract items.
 - The outlet of the culvert shall be graded to provide a free flowing condition. Above work shall be considered incidental to the various contract items.
 - The 4 inch concrete lining for gutter apron shall be considered part of the Type "A-2" Catch Basin.
 - Embankment shall be 2:1 or as directed by the Engineer.
 - G.R.P. Slope Protection limits shall be 1 foot beyond wing of Type "A-2" Catch Basin (22'-8").

STATE OF HAWAII

DEPARTMENT OF TRANSPORTATION

LAND TRANSPORTATION FACILITIES DIVISION

DRAINAGE DETAILS OF

PIPE CULVERTS-STA. 2+80±

29+15±, 37+30±, 49+11± & 82+80±

HANA HIGHWAY IMPROVEMENTS

Huelo Towards Wailua, Phase I

PROJECT NO. 360A-01-80

Scale: 1/4" = 1'-0" Date: June, 1979

7/22/80

Deleted Culvert Replacement at Sta. 82+80±

DATE

REVISION

SHEET NO. 1 OF 5 SHEETS

15 R

ORIGINAL PLAN

NO.

SURVEY PLOTTED BY

DATE

DRAWN BY

DESIGNED BY

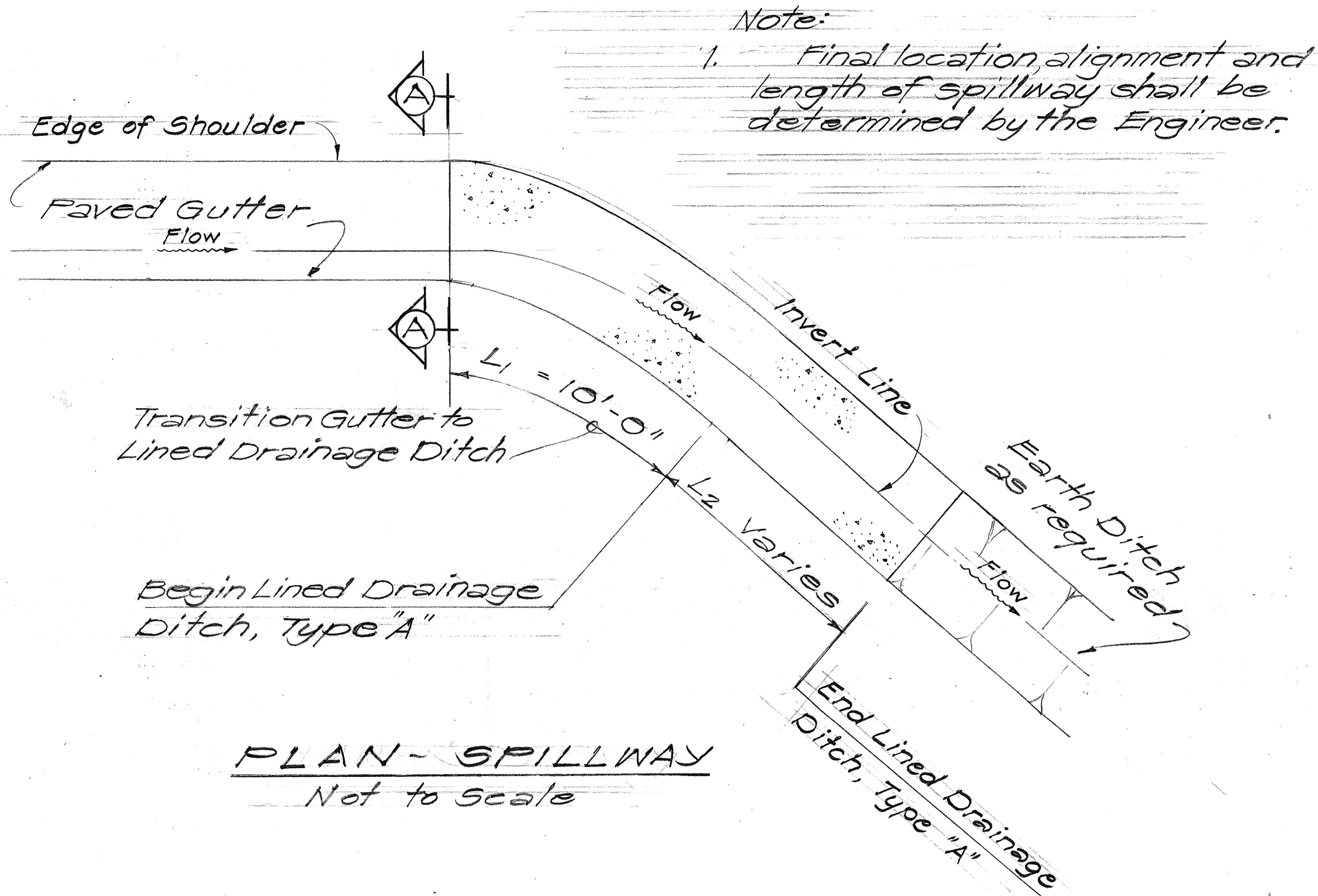
QUANTITIES BY

CHECKED BY

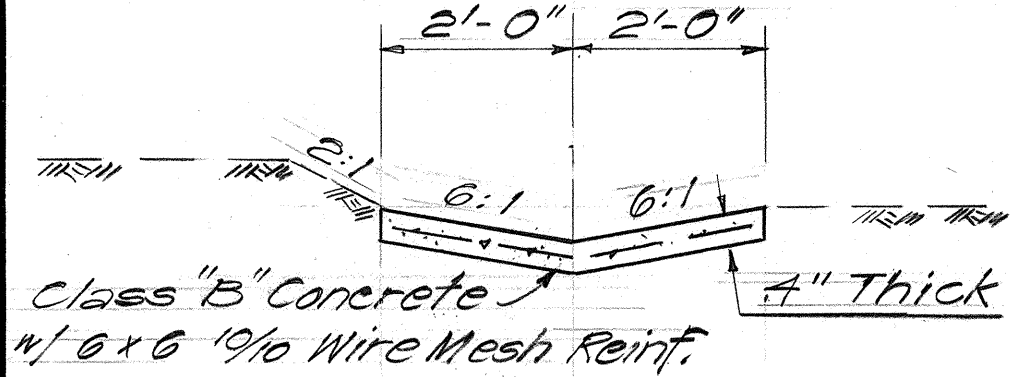
PROFILE ALONG & OF CULVERTS - HANA HIGHWAY

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

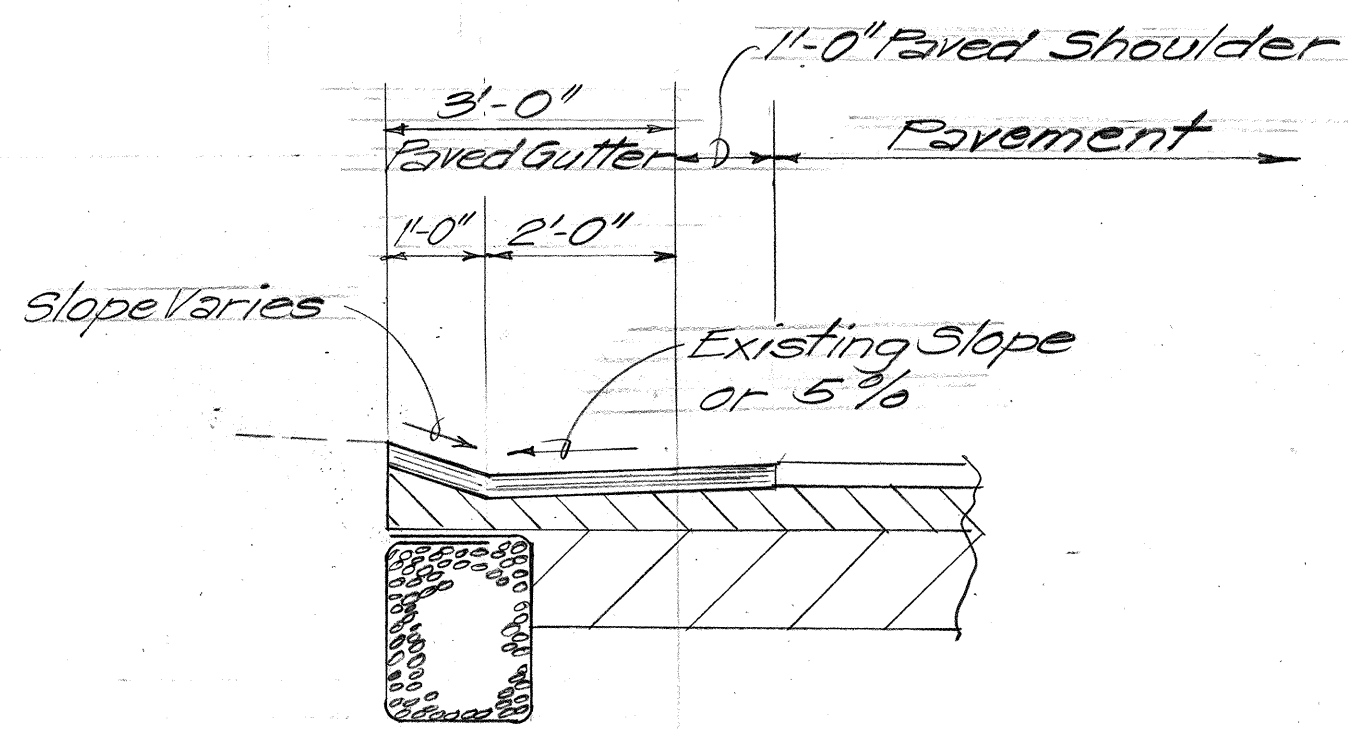
FED. ROAD DIST. NO.	STATE	PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
HAWAII	HAW.	360A-01-80	1980	16	33



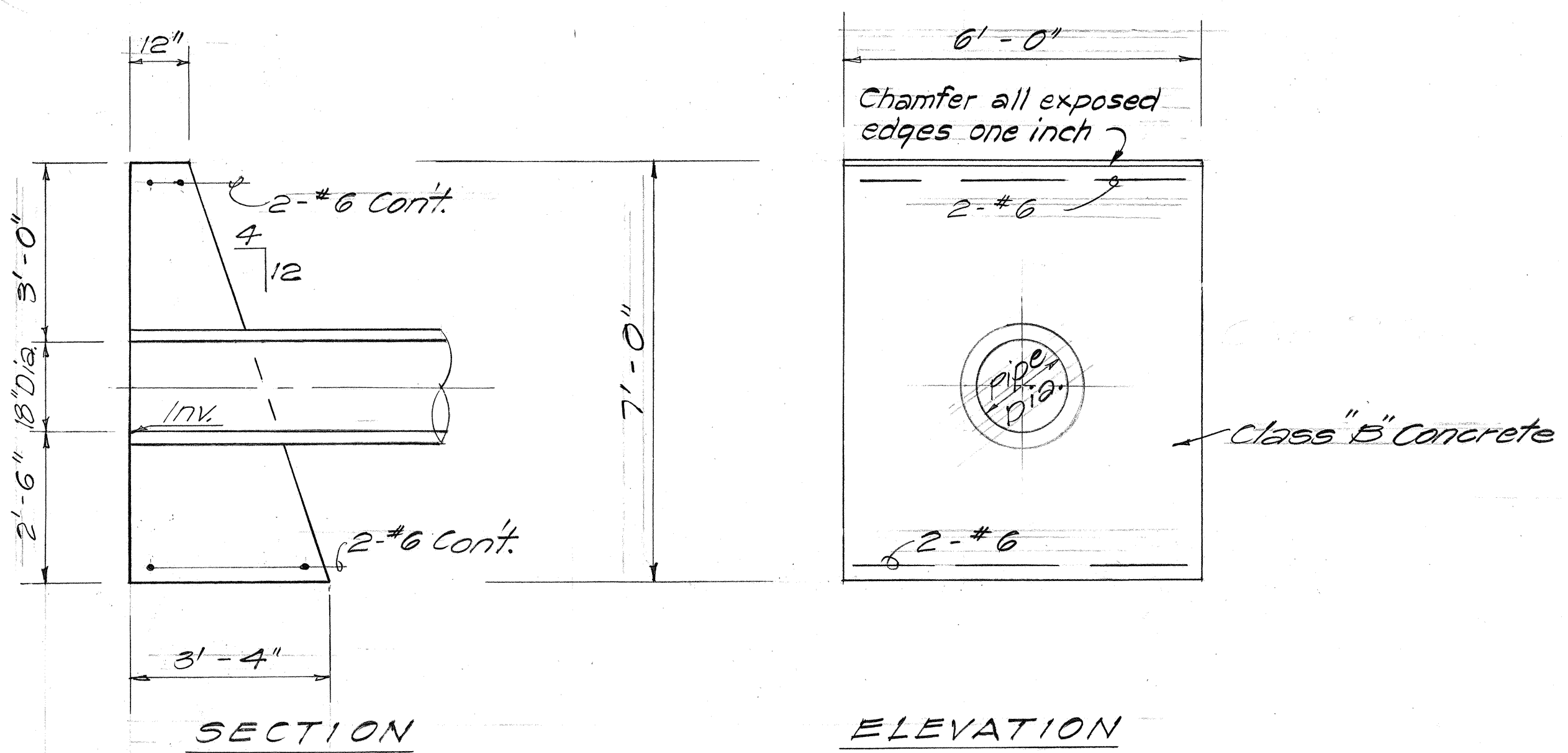
PLAN - SPILLWAY
Not to Scale



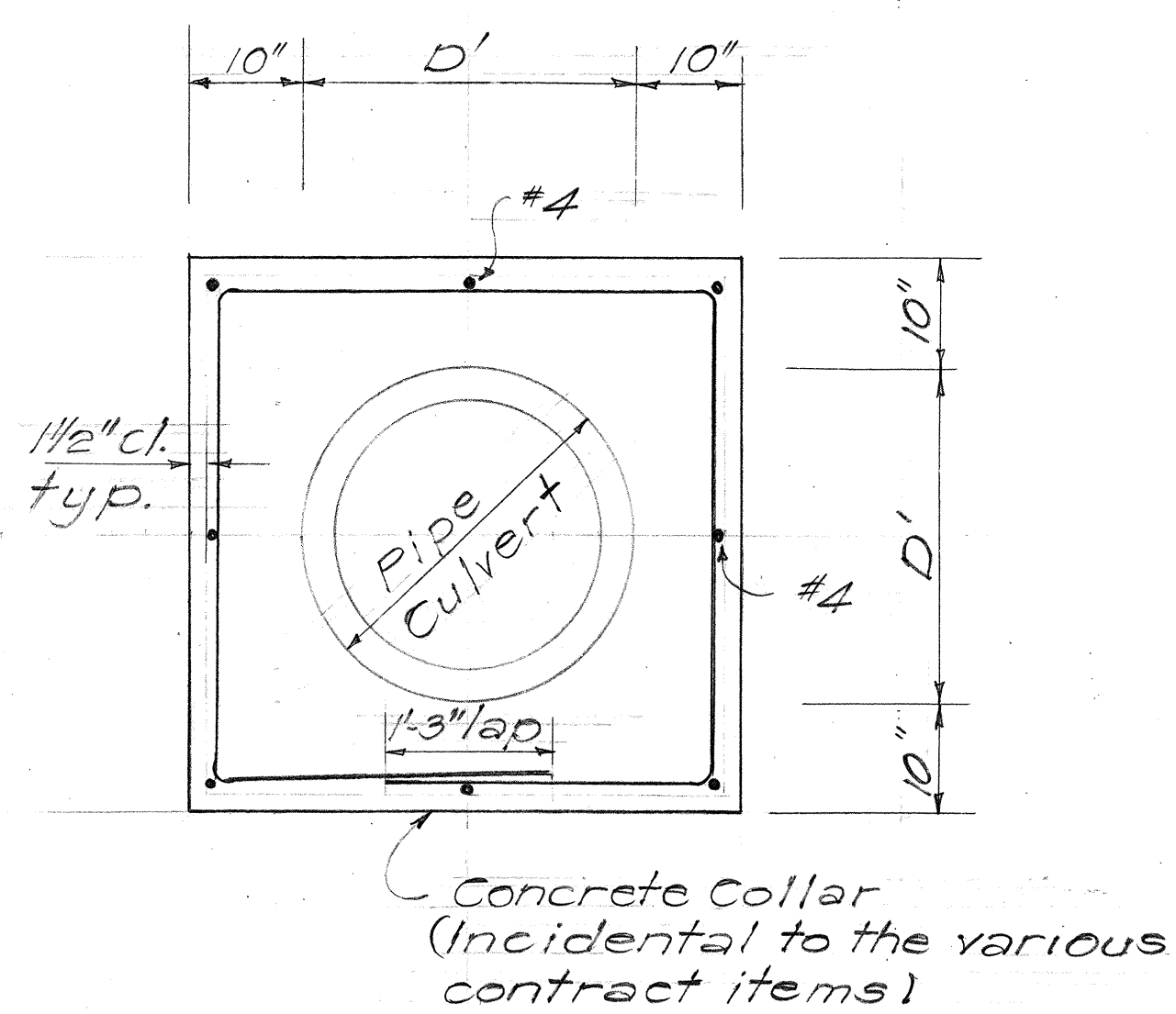
LINED DRAINAGE DITCH, TYPE "A"
Scale: 1/2" = 1'-0"



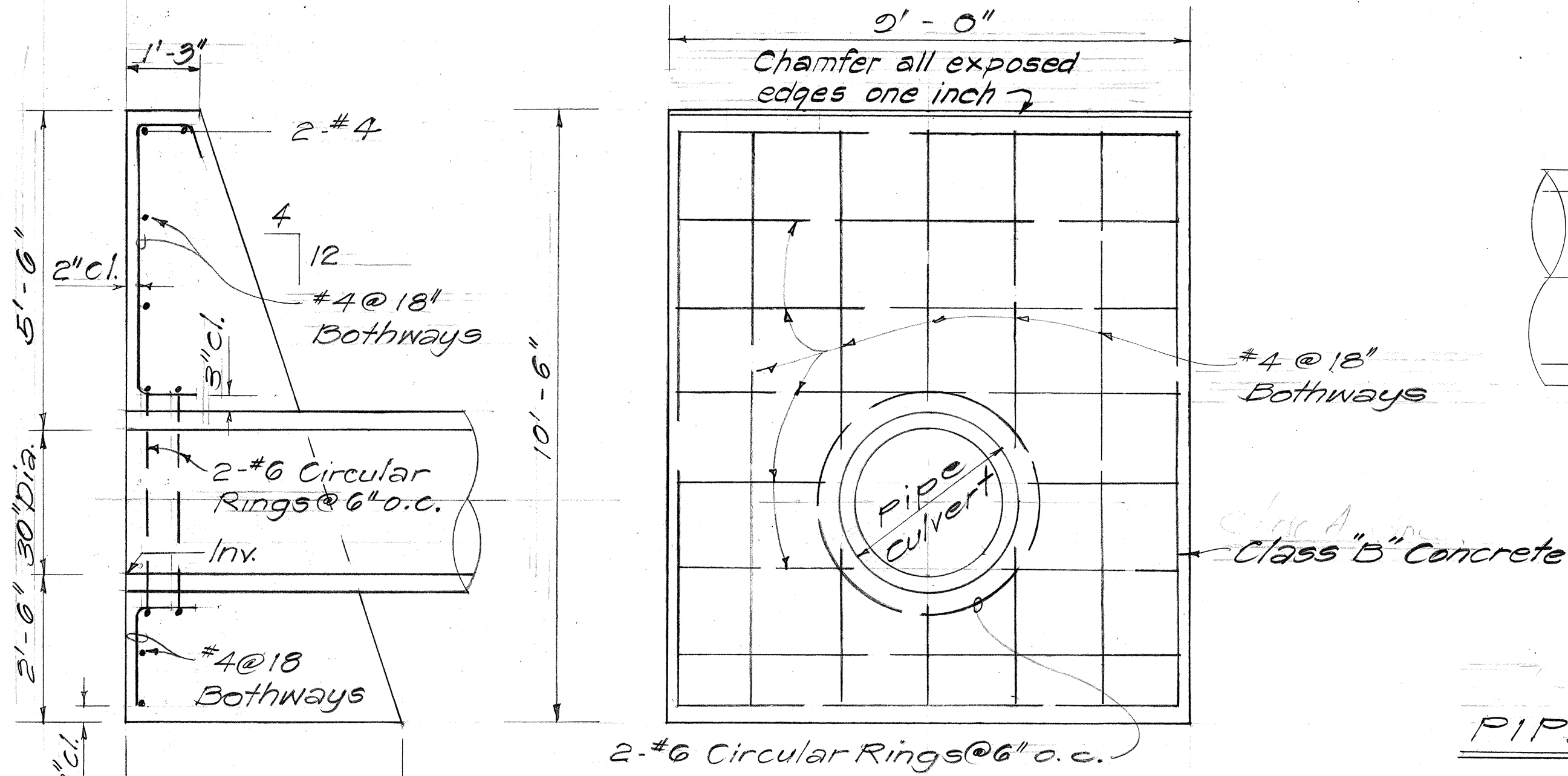
SECTION "A-A"
Scale: 1/2" = 1'-0"



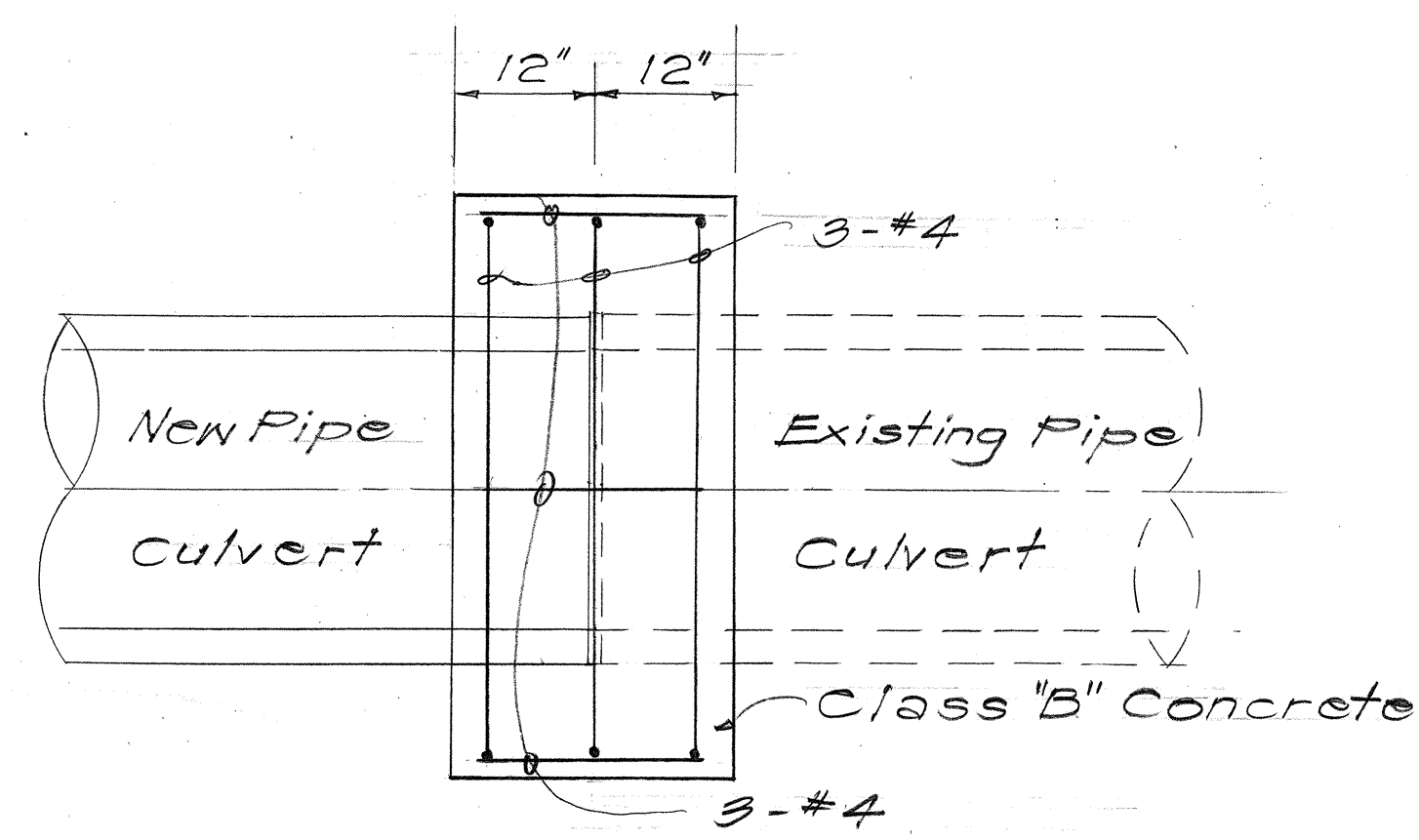
18" R.C.P. CULVERT AT STA. 37+30±
CONCRETE HEADWALL DETAIL
Scale: 1/2" = 1'-0"



FRONT VIEW



30" R.C.P. CULVERT AT STA. 49+10±
CONCRETE HEADWALL DETAIL
Scale: 1/2" = 1'-0"



SIDE VIEW

TYPICAL DETAIL OF
PIPE CULVERT CONNECTIONS
Scale: 3/4" = 1'-0"

STATE OF HAWAII

DEPARTMENT OF TRANSPORTATION

LAND TRANSPORTATION FACILITIES DIVISION

DRAINAGE DETAILS OF

SPILLWAY, CONCRETE HEADWALL

& PIPE CULVERT CONNECTIONS

HANA HIGHWAY IMPROVEMENTS

Huelo Towards Wailua, Phase I

PROJECT NO. 360A-01-80

Scale: As Shown Date: June, 1979

SHEET NO. 2 OF 5 SHEETS

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

Technical drawing of a manhole and culvert assembly. The drawing shows a cross-section of the structure with various components and dimensions labeled.

Dimensions:

- Overall width: 28'-8"
- Overall height: 2'-0"
- Top of concrete lining: 6'-0"
- Manhole Rung: 1'-8"
- Concrete Lining: 4"
- Edge of Shoulder: 1'-8"
- Manhole Rung: 1'-8"
- Concrete Lining: 4"
- Edge of Shoulder: 1'-8"

Components:

- Type "A" C.B.
- Type "B" C.B.
- Type "C" C.B.
- Type "D" C.B.
- Top of Concrete Lining
- Manhole Rung
- #3 @ 3" oc.
- 4" Concrete Lining
- Edge of Shoulder
- Manhole Rung
- Concrete Lining
- Edge of Shoulder

Notes:

- Varies 0" to 8"
- Varies 0" to 8"

Technical drawing of a manhole and culvert connection. The drawing shows a plan view of a manhole structure with a central "Type A" C.I. Frame & Cover". The manhole is 6'-0" wide and 6'-0" deep. It is connected to a 4'-0" wide culvert on the left. The manhole structure is made of "Class A" Concrete" and has "Manhole Rungs @ 12" o.c. (incidental to Cl. A' Conc.)". The culvert is made of "4" Concrete Lining w/ 6x6x10 Wire Mesh Reinforcing". The drawing includes dimensions for the throat, throat walls, and the culvert. The throat walls are 8" thick and 4" high. The throat is 4'-0" wide. The culvert is 4'-0" wide. The manhole is 6'-0" wide and 6'-0" deep. The drawing also shows the "Top of Concrete Lining" and the "Ditch Inv."

[illegible]

Normal Ditch Liny

Edge of Shoulder

Cut Slope as per plan

Varies 0" to 8"

2'-0"

Varies 0" to 2'-8"

12"

4" Concrete Lining w/ 6x6x19/10 Wire Mesh Reinforcing

Varies 0" to 3"

SECTION "C-C"

Scale: 1" = 1'-0"

APPROVAL RECOMMENDED:

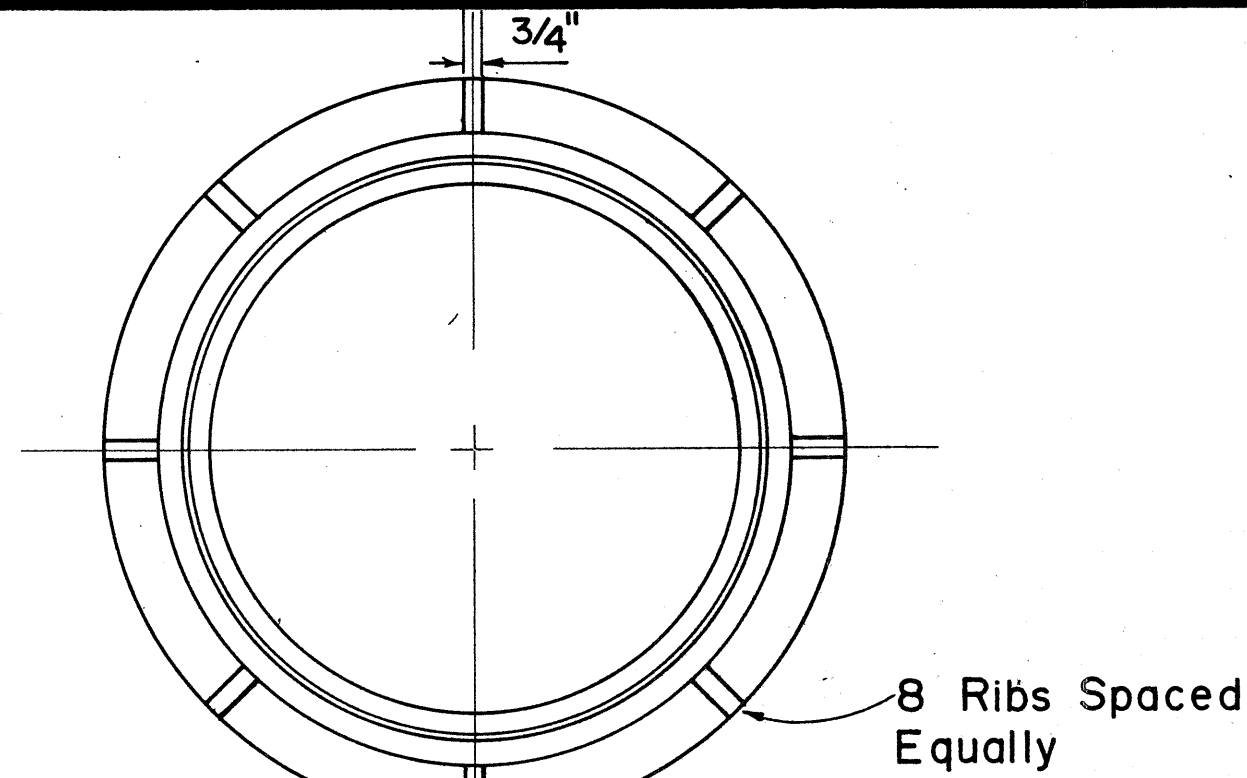
Scale: 1" = 1' - 0"

SHEET No. 5 OF 5 SHEETS **DH 4**

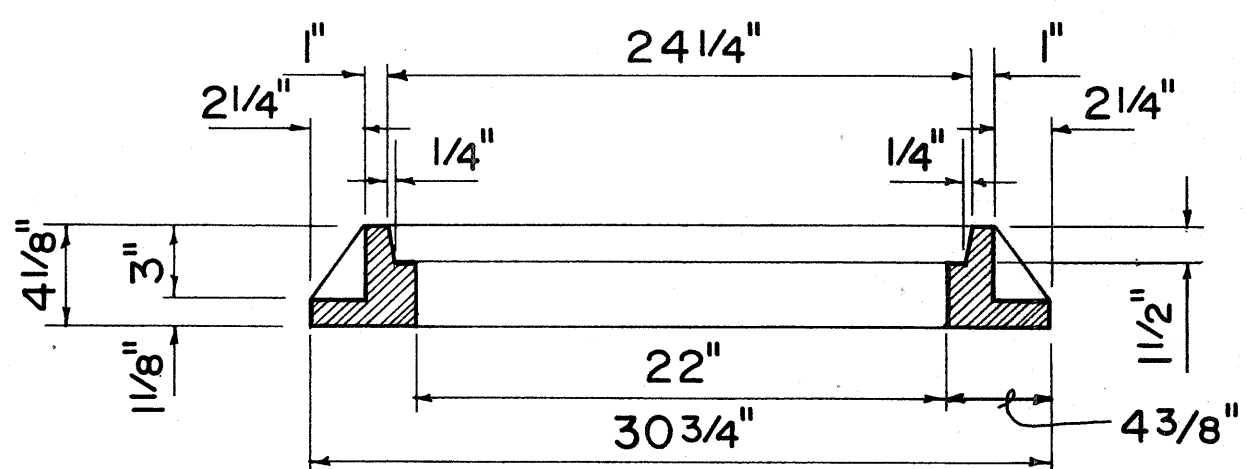
DETAILS OF TYPE "A2", "B2", "C2" AND "D2" CATCH BASIN

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

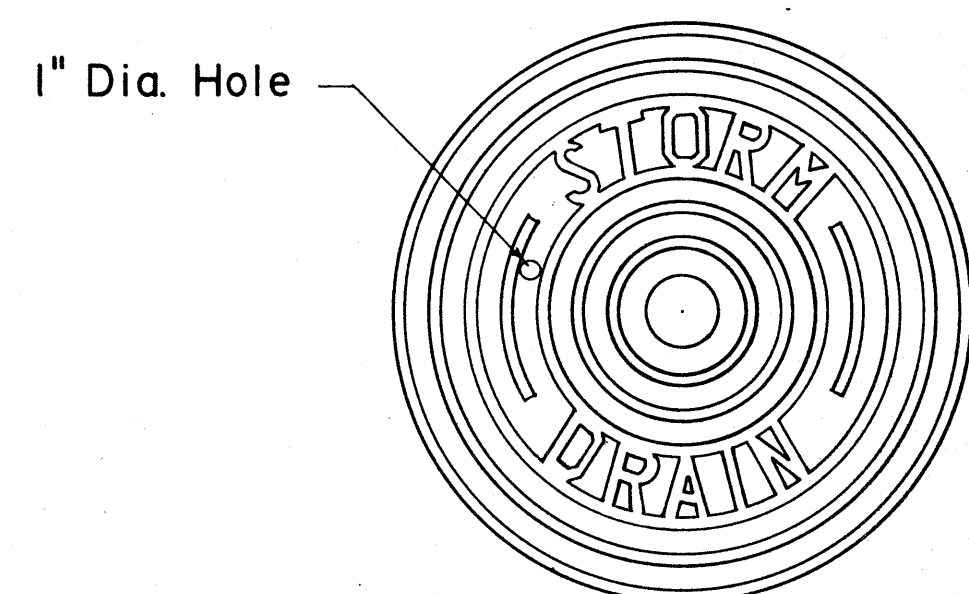
FED. ROAD DIST. NO.	STATE	PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
HAWAII	HAW.	360A-01-80	1980	18	33



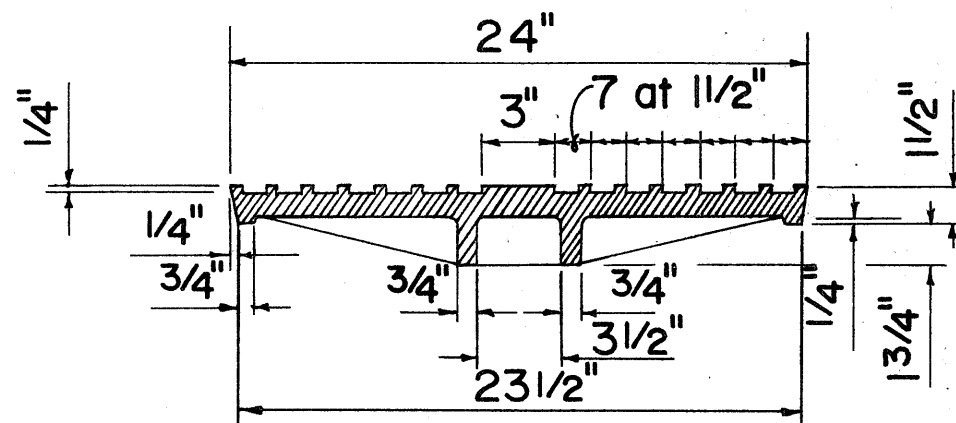
PLAN OF FRAME



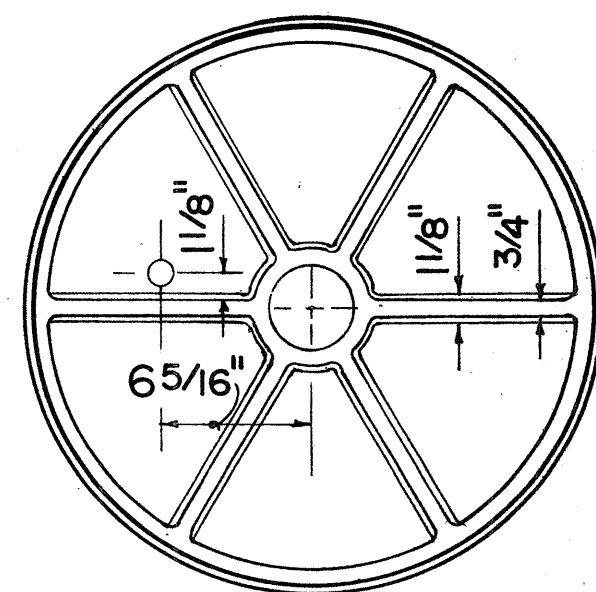
SECTION OF FRAME



TOP VIEW OF COVER

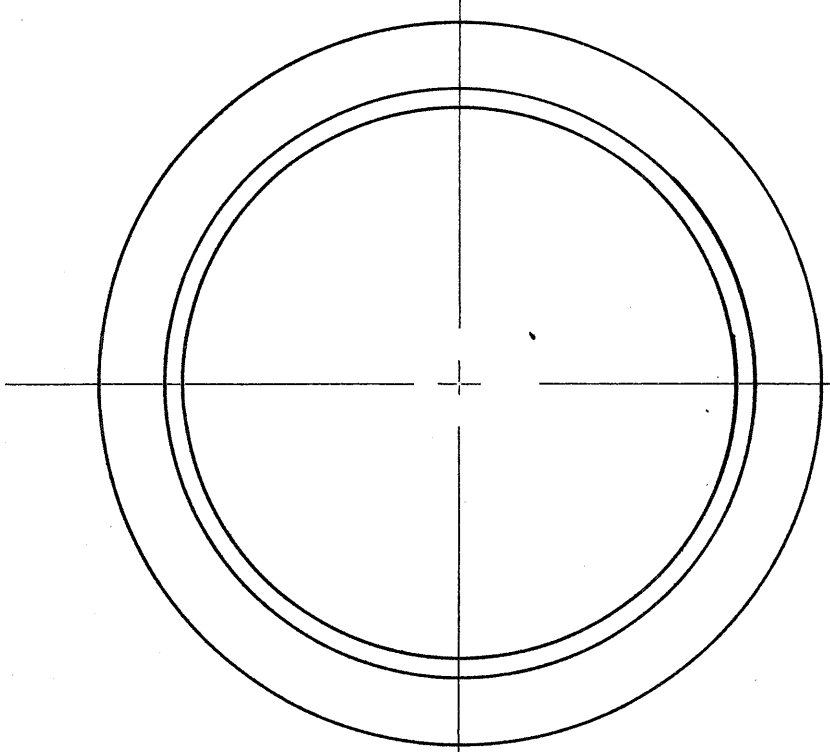


SECTION

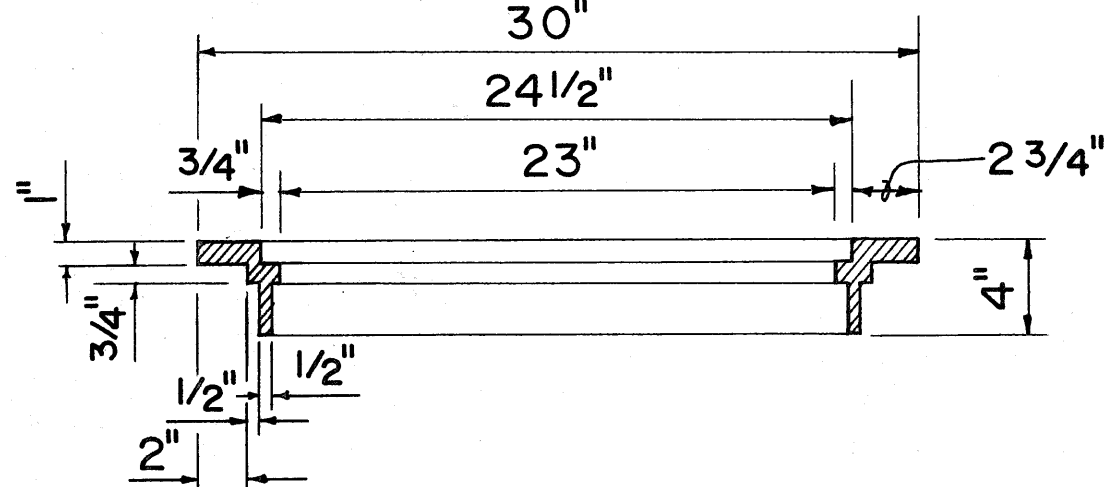


BOTTOM VIEW OF COVER

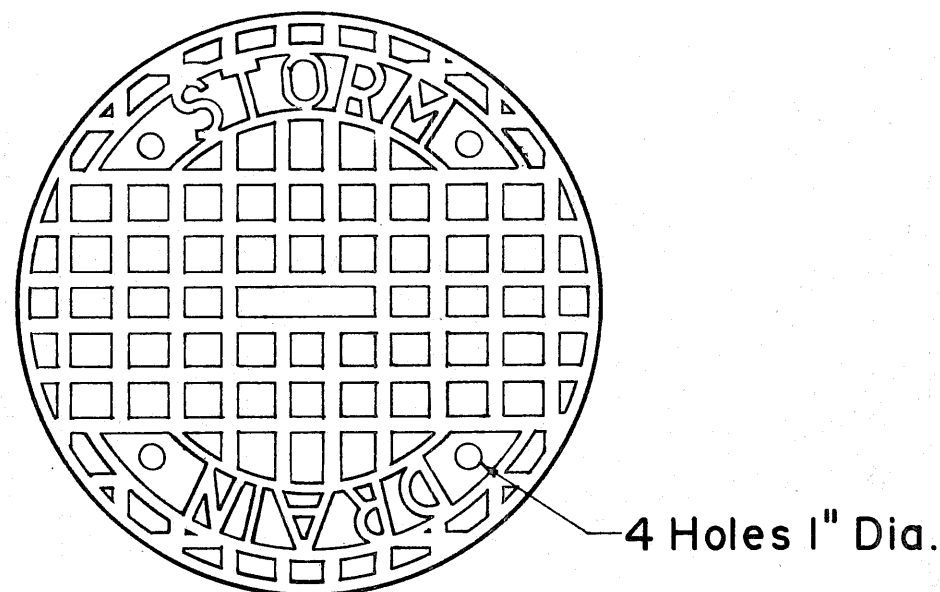
TYPE "P" CAST IRON
FRAME AND COVER



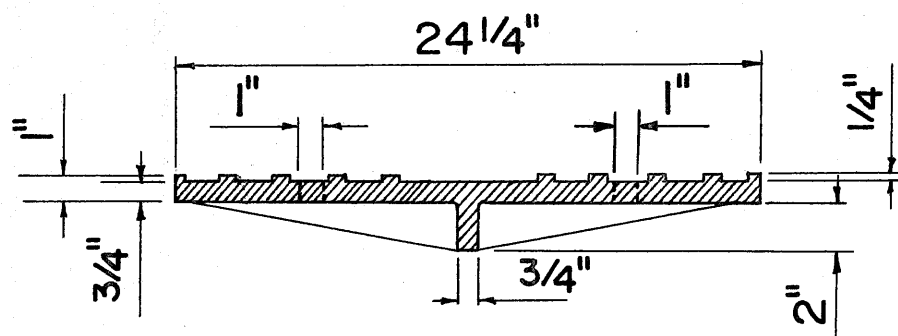
PLAN OF FRAME



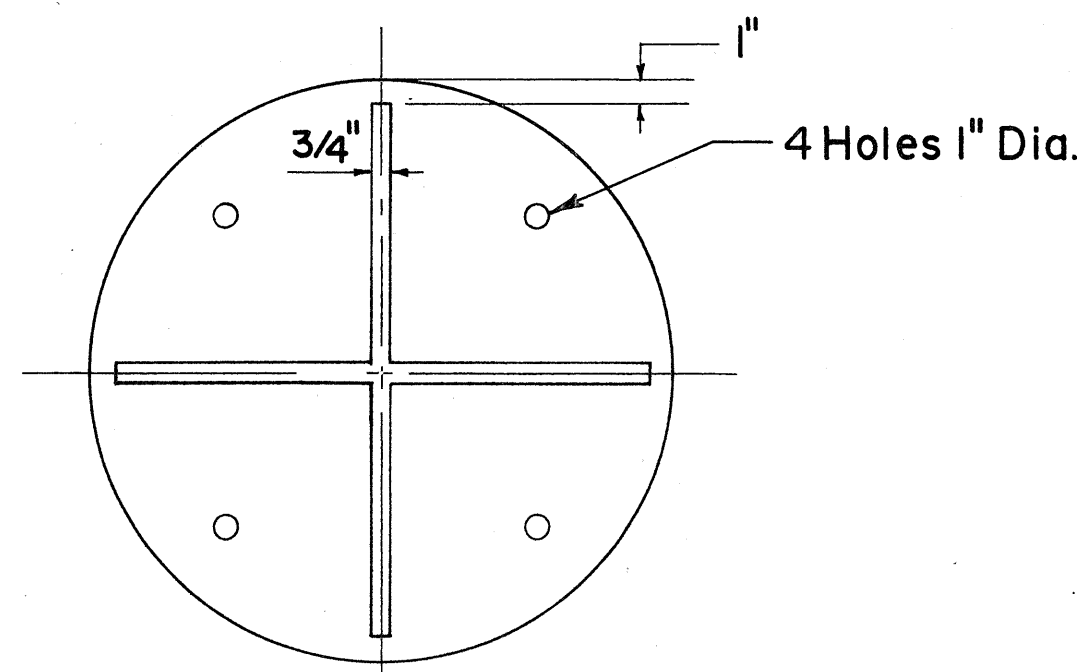
SECTION OF FRAME



TOP VIEW OF COVER

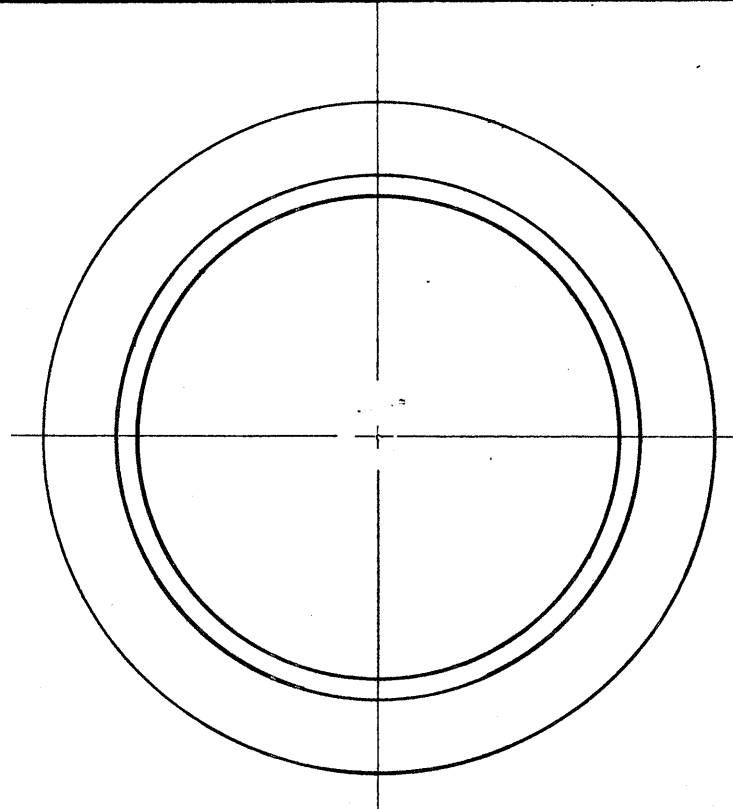


SECTION

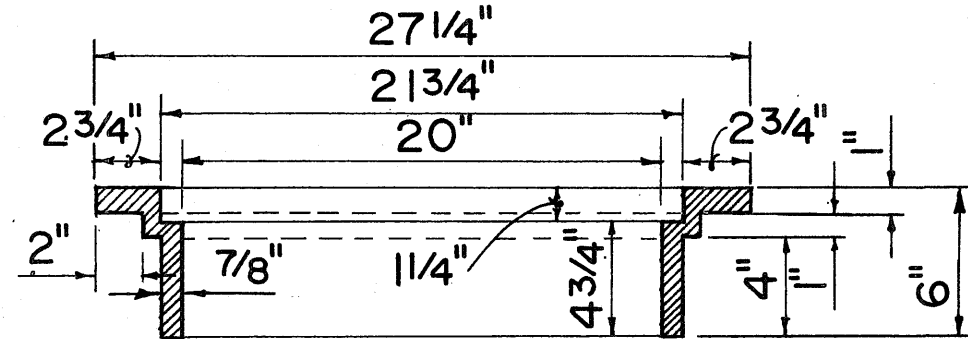


BOTTOM VIEW OF COVER

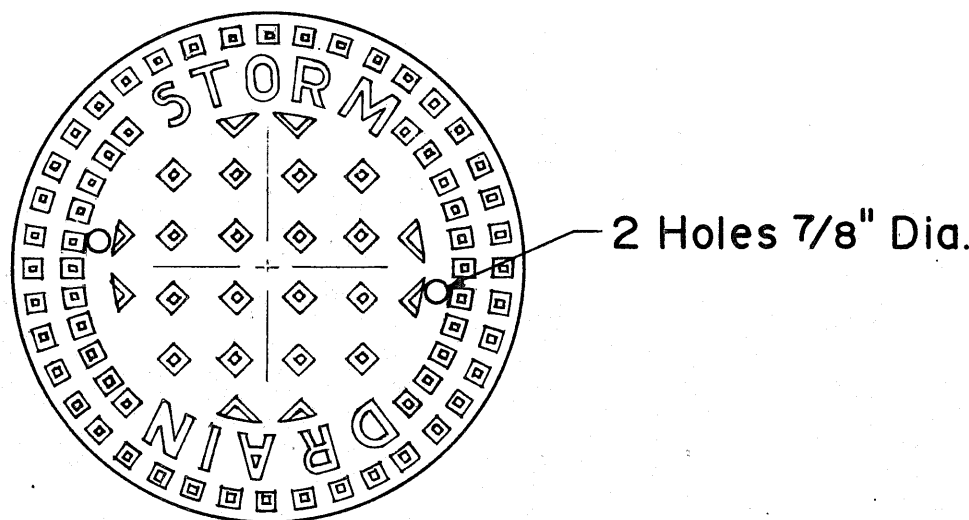
TYPE "B" CAST IRON
FRAME AND COVER



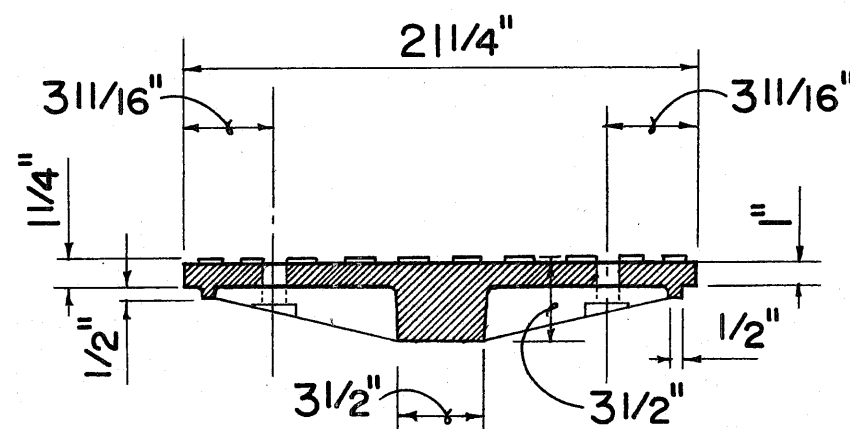
PLAN OF FRAME



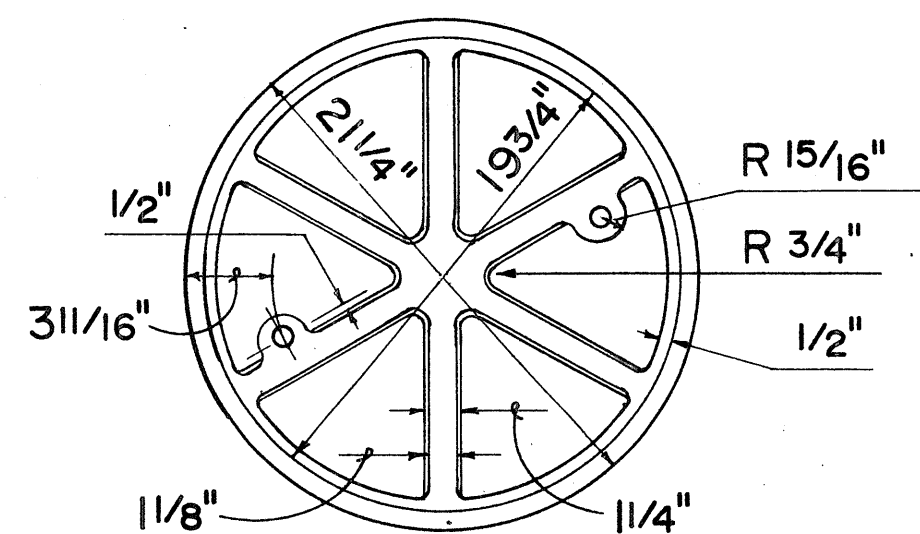
SECTION OF FRAME



TOP VIEW OF COVER

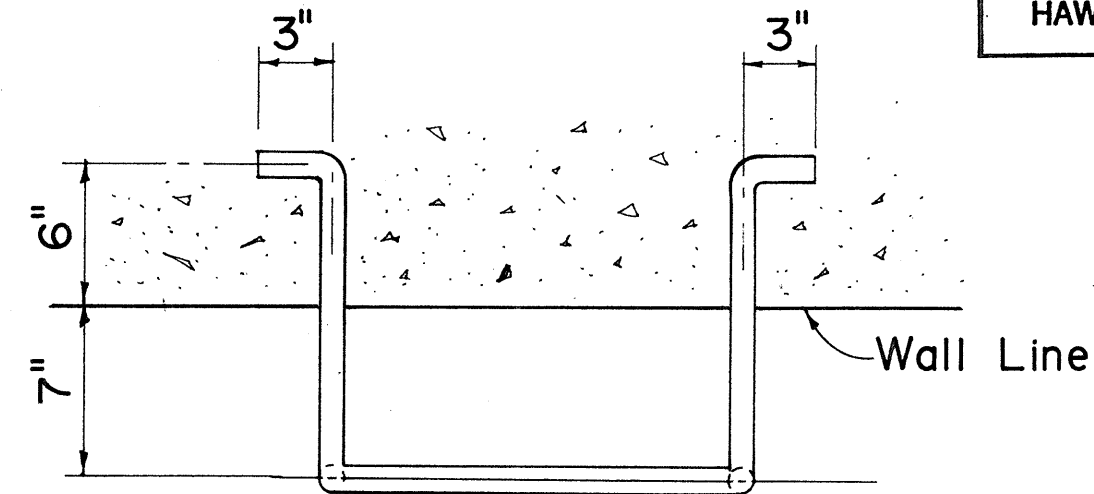


SECTION

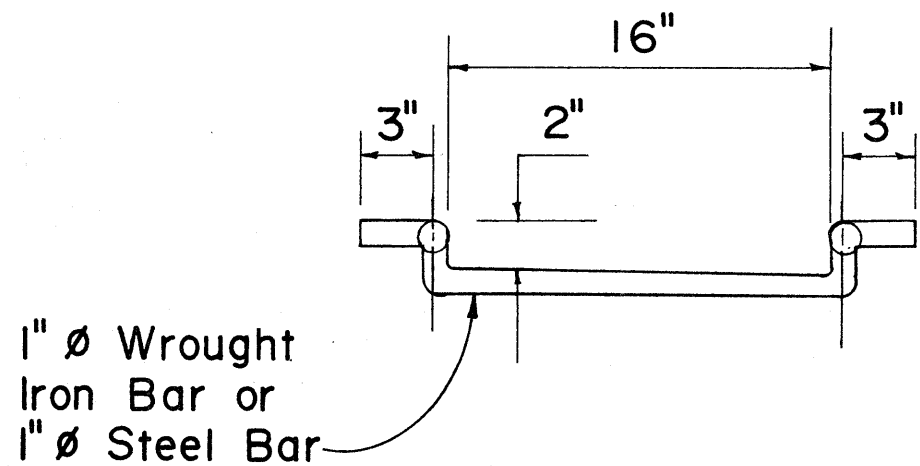


BOTTOM VIEW OF COVER

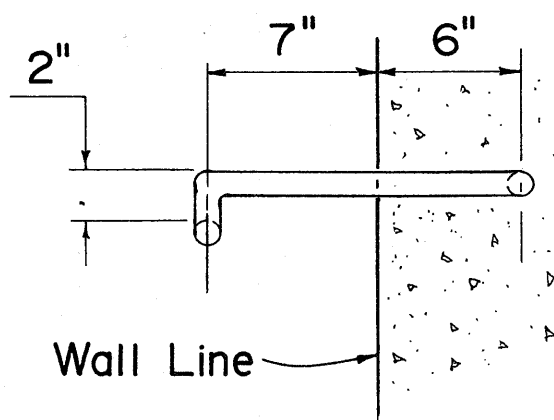
TYPE "A" CAST IRON
FRAME AND COVER



PLAN



FRONT VIEW



SIDE VIEW

MANHOLE RUNG

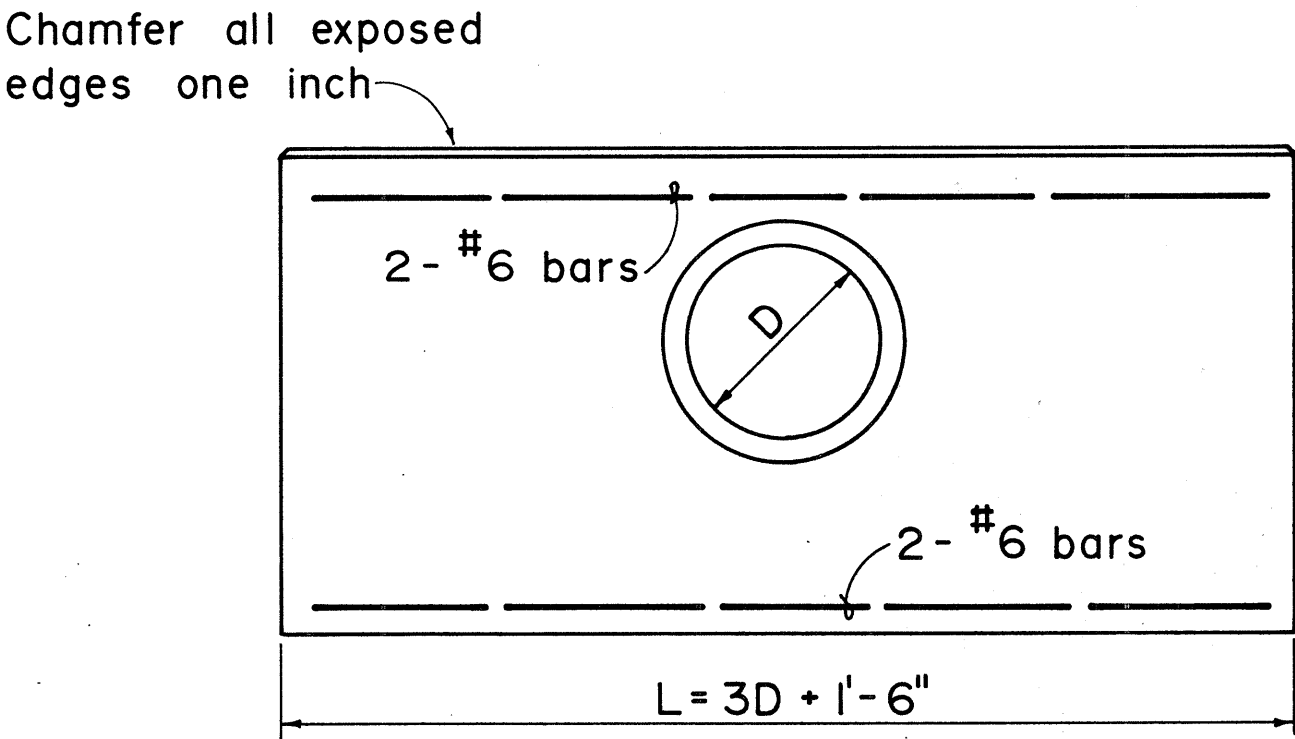
APPROVAL RECOMMENDED:
P. Takano
 HYDRAULIC DESIGN ENGINEER 6-19-79 DATE
 APPROVED:
Herbert Zakeishi
 ASSISTANT CHIEF, ENGINEERING 6-22-79 DATE

NO.	REVISION	APPROVED BY	DATE
1.	Supersedes Sht. DH 6 approved 12-17-69	H.P.	6/22/79

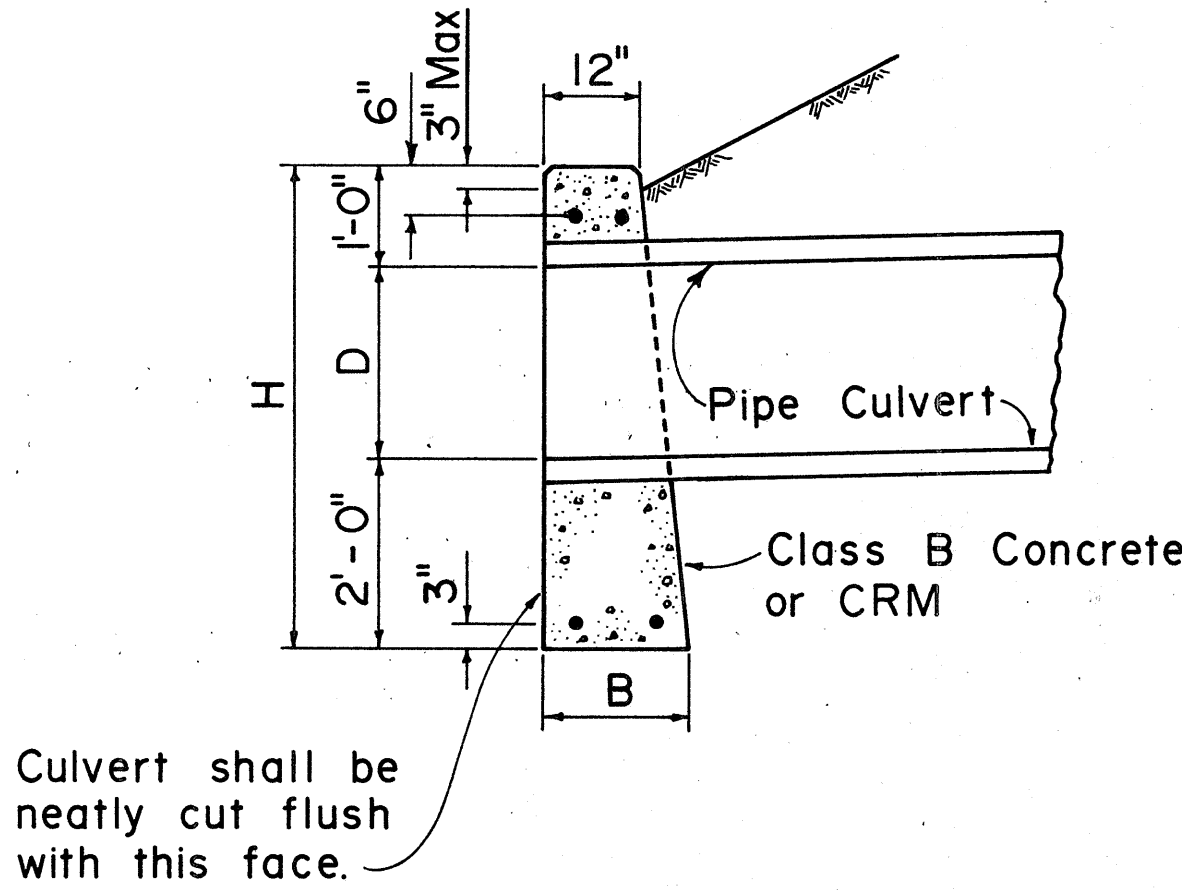
STATE OF HAWAII
 DEPARTMENT OF TRANSPORTATION
 HIGHWAYS DIVISION
 STANDARD DETAILS
 CATCH BASIN AND
 MANHOLE CASTINGS
 Not To Scale Date: Dec. 1977

SHEET NO. 4 OF 5 SHEETS DH 6

FED. ROAD DIST. NO.	STATE	PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
HAWAII	HAW.	360A-01-80	1980	19	33



ELEVATION



SECTION

DATA FOR CONC. HDWL.			
D	B	L	H
18"	1'-6"	6'-0"	4'-6"
24"	1'-6"	7'-6"	5'-0"
30"	2'-0"	9'-0"	5'-6"
36"	2'-0"	10'-6"	6'-0"
42"	2'-6"	12'-0"	6'-6"
48"	2'-6"	13'-6"	7'-0"

DATA FOR CRM HDWL.			
D	B	L	H
18"	1'-9"	6'-0"	4'-6"
24"	2'-0"	7'-6"	5'-0"
30"	2'-3"	9'-0"	5'-6"
36"	2'-6"	10'-6"	6'-0"

CONCRETE OR CRM HEADWALL

APPROVAL RECOMMENDED:
T. Takano 6-19-79
 HYDRAULIC DESIGN ENGINEER DATE
 APPROVED:
Harbert Zaleishi 6-22-79
 ASSISTANT CHIEF, ENGINEERING DATE

NO.	REVISION	APPROVED BY	DATE
1.	Supersedes Sht. DH 10 approved 12-17-69	H.I.	6/22/79

STATE OF HAWAII
 DEPARTMENT OF TRANSPORTATION
 HIGHWAYS DIVISION

STANDARD DETAIL
 CONCRETE OR CEMENT
 RUBBLE MASONRY HEADWALLS

Not To Scale
 Date: June 1979

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