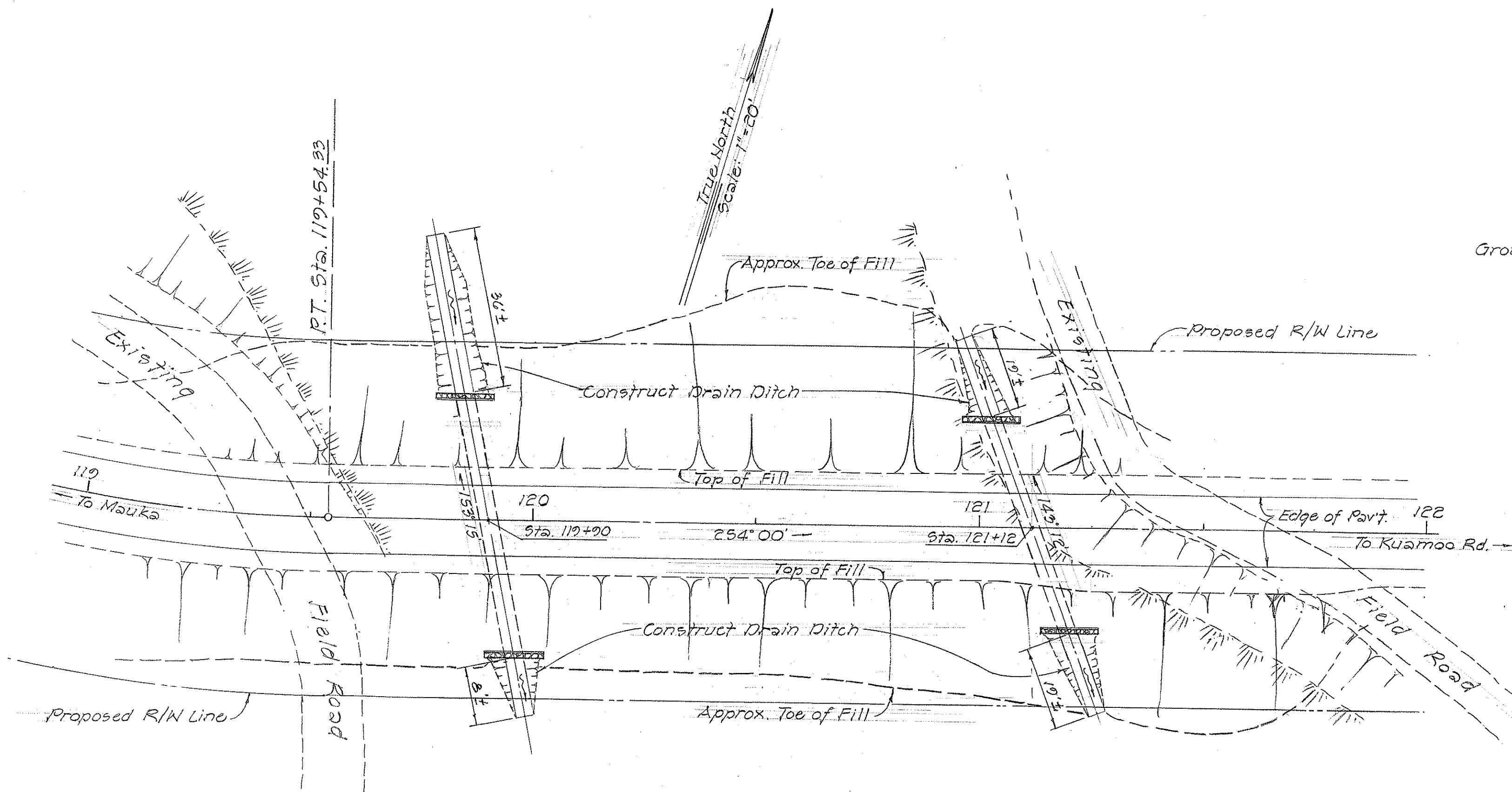
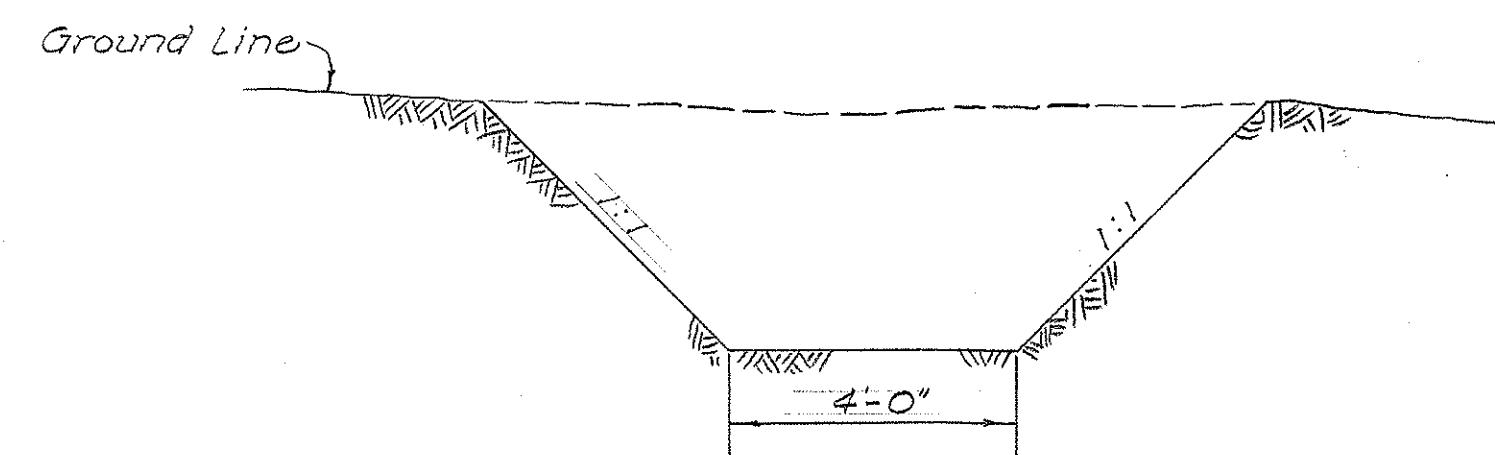


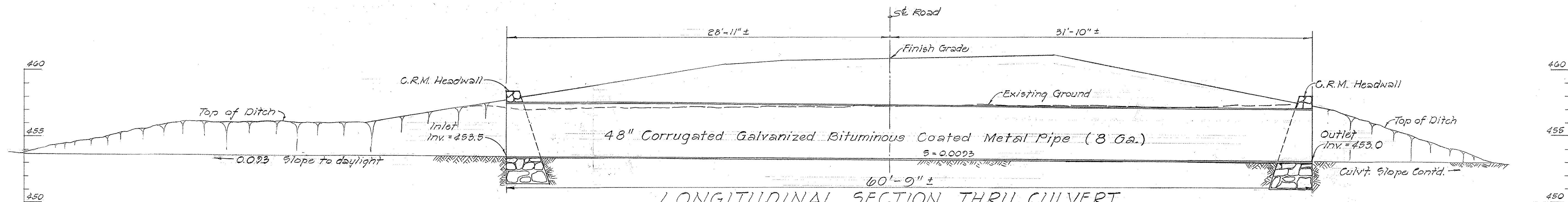


PLAN
Scale: 1" = 20'



TYPICAL DRAIN DITCH SECTION

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



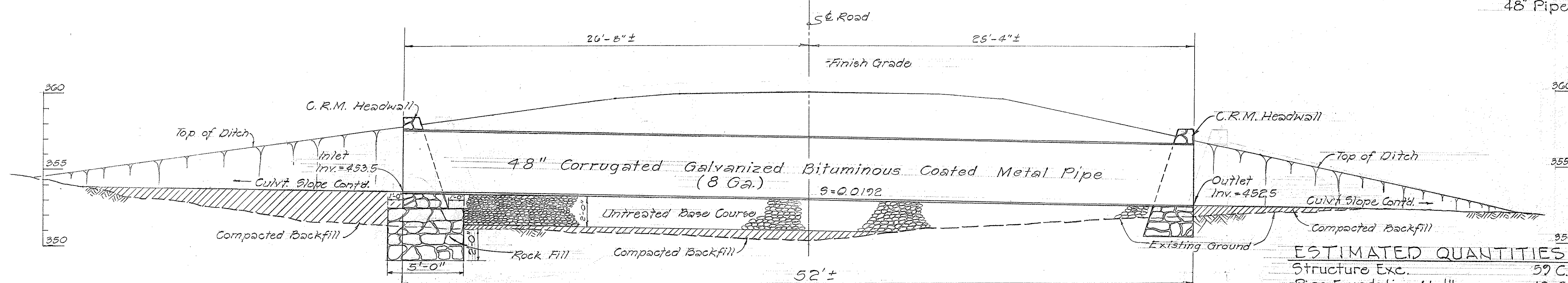
LONGITUDINAL SECTION THRU CULVERT
AT STA. 119+90

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

ESTIMATED QUANTITIES

Structure Exc.	63 C.Y.
C.R.M.	120 C.Y.
Ditch & Channel Exc.	33 C.Y.
48" Pipe Culvert	62 L.F.

Notes:
For C.R.M. Headwall
detail, see Sheet No. 7



LONGITUDINAL SECTION THRU CULVERT
AT STA. 121+12

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

ESTIMATED QUANTITIES

Structure Exc.	59 C.Y.
Pipe Foundation Mat'l.	19 C.Y.
C.R.M.	120 C.Y.
Ditch & Channel Exc.	27 C.Y.
Rock Fill	8 C.Y.
48" Culvert Pipe	54 L.F.

Note: Rock Fill Material shall
be obtained from Ford #1
and Ford #3. See Sheet No. 6

STATE OF HAWAII
DEPARTMENT OF TRANSPORTATION
HIGHWAYS DIVISION

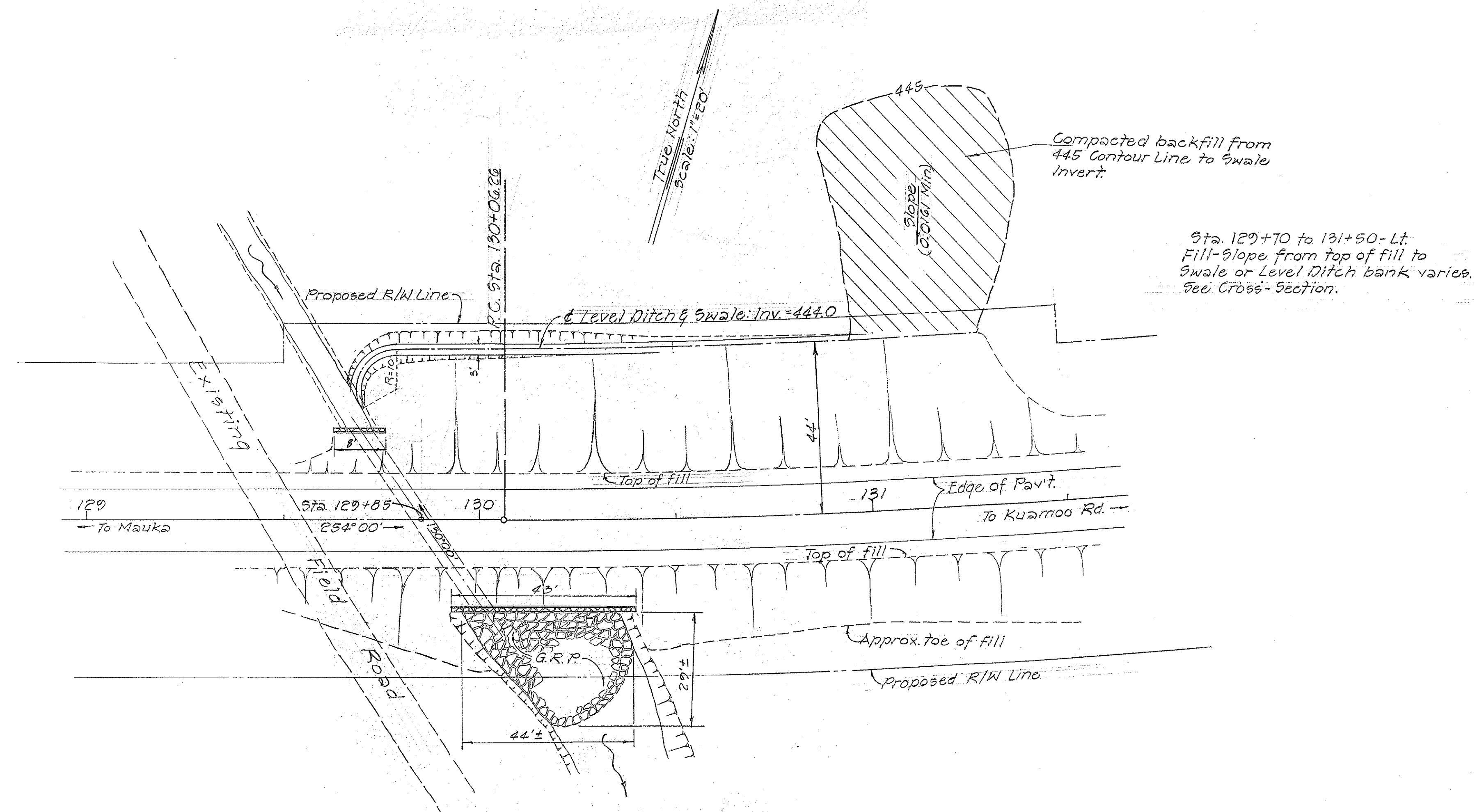
**CULVERT & DRAIN DITCH
DETAIL**

LIHUE-WAILUA-PRINCEVILLE ROAD
PROJECT NO. BD 67-359

SCALE: AS SHOWN DATE: MAY, 1968

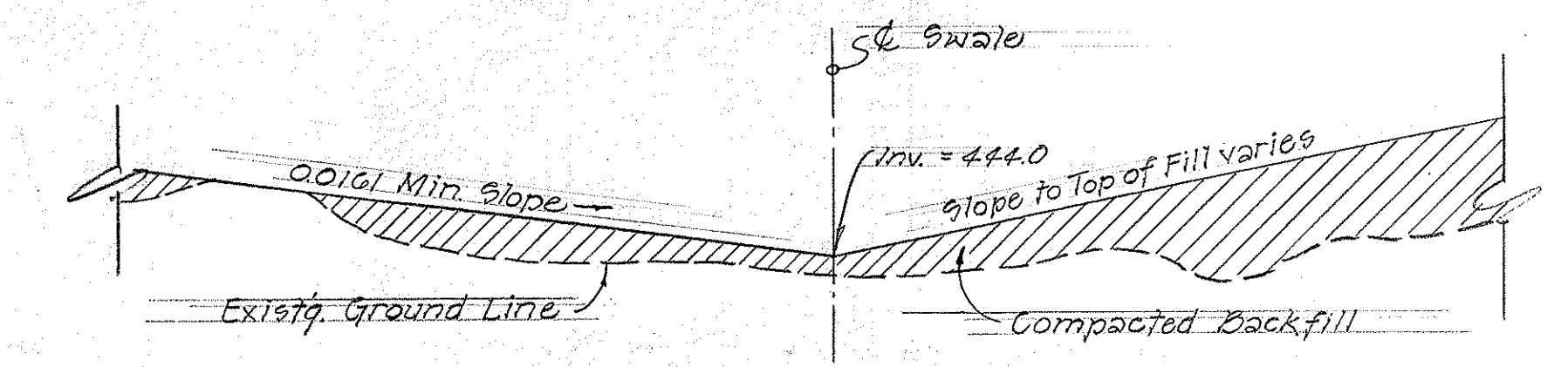
SHEET No. 1 OF 5 SHEETS

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

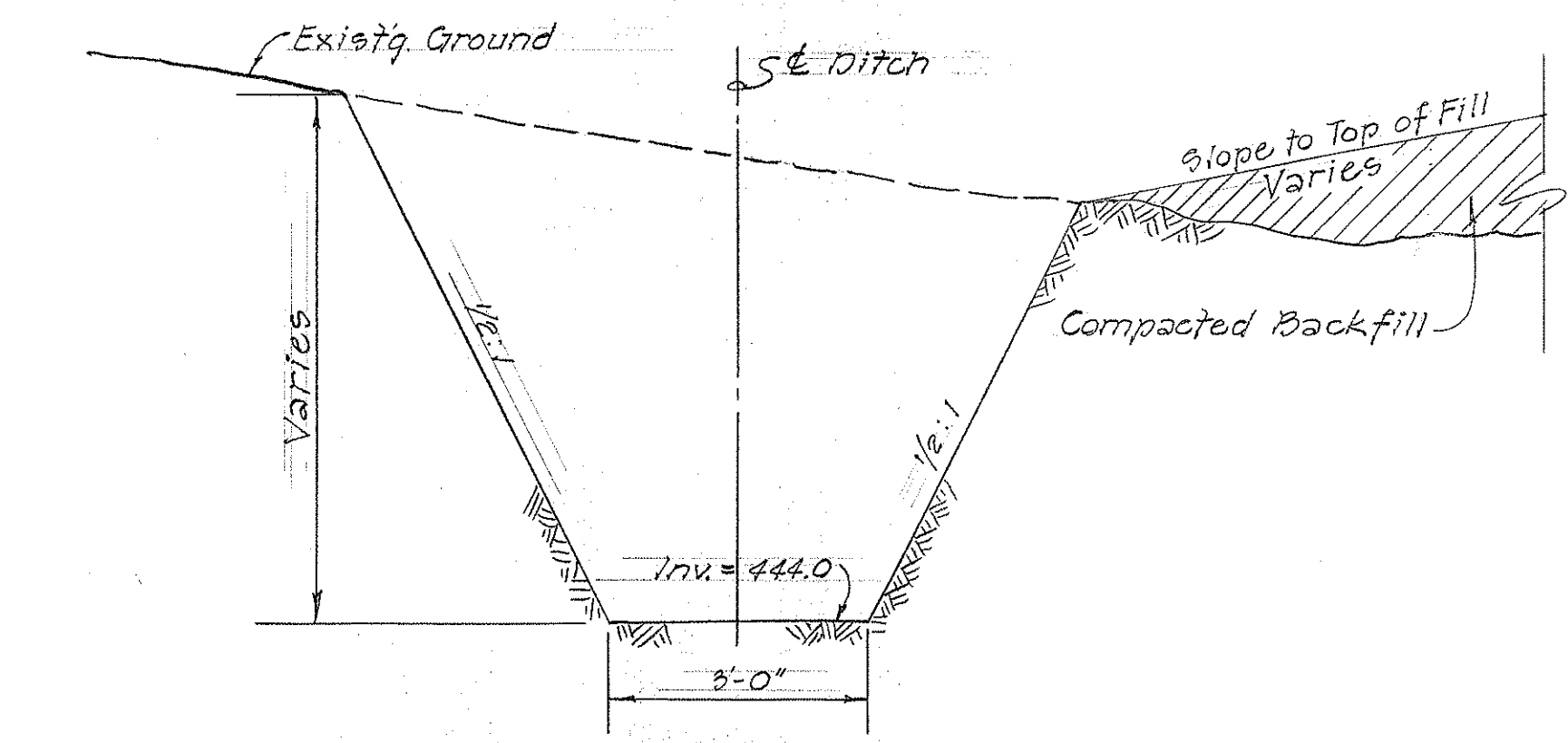


PLAN
Scale: 1" = 20'

Note:
For C.R.M. Headwall detail, see Sheet No. 7



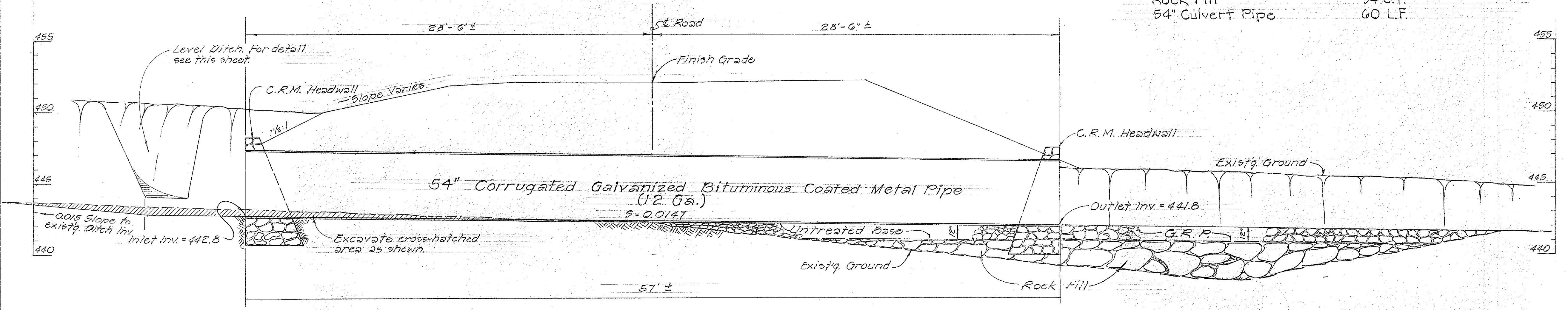
TYPICAL SWALE SECTION



TYPICAL LEVEL DITCH SECTION
Scale: 1/2" = 1'-0"

ESTIMATED QUANTITIES

Structure Exc.	63 C.Y.
Pipe Foundation Mat'l.	5 C.Y.
C.R.M.	27 C.Y.
G.R.P.	32.4 C.Y.
Ditch & Channel Exc.	60
Rock Fill	34 C.Y.
54" Culvert Pipe	60 L.F.



LONGITUDINAL SECTION THRU CULVERT
AT STA. 129+85
Scale: 1/2" = 1'-0"

Note: Rock Fill Material shall be obtained from Ford #1 and Ford #3. See Sheet No. 6

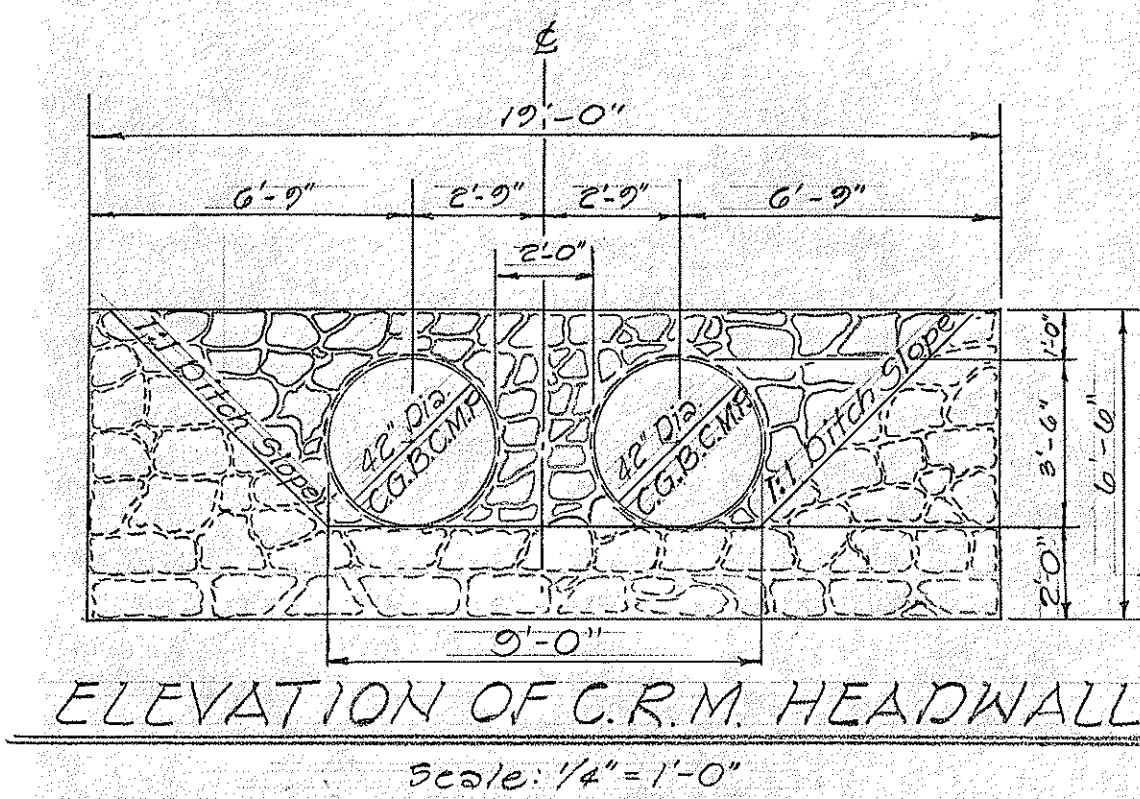
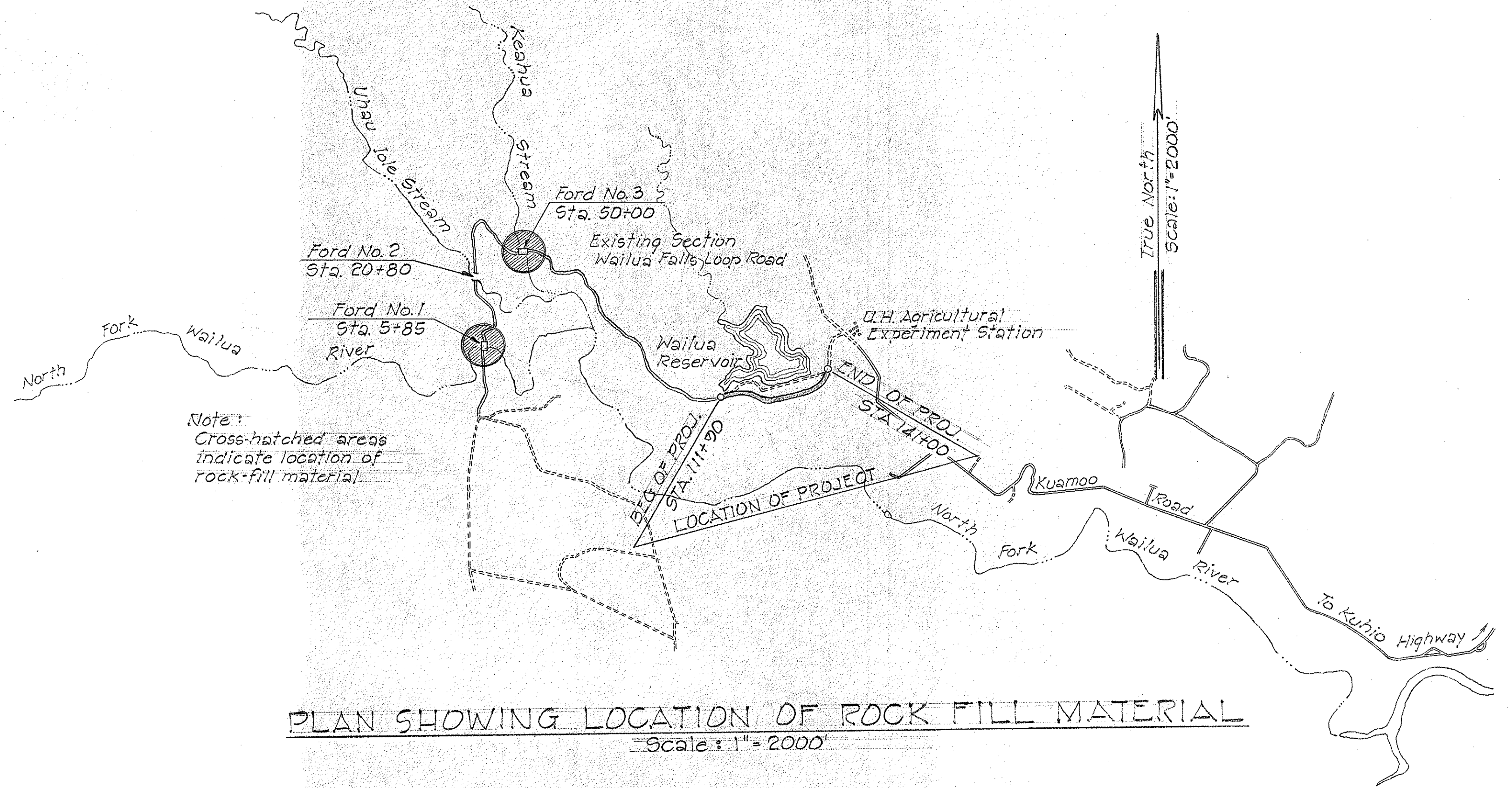
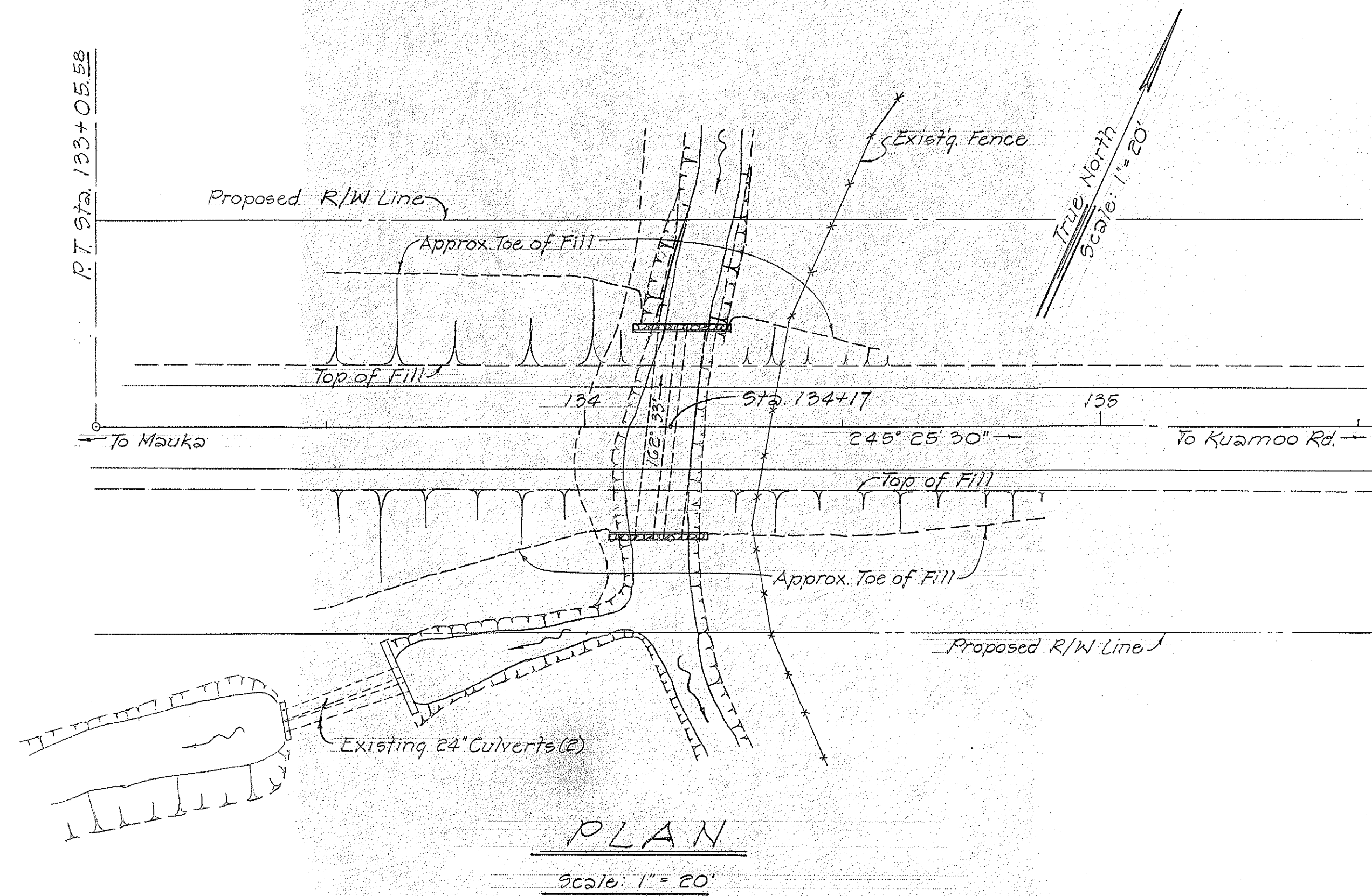
SURVEY PLOTTED BY	DATE
DRAWN BY	" "
DESIGNED BY	" "
QUANTITIES BY	" "
CHECKED BY	" "
ORIGINAL PLAN	No.
NOTE BOOK	No.

STATE OF HAWAII
DEPARTMENT OF TRANSPORTATION
HIGHWAYS DIVISION

**CULVERT & LEVEL DITCH
DETAIL**

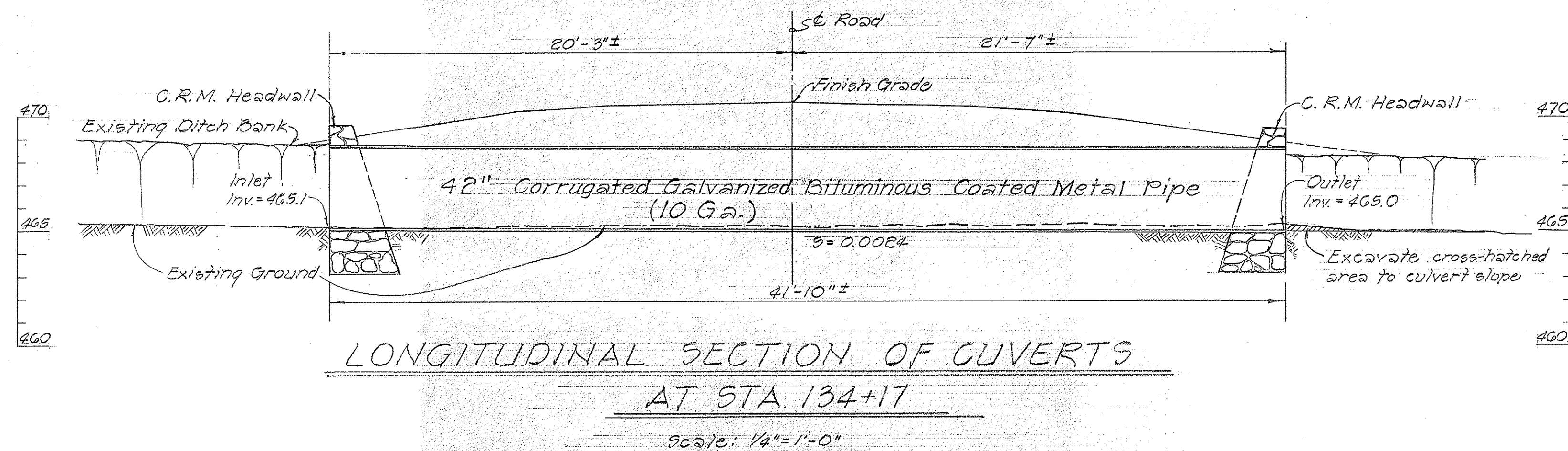
LIHUE-WAILUA-PRINCEVILLE ROAD
PROJECT NO. BD 67-359

SCALE: AS SHOWN DATE: MAY, 1968
SHEET No. 2 OF 5 SHEETS



ESTIMATED QUANTITIES	
Structure Exc.	25 C.Y.
C.R.M.	150 C.Y.
42" Pipe Culvert	84 L.F.

NOTE:
For C.R.M. Headwall detail,
see Sheet No. 7

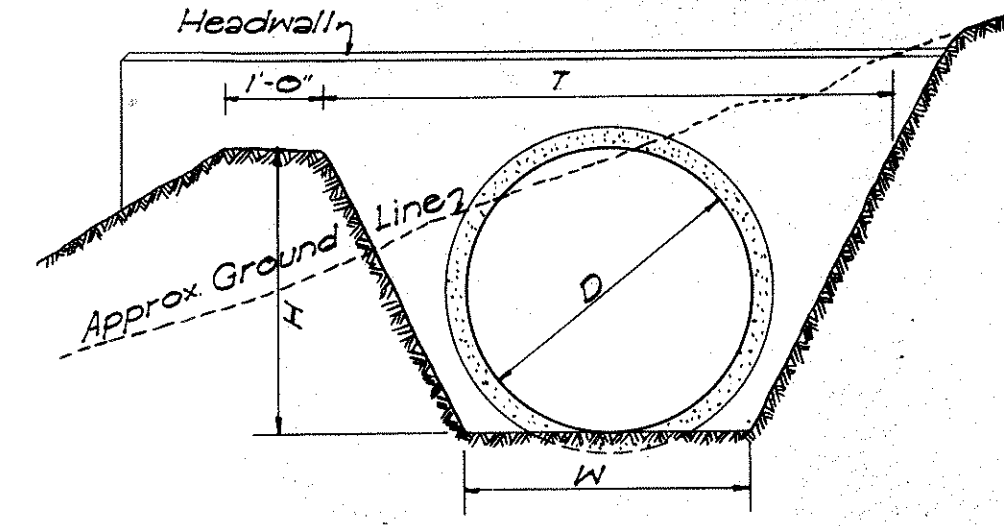


FED. ROAD DIST. NO.	STATE	PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
HAWAII	HAW	BD 67-959	1968	7	11

Revised: June 1965
Revised: August 1967

Note: To Resident Engineer
1) Consider economy of reinf. conc. for high retaining walls which did not originate on plan layout.
2) Elevation of weep holes to be determined by Resident Engineer. Holes to be placed as close to the existing ground line as local conditions permit.

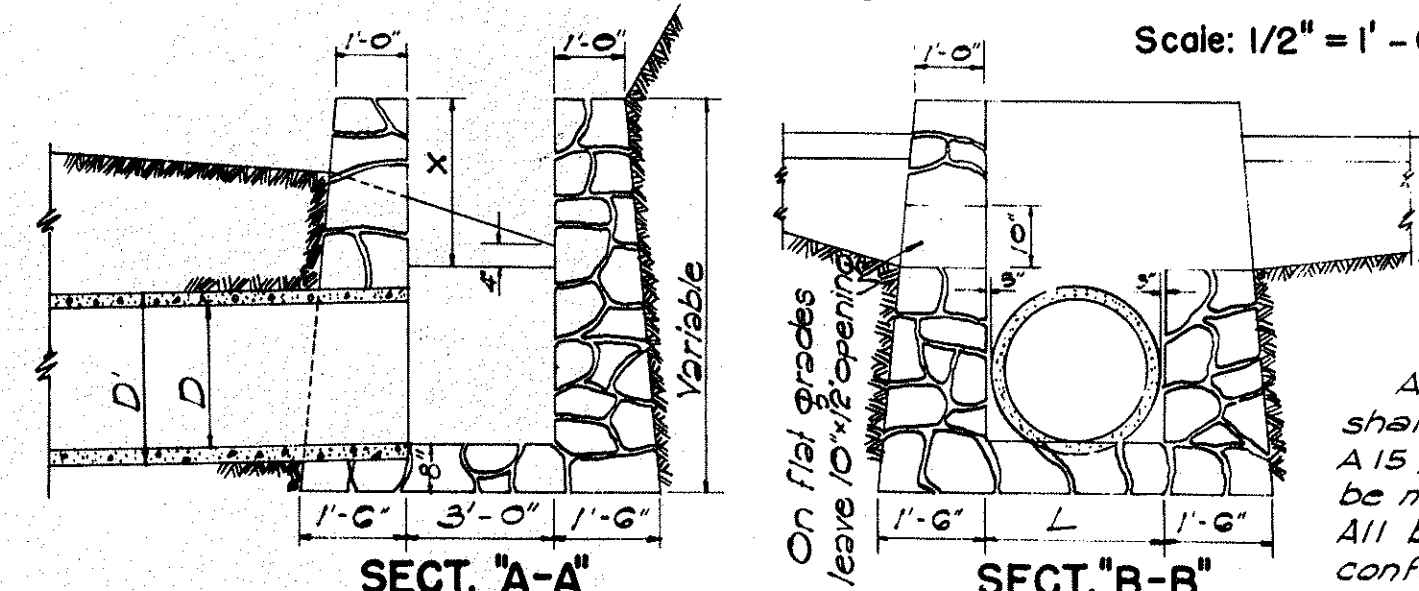
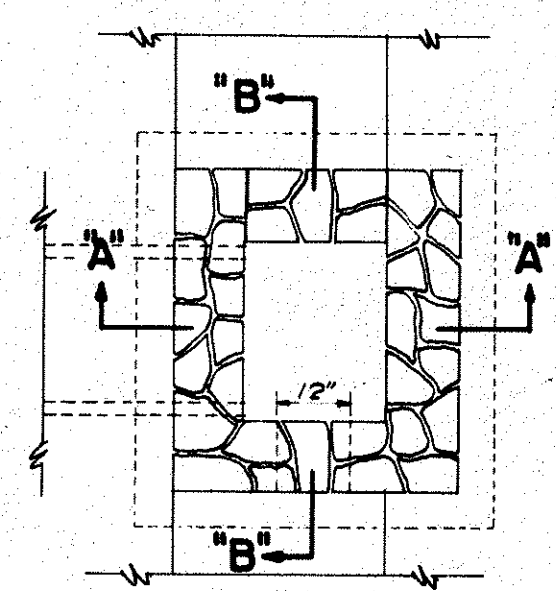
DATA FOR OUTLET DITCH				
D	W	H	T=H+H	
18"	24"	2'-0"	4'-0"	
24"	30"	2'-0"	4'-0"	
30"	30"	2'-6"	5'-0"	
36"	36"	3'-0"	6'-0"	



DETAIL OF OUTLET DITCH
Scale: 1/2" = 1'-0"

DATA FOR MASONRY DROP INTAKE					Where Variables Equal
D	D	L=D+G	Cu Yds.		
23"	18"	2'-5"	3.02	4'-6"	
30"	24"	3'-0"	3.61	5'-0"	
37"	30"	3'-7"	4.21	5'-6"	
44"	36"	4'-2"	4.85	6'-0"	

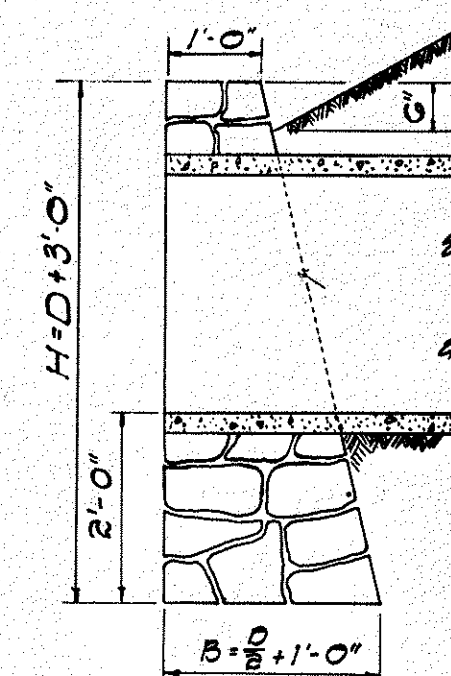
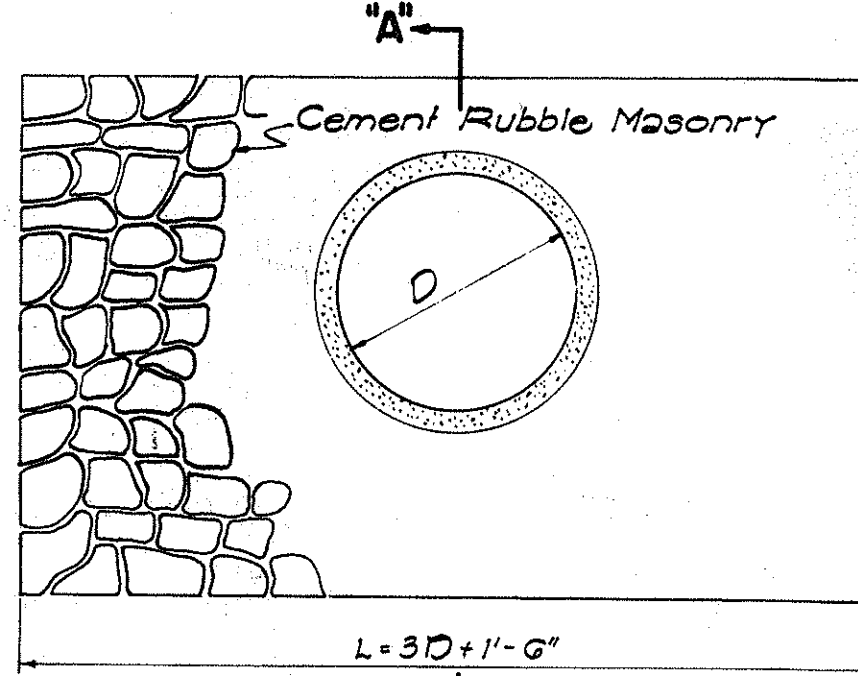
NOTE:
Dimension "X" is assumed as 2'-4" in figuring the above quantities.



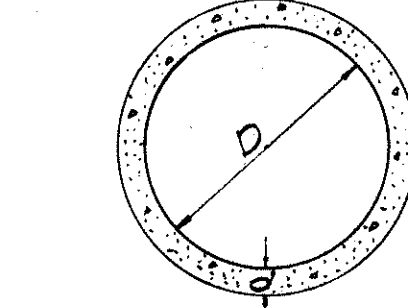
SECTION "A-A"
SECTION "B-B"
CONC. COLLAR FOR CONC. BOX CULVERT
Scale: 1/2" = 1'-0"

REINFORCING BARS
All reinforcing bars for concrete shall be Billet Steel bars, ASTM A15, intermediate grade. Steel shall be made by the open-hearth process. All bars shall be deformed type conforming to ASTM A-305.

DATA - MASONRY HEADWALL					CRM for RCCP	CRM for CGMP
D	H	B	L	Cu Yds.		
18"	4'-6"	1'-0"	6'-0"	1.34	1.20	
24"	5'-0"	2'-0"	7'-6"	1.83	1.68	
30"	5'-6"	2'-6"	9'-0"	2.56	2.70	
36"	6'-0"	3'-0"	10'-6"	3.45	3.66	



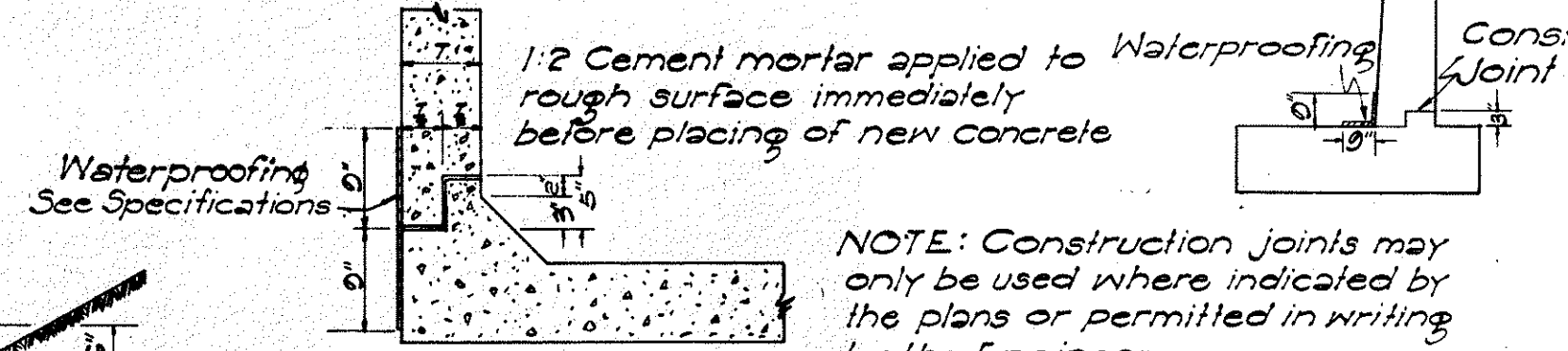
DETAIL OF MASONRY HEADWALL
Scale: 1/2" = 1'-0"



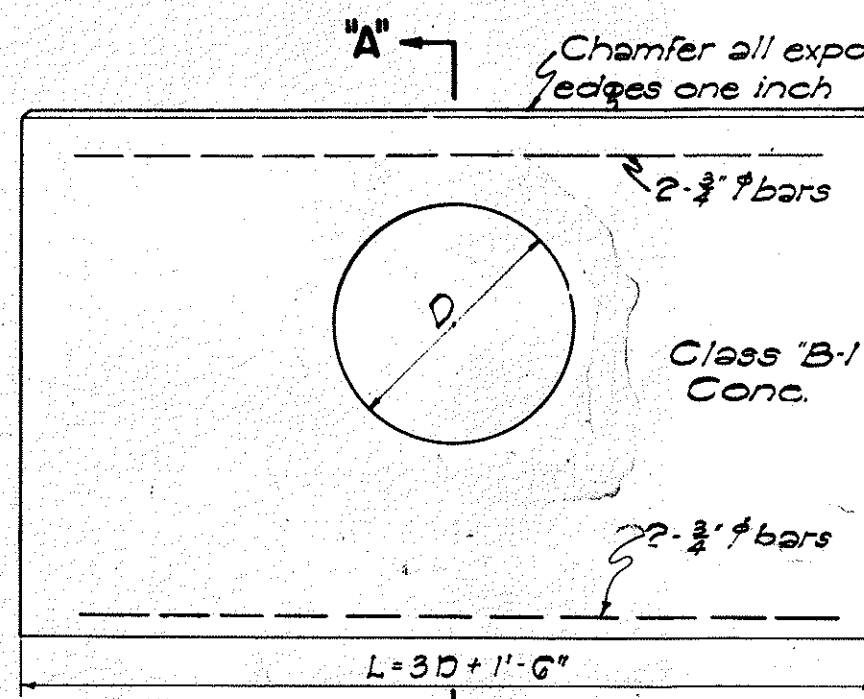
SECTION
CONC. PIPE CULVERT

NOTE:
Thickness 'd', reinforcing, and concrete used, are to conform with the approved design as provided by the Specifications.

DETAIL OF MASONRY DROP INTAKE
Scale: 3/8" = 1'-0"

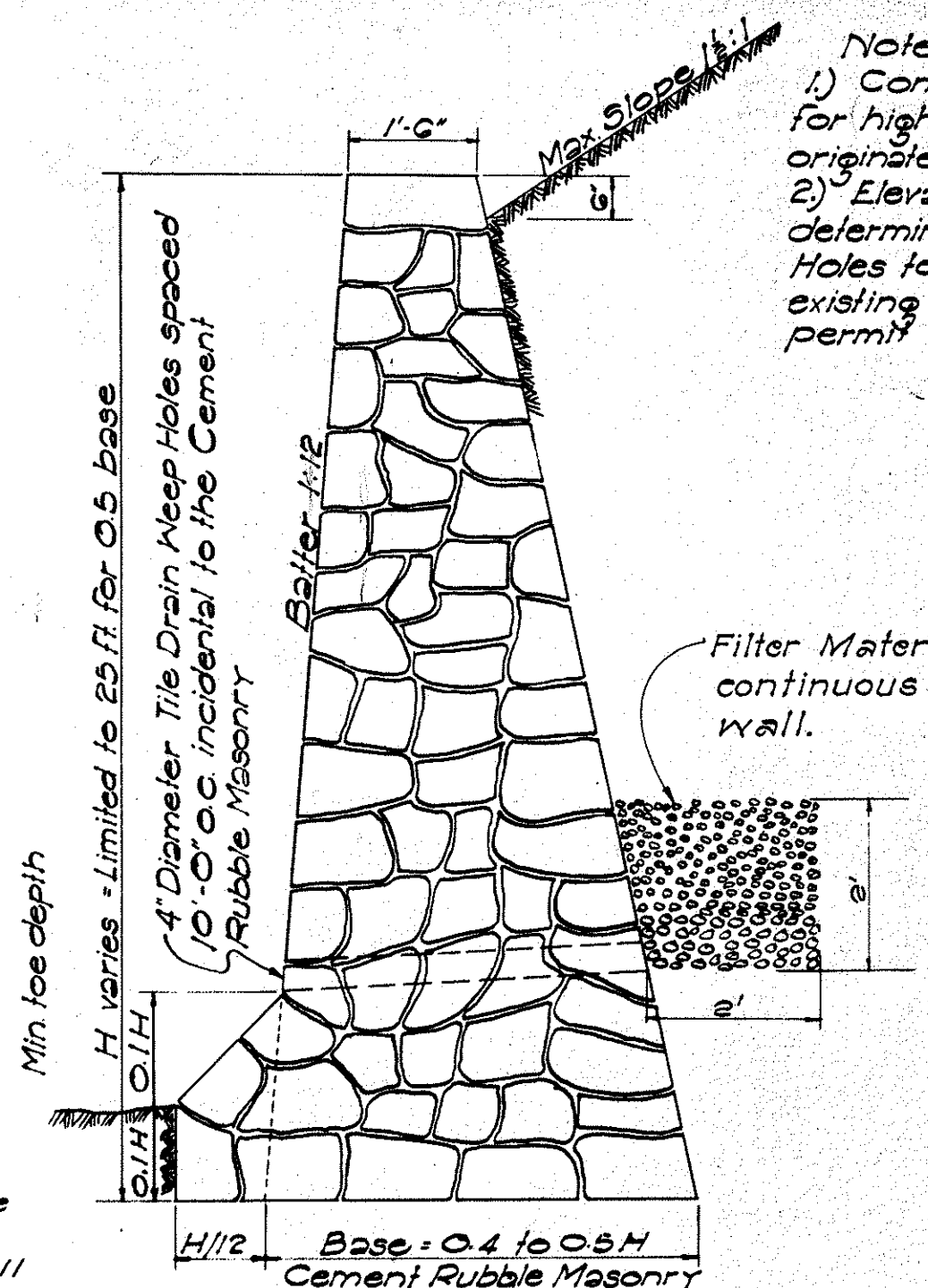


CONSTR. JOINT DETAILS

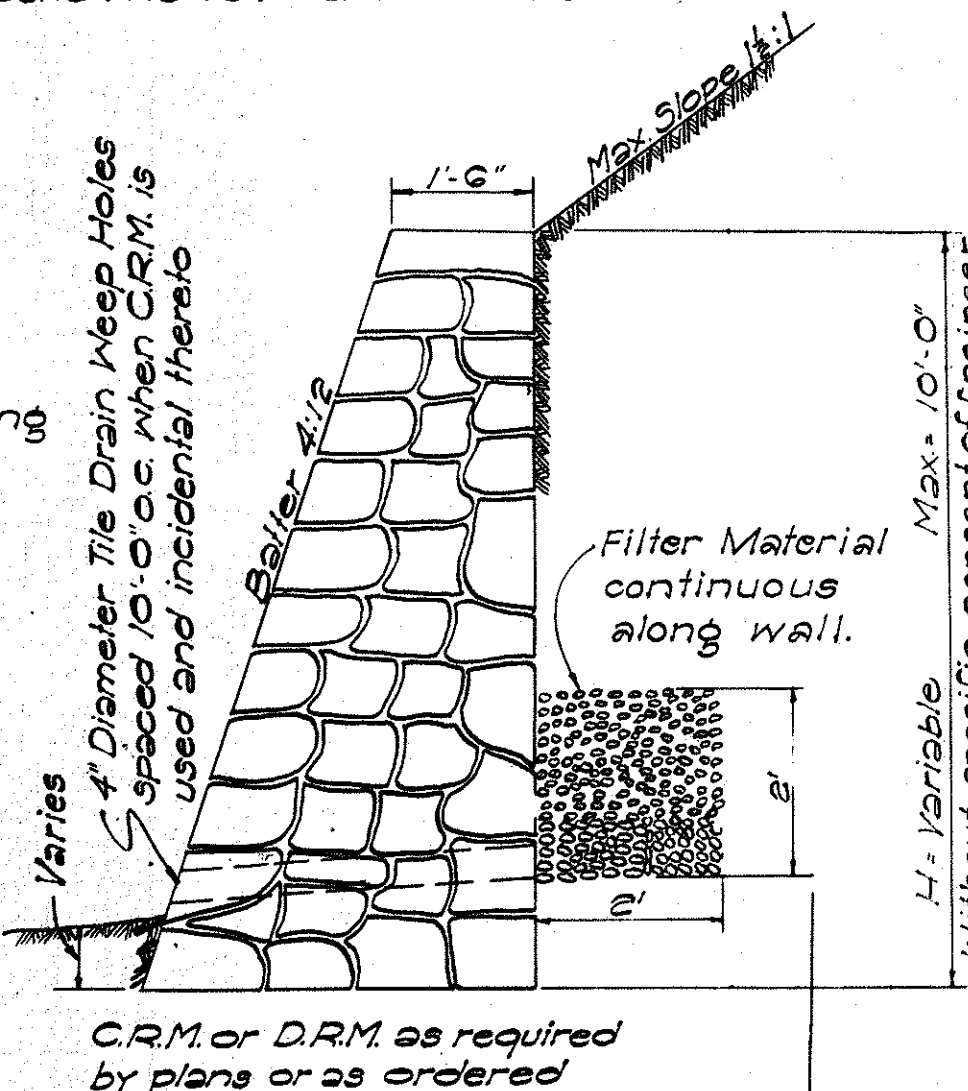


DATA FOR CONC. HEADWALL					CL "B-1" Conc. For RCCP	CL "B-1" Conc. For CGMP	Steel For One Headwall
D	B	L	H	Cu Yds.			
18"	1'-6"	6'-0"	4'-6"	1.12	1.17	4	3/4" # 5'-6"
24"	1'-6"	7'-6"	5'-0"	1.52	1.60	4	3/4" # 7'-0"
30"	2'-0"	9'-0"	5'-6"	2.36	2.49	4	3/4" # 8'-6"
36"	2'-0"	10'-6"	6'-0"	3.04	3.13	4	3/4" # 10'-0"
42"	2'-6"	12'-0"	6'-6"	4.10	4.47	4	3/4" # 11'-6"
48"	2'-6"	13'-6"	7'-0"	5.01	5.36	4	3/4" # 13'-0"

DETAIL OF CONCRETE HEADWALL
Scale: 1/2" = 1'-0"



SECTION OF HIGH CEMENT
RUBBLE MASONRY RETAINING
WALL OR SEAWALL

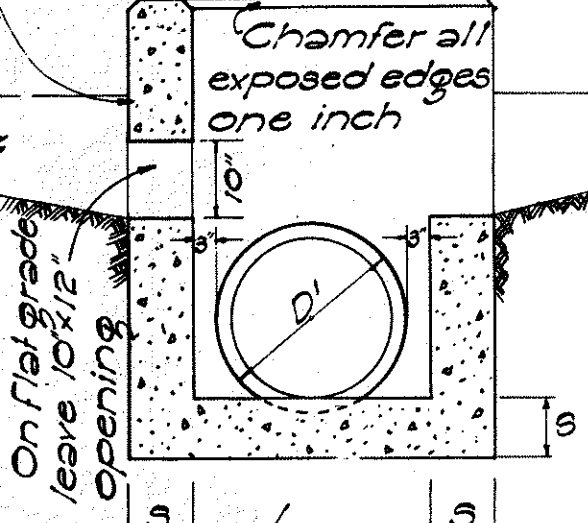


SECTION OF LOW
MASONRY RETAINING
WALL OR SEAWALL

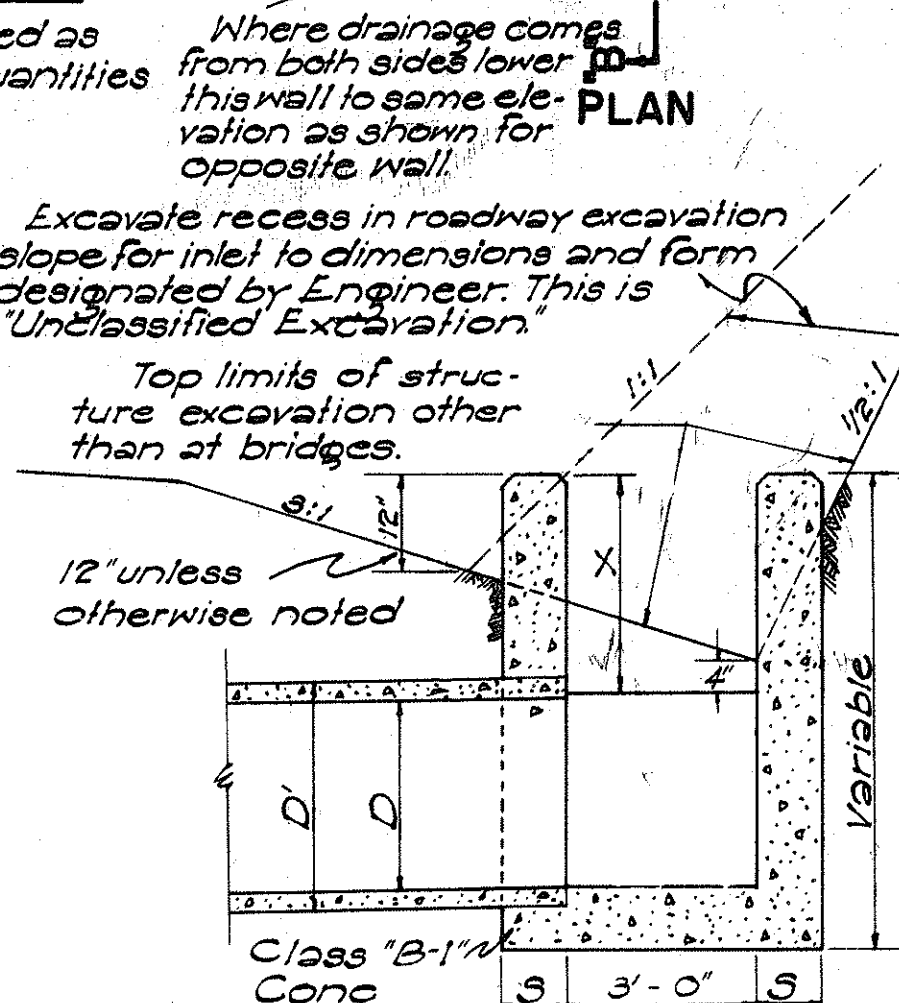
DATA - CONC. DROP INTAKE					Where Variables Equal
D	D	L=D+G	S	Cu Yds.	
23"	18"	2'-5"	8"	1.41	4'-6"
30"	24"	3'-0"	8"	1.72	5'-0"
37"	30"	3'-7"	9"	2.32	5'-6"
44"	36"	4'-2"	10"	2.73	6'-0"
51"	42"	4'-9"	10"	3.54	6'-6"
58"	48"	5'-4"	10"	4.01	7'-0"

Note: Dimension "X" is assumed as 2'-4" in figuring the above quantities.

Note: This type of structure shall also be used for the Drop Intakes of Siphons connected with Irrigation Ditches or Flumes with appropriate changes to dimensions. In this case all joints must be made water tight.

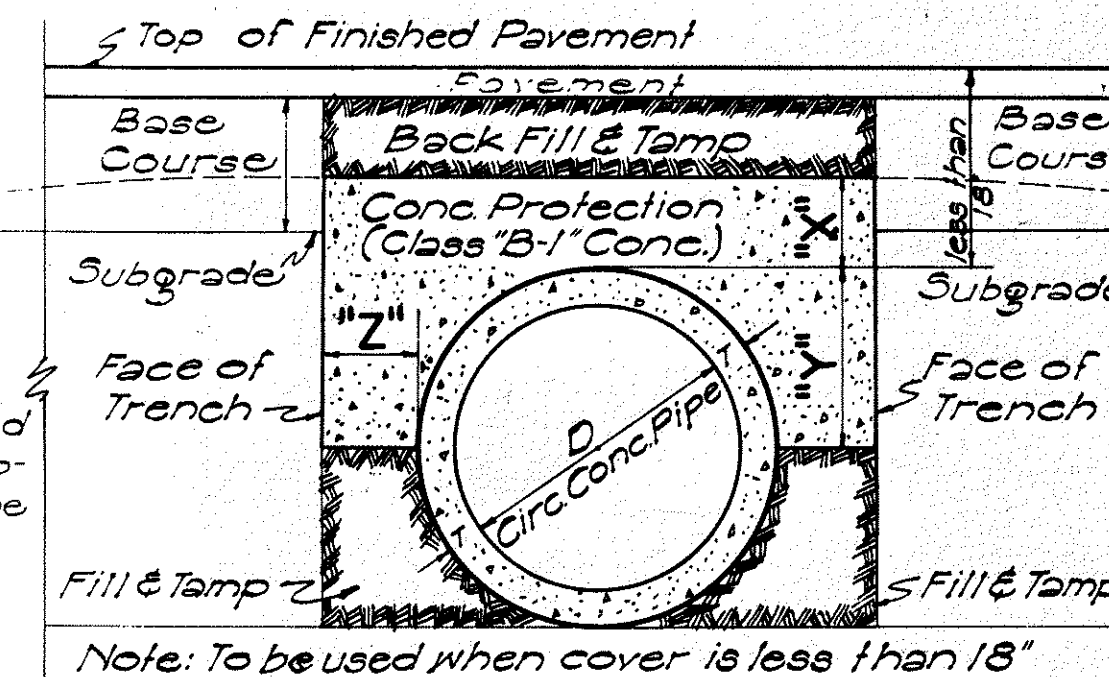


SECTION "B-B"



SECTION "A-A"

DETAIL OF CONCRETE DROP INTAKE
Scale: 1/2" = 1'-0"



DATA FOR CONCRETE PROTECTION OVER CULVERTS		
X	Y	Z
6" for 18"D		Z must be from pipe to face of trench
7" " 24"D		
8" " 30"D	D/2 + T	Minimum = X
9" " 36"D		Maximum pay quantity will be Z=12"
10" " 42"D		
11" " 48"D		
12" " 54"D		

SECT. OF CULVERT WITH CONC. PROTECTION
Scale: 1" = 1'-0"

