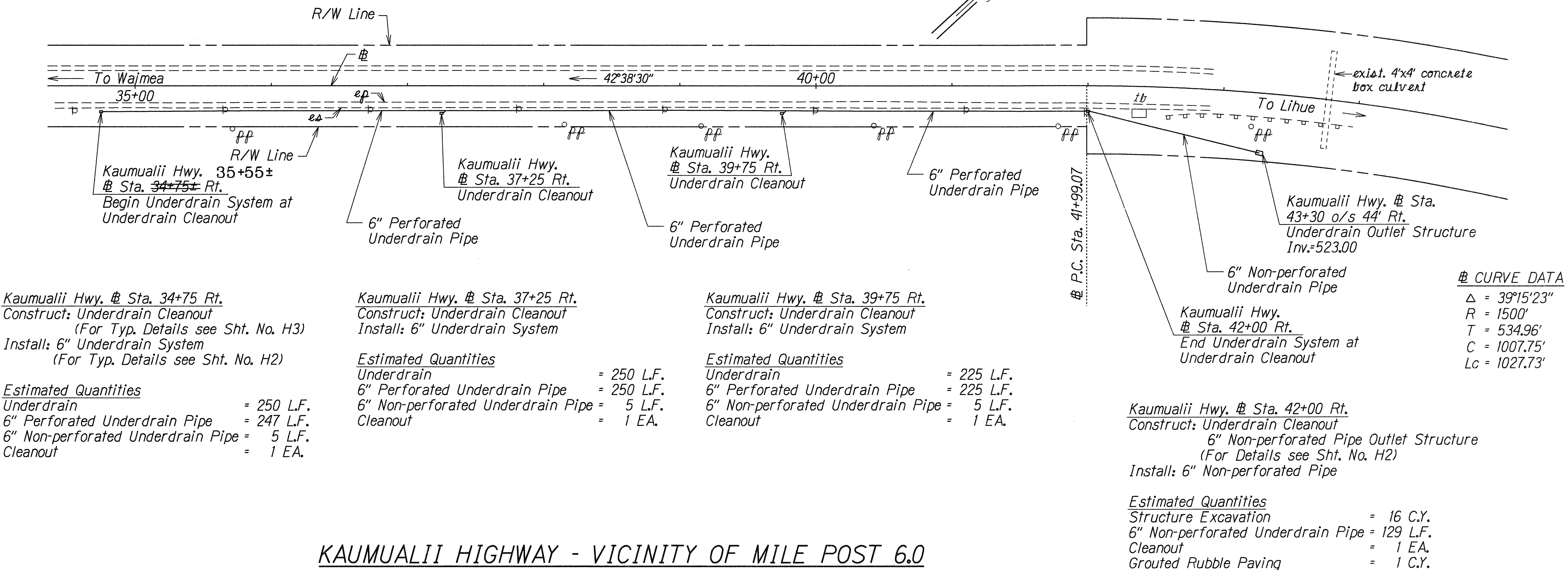


FED. ROAD DIST. NO.	STATE	FED. AID PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
HAWAII	HAW.	STP-0700(39)	1998	4	18



KAUMUALII HIGHWAY - VICINITY OF MILE POST 6.0

DRAINAGE NOTES

- Existing drainage systems will be functional at all times during construction. The Contractor is to furnish materials, equipment, labor, tools and incidentals necessary to accomplish maintenance of flow. The cost shall be incidental to the various Contract Items.
- The Contractor shall verify the locations of all existing culverts and utilities in the field. Any existing culverts and utilities damaged during construction shall be repaired or replaced by the Contractor at his own expense.
- Demolishing, removing, and disposing portions of existing slurry backfill shall not be paid for separately, but shall be considered incidental to Item 605.3000 - Underdrain.
- Installing 6" Non-perforated 45° elbow and 45° "Y" shall not be paid for separately, but shall be considered incidental to Item 605.1100 - 6-Inch Non-perforated Underdrain Pipe.

LEGEND FOR AS-BUILT POSTINGS	
	Squiggly line for as-built deletion
	Double line for as-built deletion
Roadway	Text for as-built posting

STATE OF HAWAII

DEPARTMENT OF TRANSPORTATION

HIGHWAYS DIVISION

DRAINAGE PLAN

KAUMUALII HIGHWAY DRAINAGE IMPROVEMENTS

Vicinity of M.P. 6.0, M.P. 21.9 and M.P. 23.5

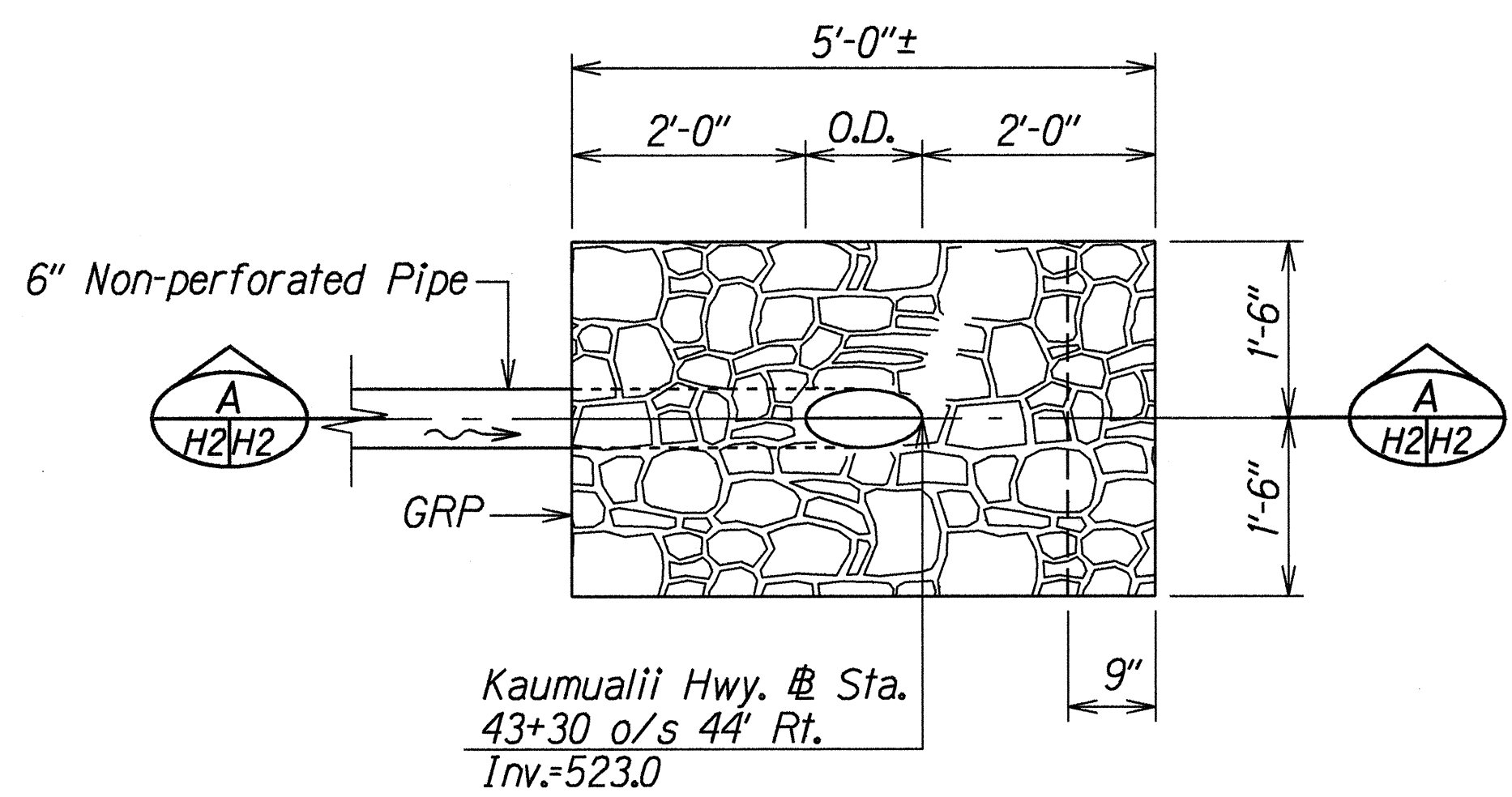
Federal Aid Project No. STP-0700(39)

Scale: 1"=40'

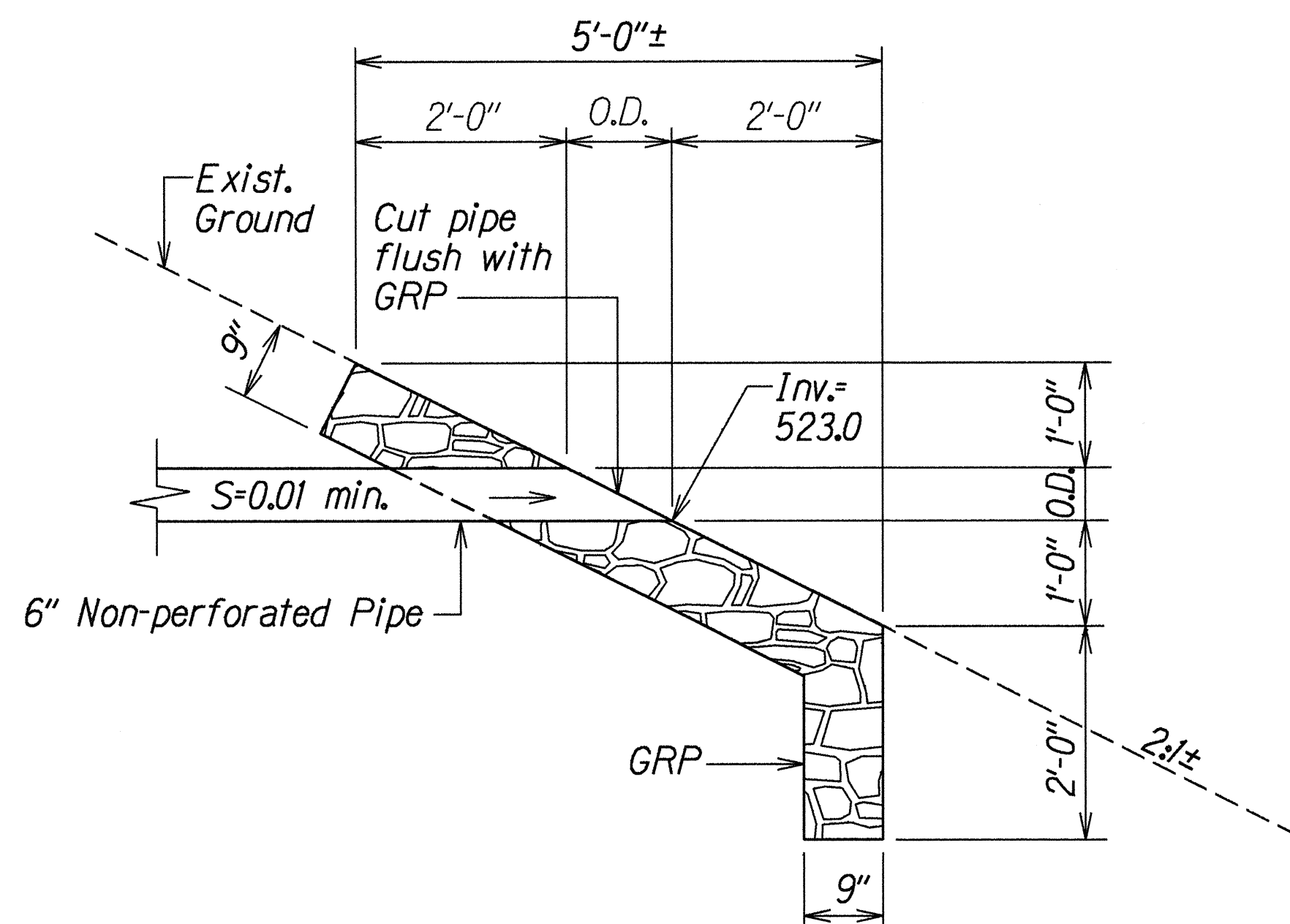
Date: Apr. 1998

ORIGINAL PLAN	SURVEY PLOTTED BY	DATE
NOTED	DRAWN BY	12/19/97
DESIGNED BY	CHECKED BY	
QUANTITIES BY		
CHECKED BY		

FED. ROAD DIST. NO.	STATE	FED. AID PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
HAWAII	HAW.	STP-0700(39)	1998	5	17

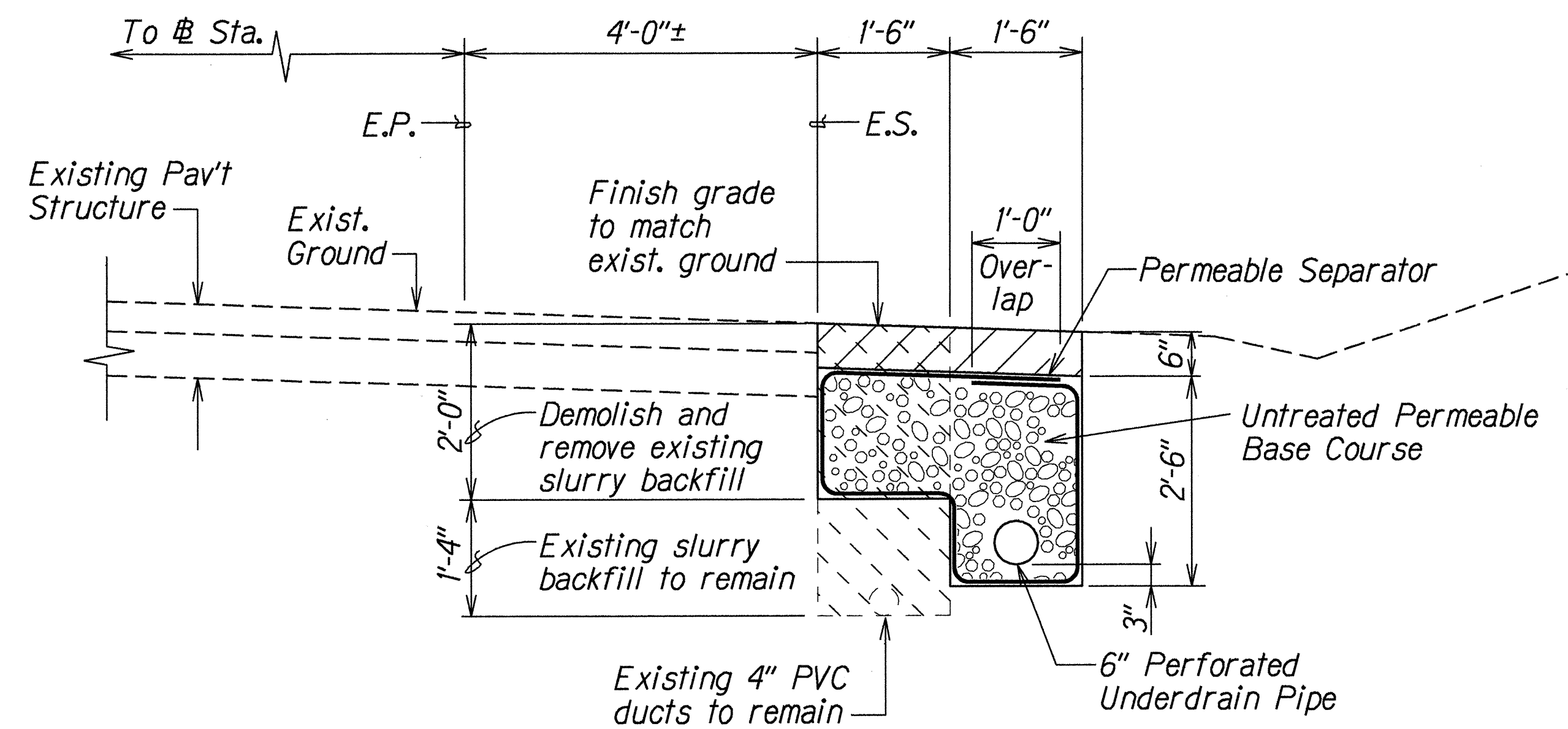


PLAN

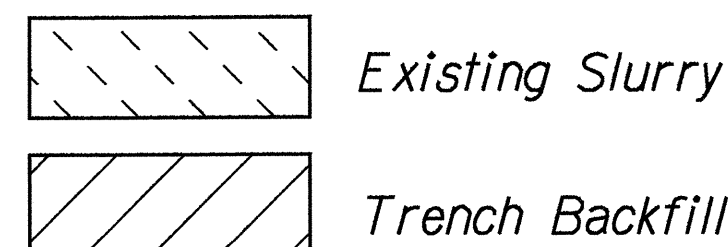


SECTION

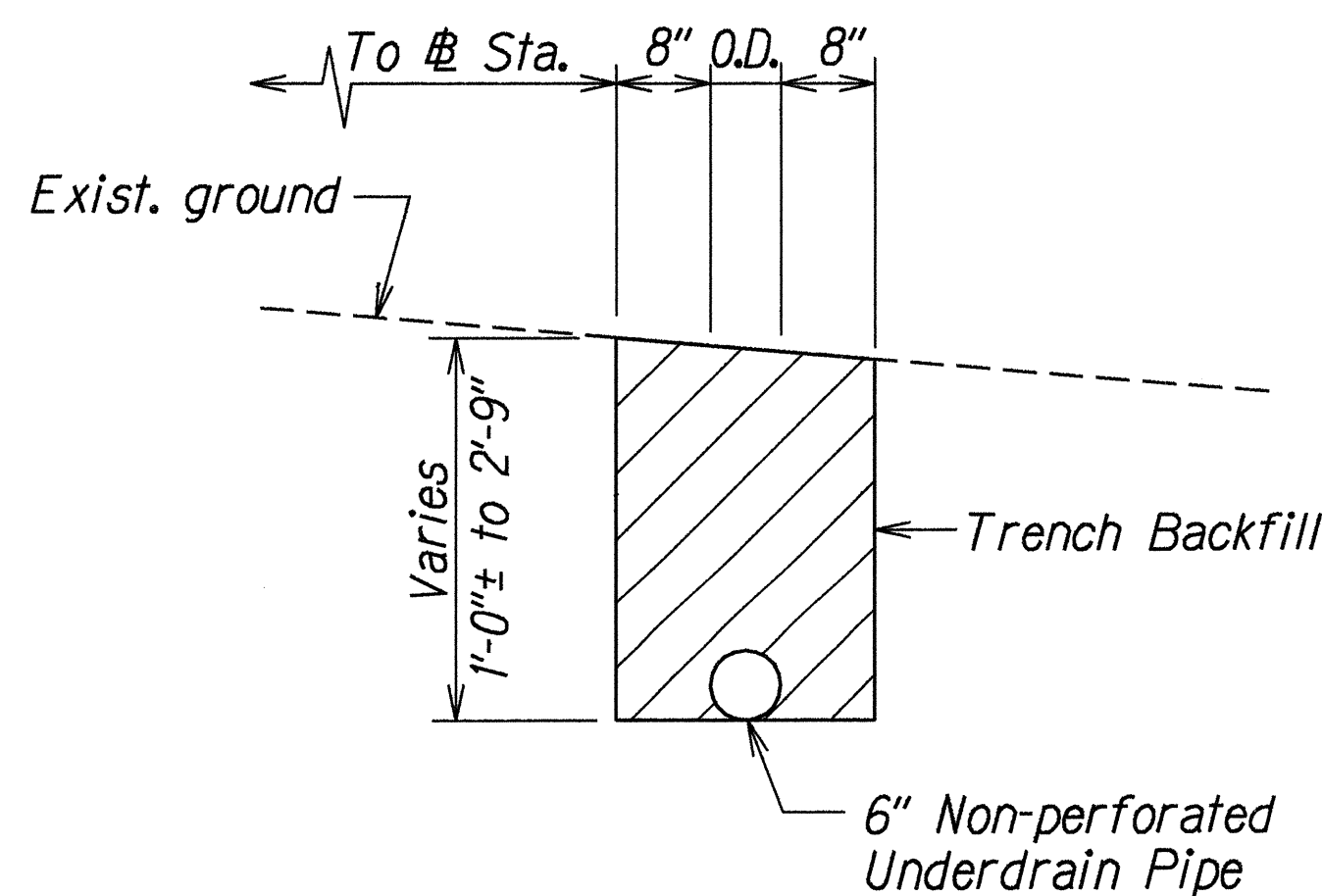
DETAILS OF 6" NON-PERFORATED PIPE OUTLET STRUCTURE



LEGEND



TYPICAL SECTION OF UNDERDRAIN (Kaumualii Hwy. Sta. 34+75± Rt. to Sta. 42+00 Rt.)



TYPICAL TRENCH DETAIL OF 6" NON-PERFORATED PIPE (Kaumualii Hwy. Sta. 42+00 Rt. to Sta. 43+30 Rt.)

STATE OF HAWAII
DEPARTMENT OF TRANSPORTATION
HIGHWAYS DIVISION

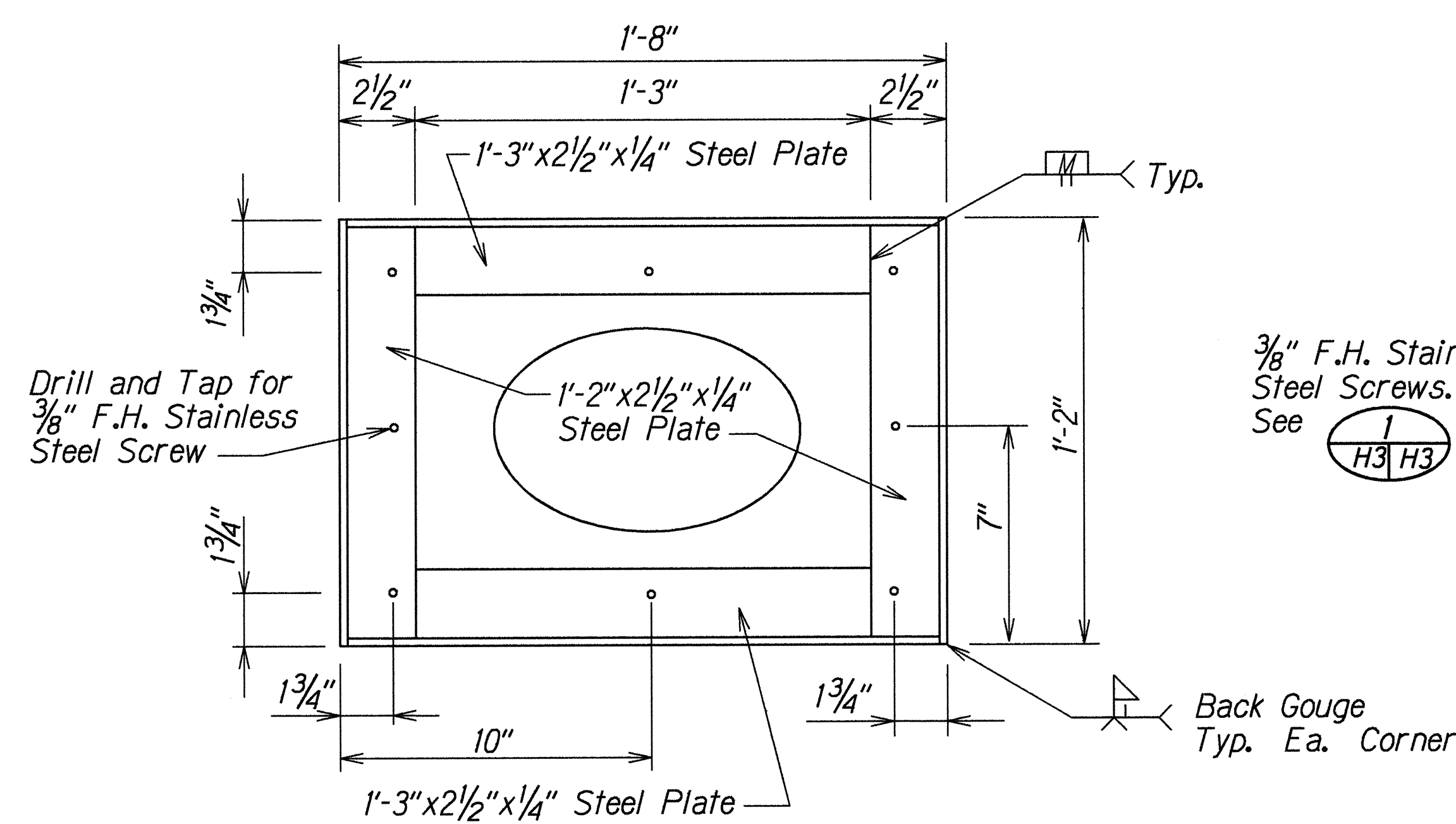
DRAINAGE DETAILS

KAUMUALII HIGHWAY DRAINAGE IMPROVEMENTS
Vicinity of M.P. 6.0, M.P. 21.9 and Makeke Road
Federal Aid Project No. STP-0700(39)

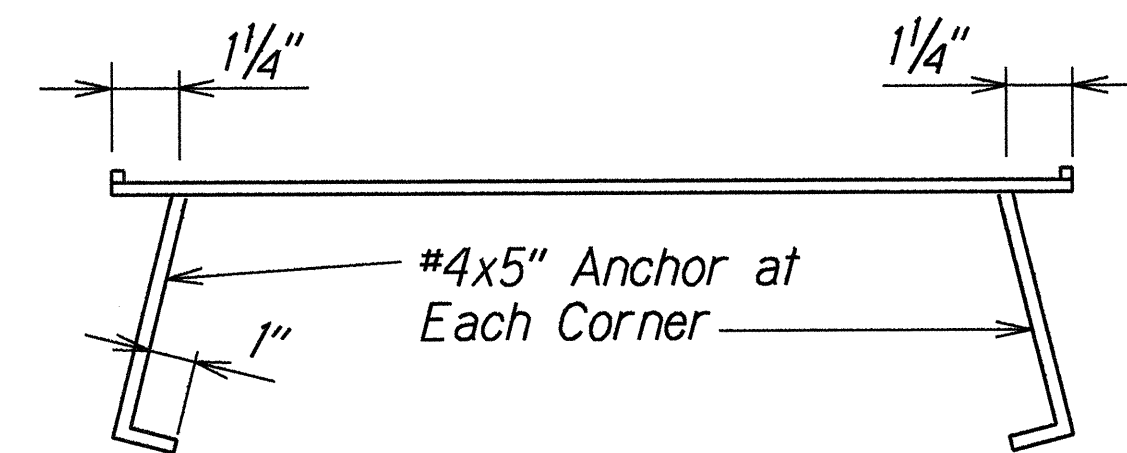
Scale: 3/4"=1'-0" Date: Apr. 1998

SHEET No. H2 OF 13 SHEETS

FED. ROAD DIST. NO.	STATE	FED. AID PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
HAWAII	HAW.	STP-0700(39)	1998	6	17

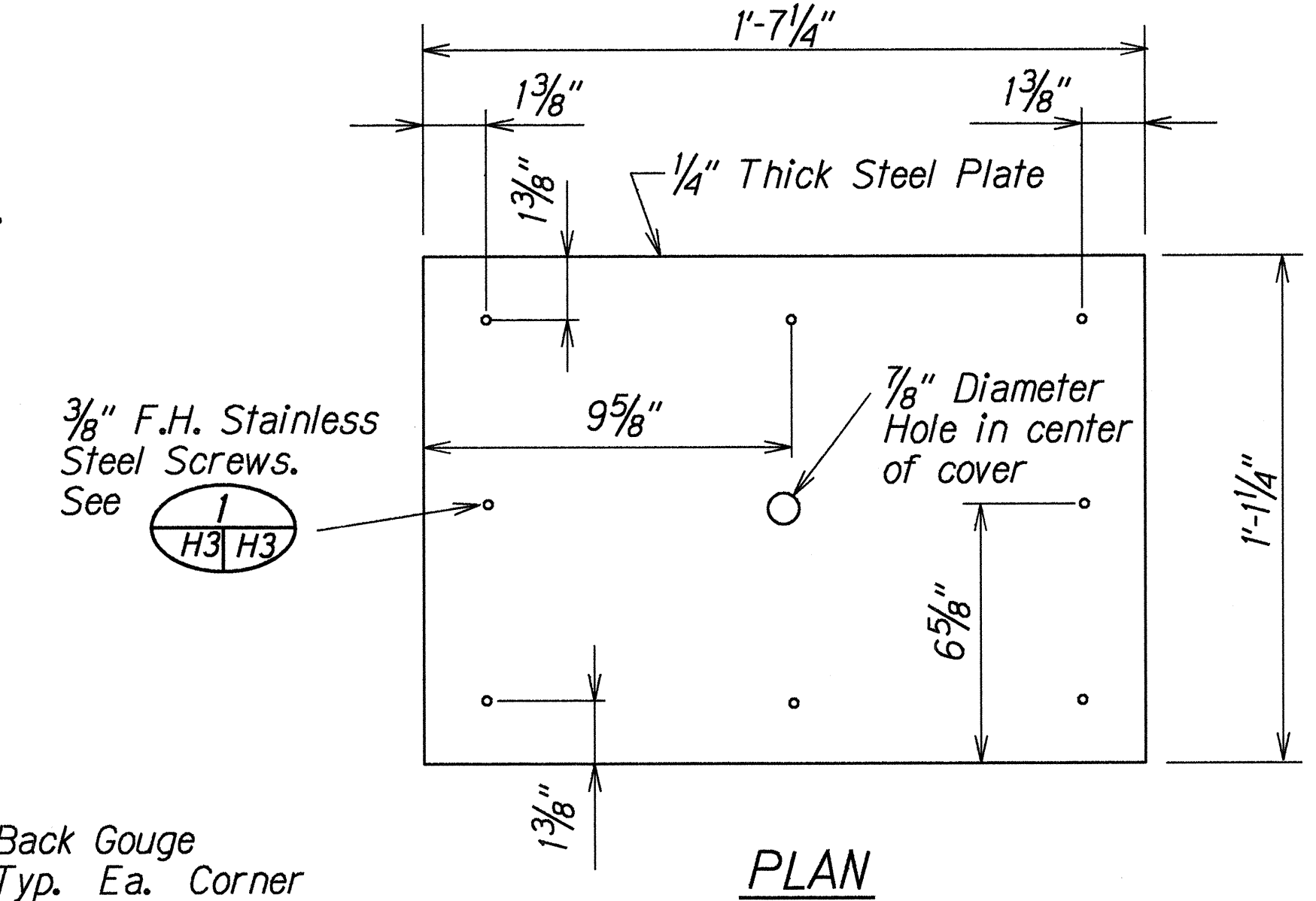


PLAN



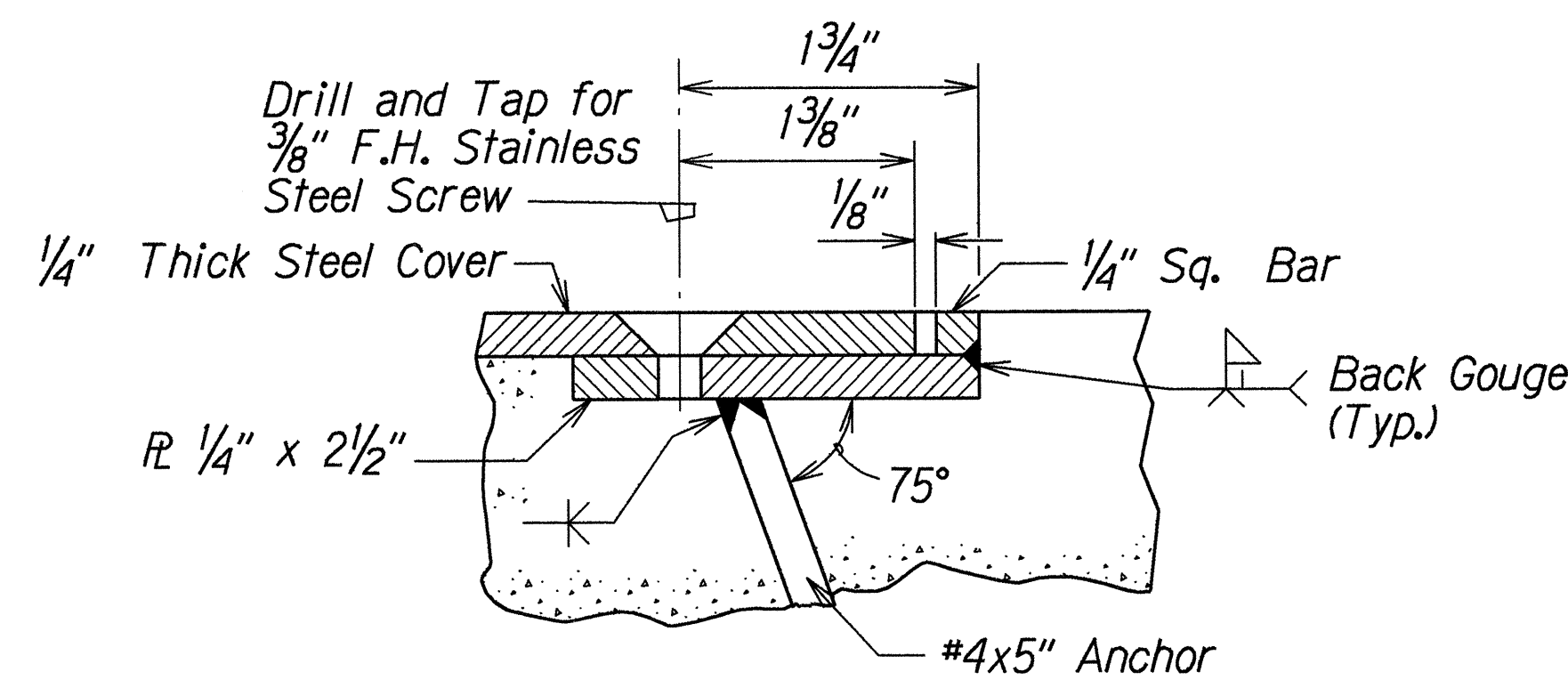
SECTION

DETAILS OF STEEL FRAME



PLAN

DETAIL OF STEEL COVER

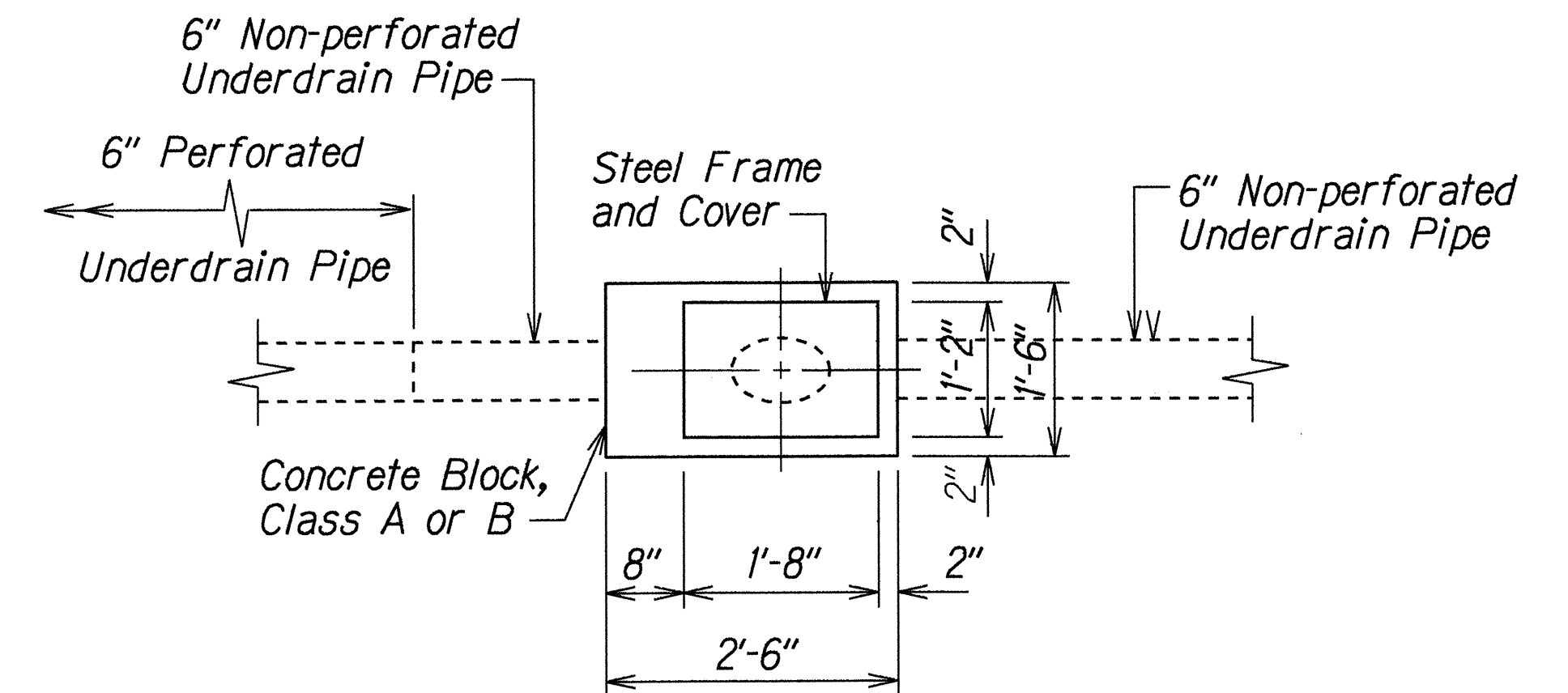


DETAIL Full Size

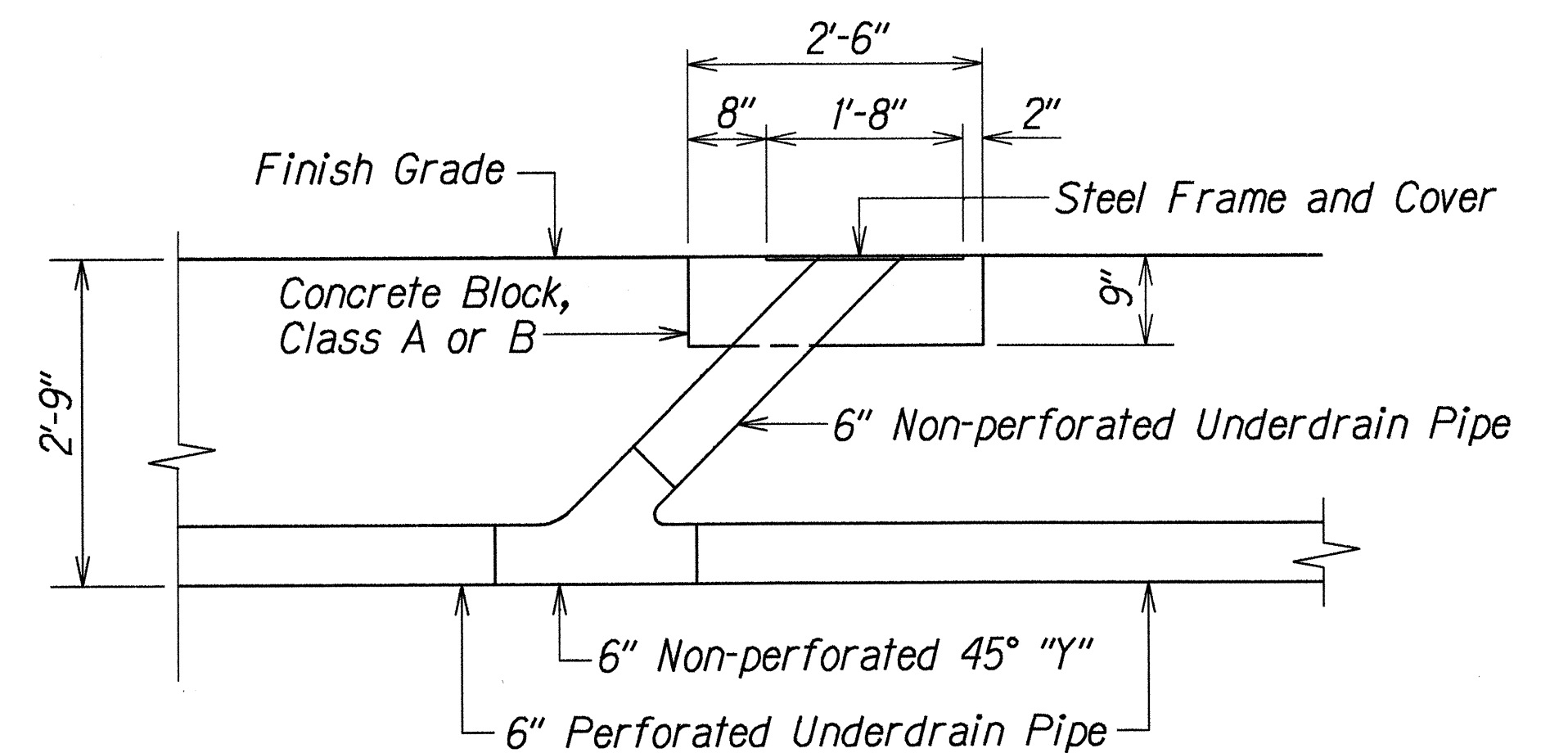
NOTE: All Steel Parts shall be zinc-coated in accordance with the requirements of ASTM A123.

DETAILS OF STEEL FRAME AND COVER FOR UNDERDRAIN CLEANOUT

Scale: 3"=1'-0"



PLAN



ELEVATION

NOTE: For Cleanout at Sta. 34+75± Rt., 6" Non-perforated 45° elbow shall be installed in lieu of 45° "Y".

TYPICAL DETAILS OF UNDERDRAIN CLEANOUT

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

ORIGINAL PLAN	DATE
SURVEY PLotted BY	12/19/97
DRAWN BY	A. Manuwa
DESIGNED BY	C. Matsuda
CHECKED BY	

STATE OF HAWAII
DEPARTMENT OF TRANSPORTATION
HIGHWAYS DIVISION

DRAINAGE DETAILS

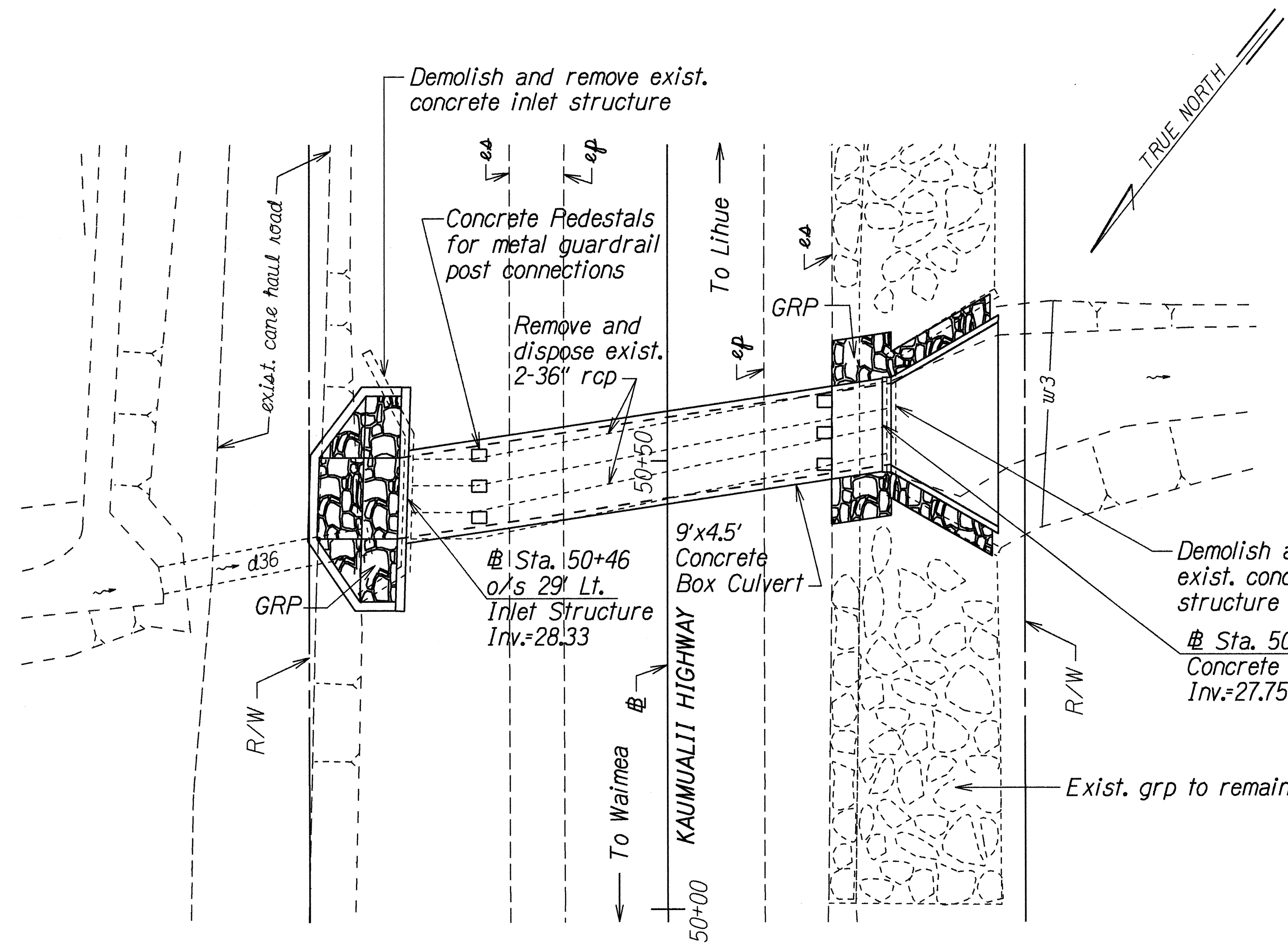
KAUMUALII HIGHWAY DRAINAGE IMPROVEMENTS

Vicinity of M.P. 6.0, M.P. 21.9 and Makeke Road

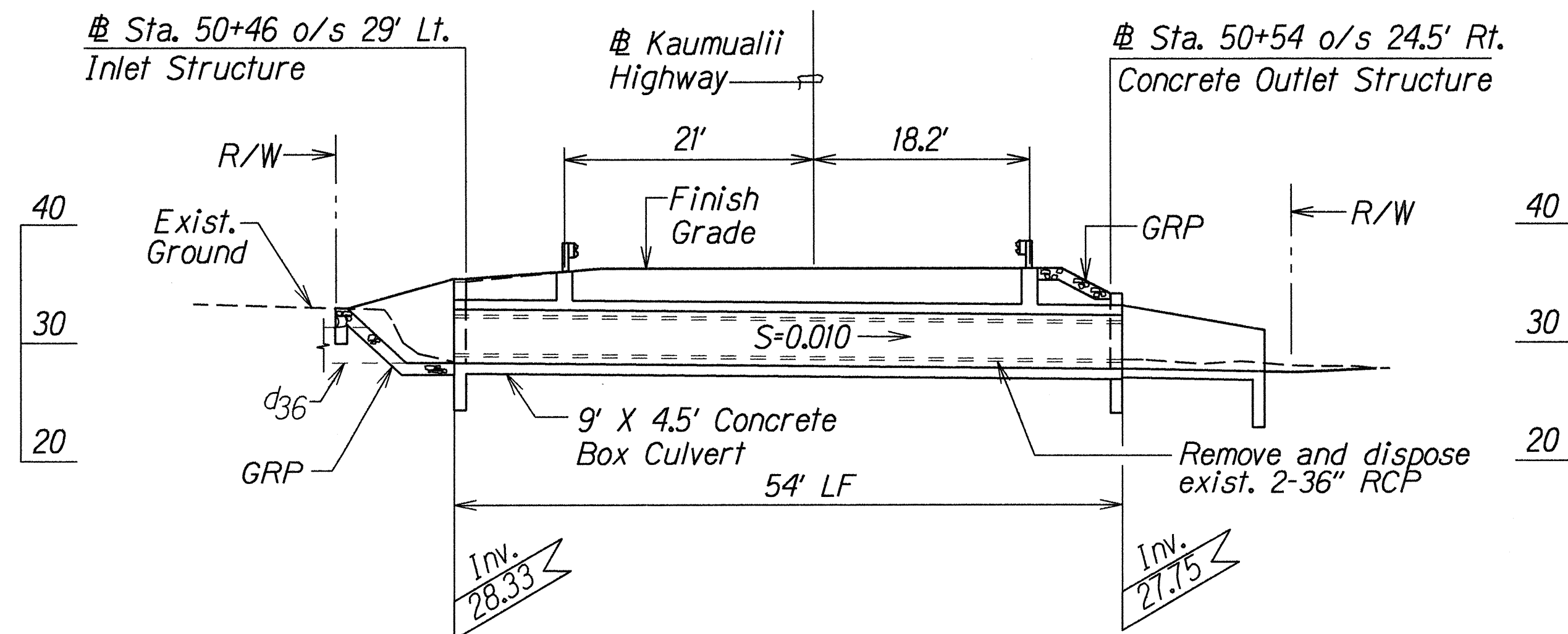
Federal Aid Project No. STP-0700(39)

Scale: As Shown Date: Apr. 1998

FED. ROAD DIST. NO.	STATE	FED. AID PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
HAWAII	HAW.	STP-0700(39)	1998	7	17



PLAN



PROFILE

KAUMUALII HIGHWAY - VICINITY OF MILE POST 21.9

Sta. 50+46 o/s 29' Lt.
Construct: Inlet Structure
(For Details see Sht. No. H5)
9'x4.5 Concrete Box Culvert
(For Typ. Details see Sht. No. H6 & H7)

Estimated Quantities
 Structure Excavation for Drainage System = 5 C.Y.
 Structure Excavation for Concrete Box = 302 C.Y.
 Structure Backfill = 75 C.Y.
 Plant Mix Glassphalt Concrete Basecourse = 47 Tons
 A.C. Pavement Mix No. IV = 11 Tons
 Concrete in Box Culvert = 49 C.Y.
 Concrete in Inlet Structure = 6 C.Y.
 Reinforcing Steel in Box Culvert = 8900 Lb.
 Reinforcing Steel in Inlet Structure = 820 Lb.
 Bedcourse Material for Concrete Box = 17 C.Y.
 Grouted Rubble Paving = 8 C.Y.

Sta. 50+54 o/s 24.5' Rt.
Construct: Outlet Structure
(For Details see Sht. No. H8)

Estimated Quantities
 Structure Excavation for Drainage System = 25 C.Y.
 Concrete in Outlet Structure = 17 C.Y.
 Reinforcing Steel in Outlet Structure = 1080 Lb.
 Grouted Rubble Paving = 7 C.Y.

DRAINAGE NOTES

- Existing drainage systems will be functional at all times during construction. The Contractor is to furnish materials, equipment, labor, tools and incidentals necessary to accomplish maintenance of flow. The cost shall be incidental to the various Contract Items.
- The Contractor shall verify the locations of all existing culverts and utilities in the field. Any existing culverts and utilities damaged during construction shall be repaired or replaced by the Contractor at his own expense.
- Demolishing, removing, and disposing of existing 36-inch culverts, concrete inlet and outlet structures; Cutting existing 36-inch culvert flush with new inlet structure shall not be paid for separately, but shall be considered incidental to Item No. 206.2020 - Structure Excavation for Drainage System.
- Concrete, steel reinforcing, steel plates, and other appurtenances for the construction of the concrete pedestal shown on Sheet No. H8 shall not be paid for separately but shall be considered incidental to Item No. 503.1031 - Concrete in Concrete Box Culvert.
- For Culvert Trench and A. C. Pavement Restoration Detail, see Sheet No. H6.

STATE OF HAWAII
DEPARTMENT OF TRANSPORTATION
HIGHWAYS DIVISION

DRAINAGE PLAN
KAUMUALII HIGHWAY DRAINAGE IMPROVEMENTS
Vicinity of M.P. 6.0, M.P. 21.9 and Makeke Road
Federal Aid Project No. STP-0700(39)
Scale: 1"=10' Date: Apr. 1998
SHEET No. H4 OF 13 SHEETS

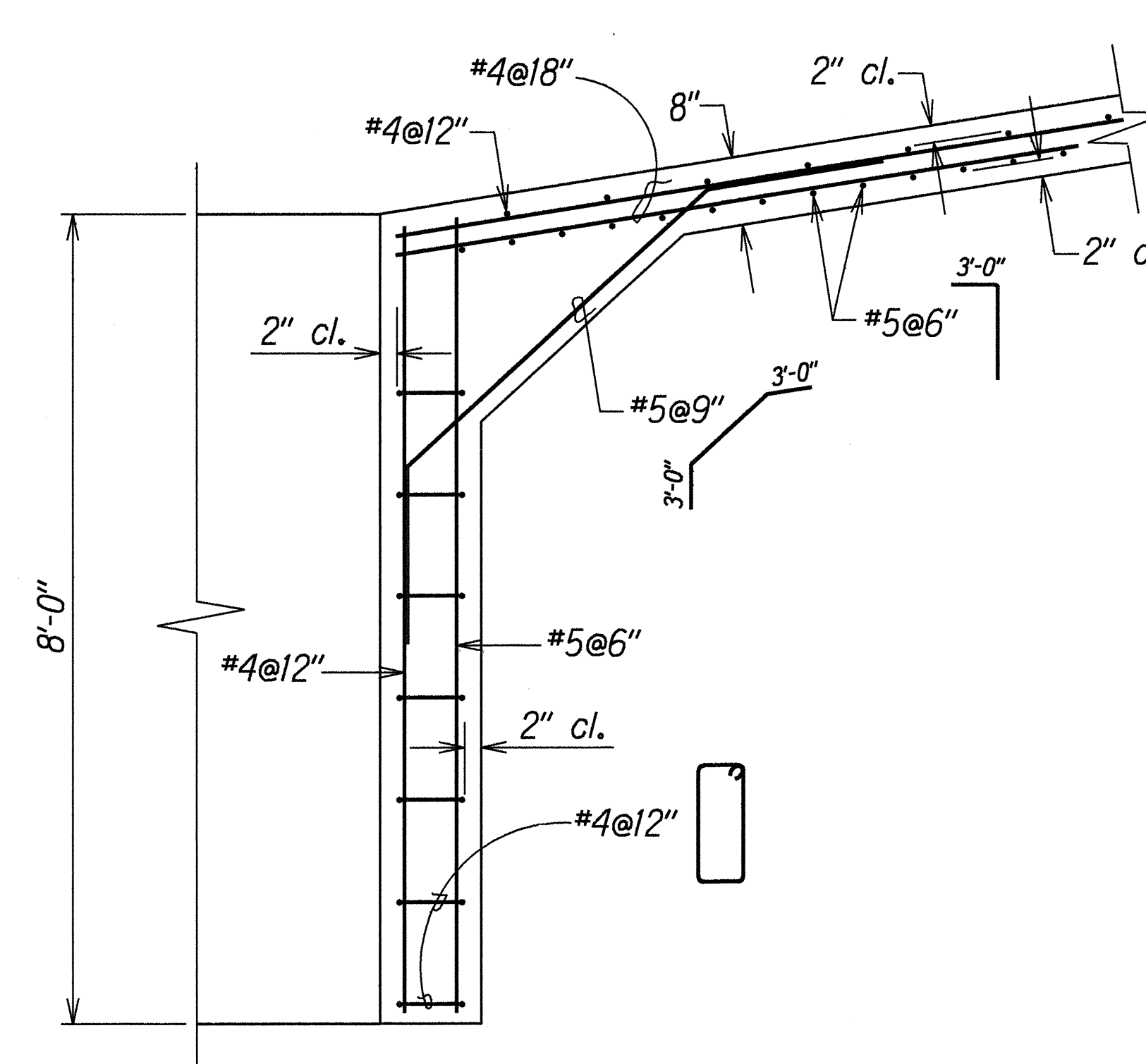
[illegible]

Technical drawing of a bridge section showing a 28-foot wide approach, a 9x4 foot concrete box culvert, and a 9x9 foot fillet. The drawing includes dimensions for the approach, culvert, and fillet, as well as reinforcement details such as #4 bars and #5 bars. A match line is shown on the left, and a section line A-A is indicated at the bottom.

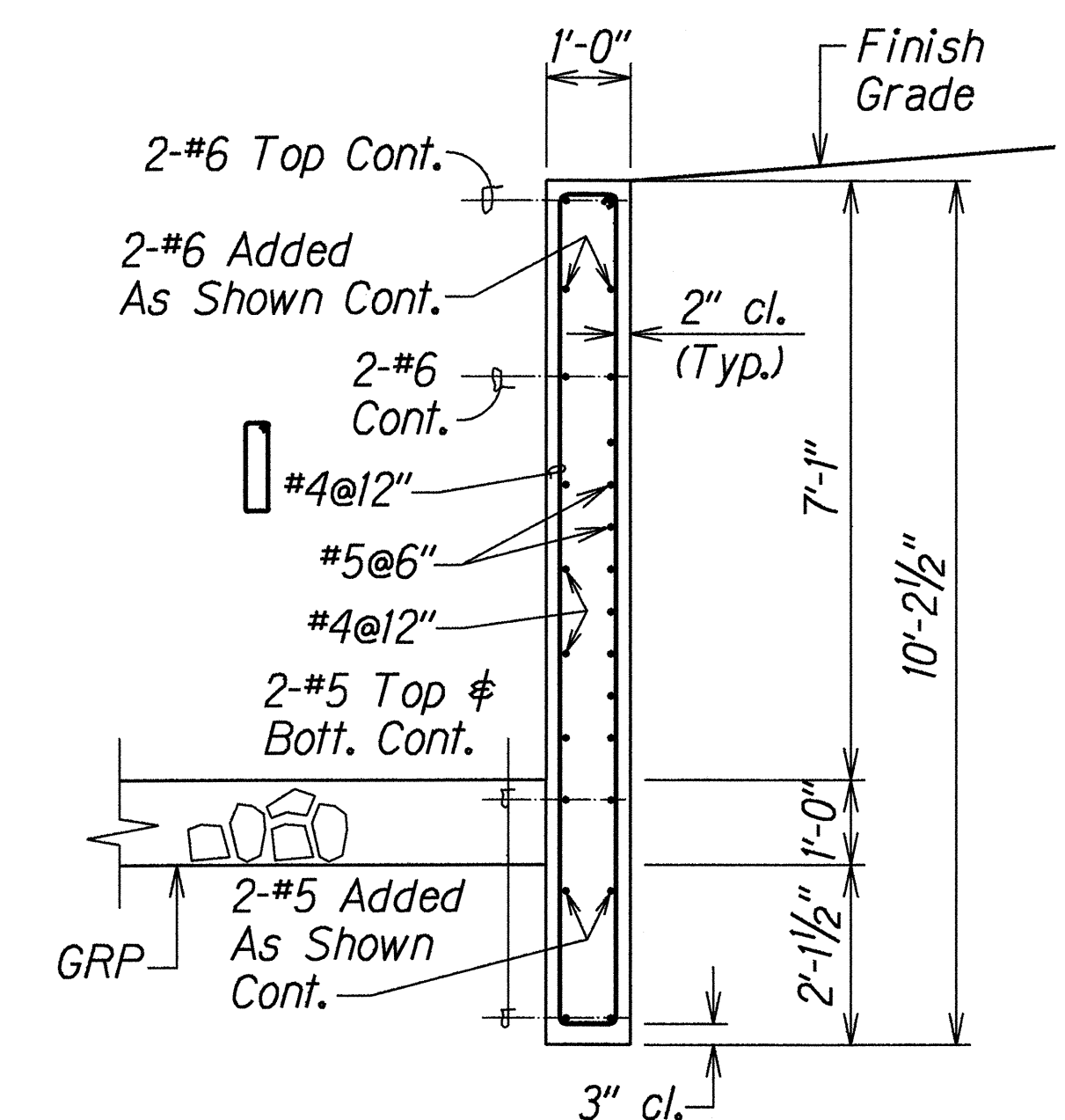
Key components and dimensions:

- Approach:** 28' wide, 1'-0" thick, 5'-0" high, 4'-0" wide, 1'-0" thick. Reinforcement: 2-#6 Top & Bott. Cont., 2-#6 Added As Shown Cont., 3/4" Chamfer, 1/2" Chamfer.
- Culvert:** 9'x4'-6" Conc. Box Culvert, 1 1/2" cl., 4'-6" high, 10'-2 1/2" wide. Reinforcement: #4@18", #6@6", #5@12", #4@12", #5@6", #5@12", #4@12", #4@18" 3" cl.
- Fillet:** 9'x9" Fillet, 3" cl., 2'-3" wide, 10 1/2" high. Reinforcement: #4@12", #4@18" 3" cl.
- Match Line:** Match with exist. cane haul road Elev.=32.3±.
- Section Line:** A-A, 5/15.

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



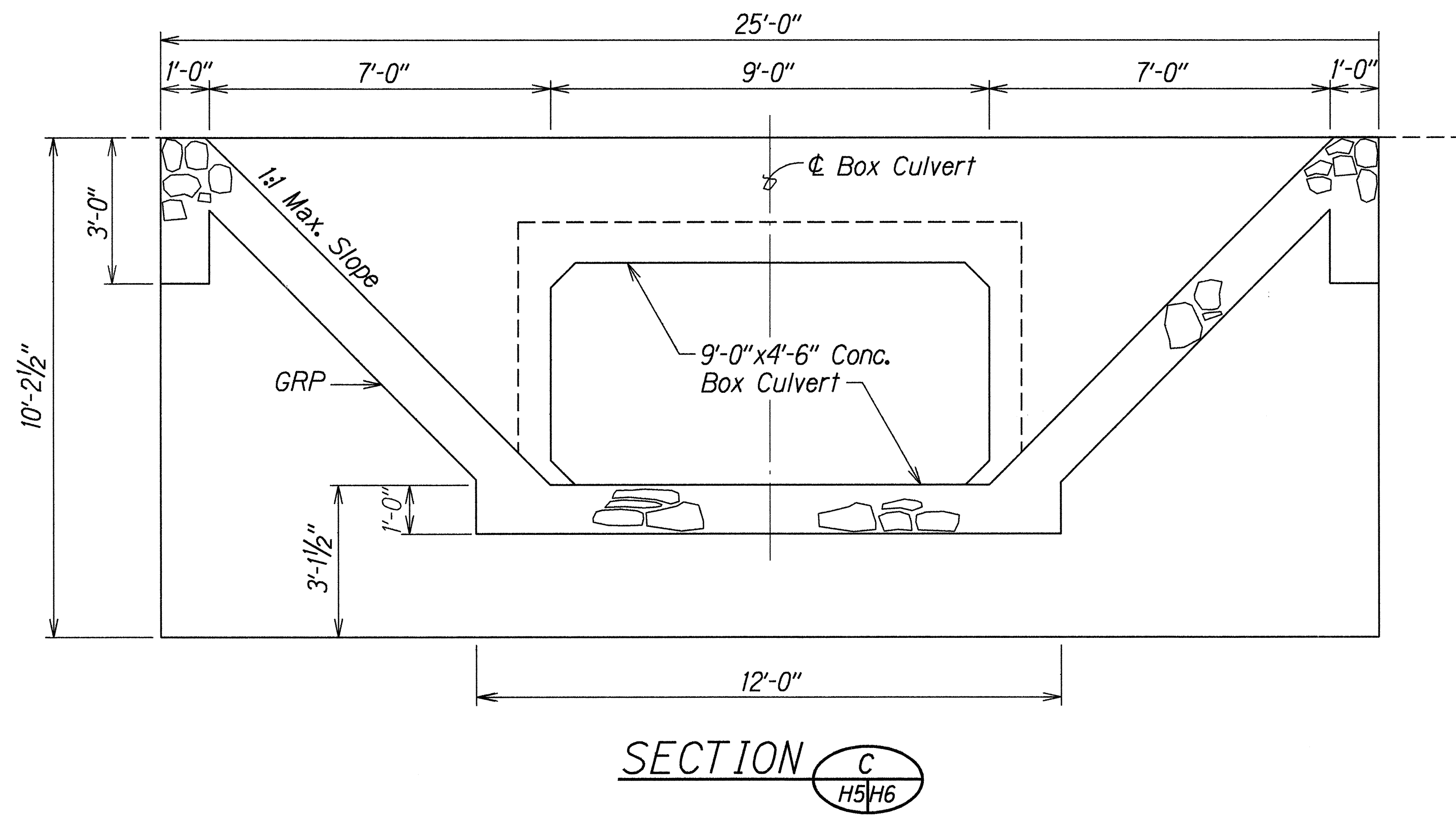
DETAIL X-X
Scale: $\frac{3}{4}" = 1'-0"$



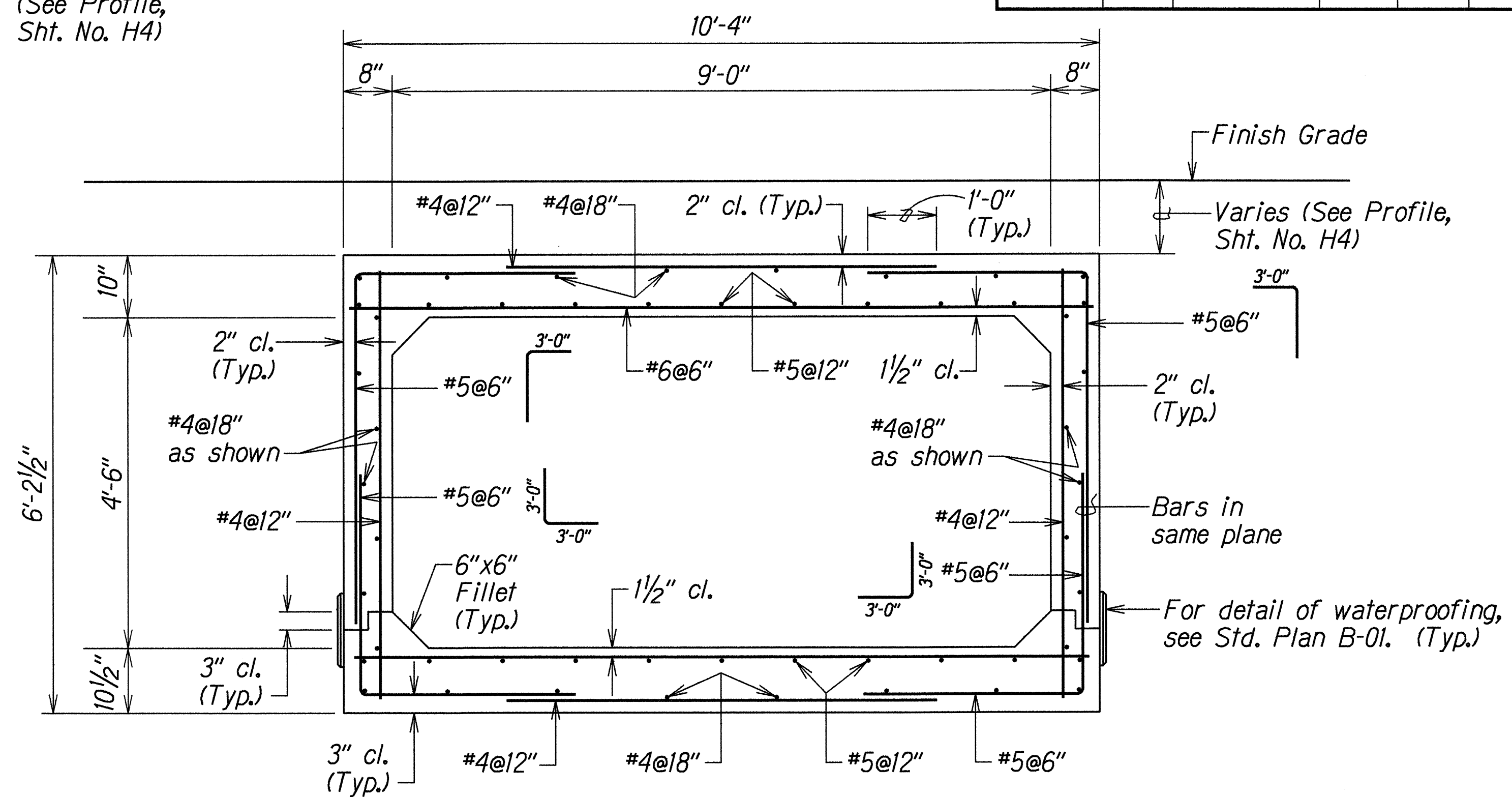
SECTION 
Scale: $\frac{1}{2}" = 1' - 0"$

SHEET No. *H5* OF *13* SHEETS

FED. ROAD DIST. NO.	STATE	FED. AID PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
HAWAII	HAW.	STP-0700(39)	1998	9	17

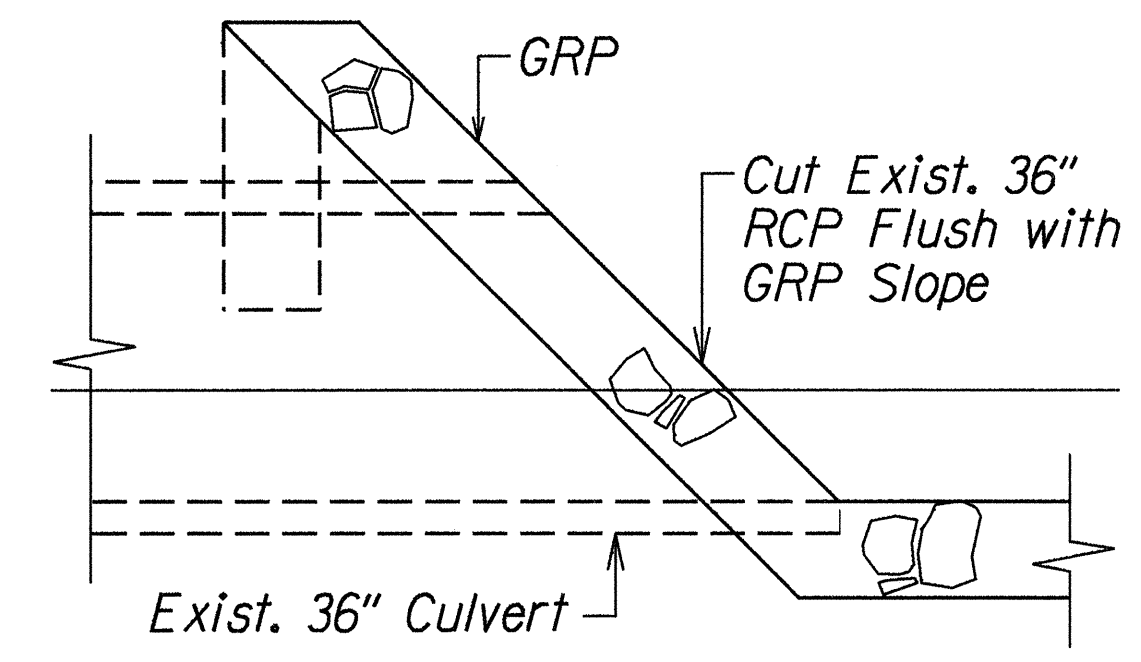


Varies
(See Profile,
Sht. No. H4)

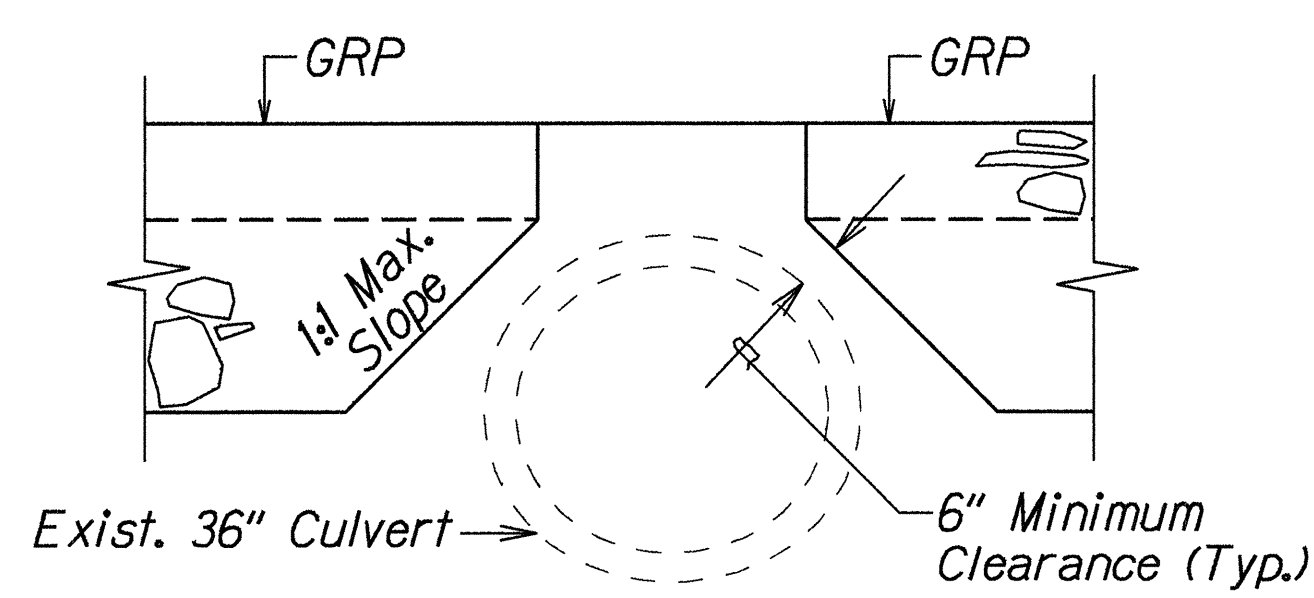


TYPICAL SECTION OF 9'-0" x 4'-6" CONCRETE BOX CULVERT

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



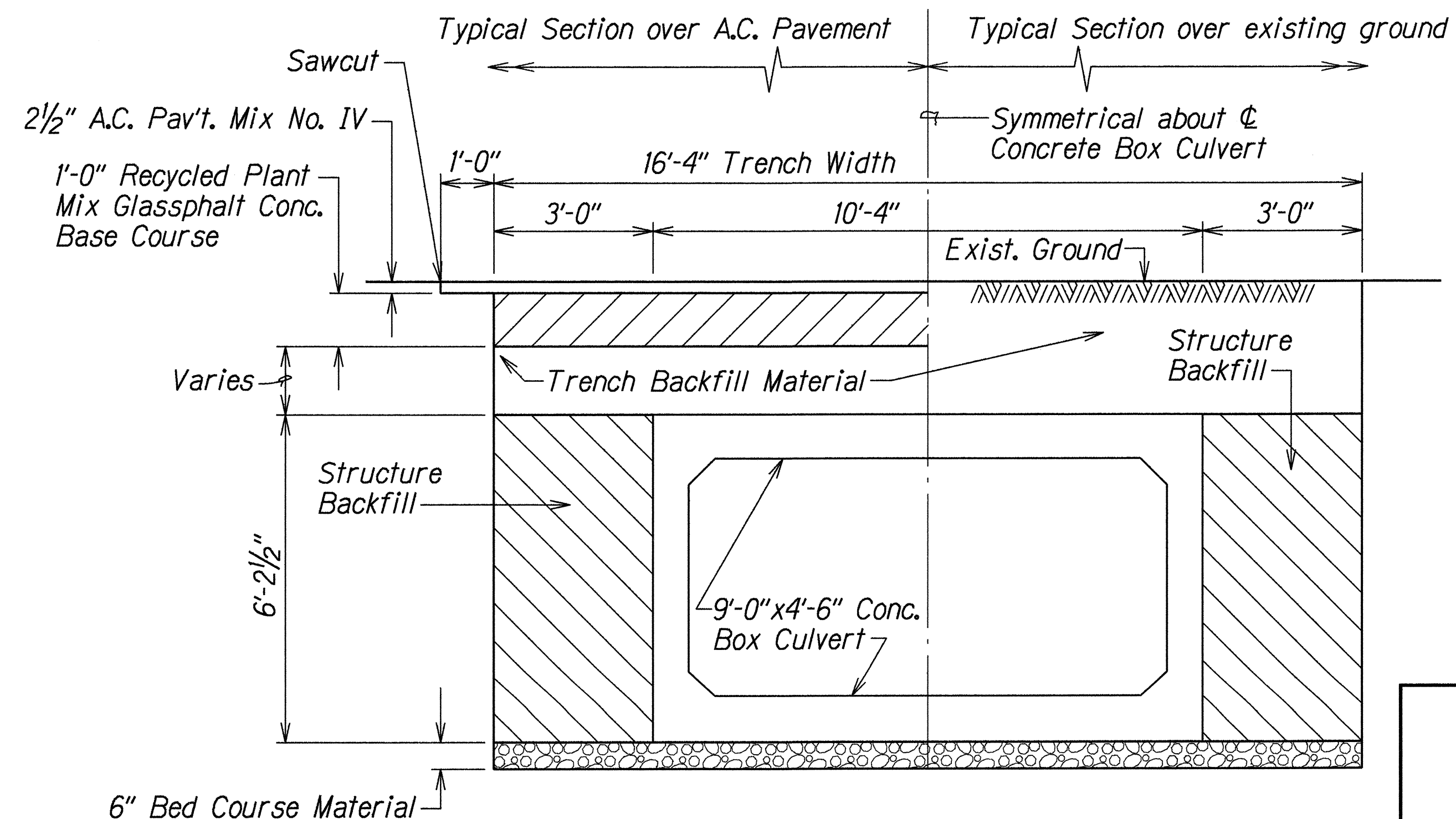
SECTION D
H5/H6



SECTION E
H5/H6

DETAILS OF INLET STRUCTURE

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



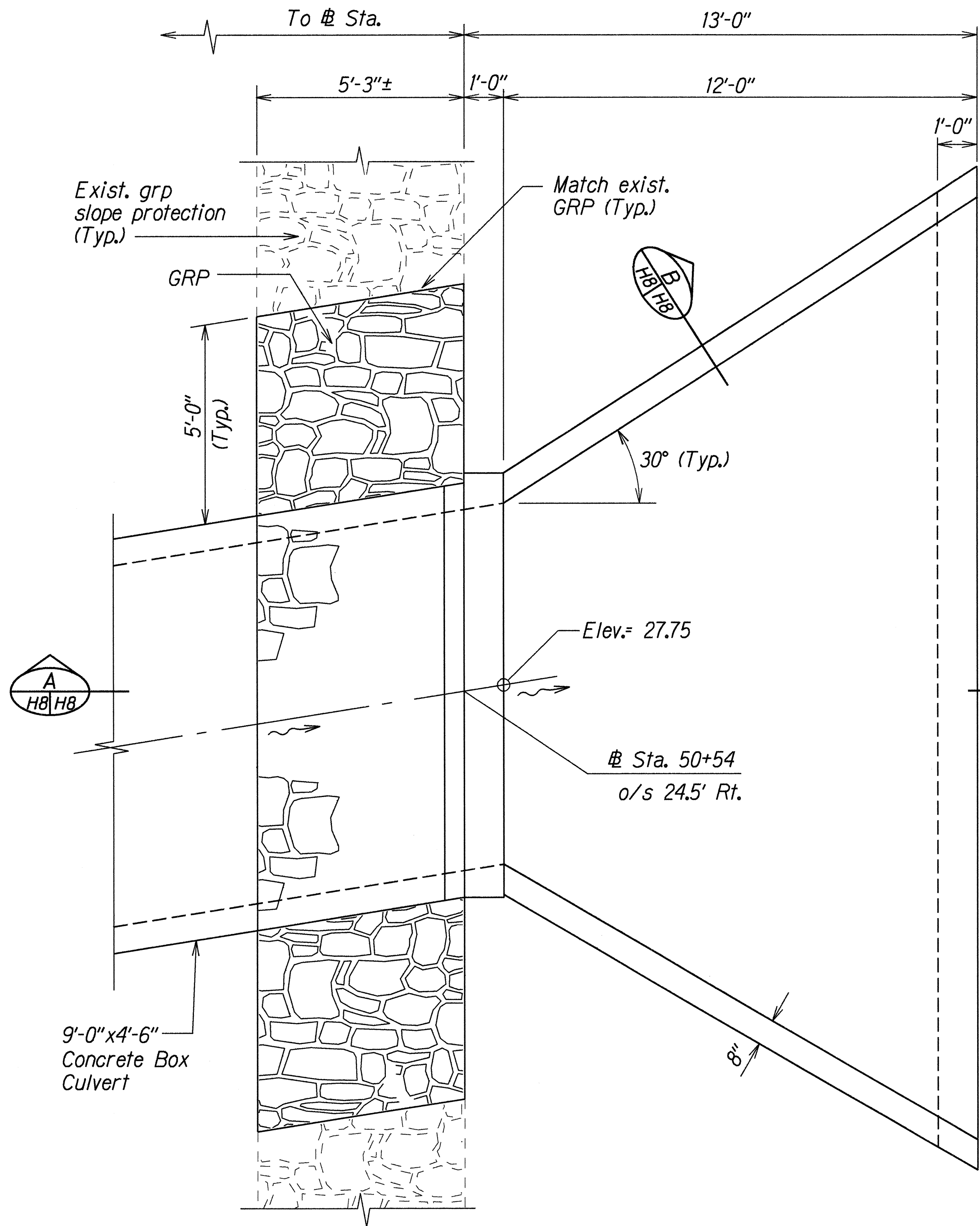
TYPICAL TRENCH DETAIL FOR 9'-0" x 4'-6" CONCRETE BOX CULVERT

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

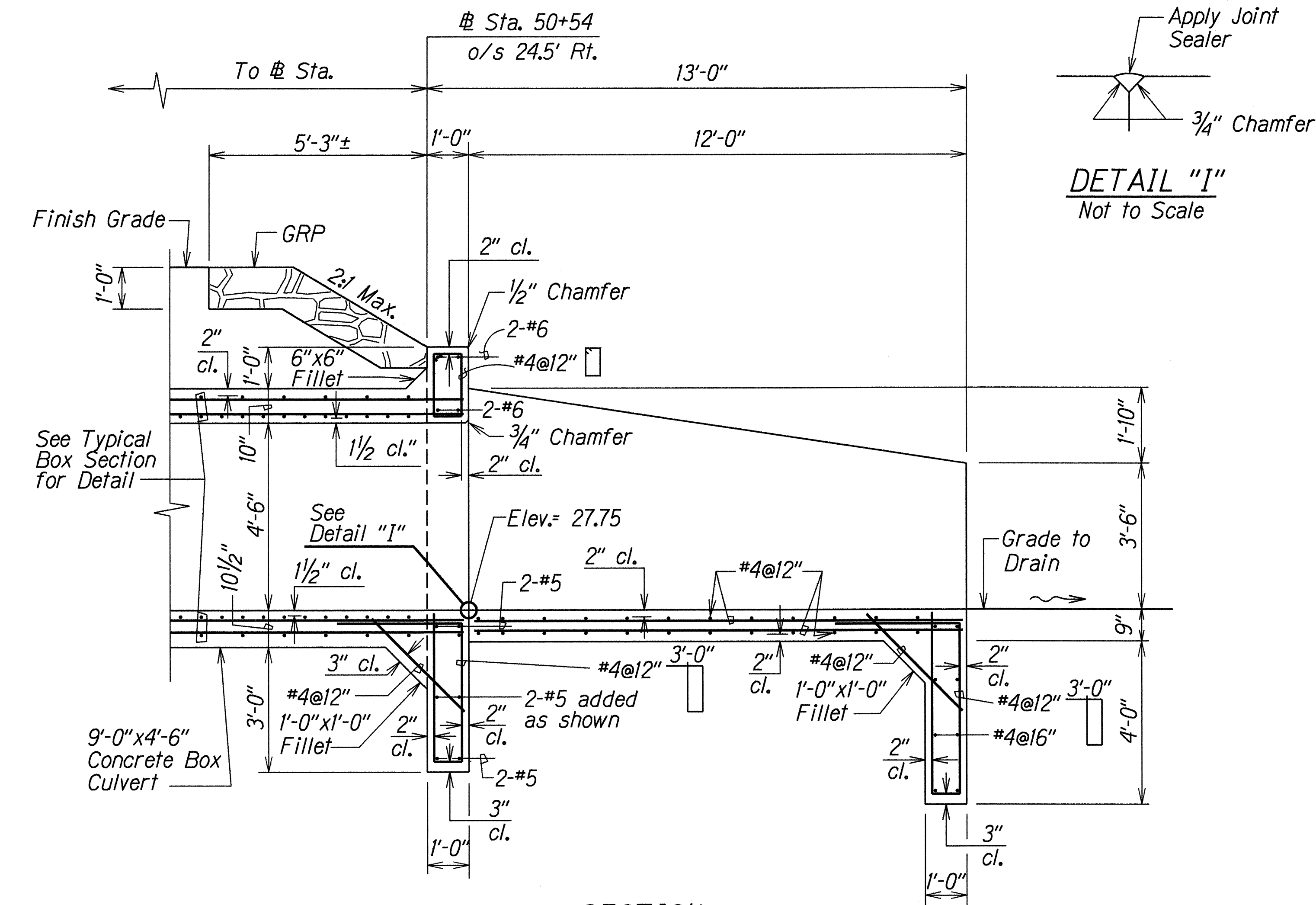
STATE OF HAWAII
DEPARTMENT OF TRANSPORTATION
HIGHWAYS DIVISION
DRAINAGE DETAILS
KAUMUALII HIGHWAY DRAINAGE IMPROVEMENTS
Vicinity of M.P. 6.0, M.P. 21.9 and Makeke Road
Federal Aid Project No. STP-0700(39)
Scale: As Noted Date: Apr. 1998
SHEET No. H6 OF 13 SHEETS

ORIGINAL PLAN	SURVEY PLOTTED BY	DATE
NOTED	DRAWN BY	3/24/98
DESIGNED BY	CHECKED BY	
APPROVED BY		

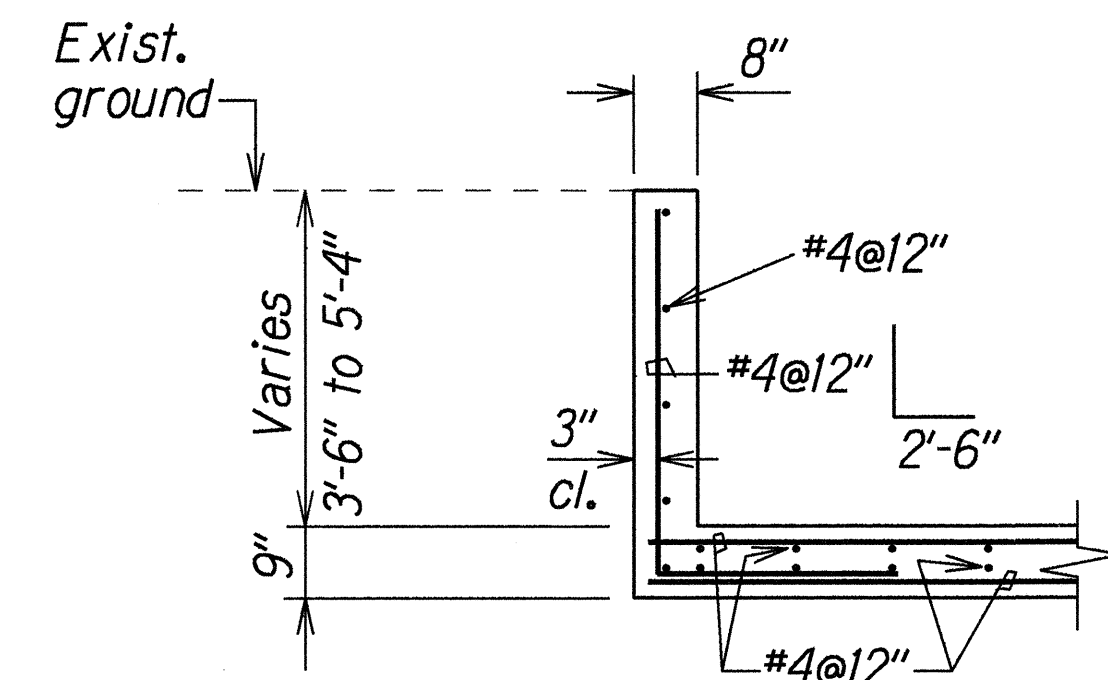
FED. ROAD DIST. NO.	STATE	FED. AID PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
HAWAII	HAW.	STP-0700(39)	1998	11	17



PLAN



SECTION A



SECTION B

DETAILS OF CONCRETE OUTLET STRUCTURE

ORIGINAL PLAN	SURVEY PLOTTED BY	DATE
NOTED	DRAWN BY	3/2/98
DESIGNED BY	CHECKED BY	
APPROVED BY		

STATE OF HAWAII
DEPARTMENT OF TRANSPORTATION
HIGHWAYS DIVISION

DRAINAGE DETAILS

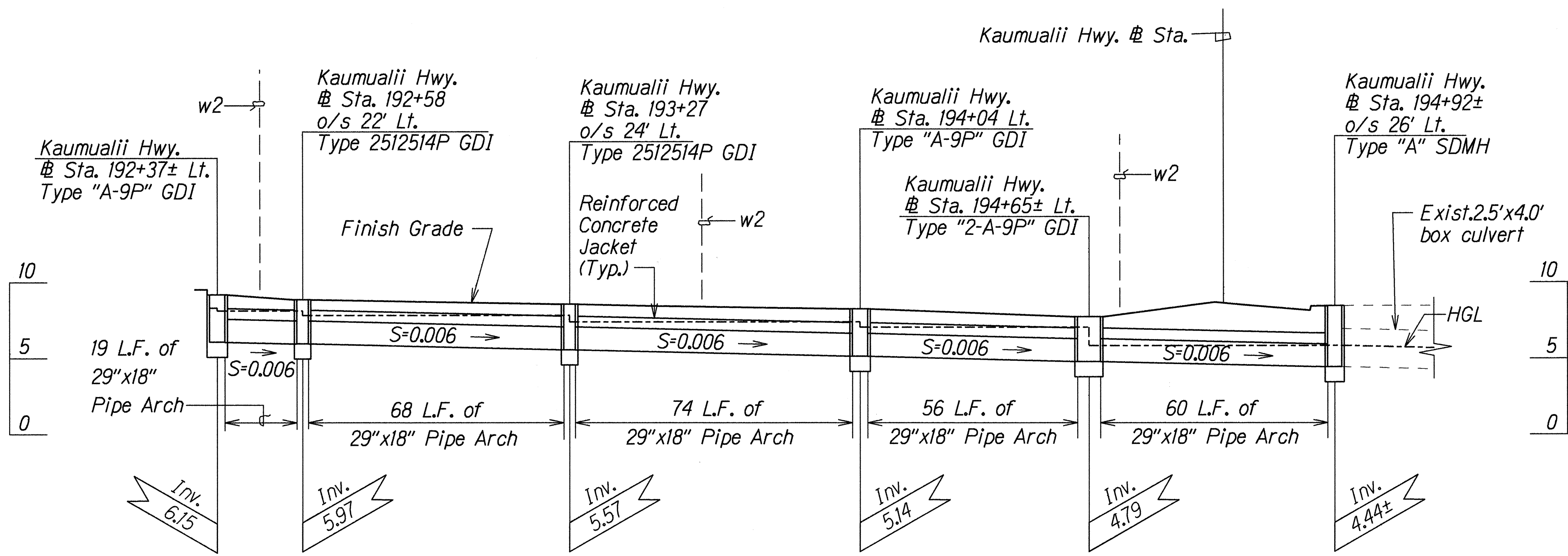
KAUMUALII HIGHWAY DRAINAGE IMPROVEMENTS

Vicinity of M.P. 6.0, M.P. 21.9 and Makeke Road

Federal Aid Project No. STP-0700(39)

Scale: 1/2"=1'-0" Date: Apr. 1998

FED. ROAD DIST. NO.	STATE	FED. AID PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
HAWAII	HAW.	STP-0700(39)	1998	13	17



PROFILE OF 29" x 18" PIPE ARCH # STA. 192+37± LT. TO # STA. 194+92± o/s 26' RT.

Scale: Horiz. 1"=20'
Vert: 1"=5'

ORIGINAL PLAN	DATE
12/30/98	
SURVEY PLOTTED BY	
DRAWN BY A. NUNUA	
DESIGNED BY C. MATAKA	
CHECKED BY	

STATE OF HAWAII
DEPARTMENT OF TRANSPORTATION
HIGHWAYS DIVISION

DRAINAGE PROFILES

KAUMUALII HIGHWAY DRAINAGE IMPROVEMENTS

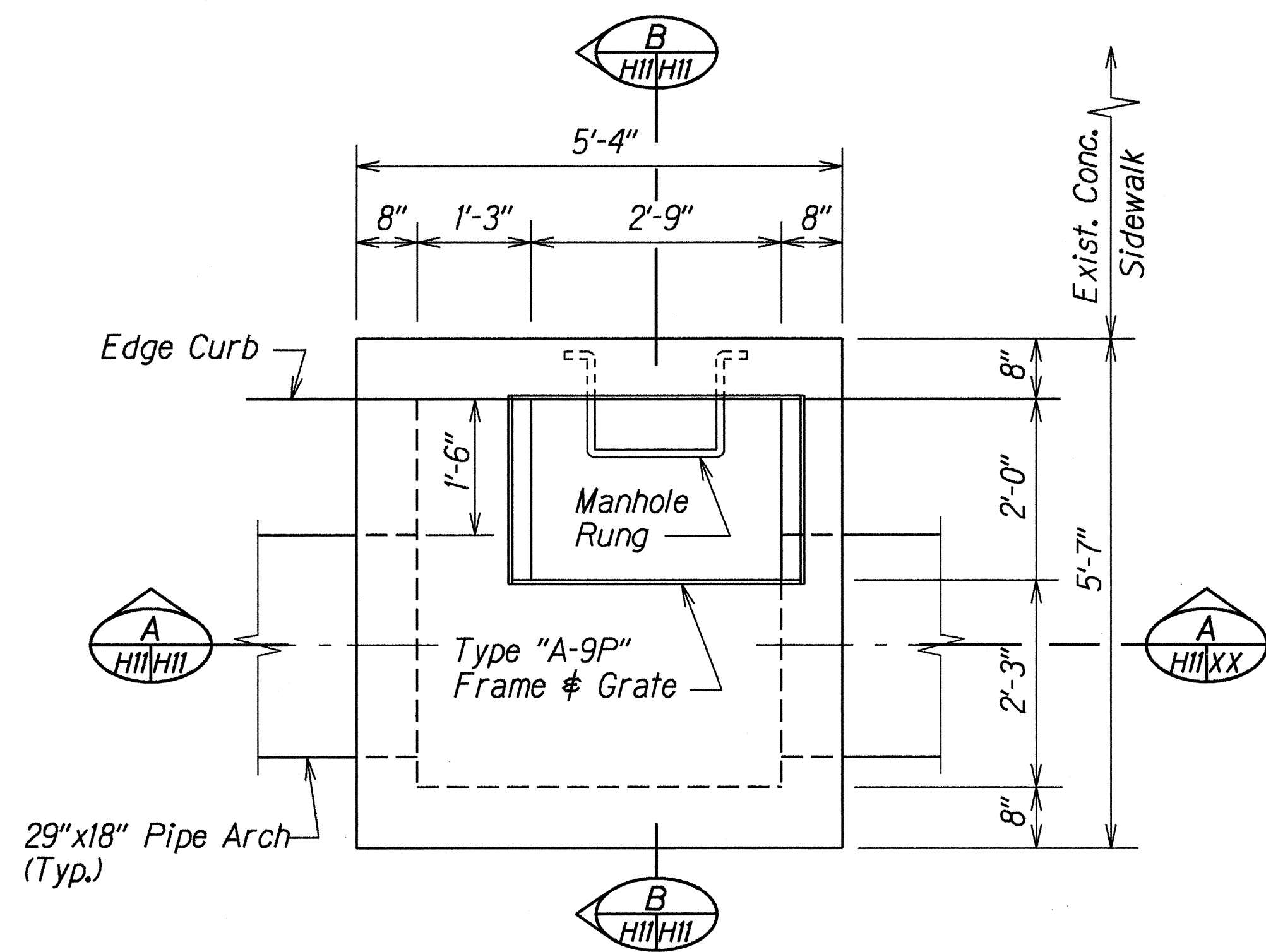
Vicinity of M.P. 6.0, M.P. 21.9 and Makeke Road

Federal Aid Project No. STP-0700(39)

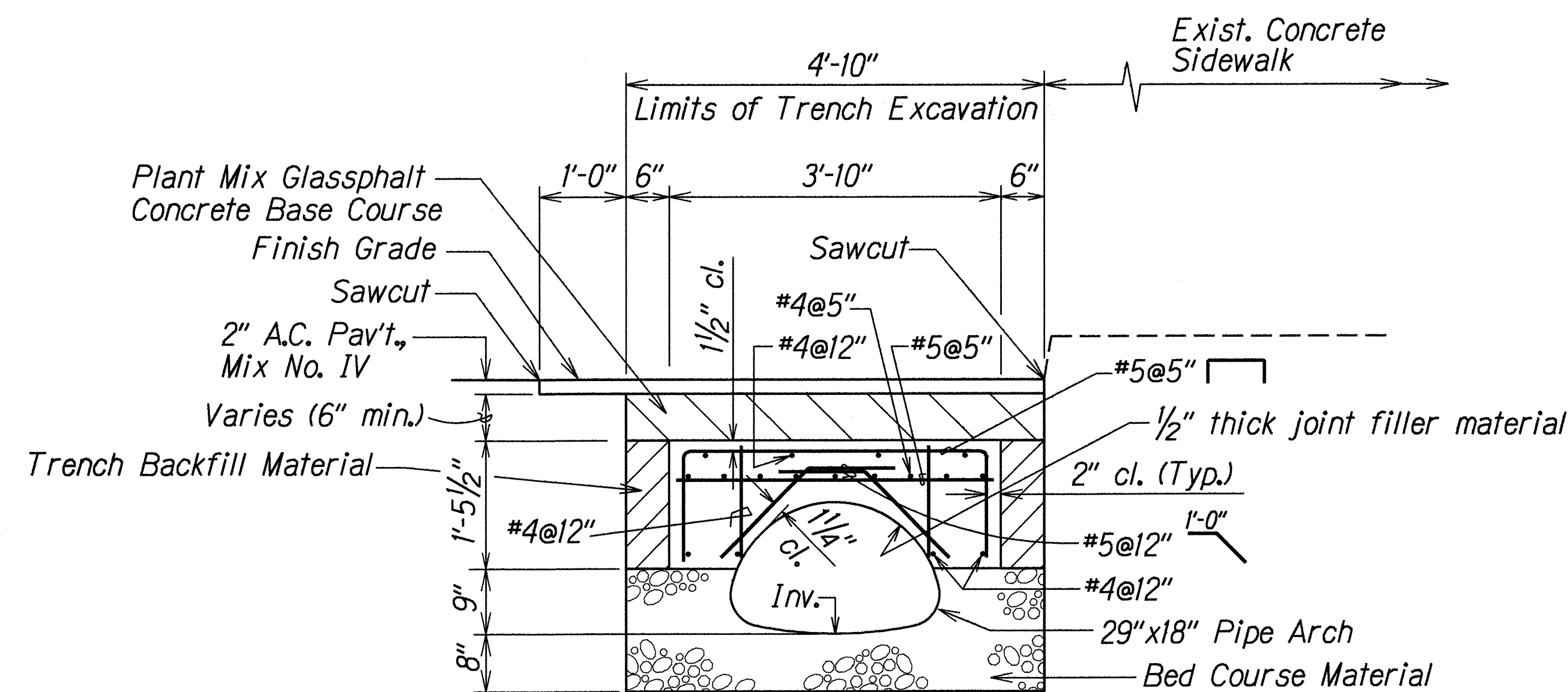
Scale: As Shown Date: Apr. 1998

SHEET No. H10 OF 13 SHEETS

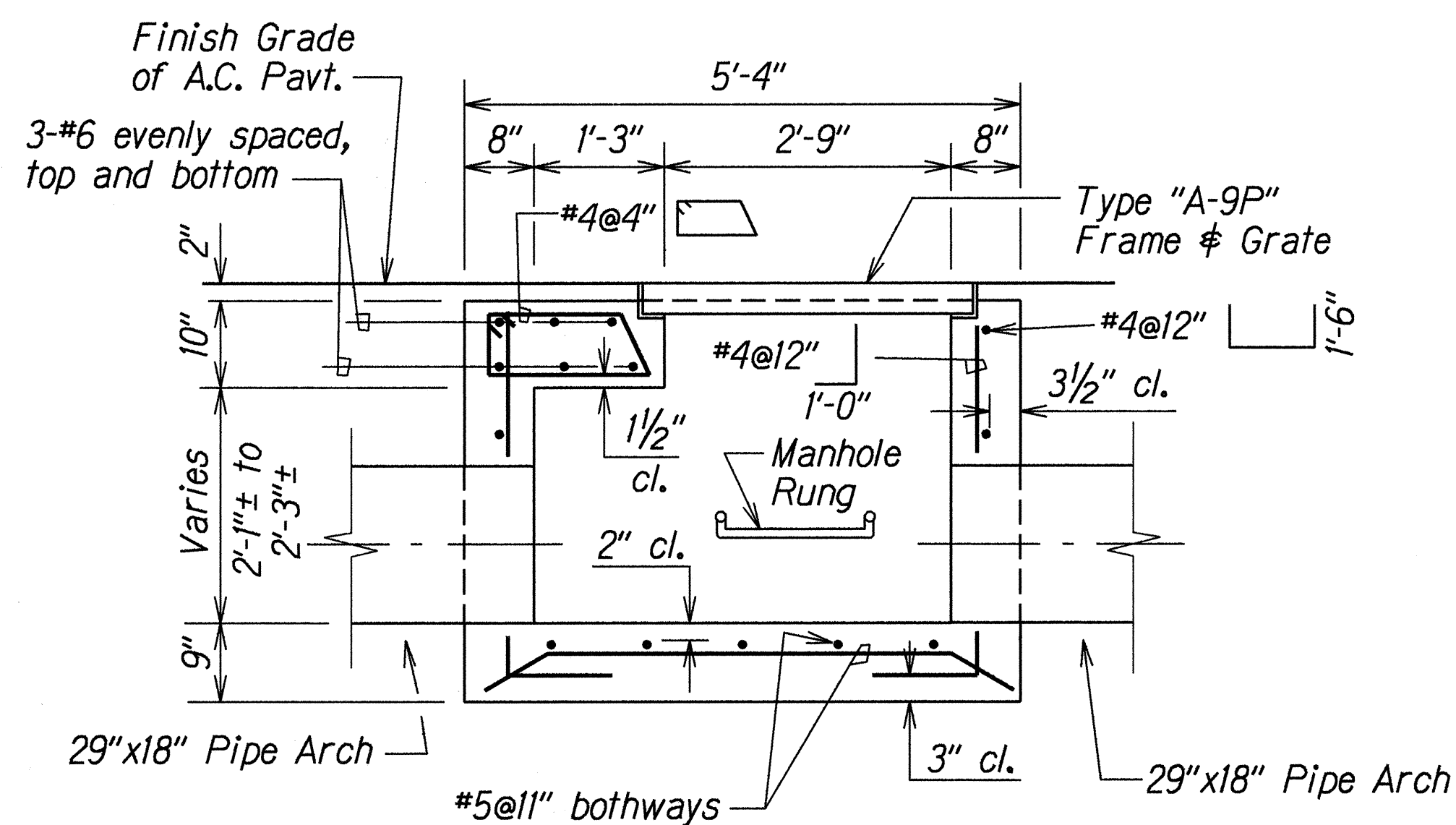
FED. ROAD DIST. NO.	STATE	FED. AID PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
HAWAII	HAW.	STP-0700(39)	1998	14	17



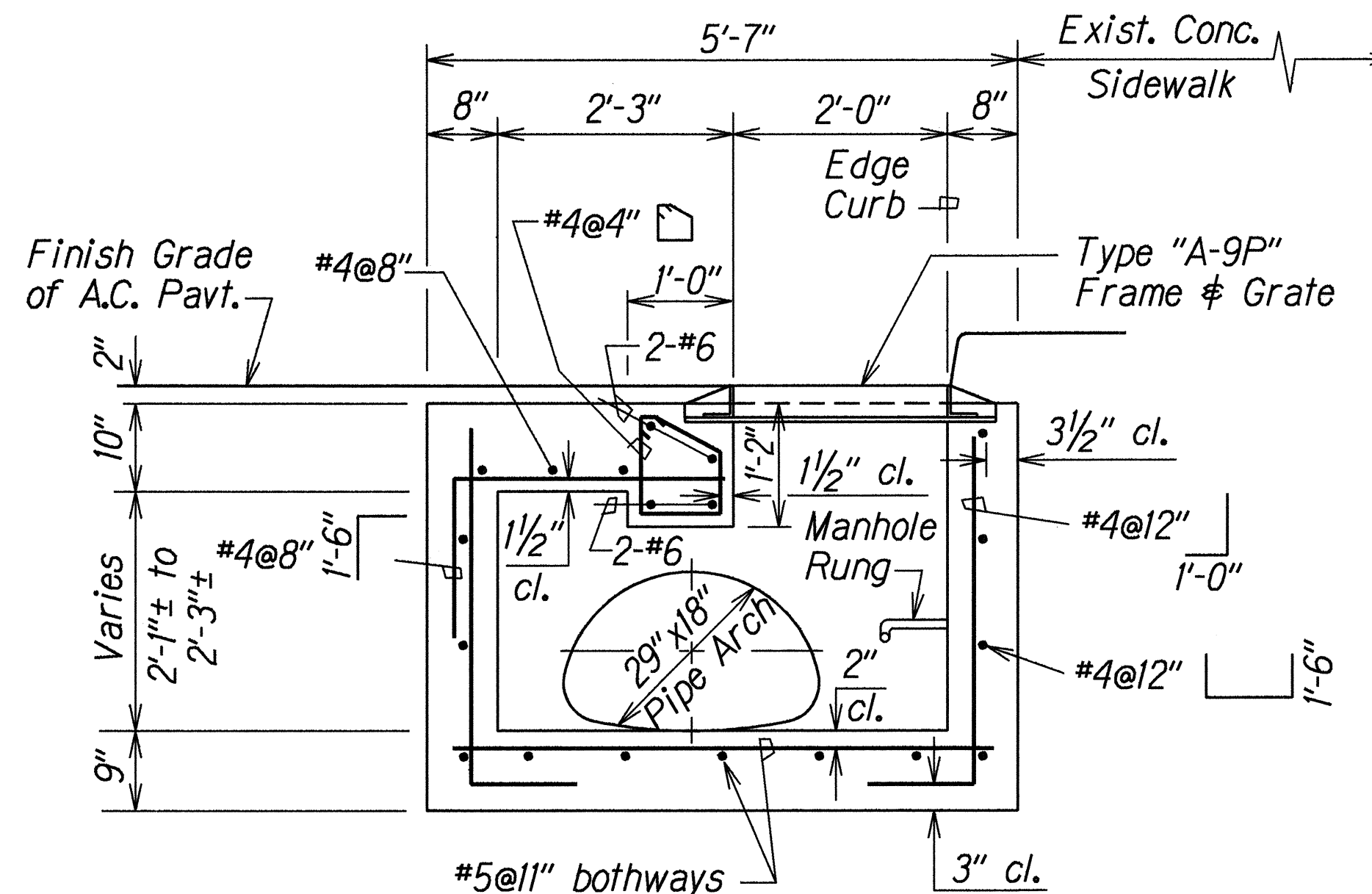
PLAN



TYPICAL DETAILS OF CULVERT TRENCH RESTORATION
AND REINFORCED CONCRETE JACKET



SECTION A



SECTION B

TYPICAL DETAILS OF TYPE "A-9P" GRATED DROP INLET

8/11/98 Revised Culvert Trench Restoration Detail to show reinforcing steel.

DATE REVISION

STATE OF HAWAII
DEPARTMENT OF TRANSPORTATION
HIGHWAYS DIVISION

DRAINAGE DETAILS

KAUMUALII HIGHWAY DRAINAGE IMPROVEMENTS

Vicinity of M.P. 6.0, M.P. 21.9 and Makeke Road

Federal Aid Project No. STP-0700(39)

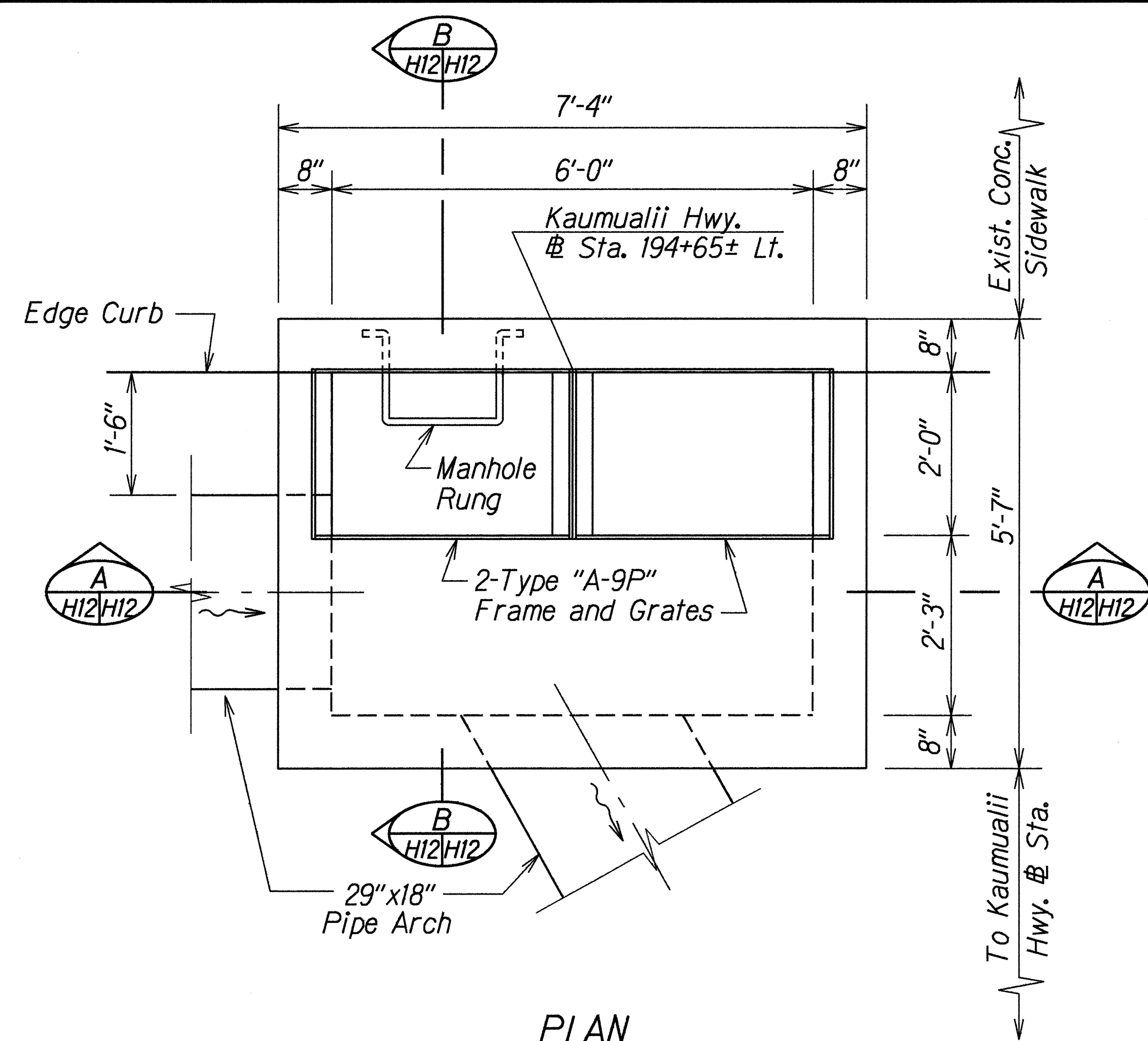
Scale: 3/4"=1'-0"

Date: Apr. 1998

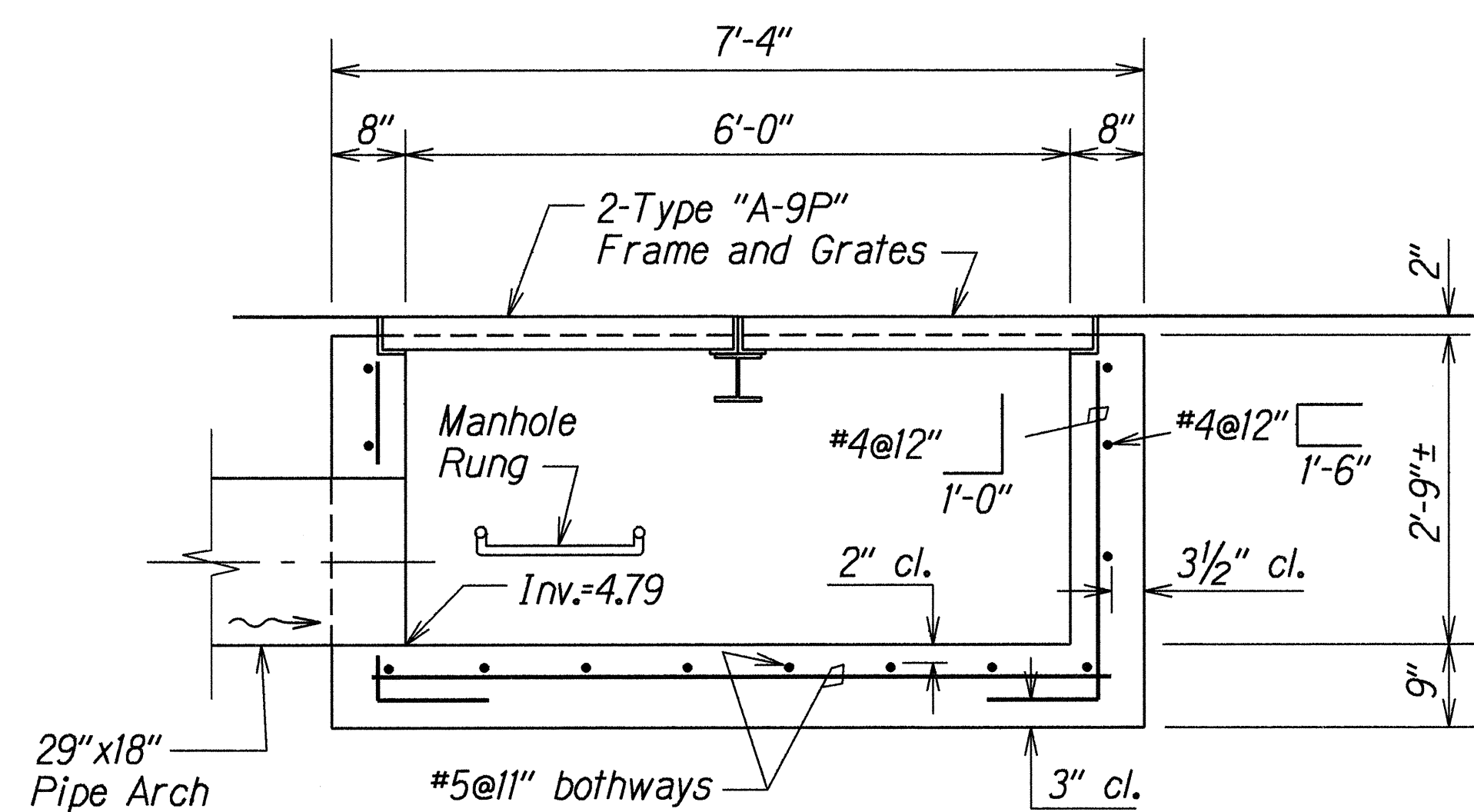
SHEET No. H11 OF 13 SHEETS

ORIGINAL PLAN	DATE
DESIGNED BY A. Mouloua	1/5/98
DRAWN BY A. Mouloua	
CHECKED BY G. Malsuda	
APPROVED BY	

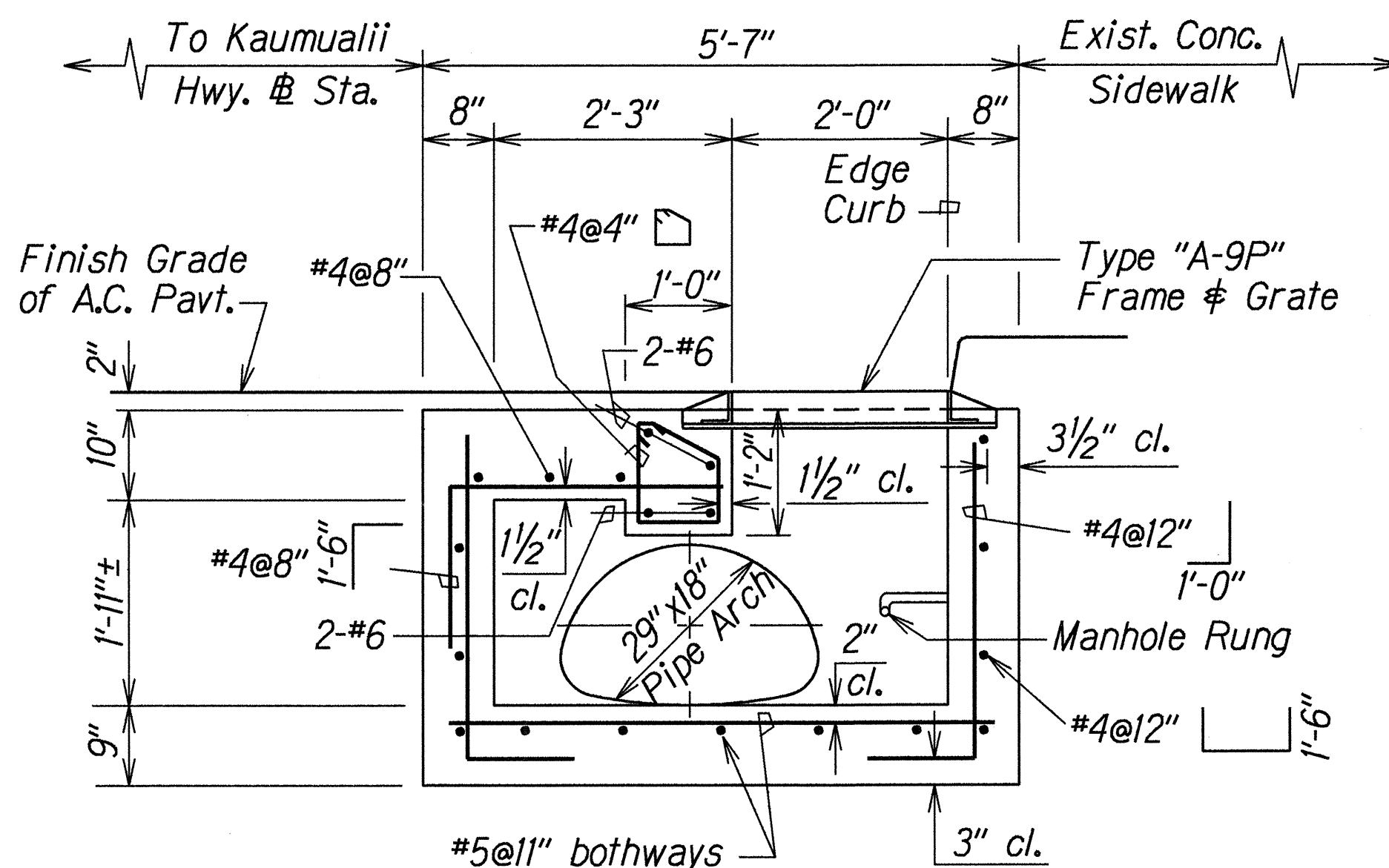
FED. ROAD DIST. NO.	STATE	FED. AID PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
HAWAII	HAW.	STP-0700(39)	1998	15	17



PLAN



SECTION A



SECTION B

DETAILS OF TYPE "2-A-9P" GRATED DROP INLET

DESIGNED BY	DATE
DRAWN BY	1/6/98
CHECKED BY	
APPROVED BY	
NOTED BY	
QUANTITIES BY	
CHECKED BY	

STATE OF HAWAII
DEPARTMENT OF TRANSPORTATION
HIGHWAYS DIVISION

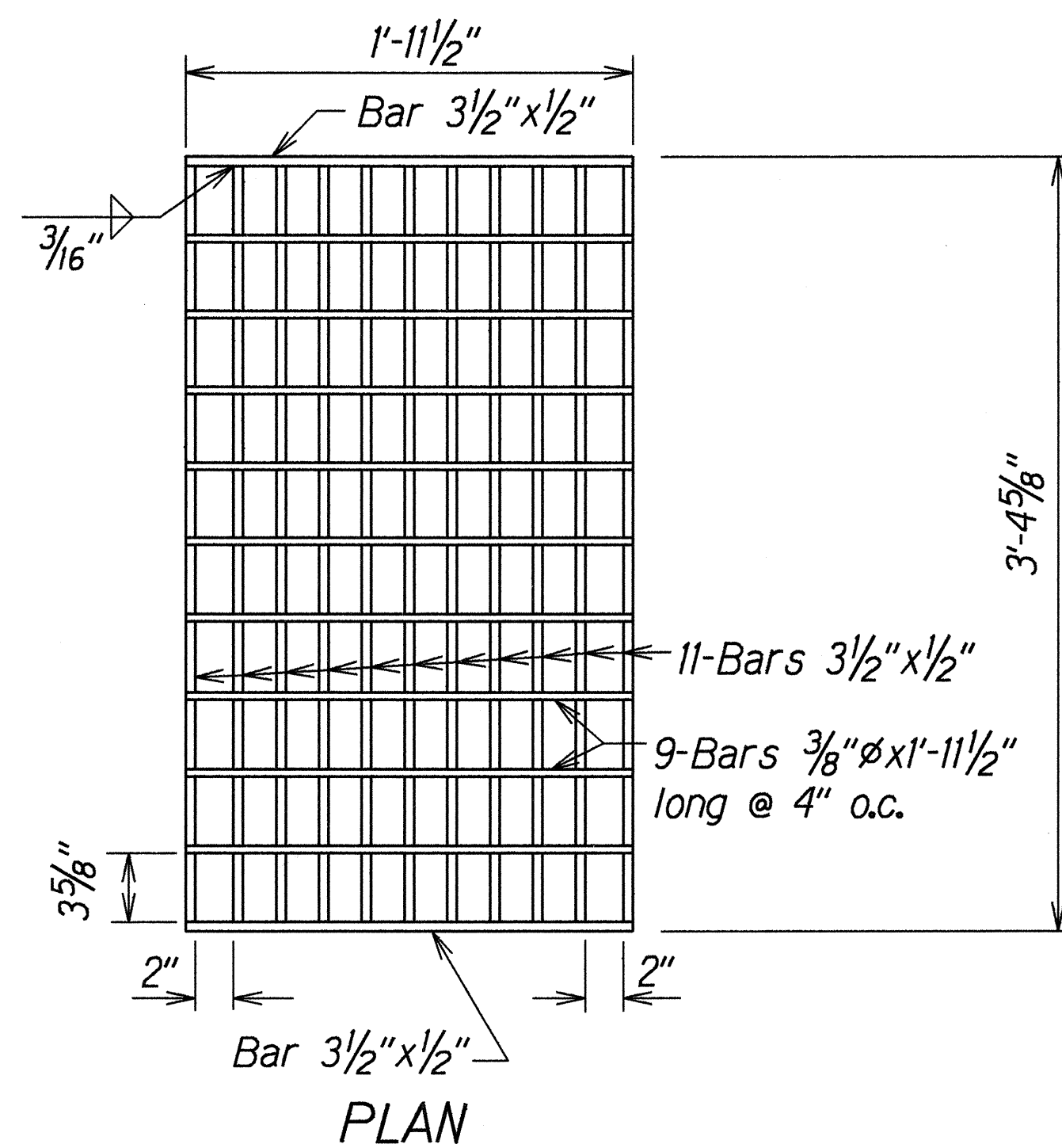
DRAINAGE DETAILS

KAUMUALII HIGHWAY DRAINAGE IMPROVEMENTS
Vicinity of M.P. 6.0, M.P. 21.9 and Makeke Road
Federal Aid Project No. STP-0700(39)

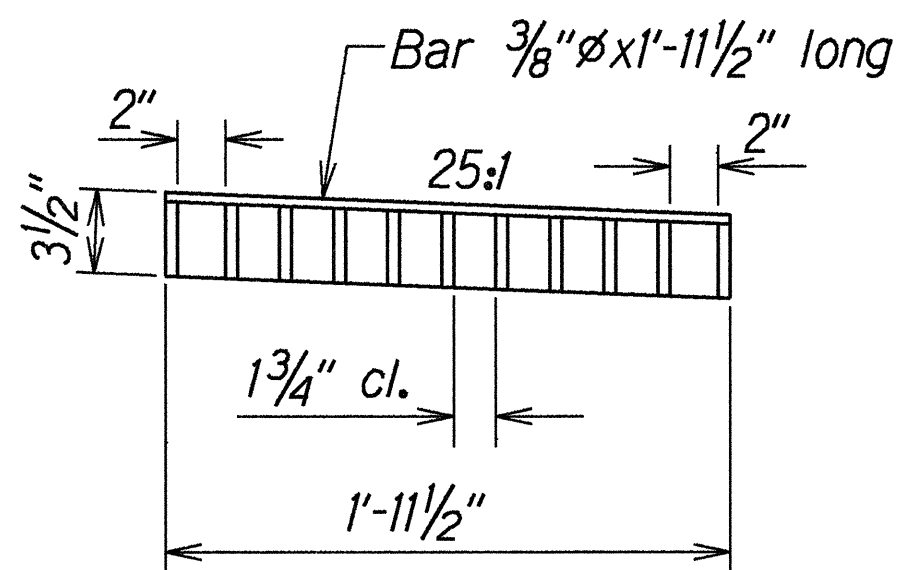
Scale: 3/4"=1'-0" Date: Apr. 1998

SHEET No. H12 OF 13 SHEETS

FED. ROAD DIST. NO.	STATE	FED. AID PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
HAWAII	HAW.	STP-0700(39)	1998	16	17



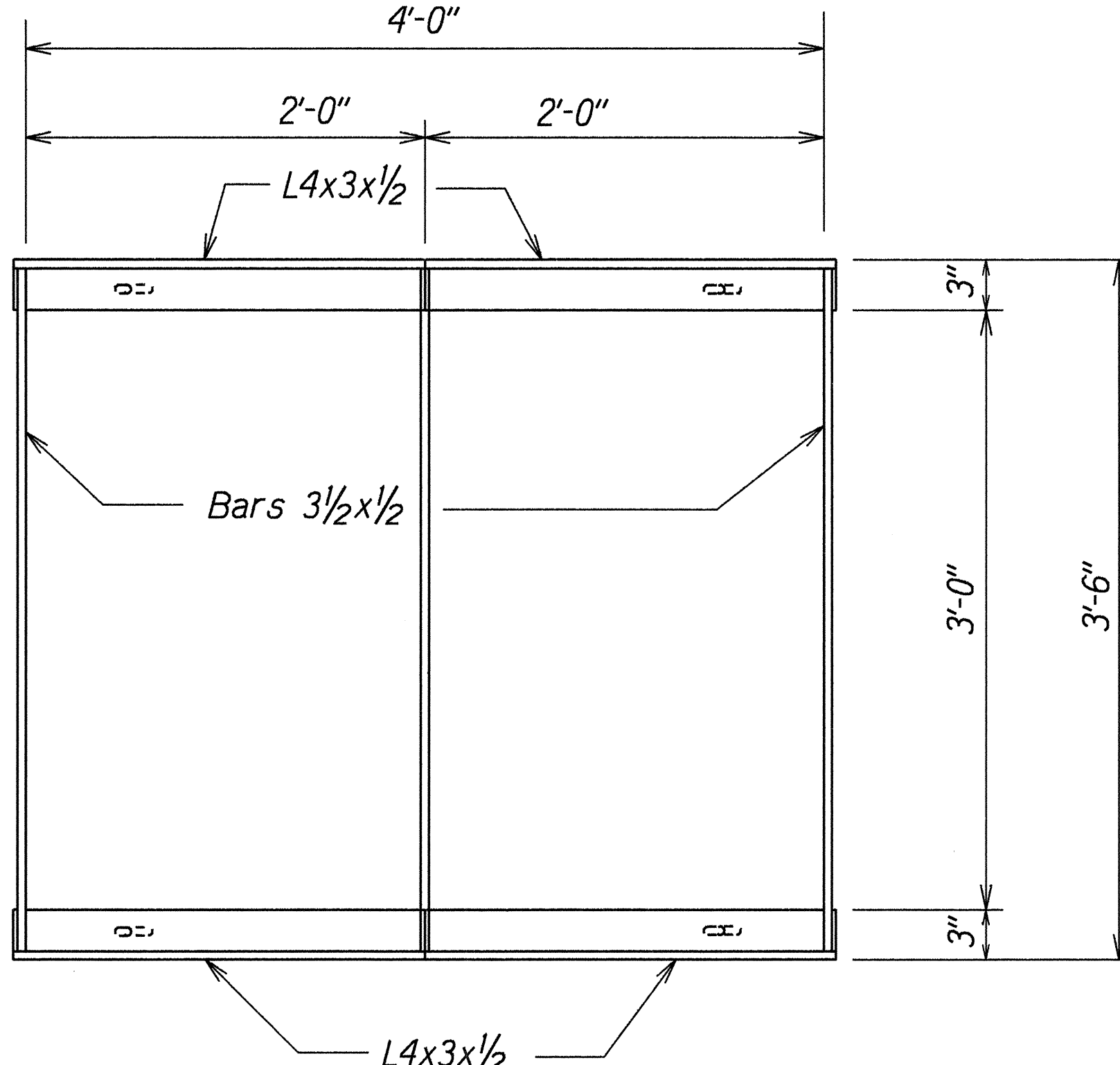
PLAN



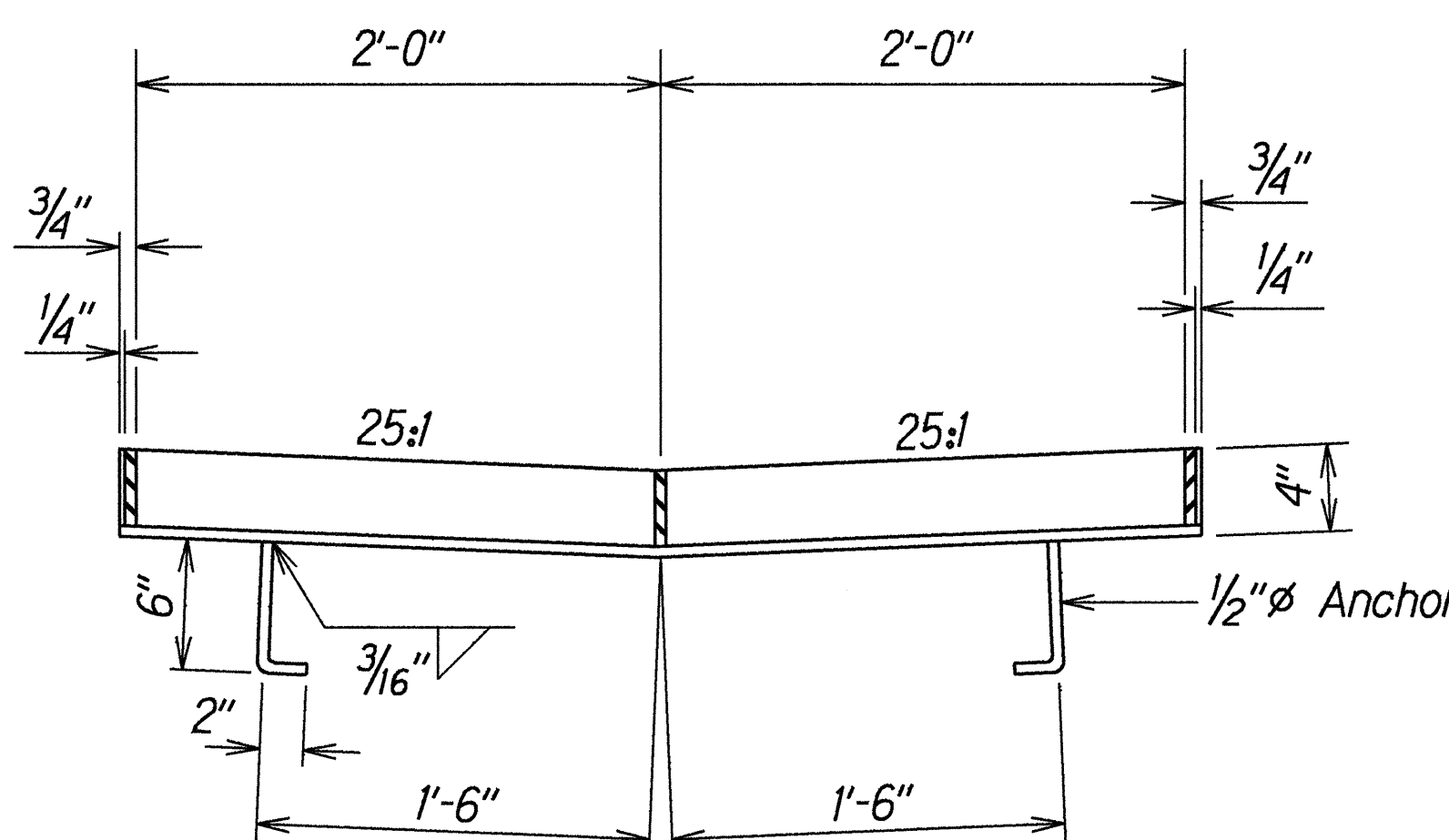
SECTION

GRATE

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



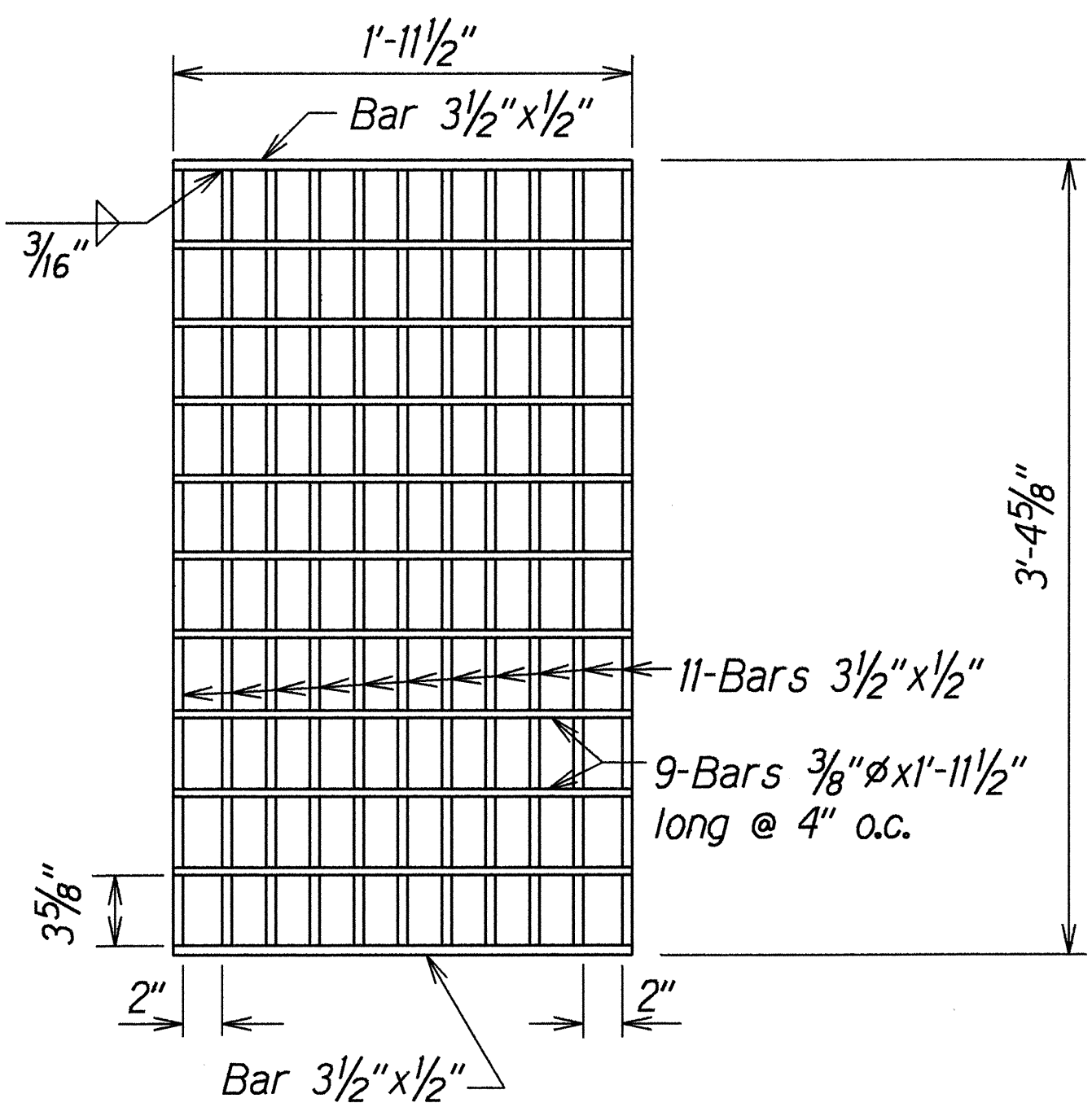
PLAN



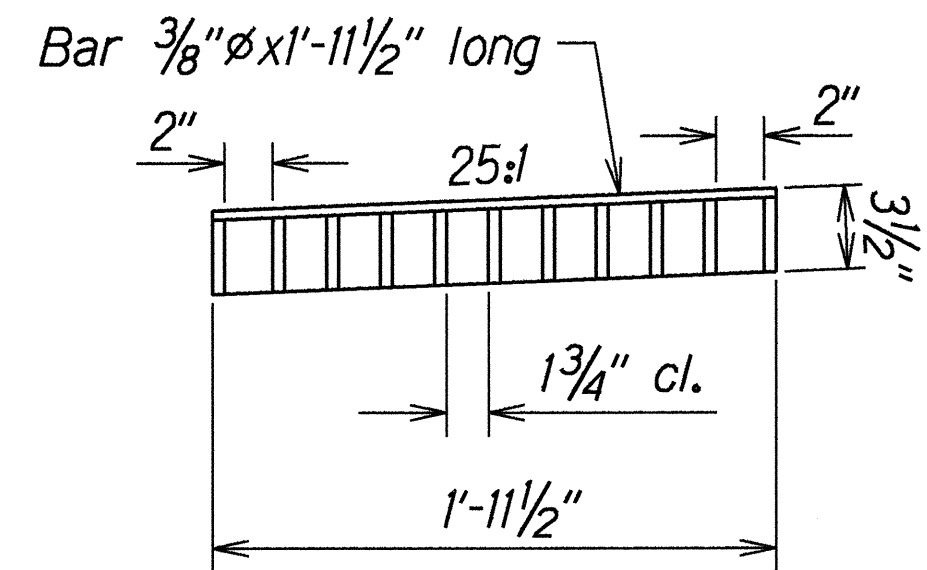
SECTION

FRAME

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



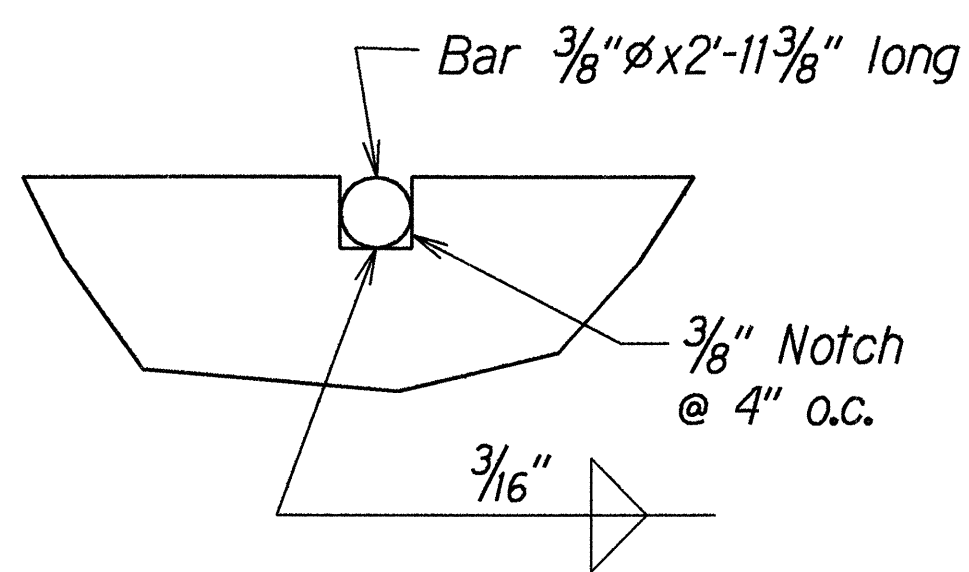
PLAN



SECTION

GRATE

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



NOTCH DETAIL

Full Size

NOTE:
All welds 3/8" unless otherwise noted.

TYPICAL DETAILS OF TYPE 2512514P STEEL FRAME AND GRATES

STATE OF HAWAII
DEPARTMENT OF TRANSPORTATION
HIGHWAYS DIVISION

DRAINAGE DETAILS

KAUMUALII HIGHWAY DRAINAGE IMPROVEMENTS
Vicinity of M.P. 6.0, M.P. 21.9 and Makeke Road
Federal Aid Proj. No. STP-0700(39)

Scale: As Shown
Date: Apr, 1998

SHEET No. H13 OF 13 SHEETS