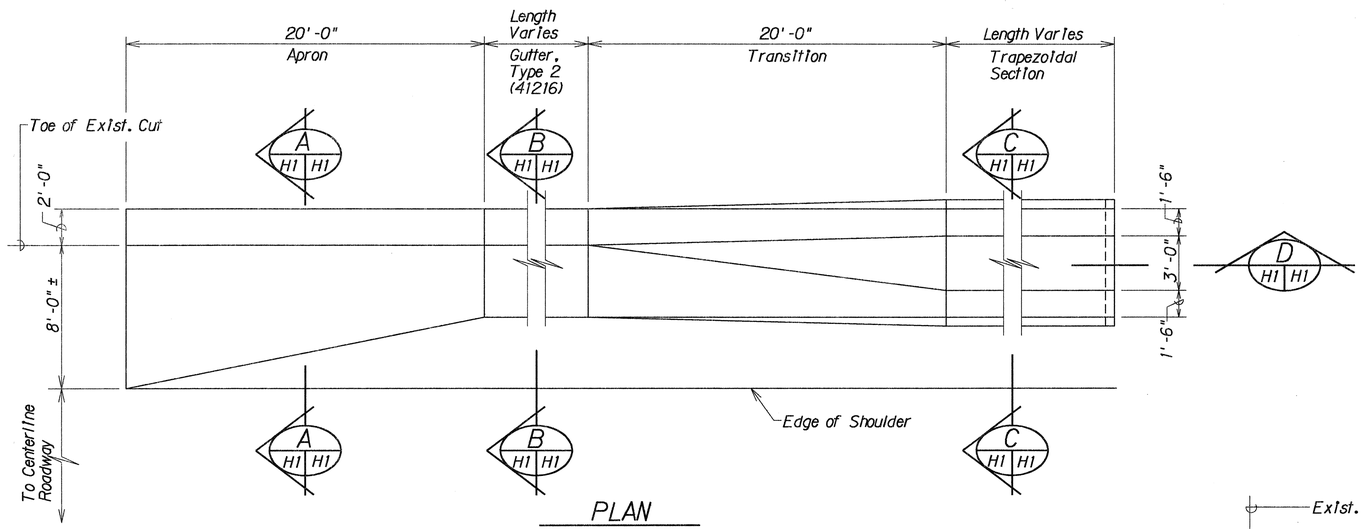
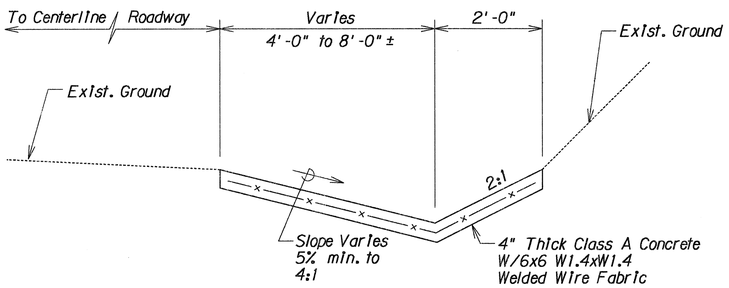
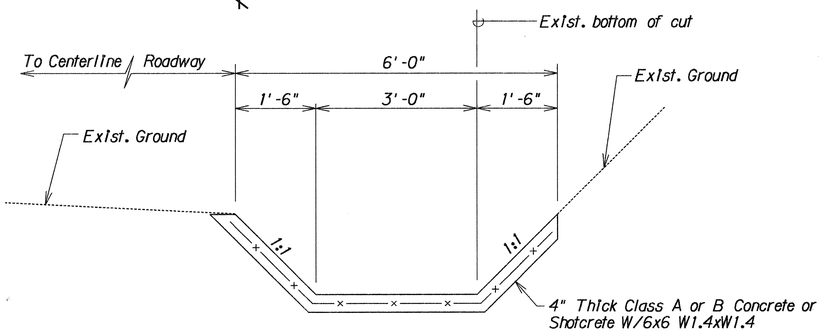
FED. ROAD DIST. NO.	STATE	~~FED. AID~~ PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
HAWAII	HAW.	460A-01-91M	1991	27	31



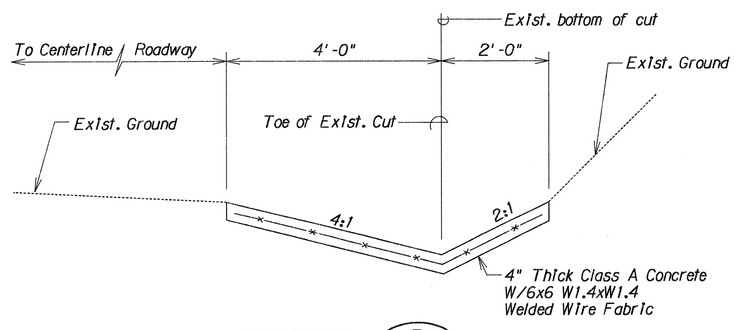
PLAN
Scale: 1/2" = 1'-0"



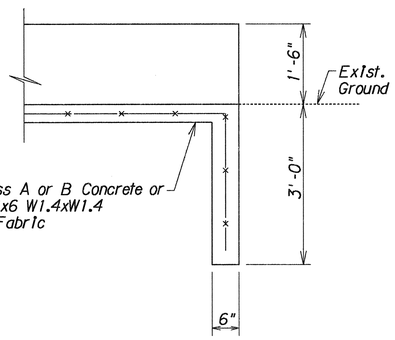
SECTION A
Scale: 3/4" = 1'-0"



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



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



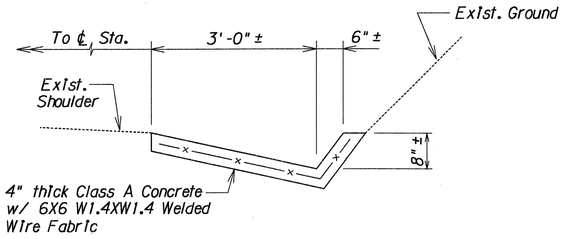
SECTION D
Scale: 3/4" = 1'-0"

TYPICAL DETAILS OF CONCRETE DRAINAGE DITCH

DRAINAGE NOTES:

1. Existing drainage systems will be functional at all times during construction. The Contractor is to furnish materials, equipment, labor, tools and incidentals necessary to maintain flow. The cost for this work shall be incidental to the various Contract Items.
2. 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.
3. Location of Standard Type 61214B GDI (C.L. Sta. 186+00) is only an approximate. Contractor shall verify the low point between C.L. Sta. 184+00 Lt. and 190+00 Lt. Standard Type 61214 GDI shall be constructed at the low point.

   Top elevation and Inverts of Standard Headwall and Type 61214B GDI shall be verified after construction.
4. Demolishing and removing portions of existing Concrete Spillway shall not be measured separately but shall be considered incidental to the various contract items.
5. Concrete shall be Class A unless otherwise noted.
6. For added reinforcing around new culverts, see Standard Plan H-04.
7. Chamfer all exposed concrete edges 1".
8. 20'-0" Concrete Apron shown on Sht. No. H1 shall be measured and paid for under Item No. 609.2200 - Gutter, Type 2(41216).
9. 20'-0" Transition area shown on Sht. No. H1 shall be measured and paid for under Item No. 640.4500 - 3.0 Feet x 1.5 Feet (s/s 1/1) Lined Trapezoidal Drainage Ditch.
10. Transitions to existing concrete spillway shall not be measured separately, but shall be considered incidental to the various contract items.
11. Actual locations of concrete gutter repair between ℄ Sta. 285+00± Rt. to ℄ Sta. 293+50± Rt. shall be determined by the Engineer in the field.



TYPICAL SECTION - CONCRETE GUTTER @ ℄ STA. 285+00± RT. TO ℄ STA. 293+50± RT.

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

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

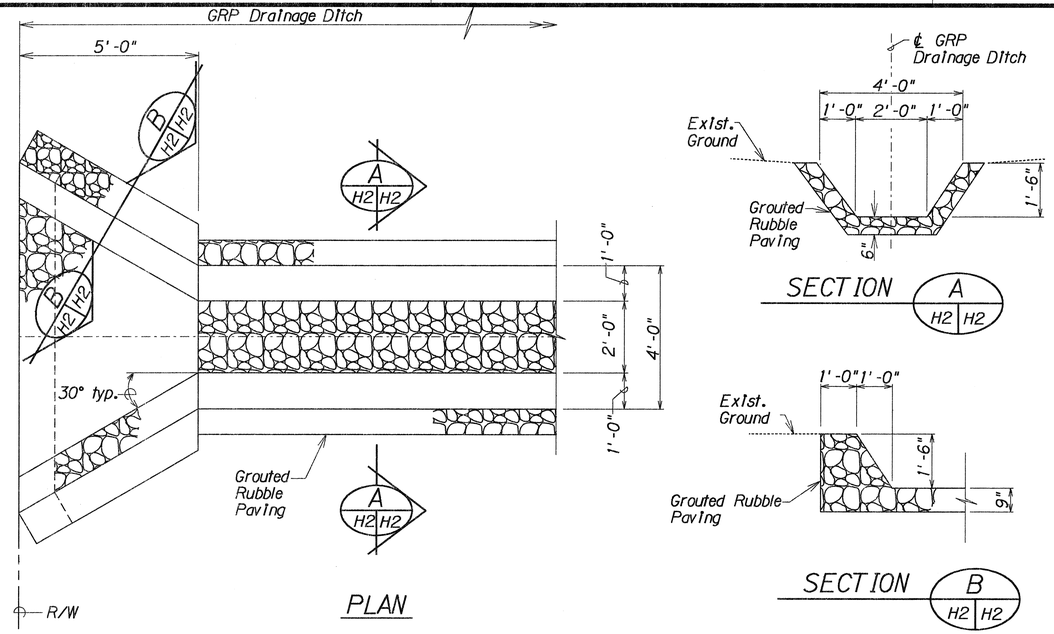
STATE OF HAWAII
DEPARTMENT OF TRANSPORTATION
HIGHWAYS DIVISION

DRAINAGE DETAILS

MAUNALOA HIGHWAY SHOULDER PAVING
KEPUHI ROAD TO KEONELELE AVENUE
PROJECT NO. 460A-01-91M

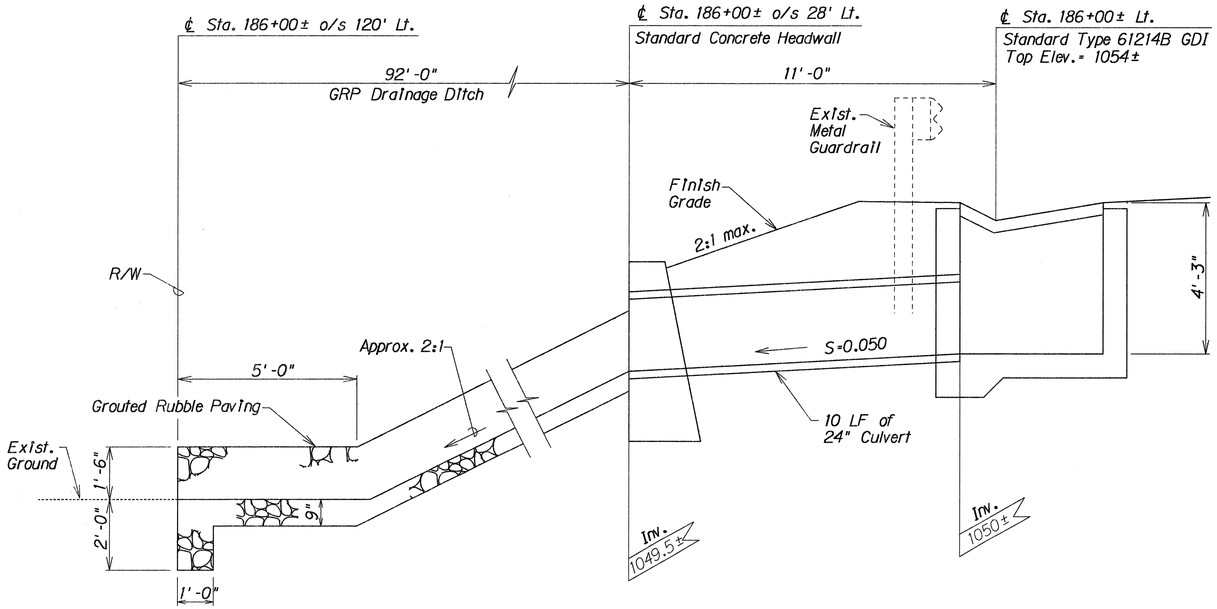
Scale As Shown — Date: April, 1991

SHEET No. H1 OF 5 SHEETS



DETAILS OF GRP DRAINAGE DITCH

Scale: ½" = 1'-0"



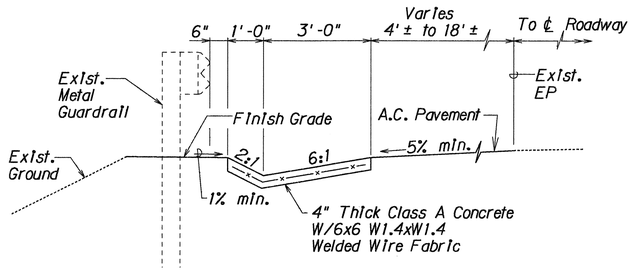
PROFILE - ℄ STA. 186+00±

Scale: ½" = 1'-0"

DRAINAGE SUMMARY

FED. ROAD DIST. NO.	STATE	~~FED. AID~~ PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
HAWAII	HAW.	460A-01-91M	1991	28	31

ITEM NO.		206	207	503	602	603	603	603	604	604	604	609	609	609	612	640	640
		2020	0100	2020	1020	0010	1018	5100	5004	5005	5006	2200	2214	4000	0100	4500	5100
UNIT USED		CY	CY	CY	LB	CY	LF	LF	EA	EA	EA	LF	LF	LF	CY	LF	LF
℄ STATION FROM	TO	Structure Excavation For Drainage System	Ditch and Channel Excavation	Class A Concrete for Drainage System	Reinforcing Steel For Drainage System	Bed Course Material For Culvert	48" RCP, CI.III	24" RCP, CI.III or 24" ASRP, sht. "I" = 0.075" or 24" CAP, sht. "I" = 0.075"	Type 61214B GDI, 4.00 Feet to 4.99 Feet	Modified Type 5'x2' GDI, 2.00 Feet to 2.99 Feet	Type "I" Pipe Grate Inlet, 3.00 Feet to 3.99 Feet	Gutter, Type 2 (41216)	Gutter, Type 2 (61214)	Repair of Existing Concrete Gutter	Grouted Rubble Paving	3.0-Feet x 1.5-Feet (s/s 1/1) Lined Trapezoidal Drainage Ditch	2.0-Feet x 2.0-Feet (s/s 6/1) Lined Trapezoidal Drainage Swale
181+00 Lt.	184+00± Lt.		16									161				53	
183+20 Rt.	185+65± Rt.		44									131				134	
184+00 Lt.	189+75 Lt.												575				
186+00± Lt.	186+00± o/s 120' Lt.	6		2	40	2		10	1						16		
188+45± Rt.	190+25 Rt.		15									140				50	
247+60 Rt.	248+64± Rt.											105					
267+43 Lt.	268+35± Lt.		23									80				73	
285+00± Rt.	293+50± Rt.													350			
380+65± Lt.	380+65± Rt.	80		17	345	9	32										
456+00± Lt.	456+60± Lt.		4							1							40
461+00± Lt.											1						
TOTAL		86	102	19	385	11	32	10	1	1	1	617	575	350	16	310	40



TYPICAL DETAIL-GUTTER, TYPE 2 (61214)

Scale: ½" = 1'-0"

STATE OF HAWAII
DEPARTMENT OF TRANSPORTATION
HIGHWAYS DIVISION

DRAINAGE DETAILS

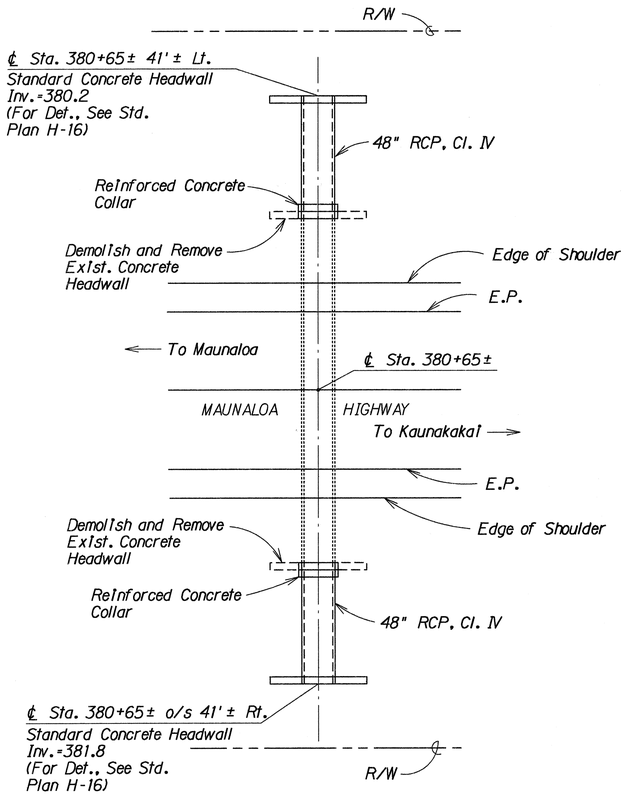
MAUNALOA HIGHWAY SHOULDER PAVING
KEPUHI ROAD TO KEONELELE AVENUE
PROJECT NO. 460A-01-91M

Scale As Shown — Date: April, 1991

SHEET No. H2 OF 5 SHEETS

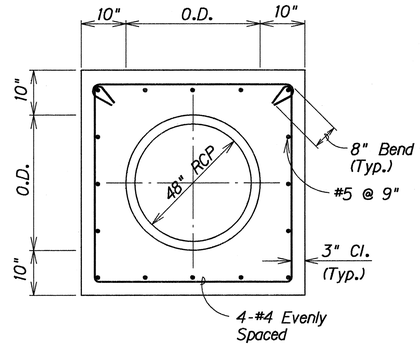
ORIGINAL PLAN | SURVEY PLOTTED BY | DRAWN BY | TRACED BY | DESIGNED BY | QUANTITIES BY | CHECKED BY | DATE | NOTE BOOK | No.

FED. ROAD DIST. NO.	STATE	~~FED. AID~~ PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
HAWAII	HAW.	460A-01-91M	1991	29	31

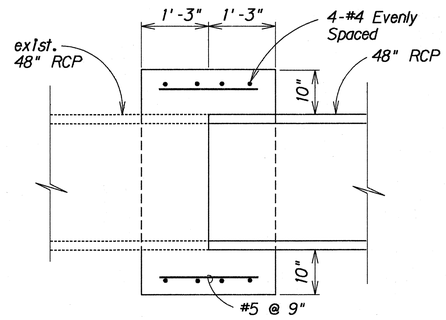


PLAN

Scale: 1"=10'



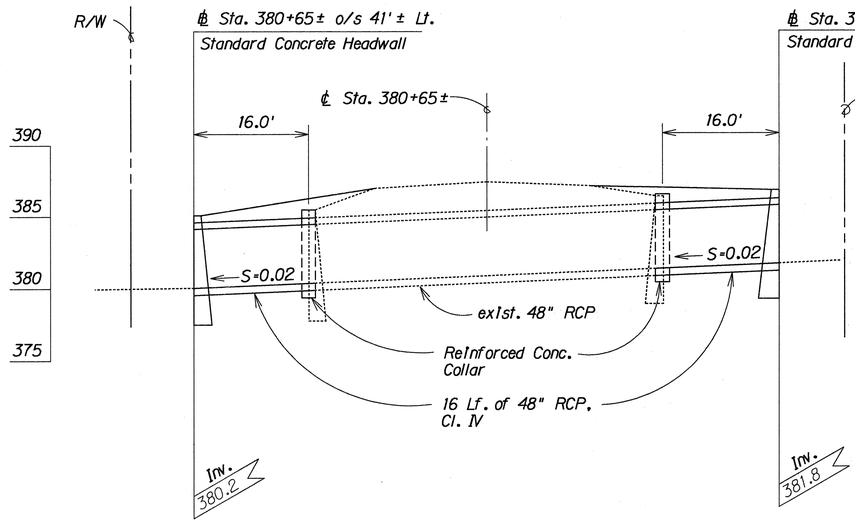
ELEVATION



SECTION

TYPICAL DETAILS OF REINFORCED CONCRETE COLLAR

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



PROFILE @ ℄ 380+65±

Scale: Horiz. 1"=10'
Vert. 1"=5'

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

ORIGINAL PLAN
NOTE BOOK
No. ____

STATE OF HAWAII
DEPARTMENT OF TRANSPORTATION
HIGHWAYS DIVISION

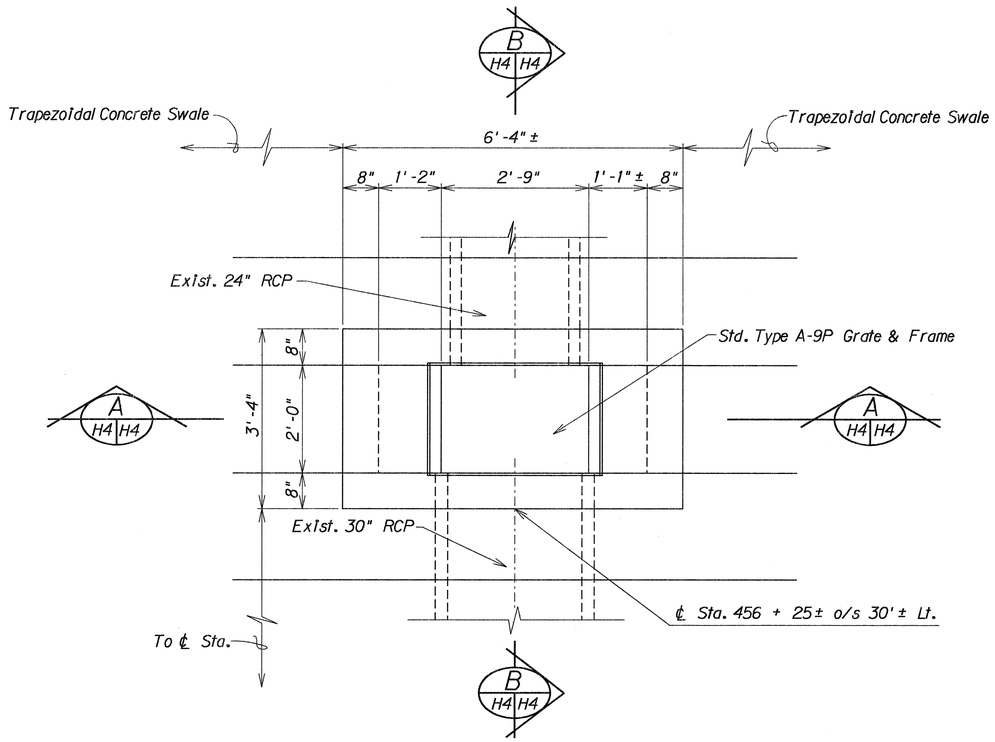
DRAINAGE DETAILS

MAUNALOA HIGHWAY SHOULDER PAVING
KEPUHI ROAD TO KEONELELE AVENUE
PROJECT NO. 460A-01-91M

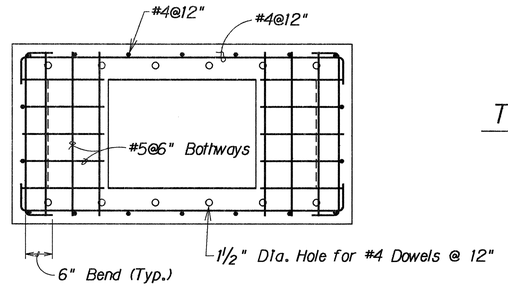
Scale As Shown Date: April, 1991

SHEET No. H3 OF 5 SHEETS

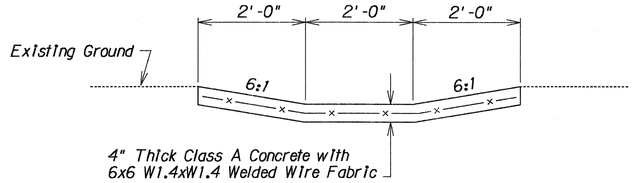
FED. ROAD DIST. NO.	STATE	~~FED. AID~~ PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
HAWAII	HAW.	460A-01-91M	1991	30	31



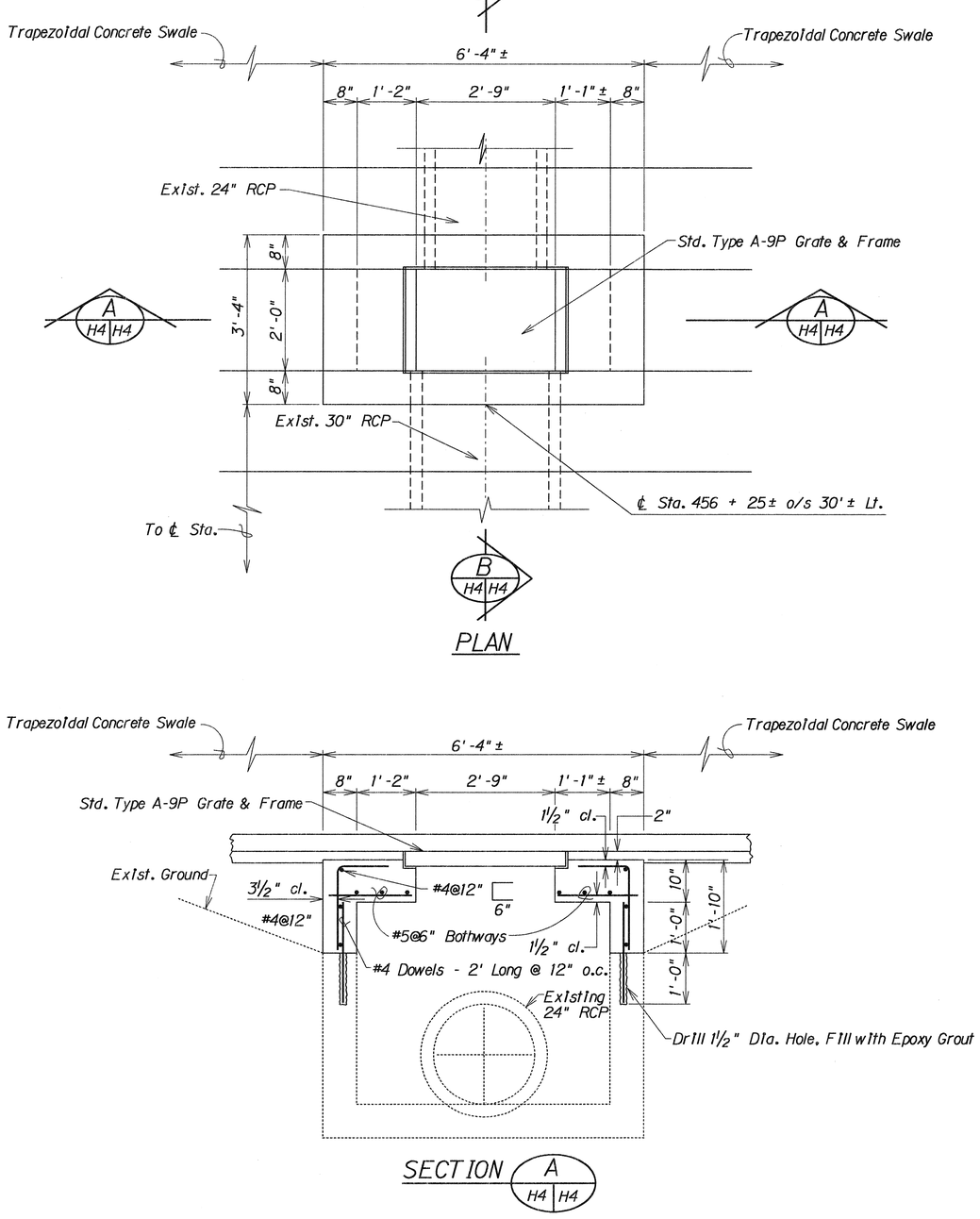
PLAN



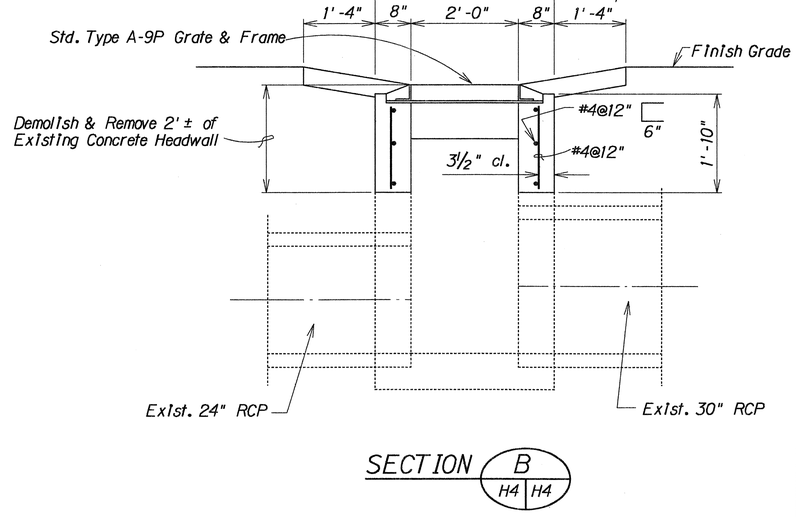
PLAN VIEW OF STEEL REINFORCING



TYPICAL SECTION OF TRAPEZOIDAL CONCRETE SWALE



SECTION A H4 H4



SECTION B H4 H4

DETAILS OF MODIFIED TYPE 5'x2' GRATED DROP INLET

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

STATE OF HAWAII
DEPARTMENT OF TRANSPORTATION
HIGHWAYS DIVISION

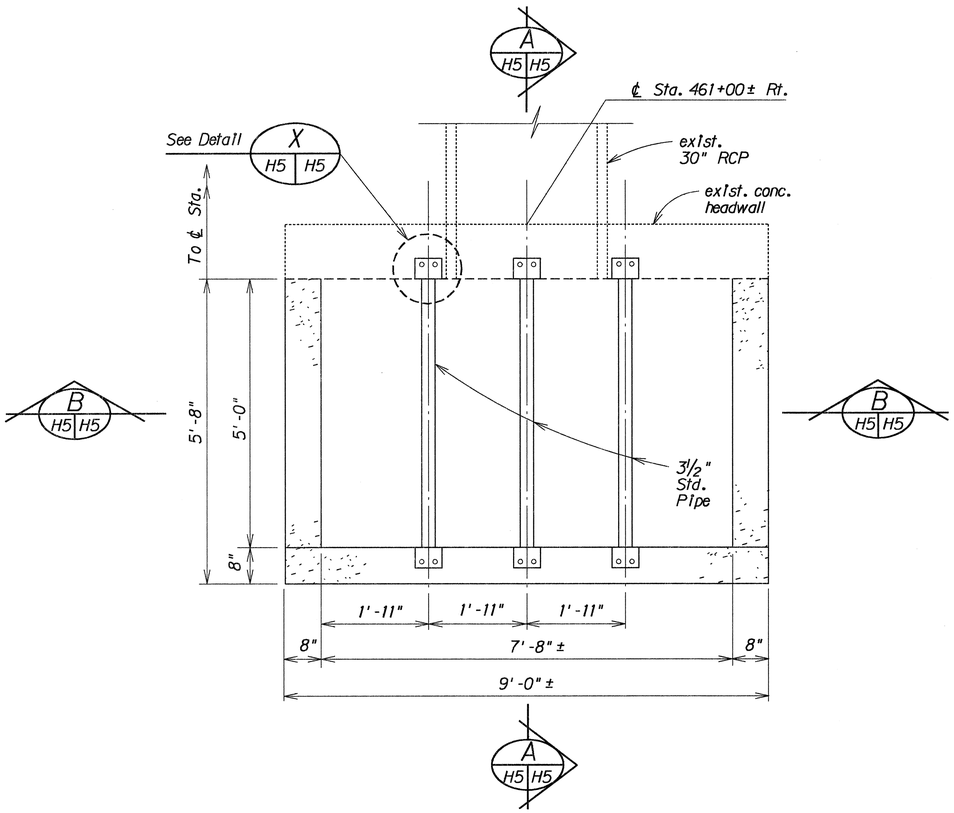
DRAINAGE DETAILS

MAUNALOA HIGHWAY SHOULDER PAVING
KEPUHI ROAD TO KEONELELE AVENUE
PROJECT NO. 460A-01-91M

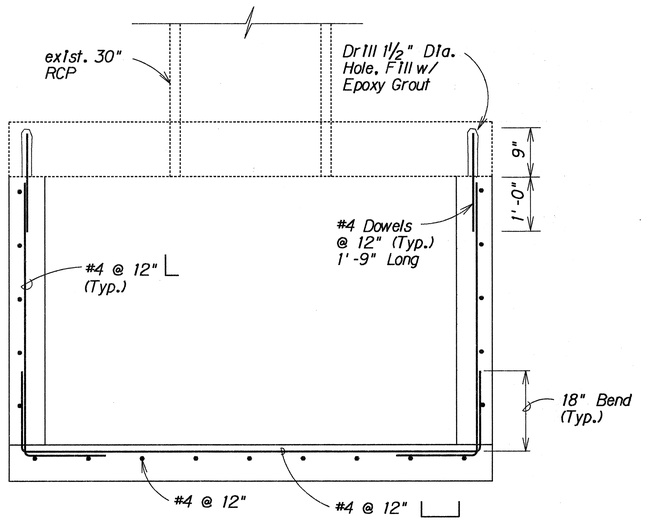
Scale: 3/4" = 1'-0" Date: April, 1991

SHEET No. H4 OF 5 SHEETS

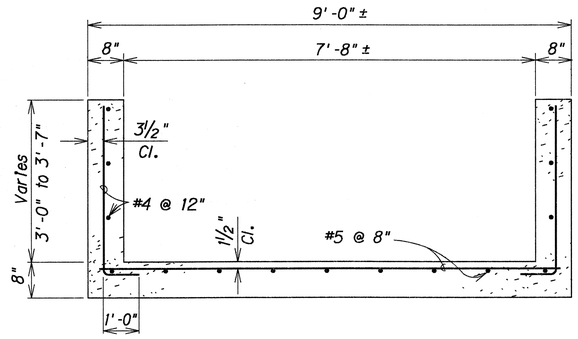
FED. ROAD DIST. NO.	STATE	~~FED. AID~~ PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
HAWAII	HAW.	460A-01-91M	1991	31	31



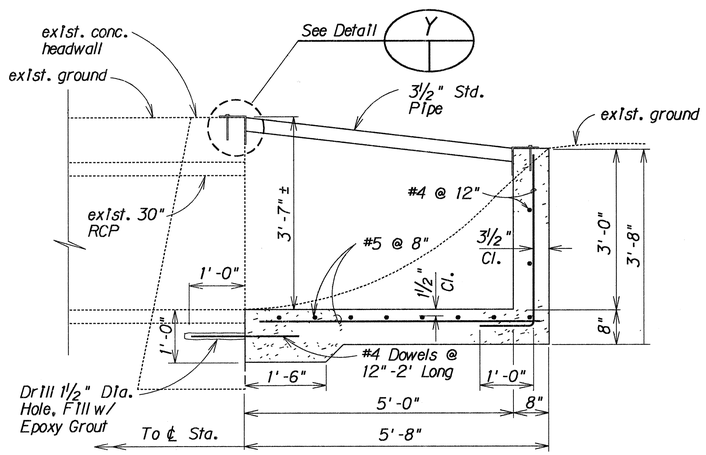
PLAN



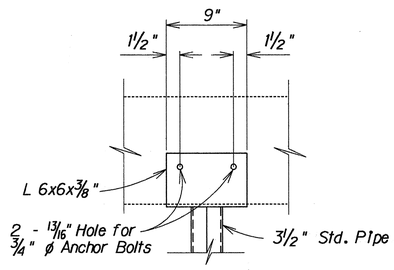
PLAN VIEW OF WALL REINFORCING



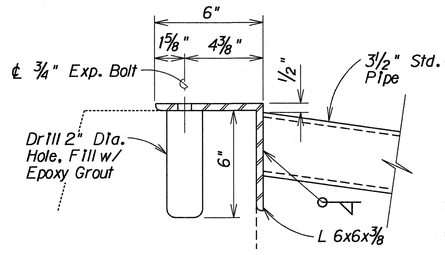
SECTION B H5 H5



SECTION A H5 H5



DETAIL X H5 H5
Scale: 1½"=1'-0"



DETAIL Y H5 H5
SCALE: 3"=1'-0"

NOTES FOR TYPE "1" PIPE GRATE INLET:

1. Structural steel shapes and plates shall conform to ASTM A-36.
2. Structural pipe shall conform to ASTM A-53 Grade B.
3. Welds shall be 3/16" fillet unless noted otherwise.
4. All dimensions shall be verified in the field by the Contractor before fabrication.
5. All structural steel assemblies and hardware shall be hot dip galvanized after fabrication.
6. Only non-pneumatic type of drill as approved by the Engineer shall be permitted for drilling holes in concrete.
7. 3½" pipe, angles and assemblies, including drilling of holes for dowels and epoxy grout shall be considered incidental to Item No. 604.5006 - Type "1" Pipe Grate Inlet.

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

STATE OF HAWAII
DEPARTMENT OF TRANSPORTATION
HIGHWAYS DIVISION

DRAINAGE DETAILS

MAUNALOA HIGHWAY SHOULDER PAVING
KEPUHI ROAD TO KEONELELE AVENUE
PROJECT NO. 460A-01-91M

Scale: ¾"=1'-0" Date: April, 1991

SHEET No. H5 OF 5 SHEETS

DETAILS OF TYPE "1" PIPE GRATE INLET @ ℄ STA. 461+00± RT.