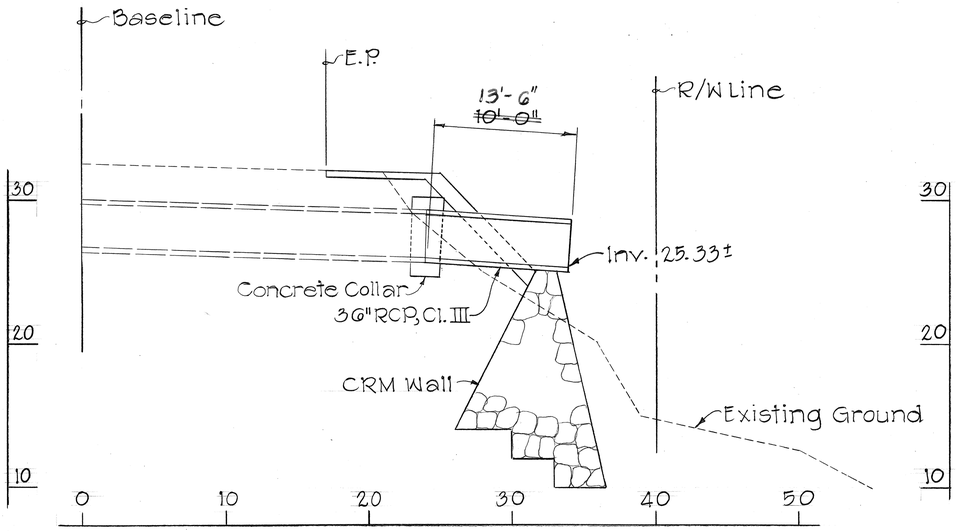
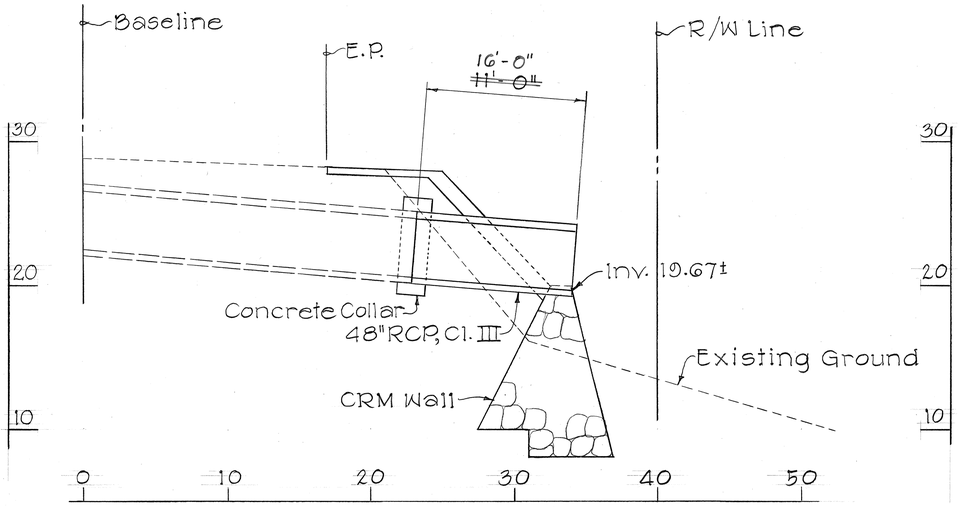
FED. ROAD DIST. NO.	STATE	FED. AID PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
HAWAII	HAW.	ER-10(1)	1984	10	27



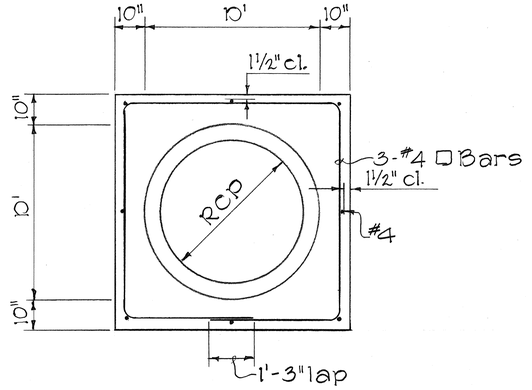
PROFILE 36" CULVERT @ ℄ STA. 213+15±

Scale: 1" = 5'

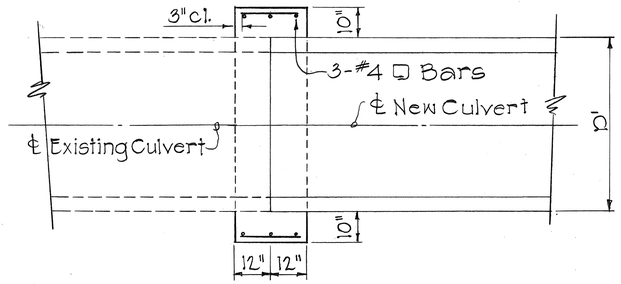


PROFILE 48" CULVERT @ ℄ STA. 222+21±

Scale: 1" = 5'



FRONT VIEW



ELEVATION VIEW

DETAIL OF CONCRETE COLLAR

Scale: ½" = 1'-0"

GENERAL NOTES:

1. Existing drainage system will be functional at all times during construction. Contractor will furnish materials, equipment, labor, tools and incidentals necessary to accomplish maintenance of flow. Above work shall be incidental to the various contract items.
2. Demolishing and removing of the existing structure shall not be paid for separately, but shall be considered incidental to the various contract items.
3. Contractor shall verify the locations of all culverts and utilities in the field. Any damage incurred during construction shall be repaired at the expense of the Contractor.
4. Concrete collar shall be incidental to Reinforced Concrete Pipe.

℄ Sta. 213+15±

Estimated Quantities

Structure Excavation	= 7	C.Y.
36" RCP, Cl. III	= 10	L.F.

℄ Sta. 222+21±

Estimated Quantities

Structure Excavation	= 13	C.Y.
48" RCP, Cl. III	= 11	L.F.

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

STATE OF HAWAII
DEPARTMENT OF TRANSPORTATION
HIGHWAYS DIVISION

DRAINAGE DETAILS

FARRINGTON HIGHWAY
EMERGENCY REPAIRS, MAKUA SECTION
F.A. PROJ. NO. ER-10(1)

Scale: As Shown Date: Jan, 1984

SHEET No. 1 OF 4 SHEETS

FED. ROAD DIST. NO.	STATE	FED. AID PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
HAWAII	HAW.	ER-10(1)	1984	11	27

GENERAL NOTES

DESIGN SPECIFICATIONS

(AASHTO) Standard Specifications for Highway Bridges (12th Edition) with subsequent interim Specifications.

DESIGN LOAD: HS-20-44

DESIGN STRESSES:

1. fc = 1200 psi (.4 fc')
2. fs = 20,000 psi

MATERIALS

1. Reinforced Concrete Class A.
2. Reinforcing Steel - ASTM A 615 Grade 40
3. Welded Wire Fabric ASTM A 185 fy = 65,000 psi.
4. Epoxy Grout shall be high early strength type (1,000 psi minimum compressive strength in 4 hrs.) approved by the Engineer & applied in strict accordance with the manufacturer's recommendations.

CONSTRUCTION REQUIREMENTS

1. See Standard Specifications for Road & Bridge Construction (Hawaii 1976) and Special Provisions.
2. Remove, clean and repair top of existing CRM wall to receive concrete block as indicated and as directed by the Engineer. Top surface of concrete block shall be roughend to receive new Concrete Slab.
3. If a segment of the existing CRM wall is found to be structurally unsound to build the concrete block upon, as determined by the Engineer, the Contractor shall repair such defects as directed by the Engineer. Such repair shall be incidental to CRM work.
4. The face of the existing slab to be epoxy bonded with the new slab shall be thoroughly wetted with clear water and scrubbed with a solution of not more than one part hydrochloric (muriatic) acid to nine parts water followed immediately by thorough rinsing with clear water.
5. All items designated for removal shall be removed in such a manner as to preclude any damage to the existing structures. Large impacting or vibratory types of equipment will not be permitted in the removal operation - small vibratory tools, approved by the Engineer will be permitted.
6. The Contractor shall make provisions to close the lane adjacent to new slab construction during epoxying operation and may reopen the lane 4 hours after completion of epoxying operation.
7. Where reinforing bars are cut in the removal of existing concrete, all exposed ends shall be under cut a minimum of 1" below the surface of the concrete and patched with mortar. Cutting of reinforcing and patching with mortar shall be incidental to structure excavation.

GENERAL

1. All items noted incidental will not be paid for separately.
2. The Contractor shall verify all dimensions in the field before commencing with any work.
3. The Contractor shall verify the location of all utility lines (including Signal Corp Line) near the culverts and shall notify their respective owners before commencing with any work.
4. See Special Provisions for Epoxy Grout and Epoxy Resin System (used in Epoxy coating of existing concrete surfaces).

ORIGINAL PLAN	SURVEY PLOTTED BY ___ DATE ___
	DRAWN BY L. COCKETT " 2/84
	TRACED BY ___ "
NOTE BOOK	DESIGNED BY D. ORNELLAS " 2/84
	QUANTITIES BY ___ "
No. ___	CHECKED BY D. ORNELLAS " 2/84

STATE OF HAWAII
DEPARTMENT OF TRANSPORTATION
HIGHWAYS DIVISION

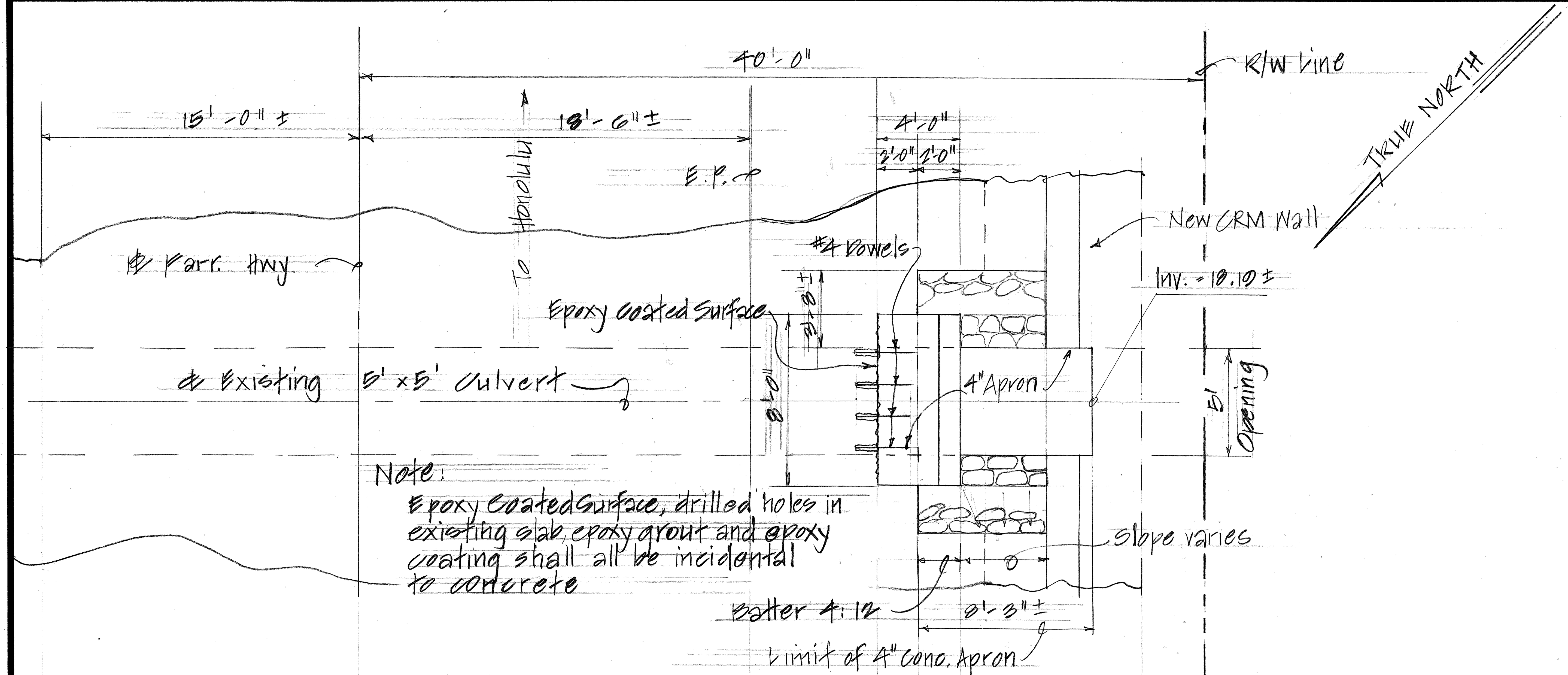
EXTENSION & REPAIR OF CULVERTS
AT STA. 227+18.5± & 231+07.5±

FARRINGTON HIGHWAY
EMERGENCY REPAIRS, MAKUA SECTION
F. A. PROJ. NO. ER-10(1)

Date: Feb. 1984

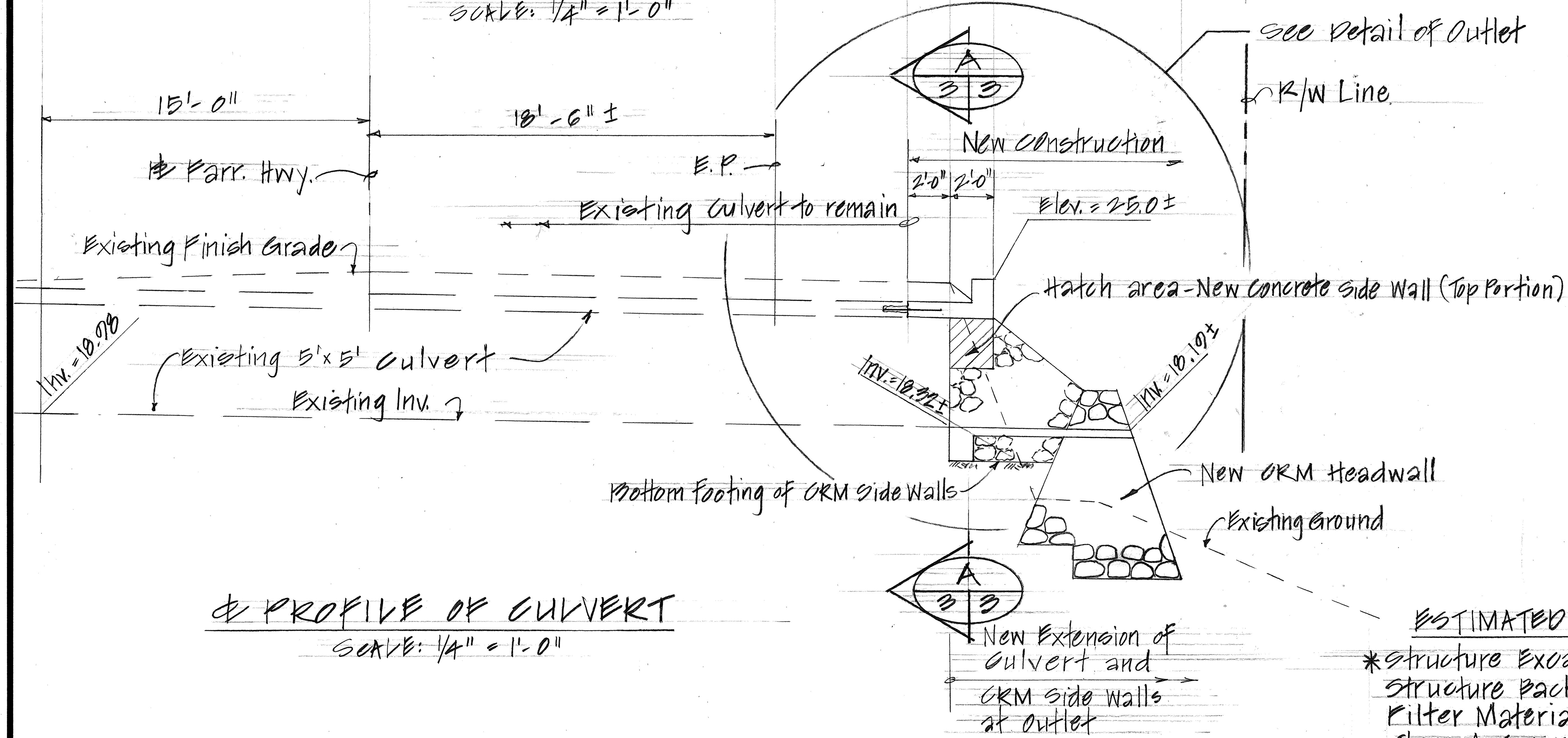
SHEET No. 2 OF 4 SHEETS

FED. ROAD DIST. NO.	STATE	FED. AID PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
HAWAII	HAW.	ER-10(1)	1984	12	27



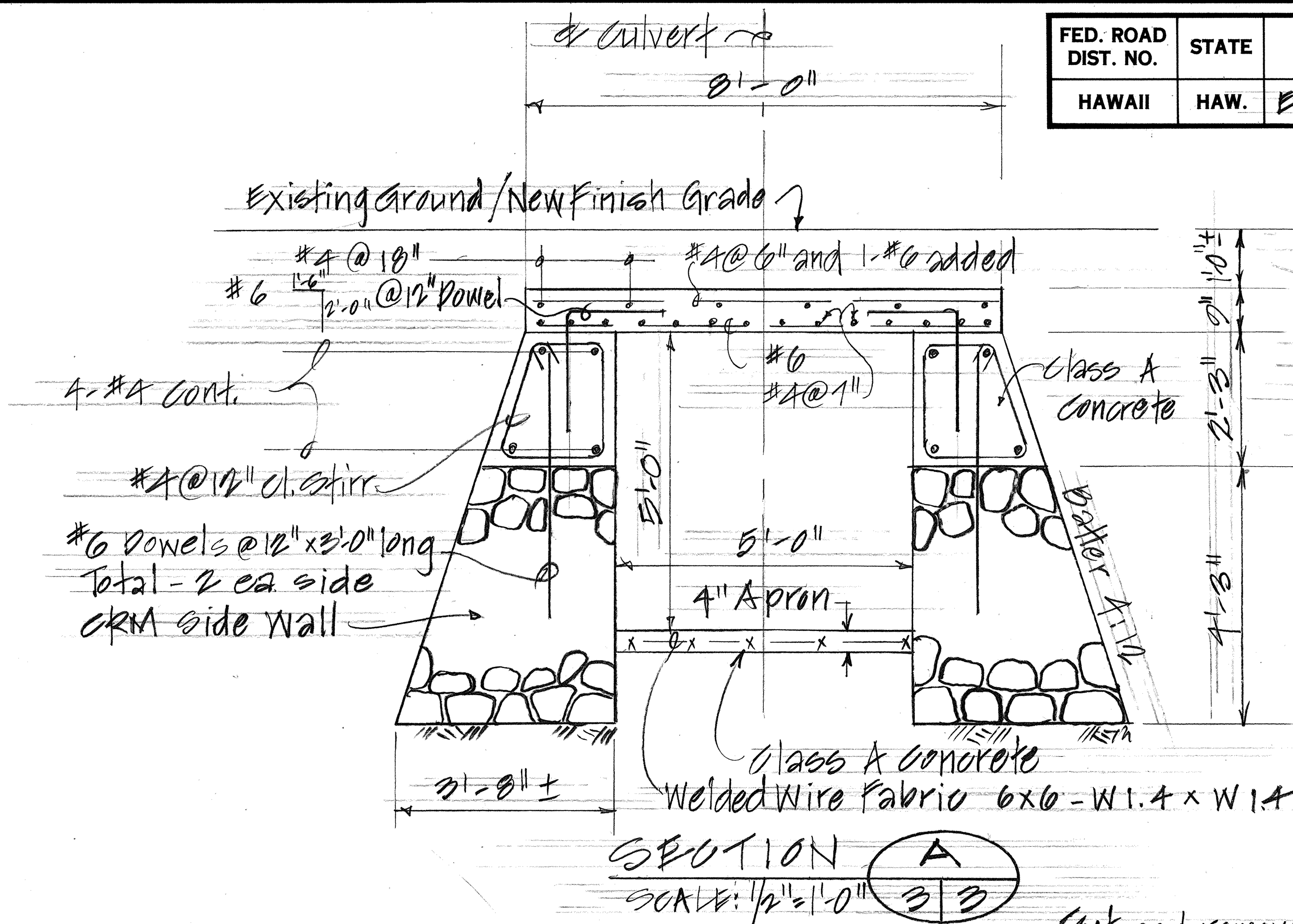
PLAN

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



℄ PROFILE OF CULVERT

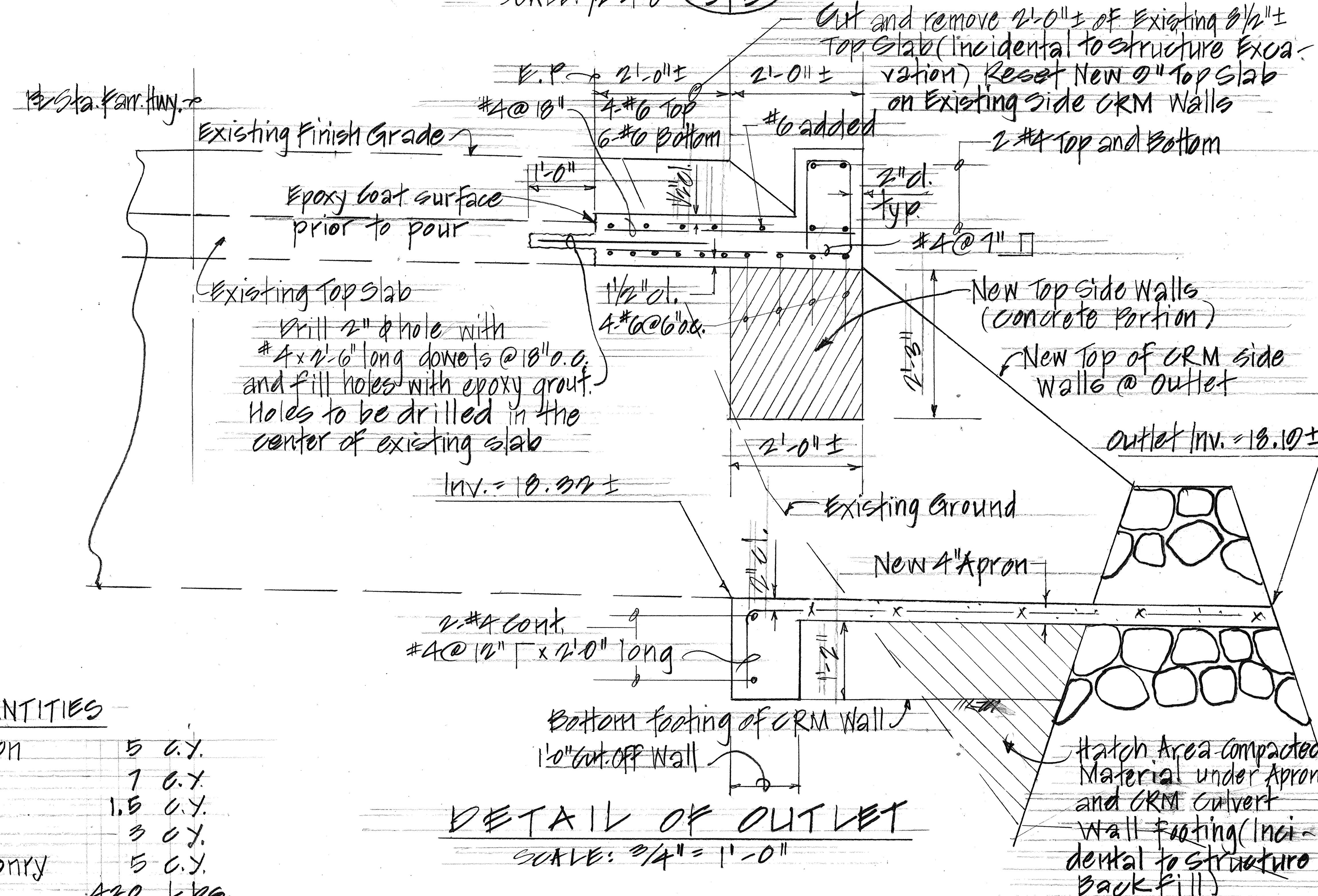
SCALE: 1/4" = 1'-0"



SECTION A/3

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

NOTE:
See 5'-0" x 5'-0" Culvert Repair and Extension at Sta. 231+07.5 ± for limits of structure excavation and backfill.



DETAIL OF OUTLET

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

ESTIMATED QUANTITIES

* Structure Excavation	5	C.Y.
Structure Backfill	7	C.Y.
Filter Material	1.5	C.Y.
Class A Concrete	3	C.Y.
Cement Rubble Masonry	5	C.Y.
** Reinforcing Steel	420	Lbs.

** Includes Welded Wire Fabric for Apron
* Includes cutting and Removal of 2'-0" of existing (8 1/2" ±) concrete slab.

DETAILS OF EXTENSION OF 5'-0" x 5'-0" CULVERT AT STA. 227+18.5 ±

STATE OF HAWAII
DEPARTMENT OF TRANSPORTATION
HIGHWAYS DIVISION

EXTENSION OF 5'-0" x 5'-0" CULVERT AT STA. 227+18.5 ±

FARRINGTON HIGHWAY
EMERGENCY REPAIRS, MAKUA SECTION
F.A. PROJ. NO. ER-10(1)

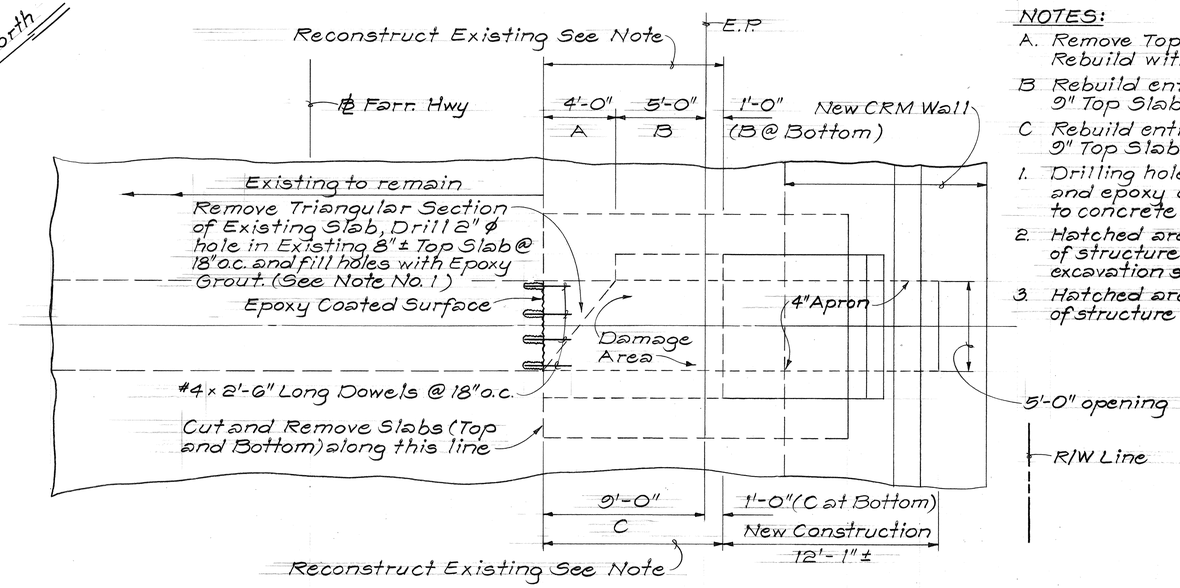
Scale: As Shown Date: Jan. 1984

SHEET No. 3 OF 4 SHEETS

ORIGINAL PLAN | NOTE BOOK | No. | SURVEY PLOTTED BY | DRAWN BY E. MORITOMO | TRACED BY | DESIGNED BY E. ORNELLAS | QUANTITIES BY E. ORNELLAS | CHECKED BY | DATE 1/84, 2/84

FED. ROAD DIST. NO.	STATE	FED. AID PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
HAWAII	HAW.	ER-10(1)	1984	13	27

True North



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

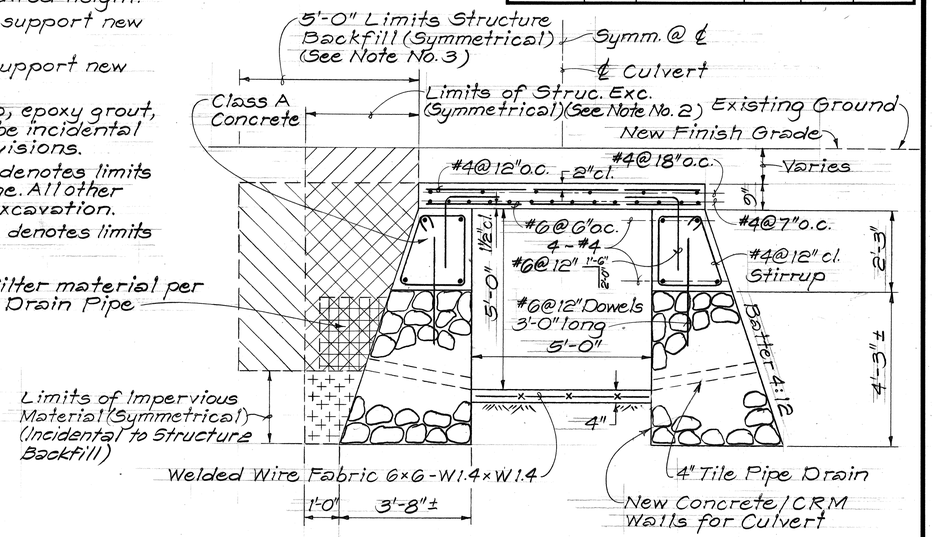
NOTES:

A. Remove Top 2'-3" of Existing CRM Wall and Rebuild with Concrete to required height.

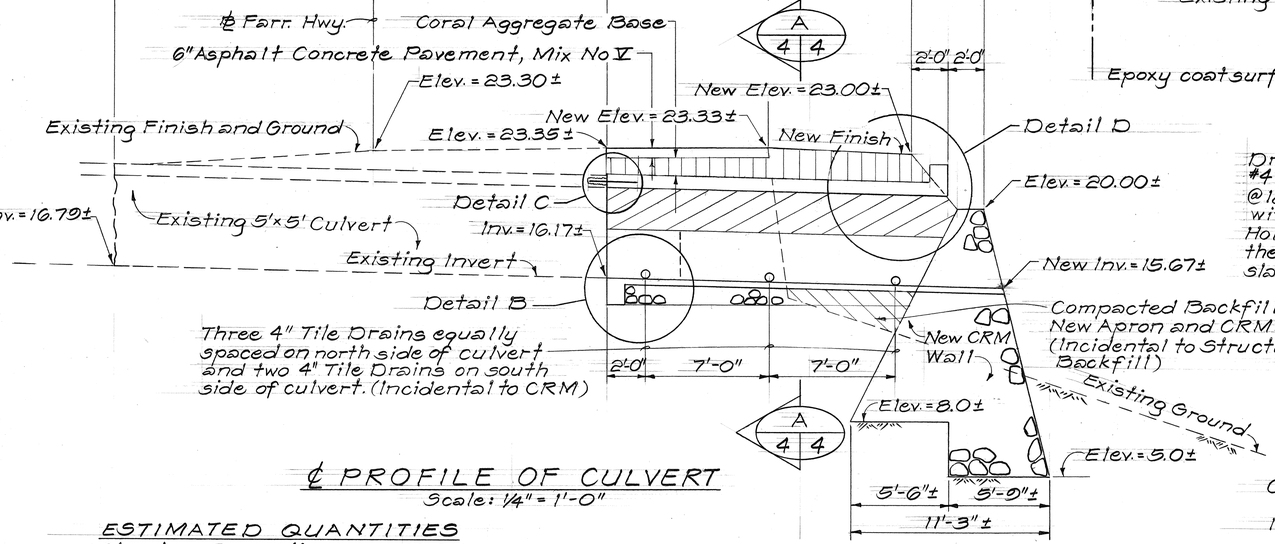
B Rebuild entire CRM Wall to support new 9" Top Slab.

C Rebuild entire CRM Wall to support new 9" Top Slab.

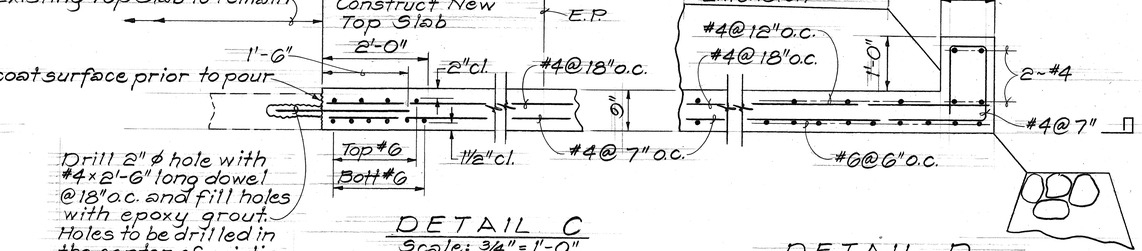
1. Drilling holes in existing slab, epoxy grout, and epoxy coating shall all be incidental to concrete. See Special Provisions.
2. Hatched area shown thus //// denotes limits of structure excavation payline. All other excavation shall be roadway excavation.
3. Hatched area shown thus \\\\ denotes limits of structure backfill.



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

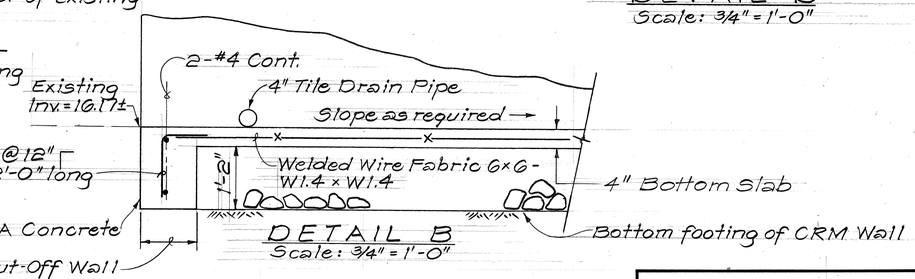


℄ PROFILE OF CULVERT
Scale: 1/4" = 1'-0"



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

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



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

ESTIMATED QUANTITIES

*Structure Excavation	33 C.Y.
Structure Backfill	33 C.Y.
Filter Material	1.5 C.Y.
Class A Concrete	12 C.Y.
Cement Rubble Masonry	15 C.Y.
**Reinforcing Steel	1620 LB.
Asphalt Concrete	5 TONS.
Coral Aggregate Base	12 C.Y.

** Includes Wired Wire Fabric
* Demolition and removal of existing area of damaged portions of culvert shall be incidental to structure excavation.

DETAILS OF 5'-0" x 5'-0" CULVERT REPAIR AND EXTENSION AT STA. 231+07.5±

ORIGINAL PLAN	SURVEY PLOTTED BY	DATE 11/84
	DRAWN BY K. SATO	" 11/84
NOTE BOOK	TRACED BY	" 2/85
	DESIGNED BY D. ORNELLAS	" 2/85
No.	QUANTITIES BY D. ORNELLAS	" 2/85
	CHECKED BY D. ORNELLAS	" 2/85

STATE OF HAWAII
DEPARTMENT OF TRANSPORTATION
HIGHWAYS DIVISION

5'-0" x 5'-0" CULVERT REPAIR AND EXTENSION AT STA. 231+07.5±

FARRINGTON HIGHWAY

EMERGENCY REPAIRS, MAKUA SECTION
F.A. PROJ. NO. ER-10(1)

Scale: As Shown Date: Jan. 1984

SHEET No. 4 OF 4 SHEETS