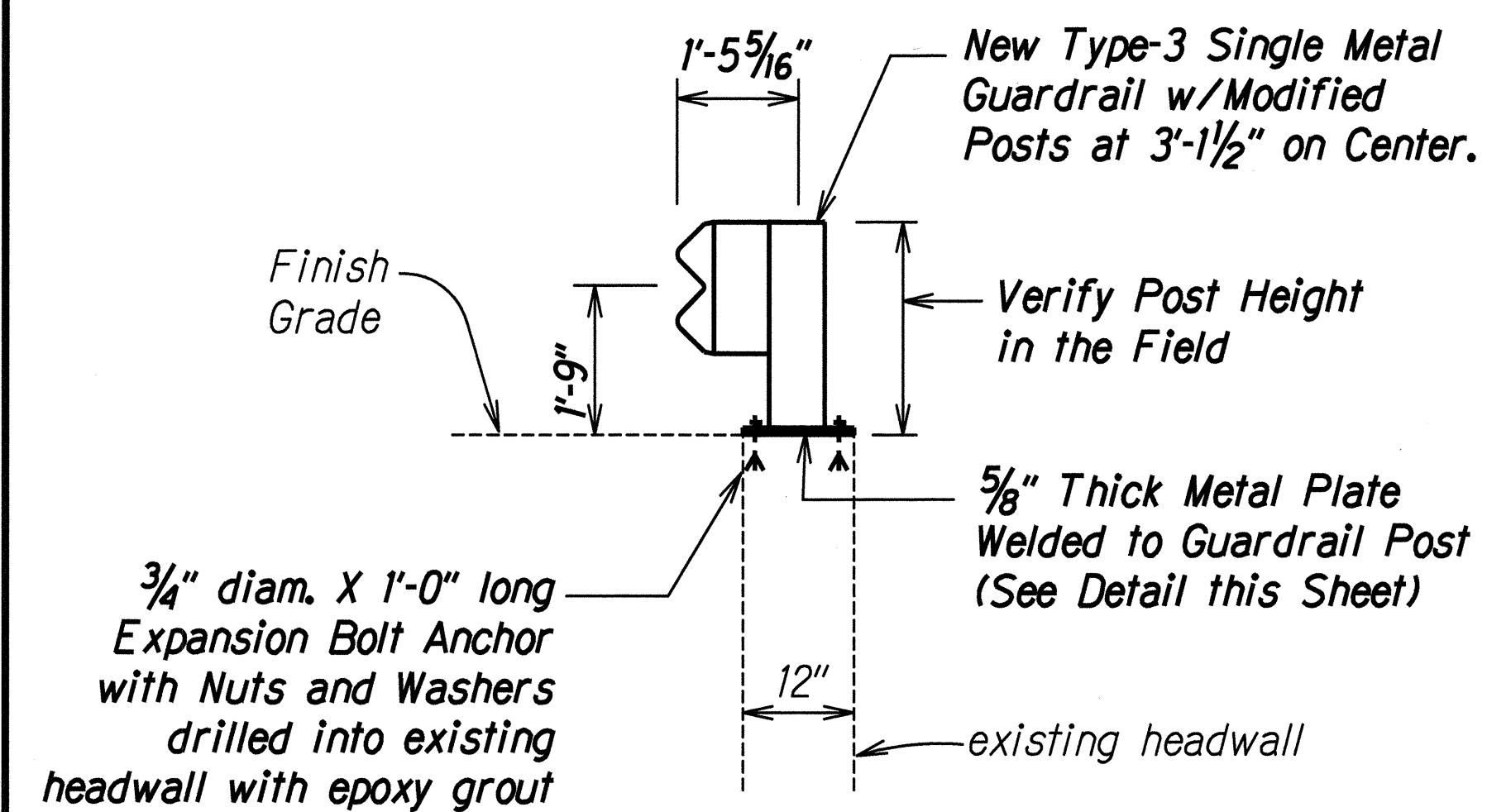
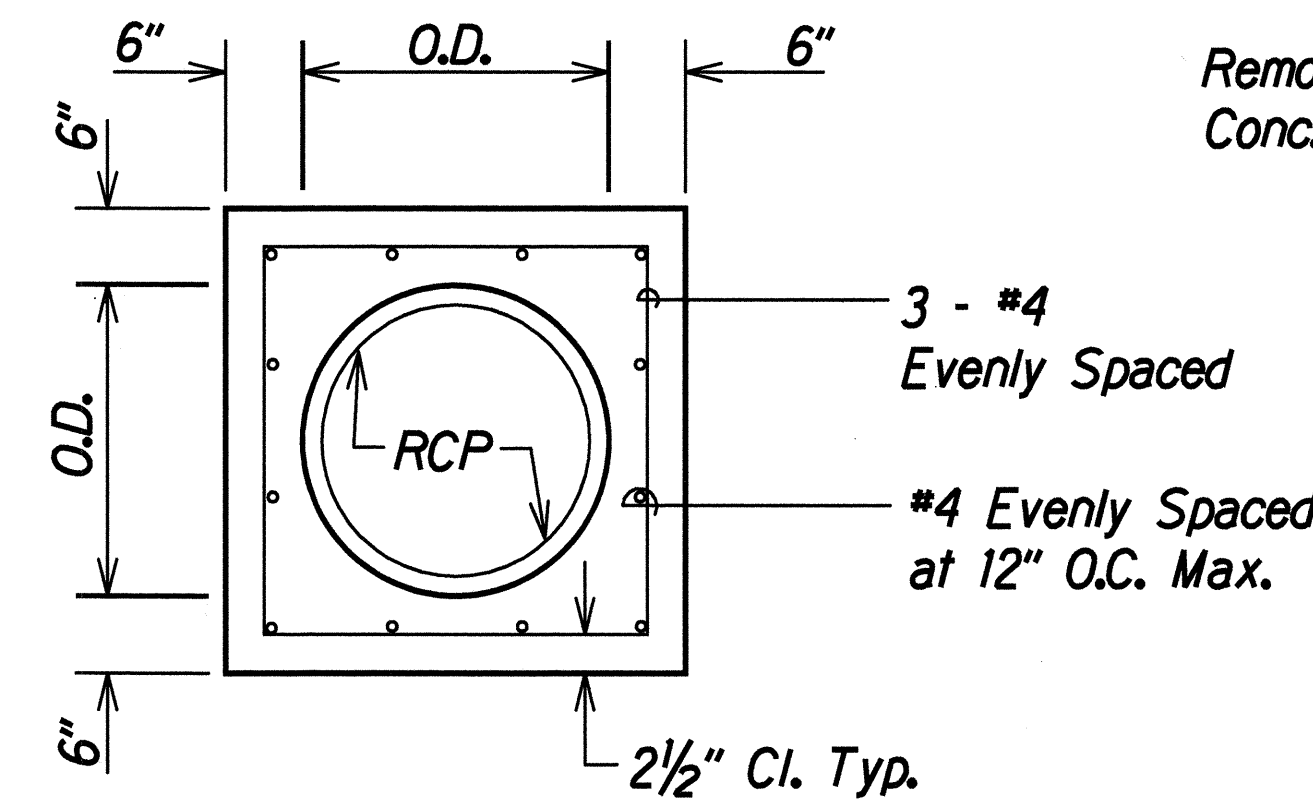


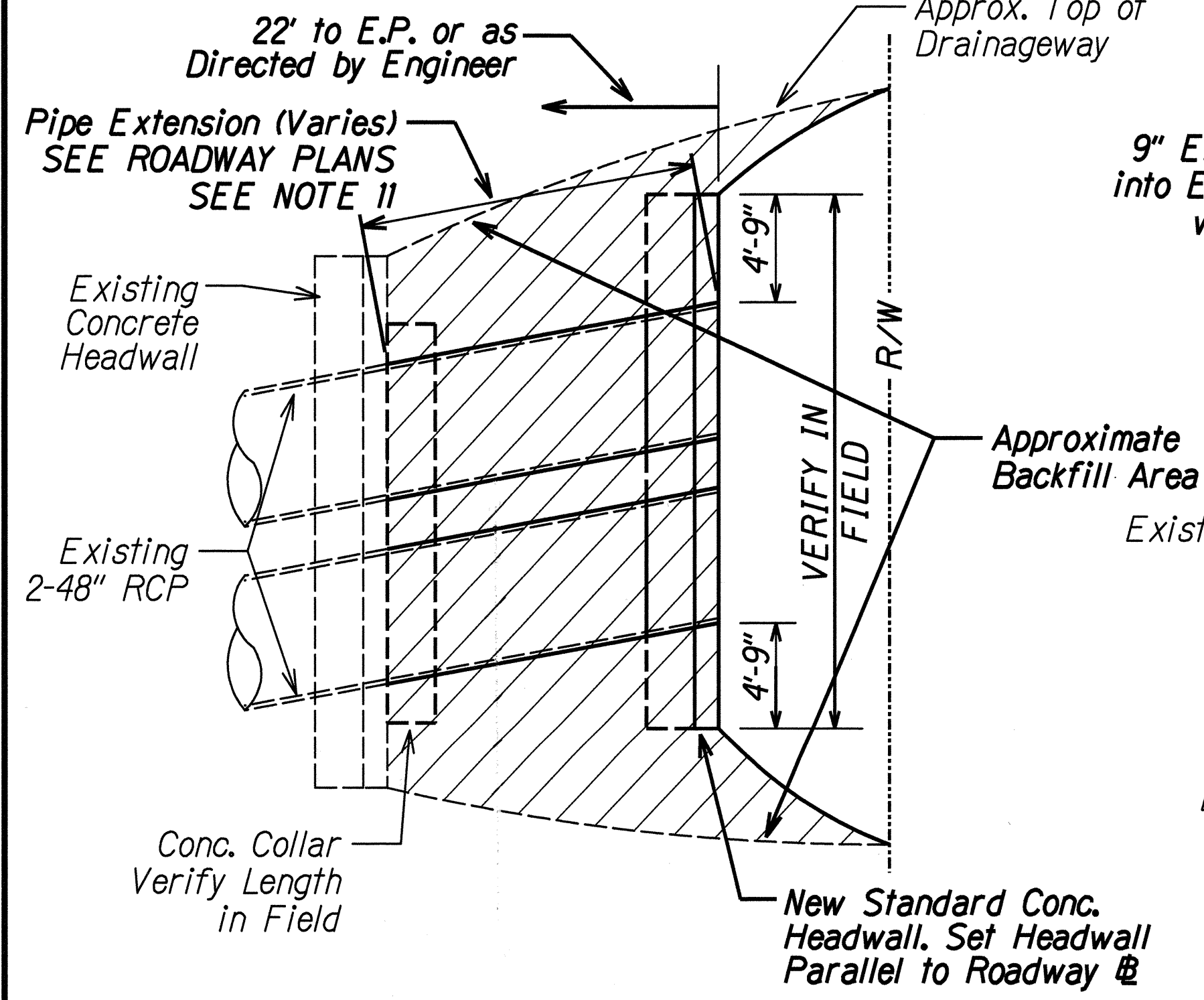
FED. ROAD DIST. NO.	STATE	FEDERAL AID PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
HAWAII	HAW.	STP-0460 (11)	1996	20	39



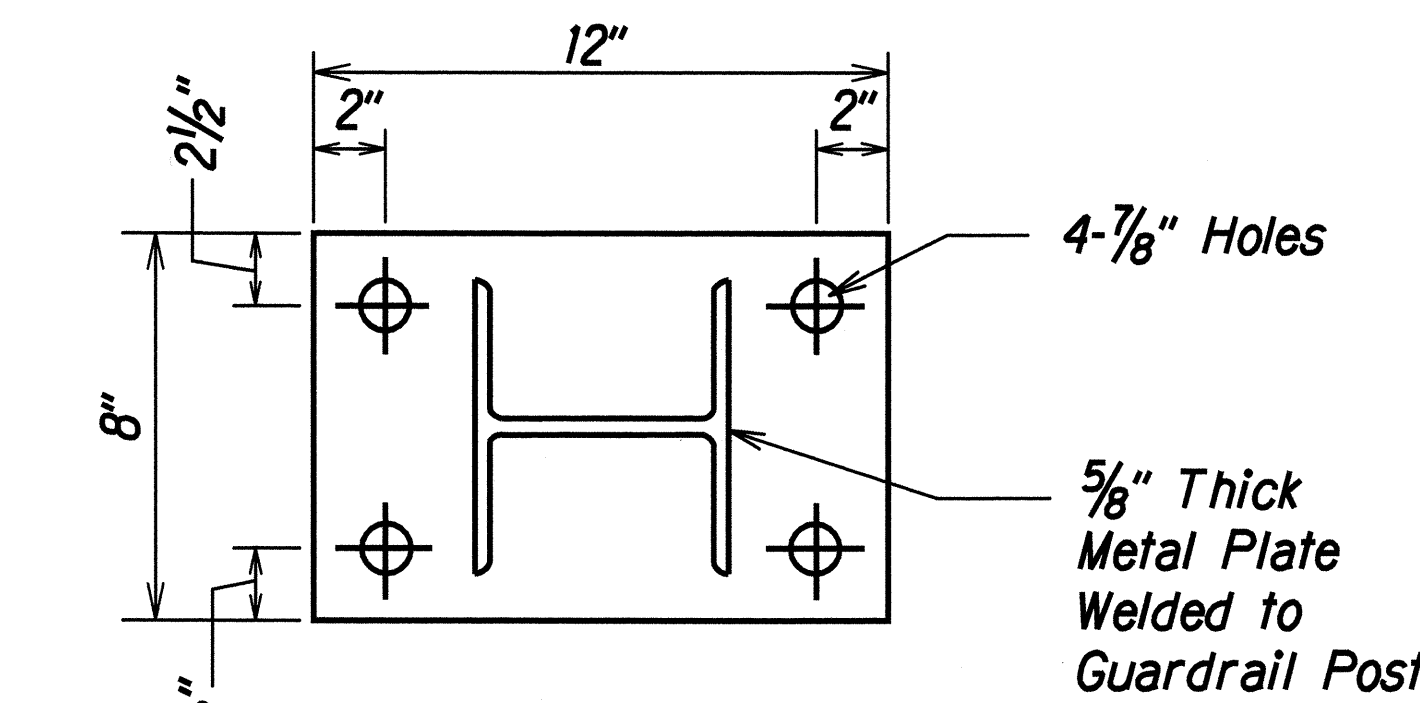
**GUARDRAIL POST DETAIL ON CONCRETE**  
Not To Scale



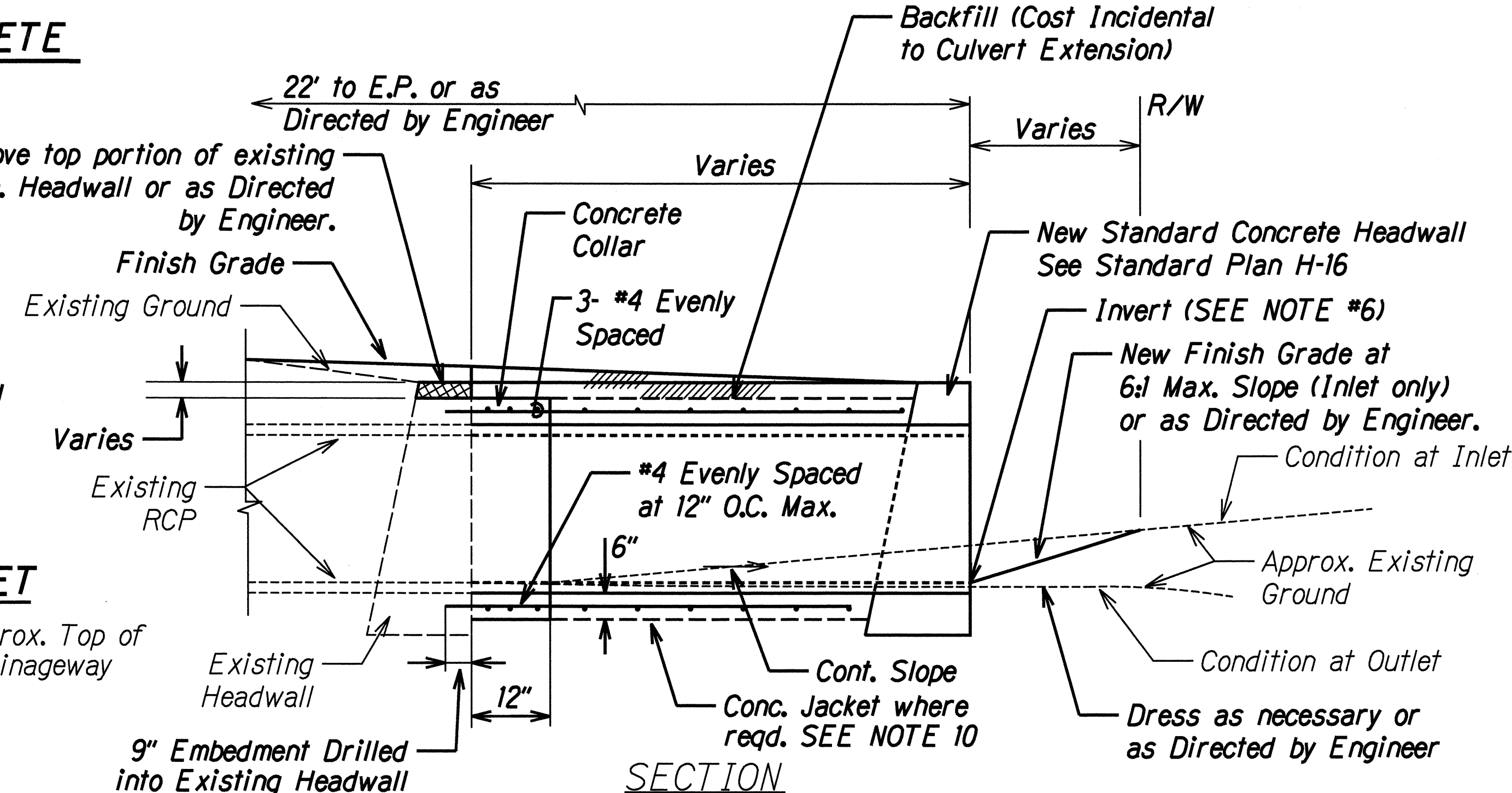
**ELEVATION - CONCRETE COLLAR/ JACKET**  
Not to Scale



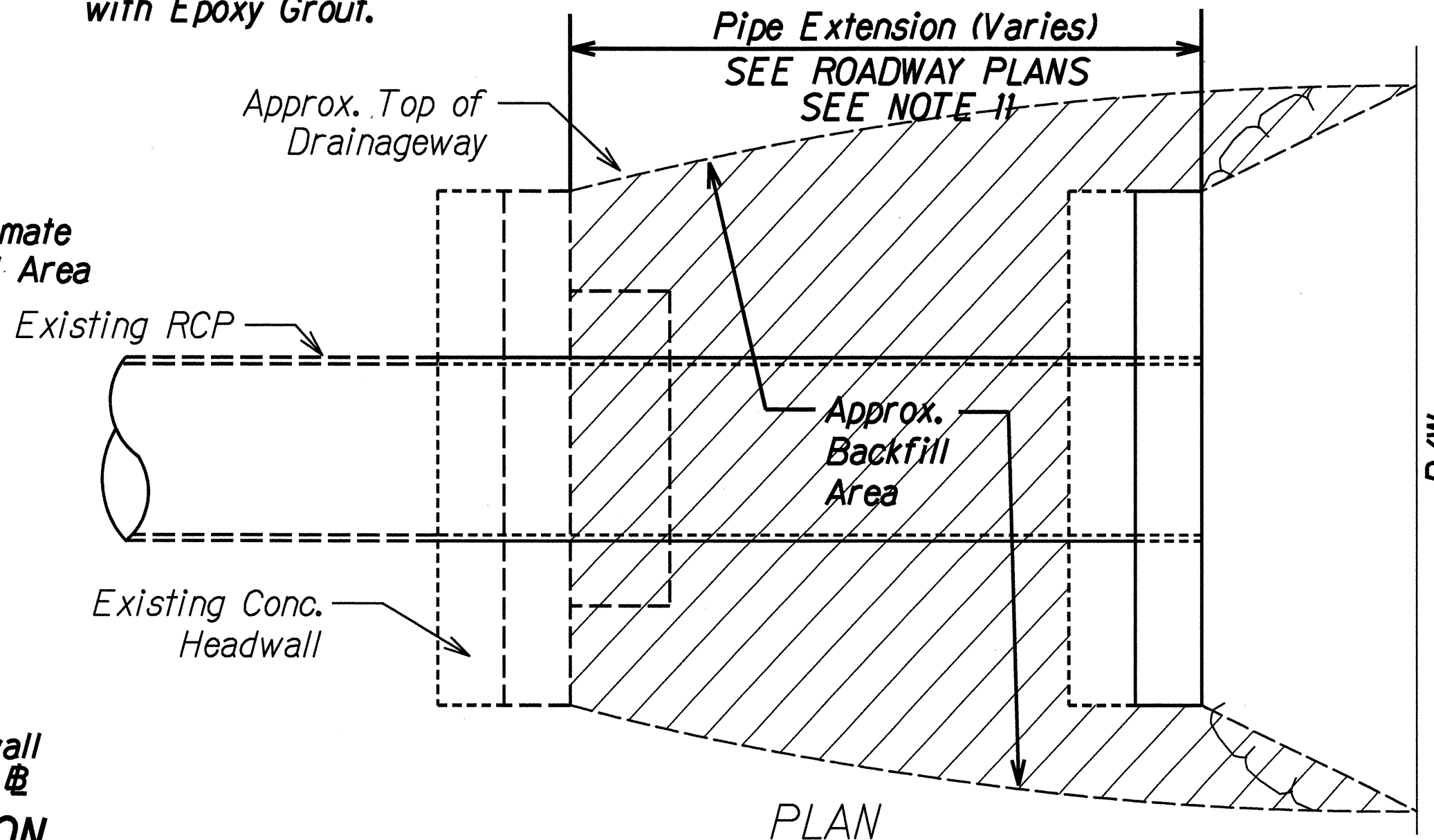
**TYPICAL PLAN CULVERT EXTENSION**  
@ F-046(1) @ STA. 144+66 ± AND STA. 138+95 ±  
Not to Scale



**DETAIL OF GUARDRAIL BASE PLATE**  
Not To Scale



**SECTION**

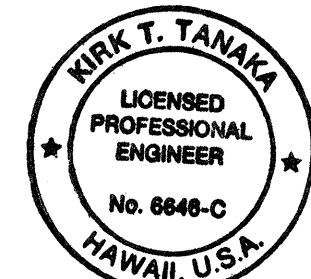


**TYPICAL DETAIL - CULVERT EXTENSION**  
Not to Scale

**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.
- Only non-pneumatic type of drill as approved by the Engineer will be permitted for drilling holes in concrete. Where indicated on Plans, the approximate diameter of drilled holes for installation of dowels shall be 1 1/4", and voids after installing dowels shall be filled with epoxy grout as directed by the Engineer.
- Demolishing, removing, and disposing portions of existing concrete headwalls shall not be paid for separately, but shall be considered incidental to the various Contract Items.
- Concrete shall be Class A unless otherwise noted.
- Exact invert elevations of the proposed culvert extensions and headwalls shall be verified by the Contractor in the field or as Directed by the Engineer.
- Furnishing and providing backfill materials for the extended drainlines and drainage structures will not be paid for but shall be considered incidental to various pay items.
- Structure and Trench Excavation for drainage system improvements will not be paid for but shall be considered incidental to the various contract items.
- Prior to bidding, Contractor shall visit the site to ascertain existing conditions and cost allowances for excavating and backfilling that shall be included in his bid. Also to determine cost allowances for required concrete jacket on culvert extensions.
- Concrete Jacket Required Where cover is less than two feet. This work shall be incidental to Reinforced Concrete Pipe.
- Exact length of pipe extension to be verified in the field by Contractor or as directed by the Engineer to obtain a minimum 22' offset from edge of pavement.

DATE	_____
SURVEY PLOTTED BY	_____
DRAWN BY	_____
NOTED BY	_____
CHECKED BY	_____
ORIGINAL PLAN	_____
NOTE BOOK	_____
QUANTITIES BY	_____
CHECKED BY	_____



THIS WORK WAS PREPARED BY  
ME OR UNDER MY SUPERVISION  
*Kirk T. Tanaka*

**R. T. TANAKA ENGINEERS, INC.**  
CIVIL ENGINEERING - LAND SURVEYING

STATE OF HAWAII  
DEPARTMENT OF TRANSPORTATION  
HIGHWAYS DIVISION  
**DRAINAGE DETAILS  
AND NOTES**  
MAUNALOHA HIGHWAY RESURFACING  
KAUNAKAKAI WHARF TO HOOLEHUA  
FEDERAL AID PROJECT NO. STP-0460 (11)  
Scale: AS NOTED  
SHEET No. 1 OF 1 SHEETS

Date: MAY, 1996