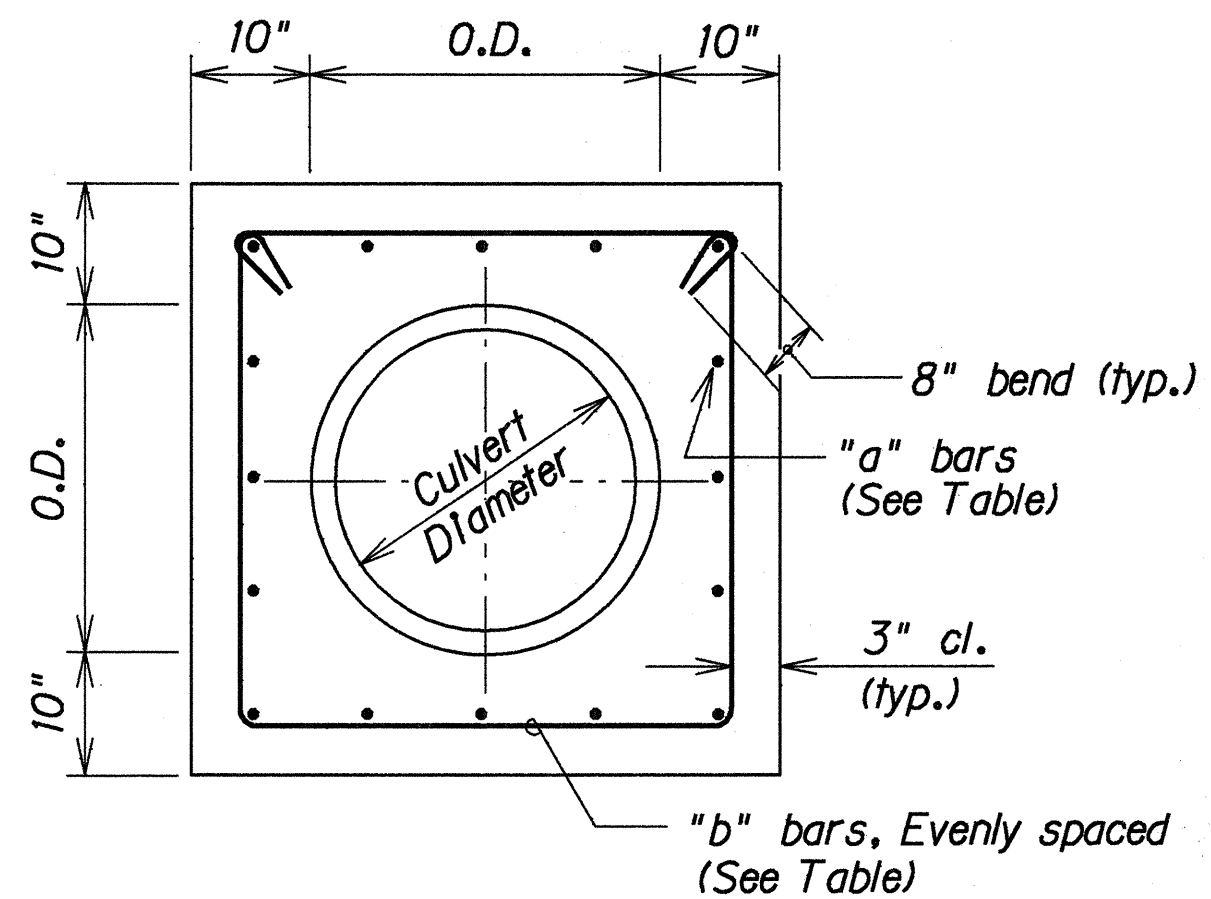
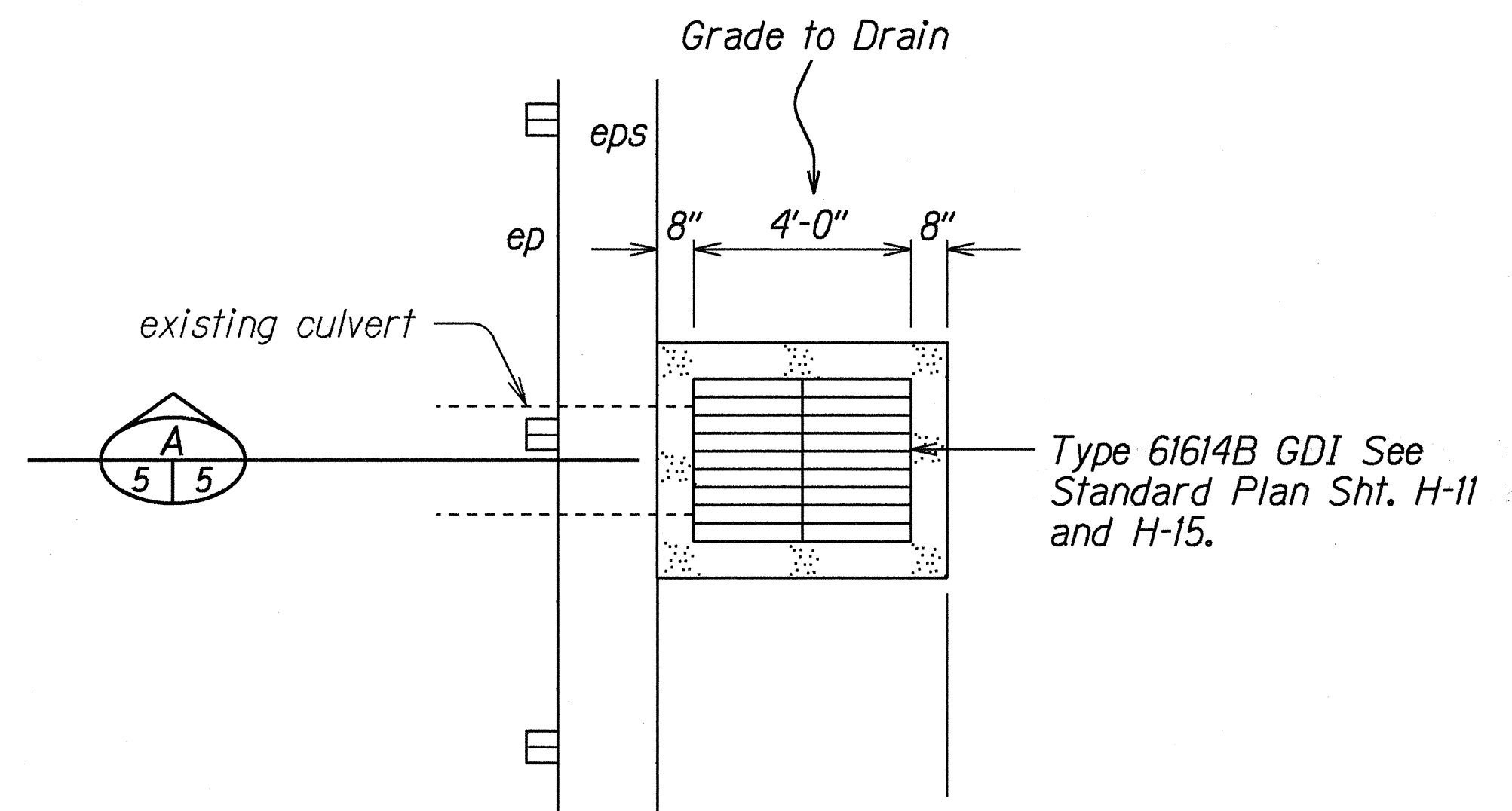


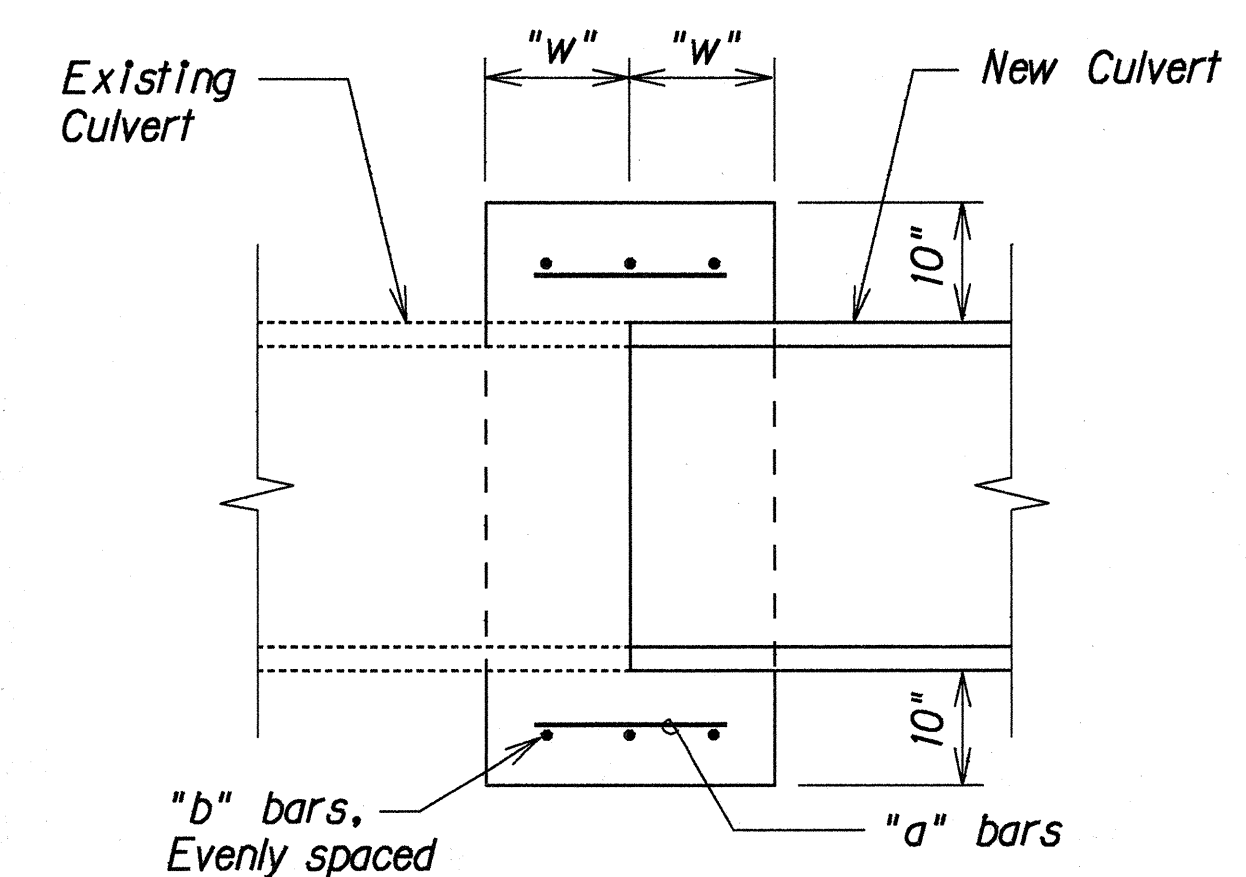
DETAIL - TYPICAL CULVERT EXTENSION DETAIL  
Scale: 1/2"=1'



ELEVATION



DETAIL - TYPICAL GRATED DROP INLET  
Not To Scale

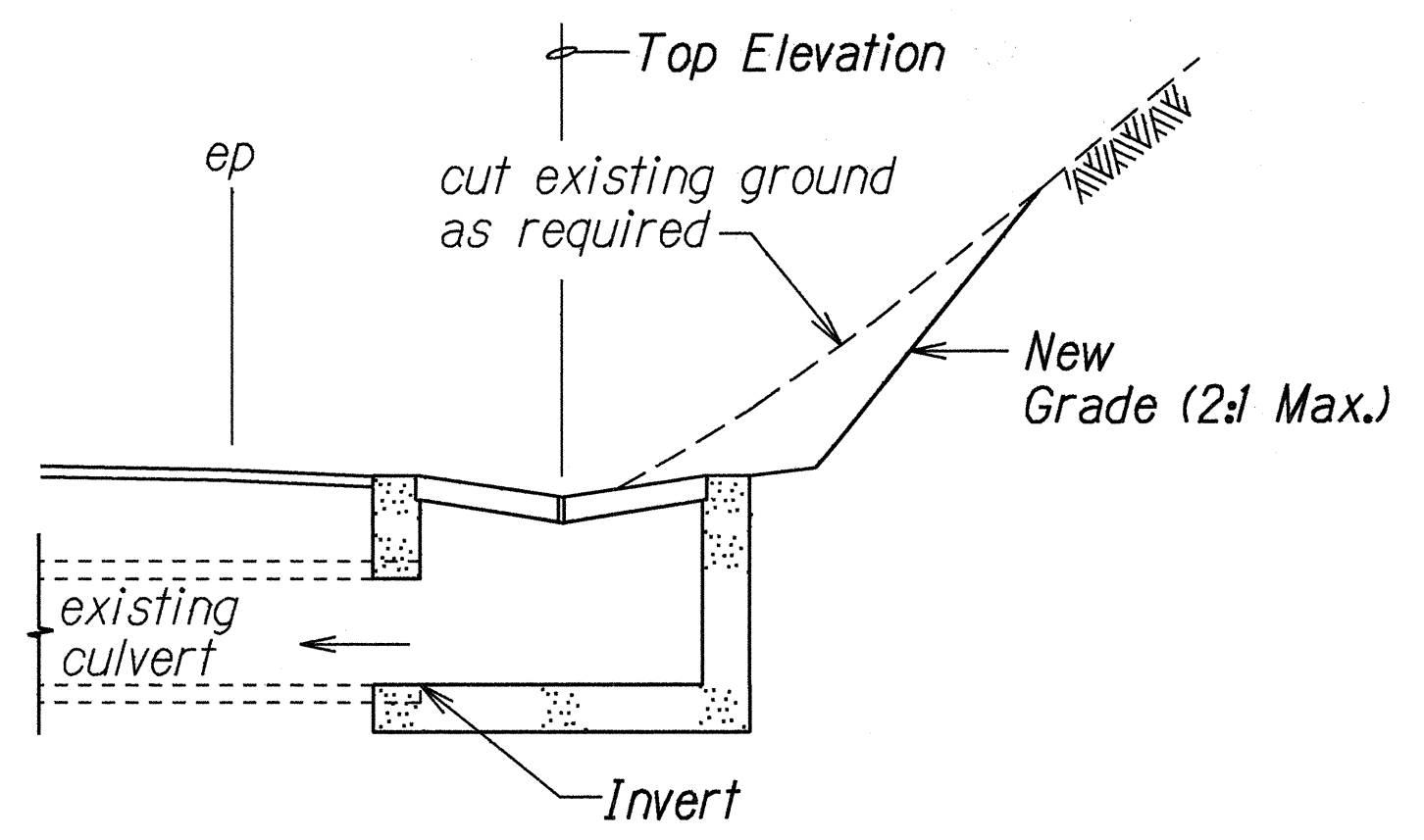


SECTION

Culvert Diameter	"a" bars	"b" bars	"w"
18" to 30"	#4 @ 9"	3- #4	12"
36" to 48"	#5 @ 9"	4- #4	15"

Note: Reinforcing Steel for Concrete Collar shall conform to the requirements of ASTM 615-Grade 60.

TYPICAL DETAILS OF REINFORCED CONCRETE COLLAR



SECTION  
Not To Scale

MISCELLANEOUS DRAINAGE NOTES:

- Existing drainage system will be functional at all times during construction. Contractor is to furnish materials, equipment, labor, tools and incidentals necessary to accomplish maintenance of flow, the cost of which shall be incidental to the various contract items.
- Demolishing and/or removing a portion or the entire existing structure shall not be paid for separately, but shall be considered incidental to the various contract items.
- Culverts within the graded drop inlets shall be cut flush with the inside face of the wall. Above work shall be considered incidental to the various contract items.
- Contractor shall verify the locations of all culverts in the field. Any culvert damaged during construction shall be repaired or replaced by the Contractor at his expense.
- Concrete for graded drop inlets and other structures shall be Class "A".
- Inlet and Outlet conditions shall be cleaned and graded to permit free flow of run-off or as directed by the Engineer. Cleaning and grading shall be to the satisfaction of the Engineer. Above work shall be considered incidental to the various contract items.
- The Contractor shall provide bedding materials for culvert, Class "C" bedding. Payment for this work will not be paid for separately but will be considered incidental to the various contract items.
- Reinforcing Steel for Concrete Structures will not be paid for separately but shall be considered incidental to various contract items.
- Location and elevations of new structures must be laid out in the field for the Engineer's approval.
- Chamfer all exposed edges 1".
- Quantities are approximate only. Contractor shall conduct an independent survey of worksites to verify and validate pay quantities.
- Reinforced concrete collar will not be paid for separately but shall be considered incidental to installation of culverts.

ORIGINAL PLAN  
DESIGNED BY  
CHECKED BY  
DATE  
JUL 1999

STATE OF HAWAII  
DEPARTMENT OF TRANSPORTATION  
HIGHWAYS DIVISION

**DRAINAGE DETAILS**  
HONOLULU HIGHWAY GUARDRAIL  
AND SHOULDER IMPROVEMENTS  
High Street to Puamana  
Fed. Aid Project No. STP-0900(53)  
Scale: As Shown Date: Aug, 1999  
SHEET No. 1 OF 1 SHEETS