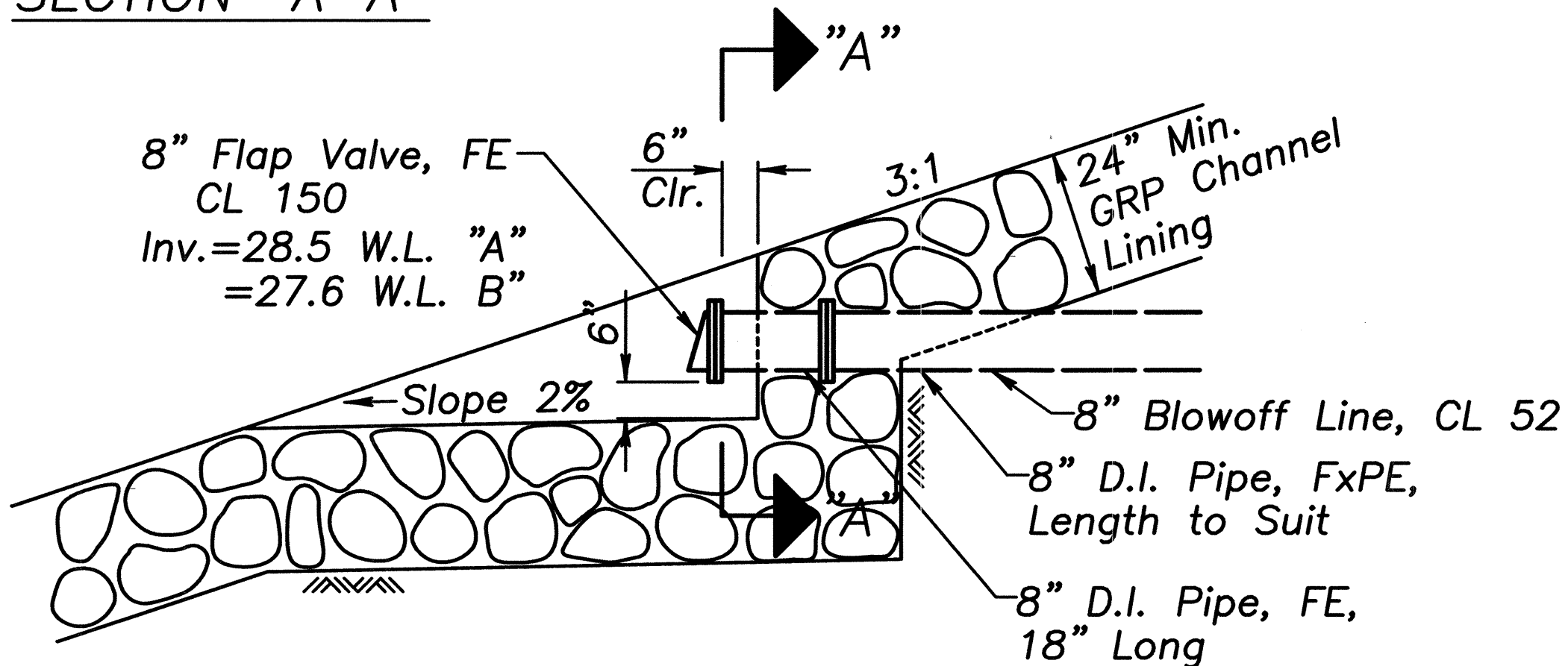
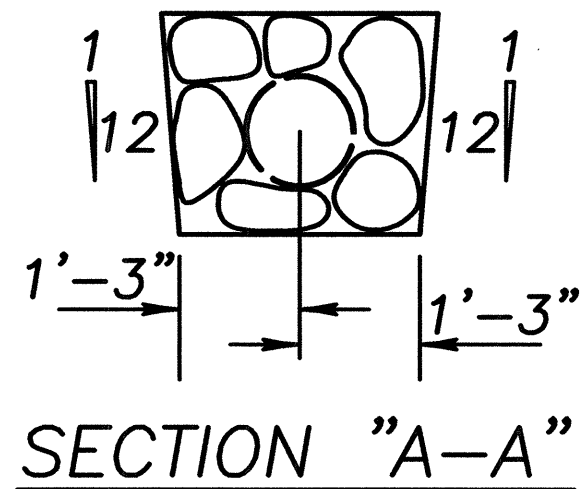
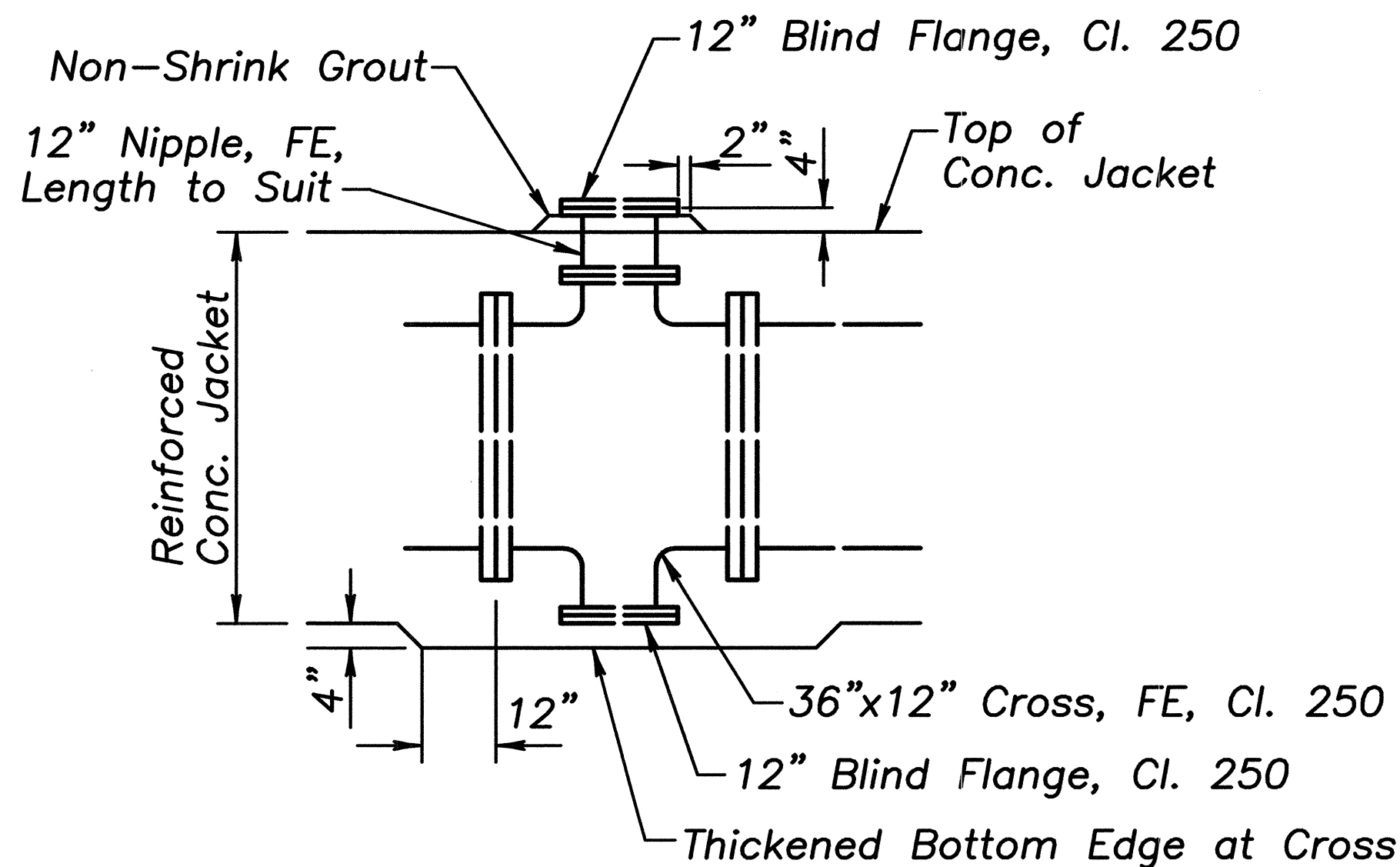


FED. ROAD DIST. NO.	STATE	FEDERAL - AID PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
HAWAII	HAW.	NH-A311(6)R	2006	57	173



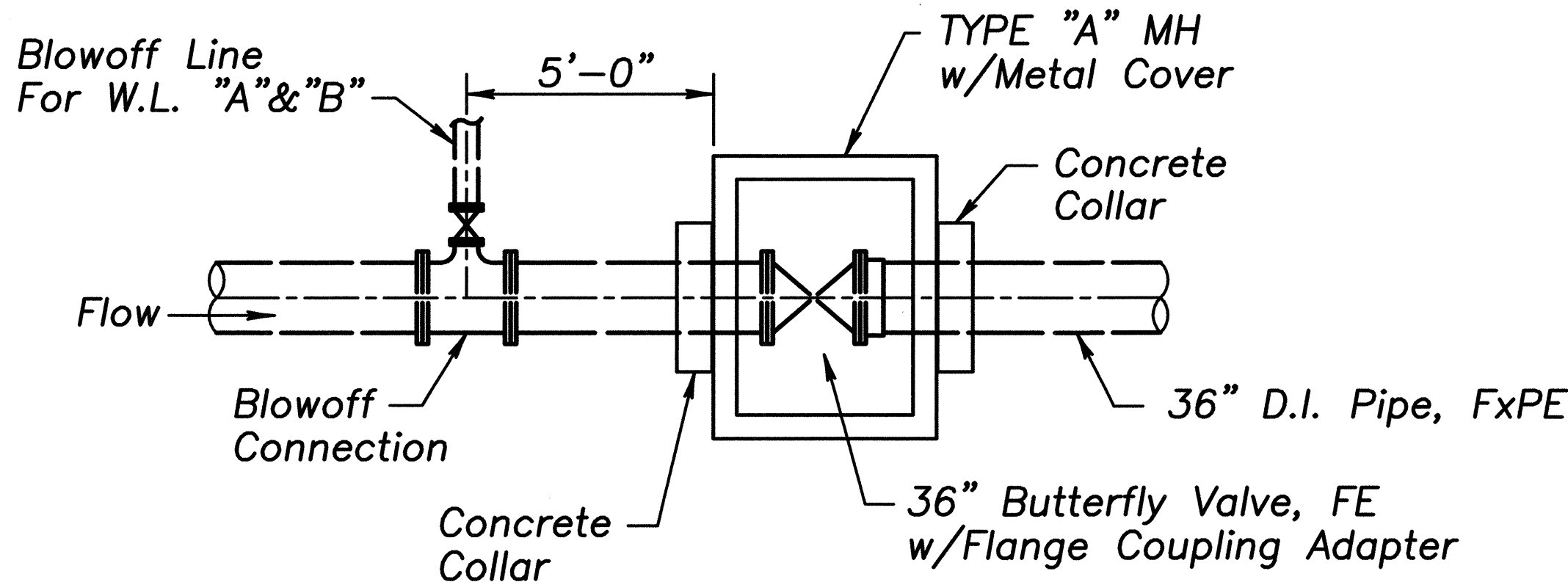
### DETAIL AT FLAP VALVE

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



### ACCESS HATCH DETAIL

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

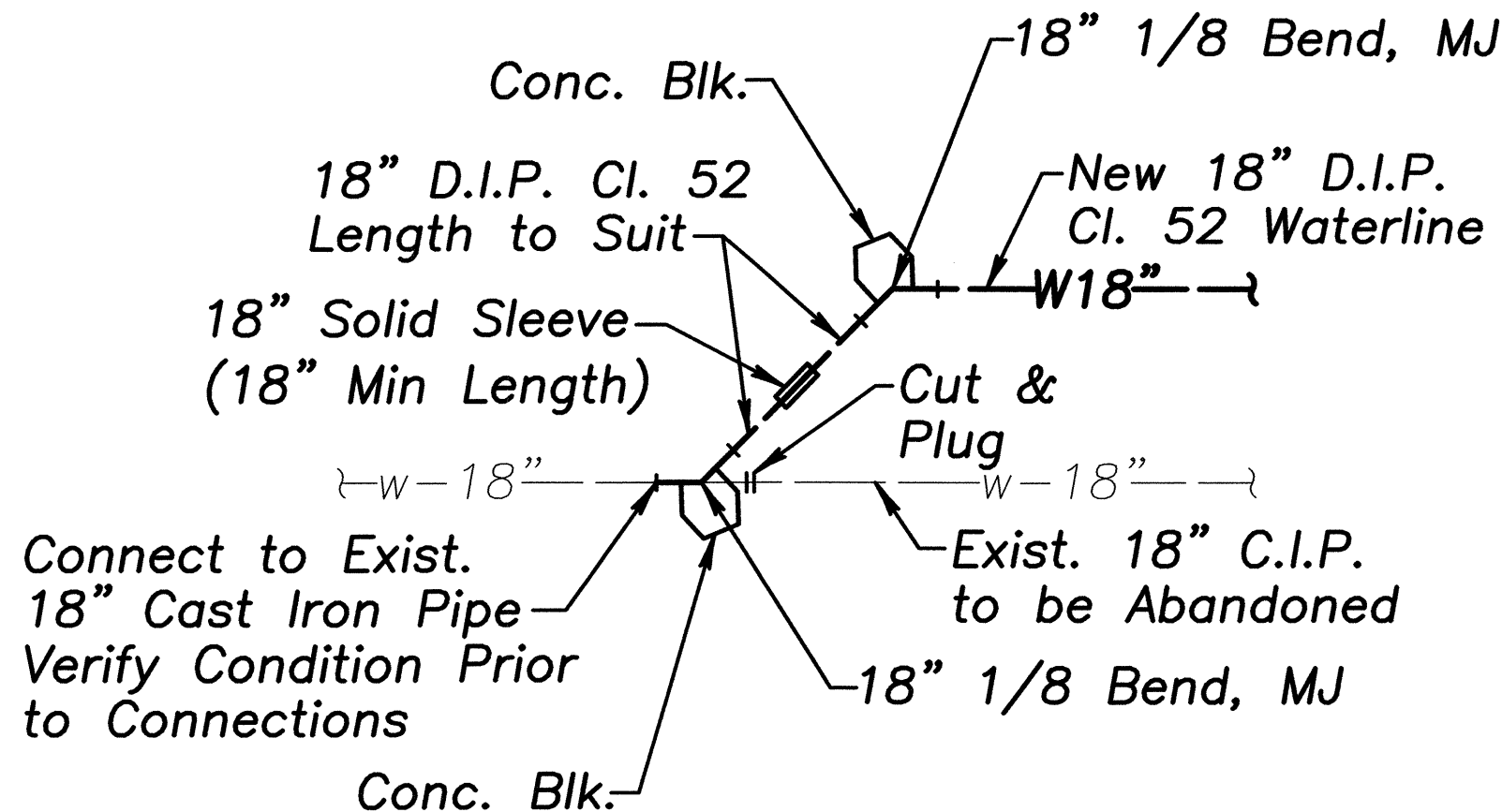


NOTE: See Plate MH6 or MH8 of The Water System Standards For Additional Information.

### BUTTERFLY VALVE ASSEMBLY DETAIL

Not To Scale

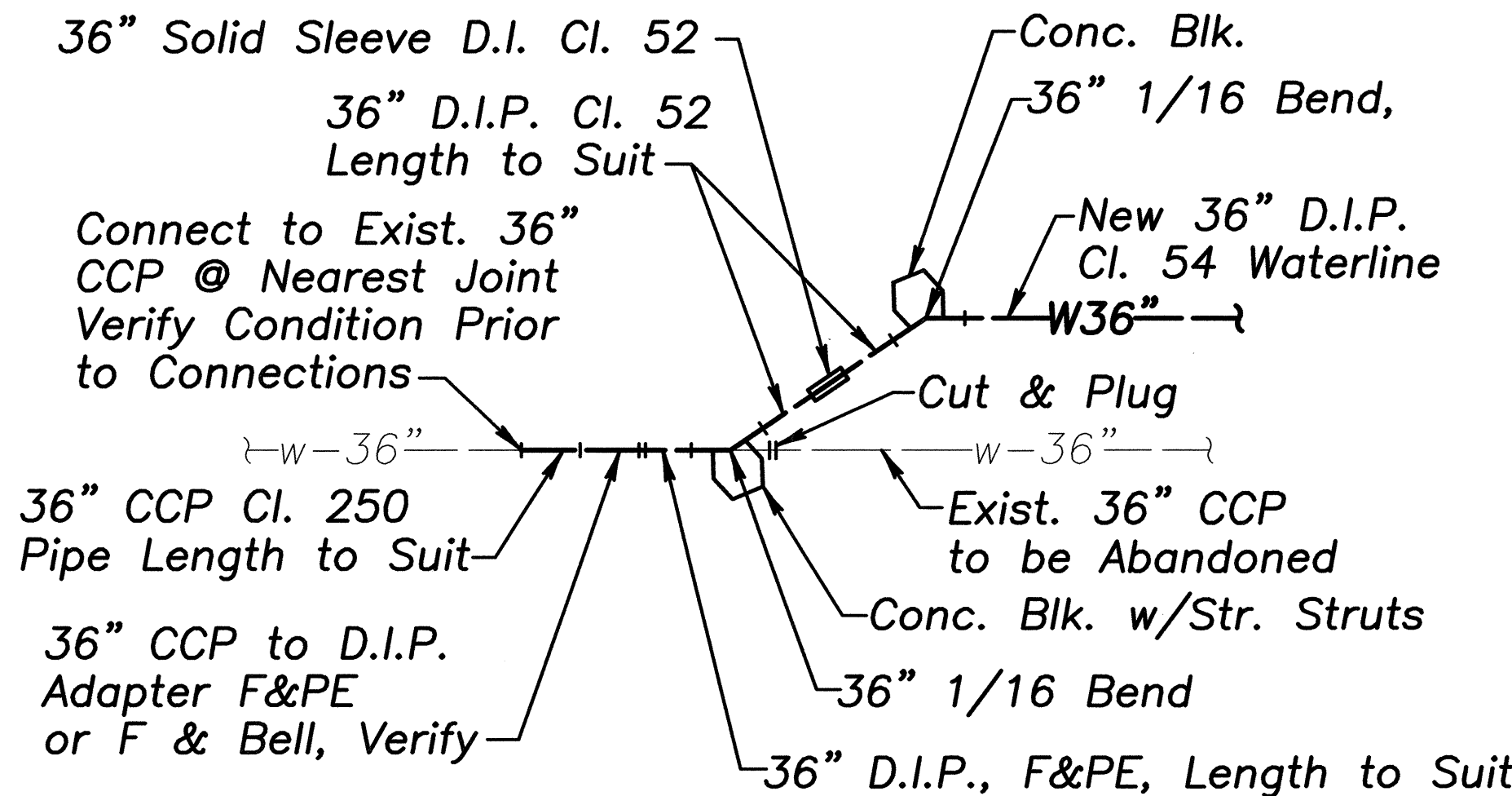
NOTE: All flanges, fittings and valves shall be Class 250.



### SCHEMATIC CONN. DETAIL FOR 18" D.I.P.

Scale: Not to Scale

NOTE: All flanges, fittings and valves shall be Class 250.



### SCHEMATIC CONN. DETAIL FOR 36" D.I.P.

Scale: Not to Scale

NOTE: All flanges, fittings and valves shall be Class 250.

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

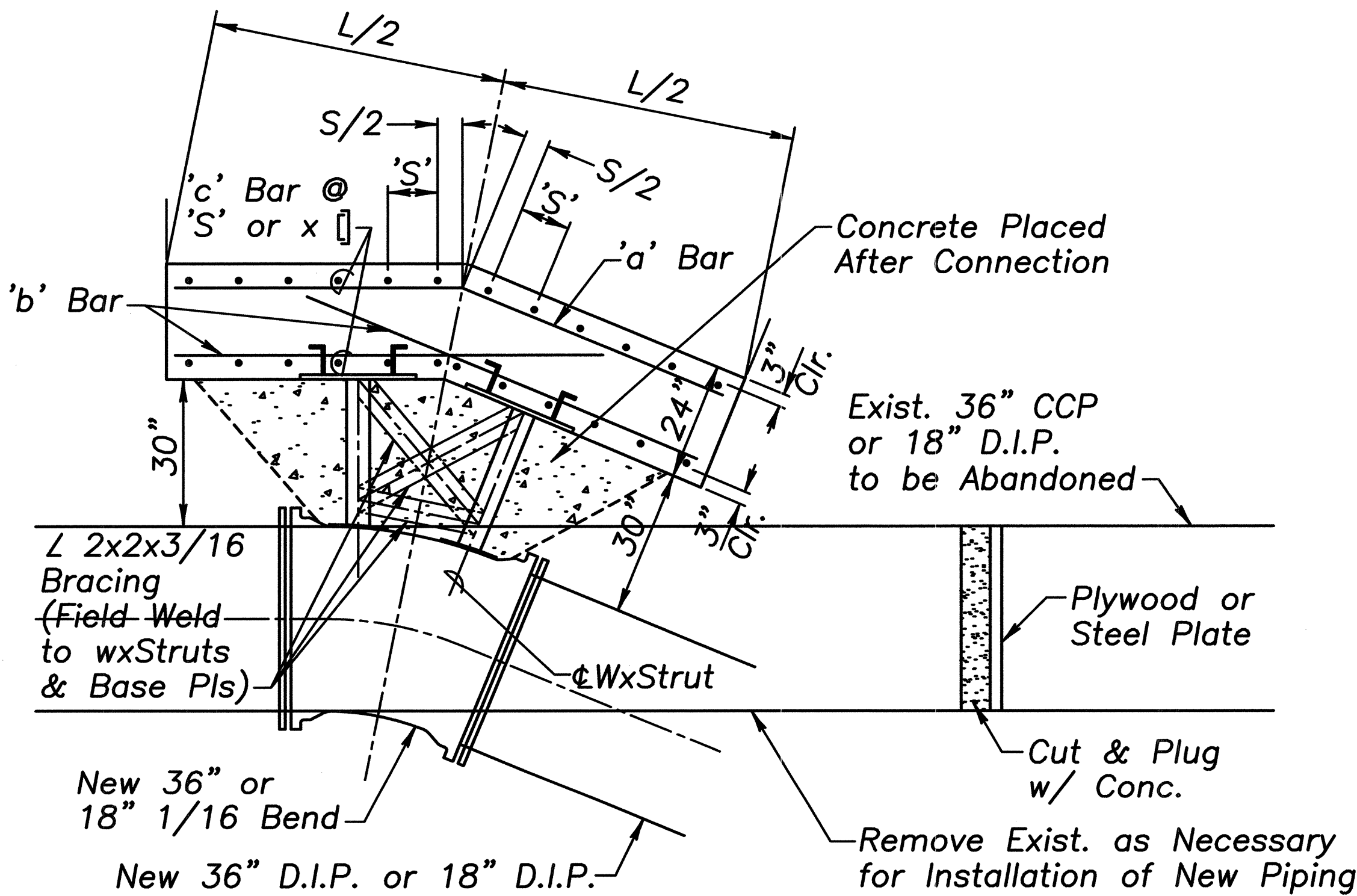
CLIFFORD M. ARAKAWA  
LICENSED PROFESSIONAL ENGINEER  
No. 1864-C  
HAWAII U.S.A.

STATE OF HAWAII  
DEPARTMENT OF TRANSPORTATION  
HIGHWAYS DIVISION

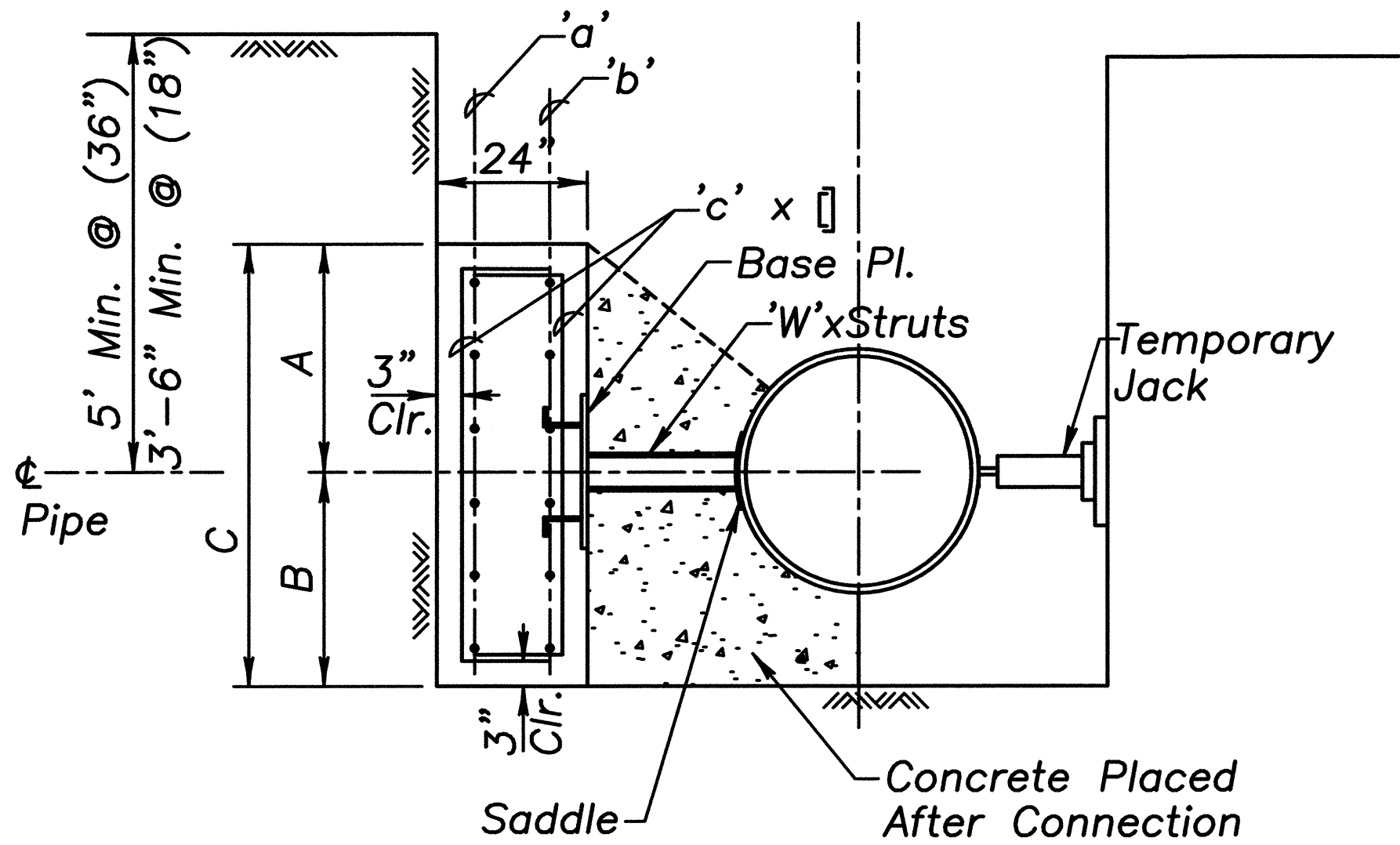
**MISCELLANEOUS WATER DETAILS**

**MOKULELE HIGHWAY WIDENING**  
Maui Humane Society  
To  
Vicinity of Kolaloa Bridge  
Federal - Aid Project No. NH-A311(6)R  
Scale: AS NOTED Date: JUNE 2005

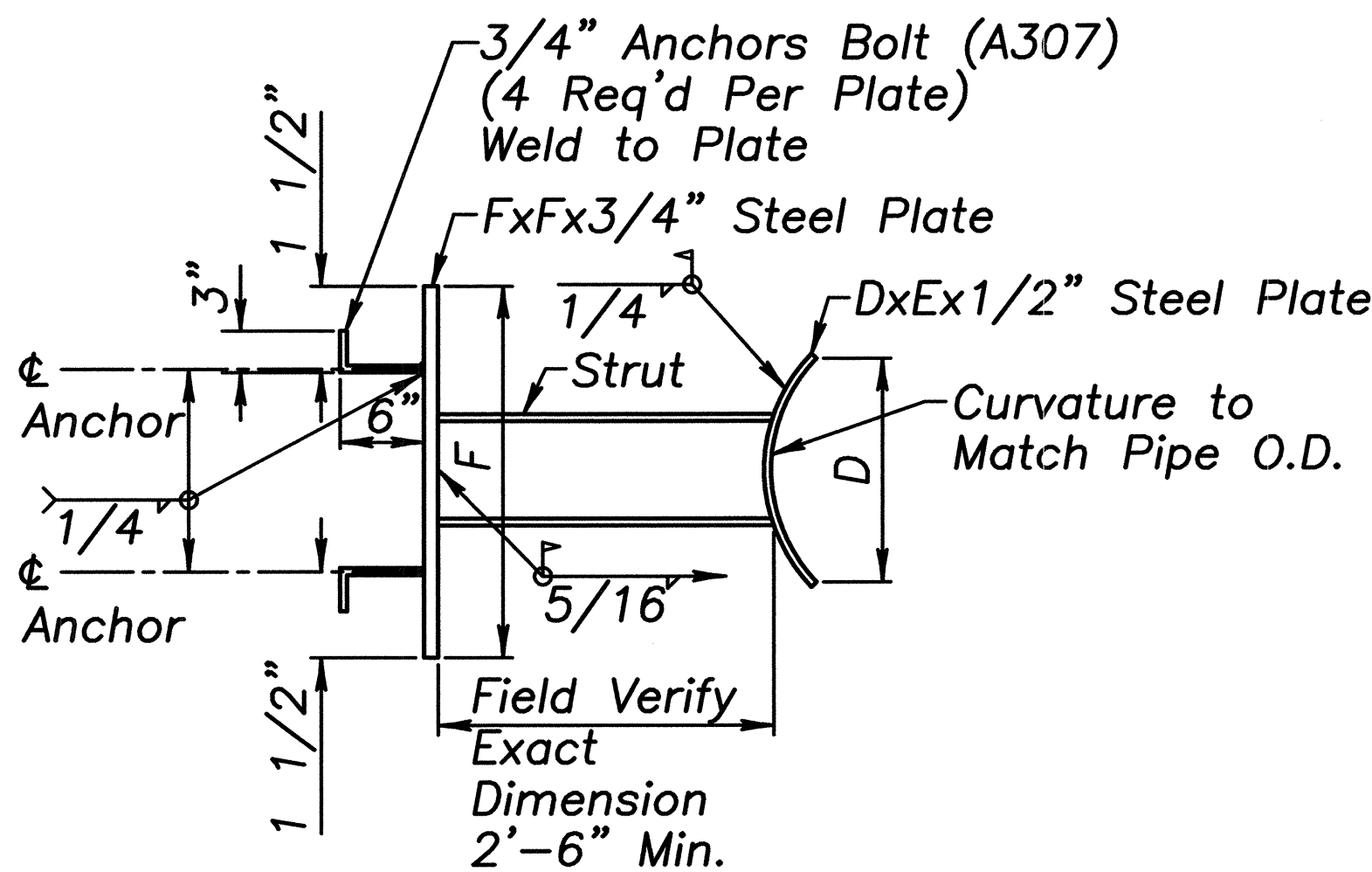
SHEET No. 1 OF 3 SHEETS



PLAN

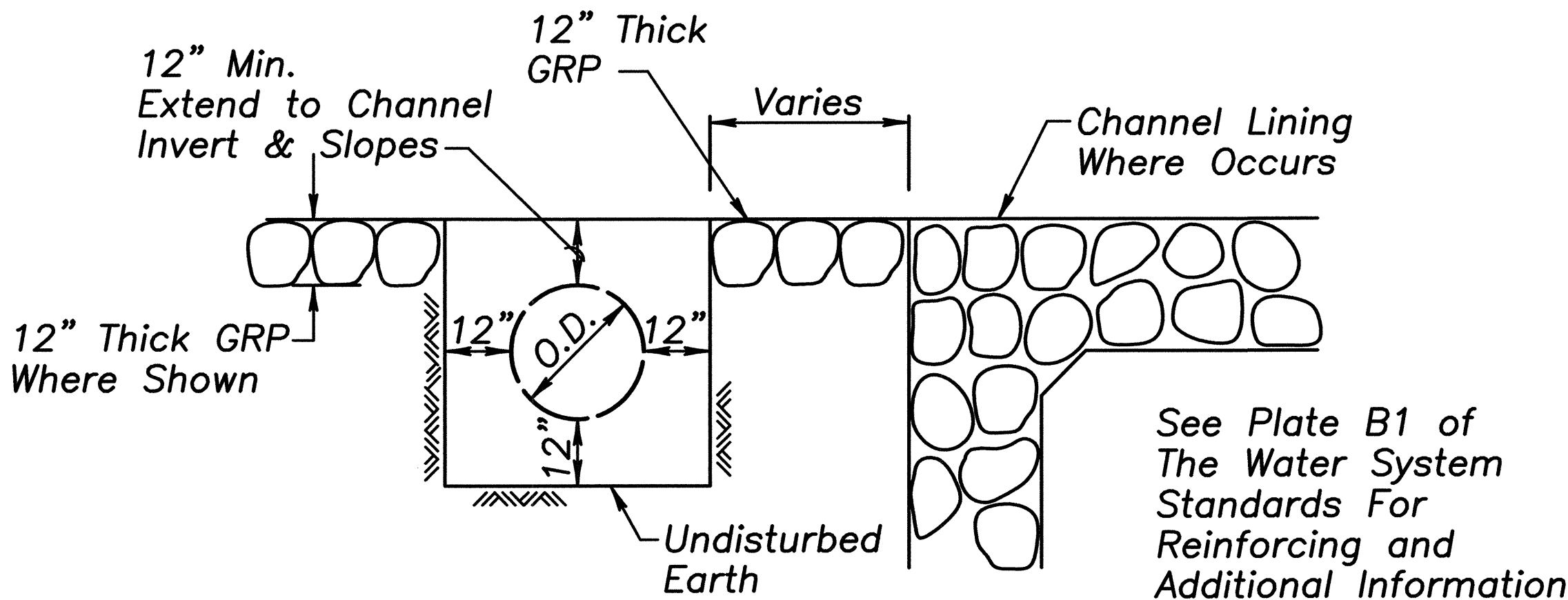


SECTION



STRUCTURAL STRUTS DETAIL

Not To Scale



REINF. CONC. JACKET DETAIL

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

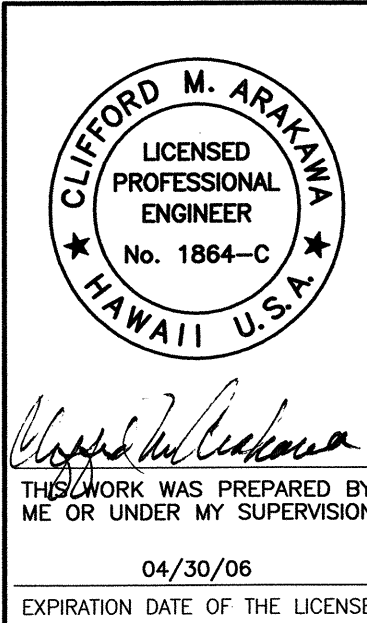
PIPE SIZE	L/2	A	B	C	STEEL PLATES			STRUT
					D	E	F	
36"	6'-0"	3'-0"	3'-0"	6'-0"	10"	8"	12"	W8x24
18"	2'-6"	2'-0"	2'-0"	4'-0"	10"	8"	12"	W6x12

a Bars	b Bars	c Bars
6 #6	6 #5	#5@12" O.C.
4 #5	4 #5	#5@12" O.C.

CONCRETE BLOCK W/ STRUCTURAL STRUTS DETAIL (HORIZONTAL BENDS)

Not To Scale

DATE	_____
SURVEY PLOTTED BY	_____
DRAWN BY	_____
DESIGNED BY	_____
CHECKED BY	_____
NOTE BOOK	_____
No.	_____



STATE OF HAWAII  
DEPARTMENT OF TRANSPORTATION  
HIGHWAYS DIVISION

**MISCELLANEOUS WATER DETAILS**

MOKULELE HIGHWAY WIDENING  
Maui Humane Society  
To  
Vicinity of Kolaloa Bridge  
Federal - Aid Project No. NH-A311(6)R  
Scale: AS NOTED Date: JUNE 2005

SHEET No. 2 OF 3 SHEETS



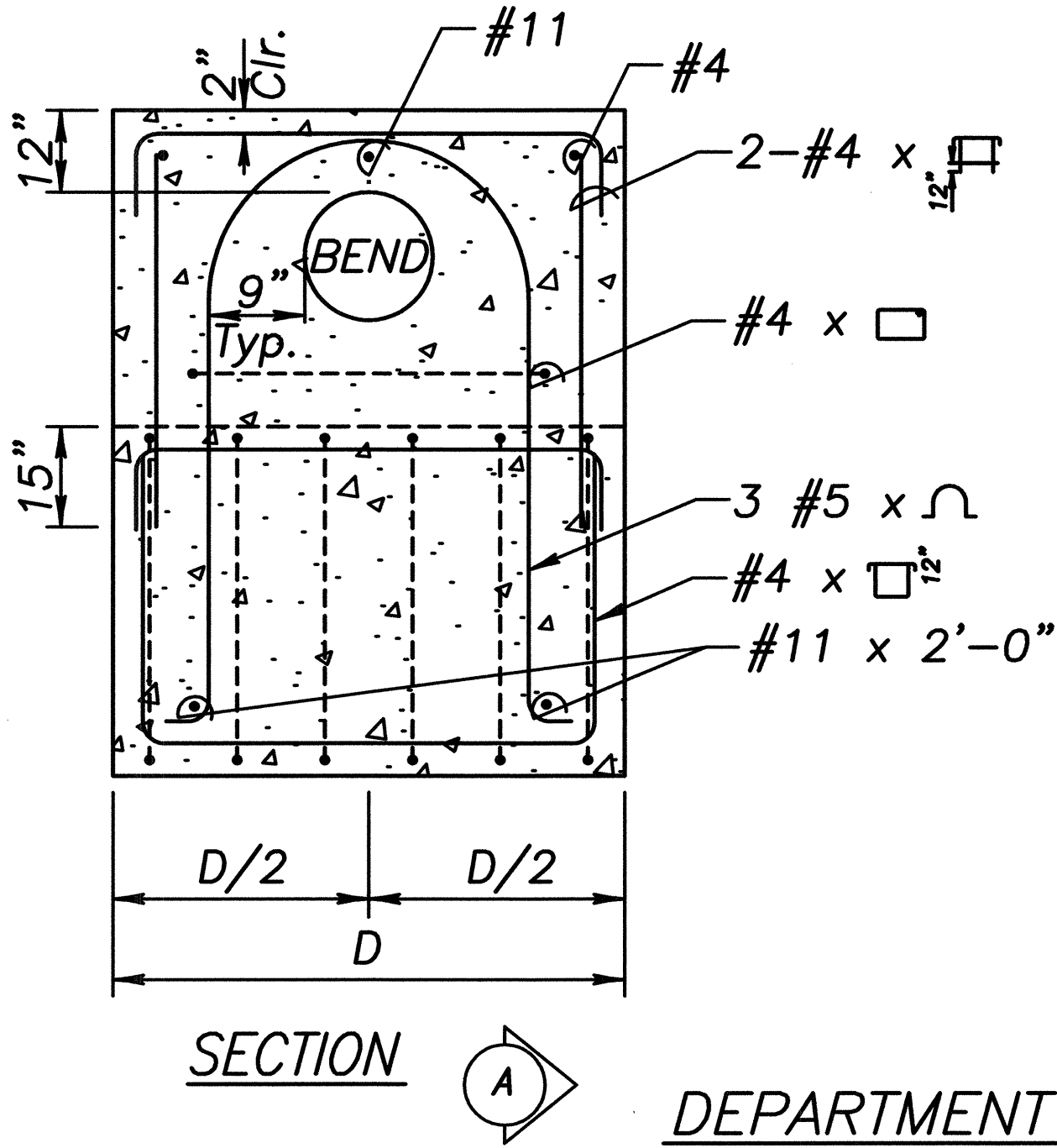
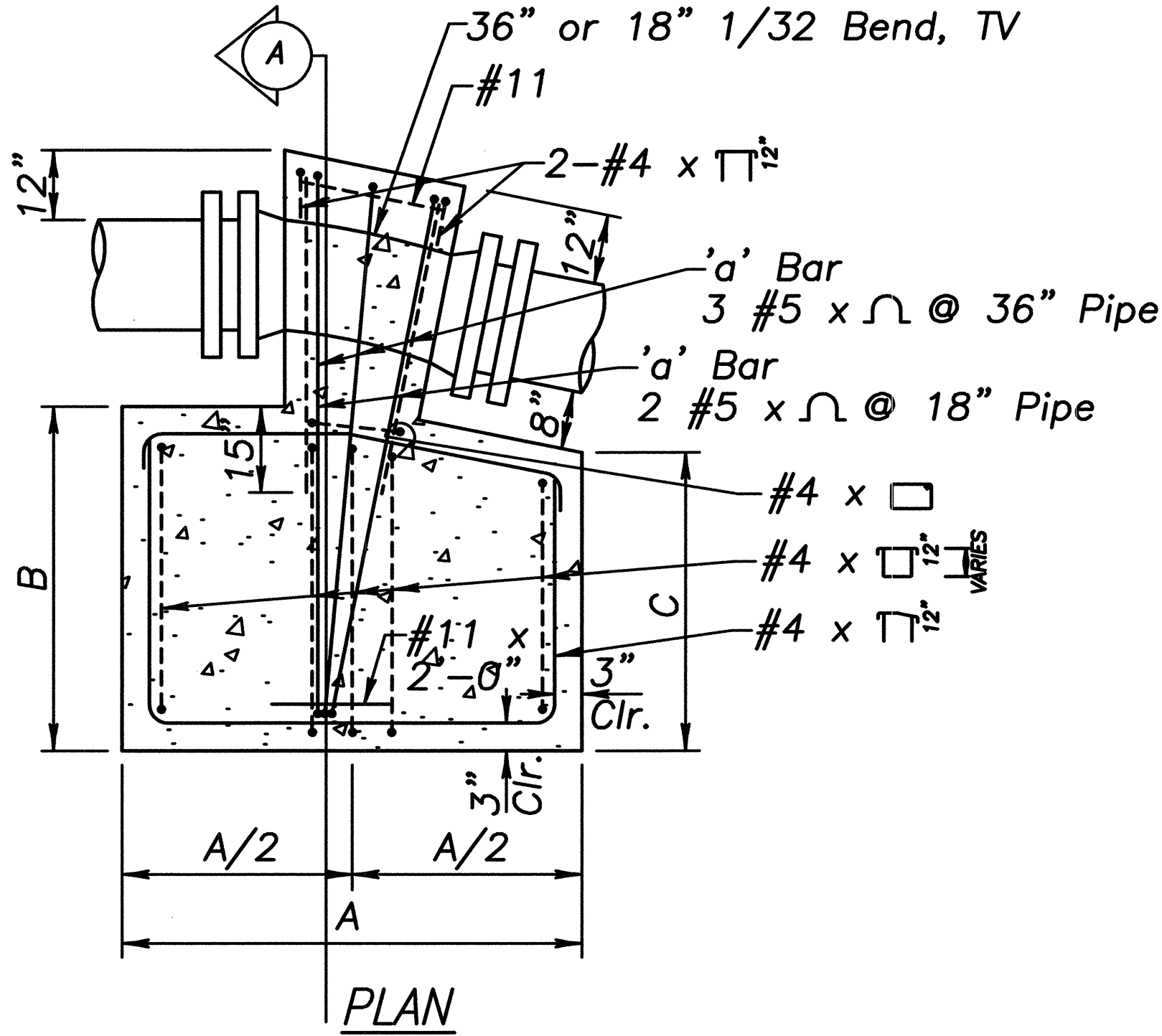
FED. ROAD DIST. NO.	STATE	FEDERAL — AID PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
HAWAII	HAW.	NH-A311(6)R	2006	59	173

DEPARTMENT OF WATER SUPPLY  
NOTES FOR CHLORINATION OF WATER SYSTEM

- Liquid chlorine or calcium hypo chlorite, conforming to AWWA standards shall be used for the chlorination of the project.
- Prior to chlorination, the project shall be thoroughly flushed.
- The interior surfaces of the project shall be exposed to the chlorinating solution for a minimum of 24 hours and the chlorine residual shall not be less than 10 ppm after such time.
- Should calcium hypo chlorite be used, no solid and /or undissolved portion of the compound shall be introduced into any section of the project to be chlorinated.
- At the end of the 24-hour disinfection period, representative samples shall be taken and analyzed to assure a chlorine residual of at least 10 ppm.
- Should the results indicate adequate chlorination, the project shall be thoroughly flushed and filled with water from the existing system and again tested for chlorine residual. The flushing shall be considered adequate if the test results indicate that the water in the project has comparable chlorine residual as the water in the existing system.
- Following the acceptable flushing of the project, two consecutive sets of acceptable samples, taken at least 24 hours apart, from representative points in the project shall be taken and subjected to micro biological tests. At least one set of samples shall be collected from every 1,200 feet of the new water main, plus one from the end of the line and at least on set from each branch. Positive results will not be acceptable and the process will be repeated.
- Analysis for residual chlorine shall be made in accordance with "Standard Methods for the Examination of Water and Wastewater," American Public Health Association, 20th Edition.
- Micro biological tests shall be made in accordance with "Standard Methods for the Examination of Water and Wastewater," American Public Health Association, 20th Edition.
- All measurements for chlorine residual and micro biological tests shall be performed by a laboratory approved by the Director.
- The Developer/Contractor shall be responsible for all costs associated with all of the foregoing.

DEPARTMENT OF WATER SUPPLY  
ADDITIONAL WATER SYSTEM NOTES

- Water service connections:  
The contractor shall furnish, all material, equipment, and labor for re-connection of consumer's pipe to new service lateral with copper piping at the contractor's expense. The size of copper pipe and fittings shall be determined by D.W.S. or as specified on plans. The use of plastic materials is prohibited.
  - All water meter installations/relocations shall be coordinated with D.W.S. personnel. Only D.W.S. personnel is authorized to remove and relocate water meter.
  - If consumer's pipe is copper or pvc, use bronze pack joint coupling. If consumer's pipe is any other material, use appropriate di-electric coupling.
  - The contractor shall be responsible for maintaining water service to consumers at all times. If water service disruption is necessary, the contractor shall coordinate all disruptions of service with consumers.
- The contractor shall furnish and install ductile iron nipples whether or not specified on the construction plans for complete installation of the waterline at the contractor's expense.
- The contractor shall furnish temporary cleanouts when necessary to test, flush, and chlorinate the waterline at the contractor's expense.
- The contractor shall concrete plug all open ends of abandoned waterlines at the contractor's expense, whether or not shown on the construction plans.
- The contractor shall remove and dispose of all portions of abandoned waterlines that are exposed or within 12-inches off the ground surface at the contractor's expense.
- The contractor shall adjust to finished pavement grades, all existing valve boxes and manholes, including frame and covers for all utilities (i.e., water, sewer, drain, etc.) affected by pavement restoration at the contractor's expense, whether or not shown on the construction plans.
- The contractor shall restore all road improvements, disturbed or damaged during construction in accordance with the "Hawaii Standard Specifications for Road, Bridge and Public Works Construction, 1994," as amended, to the satisfaction of the Department of Public Works and Waste Management. Road improvements include, but are not limited to, pavement, pavement markers, striping, and speed humps.
- Unless Otherwise Noted, Pipe, Fittings and Valves, Including Connecting Piping Shall Be:  
Waterline "A" Class 200  
Waterline "B" Class 250
- Type "A" (Traffic) and Type "D" Manholes Shall Be Provided With Metal Covers. Top of Manhole Shall Be Minimum 6" Above Finish Grade.
- Type "A" Manhole Shall Be Provided With Concrete Collars At Each Pipe Entry Into Manhole.



FITTING SIZE	A	B	C	D
36"	10'-0"	7'-6"	6'-4"±	8'-0"
18"	8'-0"	6'-10"	6'-0"±	5'-6"

TYPICAL THRUST BLOCK  
TOP VERTICAL BENDS

Not To Scale

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

CLIFFORD M. ARAKAWA

LICENSED PROFESSIONAL ENGINEER

No. 1884-C

HAWAII U.S.A.

THIS WORK WAS PREPARED BY ME OR UNDER MY SUPERVISION

04/30/06

EXPIRATION DATE OF THE LICENSE

STATE OF HAWAII

DEPARTMENT OF TRANSPORTATION

HIGHWAYS DIVISION

MISCELLANEOUS WATER DETAILS

MOKULELE HIGHWAY WIDENING

Maui Humane Society

To

Vicinity of Kolaloa Bridge

Federal — Aid Project No. NH-A311(6)R

Scale: AS NOTED

Date: JUNE 2005

SHEET No. 3 OF 3 SHEETS