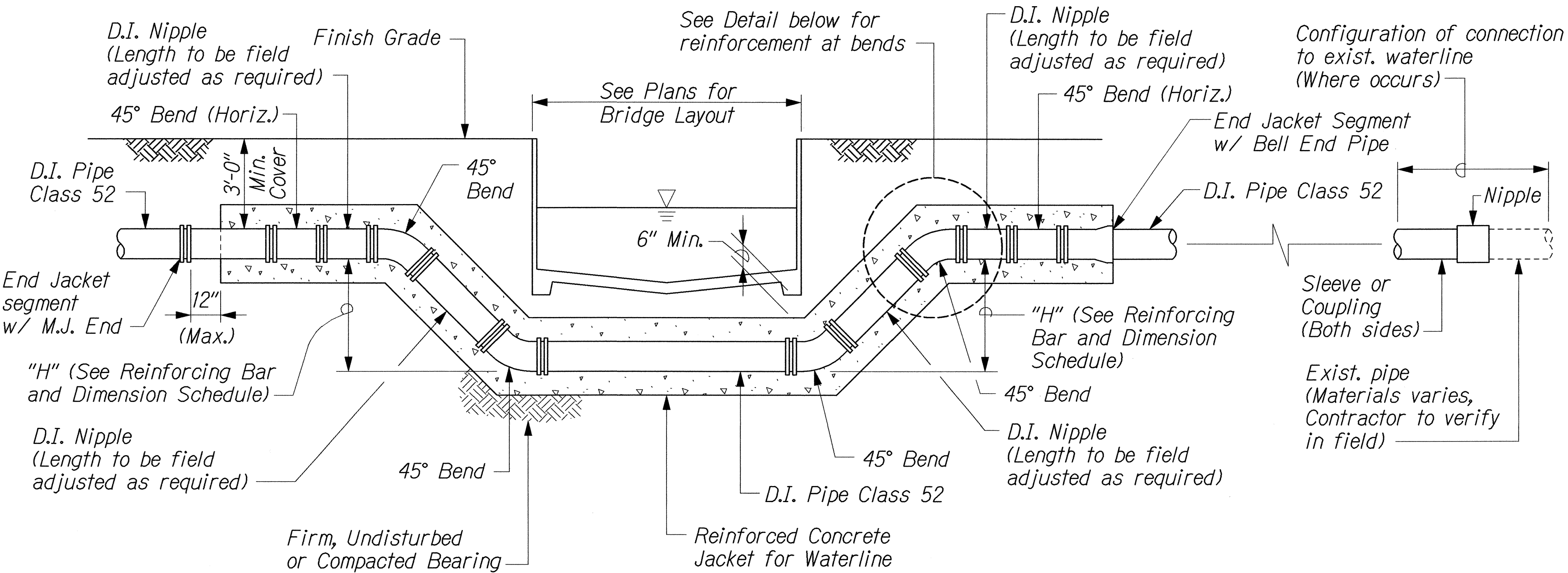


FED. ROAD DIST. NO.	STATE	FED. AID PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
HAWAII	HAW.	ER-12(4)	2003	36	76



**NOTES:**

- Contractor shall confirm location, depth and type of any existing utilities crossings prior to commencement of offset work. In the event any discrepancies occur, the Engineer shall be notified immediately, otherwise any corrective work required shall be performed solely at the Contractors expense.
- For connections to existing A.C. (Asbestos-Cement) pipe the Department of Water Supply prohibits cutting of the A.C. pipe. Contractor shall remove one (1) complete section of A.C. pipe at each conneciton to the existing A.C. waterline and replace same with equivalent diameter ductile iron pipe (Class 52).
- Wherever construction joints are required 6" rubber or neoprene waterstops shall be installed. Waterstop shall be of the type specified and manufactured by the Kirkhill Company, or approved equal.
- See reinforcing bar and dimension schedule for reinforcing and dimensions.
- All interior joints and fittings shall be "M.J.".
- Horizontal alignment of jacket shall be straight - no deflections allowed.
- Invert elevations of top bends shall be equal.
- Invert elevations of bottom ends shall be equal.

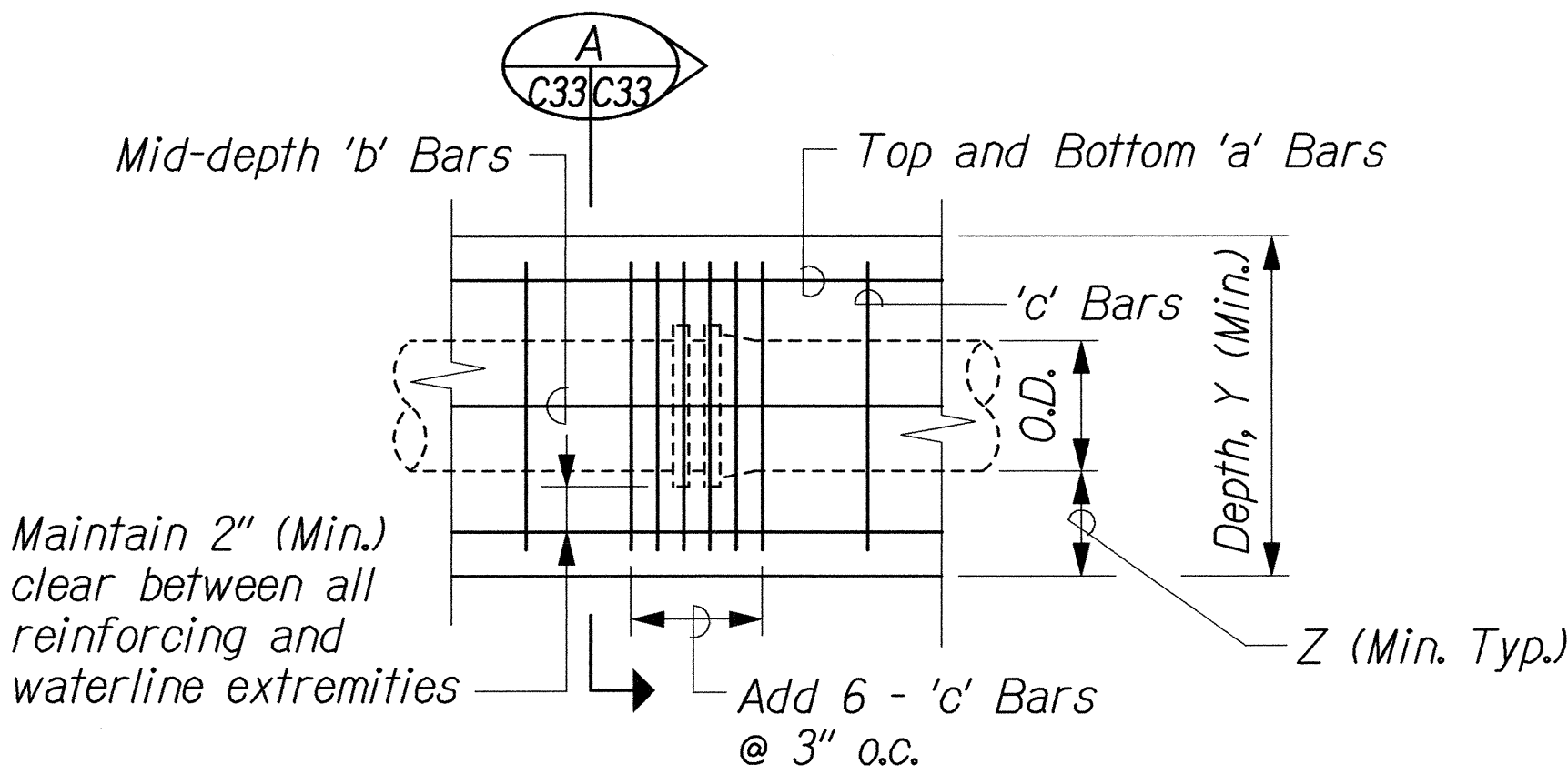
REINFORCING BAR & DIMENSION SCHEDULE							
Diameter	H (Max.)	X	Y	Z	Top & Bottom 'a' Bars	'b' Bars	'c' Bars
12"	4'-0"	2'-9"	2'-9"	10"	4-#6 TΦB	2-#6	#5 □ @ 12" o.c.
12"	5'-0"	2'-9"	2'-9"	10"	2-#6 TΦB and 2-#7 TΦB	2-#7	#5 □ @ 12" o.c.
12"	6'-0"	3'-0"	3'-0"	1'-0"	2-#6 TΦB and 2-#7 TΦB	2-#7	#5 □ @ 12" o.c.
12"	7'-0"	3'-0"	3'-0"	1'-0"	4-#7 TΦB	2-#7	#5 □ @ 12" o.c.
12"	8'-0"	3'-0"	3'-0"	1'-0"	5-#7 TΦB	2-#7	#5 □ @ 12" o.c.

**NOTES:**

- Concrete:  $f'_c = 3,500$  P.S.I. (Min.)
- Steel Reinforcement:  $f_y = 60$  K.S.I. (ASTM A615 Grade 60), Lap Bars Min. 40 Bar diameters.
- Hydraulic Design Pressure: 250 p.s.i.
- Contractor shall submit certification of compliance with above criteria for concrete and steel reinforcement within two (2) working days after fabrication of structure.
- For pre-cast applications, Contractor shall submit structurally-stamped shop drawings detailing lifting configuration and integral lifting hardware at least ten (10) working days prior to fabrication of structure.
- For cast-in-place applications where hydraulic pressure is expected prior to at least fourteen (14) days after placement of concrete. Contractor shall provide temporary thrust restraints as required and shall submit structurally-stamped shop drawings detailing same at least ten (10) working days prior to fabrication of structure.
- Concrete jacking of A.C. or PVC pipe shall not be allowed.
- All interior joints and fittings shall be "M.J.". No Compact Body Fittings allowed.

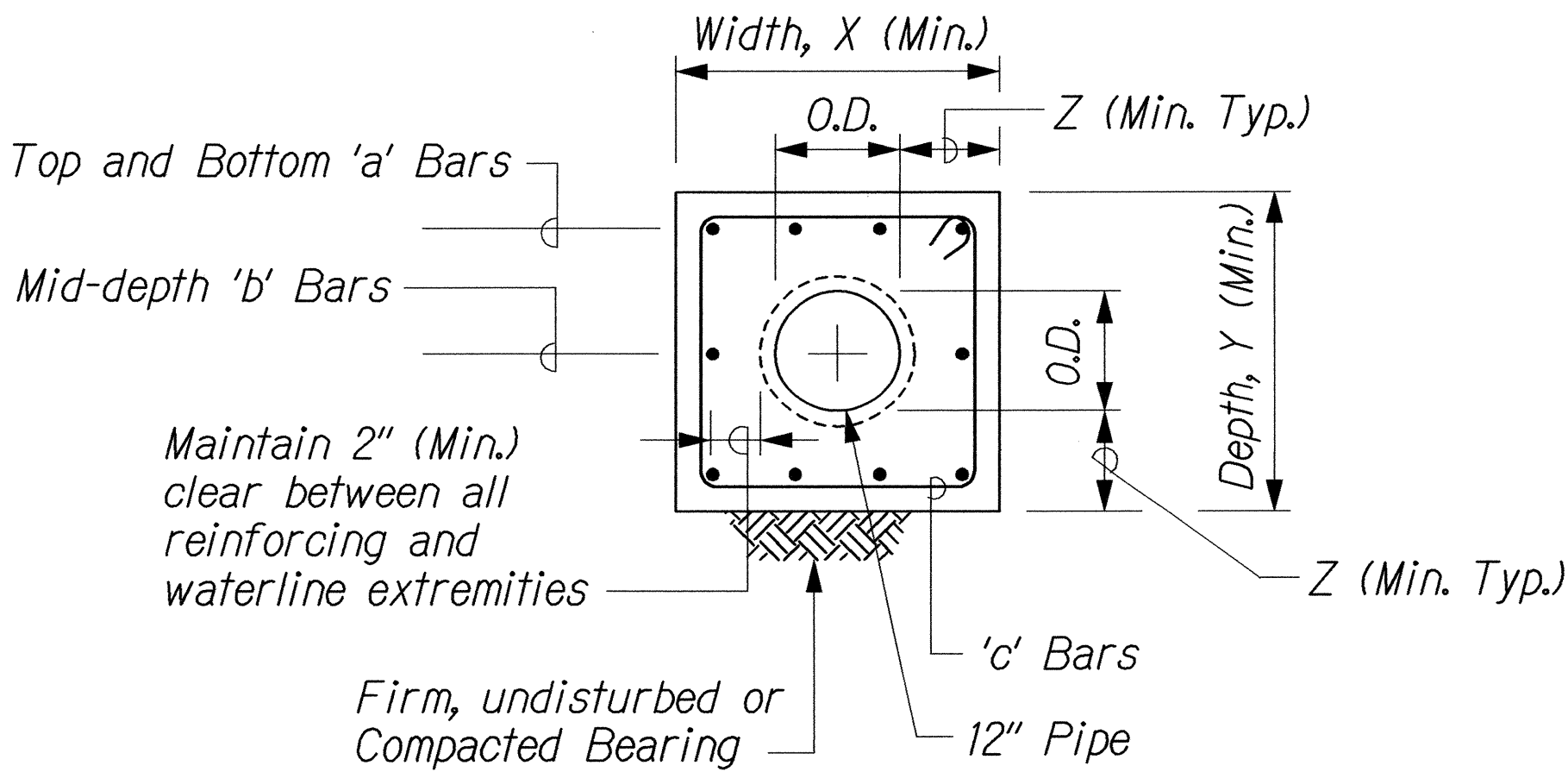
**REINFORCED CONCRETE WATERLINE JACKET FOR VERTICAL OFFSETS**

Not to Scale



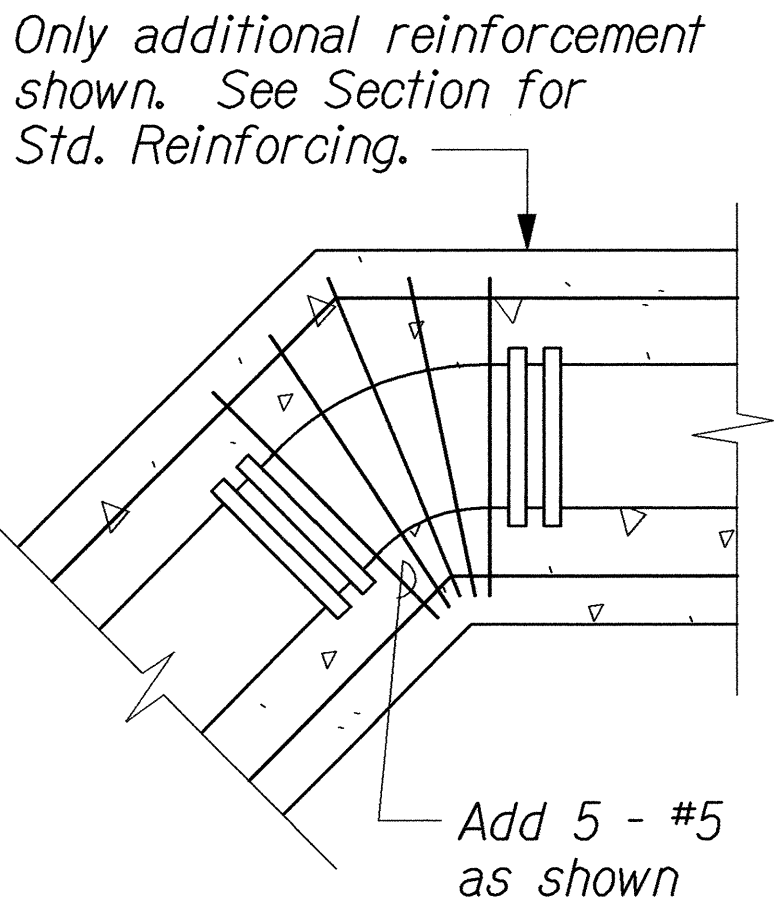
**CONCRETE JACKET AT INTERIOR JOINTS**

Not to Scale



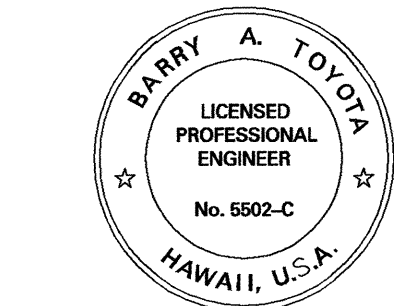
**SECTION**

Not to Scale



**ADDITIONAL REINFORCEMENT AT BENDS**

Not to Scale

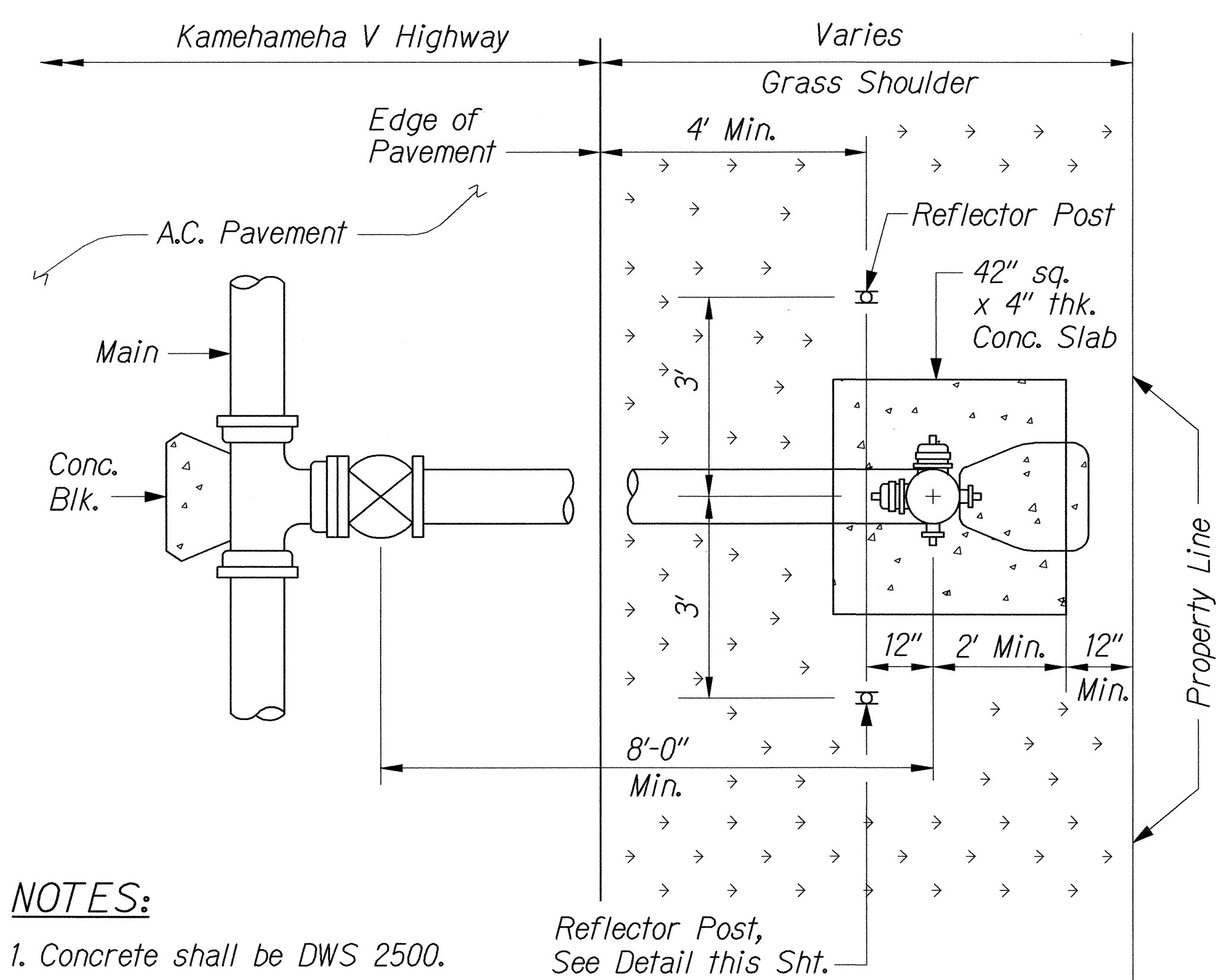


THIS WORK WAS PREPARED BY ME OR UNDER MY SUPERVISION.  
 Signature: [Signature]  
 Date: April 30, 2004  
 Expiration Date of the License

DATE	REVISION
STATE OF HAWAII DEPARTMENT OF TRANSPORTATION HIGHWAYS DIVISION <b>WATERLINE DETAILS</b> KAMEHAMEHA V HIGHWAY EMERGENCY REPLACEMENT OF KAWAIKAPU BRIDGE FEDERAL AID PROJECT NO. ER-12(4) Scale: As Shown Date: November 25, 2002	

SHEET No. C33 OF 46 SHEETS

FED. ROAD DIST. NO.	STATE	FED. AID PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
HAWAII	HAW.	ER-12(4)	2003	37	76



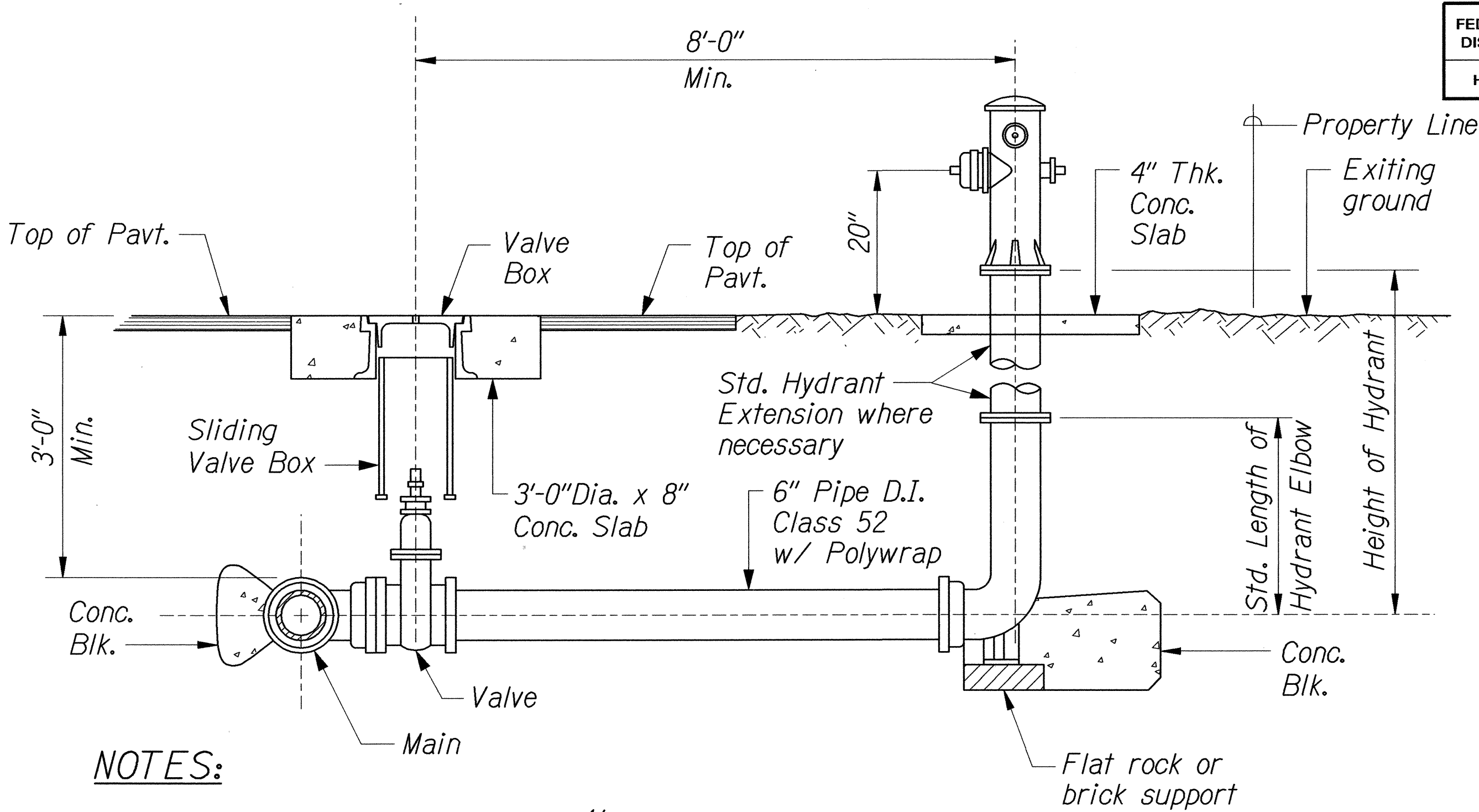
**NOTES:**

- Concrete shall be DWS 2500.
- Flanged Tee is mandatory.
- Lubricate Hydrant Nozzle Threads with non-toxic grease.

Reflector Post,  
See Detail this Sht.

Standard Hydrant Extensions are  
available in the following lengths:  
6 to 30 inches long in  
increments of 6 inches.

**PLAN**



**NOTES:**

- Gaskets for Flanged Joints shall be  $\frac{1}{8}$ " Duck-Insert Rubber Packing Garlock No. 19.
- Bolts shall be Break-Off Type  $\frac{5}{8}$ ø x 3" long machine bolts with cut threads American Standard Heavy Hexagon Heads, Galvanized.
- Nuts shall be American Standard Heavy Cold Punched Hexagon Nuts, Galvanized.

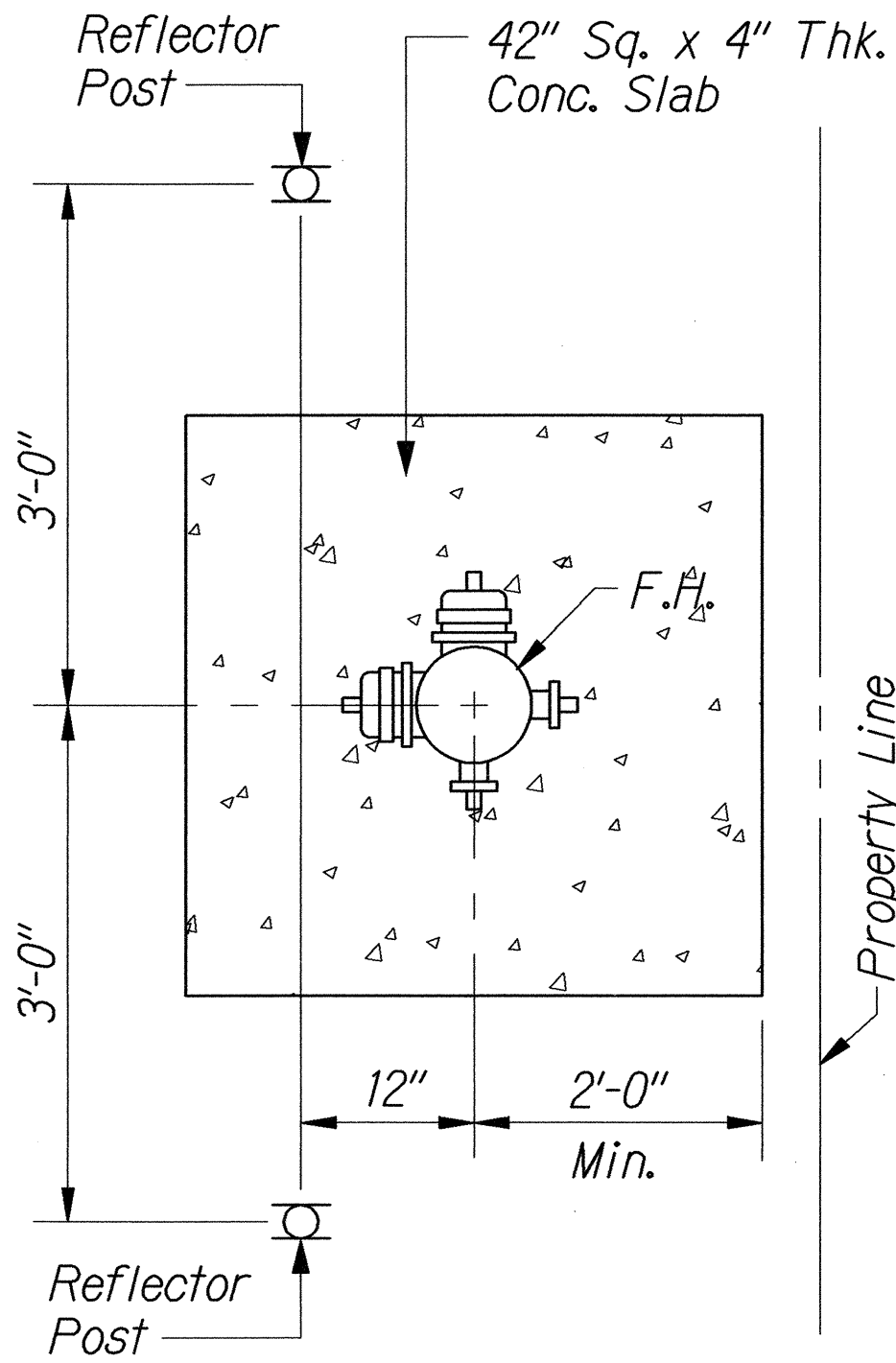
**STANDARD LENGTHS  
FOR HYDRANT ELBOWS**

30"
36"
42"
48"

**SECTION**

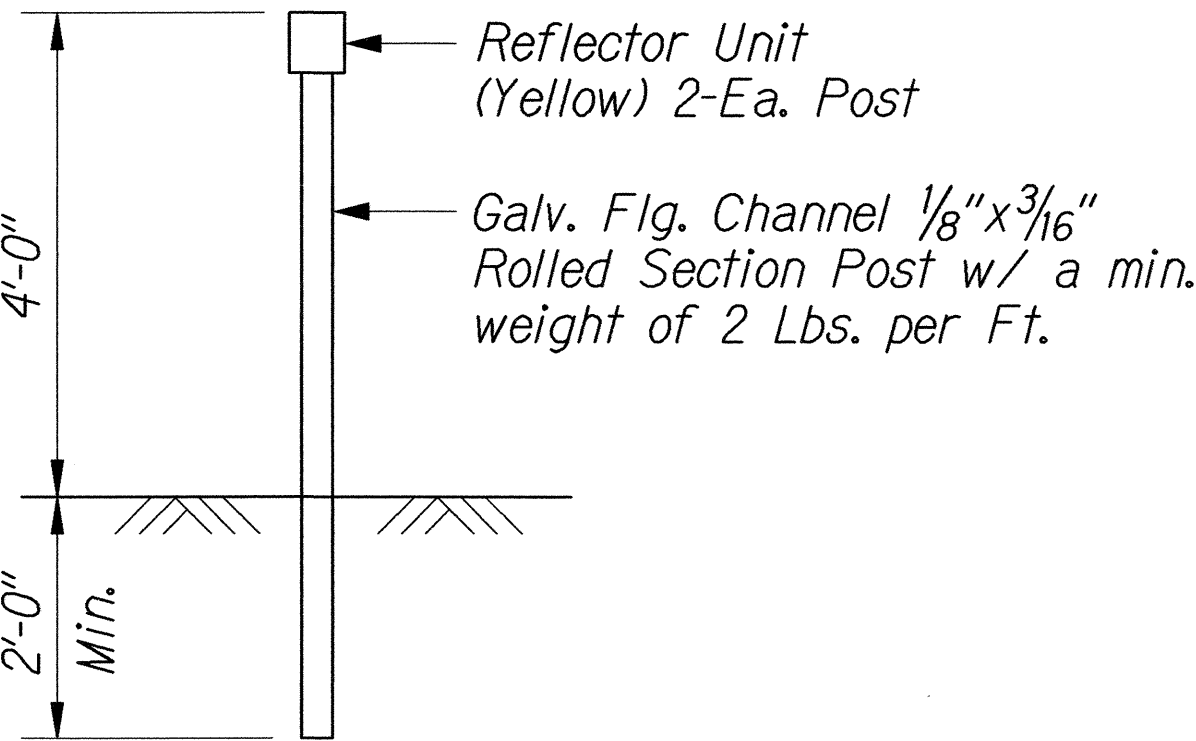
**FIRE HYDRANT CONNECTION DETAIL**

Not to Scale



**REFLECTOR POST DETAIL  
FOR MARKING HYDRANTS WITHOUT CURBING**

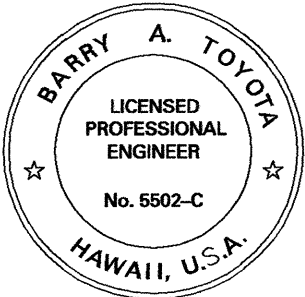
Not to Scale



**NOTE:**

Reflector Unit shall be  
RM-3 (4"x12"), Yellow.

ORIGINAL PLAN	SURVEY PLOTTED BY	DATE
NOTE BOOK	DRAWN BY	
	DESIGNED BY	
	CHECKED BY	



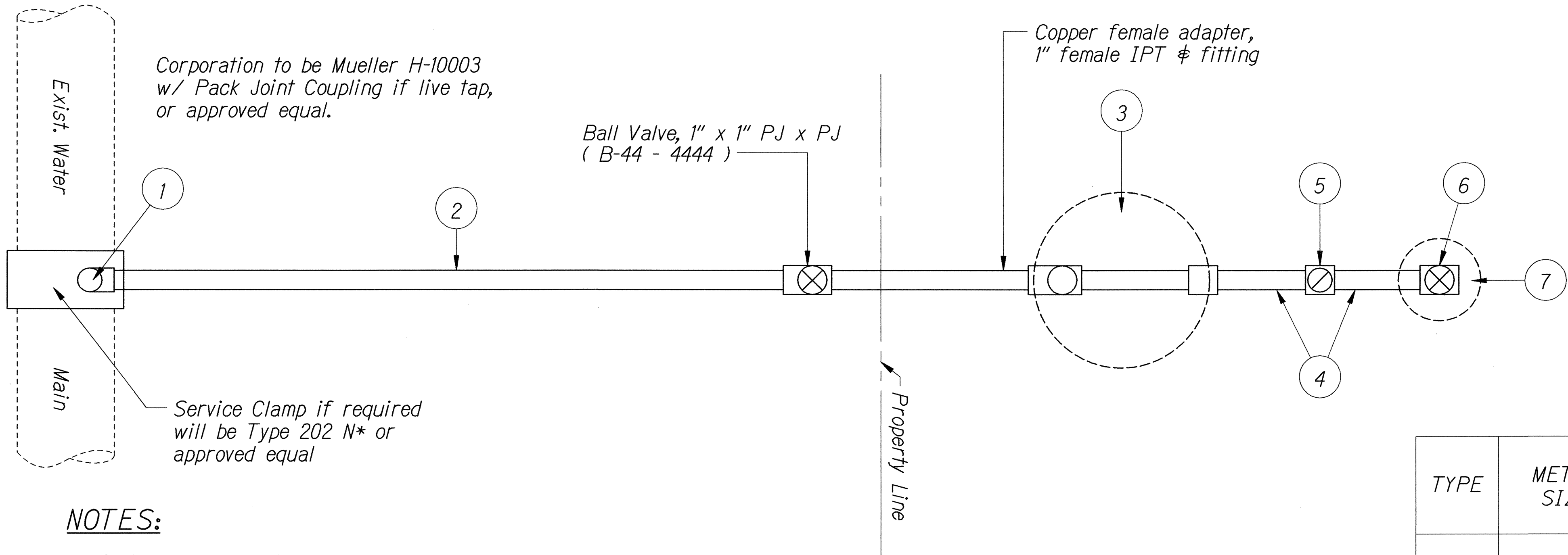
THIS WORK WAS PREPARED BY  
ME OR UNDER MY SUPERVISION.  
*Barry A. Tojima*  
SIGNATURE  
April 30, 2004  
Expiration Date of the License

DATE	REVISION
STATE OF HAWAII DEPARTMENT OF TRANSPORTATION HIGHWAYS DIVISION <b>WATERLINE DETAILS</b> <b>KAMEHAMEHA V HIGHWAY</b> <b>EMERGENCY REPLACEMENT OF KAWAIKAPU BRIDGE</b> <b>FEDERAL AID PROJECT NO. ER-12(4)</b> Scale: As Shown Date: November 25, 2002	

**SHEET No. C34 OF 46 SHEETS**



FED. ROAD DIST. NO.	STATE	FED. AID PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
HAWAII	HAW.	ER-12(4)	2003	38	76



**NOTES:**

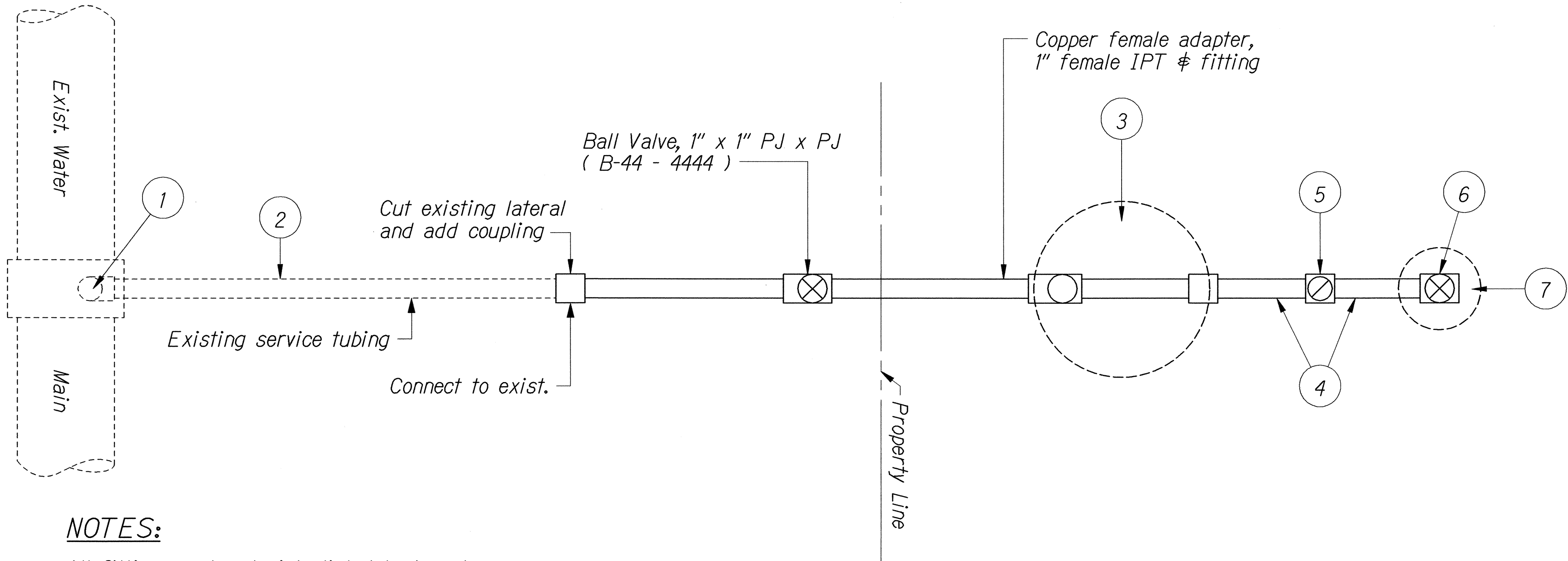
All fittings and materials listed by brand names or approved equal.

\*Ford Meter Box Manufacturing Co's. No.

**SINGLE SERVICE LATERAL**  
**(TYPE A, 5/8" METER)**

(Ref. DWS Std. Det. 81R)

TYPE	METER SIZE	1	2	3	4
		CORP. STOP	SERVICE TUBING	C.I. METER BOX	BRASS I.P.T. NIPPLE
A	5/8" x 3/4"	3/4" x 1" AWWA Thread x P.J. ( F-1000 ) *	1" Copper	1" x 3/4" P.J. Inlet w/ Female IPT Outlet (Ymb 141-243-TP) *	3/4" x 8"
		5	6	7	
		BRASS CHECK VALVE	BRONZ BALL VALVE	PLASTIC VALVE BOX	
		3/4" Hammond ( 904 ) or Stockham ( B-319 )	3/4" Female IPT ( B11-333 ) ( HB-34S )	10" Ametek ( 10-181-014 ) w/ Green Cover ( 10-181-015 )	



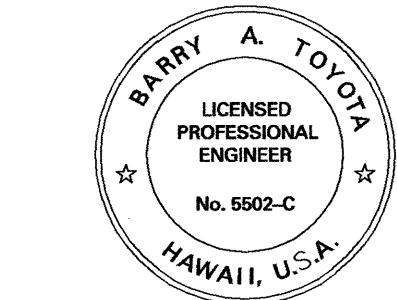
**NOTES:**

All fittings and materials listed by brand names or approved equal.

\*Ford Meter Box Manufacturing Co's. No.

**MODIFIED SINGLE SERVICE LATERAL**  
**(TYPE A, 5/8" METERS)**

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



THIS WORK WAS PREPARED BY ME OR UNDER MY SUPERVISION.  
Signature: *[Signature]*  
Date: April 30, 2004  
Expiration Date of the License

DATE	REVISION
STATE OF HAWAII DEPARTMENT OF TRANSPORTATION HIGHWAYS DIVISION <b>WATERLINE DETAILS</b> KAMEHAMEHA V HIGHWAY EMERGENCY REPLACEMENT OF KAWAIKAPU BRIDGE FEDERAL AID PROJECT NO. ER-12(4) Scale: As Shown      Date: November 25, 2002	