

GENERAL WATER NOTES

1. ALL WORK SHALL BE DONE ACCORDING TO THE WATER SYSTEM STANDARDS, STATE OF HAWAII, VOLUMES 1 AND 2, DATED 1985, AS AMENDED.
2. THE CONTRACTOR SHALL INFORM THE D.W.S. ENGINEER 72 HOURS PRIOR TO THE BEGINNING OF ANY WATERLINE WORK AND ONE WEEK PRIOR TO ANY CONNECTION, CHLORINATION, SHUT-OFF OR RELOCATION.
3. ALL WORK AND MATERIAL FURNISHED BY THE D.W.S. SHALL BE PAID FOR BY THE CONTRACTOR.
4. ALL EXISTING WATERLINE, WATERLINE APPURTENANCES AND OTHER UTILITY LOCATIONS SHOWN ON THE PLANS ARE OBTAINED FROM LATEST RELIABLE SOURCES. THE CONTRACTOR SHALL BE RESPONSIBLE TO VERIFY THE EXACT LOCATION OF ALL UTILITIES IN THE FIELD AND SHALL BEAR ALL COSTS FOR DAMAGES DONE ONTO THEM DURING THE CONTRACT PERIOD.
5. ALL HOOK-UPS TO EXISTING WATERLINES SHALL BE DONE BY THE DEPARTMENT OF WATER SUPPLY. THE CONTRACTOR SHALL PROVIDE ALL EXCAVATION, BACKFILL, ROAD REPAIR, TRAFFIC CONTROL, ETC.
6. WHERE WATER SHUT-OFF OF MORE THAN 3-HOURS BECOMES NECESSARY, THE CONTRACTOR, AT HIS OWN COST, SHALL PROVIDE A TEMPORARY BYPASS LINE, SIZE OF WHICH SHALL BE DETERMINED BY THE D.W.S. ENGINEER. THE D.W.S. ENGINEER, ALSO RESERVES THE RIGHT TO REQUIRE BYPASS LINES, REGARDLESS OF THE WATER SHUT-OFF PERIOD, IF IT IS DEEMED NECESSARY.
7. MINIMUM HORIZONTAL CLEARANCE BETWEEN WATERLINES AND OTHER UTILITIES SHALL BE 8-FEET FOR ROAD RIGHT-OF-WAYS OF 50 FEET OR LESS. MINIMUM VERTICAL CLEARANCE BETWEEN WATERLINE AND OTHER UTILITIES SHALL BE 12-INCHES PROVIDED THE OTHER UTILITY IS CONCRETE JACKETED AND 18-INCHES IF NO CONCRETE JACKETS ARE USED. IN ALL APPLICABLE INSTANCES, THE WATERLINE SHALL BE AT A GRADE HIGHER THAN OTHER UTILITIES. MINIMUM HORIZONTAL CLEARANCE BETWEEN WATERLINE AND OTHER UTILITIES SHALL BE 10-FEET FOR ROAD RIGHT-OF-WAYS OF MORE THAN 50-FEET.
8. ALL FITTINGS (CLASS 250) AND ALL GATE VALVES (CLASS 200) SHALL BE DUCTILE IRON, WITH MECHANICAL JOINTS UNLESS OTHERWISE SPECIFIED. BUTTERFLY VALVES SHALL BE CLASS 250 WITH EPOXY-COATED INTERIORS UNLESS OTHERWISE SPECIFIED.
9. THE WATERLINE SHALL BE TESTED AT A MINIMUM OF 225 P.S.I. OR ONE AND A HALF TIMES THE STATIC PRESSURE AT THE LOW POINT, UNDER D.W.S. SUPERVISION JUST PRIOR TO PAVING THE ROADWAYS.
10. THE CONTRACTOR SHALL BE RESPONSIBLE FOR THE CHLORINATION OF THE WATER SYSTEM AND SHALL BEAR ALL COST. THE PERSONS ENGAGED TO DO THE CHLORINATION WORK MUST HAVE THE APPROPRIATE LICENSE TO PERFORM THE WORK IN THE STATE OF HAWAII.
11. THE D.W.S. WILL NOT ASSUME OWNERSHIP OF NOR GRANT ANY WATER SERVICE TO THE PROJECT UNTIL THE PROJECT'S WATER SYSTEM IS DEDICATED TO THE D.W.S. ALONG WITH ALL NECESSARY EASEMENTS AND DOCUMENTS.
12. SOLDER AND FLUX SHALL CONTAIN NOT MORE THAT 0.2 PERCENT LEAD.
13. UNLESS OTHERWISE NOTED, 6 INCH DIAMETER DUCTILE IRON PIPE SHALL BE CLASS 52.

ABBREVIATIONS

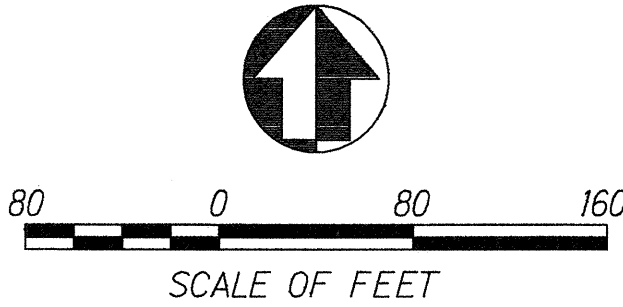
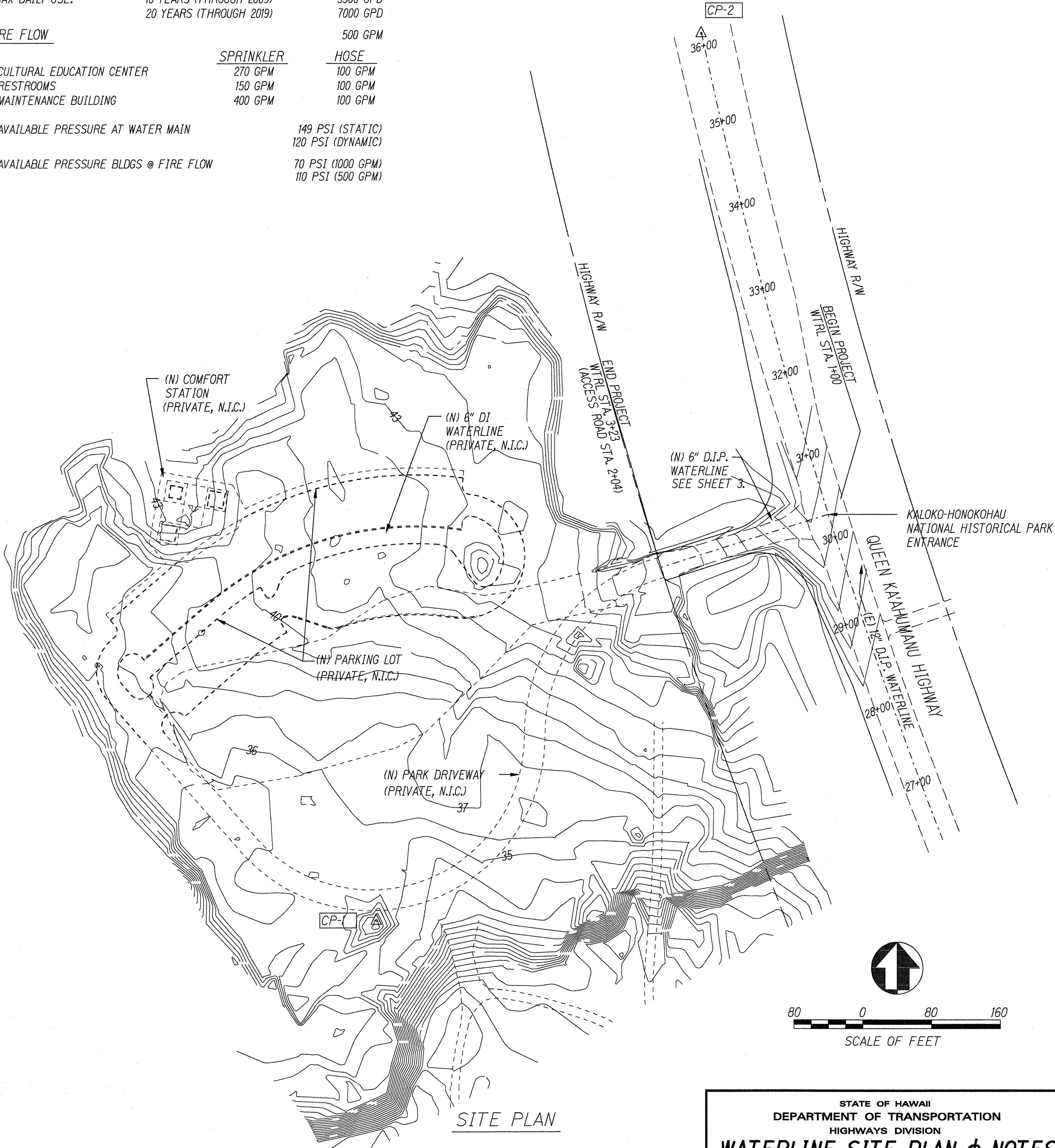
D.I.P.	DUCTILE IRON PIPE
ELEC.	ELECTRICAL
EL.	ELEVATION
ETM	ELAPSED TIME METER
(E)	EXISTING
F.C.A.	FLEXIBLE COUPLING ADAPTER
FM	FORCE MAIN
HORIZ.	HORIZONTAL
INV.	INVERT
MH	MANHOLE
MAX.	MAXIMUM
MIN.	MINIMUM
(N)	NEW
P.C.	PIECE
R/W	RIGHT OF WAY
STA.	STATION
TELE.	TELEPHONE
TYP.	TYPICAL
VERT.	VERTICAL
W/	WITH
N	NORTHING
E	EASTING
D.W.S.	DEPARTMENT OF WATER SUPPLY
D.O.T.	DEPARTMENT OF TRANSPORTATION
N.I.C.	NOT IN CONTRACT
Q	CENTER LINE
ARV	AIR RELEASE VALVE
WTRL	WATERLINE

DESIGN INFORMATION

WATER SYSTEM		
MAX DAILY USE:	10 YEARS (THROUGH 2009)	3500 GPD
	20 YEARS (THROUGH 2019)	7000 GPD
FIRE FLOW		
		500 GPM
CULTURAL EDUCATION CENTER		
EXISTING	SPRINKLER	HOSE
RESTROOMS	270 GPM	100 GPM
MAINTENANCE BUILDING	150 GPM	100 GPM
	400 GPM	100 GPM
AVAILABLE PRESSURE AT WATER MAIN		
		149 PSI (STATIC)
		120 PSI (DYNAMIC)
AVAILABLE PRESSURE BLDGS @ FIRE FLOW		
		70 PSI (1000 GPM)
		110 PSI (500 GPM)

LEGEND & SYMBOLS

6" W	NEW 6-INCH DUCTILE IRON WATER MAIN
⋈	NEW GATE VALVE AND BOX
⊙ F.H.	FIRE HYDRANT
⋈	REDUCED PRESSURE PRINCIPLE BACKFLOW DEVICE
WM	WATER METER
△	CONTROL POINT
0	DIAMETER




ORIGINAL PLAN	DATE
SURVEY PLATTED BY	
DRAWN BY	
DESIGNED BY WILLIAM L. A. WILLIAMS	
CHECKED BY	
NOTED BY	
8/4/99/11	
NO. 2500	

ESTIMATED QUANTITIES		
DESCRIPTION	UNIT	APPROX. QUANTITY
12" X 6" TAPPING SLEEVE W/ 6" TAPPING VALVE	EACH	1
VALVE BOX	EACH	2
6" SOLID BODY SLEEVE W/ 12" LONG NIPPLE	EACH	1
CONCRETE BLOCK	EACH	1
CONCRETE BLOCK *	EACH	1
6" CAP W/ 2" CLEANOUT *	EACH	1
6" D.I.P. WATERLINE	L.F.	223
1" AIR RELEASE VALVE	EACH	1
CHLORINATION AND TESTING	EACH	1

* - Temporary for testing. See Details on Sheet #45.

DEPARTMENT OF WATER SUPPLY

APPROVED: 

MANAGER D.W.S.
(For Water System Construction)

1/19/00
DATE

HORIZONTAL CONTROL		
	NORTH	EAST
	DESCRIPTION	
CP-1	307876.12	319806.92
	NPS MONUMENT - "NPS-1" (REBAR)	
CP-2	308904.41	320185.45
	(E) STREET MONUMENT (36+10.59)	

STATE OF HAWAII
DEPARTMENT OF TRANSPORTATION
HIGHWAYS DIVISION

WATERLINE SITE PLAN & NOTES

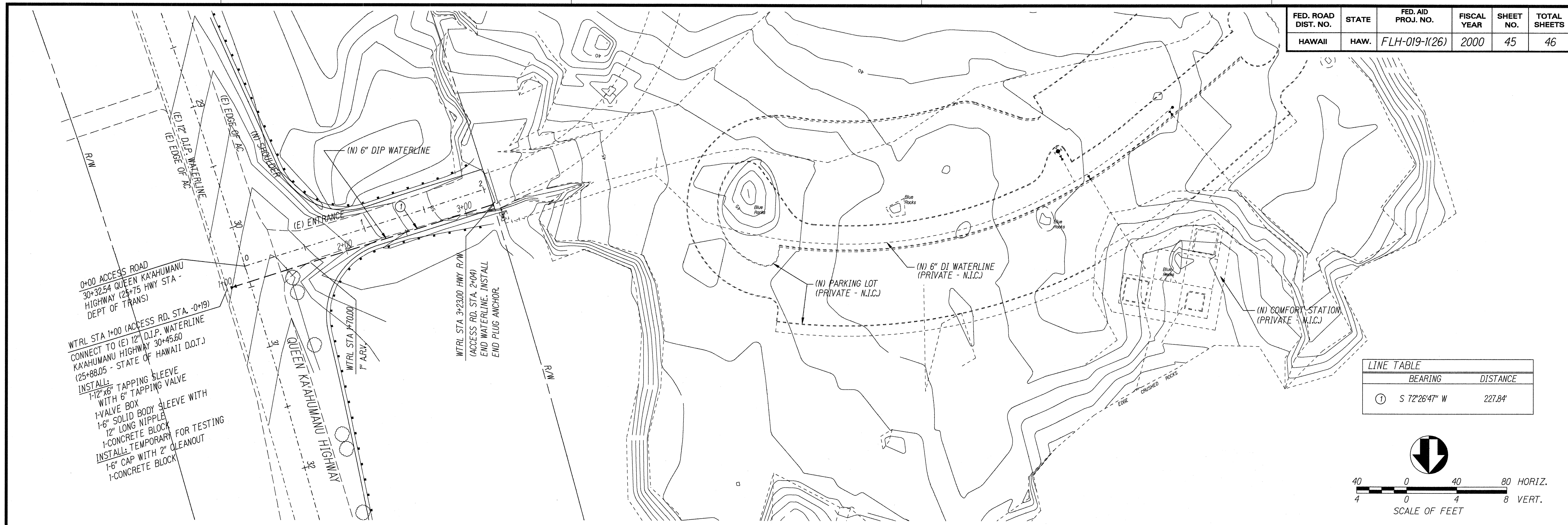
**QUEEN KA'AHUMANU HIGHWAY
INTERSECTION IMPROVEMENTS TO
KALOKO-HONOKOHAU NATIONAL HISTORICAL PARK**

PROJECT NO. FLH-019-1(26)

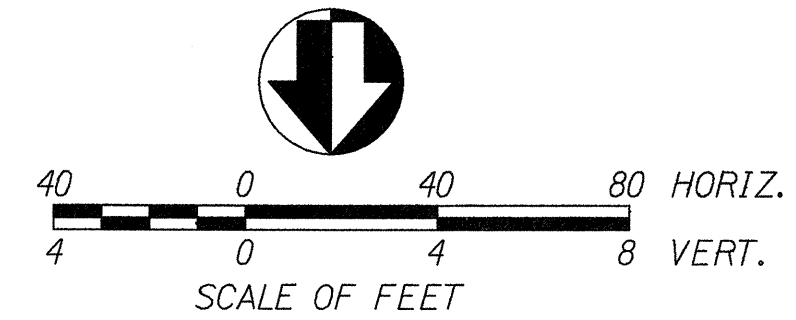
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SHEET No. 1 OF 3 SHEETS

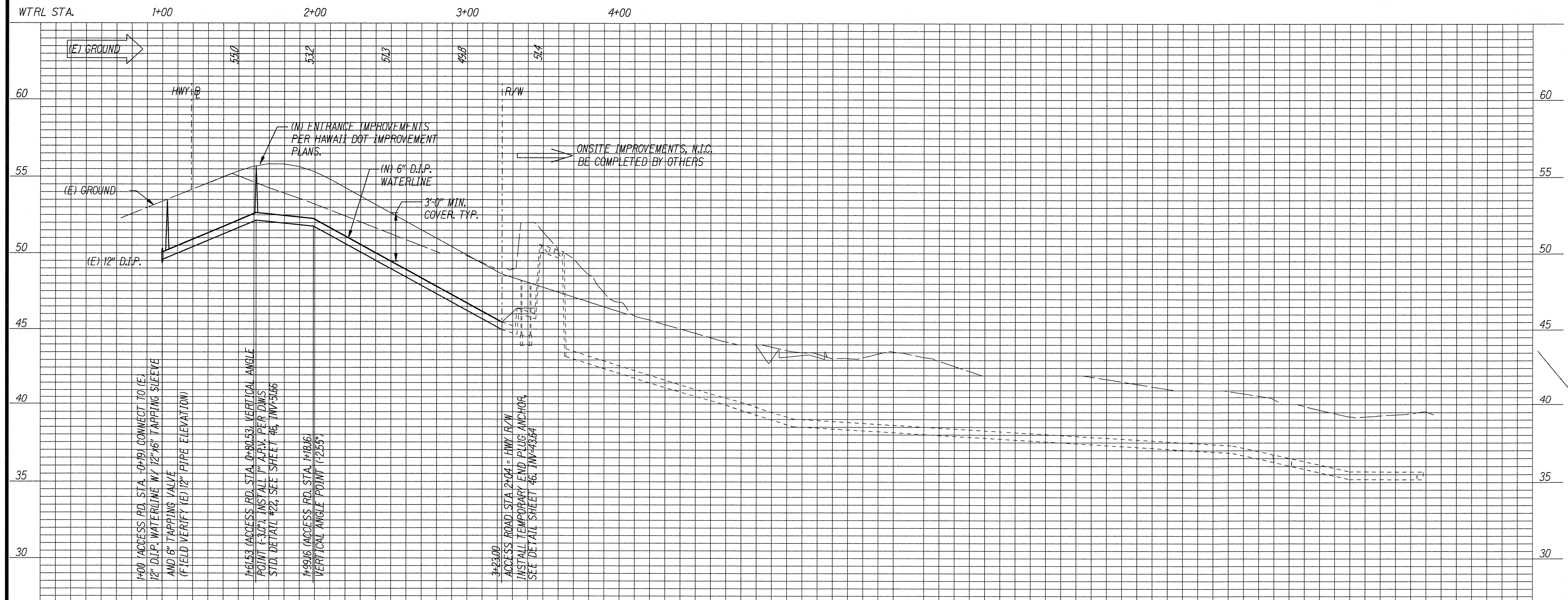
FED. ROAD DIST. NO.	STATE	FED. AID PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
HAWAII	HAW.	FLH-019-1(26)	2000	45	46



LINE TABLE	
BEARING	DISTANCE
① S 72°26'47" W	227.84'



- NOTE:
- SEE SHEET 44 FOR HORIZONTAL CONTROL POINTS.
 - SEE SHEET 35 FOR TRAFFIC CONTROL PLAN. THE CONTRACTOR MAY CHANGE THE ORDER OF THE TRAFFIC CONTROL PHASES.
 - THE WATERLINE CONSTRUCTION LUMP SUM BID ITEM SHALL INCLUDE THE COST OF THE TRAFFIC CONTROL AS SHOWN ON SHEET 35.



ORIGINAL PLAN	DATE
SURVEY PLOTTED BY	
DRAWN BY	
DESIGNED BY	
CHECKED BY	
APPROVED BY	
DATE	

DEPARTMENT OF WATER SUPPLY	
APPROVED:	
MANAGER, D.W.S. (For Water System Construction)	1/19/00 DATE

STATE OF HAWAII
DEPARTMENT OF TRANSPORTATION
HIGHWAYS DIVISION

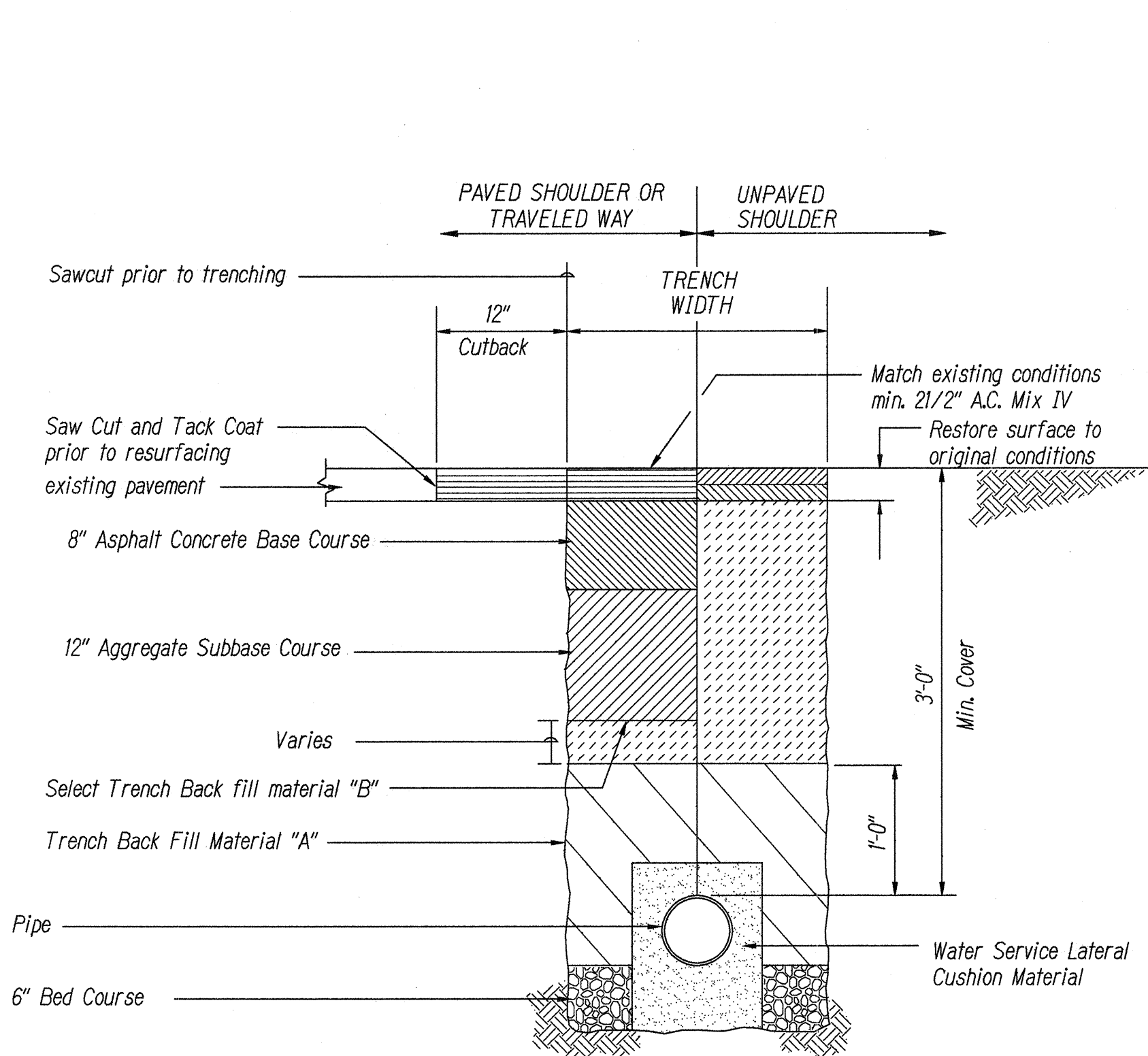
WATERLINE PLAN & PROFILE

QUEEN KA'AHUMANU HIGHWAY
INTERSECTION IMPROVEMENTS TO
KALOKO-HONOKOHAU NATIONAL HISTORICAL PARK
PROJECT NO. FLH-019-1(26)

Scale: As Shown Date: Dec., 1999

SHEET No. 2 OF 3 SHEETS

FED. ROAD DIST. NO.	STATE	FED. AID PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
HAWAII	HAW.	FLH-019-1(26)	2000	46	46



TYPICAL TRENCH AND PAVEMENT REPAIR SECTION
(STATE HIGHWAY)
(Not to Scale)

NOTES:

- 6" BED COURSE
- Where utilities are within the water table, use size #67 (AASHTO M43)
- For All other areas, bed course material shall be Trench Back fill Material "A"

TRENCH BACK FILL MATERIAL "A"

- Sand Equivalent (S.E.) >20
- 8" maximum lifts
- 95% compaction

TRENCH BACK FILL MATERIAL "B"

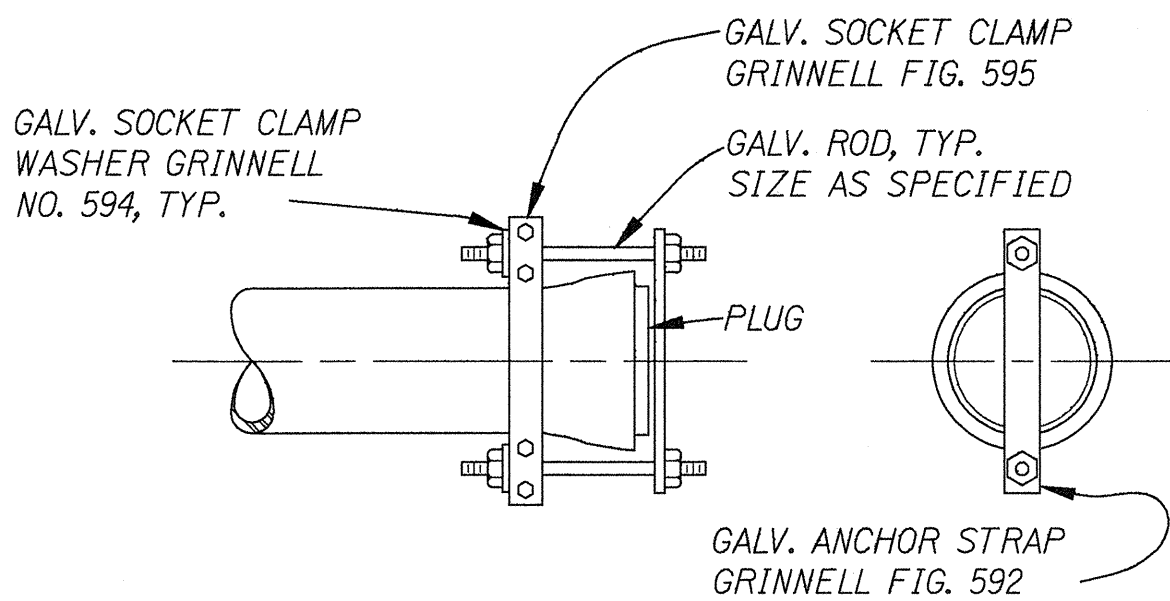
- S.E. must not be less than the area being filled and in no case shall the S.E. be < 2 regardless of where is used.
- 8" maximum lifts
- 95% compaction

SUBBASE COURSE

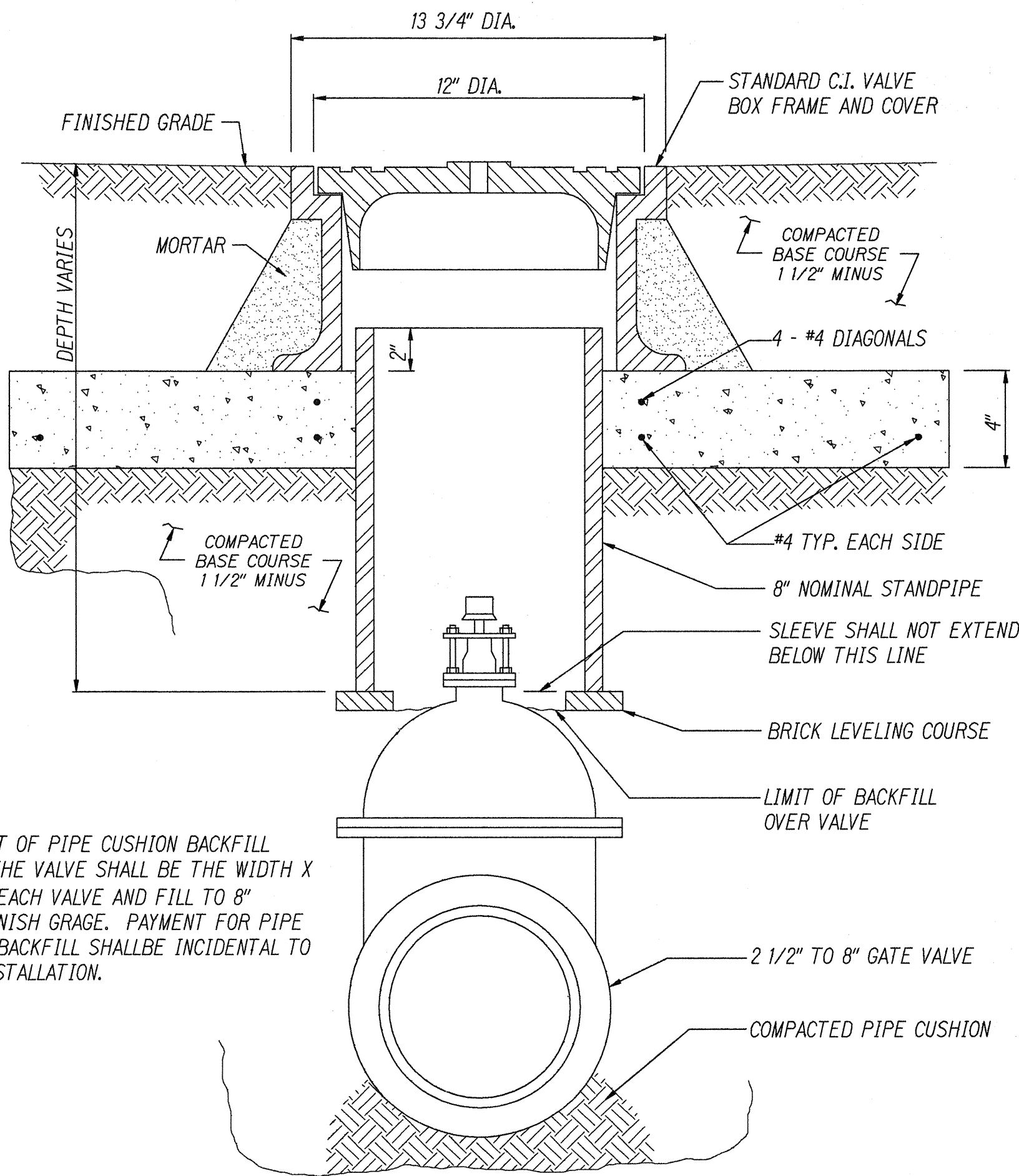
- S.E. > 25
- 8" maximum lifts
- 95% compaction

WATER SERVICE LATERAL CUSHION MATERIAL

- Provide 6" minimum cushion material around water service laterals
- Cushion material shall be No.4 sand or other material approved by the County of Hawaii, Department of Water Supply.



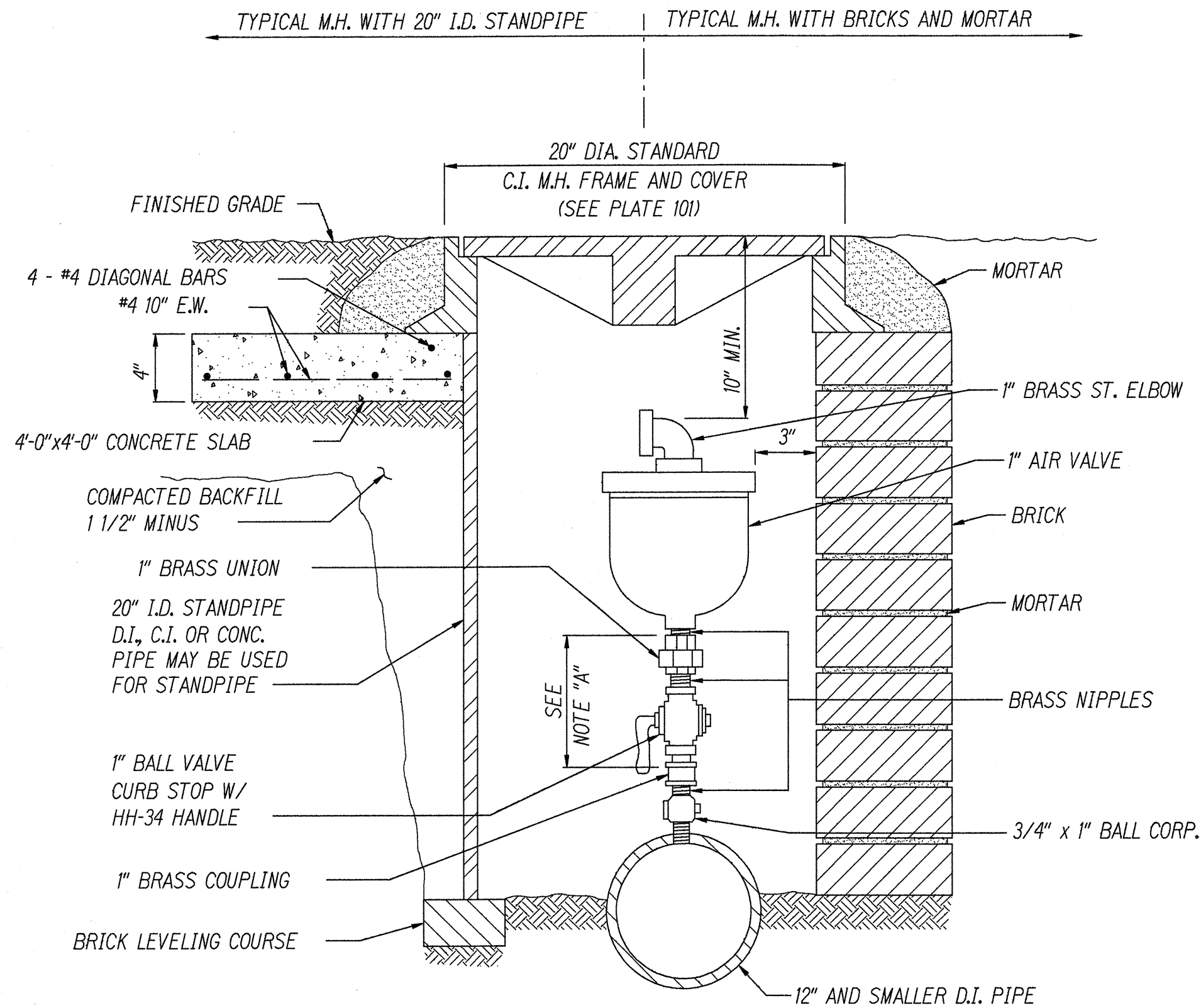
END PLUG ANCHOR
NO SCALE



NOTE:

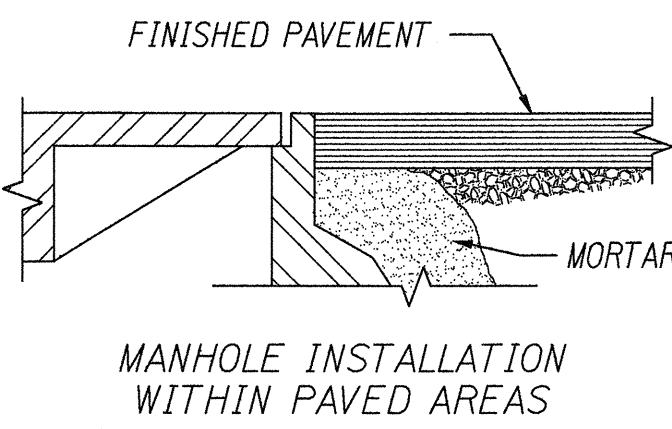
THE LIMIT OF PIPE CUSHION BACKFILL AROUND THE VALVE SHALL BE THE WIDTH X 4 FT. ON EACH VALVE AND FILL TO 8" BELOW FINISH GRADE. PAYMENT FOR PIPE CUSHION BACKFILL SHALL BE INCIDENTAL TO VALVE INSTALLATION.

VALVE BOX INSTALLATION
FOR GATE VALVE
(D.W.S. CO. OF HAWAII - STANDARD DETAIL #13)
NO SCALE



NOTES:

- ELIMINATE CURB STOP AND COUPLING WHERE PIPE BURY (TOP OF PIPE TO FINISHED GRADE) IS LESS THAN 30 INCHES. CONNECT UNION TO BALL CORP. AND ADJUST OVERALL HEIGHT ACCORDINGLY WITH BRASS NIPPLE.
- FOR INSTALLATIONS WITHIN PAVED AREAS SEE DETAIL AT RIGHT.



1" AIR VALVE UNIT DETAIL
(D.W.S. CO. OF HAWAII - STANDARD DETAIL #22)
NO SCALE

DATE	DESIGNED BY	CHECKED BY	APPROVED BY
10/1/00	J. L. HAWAII	J. L. HAWAII	J. L. HAWAII
10/1/00	J. L. HAWAII	J. L. HAWAII	J. L. HAWAII
10/1/00	J. L. HAWAII	J. L. HAWAII	J. L. HAWAII
10/1/00	J. L. HAWAII	J. L. HAWAII	J. L. HAWAII
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10/1/00	J. L. HAWAII	J. L. HAWAII	J. L. HAWAII
10/1/00	J. L. HAWAII	J. L. HAWAII	J. L. HAWAII

DEPARTMENT OF WATER SUPPLY	
APPROVED:	
MANAGER, D.W.S. (For Water System Construction)	
1/19/00	DATE

STATE OF HAWAII
DEPARTMENT OF TRANSPORTATION
HIGHWAYS DIVISION
WATERLINE DETAILS
QUEEN KA'AHUMANU HIGHWAY
INTERSECTION IMPROVEMENTS TO
KALOKO-HONOKOHAU NATIONAL HISTORICAL PARK
PROJECT NO. FLH-019-1(26)
Scale: As Shown
Date: Dec., 1999
SHEET No. 3 OF 3 SHEETS

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