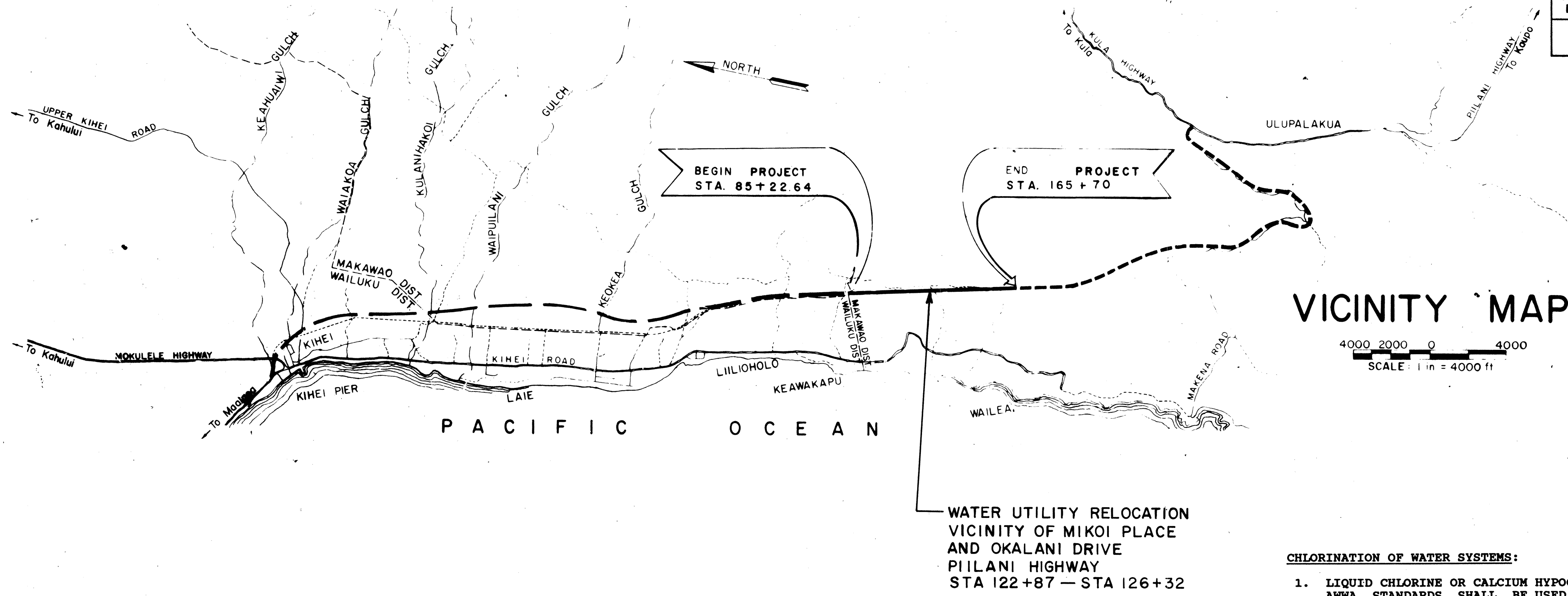


| FED. ROAD DIST. NO. | STATE | FED. AID PROJ. NO. | FISCAL YEAR | SHEET NO. | TOTAL SHEETS |
|---------------------|-------|--------------------|-------------|-----------|--------------|
| HAWAII | HAW. | F-031-1(1) | 1987 | 38 | 69 |

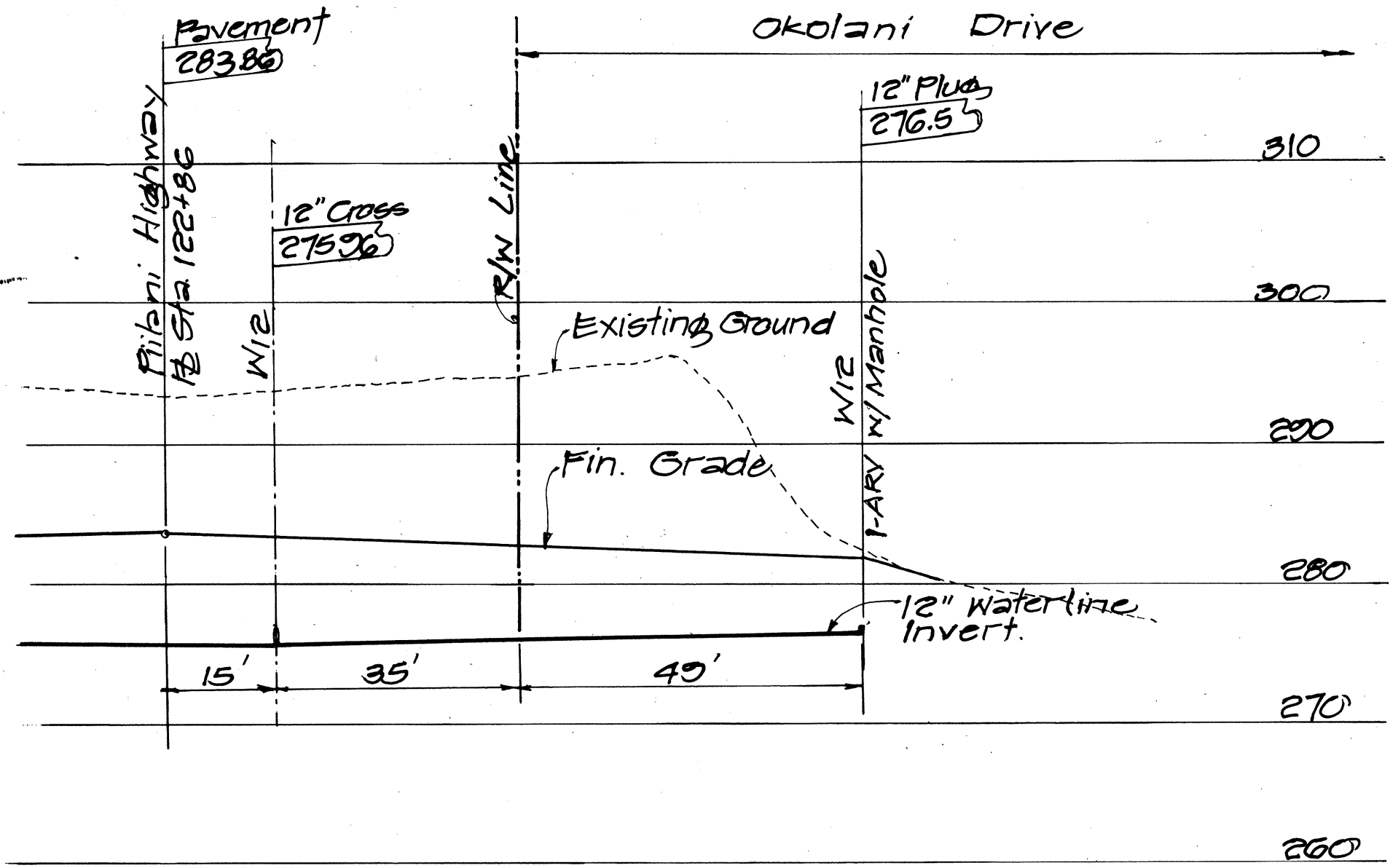


VICINITY MAP

4000 2000 0 4000
SCALE: 1 in = 4000 ft

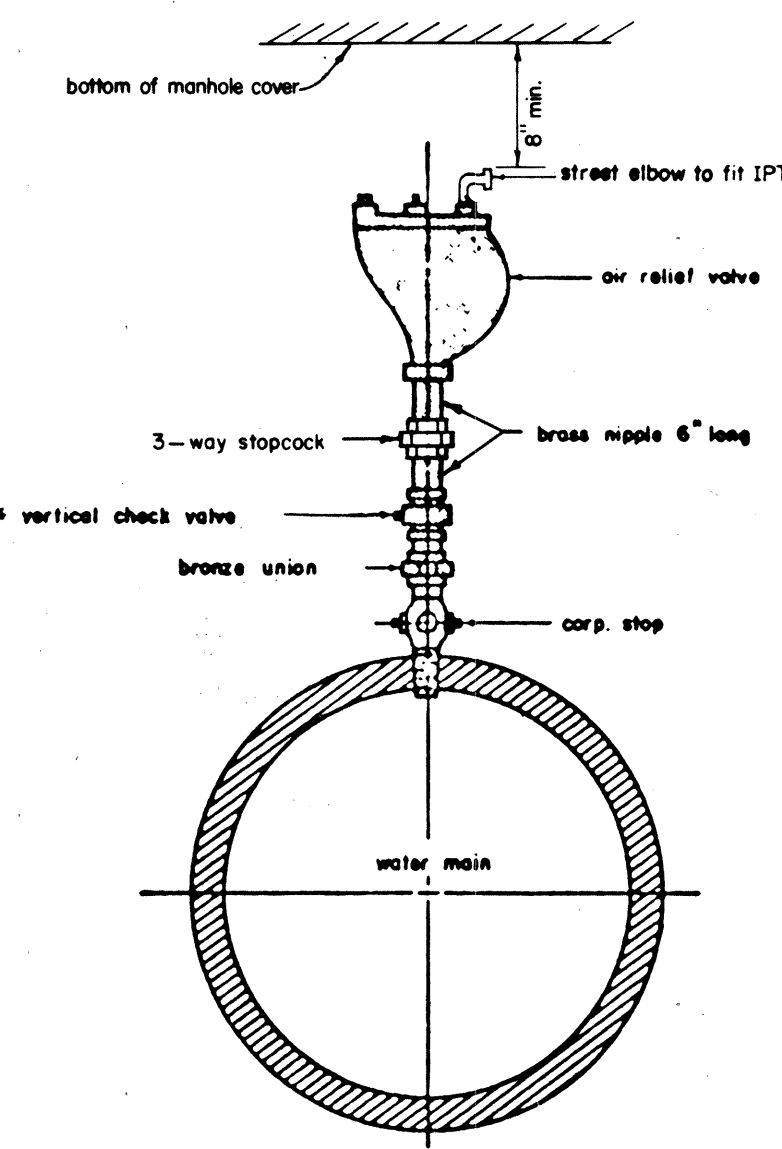
CHLORINATION OF WATER SYSTEMS:

1. LIQUID CHLORINE OR CALCIUM HYPOCHLORITE, CONFIRMING TO AWWA STANDARDS SHALL BE USED FOR THE CHLORINATION OF THE PROJECT.
2. PRIOR TO CHLORINATION, THE PROJECT SHALL BE THOROUGHLY FLUSHED.
3. THE INTERIOR SURFACES OF THE PROJECT SHALL BE EXPOSED TO THE CHLORINATION SOLUTION FOR A MINIMUM OF 24 HOURS AND THE CHLORINE RESIDUAL SHALL NOT BE LESS THAN 10 PPM AFTER SUCH TIME.
4. SHOULD CALCIUM HYPOCHLORITE BE USED, NO SOLID AND/OR UNDISSOLVED PORTION OF THE COMPOUND SHALL BE INTRODUCED INTO ANY SECTION OF THE PROJECT TO BE CHLORINATED.
5. AT THE END OF THE 24 HOUR PERIOD, REPRESENTATIVE SAMPLES SHALL BE TAKEN AND ANALYZED TO ASSURE A CHLORINE RESIDUAL OF AT LEAST 10 PPM.
6. 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 A COMPARABLE CHLORINE RESIDUAL AS THE WATER IN THE EXISTING SYSTEM.
7. ON THE FIRST AND THIRD DAYS FOLLOWING THE ACCEPTABLE FLUSHING OF THE PROJECT, SAMPLES FROM REPRESENTATIVE POINTS IN THE PROJECT SHALL BE TAKEN AND SUBJECT TO MICROBIOLOGICAL TESTS. POSITIVE RESULTS WILL NOT BE ACCEPTABLE AND THE PROCESS WILL BE REPEATED.
8. ANALYZES FOR RESIDUAL CHLORINE SHALL BE MADE IN ACCORDANCE WITH "STANDARD METHODS FOR THE EXAMINATION OF WATER AND WASTEWATER", AMERICAN PUBLIC HEALTH ASSOCIATION, 13TH EDITION, PP. 117-123.
9. MICROBIOLOGICAL TESTS SHALL BE MADE IN ACCORDANCE WITH "STANDARD METHODS FOR THE EXAMINATION OF WATER AND WASTEWATER", AMERICAN PUBLIC HEALTH ASSOCIATION, 13TH EDITION, PP. 662-688.
10. ALL MEASUREMENTS FOR CHLORINE RESIDUAL AND MICROBIOLOGICAL TESTS SHALL BE PERFORMED BY A LABORATORY APPROVED BY THE DIRECTOR.
11. THE DEVELOPER/CONTRACTOR SHALL BE RESPONSIBLE FOR ALL COSTS ASSOCIATED WITH ALL OF THE FOREGOING.



12" WATERLINE PROFILE AT OKALANI DRIVE

SCALE: HORIZ. 1" = 20'
VERT. 1" = 10'



STANDARD CONNECTION FOR AIR RELIEF VALVE

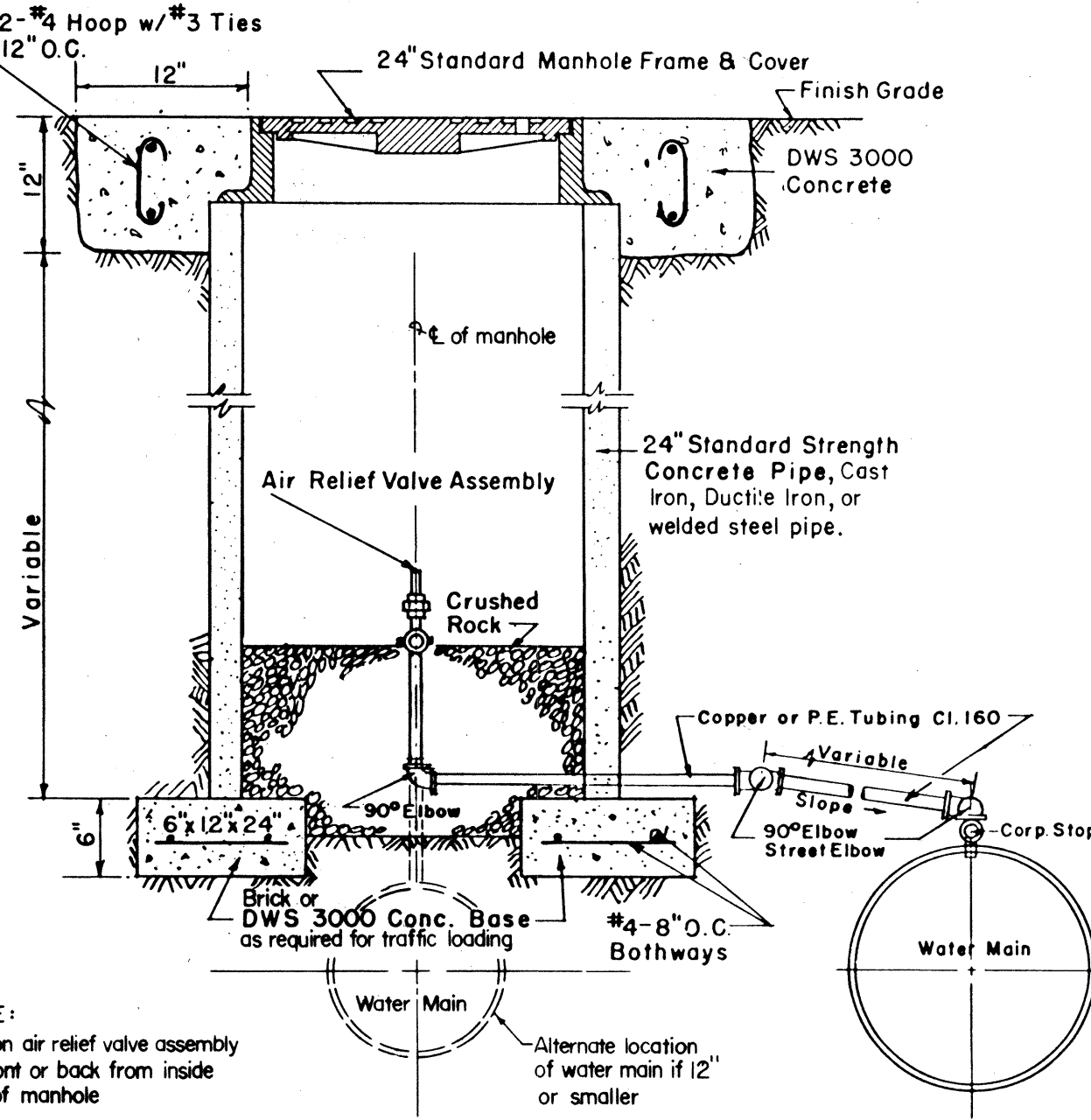
NOTE
For 2" air relief valve, size of corp. stop shall be 1 1/2" x 2". Union, vertical check valve and nipple shall be 2".
Vertical check valve required when air relief valve is immersed in water.
Provide type "F" manhole (PLATE 25) for buried installation.

| |
|------------|
| 1987 |
| 1985 |
| REVISION |
| INTERIM 23 |

AIR RELIEF VALVE CONNECTION IN MANHOLE

SCALE: NTS

STANDARD DETAILS



NOTE:
Position air relief valve assembly 4" front or back from inside wall of manhole

SECTION THROUGH MANHOLE

| |
|------------|
| 1987 |
| 1985 |
| REVISION |
| INTERIM 25 |

AIR RELIEF VALVE MANHOLE

SCALE: NTS

STANDARD DETAILS

TRANS - MERIDIAN
ENGINEERS - SURVEYORS
854 S. BERETANIA STREET
HONOLULU, HAWAII 96813

MELVIN E. LEVINE
REGISTERED PROFESSIONAL ENGINEER
No. 455-C
HAWAII, U.S.A.

STATE OF HAWAII
DEPARTMENT OF TRANSPORTATION
HIGHWAYS DIVISION

WATER UTILITY PLAN

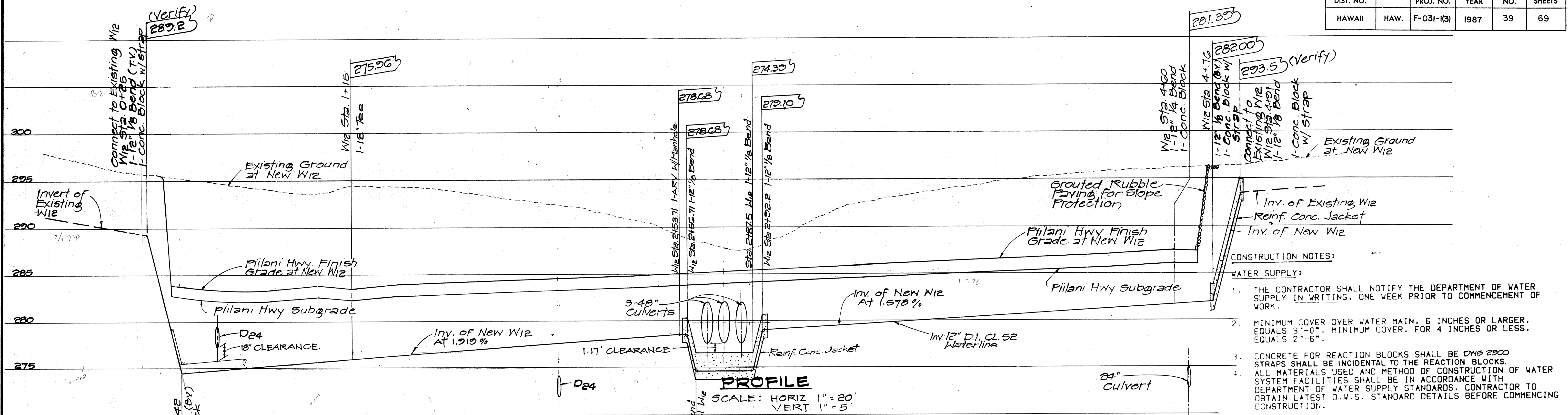
PIILANI HIGHWAY
VICINITY OF KILOHANA STREET
TO WAILEA IKE DRIVE
FA PROJECT F-031-1(3)
SCALE: AS SHOWN DATE: JAN. 1988

SHEET No. 1 OF 2 SHEETS

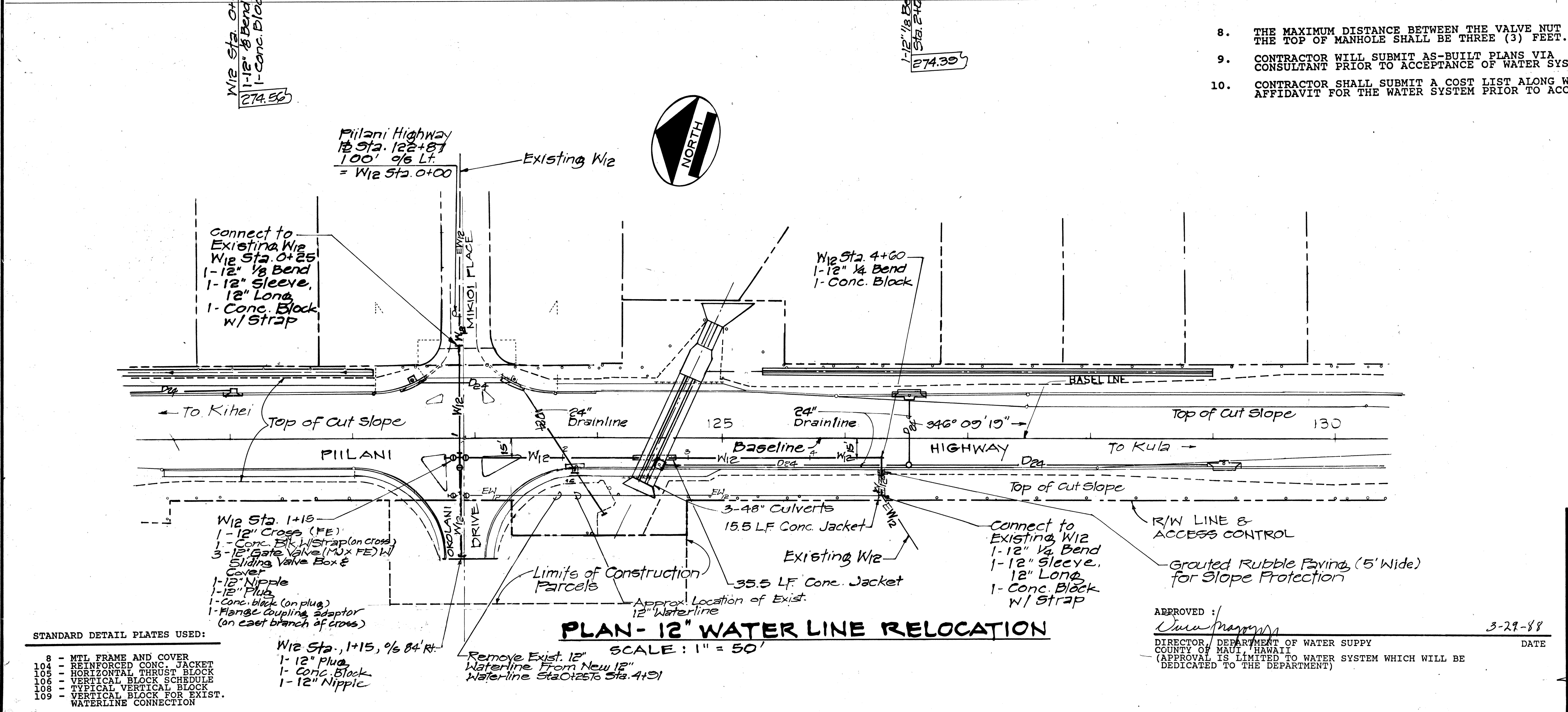
APPROVED: *[Signature]* 3-21-88
DIRECTOR, DEPARTMENT OF WATER SUPPLY
COUNTY OF MAUI, HAWAII
(APPROVAL IS LIMITED TO WATER SYSTEM WHICH WILL BE DEDICATED TO THE DEPARTMENT)

| | |
|-------------------|-------|
| DATE | ***** |
| SURVEY PLOTTED BY | |
| DRAWN BY | |
| CHECKED BY | |
| NOTE BOOK | |
| NO. | |

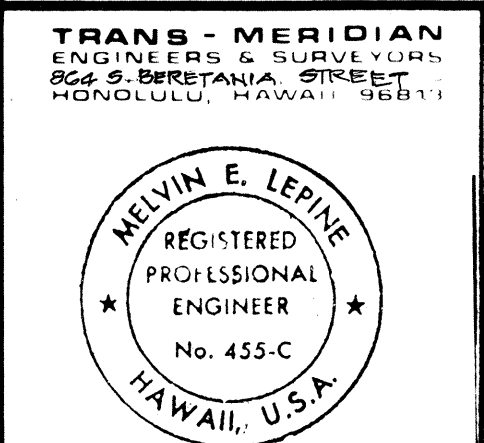
| FED. ROAD DIST. NO. | STATE | FED. AID PROJ. NO. | FISCAL YEAR | SHEET NO. | TOTAL SHEETS |
|---------------------|-------|--------------------|-------------|-----------|--------------|
| HAWAII | HAW. | F-031-1(3) | 1987 | 39 | 69 |



- CONSTRUCTION NOTES:
- WATER SUPPLY:
1. THE CONTRACTOR SHALL NOTIFY THE DEPARTMENT OF WATER SUPPLY IN WRITING, ONE WEEK PRIOR TO COMMENCEMENT OF WORK.
 2. MINIMUM COVER OVER WATER MAIN, 6 INCHES OR LARGER. EQUALS 3'-0". MINIMUM COVER, FOR 4 INCHES OR LESS, EQUALS 2'-6".
 3. CONCRETE FOR REACTION BLOCKS SHALL BE DWS 2500 STRAPS SHALL BE INCIDENTAL TO THE REACTION BLOCKS.
 4. ALL MATERIALS USED AND METHOD OF CONSTRUCTION OF WATER SYSTEM FACILITIES SHALL BE IN ACCORDANCE WITH DEPARTMENT OF WATER SUPPLY STANDARDS. CONTRACTOR TO OBTAIN LATEST D.W.S. STANDARD DETAILS BEFORE COMMENCING CONSTRUCTION.
 5. THE EXACT DEPTH AND LOCATION OF EXISTING WATERLINES, SERVICE LATERALS AND OTHER FACILITIES ARE NOT KNOWN. IT SHALL BE THE CONTRACTOR'S RESPONSIBILITY TO LOCATE SAME PRIOR TO TRENCHING OF NEW WATERLINE. THE COST OF LOWERING, RELOCATING OR ADJUSTING EXISTING WATERLINE SERVICE LATERALS (UNLESS OTHERWISE NOTED) AND OTHER UTILITIES SHALL BE CONSIDERED INCIDENTAL TO THE COST OF THE NEW WATERLINE AND WILL NOT BE PAID FOR SEPARATELY. FACILITIES DAMAGED BY THE CONTRACTOR'S OPERATION SHALL BE REPAIRED IMMEDIATELY BY THE CONTRACTOR AT HIS EXPENSE.
 6. CONNECTION TO DEPARTMENT OF WATER SUPPLY SYSTEM.
 - A. THE CONTRACTOR SHALL VERIFY THE EXACT LOCATION, DEPTH, TYPE AND CONDITION OF THE EXISTING LINE BEFORE ORDERING MATERIALS FOR THE HOOKUP. HOWEVER, HE SHALL CHECK WITH THE DEPARTMENT OF WATER SUPPLY BEFORE EXCAVATING FOR VERIFICATION PURPOSES. HE SHALL BE RESPONSIBLE FOR FURNISHING THE CORRECT FITTINGS, ADAPTORS, NIPPLES AND OTHER MATERIALS, AS REQUIRED, FOR THE HOOKUP.
 - B. WHENEVER FEASIBLE, MECHANICAL JOINT FITTINGS SHALL BE USED.
 - C. AUTHORIZED DEPARTMENT OF WATER SUPPLY PERSONNEL WILL MAKE THE FINAL CONNECTION TO THE EXISTING LINE. THE CONTRACTOR SHALL BE RESPONSIBLE FOR ALL COSTS INCURRED BY THE DEPARTMENT OF WATER SUPPLY FOR SAID WORK, INCLUDING THE COST OF PRESSURE TESTING.
 - D. THE CONTRACTOR SHALL BE RESPONSIBLE FOR FURNISHING ALL MATERIAL, EQUIPMENT AND LABOR FOR CHLORINATION, TRENCH EXCAVATION, BACKFILLING, PAVING, AND OTHER WORK NECESSARY TO COMPLETE THE HOOKUP, AS DIRECTED BY AND TO THE SATISFACTION OF THE DEPARTMENT OF WATER SUPPLY.
 7. THE CONTRACTOR SHALL SUBMIT MATERIALS LIST TO DEPARTMENT OF WATER SUPPLY FOR APPROVAL PRIOR TO CONSTRUCTION.



APPROVED: *[Signature]* DATE: 3-29-88
DIRECTOR, DEPARTMENT OF WATER SUPPLY
COUNTY OF MAUI, HAWAII
(APPROVAL IS LIMITED TO WATER SYSTEM WHICH WILL BE DEDICATED TO THE DEPARTMENT)



STATE OF HAWAII
DEPARTMENT OF TRANSPORTATION
HIGHWAYS DIVISION

WATER UTILITY PLAN

PIILANI HIGHWAY
VICINITY OF KILOHANA STREET
TO WALEA IKE DRIVE
FA PROJECT F-031-1(3)
SCALE: AS SHOWN DATE: JAN. 1988

SHEET No. 2 OF 2 SHEETS

| | |
|-------------------|-------|
| DATE | |
| SURVEY PLOTTED BY | |
| DRAWN BY | |
| TRACED BY | |
| NOTED BY | |
| CHECKED BY | |

- STANDARD DETAIL PLATES USED:
- 108 - MTL FRAME AND COVER
 - 109 - REINFORCED CONC. JACKET
 - 110 - HORIZONTAL THRUST BLOCK
 - 111 - VERTICAL BLOCK SCHEDULE
 - 112 - TYPICAL VERTICAL BLOCK
 - 113 - VERTICAL BLOCK FOR EXIST. WATERLINE CONNECTION
- W12 Sta. 1+15, 1/2 84' Rt.
1- 12" Plug
1- Conc. Block
1- 12" Nipple