

COUNTY OF KAUAI, DEPARTMENT OF WATER

JOB NO. 97-6 REHABILITATION OF 27" STEEL PIPE HANAPEPE-ELEELE WATER SYSTEM

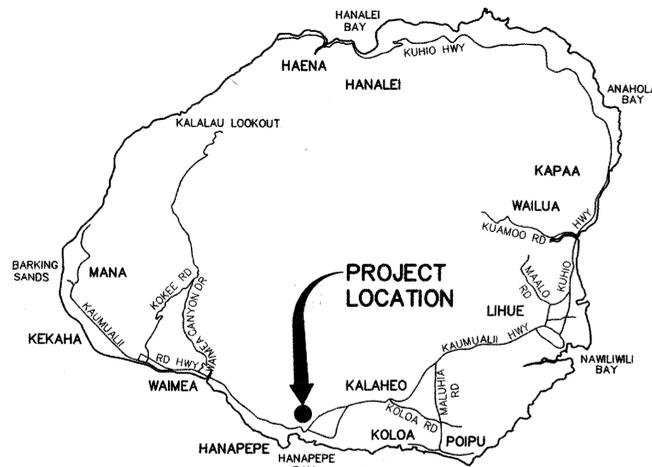
HANAPEPE,

KAUAI,

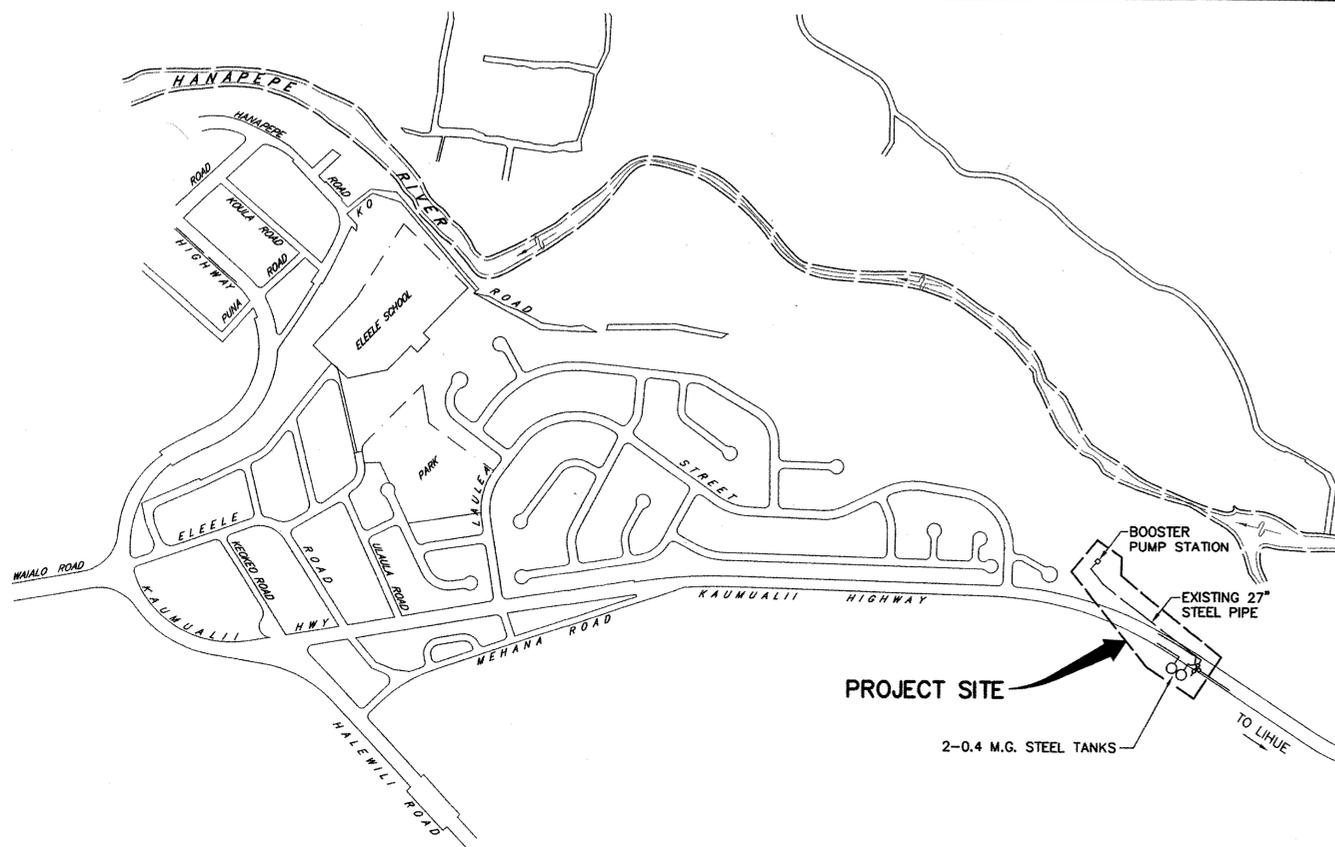
HAWAII

PREPARED BY:

HAWAII PACIFIC ENGINEERS, INC.
CONSULTING CIVIL ENGINEERS
1132 BISHOP STREET, SUITE 1003
HONOLULU, HAWAII 96813-2830



ISLAND OF KAUAI
NOT TO SCALE



VICINITY MAP
NOT TO SCALE

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AS-BUILT DRAWINGS

CERTIFIED BY: OCEANIC CO. INC.
CONTRACTOR'S NAME AND COMPANY (PRINTED)
[Signature] DATE: 4/15/04

SUBMITTED BY: HAWAII PACIFIC ENGINEERS, INC.
COMPANY NAME (PRINTED)
[Signature] DATE: 4/15/04

APPROVED:

[Signature]
MANAGER AND CHIEF ENGINEER, DEPARTMENT OF WATER DATE: 1/29/02

[Signature]
ADMINISTRATOR, HIGHWAYS DIVISION
STATE DEPARTMENT OF TRANSPORTATION (APPROVAL
GRANTED FOR WORK WITHIN STATE RIGHT-OF-WAY ONLY
I.D. NO. _____ LETTER OF APPROVAL NO. HWY-100-_____
DATED _____



THIS WORK WAS
PREPARED BY ME
OR UNDER MY
SUPERVISION
CONSTRUCTION OF
THIS PROJECT
WILL BE UNDER
MY CONTROL

T-1

PROJECT NO. _____

DATE: _____

"AS-BUILT"

LHF
PM: DESIGN: KTM/CDK
OPER: CDK/FAJBY
REVISED: 06/14/01

DATE: 12/13/00
SCALE: 1" = 1'
FILE: 0024-03

GENERAL NOTES:

- 1. ALL CONSTRUCTION, INCLUDING MATERIALS, SHALL BE DONE IN ACCORDANCE WITH THE "HAWAII STANDARD SPECIFICATIONS FOR ROAD, BRIDGE AND PUBLIC WORKS CONSTRUCTION, 1994" AND "STANDARD DETAILS FOR PUBLIC WORKS CONSTRUCTION, COUNTY OF KAUAI", DATED SEPTEMBER 1994.
2. ASSUMED COORDINATES ARE BASED ON P.C. STA. 28+84.32, ELEELELANI SUBDIVISION, PHASE 2. AZIMUTHS ARE REFERRED TO "PUOLO".
3. ELEVATIONS SHOWN ON THE PLANS ARE BASED ON MEAN SEA LEVEL DATUM.
4. PRIOR TO CONSTRUCTION, THE CONTRACTOR SHALL CONTACT THE VARIOUS UTILITY AGENCIES FOR LOCATION OF EXISTING UTILITIES WITHIN THE PROJECT LIMITS. THE CONTRACTOR SHALL LOCATE AND PROTECT ALL EXISTING UTILITIES WHETHER OR NOT SHOWN ON THE PLANS. ANY COSTS INCURRED BY DAMAGES TO EXISTING UTILITIES WILL BE BORNE BY THE CONTRACTOR.
5. ALL EXISTING UTILITIES, WHETHER OR NOT SHOWN ON THE PLANS, SHALL BE PROTECTED AT ALL TIMES BY THE CONTRACTOR UNLESS SPECIFIED ON THE PLANS TO BE ABANDONED.
6. WHEREVER CONNECTIONS TO EXISTING UTILITIES ARE SHOWN ON THE PLANS, THE CONTRACTOR SHALL EXPOSE THE EXISTING LINES PRIOR TO EXCAVATION OF THE MAIN TRENCHES TO VERIFY THEIR LOCATION AND DEPTH.
7. NO WORK SHALL BE DONE BETWEEN THE HOURS OF 5:00 PM AND 7:00 AM WITHOUT WRITTEN AUTHORIZATION FROM THE ENGINEER.
8. THE CONTRACTOR SHALL MAKE PROPER ARRANGEMENTS FOR THE USE OF UTILITIES SUCH AS ELECTRICITY, WATER, ETC. AND SHALL BE RESPONSIBLE FOR THE PAYMENT OF ALL COSTS RESULTING FROM SUCH USAGE.
9. THE CONTRACTOR SHALL BE RESPONSIBLE FOR CONTRACTING A LICENSED SURVEYOR, REGISTERED IN THE STATE OF HAWAII, TO DO THE CONSTRUCTION STAKEOUTS.
10. THE CONTRACTOR SHALL SUBMIT THE NAME TO THE DEPARTMENT OF WATER OF ITS AUTHORIZED SUPERINTENDENT ON THE JOB.

GENERAL CONSTRUCTION NOTES:

- 1. LOCATIONS OF ALL UNDERGROUND UTILITIES AND PIPES SHOWN ON THE PLANS ARE APPROXIMATE ONLY. THE CONTRACTOR SHALL VERIFY THE EXACT LOCATIONS AND INVERTS OF THE EXISTING UTILITIES AND SHALL BE RESPONSIBLE FOR ANY DAMAGE TO THEM.
2. ANY PORTION OF EXISTING UTILITIES THAT MUST BE REMOVED OR OTHERWISE DISTURBED TO ACCOMPLISH THE WORK CALLED FOR ON THE PLANS SHALL BE RECONSTRUCTED, REPLACED OR RESTORED TO THEIR ORIGINAL CONDITION AT THE CONTRACTOR'S EXPENSE.
3. ALL DAMAGED PAVEMENT WITHIN THE COUNTRY'S RIGHT-OF-WAY SHALL BE RESTORED TO ITS ORIGINAL CONDITION IN ACCORDANCE WITH COUNTY OF KAUAI, "STANDARD SPECIFICATIONS FOR PUBLIC WORKS CONSTRUCTION", DATED SEPTEMBER 1986. ALL COSTS INVOLVED SHALL BE CONSIDERED INCIDENTAL TO THE CONTRACT.

GRADING NOTES:

- 1. ALL GRADING WORK SHALL BE DONE IN ACCORDANCE WITH THE "GRADING ORDINANCE NO. 695", COUNTY OF KAUAI.
2. HOURS OF OPERATIONS - 7:00 A.M. TO 5:00 P.M. DAILY EXCEPT SATURDAYS, SUNDAYS AND HOLIDAYS AND AS AUTHORIZED IN WRITING BY THE ENGINEER.

TEMPORARY DUST CONTROL NOTES:

- 1. THE GRADED OR PROJECT SITE THAT IS CLEARED OF VEGETATION SHALL BE KEPT DAMP FOR SEVEN (7) DAYS A WEEK. AT THE END OF EACH DAY, THE SITE SHALL BE SUFFICIENTLY DAMPENED SO THAT THE SITE WILL REMAIN MOISTENED DURING THE NIGHT.
2. THE CONTRACTOR SHALL CONDUCT HIS OPERATIONS SO THAT EXCAVATION, EMBANKMENT AND IMPORTED MATERIAL SHALL BE DAMPENED TO PREVENT DUST PROBLEMS.

ENVIRONMENTAL PROTECTIONS NOTES:

- 1. IN ACCORDANCE WITH CHAPTER 11-60.1, AIR POLLUTION CONTROL, TITLE 11, STATE ADMINISTRATIVE RULES, THE CONTRACTOR SHALL BE RESPONSIBLE FOR ENSURING THAT EFFECTIVE CONTROL MEASURES ARE PROVIDED TO MINIMIZE OR PREVENT ANY VISIBLE DUST EMISSION CAUSED BY THE CONSTRUCTION WORK FROM IMPACTING THE SURROUNDING AREAS INCLUDING THE OFF-SITE ROADWAYS USED TO ENTER/EXIT THE PROJECT. THESE MEASURES INCLUDE BUT ARE NOT LIMITED TO THE USE OF WATER WAGONS, SPRINKLER SYSTEMS, DUST FENCES, ETC.

ENVIRONMENTAL PROTECTIONS NOTES (CONTINUATION):

- 2. IN ACCORDANCE WITH CHAPTER 11-55, WATER POLLUTION CONTROL AND CHAPTER 11-54, WATER QUALITY STANDARDS, TITLE 11, STATE ADMINISTRATIVE RULES, THE CONTRACTOR SHALL BE RESPONSIBLE FOR ENSURING THAT THE BEST MANAGEMENT PRACTICE (BMP) TO MINIMIZE OR PREVENT THE DISCHARGE OF SEDIMENTS, DEBRIS, AND OTHER WATER POLLUTANT INTO STATE WATERS IS PROVIDED.
3. IN ACCORDANCE WITH CHAPTER 11-58.1, SOLID WASTE MANAGEMENT CONTROL, TITLE 11, STATE ADMINISTRATIVE RULES, THE CONTRACTOR SHALL BE RESPONSIBLE FOR ENSURING THAT GRUB MATERIAL, DEMOLITION WASTE AND CONSTRUCTION WASTE GENERATED BY THE PROJECT ARE DISPOSED OF IN A MANNER OR AT A SITE APPROVED BY THE STATE DEPARTMENT OF HEALTH. DISPOSAL OF ANY OF THESE WASTES BY BURNING IS PROHIBITED.
4. THE CONTRACTOR SHALL BE RESPONSIBLE FOR OBTAINING ALL APPLICABLE PERMITS FROM THE DEPARTMENT OF HEALTH INCLUDING BUT NOT LIMITED TO NATIONAL POLLUTION DISCHARGE ELIMINATION SYSTEM (NPDES) PERMITS FOR STORM WATER HYDROSTATIC TEST AND DEWATERING DISCHARGES PRIOR TO COMMENCING CONSTRUCTION.

WATER NOTES:

- 1. UNLESS OTHERWISE SPECIFIED, ALL MATERIALS AND CONSTRUCTION OF WATER FACILITIES AND APPURTENANCES SHALL BE IN ACCORDANCE WITH THE "WATER SYSTEM STANDARDS" VOLUME I AND VOLUME II, 1985, AS ADOPTED BY THE DEPARTMENT OF WATER, COUNTY OF KAUAI, INCLUDING ALL SUBSEQUENT AMENDMENTS AND ADDITIONS.
2. THE CONTRACTOR SHALL ARRANGE A PRE-CONSTRUCTION CONFERENCE AT LEAST 10 DAYS BEFORE CONSTRUCTION AND SHALL NOTIFY THE DEPARTMENT OF WATER AT LEAST 3 WORKING DAYS PRIOR TO THE START OF CONSTRUCTION.
3. THE CONTRACTOR SHALL SUBMIT THE NAME OF ITS AUTHORIZED SUPERINTENDENT ON THE JOB. THE CONTRACTOR SHALL ALSO SUBMIT THE NAMES AND TELEPHONE NUMBERS OF AT LEAST THREE (3) PERSONS TO CONTACT IN CASE OF EMERGENCY DURING NON-WORKING HOURS.
4. THE CONTRACTOR SHALL NOTIFY THE DEPARTMENT OF WATER AT LEAST 24 HOURS PRIOR TO ANY TRENCHING, PIPE LAYING, BACKFILLING, TESTING OR CHLORINATION TO INSURE THAT INSPECTIONAL SERVICES WILL BE AVAILABLE.
5. ALL MATERIALS (PIPE, PIPE LUBRICANTS, PAINTS, SEALANTS, FORM OIL, CONCRETE ADMIXTURES, ETC.) IN DIRECT CONTACT WITH THE POTABLE WATER SHALL HAVE NATIONAL SANITATION FOUNDATION (NSF) APPROVALS. THE CONTRACTOR SHALL SUBMIT THESE APPROVALS TO THE DEPARTMENT OF WATER FOR REVIEW AND APPROVAL PRIOR TO ITS APPLICATION.
6. THE CONTRACTOR SHALL VERIFY IN THE FIELD THE LOCATION OF THE EXISTING WATER MAINS AND APPURTENANCES. THE CONTRACTOR SHALL EXPOSE THE EXISTING WATER MAIN PRIOR TO TRENCHING. EXCAVATION AROUND ANY EXISTING WATER MAIN SHALL BE DONE BY HAND.
7. WHERE A UTILITY IS FOUND TO BE IN CONFLICT WITH THE WATERLINE, THE CONTRACTOR SHALL NOTIFY THE ENGINEER PRIOR TO MAKING ANY ADJUSTMENT. ANY DAMAGE TO ANY EXISTING UTILITY NOT IN CONFLICT WITH THE INSTALLATION OF THE WATERLINE SHALL BE REPAIRED BY THE CONTRACTOR AT HIS OWN EXPENSE.
8. ACCESS TO EXISTING FIRE HYDRANTS, VALVES AND WATER METERS SHALL NOT BE HINDERED BY THE CONTRACTOR AT ANYTIME.
9. THE CONTRACTOR SHALL WHENEVER NECESSARY, PROPERLY SHEET AND BRACE ALL EXCAVATIONS TO RENDER IT SECURE AND SHALL REMOVE ALL SUCH SHEETING AND BRACING BEFORE COMPLETION OF THE BACKFILL.
10. THERE SHALL BE NO PHYSICAL CONNECTION BETWEEN A PUBLIC OR PRIVATE POTABLE WATER SYSTEM AND A NON-POTABLE WATER SYSTEM, SEWER, OR APPURTENANCE THERETO WHICH COULD PERMIT THE PASSAGE OF ANY SEWAGE OR POLLUTED WATER INTO THE POTABLE WATER SUPPLY.
11. TRENCH EXCAVATION, BACKFILLING IN LIFTS, AND REPAVING SHALL CONFORM TO THE HAWAII STANDARD SPECIFICATIONS FOR ROAD, BRIDGE, AND PUBLIC WORKS CONSTRUCTION, 1994.

- 12. PLASTIC PIPES FOR SERVICE LATERALS SHALL BE PVC 1120, OR PVC 1200 SDR 21, CLASS 200 WITH NSF SEAL OF APPROVAL. PLASTIC PIPES FOR SERVICE LATERALS SHALL BE OF THE SOLVENT-WELDED TYPE.
13. METALLIZED TAPE SHALL BE PLACED ABOVE ALL INSTALLED WATER MAINS. METALLIZED TAPE SHALL BE INSTALLED A MAXIMUM OF 24" AND A MINIMUM OF 12" BELOW FINISHED GRADE. IN NO INSTANCE WILL THE TAPE BE INSTALLED IN THE ROADWAY STRUCTURE INCLUDING SELECT BORROW, SUBBASE, BASE COURSE OR WEARING SURFACE. THE TAPE SHALL BE INSTALLED ON TOP OF A COMPACTED LAYER OF TRENCH BACKFILL MATERIAL AND PLACED AS CLOSE AS PRACTICAL TO A POSITION DIRECTLY ABOVE THE INSTALLED PIPELINE.
14. METALLIZED TAPE SHALL BE BLUE AND IMPRINTED WITH THE FOLLOWING: "CAUTION WATER LINE BELOW". TAPE SHALL BE TWO INCHES IN WIDTH AND SHALL BE READILY DETECTABLE WITH ANY STANDARD PIPE OR CABLE LOCATOR.
15. ALL FIRE HYDRANTS SHALL BE CLEANED AFTER INSTALLATION AND PAINTED WITH TWO COATS OF PAINT. PAINT SHALL BE DUPONT DOLOX HIGH-VISIBILITY YELLOW, KEM LUSTRE ENAMEL LIGHT YELLOW #6512 OR EQUAL.

WATER NOTES (CONTINUATION):

- 16. UNLESS OTHERWISE DIRECTED, PRIOR TO THE CONNECTION OF ANY PIPELINE TO THE EXISTING MAIN, THE PIPELINE INSTALLED SHALL BE PRESSURE TESTED, CLEANED, CHLORINATED, FLUSHED, AND SAMPLED IN ACCORDANCE WITH THE "WATER SYSTEM STANDARDS" AND/OR IN ACCORDANCE WITH THE PROCEDURES OUTLINED BELOW IN NOTES 17 THROUGH 22.
17. ALL WATER MAINS AND APPURTENANCES SHALL BE SUBJECT TO A 150 PSI HYDROSTATIC PRESSURE TEST FOR EITHER:
A. ONE (1) HOUR WITH A DROP IN PRESSURE OF NO MORE THAN THREE (3) PSI. PIPE AND JOINTS MAY BE BACKFILLED.
B. THIRTY (30) MINUTES WITH A DROP IN PRESSURE OF NO MORE THAN TEN (10) PSI. ALL JOINTS OF THE PIPE MUST BE EXPOSED DURING THE TEST.
18. CLEANING SHALL BE BY THE USE OF "PIGS" INTRODUCED INTO THE PIPELINE AND RUN COMPLETELY THROUGH ALL INSTALLED PIPELINES EXCLUDING BRANCH LINES FOR FIRE HYDRANTS AND SERVICE LATERALS. "PIGS" SHALL CONSIST OF A CYLINDRICAL PIECE OF POLYURETHANE FOAM WITH A DENSITY RANGE OF 1.25 TO 1.45 POUNDS PER CUBIC FOOT. FOR WATERLINES UP TO 8" IN DIAMETER, THE DIAMETER OF THE PIG SHALL BE 2" LARGER THAN THE PIPE TO BE CLEANED AND 18" LONG. FOR 12" DIAMETER WATERLINES, THE PIG SHALL BE 16" IN DIAMETER AND 30" LONG. FOR 16" DIAMETER WATERLINES, THE PIG SHALL BE 20" IN DIAMETER AND 36" LONG.
19. CHLORINATION OF THE INSTALLED PIPELINE SHALL BE IN ACCORDANCE WITH PART III SECTION 1.12.17 OF THE "WATER SYSTEM STANDARDS." THE CONTRACTOR SHALL BE RESPONSIBLE FOR THE PROPER DISPOSAL OF CHLORINATED WATER TO SAFEGUARD PUBLIC HEALTH AND ENVIRONMENT IN ACCORDANCE WITH APPLICABLE STATE DEPARTMENT OF HEALTH REQUIREMENTS.
A. THE CONTRACTOR SHALL CONTACT THE DEPARTMENT OF HEALTH TO DETERMINE IF A NATIONAL POLLUTANT DISCHARGE ELIMINATION SYSTEM (NPDES) PERMIT IS REQUIRED FOR THE DISPOSAL OF WATER USED FOR HYDROTESTING AND CHLORINATION.
B. IF A NPDES PERMIT IS REQUIRED, THE CONTRACTOR SHALL BE RESPONSIBLE FOR OBTAINING THE PERMIT FROM THE DEPARTMENT OF HEALTH.
20. THE INSTALLED PIPELINE SHALL BE FLUSHED AFTER CHLORINATION. WATER SAMPLES SHALL BE TESTED WITH A LOW RANGE CHLORINE TEST KIT TO EVIDENCE FLUSHING.
21. MICROBIOLOGICAL SAMPLES SHALL BE TAKEN IN ALL CASES AFTER ALL CHLORINE HAS BEEN FLUSHED. SAMPLING SHALL BE DONE BY THE CONTRACTOR IN COORDINATION WITH THE DEPARTMENT'S INSPECTOR WITH SAMPLING BOTTLES FURNISHED BY A CERTIFIED LABORATORY. THE DEPARTMENT SHALL DETERMINE THE LOCATIONS OF THE SAMPLING POINT(S) ALONG THE NEW WATER MAIN. UNDER NO CIRCUMSTANCES SHALL THE SAMPLE BOTTLES BE RINSED OUT.
22. TESTING OF THE WATER SAMPLES SHALL BE MADE BY AN APPROVED LABORATORY CERTIFIED BY THE STATE DEPARTMENT OF HEALTH. THE CONTRACTOR MAY CHOOSE TO COLLECT ONE WATER SAMPLE AT EACH SAMPLE POINT OR COLLECT TWO WATER SAMPLES, 24 HOURS APART, AT EACH SAMPLE POINT.
A. IF ONE WATER SAMPLE PER SAMPLE POINT IS COLLECTED, THE DISINFECTING PROCEDURE SHALL BE CONSIDERED ACCEPTABLE AFTER THE LABORATORY TEST RESULTS SHOW THE ABSENCE OF BOTH COLIFORM AND NON-COLIFORM BACTERIA.
B. IF TWO WATER SAMPLES (24 HOURS APART) ARE COLLECTED PER SAMPLE POINT, THE DISINFECTION PROCEDURE SHALL BE CONSIDERED ACCEPTABLE AFTER THE LABORATORY TEST RESULTS SHOW THE ABSENCE OF COLIFORM AND THE NON-COLIFORM BACTERIAL COUNT IS LESS THAN 200 COLONIES PER 100 MIL FOR EACH SAMPLE COLLECTED.
23. ALL CONNECTIONS SHALL BE SCHEDULED IN COORDINATION WITH THE DEPARTMENT OF WATER.
A. AN ADVANCE DEPOSIT IS REQUIRED FOR OPERATING VALVES, FLUSHING LINES AND NOTIFYING CONSUMERS AFFECTED BY A WATER SHUTDOWN DURING CONNECTIONS. THE CONTRACTOR WILL BE CHARGED THE ACTUAL COST. DEPOSIT AND FEES ARE WAIVED FOR PROJECTS CONTRACTED BY THE DEPARTMENT OF WATER.
B. THE CONTRACTOR SHALL PLACE THE DEPOSIT A MINIMUM OF 48-HOURS PRIOR TO THE SCHEDULED CONNECTION DATE.
C. CONNECTIONS SHALL BE SCHEDULED ON TUESDAYS THROUGH THURSDAYS. NO CONNECTIONS SHALL BE SCHEDULED ON MONDAYS, FRIDAYS AND WEEKENDS.
D. ALL MATERIALS SHALL BE ON HAND AND APPROVED BY THE ENGINEER PRIOR TO SCHEDULING THE CONNECTION DATE.
E. PUMPS USED TO DE-WATER THE CONNECTION AREA SHALL BE OPERATED IN THE PRESENCE OF THE ENGINEER PRIOR TO SCHEDULING THE CONNECTION DATE.
F. ALL CONNECTIONS SHALL BE PERFORMED IN THE PRESENCE OF THE ENGINEER.
24. IN ORDER TO PREVENT DAMAGE TO THE POLYETHYLENE ENCASUREMENT FROM EXCESSIVE HANDLING, THE POLYWRAP SHALL BE INSTALLED AROUND THE BARREL OF THE DUCTILE IRON PIPE AT ITS FINAL LOCATION ALONG THE TRENCHLINE. THE POLYETHYLENE ENCASED PIPE SHALL BE LIFTED USING A FABRIC TYPE SLING OR A SUITABLY PADDED CABLE OR CHAIN TO PREVENT DAMAGE TO THE POLYETHYLENE.

AS-BUILT DRAWINGS

CERTIFIED BY: OCEANIC CO., INC. CONTRACTOR'S NAME AND COMPANY (PRINTED) DATE: 4/15/04
SUBMITTED BY: HAWAII PACIFIC ENGINEERS, INC. COMPANY NAME (PRINTED) DATE: 4/15/04

APPROVED:

MANAGER AND CHIEF ENGINEER, DEPARTMENT OF WATER DATE: 4/15/04

JOB 97-6 - REHABILITATION OF 27" STEEL PIPE HANAPEPE-ELEELE WATER SYSTEM HAWAII KAUAI

Table with columns for REVISION, DATE, and DESCRIPTION.

C-1

SHEET 2 OF 13 SHEETS PROJECT NO. DATE:



THIS WORK WAS PREPARED BY ME OR UNDER MY SUPERVISION. CONSTRUCTION OF THIS PROJECT WILL BE UNDER MY SUPERVISION. (CONSENT OF CONSTRUCTION - I, THE ENGINEER, HEREBY CERTIFY THAT I AM A LICENSED PROFESSIONAL ENGINEER IN THE STATE OF HAWAII.)

GENERAL NOTES

DATE: 02/16/01 SCALE: 1" = 1' FILE: 0024-07
LHF: KTN/ODK DESIGN: FAI OPER: FAI REVISION: 08/02/07

NOTES FOR CONSTRUCTION WITHIN STATE RIGHT-OF-WAY:

1. THE CONTRACTOR SHALL OBTAIN A PERMIT TO PERFORM WORK UPON STATE HIGHWAYS FROM THE STATE HIGHWAYS DISTRICT ENGINEER, AT 3060 EWA STREET, RM. 205, PRIOR TO COMMENCEMENT OF WORK WITHIN THE STATE'S HIGHWAY RIGHT-OF-WAY.

2. CONSTRUCTION AND RESTORATION OF ALL EXISTING HIGHWAY FACILITIES WITHIN THE STATE'S RIGHT-OF-WAY, INCLUDING THE LEGAL RELATIONS AND RESPONSIBILITIES TO THE PUBLIC SHALL BE IN ACCORDANCE WITH THE CURRENT STANDARD SPECIFICATIONS FOR ROAD, BRIDGE AND PUBLIC WORKS CONSTRUCTION, AND THE SPECIFICATIONS FOR INSTALLATION OF MISCELLANEOUS IMPROVEMENTS WITHIN STATE HIGHWAYS, OF THE STATE HIGHWAYS DIVISION.

3. WORK MAY BE PERFORMED ONLY BETWEEN THE HOURS OF 8:30 A.M. AND 3:30 P.M., MONDAY THROUGH FRIDAY, EXCEPT HOLIDAYS, UNLESS OTHERWISE PERMITTED BY THE DISTRICT ENGINEER.

DURING WORK HOURS, ONLY ONE LANE OF TRAFFIC SHALL BE CLOSED, UNLESS OTHERWISE APPROVED IN WRITING BY THE DISTRICT ENGINEER.
AT CERTAIN LOCATIONS, "NO LANE CLOSURE" WILL BE ALLOWED DURING THE "BACK TO SCHOOL JAM", THANKSGIVING WEEKEND, CHRISTMAS/NEW YEAR PERIOD, AND AT OTHER TIMES AS DIRECTED BY THE HIGHWAYS DIVISION.

4. THE CONTRACTOR SHALL PROVIDE, INSTALL, AND MAINTAIN ALL NECESSARY SIGNS, LIGHTS, FLARES, BARRICADES, MARKERS, CONES, AND OTHER PROTECTIVE FACILITIES, AND SHALL TAKE ALL NECESSARY PRECAUTIONS FOR THE PROTECTION, CONVENIENCE, AND SAFETY OF PUBLIC TRAFFIC. ALL SUCH PROTECTIVE FACILITIES AND PRECAUTIONS TO BE TAKEN SHALL CONFORM WITH THE "ADMINISTRATIVE RULES OF HAWAII GOVERNING THE USE OF TRAFFIC CONTROL DEVICES AT WORK SITES ON OR ADJACENT TO PUBLIC STREETS AND HIGHWAYS," ADOPTED BY THE DIRECTOR OF TRANSPORTATION AND THE CURRENT U.S. FEDERAL HIGHWAYS ADMINISTRATION "MANUAL ON UNIFORM TRAFFIC CONTROL DEVICES, PART VI - STANDARDS AND GUIDES FOR TRAFFIC CONTROLS FOR STREET AND HIGHWAY CONSTRUCTION, MAINTENANCE, UTILITY AND INCIDENT MANAGEMENT OPERATIONS".

IF LANE CLOSURES ARE REQUIRED DURING CONSTRUCTION, A TRAFFIC CONTROL PLAN SHALL BE INCORPORATED INTO THE CONSTRUCTION PLANS AND MUST BE APPROVED BY THE DIVISION PRIOR TO THE ISSUANCE OF THE PERMIT.

5. THE MINIMUM PAVEMENT STRUCTURE SHALL CONSIST OF CHANNELIZED INTERSECTIONS AND UTILITY INSTALLATIONS ON MAJOR HIGHWAYS.

4" ASPHALT CONCRETE (MIX IV), 8" AGGREGATE BASE COURSE AND 12" AGGREGATE SUBBASE, OR 4" ASPHALT CONCRETE AND 8" ASPHALT CONCRETE BASE COURSE OR ASPHALT CONCRETE, OR MATCH EXISTING PAVEMENT STRUCTURE, WHICHEVER IS GREATER.

6. NO MATERIAL AND/OR EQUIPMENT SHALL BE STOCKPILED OR OTHERWISE STORED WITHIN THE HIGHWAY RIGHT-OF-WAY, EXCEPT AT LOCATIONS DESIGNATED IN WRITING AND APPROVED BY THE DISTRICT ENGINEER.

7. COMPACTION TESTS SHALL BE TAKEN IN ACCORDANCE WITH THE SPECIFICATIONS FOR INSTALLATION OF MISCELLANEOUS IMPROVEMENTS WITHIN STATE HIGHWAYS, AS FOLLOWS:

- A. SUBBASE: ONE (1) COMPACTION TEST PER LIFT PER 200 LINEAL FEET OF ROADWAY.
- B. BASE COURSE: ONE (1) COMPACTION TEST PER LIFT PER 200 LINEAL FEET OF ROADWAY.
- C. ONE (1) COMPACTION TEST PER LIFT PER 300 LINEAL FEET OF TRENCH.
- D. A COPY OF THE TEST RESULTS SHALL BE SUBMITTED TO THE DISTRICT ENGINEER.

8. PRIOR TO COMMENCING TRENCH EXCAVATION WORK, THE CONTRACTOR SHALL TAKE A PROFILE ALONG THE CENTERLINE OF THE PROPOSED UTILITY TRENCH. THIS INFORMATION SHALL BE USED IN THE VERIFICATION OF RESTORING THE ROADWAY TO ITS ORIGINAL CONDITION. A COPY OF THE PROFILE SHALL BE SUBMITTED TO THE DISTRICT ENGINEER.

9. THE CONTRACTOR SHALL PROVIDE AN ADEQUATE AND SAFE NON-SKID BRIDGING MATERIAL, INCLUDING SHORING, OVER TRENCHES IN PAVEMENT AREAS. THE BRIDGING SHALL BE ABLE TO SUPPORT ALL TYPES OF VEHICULAR TRAFFIC.

10. UNLESS OTHERWISE NOTED, NO TRENCH SHALL BE OPENED MORE THAN 300 FEET IN ADVANCE OF INSTALLED AND TESTED PIPELINE AND/OR DUCTLINE.

11. EXISTING DRAINAGE SYSTEMS SHALL BE FUNCTIONAL AT ALL TIMES.

12. THE CONTRACTOR SHALL EXERCISE CARE TO MINIMIZE DAMAGES TO EXISTING HIGHWAY IMPROVEMENTS. ALL DAMAGES SHALL BE REPAIRED BY THE CONTRACTOR, AT HIS EXPENSE, TO THE SATISFACTION OF THE DISTRICT ENGINEER.

13. APPROVAL OF PERMIT CONSTRUCTION PLANS SHALL BE VALID FOR A PERIOD OF ONE (1) YEAR FROM THE DATE OF NOTIFICATION OF APPROVAL TO THE APPLICANT. IN THE EVENT CONSTRUCTION DOES NOT COMMENCE WITHIN THIS ONE-YEAR PERIOD, THE APPLICANT WILL BE REQUIRED TO RESUBMIT THE CONSTRUCTION PLANS FOR THE DIVISION'S REVIEW AND REAPPROVAL.

14. ALL REGULATORY, GUIDE, AND CONSTRUCTION SIGNS AND BARRICADES SHALL HAVE A HIGH-INTENSITY REFLECTIVE BACKGROUND.

15. THE CONTRACTOR SHALL INFORM THE STATE HIGHWAYS PERMIT OFFICE (808) 274-3111 AT LEAST TWO (2) DAYS PRIOR TO CLOSING ANY LANES.

16. DRIVEWAYS SHALL BE KEPT OPEN UNLESS THE OWNERS OF THE PROPERTIES USING THESE RIGHTS-OF-WAY ARE OTHERWISE PROVIDED FOR SATISFACTORILY.

17. THE CONTRACTOR SHALL NOTIFY THE STATE HIGHWAYS AREA ENGINEER (274-3111), THREE (3) WORKING DAYS PRIOR TO COMMENCING WORK.

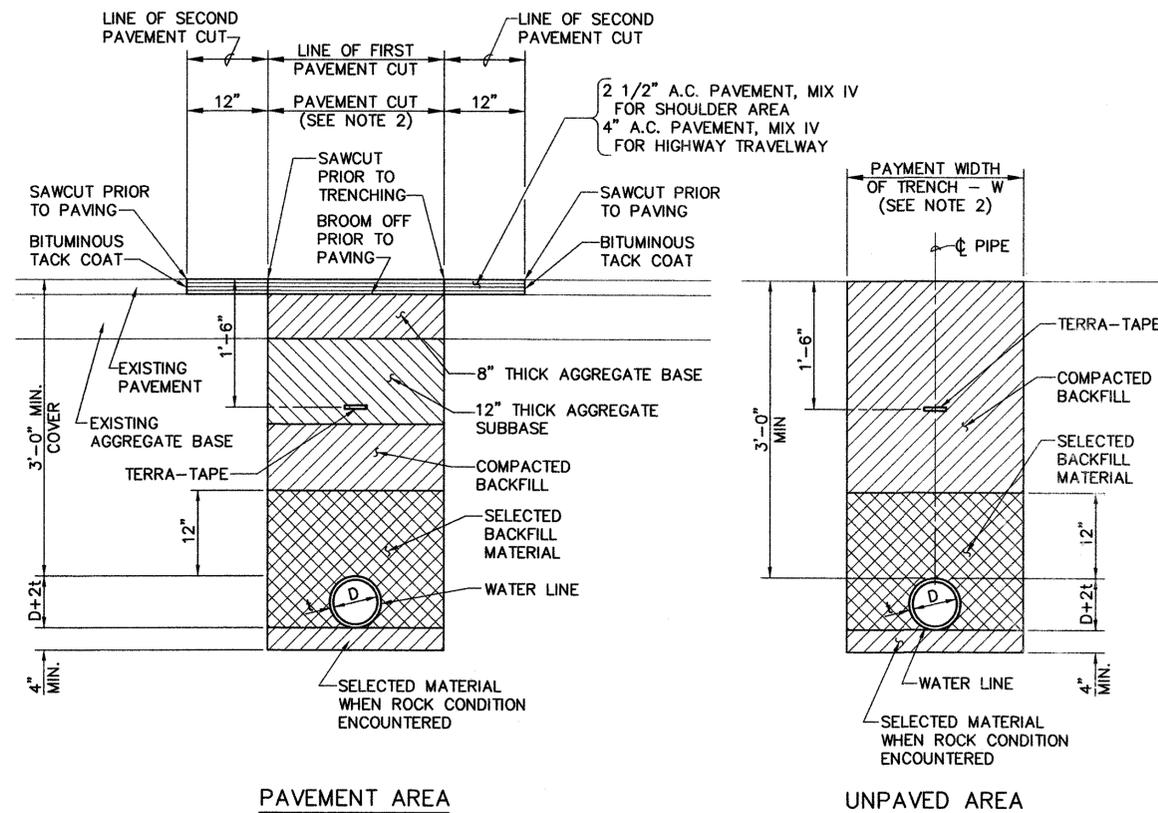
18. THE CONTRACTOR SHALL REFERENCE, TO THE SATISFACTION OF THE DISTRICT ENGINEER, ALL EXISTING TRAFFIC SIGNS, POSTS, AND PAVEMENT MARKINGS PRIOR TO THE COMMENCEMENT OF CONSTRUCTION. THE CONTRACTOR SHALL REPLACE OR REPAIR ALL TRAFFIC SIGNS, POSTS, AND PAVEMENT MARKINGS DISTURBED BY HIS ACTIVITIES, AT HIS EXPENSE, UNLESS DIRECTED OTHERWISE BY THE DISTRICT ENGINEER OR HIS REPRESENTATIVE.

19. THE CONTRACTOR SHALL EXERCISE CARE WHEN PERFORMING WORK IN OR ADJACENT TO THE STATE HIGHWAY RIGHT-OF-WAY. DAMAGES TO THE EXISTING FACILITIES SHALL BE IMMEDIATELY REPORTED TO THE RESPECTIVE UTILITY COMPANIES AND/OR CITY OR STATE AGENCIES. THE REPAIR WORK SHALL BE DONE AT THE CONTRACTOR'S EXPENSE.

20. THE PERMIT TO PERFORM WORK UPON STATE HIGHWAYS MAY BE REVOKED BECAUSE OF DEFAULT IN ANY OF THE FOLLOWING, BUT NOT LIMITED TO, CONDITIONS:

- A. WORK PERFORMED BEFORE OR AFTER PERMITTED HOURS.
- B. FAILURE TO MAINTAIN ROADWAY SURFACES IN A SMOOTH AND SAFE CONDITION.
- C. FAILURE TO CLEAN UP CONSTRUCTION DEBRIS GENERATED FROM PROJECT WORK.
- D. FAILURE TO PROVIDE PROPER TRAFFIC CONTROL.
- E. FAILURE TO REPLACE DAMAGED PAVEMENT MARKINGS AND SIGNS.

21. TRENCHING ACROSS KAUMUALII HIGHWAY WILL NOT BE PERMITTED UNTIL JUNE 15, 2002.



PAVEMENT AREA

UNPAVED AREA

NOTE:

- 1. PAVEMENT CONSTRUCTION SHALL BE EQUAL OR BETTER THAN EXISTING IN THICKNESS AND QUALITY.
- 2. TRENCH WIDTH:
D = 16" W = 2'-6"
D = 8" W = 2'-0"
- 3. IF ROCK CONDITION IS ENCOUNTERED, REFER TO WATER SYSTEM STANDARDS, DETAIL #124 FOR "DETAIL AT JOINT".
- 4. TRENCHING ACROSS KAUMUALII HIGHWAY WILL NOT BE PERMITTED UNTIL JUNE 15, 2002.

**TYPICAL TRENCH RESTORATION
(FOR WORK WITHIN STATE HIGHWAY RIGHT-OF-WAY)**

NOT TO SCALE

AS-BUILT DRAWINGS

CERTIFIED BY: OCEANIC CO., INC.
CONTRACTOR'S NAME AND COMPANY (PRINTED)
[Signature] DATE: 4/15/04

SUBMITTED BY: HAWAII PACIFIC ENGINEERS, INC.
COMPANY NAME (PRINTED)
[Signature] DATE: 4/15/04

APPROVED: [Signature] 4/29/04
MANAGER AND CHIEF ENGINEER, DEPARTMENT OF WATER DATE

LHF: KTN/CDK
PM: DESIGN: CDK/FAI
OPER: CDK/FAI
REVISED: 08/02/01

DATE: 12/19/00
SCALE: 1 = 1
FILE: 0024-06

THIS WORK WAS PREPARED BY ME OR UNDER MY SUPERVISION OF CONSTRUCTION OF THIS PROJECT WILL BE UNDER MY SUPERVISION. (SUPERVISION OF CONSTRUCTION OF THIS PROJECT IS LIMITED TO THE STATE OF HAWAII AND DOES NOT CONSTITUTE AN ARCHITECTURAL OR ENGINEERING DESIGN OR SERVICE OF THE STATE OF HAWAII.)

LESTER H. FUKUDA
LICENSED PROFESSIONAL ENGINEER
HAWAII, No. 6008-C

[Signature]

**JOB 97-6 - REHABILITATION OF 27" STEEL PIPE
HANAPEPE-ELEELE WATER SYSTEM
HAWAII
HANAPEPE - ELEELE, KAUAI**

**GENERAL NOTES AND
TRENCH RESTORATION DETAILS**

NO.	REVISION	DATE

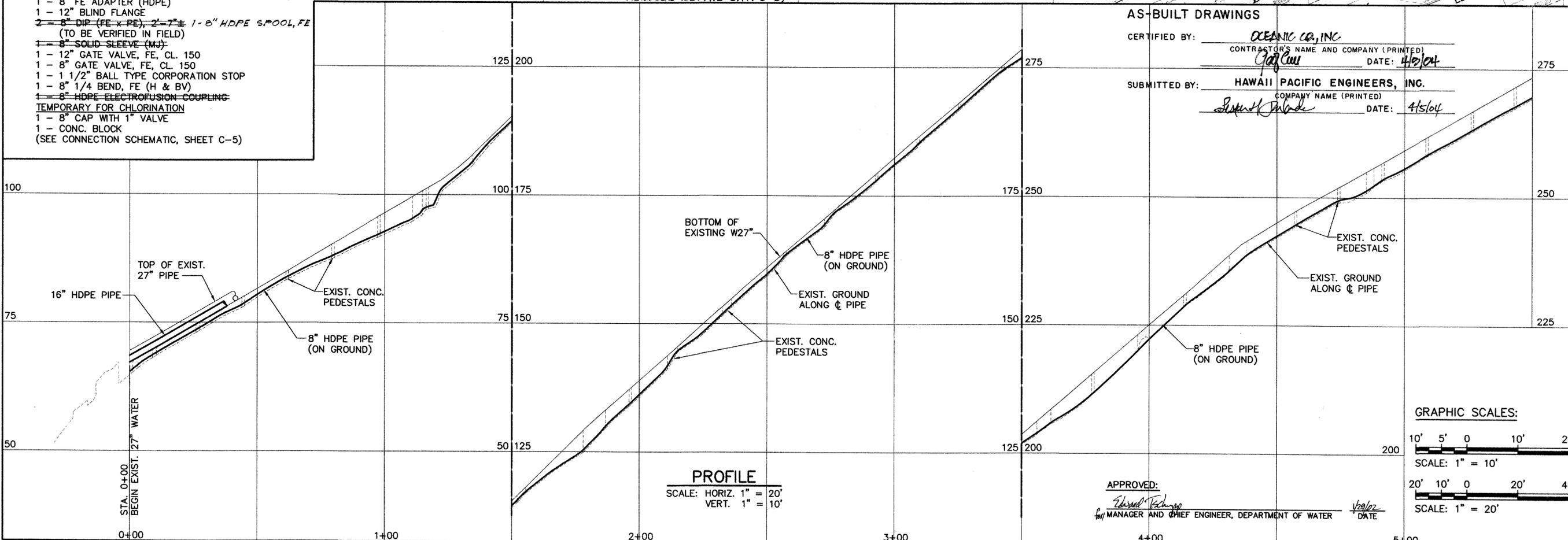
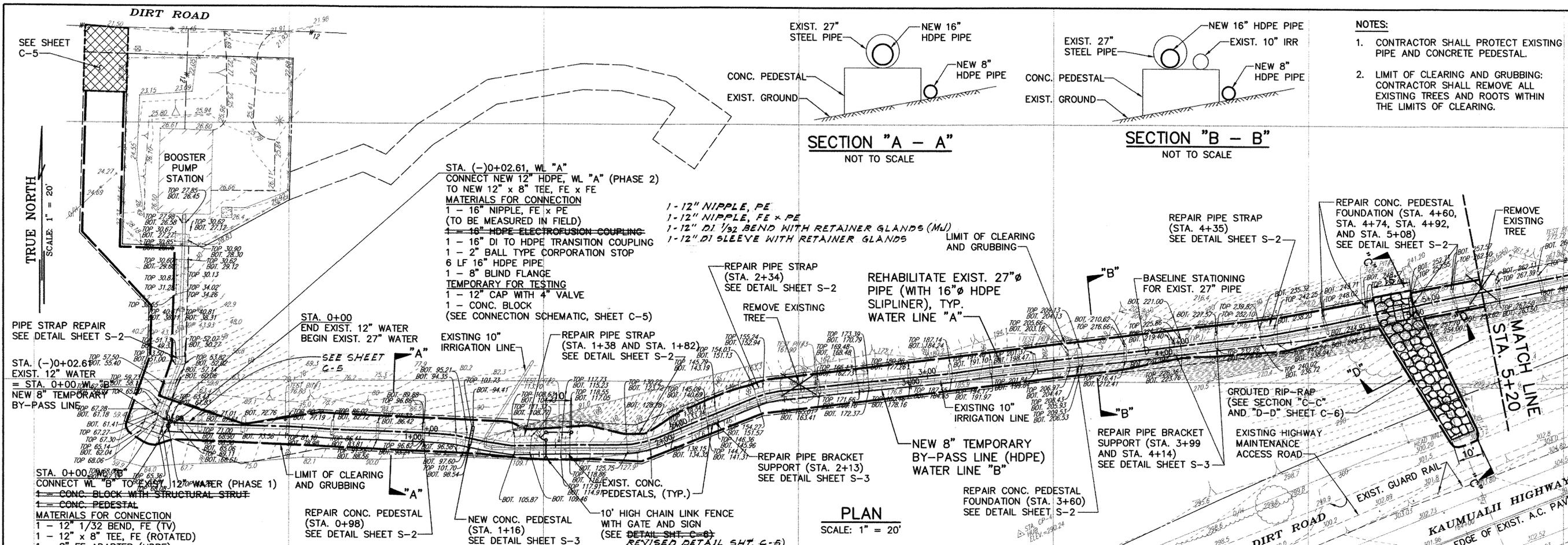
C-2

SHEET 3 OF 14 SHEETS

PROJECT NO. _____

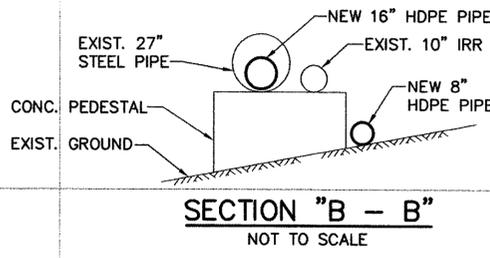
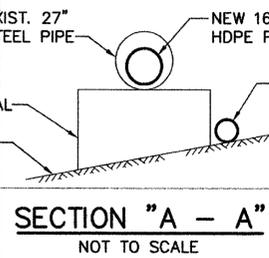
DATE: _____

Hawaii Pacific Engineers, Inc.
CIVIL ENGINEERING AND PLANNING
CONSTRUCTION MANAGEMENT SERVICES



LHF: KTN/COK
 PM: DESIGN: CDK/FAI
 OPER: CDK/FAI
 REVISION: 01/08/02
 DATE: 12/13/00
 SCALE: 1" = 20'
 FILE: 0024-01

AS-BUILT



- NOTES:**
- CONTRACTOR SHALL PROTECT EXISTING PIPE AND CONCRETE PEDESTAL.
 - LIMIT OF CLEARING AND GRUBBING: CONTRACTOR SHALL REMOVE ALL EXISTING TREES AND ROOTS WITHIN THE LIMITS OF CLEARING.

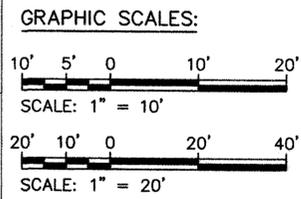


THIS WORK WAS PREPARED BY ME OR UNDER MY SUPERVISION. CONSTRUCTION OF THIS PROJECT WILL BE UNDER MY SUPERVISION. (SUPERVISION OF CONSTRUCTION OF THIS PROJECT IS LIMITED TO THE FIELD AND 12 HOURS PER WEEK AND 12 HOURS PER MONTH OF THE STATE OF HAWAII)

Hawaii Pacific Engineers, Inc.
 CIVIL ENGINEERING AND PLANNING
 CONSTRUCTION MANAGEMENT SERVICES

JOB 97-6 - REHABILITATION OF 27" STEEL PIPE HANAPEPE-ELEELE WATER SYSTEM
PLAN AND PROFILE - WATER LINE "A"
STA. 0+00 TO STA. 5+50

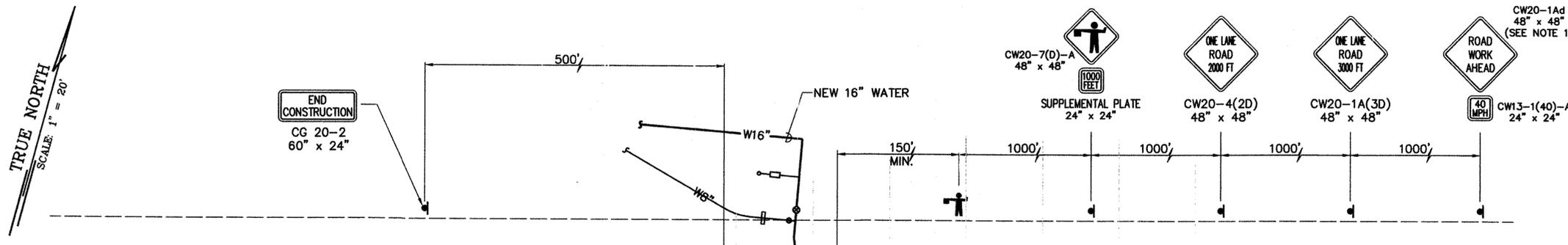
AS-BUILT DRAWINGS
 CERTIFIED BY: OCEANIC CO., INC.
 CONTRACTOR'S NAME AND COMPANY (PRINTED) DATE: 4/15/04
 SUBMITTED BY: HAWAII PACIFIC ENGINEERS, INC.
 COMPANY NAME (PRINTED) DATE: 4/15/04



C-3

SHEET 4 OF 14 SHEETS
 PROJECT NO. _____
 DATE: _____

APPROVED: Edward Technip
 MANAGER AND CHIEF ENGINEER, DEPARTMENT OF WATER
 DATE: 4/29/02



CW20-1Ad
48" x 48"
(SEE NOTE 1)

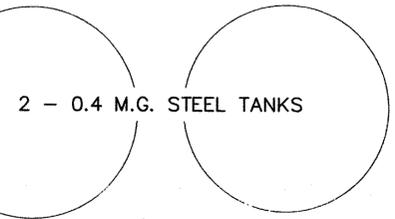
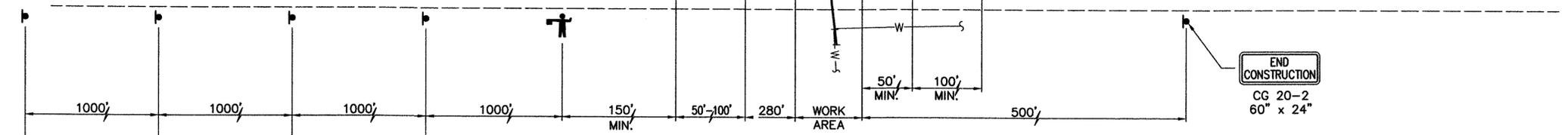
CW20-7(D)-A
48" x 48"
SUPPLEMENTAL PLATE
24" x 24"

CW20-4(2D)
48" x 48"

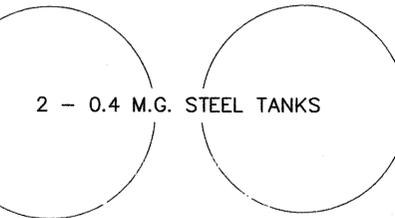
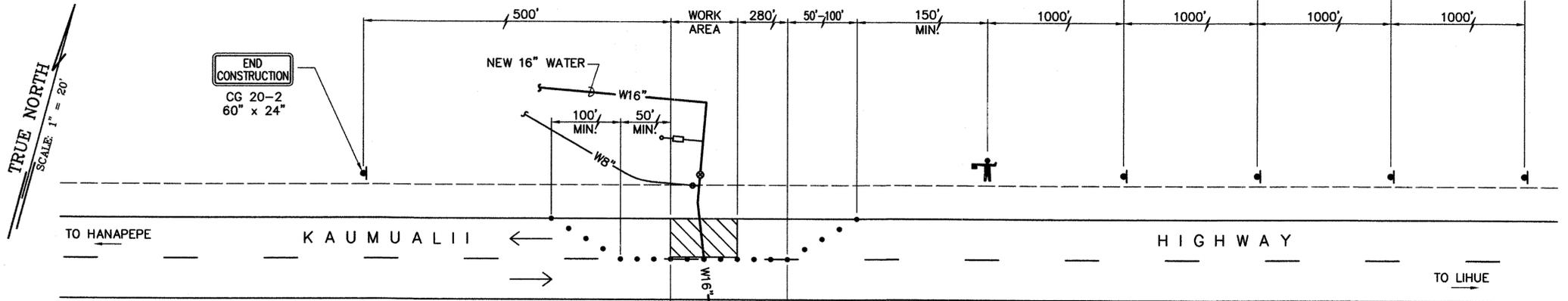
CW20-1A(3D)
48" x 48"

CW13-1(40)-A
24" x 24"

TO HANAPEPE KAUMUALII HIGHWAY TO LIHUE



TRAFFIC CONTROL PLAN
NOT TO SCALE



TRAFFIC CONTROL PLAN
NOT TO SCALE

GENERAL NOTES FOR TRAFFIC CONTROL PLAN:

1. THE PERMITTEE SHALL MAKE MINOR ADJUSTMENTS AT INTERSECTIONS, DRIVEWAYS, BRIDGES, STRUCTURES, ETC., TO FIT FIELD CONDITIONS.
2. CONES OR DELINEATORS SHALL BE EXTENDED TO A POINT WHERE THEY ARE VISIBLE TO APPROACHING TRAFFIC.
3. TRAFFIC CONTROL DEVICES SHALL BE INSTALLED SUCH THAT THE SIGN OR DEVICE FARTHEST FROM THE WORK AREA SHALL BE PLACED FIRST. THE OTHERS SHALL THEN BE PLACED PROGRESSIVELY TOWARD THE WORK AREA.
4. REGULATORY AND WARNING SIGNS WITHIN THE CONSTRUCTION ZONE THAT ARE IN CONFLICT WITH THE TRAFFIC CONTROL PLANS SHALL BE REMOVED OR COVERED. ALL SIGNS SHALL BE RESTORED UPON COMPLETION OF THE WORK.
5. FLAGGERS AND/OR POLICE OFFICERS SHALL BE IN SIGHT OF EACH OTHER OR IN DIRECT COMMUNICATION AT ALL TIMES. ALL FLAGMEN, AND/OR POLICEMEN, SHALL BE POSITIONED SUCH THAT MOTORISTS IN VEHICLES APPROACHING THE WORK ZONE HAVE ADEQUATE SIGHT DISTANCE (FOR 50 MPH ZONE) TO REACT SAFELY TO THE FLAGMEN DIRECTIVES.
6. ALL CONSTRUCTION WARNING SIGNS SHALL BE PROMPTLY REMOVED OR COVERED WHENEVER THE MESSAGE IS NOT APPLICABLE OR NOT IN USE.
7. THE BACKS OF ALL SIGNS USED FOR TRAFFIC CONTROL SHALL BE APPROPRIATELY COVERED TO PRECLUDE THE DISPLAY OF INAPPLICABLE SIGN MESSAGES (I.E., WHEN SIGNS HAVE MESSAGES ON BOTH FACES).
8. AT THE END OF EACH DAY'S WORK OR AS SOON AS THE WORK IS COMPLETED, THE PERMITTEE SHALL REMOVE ALL TRAFFIC CONTROL DEVICES NO LONGER NEEDED TO PERMIT FREE AND SAFE PASSAGE OF PUBLIC TRAFFIC. REMOVAL SHALL BE IN THE REVERSE ORDER OF INSTALLATION.
9. REPLACE PERMANENT PAVEMENT MARKINGS AND TRAFFIC SIGNS UPON COMPLETION OF EACH PHASE OF WORK.

AS-BUILT DRAWINGS

CERTIFIED BY: OCEANIC CO, INC
CONTRACTOR'S NAME AND COMPANY (PRINTED)
Joe Lee DATE: 4/5/04

SUBMITTED BY: HAWAII PACIFIC ENGINEERS, INC.
COMPANY NAME (PRINTED)
Edward F. Balanda DATE: 4/5/04

APPROVED: Edward F. Balanda 1/29/02
for MANAGER AND CHIEF ENGINEER, DEPARTMENT OF WATER DATE

- LEGEND
- ▲ SIGN
 - CONE
 - ← DIRECTION OF TRAFFIC
 - ⚓ POLICE OFFICER/FLAGGER

JOB 97-6 - REHABILITATION OF 27" STEEL PIPE
HANAPEPE-ELEELE WATER SYSTEM
HAWAII
KAUAI

TRAFFIC CONTROL PLAN

REVISION	DESCRIPTION	DATE	APPROVAL

C-7

SHEET 8 OF 13 SHEETS
PROJECT NO. _____

DATE: _____

LHF
PM: DESIGN: KTN/CDK
OPER: CDK/FAL
REVISED: 06/19/01

DATE: 02/26/01
SCALE: 1" = 20'
FILE: 0024-09



"AS-BUILT"

TRUE NORTH
SCALE: 1" = 40'

STABILIZED CONSTRUCTION ENTRANCE 17' x 25', 8" THICK NO. 2 CRUSHED ROCK
RELOCATED TO END OF EXISTING ACCESS ROAD

STABILIZED CONSTRUCTION AREA 10' x 80'±, 8" THICK NO. 2 CRUSHED ROCK

STABILIZED CONSTRUCTION ACCESS, 8" THICK NO. 2 CRUSHED ROCK

TEMPORARY GRAVEL ROAD

20' TRANSITION TO MEET EXIST. DIRT ROAD

EDGE OF EXISTING HIGHWAY PAVEMENT

KAUMUALII
HIGHWAY

EROSION CONTROL PLAN
SCALE: 1" = 40'

APPROVED:
Edwiel P. Peltz
MANAGER AND CHIEF ENGINEER, DEPARTMENT OF WATER
DATE: 1/20/02

AS-BUILT DRAWINGS
CERTIFIED BY: OCEANIC CO., INC.
CONTRACTOR'S NAME AND COMPANY (PRINTED)
Gay Cui DATE: 4/15/04
SUBMITTED BY: HAWAII PACIFIC ENGINEERS, INC.
COMPANY NAME (PRINTED)
Robert J. Peltz DATE: 4/15/04

GRAPHIC SCALE:
40' 20' 0 40' 80'
SCALE: 1" = 40'

LHF
PM: KTN
DESIGN: KTN
OPER: FAI
REVISED: 01/09/02
DATE: 01/04/02
SCALE: 1" = 40'
FILE: 0024-11

JOB 97-6 - REHABILITATION OF 27" STEEL PIPE
HANAPEPE-ELEELE WATER SYSTEM
HAWAII
HANAPEPE - ELEELE,
KAUAI

EROSION CONTROL PLAN

NO.	DESCRIPTION	DATE	APPROV.

C-8

SHEET 9 OF 14 SHEETS
PROJECT NO. -
DATE: -



THIS WORK WAS PREPARED BY ME OR UNDER MY SUPERVISION. CONSTRUCTION OF THIS PROJECT WILL BE UNDER MY SUPERVISION.
(SUPERVISION OF CONSTRUCTION OF THIS PROJECT IS REQUIRED BY SECTION 12 (A) OF THE RULES AND REGULATIONS OF THE BOARD OF PROFESSIONAL ENGINEERS OF THE STATE OF HAWAII.)

Hawaii Pacific Engineers, Inc.
CIVIL ENGINEERING AND PLANNING
CONSTRUCTION MANAGEMENT SERVICES

"AS-BUILT"

STRUCTURAL NOTES

GENERAL:

- A. WORKMANSHIP AND MATERIALS SHALL CONFORM TO THE PROJECT SPECIAL PROVISIONS AND GENERAL PROVISIONS AND THE WATER SYSTEM STANDARDS FOR THE DEPARTMENT OF WATER, COUNTY OF KAUALI. HOWEVER, WHERE REFERENCE IS MADE TO PERFORMANCE CONFORMING TO OTHER STANDARDS THE MORE STRINGENT SHALL APPLY.
- B. THE CONTRACTOR SHALL COMPARE ALL THE CONTRACT DOCUMENTS WITH EACH OTHER AND REPORT IN WRITING TO THE ENGINEER ALL INCONSISTENCIES AND OMISSIONS.
- C. THE CONTRACTOR SHALL TAKE FIELD MEASUREMENTS AND VERIFY FIELD CONDITIONS AND SHALL COMPARE SUCH FIELD MEASUREMENTS AND CONDITIONS WITH THE DRAWINGS BEFORE COMMENCING WORK. REPORT IN WRITING TO THE ENGINEER ALL INCONSISTENCIES AND OMISSIONS.
- D. THE CONTRACTOR SHALL BE RESPONSIBLE FOR COORDINATING THE WORK OF ALL TRADES.
- E. THE CONTRACTOR SHALL BE RESPONSIBLE FOR METHODS OF CONSTRUCTION, WORKMANSHIP AND JOB SAFETY. THE CONTRACTOR SHALL PROVIDE TEMPORARY SHORING AND BRACING AS REQUIRED FOR STABILITY OF STRUCTURAL MEMBERS AND SYSTEMS.
- F. THE CONTRACTOR SHALL BE RESPONSIBLE FOR PROTECTION OF THE ADJACENT PROPERTIES, STRUCTURES, STREETS AND UTILITIES DURING THE CONSTRUCTION PERIOD AND SHALL REPAIR ANY DAMAGE AT HIS OWN EXPENSE, TO THE SATISFACTION OF THE ENGINEER. THE CONTRACTOR SHALL PREVENT DEBRIS FROM FALLING INTO THE VALLEY.
- G. DETAILS NOTED AS TYPICAL ON THE STRUCTURAL DRAWINGS SHALL APPLY IN ALL CONDITIONS UNLESS SPECIFICALLY SHOWN OR NOTED.

FOUNDATION:

- A. FOUNDATION DESIGN IS BASED ON GEOTECHNICAL INVESTIGATION BY PACIFIC GEOTECHNICAL ENGINEERS INC. AND REPORT DATED MARCH 28, 2001.
- B. MAXIMUM ALLOWABLE FOUNDATION BEARING PRESSURE SHALL BE 3,000 PSF.
- C. ALL FOOTING AND TRENCH EXCAVATIONS AND WORKING ON THE EXISTING BENCH SHALL BE THE CONTRACTOR'S RESPONSIBILITY. ALL TEMPORARY EXCAVATIONS SHALL BE PROPERLY SHORED AND BRACED OR SLOPED IN ACCORDANCE WITH APPLICABLE COUNTY, STATE, AND FEDERAL OSHA REGULATIONS. THE CONSTRUCTION ACTIVITIES ON THE BENCH SHALL ALSO INCLUDE APPROPRIATE MEASURES TO PROTECT WORKERS AGAINST POTENTIAL ROCK FALL HAZARDS.
- D. PRIOR TO THE PLACEMENT OF THE CONCRETE AND REINFORCING, THE EXCAVATIONS FOR NEW PIPE SUPPORTS AND REPAIRS SHALL BE CHECKED BY THE PROJECT GEOTECHNICAL ENGINEER ENGAGED BY THE DEPARTMENT OF WATER.
- E. PRIOR TO CONSTRUCTING NEW PIPE SUPPORTS AND REPAIRING UNDERMINED SUPPORTS, THE GROUND SURFACE AND TOP 6 INCHES OF SOIL CONTAINING VEGETATION, ROOTS, AND ORGANIC MATTER IN THE AREA OF THE PLANNED REPAIRS AND NEW SUPPORTS SHALL BE REMOVED.
- F. BOULDERS, OLD SUPPORTS AND OTHER DEBRIS THAT INTERFERE WITH NEW SUPPORTS SHALL BE DEMOLISHED AND REMOVED. CARE SHALL BE TAKEN TO KEEP BOULDERS AND CONCRETE DEBRIS FROM FALLING DOWN THE HILLSIDE DURING THE PERFORMANCE OF THIS WORK.
- G. ALL NEW PIPE SUPPORTS AND REPAIR TO FOOTING UNDERMINING SHALL BE FOUNDED DIRECTLY ON HARD, INTACT ROCK, WELDED CLINKER, OR FIRM SOIL. ANY LOOSE SOILS AND ROCKS AT THE BOTTOM OF FOOTING EXCAVATIONS SHALL BE REMOVED TO FIRM MATERIAL. THE NEW SUPPORTS AND REPAIRS SHALL NOT BE FOUNDED ON LOOSE SOILS AND ROCKS OR ISOLATED BOULDERS. TEMPORARY SHORING AND/OR CRIBBING SHALL BE PROVIDED TO REDUCE THE POTENTIAL FOR MOVEMENT IN THE PIPELINE DURING THE EXCAVATION WORK.
- H. ALL NEW PIPE SUPPORTS AND CONCRETE REPAIRS TO FOOTING UNDERMINING SHALL BE EMBEDDED A MINIMUM OF 24 INCHES BELOW THE LOWEST OUTSIDE FINISH GRADE. THE EMBEDMENT DEPTH MAY BE REDUCED TO A MINIMUM OF 12 INCHES IF THE SUPPORT OR REPAIR IS FOUNDED ON HARD, INTACT ROCK.
- I. FOOTINGS ON SLOPES STEEPER THAN 10H:1V SHALL BE STEPPED SO THAT THEIR BOTTOMS ARE APPROXIMATELY HORIZONTAL.
- J. THE TOP 6 INCHES OF FOOTING EXCAVATION FOR SUPPORTS SHALL BE SCARIFIED AND THOROUGHLY MOISTURE CONDITIONED TO BETWEEN OPTIMUM AND 3 PERCENT WET OF OPTIMUM MOISTURE CONTENT FOR THIS MATERIAL AND COMPACTED TO A MINIMUM 95 PERCENT OF RELATIVE COMPACTION. COMPACTION OF BOTTOM OF FOOTINGS FOUNDED DIRECTLY ON HARD, INTACT ROCK IS NOT NECESSARY.
- K. THE EXCAVATED ON-SITE SILTY SAND, AND SILTY GRAVEL FREE OF VEGETATION, ORGANICS, DEBRIS, CONCRETE, AND PARTICLES LARGER THAN 3 INCHES IN MAXIMUM DIMENSION MAY BE RE-USED AS BACKFILL AROUND NEW PIPE SUPPORTS AND REPAIRS. THE BACKFILL MATERIAL SHALL BE PLACED IN NOT MORE THAN 10-INCH THICK HORIZONTAL LOOSE LIFTS, MOISTURE CONDITION TO BETWEEN OPTIMUM AND 3 PERCENT WET OF OPTIMUM MOISTURE CONTENT FOR THE MATERIAL BEING PLACED AND COMPACTED TO A MINIMUM 90 PERCENT RELATIVE COMPACTION.
- L. RELATIVE COMPACTION IS DEFINED AS THE DRY UNIT WEIGHT OF THE COMPACTED MATERIAL EXPRESSED AS A PERCENTAGE OF THE MAXIMUM DRY UNIT WEIGHT OF THE SAME MATERIAL BASED ON ASTM D1557-91 TEST PROCEDURES.

CONCRETE:

- A. CONCRETE CONSTRUCTION SHALL CONFORM TO AMERICAN CONCRETE INSTITUTE ACI 318R-95.
- B. CONCRETE SHALL BE REGULAR WEIGHT HARD ROCK CONCRETE AND SHALL HAVE A MINIMUM 28 DAY COMPRESSIVE STRENGTH OF 3,000 PSI.
- C. ALL INSERTS, ANCHOR BOLTS, PLATES, AND OTHER ITEMS TO BE CAST IN THE CONCRETE SHALL BE HOT-DIPPED GALVANIZED AFTER FABRICATION UNLESS OTHERWISE NOTED.
- D. REINFORCING STEEL, ANCHOR BOLTS, INSERTS, AND OTHER ITEMS TO BE CAST IN THE CONCRETE SHALL BE SECURED IN POSITION PRIOR TO PLACEMENT OF CONCRETE.
- E. NON-SHRINK GROUT SHALL BE A PREMIXED NON-METALLIC FORMULA, CAPABLE OF DEVELOPING A MINIMUM COMPRESSIVE STRENGTH OF 3,000 PSI IN 1 DAY AND 5,000 PSI IN 28 DAYS.

REINFORCING STEEL:

- A. REINFORCING STEEL SHALL BE DEFORMED BARS CONFORMING TO ASTM A615, GRADE 60.
- B. CLEAR CONCRETE COVER FOR REINFORCING STEEL SHALL BE 3" FOR CONCRETE CAST AGAINST EARTH AND 2" FOR CONCRETE EXPOSED TO EARTH OR WEATHER.
- C. REINFORCING STEEL SHALL BE SPLICED IN ACCORDANCE WITH ACI 318.
- D. BAR BENDS AND HOOKS SHALL BE "STANDARD HOOKS" IN ACCORDANCE WITH ACI 318.

STRUCTURAL STEEL:

- A. FABRICATION AND ERECTION OF STRUCTURAL STEEL SHALL CONFORM TO THE AMERICAN INSTITUTE OF STEEL CONSTRUCTION MANUAL OF STEEL CONSTRUCTION, NINTH EDITION.
- B. STRUCTURAL STEEL SHALL CONFORM TO ASTM A36 UNLESS OTHERWISE NOTED.
- C. BOLTS SHALL CONFORM TO ASTM A307, GRADE A UNLESS OTHERWISE NOTED.
- D. WELDS AND WELDING PROCEDURES SHALL CONFORM TO THE STRUCTURAL WELDING CODE AWS D1.1 OF THE AMERICAN WELDING SOCIETY.
- E. FIELD WELDING SHALL NOT BE PERMITTED.
- F. WELDING SHALL BE PERFORMED BY WELDERS PREQUALIFIED FOR WELDING PROCEDURES TO BE USED.
- G. WELDING ELECTRODES SHALL BE E70XX.
- H. ALL STEEL SHAPES, PLATES, BOLTS AND CONNECTION HARDWARE SHALL BE HOT-DIPPED GALVANIZED AFTER FABRICATION.

EPOXY

THE EPOXY SYSTEM FOR EMBEDMENT OF THREADED ROD AND REINFORCING SHALL BE A TWO COMPONENT, MOISTURE INSENSITIVE ADHESIVE, CONFORMING TO ASTM C881, CLASS C. USE TYPE IV, GRADE 3 (NON-SAG) IN A NEAT FORM FOR VERTICAL OR OVERHEAD EMBEDMENT. MANUFACTURER'S RECOMMENDED INSTALLATION PROCEDURE SHALL BE FOLLOWED. CONTRACTOR SHALL SUBMIT EPOXY PRODUCT INFORMATION FOR APPROVAL PRIOR TO INSTALLATION.

CONCRETE REPAIR PROCEDURE:

- A. ALL NEW PEDESTAL REPAIR WORK SHALL BE PERFORMED WHEN 27 INCH PIPE IS NOT FILLED WITH WATER.
- B. CRACKED CONCRETE SHALL BE COMPLETELY REMOVED TO SOUND SUBSTRATE. THE CONTRACTOR SHALL TAKE THE NECESSARY PRECAUTIONS TO AVOID DAMAGING THE UNDERLYING SOUND CONCRETE.
- C. THE PATCH AREA SHALL BE CLEANED OF ALL DUST AND DEBRIS.
- D. VERTICAL SURFACES SHALL BE FORMED.
- E. PRIOR TO PLACEMENT OF PATCH MATERIAL, THE EXPOSED CONCRETE SURFACE SHALL BE SATURATED WITH NO WATER ACCUMULATION ON THE SURFACE.
- F. A SLURRY COAT OF CEMENTITIOUS MORTAR HAVING THE CONSISTENCY OF THICK CREAM SHALL BE USED TO SCRUB INTO AND PRIME THE SATURATED SURFACE DRY SUBSTRATE. WHILE THE SLURRY COAT IS STILL WET, APPLY THE REPAIR CONCRETE.
- G. THE REPAIR CONCRETE SHALL BE VIBRATED, RODDED OR TAMPED DURING PLACEMENT TO CONSOLIDATE THE POUR AND FILL ALL CORNERS OF THE PATCH OR FORM AND AROUND THE REINFORCING.
- H. THE REPAIR CONCRETE SHALL BE CURED FOR SEVERAL DAYS BY COVERING THE SURFACE WITH A POLYETHYLENE SHEET OVER WET BURLAP.

NEW PEDESTAL NOTES:

- A. ALL NEW PEDESTAL REPAIR WORK SHALL BE PERFORMED WHEN 27 INCH PIPE IS NOT FILLED WITH WATER.
- B. NEW PEDESTAL SHALL BE PLACED UPSLOPE OF AND ADJACENT TO LOCATION OF OLD SUPPORT.
- C. PROVIDE SHORING AT EITHER SIDE OF EXISTING PEDESTAL PRIOR TO INSTALLATION OF NEW PEDESTAL.
- D. ALLOW CONCRETE TO CURE MINIMUM 7 DAYS PRIOR TO INSTALLATION OF GROUT.
- E. INSTALL GROUT WHEN PIPE IS EMPTY OF WATER AND PRIOR TO INSTALLING NEW PIPE LINING.

REPAIR SCHEDULE

DESCRIPTION OF WORK:	LOCATION: (STA. NO.)	SHT. NO.:
A. CONCRETE PEDESTAL REPAIR	0+98	S-2
B. CONCRETE PEDESTAL FOUNDATION REPAIR	0+25 3+60 4+60 4+74 4+92 5+08	S-2
C. PIPE STRAP REPAIR	SEE SCHEDULE ON S-2	
D. NEW CONCRETE PEDESTAL ADJACENT TO FAILED PEDESTAL	0+10 1+16	S-3
E. PIPE BRACKET SUPPORT AT CORRODED PIPE SECTION	2+13 3+99 4+14 5+86	S-3
F. PIPE GROUT SUPPORT	0+02	S-3
G. PIPE GROUT SUPPORT	6+43	S-3

NEW STRUCTURAL SUPPORTS SCHEDULE

DESCRIPTION OF WORK:	LOCATION: (STA. NO.)	SHT. NO.:
A. SPECIAL REINFORCED CONCRETE THRUST BEAM WITH REVERSE BELL	7+80± 7+74±	S-4
B. PEDESTAL SUPPORT FOR CONNECTION WL "A"	0+00±	S-4
C. SPECIAL REINFORCED CONCRETE THRUST BLOCK ABUTTING E/W27", WITH WATER STOP	7+70±	S-5

AS-BUILT DRAWINGS

CERTIFIED BY: OCEANIC CO., INC.
CONTRACTOR'S NAME AND COMPANY (PRINTED)
Gag Cui DATE: 4/10/04

SUBMITTED BY: HAWAII PACIFIC ENGINEERS, INC.
COMPANY NAME (PRINTED)
Robert J. J. J. DATE: 4/10/04

APPROVED: Shirley P. P. 1/20/02
MANAGER AND CHIEF ENGINEER, DEPARTMENT OF WATER DATE



THIS WORK WAS PREPARED BY ME OR UNDER MY SUPERVISION. CONSTRUCTION OF THIS PROJECT WILL BE UNDER MY SUPERVISION. (SEAL OF PROFESSIONAL ENGINEER, STATE OF HAWAII)

JOB 97-6 - REHABILITATION OF 27" STEEL PIPE HANAPEPE-ELEELE WATER SYSTEM HAWAII KAUAI, HANAPEPE - ELEELE.
GENERAL NOTES, REPAIR SECTIONS AND DETAILS

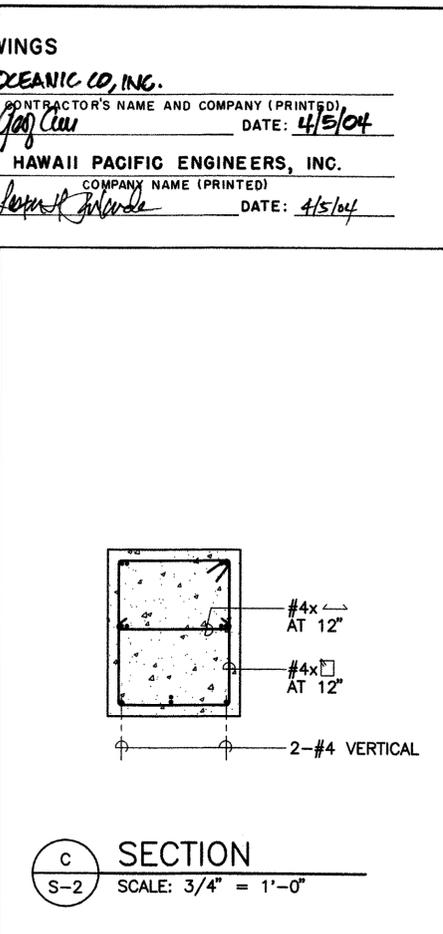
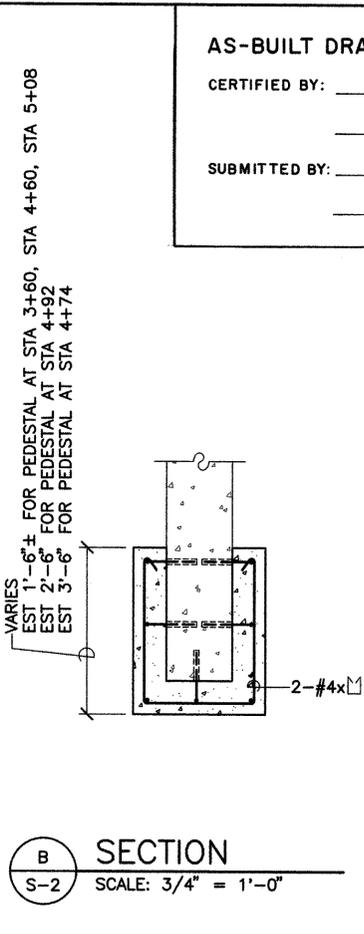
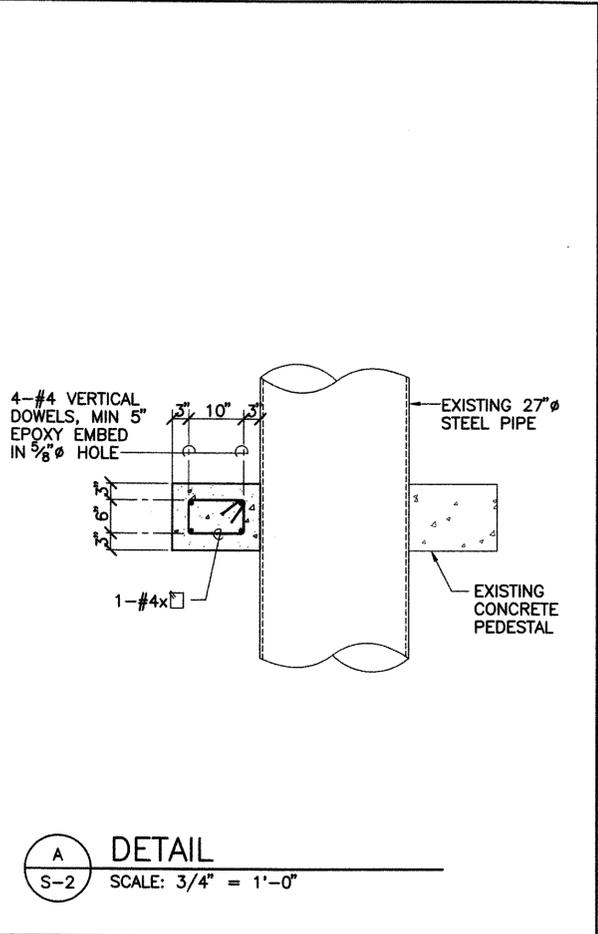
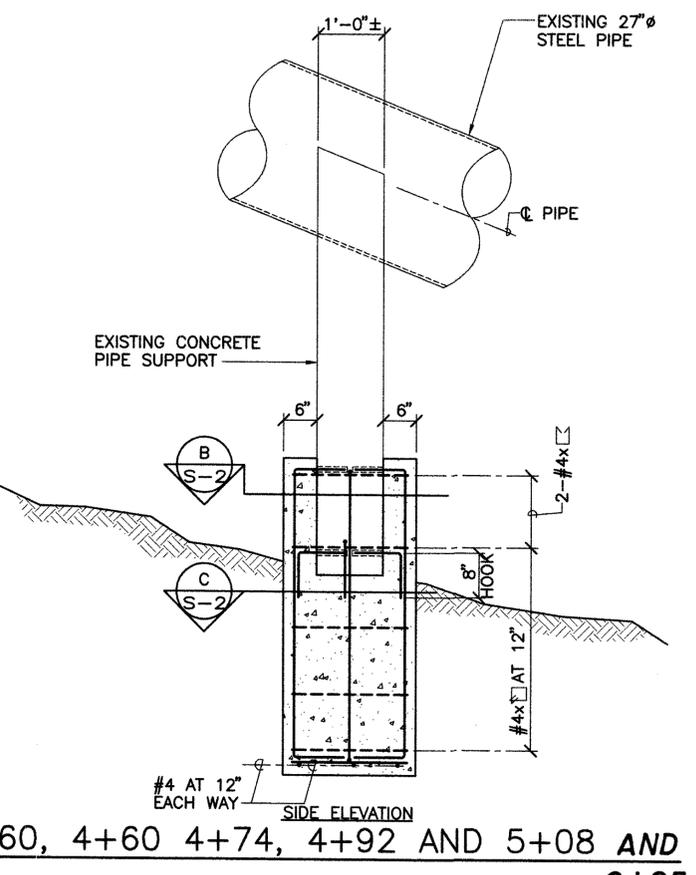
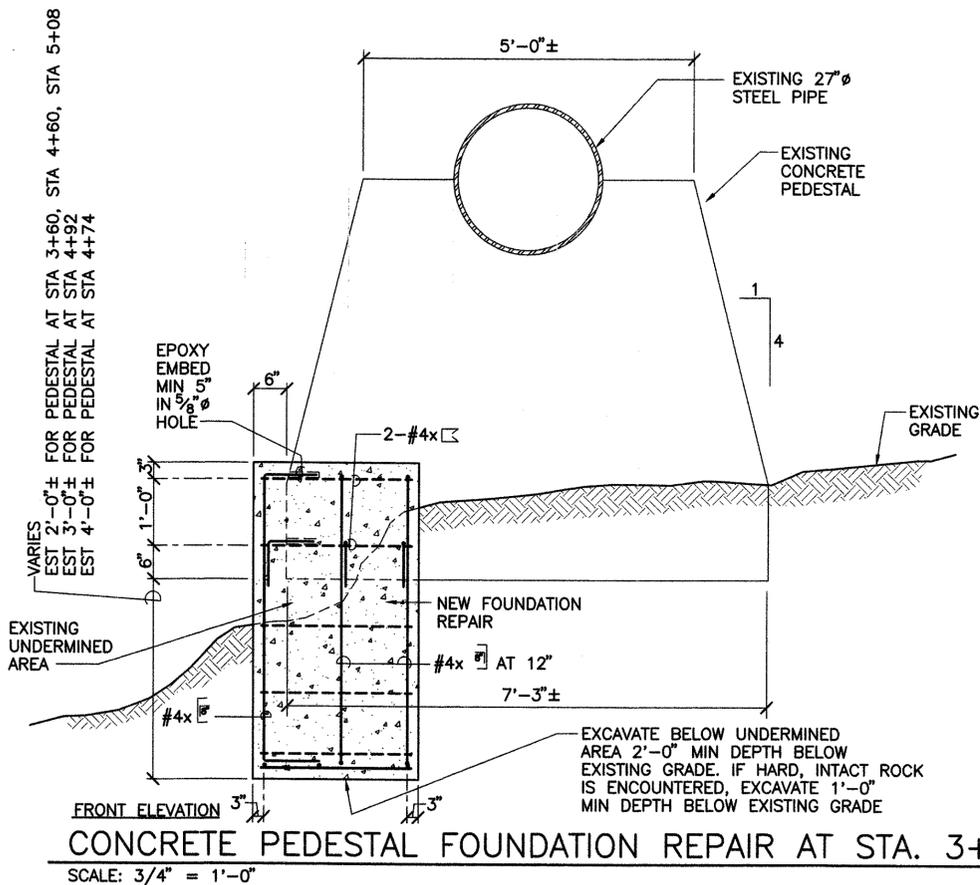
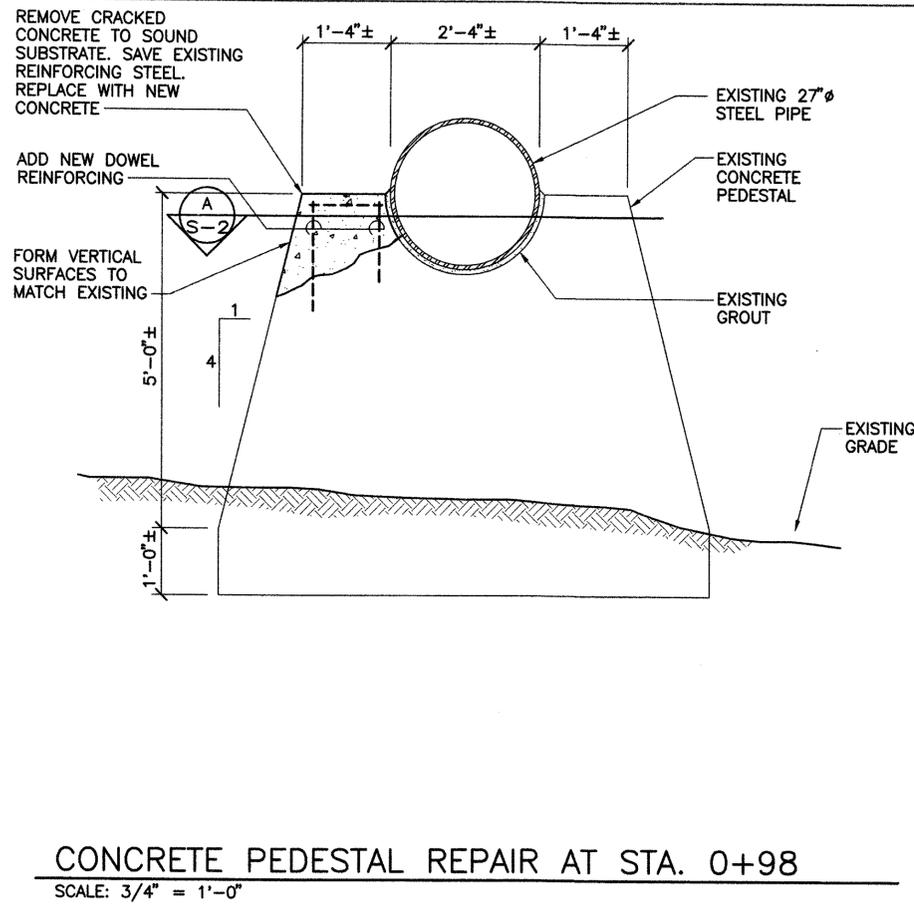
REVISION	DESCRIPTION	DATE	APPROVAL

S-1

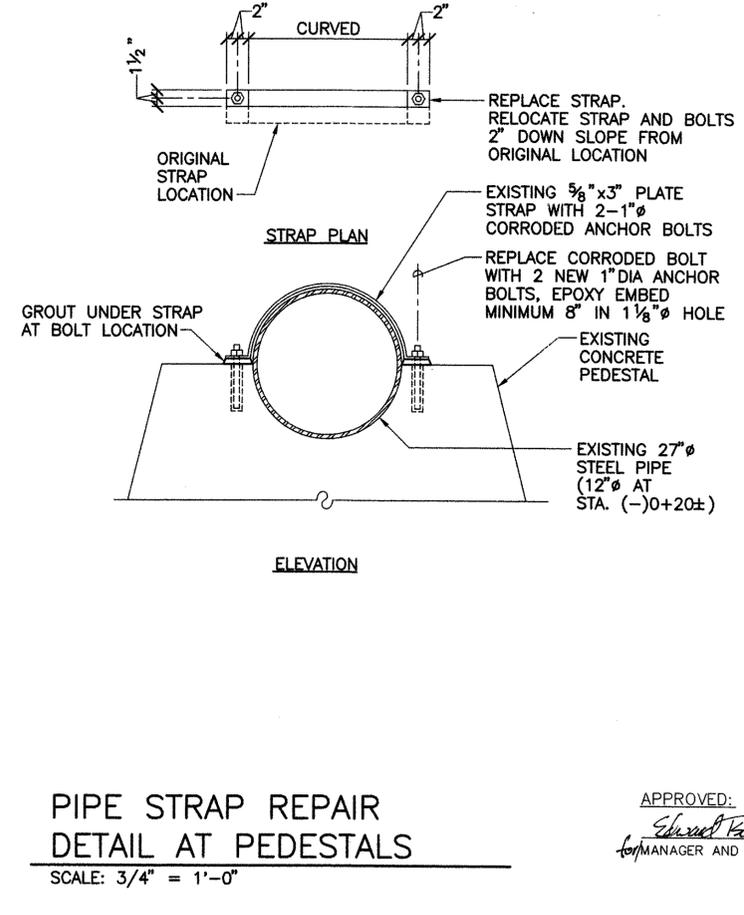
SHEET 10 OF 14 SHEETS

PROJECT NO. _____

DATE: _____



AS-BUILT DRAWINGS
 CERTIFIED BY: *DEANIC CO, INC.*
 CONTRACTOR'S NAME AND COMPANY (PRINTED) *Deanic Co* DATE: *4/5/04*
 SUBMITTED BY: *Sam J. J. J.*
 COMPANY NAME (PRINTED) *HAWAII PACIFIC ENGINEERS, INC.* DATE: *4/5/04*



STRAP REPAIR SCHEDULE	
PEDESTAL STA NO	NUMBER OF STRAPS
6+64	3
5+66	1
4+35	8
2+34	4
1+82	4
1+38	8
SEE SHEET C-3 FOR LOCATION	4*

* REPLACE 3/8" ANCHOR BOLT AT STRAP FOR 12" PIPE. GROUT UNDER STRAP AT BOLT LOCATION.

APPROVED: *Edward T. ...*
 for MANAGER AND CHIEF ENGINEER, DEPARTMENT OF WATER DATE: *1/29/02*

HAWAII PACIFIC ENGINEERS, INC.
 CIVIL ENGINEERING AND PLANNING
 CONSTRUCTION MANAGEMENT SERVICES

CELESTINE M. MIYASATO
 LICENSED PROFESSIONAL ENGINEER
 No. 8121-S
 HAWAII

THIS WORK WAS PREPARED BY ME OR UNDER MY SUPERVISION. CONSTRUCTION OF THIS PROJECT WILL BE UNDER MY SUPERVISION. (SUPERVISION OF CONSTRUCTION IS DEFINED AS THE ACT OF THE REGISTERED PROFESSIONAL ENGINEER OR ARCHITECT AND SUPERVISORS OF THE STATE OF HAWAII.)

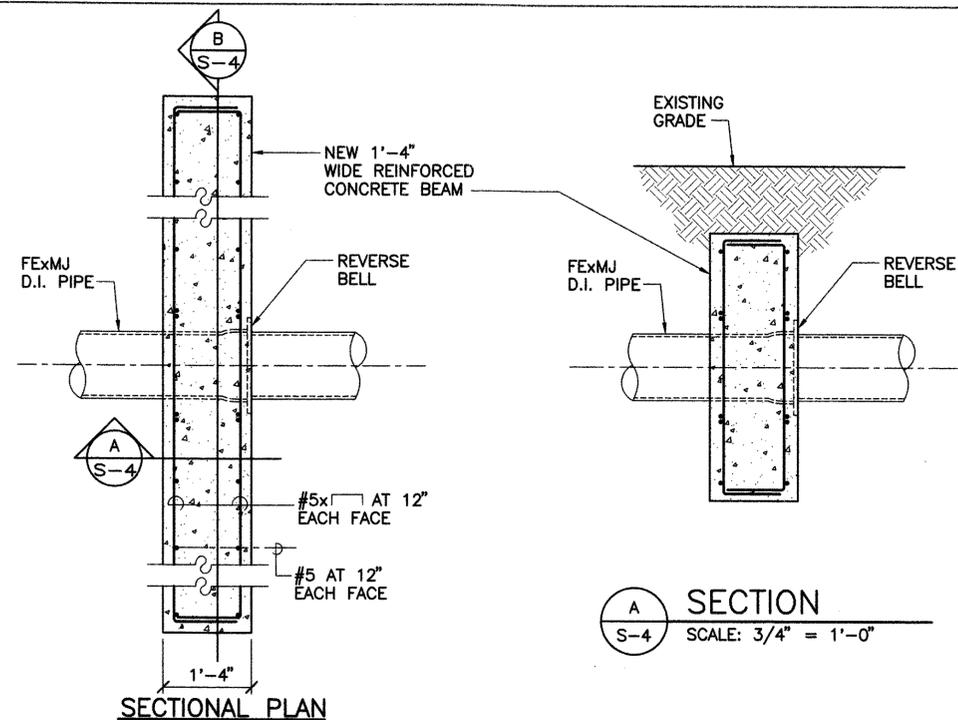
JOB 97-6 - REHABILITATION OF 27" STEEL PIPE HANAPEPE-ELEELE WATER SYSTEM HAWAII, KAUAI.

REPAIR SECTIONS AND DETAILS

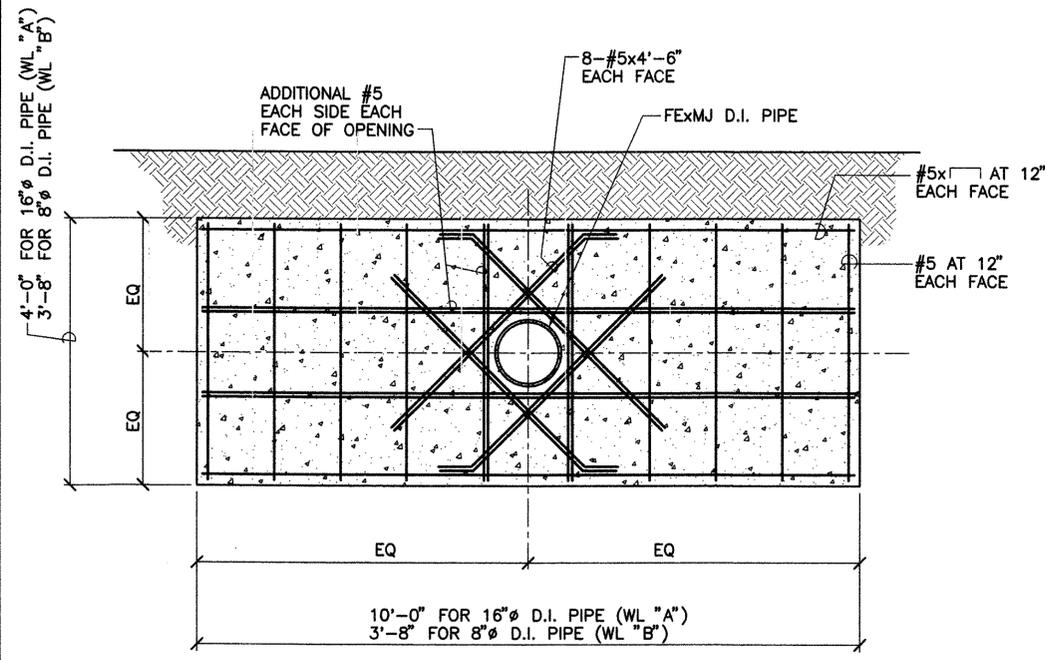
NO.	DESCRIPTION	DATE	APPROVED

S-2
 SHEET *11* OF *14* SHEETS
 PROJECT NO.
 DATE:

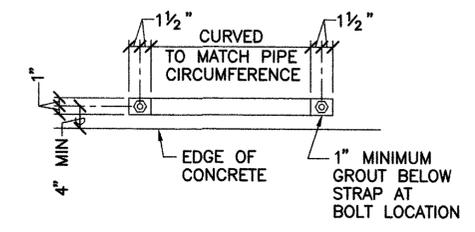
"AS-BUILT"



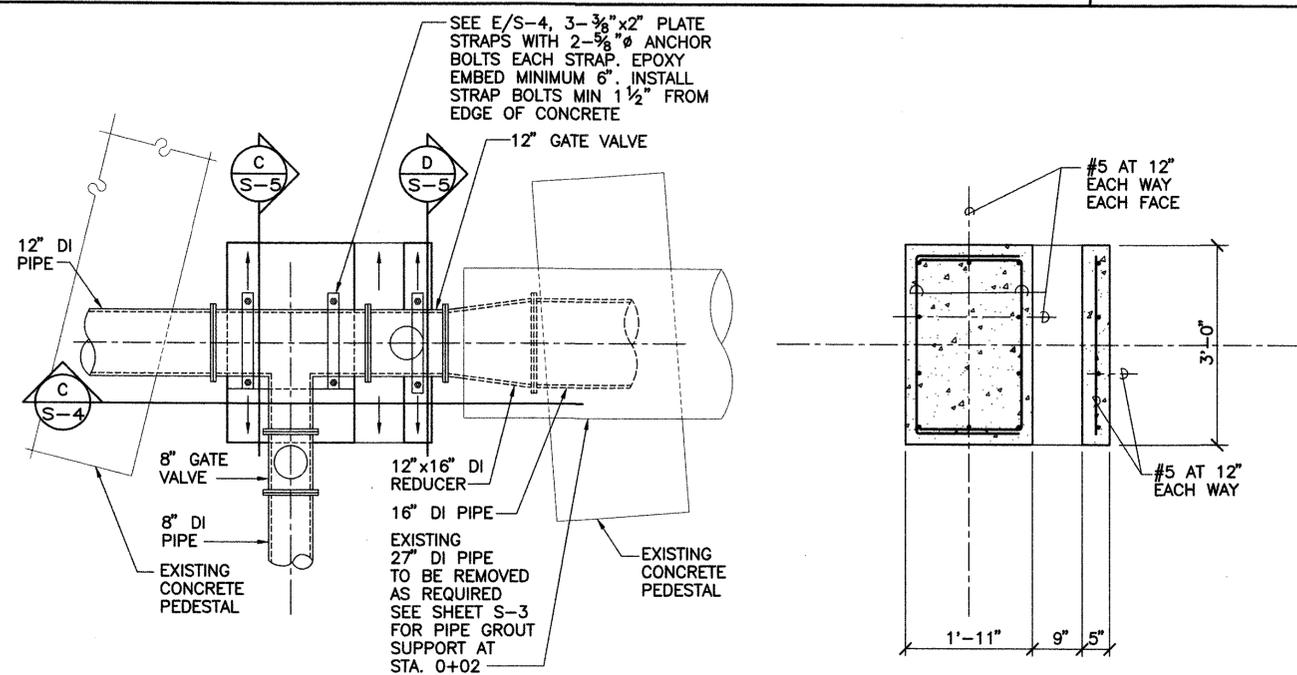
SECTIONAL PLAN
 SPECIAL REINF. CONC. THRUST BEAM WITH REVERSE BELL
 AT STA. 7+80± FOR 16"Ø D.I. PIPE (WL "A")
 AT STA. 7+75± FOR 8"Ø D.I. PIPE (WL "B")
 AT STA. 8+50± FOR 16"x12" D.I. REDUCER (WL "A")
 SCALE: 3/4" = 1'-0"



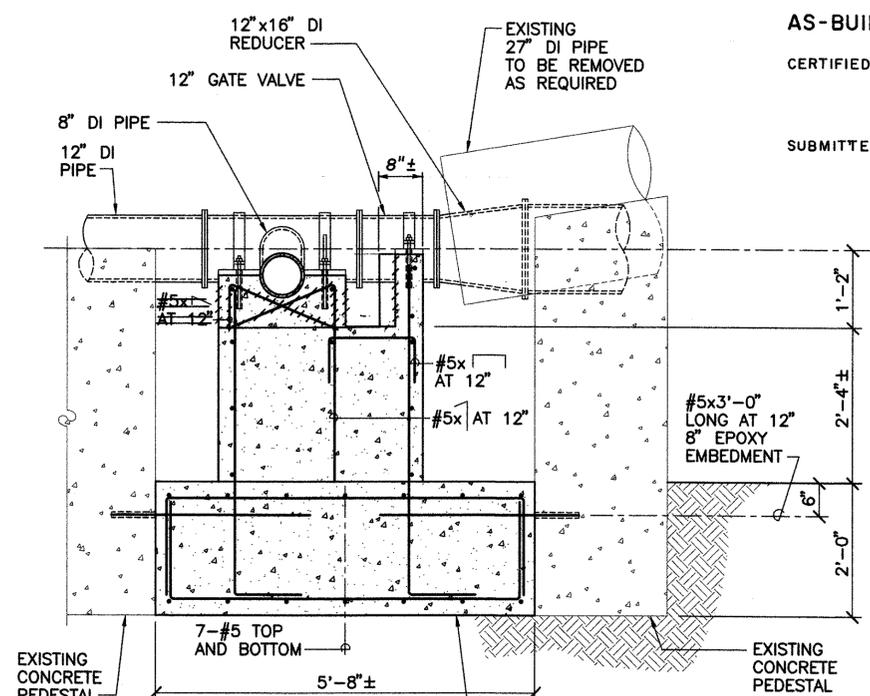
SECTION B
 SCALE: 3/4" = 1'-0"



STRAP DETAIL
 SCALE: 3/4" = 1'-0"



SECTIONAL PLAN
 PEDESTAL SUPPORT FOR CONNECTION WL "A"
 SCALE: 3/4" = 1'-0"



SECTION C
 SCALE: 3/4" = 1'-0"

EXCAVATE 2'-0" MIN DEPTH BELOW EXISTING GRADE FOR PLACEMENT OF FOOTING CONCRETE. IF HARD, INTACT ROCK IS ENCOUNTERED, EXCAVATE 1'-0" MIN DEPTH BELOW EXISTING GRADE. DO NOT UNDERMINE EXISTING PEDESTAL FOOTINGS

AS-BUILT DRAWINGS
 CERTIFIED BY: OCEANIC CO., INC.
 CONTRACTOR'S NAME AND COMPANY (PRINTED)
Greg Cui DATE: 4/5/04
 SUBMITTED BY: HAWAII PACIFIC ENGINEERS, INC.
 COMPANY NAME (PRINTED)
Justin Palanda DATE: 4/5/04

APPROVED: Schuel Bohm
 MANAGER AND CHIEF ENGINEER, DEPARTMENT OF WATER
 DATE: 1/20/02

JOB 97-6 - REHABILITATION OF 27" STEEL PIPE HANAPEPE-ELEELE WATER SYSTEM
 HAWAII
 KAUAI

NEW PIPE SUPPORT SECTIONS AND DETAILS



THIS WORK WAS PREPARED BY ME UNDER MY SUPERVISION AND I AM A LICENSED PROFESSIONAL ENGINEER. THIS PROJECT WILL BE UNDER MY SUPERVISION. (SUPERVISION OF CONSTRUCTION AS DEFINED IN SECTION 101-10.1 OF THE HAWAIIAN REGULATIONS OF THE BOARD OF ARCHITECTS AND SURVEYORS OF THE STATE OF HAWAII)

Hawaii Pacific Engineers, Inc.
 CIVIL ENGINEERING AND PLANNING
 CONSTRUCTION MANAGEMENT SERVICES

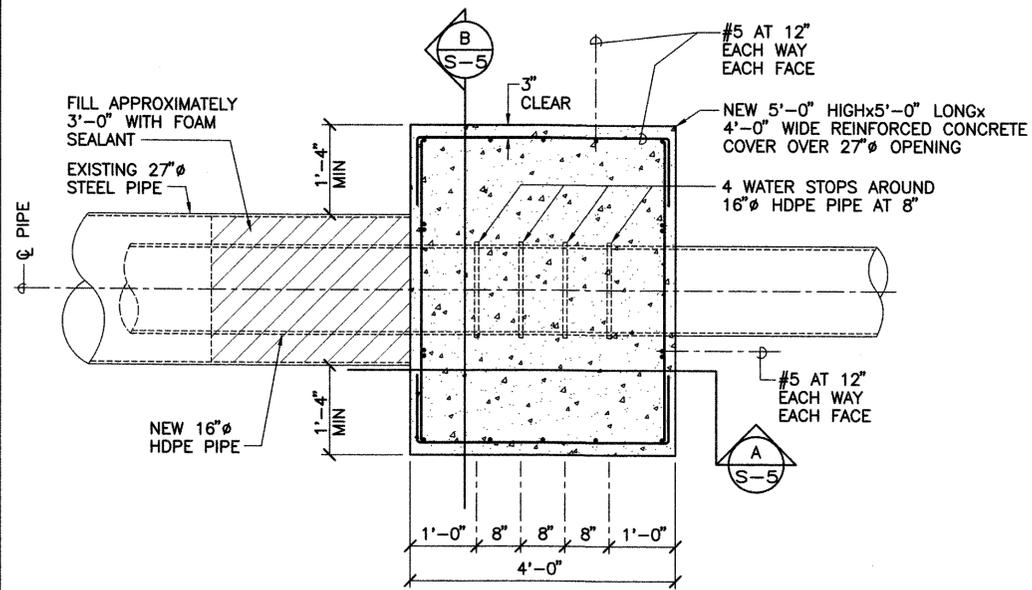
REVISION	DESCRIPTION	DATE	APPROVAL

S-4

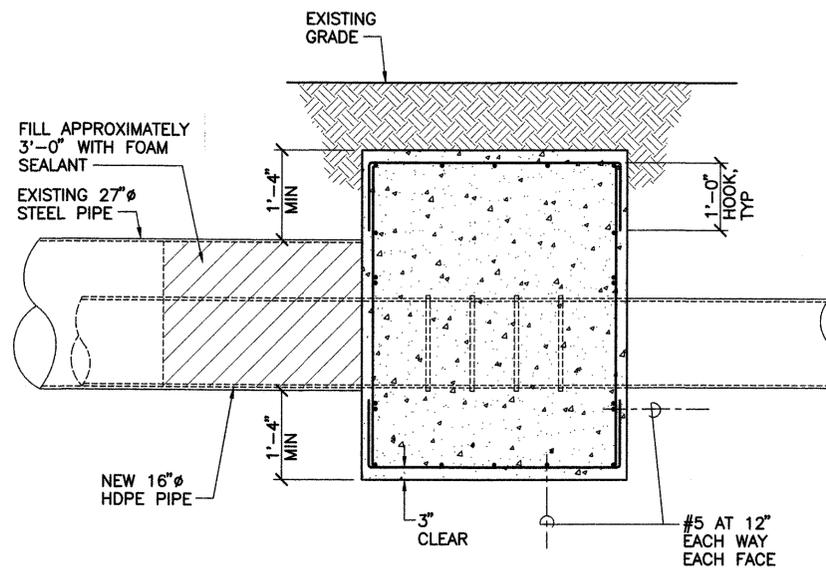
SHEET 13 OF 14 SHEETS
 PROJECT NO. _____

DATE: _____

"AS-BUILT"



SECTIONAL PLAN



SECTION A SCALE: 3/4" = 1'-0"

SPECIAL REINFORCED CONCRETE THRUST BLOCK ABUTTING E/W27", WITH WATER STOP
SCALE: 3/4" = 1'-0"

AS-BUILT DRAWINGS

CERTIFIED BY: OCEANIC CO., INC.
CONTRACTOR'S NAME AND COMPANY (PRINTED)
[Signature] DATE: 4/15/04

SUBMITTED BY: HAWAII PACIFIC ENGINEERS, INC.
COMPANY NAME (PRINTED)
[Signature] DATE: 4/15/04



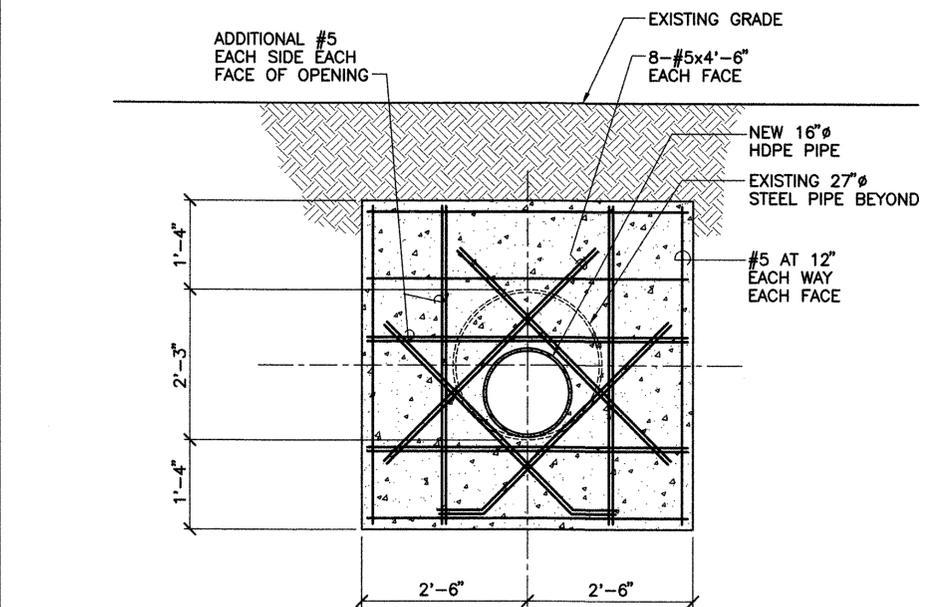
THIS WORK WAS PREPARED BY ME OR UNDER MY SUPERVISION. CONSTRUCTION OF THIS PROJECT WILL BE UNDER MY SUPERVISION. (SUPERVISION OF CONSTRUCTION OF THIS PROJECT IS REQUIRED BY SECTION 12 (D) OF THE RULES AND REGULATIONS OF THE BOARD OF PROFESSIONAL ENGINEERS AND SURVEYORS OF THE STATE OF HAWAII.)

Hawaii Pacific Engineers, Inc.
CIVIL ENGINEERING AND PLANNING
CONSTRUCTION MANAGEMENT SERVICES

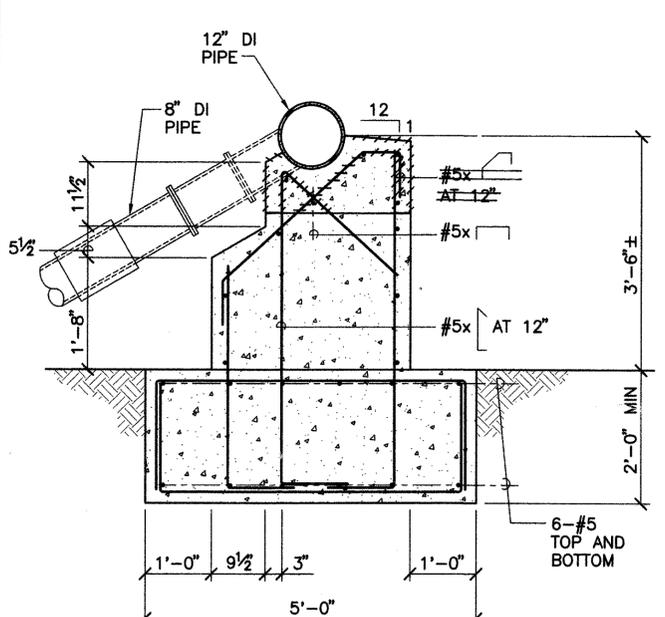
JOB 97-6 - REHABILITATION OF 27" STEEL PIPE
HANAPEPE-ELEELE WATER SYSTEM
HANAPEPE - ELEELE, KAUAI, HAWAII

NEW PIPE SUPPORT
SECTIONS AND DETAILS

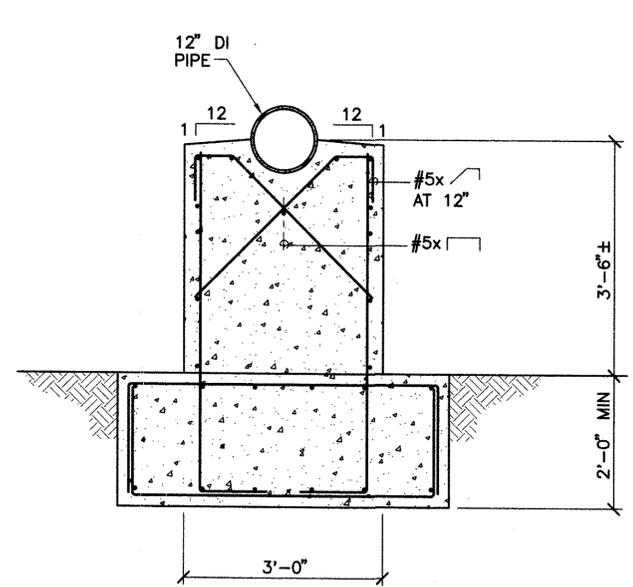
REVISION	DESCRIPTION	DATE	APPROVED



SECTION B SCALE: 3/4" = 1'-0"



SECTION C SCALE: 3/4" = 1'-0"



SECTION D SCALE: 3/4" = 1'-0"

APPROVED: [Signature] DATE: 1/29/02
MANAGER AND CHIEF ENGINEER, DEPARTMENT OF WATER

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SHEET 14 OF 14 SHEETS
PROJECT NO.
DATE:

"AS-BUILT"