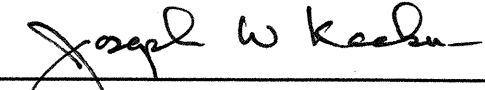


BWS WATERLINE NOTES

FED. ROAD DIST. NO.	STATE	PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
HAWAII	HAW.	93A-01-01 93A-02-01	2004	4	48

1. Unless otherwise specified, all material and construction of water system facilities and appurtenances shall be in accordance with the STANDARD SPECIFICATIONS FOR ROAD AND BRIDGE CONSTRUCTION, dated 1994, as amended of the HAWAII, Highways Division, Department of Transportation, and the City and County of Honolulu Board of Water Supply's "WATER SYSTEM STANDARDS", dated 2002. The "WATER SYSTEM EXTERNAL CORROSION CONTROL STANDARDS", VOLUME 3, DATED 1991 and all subsequent amendments and all subsequent amendments and additions.
2. All plans approved by the Board of Water Supply are based solely on this adequacy of the water supply. All other features of the water system , such as lines, grades, fittings drainage, etc. and other features of improvements shall not be the responsibility of the Board of Water Supply.
3. The Contractor shall notify BWS Maintenance Unit - Engineering Construction Section in writing and submit five (5) sets approved construction plans one week prior to commencing work on the water system.
4. The Contractor shall be responsible for the protection of all water lines during construction. The Contractor shall be especially careful when excavating behind water lines, tees, and bends, wherever there is a possibility of water line movement due to the removal of the supporting earth beyond the existing reaction blocks. The Contractor shall take whatever measures necessary to protect the water lines, such as constructing special reaction blocks (with BWS approval)and/or modifying his construction method.
5. The existence and location of underground utilities and structures as shown on the plans are from the latest available data but is not guaranteed as to the accuracy or the encountering of other obstacles during the course of the work. The Contractor shall be responsible and pay for all damages to existing Utilities. The Contractor shall not assume that where no utilities are shown, that none exist.
6. Prior to installation, the Contractor shall submit for approval by Board of Water Supply, the manufacturer's certification that all cast iron (gray or ductile) fitting for the project conform in all respects to the Water System Standards, dated 1985.
7. Polygon shape for mechanical joint glands as described in AWWA Standard C111 shall be "straight-sided" or an approved equal on a job to job basis.
8. Re-approval shall be required if this project is not under construction within a period of two years.
9. The Contractor shall cut and plug at existing unused laterals at the main whether or not shown on the plans. The damaged area shall be repaired to an equal or better condition than the immediate area. All work shall be done at the expense of the Contractor.
10. The Contractor/Developer shall obtain a NPDES permit prior to chlorination and/or dewatering. A copy of the permit shall be submitted to the Board of Water Supply, Planning and Engineering Division, Construction Section.
11. Two-way reflective hydrant markers Type DB shall be installed at all new fire hydrant installations. Contractor shall verify the exact locations of hydrants markers with the nearest Honolulu Fire Department Battalion Chief.
12. Prior to any excavating, the Contractor shall verify in the field the location of existing mains and appurtenances.
13. The Contractor and State Department of Transportation shall notify BWS Construction Section (527-5205 or 527-5206) sixty (60) days prior to construction at or near areas in conflict with the BWS projects: Farrington Highway: 8-inch, 12-Inch & 24-Inch mains Part II-Phase A, Job 01-0551 (tentative Construction Schedule: 10/2001 - 3/2003) Hakimo Road to Nanaikeola Street; and Farrington Highway: 24-Inch Transmission Mains, Part I-Phase A&B, (Tentative Construction Schedule: 4/2003 - 12/2004) Haleakala Avenue to Aliinui Drive to avoid delays and conflict during construction. The Contractor shall allow BWS's contractor to install new water mains prior to any resurfacing or utility improvements work at areas in conflict. BWS and State Department of Transportation shall not be liable for any delays due to contractor's failure to coordinate the construction schedule for this utility project.
14. The Contractor shall chlorinate the entire inside surface of each pipe and fitting with disinfection solution of 5 ounces of sodium hypochlorite mixed with 10 gallons of water. (For connection only)
15. Test pressure shall be 150 psi.
16. Prior to installation, the Contractor shall submit for approval by Board of Water Supply, the manufacturer's certification that all cast iron (gray or ductile) fittings for the project conform in all respects to the Water System Standards, dated 2002.
17. Pipe cushion shall be of high resistivity material. The Contractor shall submit a soil certification that high resistant cushion material has a resistivity greater than 5,000 OHM-CM. Remainder of the backfill material shall contain no hazardous substances above regulatory action levels including but not limited to lead, asbestos, mercury, chromium, cadmium, zinc, strontium and polychlorinated biphenyls (PCB).
18. All ductile iron pipe, fittings and valves shall be wrapped with two layers of 8 mil. Polyethylene wrap.
19. Ball corp and ball stop shall be used in lieu of a corporation stop and stopcock, respectively.
20. Install 4 mil. thick, non-metallic, blue colored, 6 inches wide warning tape over centerline of the pipe and below the base course along the entire length of trench. Tape should be marked with "CAUTION WATER LINE BURIED BELOW".
21. All waterline construction requiring shutdown connection shall be scheduled for normal working hours for residential and after normal working hours for commercial six (6) hours maximum down time.

ORIGINAL PLAN	SURVEY PLOTTED BY	DATE
002900	J. Alencastro	1/8/03
002900	DESIGNED BY	
002900	CHECKED BY	

APPROVED:	
	5/21/03
Principal Executive Maintenance Unit, BWS	DATE

STATE OF HAWAII DEPARTMENT OF TRANSPORTATION HIGHWAYS DIVISION
UTILITY NOTES
FARRINGTON HIGHWAY DRAINAGE IMPROVEMENTS
Vicinity of Nanakuli Avenue to Nanakuli Stream and Vicinity of Lualei Place to Princess Kahanu Avenue
Project Nos. 93A-01-01 & 93A-02-01
Date: August, 2002
SHEET No. 1 OF 3 SHEETS

HAWAIIAN ELECTRIC COMPANY NOTES

1. LOCATION OF HECO FACILITIES
The location of HECO overhead and underground facilities shown on the plans are existing records with varying degrees of accuracy are not guaranteed as shown. The Contractor shall verify in the field, the locations of the facilities and shall exercise proper care in excavating and working in the area. Wherever connections of new utilities to existing utilities and utility crossings are shown, the Contractor shall expose the existing lines at the proposed connections and crossings to verify the depths prior to excavation for the new lines. The Contractor shall be responsible for any damages to HECO's facilities whether shown or not shown on the plans.
2. COMPLIANCE WITH HAWAII OCCUPATIONAL SAFETY AND HEALTH LAWS
The Contractor shall comply with the State of Hawaii's Occupational Safety and Health Laws and Regulations, including without limitation, those related to working on or near exposed or energized electrical lines and equipment.
3. EXCAVATION PERMIT
The Contractor shall obtain an excavation permit from HECO's Technical Division (543-5654) located at 820 Ward Avenue, 4th floor, two weeks prior to starting construction. Please refer to our request number at that time.
4. CAUTION!!! ELECTRICAL HAZARD!!!
Existing HECO overhead and underground lines are energized and will remain energized during construction unless prior special arrangements have been made with HECO. Only HECO personnel are to handle these energized lines and erect temporary guards to protect these lines from damage. The Contractor shall work cautiously at all times to avoid accidents and damage to existing HECO facilities, which can result in electrocution.
5. OVERHEAD LINES
State laws requires that a worker and the longest object he or she may use cannot come closer than a minimum radial clearance of 10 feet when working close to or under any overhead lines rated 50KV and below. For each additional 1KV above 50KV, an additional 0.4 inch shall be added to the 10-foot clearance requirement. The preceding information on line clearance is provided as a convenience and it is the Contractor's responsibility to be informed of and comply with any revisions or amendments to the law.

Should the Contractor anticipate that his work will result in the need to encroach within the minimum required clearance at any time, the Contractor shall notify HECO at least four (4) weeks prior to the planned encroachment so that, if feasible, the necessary protections (e.g. relocation, de-energize, or blanket HECO lines) can be put in place. HECO's cost of safeguarding its line will be charged to the contractor.

Contact HECO's Customer Installation Department at 543-7846 for assistance in identifying and safeguarding overhead powerlines.

Refer to Section X of HECO's Electric Service Installation Manual for additional guidelines when working around HECO's facilities. A copy may be obtained from HECO's Customer Installations Department.

6. POLE BRACING
A minimum clearance of 10 feet must be maintained when excavating around utility poles and/or their anchor system to prevent weakening or pole support failure. Should work require excavating within 10 feet of a pole and/or its anchor system, the Contractor shall protect, support, secure and take all other precautions to prevent damage to or leaning of these poles. The Contractor is responsible for all associated costs to brace, repair, or straighten poles. All means of structural support for poles proposed by the Contractors shall first be reviewed by HECO before implementation. For pole bracing instructions, the Contractor shall call the HECO Construction and Maintenance Dept., Customer & System Superintendent at 543-4223 a minimum of two (2) weeks in advance.

7. UNDERGROUND LINES
The Contractor shall exercise extreme caution whenever construction crosses or is in close proximity of underground lines. HECO's existing electrical cables are energized and will remain energized during construction. Only HECO personnel are to break into existing HECO facilities, handle these cables, and erect temporary guards to protect these cables from damage. The cost of HECO's assistance in providing proper support and protection of its underground lines will be charged to the Contractor. Special precautions are required when excavating near HECO's 138 KV underground lines (see HECO instructions to Consultant/Contractors on "Excavation Near HECO's Underground 138KV Lines" for detailed requirements.

For verification of underground lines, the Contractor shall call HECO's Underground Division at 543-7049 a minimum of 72 hours in advance.

For assistance in providing proper support and protection of these lines, the Contractor shall call HECO's Construction and Maintenance Dept., Customer & System Superintendent, at 543-4223, a minimum of two (2) weeks in advance.

8. EXCAVATIONS
When trench excavation is adjacent to or beneath HECO's existing structures or facilities, the Contractor is responsible for:
a) Sheeting and bracing the excavation and stabilizing the existing ground to render it safe and secure and to prevent possible slides, cave-ins, and settlements.
b) Properly supporting existing structures or facilities with beams, struts, or under-pinnings to fully protect it from damage.
c) Backfilling with proper backfill material including special thermal backfill where existing (refer to Engineering Department for thermal backfill specifications).
9. RELOCATION OF HECO FACILITIES
Any work required to relocate or modify HECO facilities shall be done by HECO, or by the Contractor under HECO's supervision. The Contractor shall be responsible for all coordination, and shall provide necessary support for HECO's work, which may include, but not be limited to, excavation and backfill, permits and traffic control, barricading, and restoration of pavement, sidewalk and other facilities. All costs associated with any relocation or modification (either temporary or permanent for the convenience of the Contractor, or to enable the Contractor to perform his work in a safe and expeditious manner in fulfilling his contract obligations shall be borne by the Contractor.

10. CONFLICTS
Any redesign or relocation of HECO's facilities not shown on the plans may be cause for lengthy delays. The Contractor acknowledges that HECO is not responsible for any delay or damage that may arise as a result of any conflicts discovered or identified with respect to the location or construction of HECO's electrical facilities in the field, regardless of whether the Contractor has met the requested minimum advance notices. In order to minimize any delay or impact arising from such conflicts, HECO should be notified immediately upon discovery or identification of such conflict.

11. DAMAGE TO HECO FACILITIES
The Contractor shall be responsible for the protection of all HECO surface and subsurface utilities and shall be responsible for any damages to HECO's facilities as a result of his operations. The Contractor shall immediately report such damages to HECO's Trouble Dispatcher at 548-7961. Repair work shall be done by HECO or by the Contractor under HECO's Supervision. Costs for damages to HECO facilities shall be borne by the Contractor.

In case of damage or suspected damage to HECO's fuel pipeline, the Contractor shall immediately notify HECO's Honolulu Power Plant Shift Supervisor at 532-2102 (a 24-hour number) so HECO personnel can secure the damaged section and report any oil spills to the proper authorities. All costs associated with the damage, repair, and oil spill cleanup shall be borne by the Contractor.

12. HECO STAND-BY PERSONNEL
The Contractor may request HECO to provide an inspector to stand-by during construction near HECO's facilities. The cost of such inspection will be charged to the Contractor.

The Contractor shall call the HECO Construction and Maintenance Dept., Customer & System Superintendent at 543-4223 a minimum of 5 working days in advance to arrange for HECO stand-by personnel.

13. CLEARANCES
The following clearances shall be maintained between HECO's ductline and all adjacent structures (charted and uncharted) in the trench:

STRUCTURE TYPE	MINIMUM CLEARANCE (INCHES)
Water Lines, parallel	36
Water Lines, crossing	12 (A)
Sewer Lines, parallel	36 (B)
Sewer Lines, crossing	24 (C)
Drain Lines, parallel	12
Drain Lines, crossing	6 (D)
Electrical and Gas Lines, parallel	12
Electrical and Gas Lines, crossing	12
Telephone Lines, parallel	6 (D)
Telephone Lines, crossing	6 (D)
Chevron Oil Lines, parallel	36
Chevron Oil Lines, crossing	48 below oil line (E)

- A. The minimum vertical clearances to water lines crossing electrical ductlines can be reduced to 6 inches if the electrical ductline structure is smaller than 16 inches, is concrete encased, and is below the water line.
- B. A minimum horizontal clearance of 36 inches is required between new handholes and existing sewer laterals.
- C. The minimum horizontal clearances to sewer pipes crossing electrical ductlines can be reduced to 12 inches if the sewer pipe is jacketed in concrete.
- D. The minimum clearances shall be increased to 12 inches if the electrical ductline is direct buried.
- E. The minimum vertical clearances to oil lines crossing electrical ductlines can be reduced to 24 inches below oil lines if the crossings are encased in 6 inches of concrete.
- F. The Contractor shall notify the Construction Manager & HECO of any heat sources (power cable duct bank, steamline, etc.) encountered that are not properly identified on the drawing

15. INDEMNITY
The Contractor shall indemnify, defend and hold harmless HECO from and against all losses, damages, claims, and actions including but not limited to reasonable attorney's fees and costs based upon or arising out of damage to property or injuries to persons, or other tortious acts caused or contributed to by the Contractor or anyone acting under its direction or control or on behalf; provided Contractor's indemnity shall not be applicable to any liability based upon the sole negligence of HECO.

FED. ROAD DIST. NO.	STATE	PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
HAWAII	HAW.	93A-01-01 93A-02-01	2004	5	48

SURVEY PLOTTED BY	DATE
DRAWN BY	
TRACED BY	
CHECKED BY	
QUANTITIES BY	
NO. 904	

STATE OF HAWAII DEPARTMENT OF TRANSPORTATION HIGHWAYS DIVISION UTILITY NOTES FARRINGTON HIGHWAY DRAINAGE IMPROVEMENTS Vicinity of Nanakuli Avenue to Nanakuli Stream and Vicinity of Lualei Place to Princess Kahanu Avenue Project Nos. 93A-01-01 & 93A-02-01 Date: August, 2002 SHEET No. 2 OF 3 SHEETS

HAWAIIAN ELECTRIC COMPANY NOTES-CONT.

FED. ROAD DIST. NO.	STATE	PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
HAWAII	HAW.	93A-01-01 93A-02-01	2004	6	48

16.

SCHEDULE

Contractor shall furnish his construction schedule at least 60 working days prior to starting work on HECO facilities. Contractor shall give HECO, in writing, forty (40) working days notice to proceed with HECO's portion of work.
17.

AUTHORITY

All construction, restoration work and inspection shall be subject to whichever governmental agency has authority over the work.
18.

SPECIFICATION

Construction of HECO's underground facilities shall be constructed in accordance with the latest revisions of HECO Specifications CS7001, CS7003, CS7202, CS9301, and CS9401 and applicable HECO standards.
19.

CONSTRUCTION

Contractor shall furnish all labor, materials, equipment, and services to properly perform and fully complete all work shown on the contract, drawings, and specifications. All materials shall be new and manufactured in the United States of America. All manhole, handhole, and ductline installations shall be inspected and approved by HECO prior to excavation and prior to placing concrete. Contractor shall notify HECO's Inspection Division at 543-4356 at least 48 hours prior to placing concrete.
20.

STAKEOUT

The Contractor shall stakeout all proposed HECO facilities within the project area so as to not conflict with any utility (existing or proposed) and any proposed construction or improvement work for verification by HECO before proceeding with HECO work.
21.

DUCTLINES

All ductlines installations shall be PVC schedule 40 encased in concrete, unless otherwise noted. All completed ductlines shall be mandrel rested by the Contractor in the presence of HECO's inspector using HECO's standard practice. The Contractor shall install a 1/8" polyolefin pull line in all completed ductlines after mandrel testing is complete.
22.

JOINT POLE REMOVAL

The last joint pole occupant off the poles shall remove the poles.

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

STATE OF HAWAII
DEPARTMENT OF TRANSPORTATION
HIGHWAYS DIVISION

UTILITY NOTES

FARRINGTON HIGHWAY DRAINAGE IMPROVEMENTS
Vicinity of Nanakuli Avenue to Nanakuli Stream and
Vicinity of Lualei Place to Princess Kahanu Avenue
Project Nos. 93A-01-01 & 93A-02-01
Date: August, 2002

SHEET No. 3 OF 3 SHEETS