

FED. ROAD DIST. NO.	STATE	FEDERAL AID PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
HAWAII	HAW.	CMAQ-031-K012	2013	9	54

HAWAIIAN TELCOM NOTES:

- ORIGINAL PLAN
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No.
- The Contractor shall procure and pay for all licenses and permits and shall give all notices necessary and incident to the due and lawful prosecution of the work.
 - The Contractor shall obtain an excavation permit and toning request from Hawaiian Telcom's Excavation Permit Section, located at 1177 Bishop Street, two weeks prior to the start of construction. Hours of business are 8:00 a.m. to 11:00 a.m. and 12:00 a.m. to 3:00 p.m. Monday through Friday, except holidays.
 - Prior to the excavation of the ductline, the Contractor shall request Hawaiian Telcom to locate existing ductline wherever required. For underground cable locating and marking, five (5) working days advance notice is required. Three (3) working days advance notice is required for any inspection by a designated representative.
 - The locations of existing utilities are approximate only. The Contractor shall exercise extreme caution and shall maintain proper clearances whenever construction crosses or is in close proximity of Hawaiian Telcom facilities. The Contractor shall verify their locations and shall be liable for any damages to Hawaiian Telcom facilities. Any damages shall be reported immediately to Hawaiian Telcom's Repair Section at *611 (24 hours) or to the Excavation Permit Section at 546-7746 (normal working hours, Monday through Friday, except holidays). As a result of his operations, adjustments to the new ductline alignment, if required, shall be made to provide the required clearances.
 - The Contractor shall take necessary precaution not to damage existing cables or ducts. A Hawaiian Telcom inspector or designated representative is required to be at any job site whenever there will be a breakage into or entry into any structure that contain Hawaiian Telcom facilities. Temporary cable and duct supports shall be provided wherever necessary.
 - The Contractor shall notify Hawaiian Telcom's inspector or designated representative a minimum of 72 hours prior to excavation, bracing, or backfilling of Hawaiian Telcom's structures or facilities.
 - All applicable construction work shall be done in accordance with the "Hawaiian Telcom Standard Specifications for Placing Underground Telephone Systems" dated January 2007. All subsequent amendments and additions, and all other pertinent standards for telephone construction. Contractor shall familiarize his personnel by obtaining applicable specifications.
 - When excavation is adjacent to or beneath Hawaiian Telcom's existing structures or facilities, the Contractor shall:

a) Sheet and/or brace the excavation to prevent slides, cave-ins, or settlements to ensure no movement to Hawaiian Telcom's structures or facilities.

b) Protect existing structures and/or facilities with beams, struts, or underpinning while excavating beneath them to ensure no movement to Hawaiian Telcom's structures or facilities.
 - The Contractor shall brace all poles or light standards near the new ductline, manhole, or handhole during his operations.

HAWAIIAN TELCOM NOTES (CONT.):

- The Contractor shall saw-cut A.C. pavement and concrete gutter wherever new manholes, handholes, or ductlines are to be placed and shall restore to existing condition or better.
- The Contractor shall comply with the policy adopted by the Department of Public Works, City and County of Honolulu, concerning the replacement of concrete sidewalks after excavation work.
- The underground pipes, cables, or ductlines known to exist by the Engineer from his search of records are indicated on the plans. The Contractor shall verify the locations and depths of the facilities and exercise proper care in excavating in the area. Wherever connections of new utilities to existing utilities are shown on the plans, the Contractor shall expose the existing lines at the proposed connections to verify their locations and depths prior to excavation for the new lines.
- Wherever connections to existing utilities are shown on the plans the Contractor shall expose the existing utilities prior to excavation of the main trenches to verify their locations and depths.
- The Contractor, at his own expense, shall keep the project and surrounding area free from dust nuisance. The cost for supplementary measures, which will be required by the County, shall be borne by the Contractor.
- The Contractor shall pump all manholes dry during final inspection.
- The Contractor shall notify Hawaiian Telcom inspector 24 hours prior to the pouring of concrete or backfilling.
- When connecting to manhole walls, all existing reinforcing bars shall be left intact. Ducts shall be adjusted in the field in order to clear reinforcing.
- The Contractor shall be responsible for laying out all required lines and grades and shall preserve all benchmarks and working points necessary to lay out the work correctly. The new ductline shall be adjusted by the Contractor to suit the existing conditions and the details as described in the plans.
- Minimum concrete strength shall be:

For ductline 2500 psi at 28 days

For manhole 3000 psi at 28 days or as specified in design notes
- Bends in the duct alignment due to changes in grade shall have a minimum radius of 25 feet. All 90 degree C-bends at a pole or at the building floor slab penetration shall have a bend radius of ten times the diameter of the duct or greater.
- After ductline has been completed, a mandrel with a square front not less than 12" long and having a diameter of 1/4" less than the inside diameter of the duct, shall be pulled through each duct after which a brush with stiff bristles shall be pulled through to make certain that no particles of earth, sand, or gravel have been left inside. Ducts shall be completely dry and clean.
- All ducts and conduits shall have an 1800* polyester mule-tape (NEPTCO, WP1800P, Hawaiian Telcom Material Code No. 571154) installed throughout its entire length. All ducts shall be capped to prevent entry of foreign material during construction and at the completion of installation.

MECO NOTES:

- Location of MECO Facilities:

The location of MECO's overhead and underground facilities shown on the plans are from existing records with varying degrees of accuracy and 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 MECO's facilities whether shown or not shown on the plans.
- 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.
- Excavation Permit:

The Contractor shall obtain an excavation permit from MECO's Technical Division (871-8461) located at 210 West Kamehameha Avenue, two weeks prior to starting construction. Please refer to our request number at that time.
- Caution!!! Electrical Hazard!!!

Existing MECO overhead and underground lines are energized and will remain energized during construction unless prior special arrangements have been made with MECO. Only MECO 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 MECO facilities, which can result in electrocution.
- Overhead Lines:

State law requires that a worker and the longest object he or she may contact 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 requirements 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 MECO at least four (4) weeks prior to the planned encroachment so that, if feasible, the necessary protections (e.g. relocate, de-energize, or blanket MECO lines) can be put in place. MECO's cost of safeguarding its lines will be charged to the Contractor.

DEXTER S. ELLIOTT
LICENSED PROFESSIONAL ENGINEER
No. 4739-C
HAWAII, U.S.A.

THIS WORK WAS PREPARED BY ME OR UNDER MY SUPERVISION.
SIGNATURE
04/30/14
EXPIRATION DATE OF THE LICENSE

STATE OF HAWAII
DEPARTMENT OF TRANSPORTATION
HIGHWAYS DIVISION

UTILITY NOTES

PIILANI HIGHWAY
TRAFFIC OPERATION IMPROVEMENTS AT OHUKAI ROAD
FEDERAL AID PROJECT NO. CMAQ-031-K012

Scale: None
Date: March 2013

FED. ROAD DIST. NO.	STATE	FEDERAL AID PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
HAWAII	HAW.	CMAQ-031-1(012)	2013	10	54

MECO NOTES (CONT.):

Contact MECO's Customer Installations Department at 871-8461 for assistance in identifying and safeguarding overhead power lines.

Refer to Section X of MECO's Electric Service Installation Manual for additional guidelines when working around MECO's facilities. A copy may be obtained from MECO'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 the pole proposed by the Contractor shall first be reviewed by MECO before implementation. For pole bracing instructions, the Contractor shall call the MECO Construction and Maintenance Dept., Customer & System Superintendent at 871-8461 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. MECO's existing electrical cables are energized and will remain energized during construction. Only MECO personnel are to break into existing MECO facilities, handle these cables and erect temporary guards to protect these cables from damage. The cost of MECO'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 MECO's 138KV underground lines (See MECO instructions to Consultants/Contractors on "Excavation near MECO's underground 138KV lines" for detailed requirements).

For verification of underground lines, the Contractor shall call MECO's underground division at 871-2394 a minimum of 72 hours in advance.

For assistance in providing proper support and protection of these lines, the contractor shall call MECO's Construction & Maintenance Dept., Customer & System Superintendent, at 871-8461, a minimum of two (2) weeks in advance.

8. Underground Fuel Pipelines:

The Contractor shall exercise extreme caution whenever construction crosses or is in close proximity of MECO's underground fuel oil pipelines. Special precautions are required when excavating near MECO's underground fuel oil pipelines (See MECO instructions to Consultants/Contractors on "Excavation near MECO's underground Fuel Pipelines" for detailed requirements).

9. Excavations:

When trench excavation is adjacent to or beneath MECO'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).

MECO NOTES (CONT.):

10. Relocation of MECO Facilities:

Any work required to relocate or modify MECO facilities shall be done by MECO, or by the Contractor under MECO's supervision. The Contractor shall be responsible for all coordination, and shall provide necessary support for MECO's work, which may include, but not be limited to, excavation and backfill, permits and traffic control, barricading, and restoration of pavement, sidewalks, 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.

11. Conflicts:

Any redesign or relocation of MECO's facilities not shown on the plans may be cause for lengthy delays. The Contractor acknowledges that MECO 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 MECO'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, MECO should be notified immediately upon discovery or identification of such conflict.

12. Damage to MECO Facilities:

The Contractor shall be responsible for the protection of all MECO surface and subsurface utilities and shall be responsible for any damages to MECO's facilities as a result of his operations. The Contractor shall immediately report such damages to MECO's Trouble Dispatcher at 871-7777. Repair work shall be done by MECO or by the Contractor under MECO's supervision. Costs for damages to MECO's facilities shall be borne by the Contractor.

13. MECO Stand-by Personnel:

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

The Contractor shall call the MECO Construction and Maintenance Dept., Customer & System Superintendent at 871-8461 a minimum of 5 working days in advance to arrange for MECO stand-by personnel.

MECO NOTES (CONT.):

14. Clearances:

The following clearances shall be maintained between MECO's ductline and all adjacent structures (Charted and Uncharted) in the trench:

Structural Type	Minimum Clearances (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 vertical 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 & MECO 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 MECO 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 Contractor or anyone acting under its direction or control or on its behalf; provided Contractor's indemnity shall not be applicable to any liability based upon the sole negligence of MECO.

<div><div>DEKSTER S. EJI</div><div>LICENSED PROFESSIONAL ENGINEER</div><div>No. 4739-C</div><div>HAWAII, U.S.A.</div></div> <div>THIS WORK WAS PREPARED BY ME OR UNDER MY SUPERVISION.</div> <div><div>Signature</div><div>04/30/14</div><div>EXPIRATION DATE OF THE LICENSE</div></div>	<div>STATE OF HAWAII</div> <div>DEPARTMENT OF TRANSPORTATION</div> <div>HIGHWAYS DIVISION</div> <div>UTILITY NOTES</div> <div>PIILANI HIGHWAY</div> <div>TRAFFIC OPERATION IMPROVEMENTS AT OHUKAI ROAD</div> <div>FEDERAL AID PROJECT NO. CMAQ-031-1(012)</div> <div>Scale: NONE</div> <div>Date: March 2013</div>
SHEET No. G-9 OF 16 SHEETS	

FED. ROAD DIST. NO.	STATE	FEDERAL AID PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
HAWAII	HAW.	CMAQ-031-K012	2013	11	54

MECO NOTES (CONT.):
ADDITIONAL NOTES WHEN WORK INVOLVES CONSTR.
OF MECO FACILITIES:

16. Schedule:

Contractor shall furnish his construction schedule 10 working days prior to starting work on MECO facilities. Contractor shall give MECO, in writing, 10 working days notice to proceed with MECO'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. Specifications:

Construction of MECO's underground facilities shall be constructed in accordance with the latest revisions of MECO Specifications CS7001, CS7003, CS7202, CS9301, and CS9401 and applicable MECO 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 MECO prior to excavation and prior to placing concrete. Contractor shall notify MECO's Inspection Division at 871-8461 at least 48 hours prior to placing concrete.

20. Stakeout:

The Contractor shall stakeout all proposed MECO 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 MECO before proceeding with MECO work.

21. Ductlines:

All ductline installations shall be PVC Schedule 40 encased in concrete, unless otherwise noted. All completed ductlines shall be Mandrel Tested by the Contractor in the presence of MECO's Inspector using MECO'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.

23. As-built plans:

The Contractor shall provide MECO with two sets of As-Built reproducible tracings showing the offsets, stationing, and vertical elevation of the duct lines(s) constructed.

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DEXTER S. EJI

LICENSED PROFESSIONAL ENGINEER

No. 4739-C

HAWAII, U.S.A.

THIS WORK WAS PREPARED BY ME OR UNDER MY SUPERVISION.

SIGNATURE

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DEPARTMENT OF TRANSPORTATION

HIGHWAYS DIVISION

UTILITY NOTES

PIILANI HIGHWAY

TRAFFIC OPERATION IMPROVEMENTS AT OHUKAI ROAD

FEDERAL AID PROJECT NO. CMAQ-031-K012

Scale: None

Date: March 2013

SHEET No. 6-10 OF 16 SHEETS

WATER NOTES:

1. Unless otherwise specified, all materials and construction of water system facilities and appurtenances shall be in accordance with the STANDARD SPECIFICATIONS FOR ROAD AND BRIDGE CONSTRUCTION, dated 2005, as amended, of the Hawaii Highways Division, Department of Transportation, and the County of Maui, Department 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 additions.
2. All plans approved by the Department of Water Supply are based solely on the 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 Department of Water Supply.
3. The Contractor shall notify DWS Capital Projects Division, Construction Section in writing and submit six (6) sets of approved construction plans one week prior to commencing work on the water system.
4. 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.
5. Re-approval shall be required if this project is not under construction within a period of two years.
6. 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 measure necessary to protect the water lines, such as constructing special reaction blocks (with DWS approval) and/or modifying his construction methods.
7. Prior to any excavating, the Contractor shall verify in the field the location of existing water mains and appurtenances.
8. The Contractor shall verify all existing service lateral locations whether shown or not shown on plans prior to commencing with any of the work and shall not assume that where no services are shown, none exist.
9. The Contractor shall adjust all manhole frames/valve boxes/meter boxes within the resurfaced area. The Contractor shall be responsible for "referencing" these manholes/valve boxes/meter boxes to facilitate the adjustments.
10. Maintain 3'-0" minimum cover for all existing waterlines (18" minimum for service laterals) from new finish grade. The Contractor shall probe the waterline and service laterals and submit the probing data to DWS Capital Projects Division, Construction Section. Any adjustments to the existing water system to meet the minimum cover and the requirements of the DWS standards, whether shown on plans or not, shall be done by the Contractor at no cost to DWS.
11. All waterline construction requiring shutdown connection shall be scheduled for normal working hours at six (6) hours maximum downtime.
12. Maintain 3'-0" min. horizontal clear separation between all waterline systems and nearest electrical/signal ductlines paralleling the water system at no cost to the Department of Water Supply.

13. At the electrical/signal ductline water crossings, adjust all electrical/signal ductline elevations to maintain 6" vertical clear separation from all waterlines (12" clear for all electrical/signal ductline structures larger than 16") at no cost of the Department of Water Supply.
14. Maintain 3'-0" min. horizontal clear separation between street light/traffic signal, standards (including any modular units) and the nearest water system. Contractor shall field verify for any conflicts at each street light/traffic signal standard location. Where conflicts occur, the Contractor shall coordinate with the project engineer to revise the street light/traffic signal standard to provide the required clearances at no cost to the DWS.
15. The Contractor shall furnish and install polyethylene wrap, 3 feet minimum at all taps (for DI pipe and copper lateral combination only) and plastic pipe (PE tubing) 3 feet long after meters for all service lateral connections. (For copper service laterals only.)
16. Soil resistivity for the site has a corrosion rating of 2#4 as reported by Hirata & Associates, Inc. All required electrical isolation procedures and corrosion control requirements shall apply.
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 be as specified in the Water Systems Standards. Pipe cushion and 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. Polyvinyl chloride (PVC) pipes shall be Class 150 or 200. All ductile iron valves and metallic fittings shall be wrapped with two layers of 8 mil polyethylene wrap. No bending of polyvinyl chloride pipes shall be permitted. The installation of PVC pipe, according to the plans and specifications as bid on by the Contractor, may require additional design work, additional fittings and special couplings and shall be considered incidental to the unit price bid in the proposal for PVC pipe. Any additional design work shall be the responsibility of the Contractor. Electronic markers shall be installed along the centerline of the entire length of the pipeline at a minimum depth of 2 feet and a maximum depth of 3 feet from finish grade.
20. All Polyvinyl Chloride (PVC) pipe deflections shall be accomplished only by the use of special PVC deflection couplings. Deflection around curves shall be accomplished only by the use of PVC deflection couplings.
21. The Contractor shall furnish and install polyethylene wrap, 3 feet minimum at all taps (for DI pipe and copper lateral combination only) and plastic pipe (PE tubing) 3 feet long after meters for all service lateral connections.
22. All sections of the water main requiring reinforced concrete jacketing shall be ductile iron pipe Class 52 with ductile iron fittings or concrete cylinder pipe and fittings.
23. Bossed tees required for all lateral and ARV connections to PVC mains.

24. The Contractor shall install electronic markers to all mains and test the electronic markers prior to installations to verify proper operation. BWS personnel shall verify the number and locations of placed electronic markers before final paving of the project.
25. All PVC fittings shall conform to American Water Works Associations (AWWA) C-907. Ductile iron fittings shall be used for all types of fittings not specified in AWWA C-907.
26. Reaction block requirements for PVC fittings shall be the same for ductile iron fittings.
27. The use of hub clamps and set screws on PVC fittings is not approved.
28. Prior to the PVC fitting installation, the Contractor shall submit for approval by the DWS, the manufacturer's certification that all PVC fittings conform to AWWA C-907.
29. Pipe Alternatives
- A. Ductile iron pipes shall be Class 52, wrapped with two layers of 8 mil. polyethylene.
- B. Concrete Cylinder pipes shall be Class A.
30. Two-way blue reflective hydrant markers Type DB shall be installed at all new fire hydrant installations. Contractor shall verify the exact locations of hydrant markers with the nearest Maui Fire Department Battalion Chief.
31. The Contractor shall coordinate the securing of the existing water system with the DWS prior to excavating behind or removing any existing thrust blocks, structural struts or reaction beams, or any fittings such as tees, plugs, caps, bends, offsets, and valves, or any other pipeline appurtenance. The Contractor shall be responsible for all associated damages resulting from failure to adequately secure the existing system.
32. Water Pipeline Chlorination and Testing Procedures:
- A. The following chlorination and water sample collection procedure shall apply to all water pipeline projects:

Step 1: Chlorinate main by filling with water and introducing chlorine in sufficient quantity to obtain a minimum chlorine concentration of 50 parts per million. Leave chlorinated water in main overnight.

Step 2: Flush main with fresh water until all chlorine has been flushed out as evidenced by the ortho-tolidine test, then collect a water sample while continuing to flush the main.

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HAWAII	HAW.	CMAQ-031-K012	2013	13	54

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DEXTER S. ELLIOTT

LICENSED PROFESSIONAL ENGINEER

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HAWAII, U.S.A.

THIS WORK WAS PREPARED BY ME OR UNDER MY SUPERVISION.

SIGNATURE

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SHEET No. G-12 OF 16 SHEETS

Step 3: Repeat Steps 1 and 2. After collecting the second water sample, stop flushing and allow the water to stand in the main overnight.

Step 4: Thoroughly flush the main with fresh water until all water that had been standing in the main overnight has been flushed out. Stop flushing and let the water stand in the main for one hour. Collect a water sample.

- B. The main is deemed acceptable and certified when (1) two consecutive water samples, collected 24 hours apart under Steps 1 and 2, show no total and fecal coliform and less than 200 colony forming units (CFU) of total bacteria and (2) the sample of water held in the main for one hour, collected under Step 4, also shows no total and fecal coliform and less than 200 CFU of total bacteria.
- C. Chlorination, flushing, sampling and testing will be extended should unsatisfactory results be encountered. Any sample that shows positive coliform presence or total bacteria greater than 200 CFU is unsatisfactory.
- D. Steps 1 and 2 may be repeated before collecting the one-hour hold sample specified in Step 4. Repeating Steps 1 and 2 is recommended in the event samples show the presence of coliforms and/or increasing total bacterial results from one sample to the next.
- E. Water samples that show the presence of atypical colonies, debris or results inconsistent with existing water are subject to reconfirmation. DWS reserves the right to request and test additional water samples in the interest of safeguarding public health and safety.
32. Test pressure shall be 150 psi. During the 30-minute pressure test, the pressure shall not drop more than 10 psi.
33. 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)
34. Prior to installation, the Contractor shall submit for approval by Department 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 Systems Standards, dated 2002.
35. 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.
36. Contractor shall cut and plug all 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.
37. The Contractor/Developer shall obtain a NPDES permit prior to chlorination and/or dewatering. A copy of the permit shall be submitted to the Department of Water Supply, Capital Projects Division, Construction Section.
38. All ductile iron pipe, fittings and valves shall be wrapped with two layers of 8 mil. polyethylene wrap.
39. Ball corp and ball stop shall be used in lieu of corporation stop and stopcock, respectively.
40. 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".

41. Cleaning shall be by the use of "pigs" introduced into the pipeline and run completely through all installed pipelines and all branch lines for fire hydrants. "Pigging" of service laterals is not required. Bare foam "pigs" shall be used to swab piping clean as each length of the pipeline is installed. Each "pig" shall consist of a cylindrical piece of polyurethane foam with a density of 3-7 pounds per cubic foot and a vinyl-coated nose. Outside diameter of the "pig" shall be equal to 1-1/4 to 1-1/2 times the inside diameter of the pipe being installed. The length of the "pig" shall be 1-1/2 to 2 times its diameter. Prior to use, the "pig" shall be submerged in a chlorine solution of 1 oz. of 5% chlorine bleach in 5 gallons of water. "Pigging" of the pipeline shall be considered incidental to the installation of the new pipeline.
42. Nuts and bolts for flange connections within meter boxes shall be bronze or stainless steel except coupling adapters where "COR-TEN" (U.S. Steel) or "MAYARI" (Bethlehem Steel) may be used. Flange connections outside of meter box may use "COR-TEN" or "MAYARI" type nuts and bolts.
43. Contractor shall cut and plug all existing unused laterals at the main whether or not shown on the plans. Meter and valve boxes to be or already abandoned shall be demolished or removed and properly disposed of. 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.
44. For meters 3 inches and larger (Compound, F.M. and Detector Check), Contractor shall notify Customer Care Division - Service Engineering Section in writing after the plan is approved, no later than 120 days, prior to withdrawing meter from DWS storeyard. Such notice shall indicate number, size, and type of meter (Compound, F.M. or Detector Check) and approximate month and year meter is anticipated to be drawn out. If the approved plan is allowed to lapse, the 120 day notice will be voided.

NON-POTABLE WATER SYSTEM OR IRRIGATION
IMPROVEMENT NOTES:

1. Unless otherwise specified, all materials and construction of water system facilities and appurtenances shall be in accordance with the County of Maui, Department 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 additions.
2. All plans approved by the Department of Water Supply are based solely on the 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 Department of Water Supply.
3. Test pressure shall be 150 psi. During the 30-minute pressure test, the pressure shall not drop more than 10-psi.
4. The Contractor shall notify DWS Capital Projects Division, Construction Section in writing and submit six (6) sets of approved construction plans one week prior to commencing work on the water system.
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. Interconnection between irrigation/non-potable and potable mains shall not be allowed.

FED. ROAD DIST. NO.	STATE	FEDERAL AID PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
HAWAII	HAW.	CMAQ-031-K012	2013	14	54

7. Prior to installation, the Contractor shall submit for approval by the Dept. 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.
8. The Contractor shall be responsible for the protection of all water lines during construction. The Contractor shall be especially careful when excavating behind waterlines, 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 DWS approval) and/or modifying his construction method.
9. The Contractor/Developer shall obtain a NPDES permit prior to chlorination and/or dewatering. A copy of the permit shall be submitted to the Department of Water Supply, Capital Projects Division, Construction Section.
10. Three-inch wide warning tape, purple in color, with the words "CAUTION NON-POTABLE WATER - DO NOT DRINK" imprinted in intervals not greater than five feet shall be installed directly on the top of all irrigation/non-potable laterals, PVC pipes not marked non-potable, and ductile iron pipes. The warning tape shall be installed longitudinally and continuously over the entire length of the pipe and shall be fastened to the pipe with fiber-reinforced tape at 8 feet on centers. Letters shall be a minimum of 3/4 inch high.
11. Materials for frames and covers of manholes, valve boxes, and meter boxes shall conform to the requirements specified in the Water System Standards. The irrigation/non-potable covers shall be cast with the word "IRRIGATION" and shall be provided with a 24-inch long galvanized steel coil chain, 3/16-inch size with 12.5 links per foot, and be welded to the frame and cover.
12. Horizontal clearance of 3-feet and vertical clearance of 6-inches shall be maintained between irrigation/non-potable and other pipelines.
13. Valve covers, manhole covers, fire hydrants, meter covers and bodies shall all be painted OSHA purple for identification.
14. PVC C900 pipe shall be in compliance with AWWA C900, 4-inch to 12-inch. All non-potable C900 PVC mains shall be marked on opposite sides to read "CAUTION NON-POTABLE WATER - DO NOT DRINK" in intervals not greater than five feet. Letters shall be a minimum of 3/4 inches high. Non-potable C900 PVC mains may be purple in color.
15. Prior to any excavating, the Contractor shall verify in the field the location of existing water mains and appurtenances.
16. The Contractor shall install electronic markers to all mains and test the electronic markers prior to installations to verify proper operation. BWS personnel shall verify the number and locations of placed electronic markers before final paving of the project.

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

T:\16392A-TRAFFIC OPERATION IMPROVEMENTS-MAUI\CADD\SHEETS\notes_13.dgn

DEXTER S. EU

LICENSED PROFESSIONAL ENGINEER

No. 4739-C

HAWAII, U.S.A.

THIS WORK WAS PREPARED BY ME OR UNDER MY SUPERVISION.

SIGNATURE

04/30/14

EXPIRATION DATE OF THE LICENSE

STATE OF HAWAII

DEPARTMENT OF TRANSPORTATION

HIGHWAYS DIVISION

UTILITY NOTES

PILANI HIGHWAY

TRAFFIC OPERATION IMPROVEMENTS AT OHUKAI ROAD

FEDERAL AID PROJECT NO. CMAQ-031-K012

Scale: None

Date: March 2013

