



STATE OF HAWAII  
DEPARTMENT OF HAWAIIAN HOME LANDS  
91-5420 Kapolei Parkway,  
Kapolei, HI. 96707

# **Bidding and Contract Requirements**

FOR

**Pressure Testing and Chlorination of Waterlines  
in Maku'u  
Keaau-Paho, Hawaii**

IFB NO.: IFB-25-HHL-008

November 2024



# INVITATION FOR BIDS

(CHAPTER 103D, HRS)

## **Pressure Testing & Chlorination of Waterlines in Maku'u**

**PARCEL ID: 151190510000**

**Niaulani Street, Keaau-Pahoa, Hawaii 96778**

**IFB No.: IFB-25-HHL-008**

Provide the labor, materials, and equipment for the pressure testing and chlorination of portions of existing waterlines and laterals for conveyance over to Department of Water Supply. The parcel is located in the Maku'u Subdivision, Department of Hawaiian Home Lands (DHHL) located on Niaulani Street, Kauhaena Place, Kauakahi Place, Kapika Street and Kapika Place in accordance with the construction documents and technical specifications, and in compliance with all applicable laws and regulations and other related work. Any damage caused by the Contractor shall be repaired at no cost to DHHL to the satisfaction of the Project Manager. The Contractor shall be responsible to restore any damaged areas back to the original condition or better. Labor wages shall comply with the current State of Hawaii wage rate schedule.

The Contractor shall include in his quote a contingency amount of \$10,000.00 for work due to unforeseen conditions and for additional work directed by DHHL. The unspent portion of the contingency shall be deducted from the contract amount.

A pre-bid meeting and site inspection is scheduled on **Thursday, November 7, 2024 at 9:00 a.m., HST**, at the intersection of Niaulani Street and Kauhaena Place in Maku'u. Attendance is recommended. Pre-Bid meeting agenda shall be posted on the HIEPro website.

### **General Scope of Work**

The Selected Contractor shall furnish all labor, equipment, materials and supervision to satisfactorily complete all work as described below and as shown on the attachment(s) provided.

1. Tone and verify underground utilities in the proposed areas for isolating lines and pressure testing. Exercise each valve before and after the pressure test.
2. Obtain permits for traffic control, road repairs and scheduling for planned outages. Coordinate all work with DWS inspector and notify DHHL. DHHL shall notify the Maku'u Farmers Association. Update schedule whenever deviations occur at least 24 hrs. in advance.
3. Sawcut and excavate points of pressure testing (if needed). Record all test results and isolate areas to identify sections with possible leaks. No open trenches shall be allowed when Contractor leaves site. Metal plates and proper signage shall be provided by the Contractor
4. Chlorination and flushing of lines shall be done after certification and approval by DWS following Water System Standards, State of Hawaii - 2002.
5. Final connections and restoration of roads shall be coordinated between COH and DHHL. Any testing and inspections shall be coordinated with DWS for acceptance of the piping and appurtenances.

6. The contractor shall keep the site clean and neat at the end of each workday. Disposal of construction debris shall be contained or hauled to a proper landfill.
7. DHHL does not provide any security, storage of equipment shall be at Contractor's own risk.
8. The Contractor shall provide daily reports with photos of the work in progress along with Certified Payroll on a weekly basis.

### **General Excise Tax**

General excise tax shall be inclusive in the Contractor's bid, and shall be noted on the bid in the Bid Offer Form.

### **Additional Services**

#### **A. Repairs and Inspections for Leaks**

- All repairs to pipes, fitting or valves shall be with the approval of DHHL and DWS following Water System Standards, State of Hawaii 2002.
- All excavated areas shall be restored to original or better condition with approval by DHHL and DWS.
- Replacing ARV's and testing of lines and repairs shall be coordinated with DWS Inspector. ARV's shall be removed and returned to DWS.
- All excavated materials shall be disposed of in an approved landfill site.
- DHHL will make periodic inspections to verify work in progress for payment invoiced by the Contractor.
- The Contractor shall notify DHHL prior to any work being done not indicated on the contract documents
- All repairs and replacement of parts shall be recorded as Time and Material with proper invoices. Extra work shall come out of the contingency funds.

### **Terms of Contract**

The selected contractor shall enter into a contract for 90 calendar days subject to the availability of funds.

Required submittals prior to award: "Certificate of Vendor Compliance" found on this website: <http://vendors.ehawaii.gov/hce/splash/welcome.html> and a Certificate of Insurance for general liability insurance for \$2,000,000 combined single limit per occurrence and \$2,000,000 aggregate for bodily injury and property damage, and automobile insurance for \$1,000,000 each person and \$1,000,000 per accident and property damage of \$1,000,000 per accident or combined single limit of \$2,000,000. The State of Hawaii, the Department of Hawaiian Home Lands (DHHL), its elected and appointed officials, officers, and employees shall be named as additional insured parties for operations performed under this contract. The insurer shall notify DHHL in writing of any cancellation or change in provisions thirty (30) calendar days prior to the effective date of such cancellation or change. DHHL is a self-insured State agency. The Contractor's insurance shall be primary. Any insurance maintained by the State of Hawaii shall apply in excess of, and shall not contribute with, insurance provided by the Contractor.

**Bid Offers shall be electronically submitted via HiePRO no later than 2:00 p.m. on Tuesday, Novemer 26, 2024. The Bid Offer Form must also be included as an attachment when submitting your offer via HiePRO.** All offers shall be submitted as a lump sum amount including all applicable taxes and fees. Only offers submitted through HiePRO shall be considered for award. Award shall be based on the lowest qualified Total Base Offer Amount. Failure to submit the Bid Offer Form may be grounds for rejection of the Bid Offer. A performance and payment bond equal to one hundred per cent of the Total Base Offer Amount will be required if the Total Base Offer Amount exceeds \$50,000.

The work shall be completed within 90 consecutive calendar days after the Notice to Proceed is issued. The liquidated damages per calendar day for failure to complete the work on time shall be \$100.00 per calendar day. Upon completion, the Contractor shall clean-up the worksite of all materials, construction debris and rubbish as described.

Contact Personnel: Kelbert Yoshida (Project Manager).....(808) 730-0322

STATE OF HAWAII  
DEPARTMENT OF HAWAIIAN HOME LANDS

BID OFFER FORM FOR

**PRESSURE TESTING and CHLORINATION of WATERLINES in MAKU'U**

**Keaau-Paho, Island of Hawaii**

**IFB NO.: IFB-25-HHL-008**

Chairperson  
Hawaiian Homes Commission  
Department of Hawaiian Home Lands  
91-5420 Kapolei Parkway  
Kapolei, Hawaii 96707

The undersigned has carefully examined, read, and understands the terms and conditions in the Plans and Specifications, Special Conditions attached hereto, DHHL Construction General Conditions, and General Conditions specified in the Invitation For Bids (IFB) No. IFB-25-HHL-008. The State of Hawaii's (State) Requisition and Purchase Order Form C-03, AG-008 103D General Conditions, are included by reference and made part hereof and available upon written request to the Procurement Officer. The undersigned hereby submits the following offer to perform the work as specified herein, all in accordance with the true intent and meaning thereof.

The undersigned understands and agrees that:

1. The State reserves the right to reject any and all offers and to waive any items that are defective when, in the State's opinion, such rejection or waiver will be in the best interest of the State. A solicitation may be rejected in whole or part when in the best interest of the State.
2. If awarded the contract, all services will be in accordance with Hawaii Revised Statutes (HRS) § 103-55.5.
3. In submitting this offer, the Offeror is not in violation of HRS Chapter 84, concerning prohibited State contracts.
4. By submitting this offer, the Offeror certifies that the offer was independently arrived at without collusion and the Offeror did not participate in any practices to restrict competition.
5. It is understood that the failure to receive any addendum shall not relieve the Offeror from any obligation under this IFB.

Date: \_\_\_\_\_

The undersigned represents that it is: **(Check  one only)**

- A **Hawaii business** incorporated or organized under the laws of the State of Hawaii; **OR**
- A **Compliant Non-Hawaii business** not incorporated or organized under the laws of the State of Hawaii, is or shall be registered at the State of Hawaii Department of Commerce and Consumer Affairs Business Registration Division (DCCA-BREG) to do business in the State of Hawaii.

State of incorporation: \_\_\_\_\_

Offeror is:

- Sole Proprietor     Partnership     Corporation     Joint Venture     Other: \_\_\_\_\_

Federal ID No.: \_\_\_\_\_

Hawaii General Excise Tax ID No.: \_\_\_\_\_

Telephone No.: \_\_\_\_\_

Fax No.: \_\_\_\_\_

E-Mail Address: \_\_\_\_\_

Payment address (other than street address below)

\_\_\_\_\_  
(Street Address, City, State, Zip Code)

Business address

\_\_\_\_\_  
(Street Address, City, State, Zip Code)

Respectfully submitted:

\_\_\_\_\_  
Authorized (Original) Signature

\_\_\_\_\_  
Name and Title (Please Type or Print)

\* \_\_\_\_\_  
**Exact Legal Name of Company (Offeror)**

\*If Offeror shown above is a "dba" or a "division" of a corporation, furnish the exact legal name of the corporation under which the awarded contract will be executed:

\_\_\_\_\_

The following bid is hereby submitted for IFB No.: IFB-25-HHL-008, Pressure Testing and Chlorination of Waterlines in Maku'u, Keaau – Pahoia on the Island of Hawaii for the Department of Hawaiian Home Lands.

Item No.	Estimated Quantity	Description	Unit Price	TOTAL
1	L.S.	Permits and Fees for County Right-Of-Way		
2	L.S.	Mobilization & Demobilization including signage		
3	L.S.	BMP's installation and removal including clean-up		
4	L.S.	Prep work & Pressure Test approx. 6350 ft. of 8", 6" & 4" HSW Line & Laterals		
5	L.S.	Chlorination & Flushing approx. 6350 ft. of 8", 6" & 4" HSW Line and proper disposal		
6	L.S.	Replace 8 - ARV's		
		ALLOWANCES		
7	2	6" gate valve		
8	2	4" gate valve		
9	2	4" pressure reducing valve		
10	2	1" gate valve		
11	2	10 LF 1 1/2" Type "C" service lateral		
12	2	10 LF RC Jacket & piping		
13	3	10 LF Excavation, Repair and Restoration Per location under AC pavement		
14	5	10 LF Excavation, Repair and Restoration Per location under landscaped area		
15	1	Contingency - additional work/unforeseen conditions		\$15,000.00
		GET taxes	4.712%	
		GRAND TOTAL		

**\*Units listed are estimates and are for evaluation and award purposes only. Invoice charge will be based on unit bid price multiplied by actual number of units worked on.**

TOTAL LUMP SUM BID = \_\_\_\_\_ Dollars (\$\_\_\_\_\_).

The prices herein for the above items shall include all materials, labor, tools, equipment, machinery and all incidentals necessary, inclusive of general excise tax to install or to construct these items in place complete and in accordance with the plans and specifications contained in this IFB for the period of (6) six consecutive months.

### **METHOD OF AWARD**

Bidder is required to bid on the entire project. The low bidder shall be determined by the procedures outlined in items 1) through 4) below:

- 1) Prior to opening of bids, the State will determine the amount of funds available for the project. This amount will be designated the "control amount". The control amount shall be announced at, and prior to the opening of bids.
- 2) The Base Bid and Alternate, if any, of each Bidder will be adjusted to reflect the applicable preferences in accordance with Chapter 103D, HRS. The Alternate, if any, will then be added to the Base Bid and compared with the control amount.
- 3) The low bidder shall be the Bidder having the lowest aggregate amount, within the control amount (after application of the various preferences), for the Base Bid plus the Alternate, if any.
- 4) If adding the Alternate, if any, would make the aggregate amount exceed the control amount for all Bidders, the low bidder shall be the Bidder having the lowest Base Bid after application of the various preferences.

It is further understood and agreed that:

- 1) The Chairman reserves the right to reject any and/or all bids and waive any defects when, in his opinion, such rejection or waiver will be in the best interest of the State.
- 2) After determining the low bidder, an award may be made either on the amount of the Base Bid alone, or including the Alternate (exclusive of preferences), if:
  - a. It is in the best interest of the State;
  - b. Funds are available at time of the award; and
  - c. The combination of the Base Bid plus Alternate does not change the apparent low bidder.



- 3) In the event the Base Bid for all Bidders exceed the control amount, the Chairman reserves the right to negotiate with the lowest responsible and responsive bidder to award a contract within available funds.
- 4) In the event the award is made for the Base Bid alone, the Chairman reserves the right to amend the contract at a later date to include the Alternate should funds subsequently become available.

### **OTHER CONDITIONS**

- 1) By submitting this bid, the undersigned is declaring that his firm has not been assisted or represented on this matter by an individual who has, in a State capacity, been involved in the subject matter of this contract in the past one (1) year.
- 2) By submitting this bid, the undersigned is declaring that Bidder's own organization will perform at least 20% of the contractor's work. For the purposes of this section, the Contractor's work is defined as: direct cost labor for contractor's forces; direct cost materials installed by the contractor's direct cost labor force; direct cost equipment, either owned or leased, used by the contractor's direct cost labor force; and field overhead cost to include: field supervision, field office trailer (if any), field office equipment and supplies, etc.
- 3) The quantities given herewith are approximate only and are subject to increase or decrease.
- 4) The estimated quantities shown for items for which a UNIT PRICE is asked in this bid are only for the purpose of comparing on a uniform basis bids offered for the work under this contract. No claim shall be filed for anticipated profit or loss because of any difference between the quantities of the various classes of work done or the materials and equipment actually installed and the said estimated quantities. Payment on UNIT PRICE items will be made only for the actual number of units incorporated into the finished project at the contract UNIT PRICE.
- 5) If the product of the UNIT PRICE BID and the number of units does not equal the total amount stated by the undersigned in the Bid for any item, it will be assumed that the error was made in computing the total amount. For the purpose of determining the lowest Bidder, the stated UNIT PRICE alone will be considered as representing the Bidder's intention and the total amount bid on such items shall be considered to be the amount arrived at by multiplying the UNIT PRICE by the number of units.

Receipt of the following addenda issued by the Department is acknowledged by the date(s) of receipt indicated below:

	Date		Date
Addendum No. 1	_____	Addendum No. 3	_____
Addendum No. 2	_____	Addendum No. 4	_____

It is understood that failure to receive any such addendum shall not relieve the Contractor from any obligation under this RFQ as submitted.

Respectfully submitted,

\_\_\_\_\_  
Name of Company, Joint Venture or Partnership

\_\_\_\_\_  
License No.

By \_\_\_\_\_  
Signature (\*1)

Title: \_\_\_\_\_

Date: \_\_\_\_\_

Address: \_\_\_\_\_  
\_\_\_\_\_

Telephone No.: \_\_\_\_\_

(IF A CORPORATION, AFFIX CORPORATE SEAL TO SIGNATURE, BE SURE TO FILL IN ATTACHED LIST OF SUBCONTRACTORS. THIS BID FORM MAY NOT BE ALTERED AND BIDDERS MAY NOT QUALIFY OR CONDITION THEIR BIDS IN ANY WAY.)

PLEASE FILL OUT THE ATTACHED CERTIFICATE OF RESOLUTION GIVING EVIDENCE OF THE AUTHORITY OF THIS OFFICER TO SUBMIT BIDS ON BEHALF OF THE COMPANY.

NOTES:

- \*1. Please attach to this page evidence of the authority of this officer to submit bids on behalf of the Company, and also the names and residence addresses of all officers of the Company.
- \*2. Fill in all blank spaces with information asked for or bid may be invalidated. BID MUST BE INTACT; MISSING PAGES MAY INVALIDATE YOUR BID.

CERTIFICATE OF RESOLUTION

I, \_\_\_\_\_, Secretary of \_\_\_\_\_, a Hawaii Corporation, do hereby certify that the following is a full, true and correct copy of a resolution duly adopted by the Board of Directors of said Corporation, at its meeting duly called and held at the office of the Corporation \_\_\_\_\_, Hawaii, on \_\_\_\_\_ day of \_\_\_\_\_, 20\_\_\_\_, at which a quorum was present and acting throughout; and that said resolution has not been modified, amended or rescinded and continues in full force and effect.

“RESOLVED that any individual at the time holding the position(s) of \_\_\_\_\_, be, and each of them hereby is, authorized to execute on behalf of the Corporation any bid, proposal or contract for the sale or rental of the products of the Corporation or for the services to be performed by the Corporation and to execute any bond required by any such bid, proposal or contract with the United States Government or the State of Hawaii or the City and County of Honolulu, or any County of Municipal Government of said State, or any department or subdivision of any of them.”

IN WITNESS THEREOF, I have hereunto set my hand and affixed the corporate seal of said

\_\_\_\_\_ this \_\_\_\_\_ day of \_\_\_\_\_, 20\_\_\_\_\_.

\_\_\_\_\_  
Secretary

**WAGE CERTIFICATE  
FOR SERVICE CONTRACTS**

Subject: IFB No.: IFB-25-HHL-008

Title of IFB: Pressure Testing and Chlorination of Waterlines in MAKU'U

Pursuant to Section 103-55, Hawaii Revised Statutes (HRS), I hereby certify that if awarded the contract in excess of \$25,000, the services to be performed will be performed under the following conditions:

1. All applicable laws of the federal and state governments relating to workers' compensation, unemployment compensation, payment of wages, and safety will be fully complied with; and
2. The services to be rendered shall be performed by employees paid at wages or salaries not less than the wages paid to public officers and employees for similar work, with the exception of professional, managerial, supervisory, and clerical personnel who are not covered by Section 103-55, HRS.

I understand that failure to comply with the above conditions during the period of the contract shall result in cancellation of the contract, unless such noncompliance is corrected within a reasonable period as determined by the procurement officer. Payment in the final settlement of the contract or the release of bonds, if applicable, or both shall not be made unless the procurement officer has determined that the noncompliance has been corrected; and

I further understand that all payments required by Federal and State laws to be made by employers for the benefit of their employees are to be paid in addition to the base wage required by section 103-55, HRS.

Offeror \_\_\_\_\_

Signature \_\_\_\_\_

Title \_\_\_\_\_

Date \_\_\_\_\_

END OF BID

STATE OF HAWAII  
DEPARTMENT OF HAWAIIAN HOME LANDS  
LAND DEVELOPMENT DIVISION

**DAILY PROJECT REPORT**

<b>PROJECT:</b>		<b>REPORT NO.:</b>	
		<b>DATE:</b>	
<b>IFB / RFQ NO.:</b>		<b>DAY</b>	
<b>CONTRACTOR:</b>		<b>SITE INSPECTOR:</b>	
<b>SUPERINTENDANT:</b>		<b>PROJECT MANAGER:</b>	
<b>WEATHER:</b>		<b>CONDITION:</b>	
CLEAR	CLOUDY	RAIN	WINDY
DRY	DAMP	MUDDY	DUSTY

**WORKERS ON THE PROJECT**

**TRADE:**

ENVIRONMENTAL	STRUCT. STEEL	CARPENTRY - RGH	DRYWALL	ELECTRICAL - EXT
LANDSCAPING	MASONARY	CARPENTRY - FIN	HARD TILE	ELECTRICAL - INT
GRADING	SPECIALIST	ROOFING	FLOORING CARPET	FIRE SYSTEM
FOUNDATION - PILE	OPERATORS	WATERPROOF	CEILING	SOLAR HOT WATER
FOUNDATION - REG	LABORERS	PAINTERS	AIR COND / VENT	PHOTOVOLTAIC
REINF. STEEL	JANITORS	GLASS / GLAZIERS	PLUMBER	SHEETMETAL

<b>CLASSIFICATION:</b>	Foreman / Operator	<b><u>NO. OF PEOPLE</u></b>	<b><u>TOTAL HOURS</u></b>
	Laborers		

**WORK IN PROGRESS:**

**OBSERVED DEFECTIVE / CORRECTIVE WORK:**

**OBSERVED EQUIPMENT ON SITE:**

**MATERIALS DELIVERED TODAY:**

**TESTING DONE TODAY:**

**QUESTIONS OR PROBLEMS:**

**REMARKS:**

## Daily Photos

Start of day	Main activity
Material, Equipment & Truck	Misc. activity
Testing / Inspectors	Weather
Sub's activity	Sub's personnel
Site / Clean-up	End of day

Prepared By

Reviewed and Accepted

\_\_\_\_\_  
Name and Title of Authorized Representative

\_\_\_\_\_  
Name and Title of Authorized Representative

\_\_\_\_\_  
Signature and Date

\_\_\_\_\_  
Signature and Date

# INDEX TO TECHNICAL SPECIFICATIONS

## TECHNICAL SPECIFICATIONS

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## DIVISION 2 – CIVIL WORK

### SECTION 02010 – GENERAL REQUIREMENTS FOR CIVIL WORK

#### PART 1 – GENERAL

##### 1.01 GENERAL CONDITIONS

The General Provisions and Special Provisions in these specifications shall govern all work specified hereinafter in all DIVISIONS and SECTIONS.

##### 1.02 DIVISION OF WORK

The Divisions and Sections into which these specifications are divided shall not be considered an accurate or complete segregation of work by trades. This also applies to all work specified within each section.

##### 1.03 SCOPE OF WORK

The work required to be performed by the Contractor consists of pressure testing and chlorinating the specified water lines as indicated for the Department of Hawaiian Home Lands at Maku'u, in accordance with the Drawings and Specifications and all applicable provisions of the Contract Documents.

##### 1.04 DRAWINGS

A. The location, extent and design of the required construction and improvements are shown and noted on the Drawings accompanying these Specifications, which Drawings are hereby made a part of these Specifications and the Contract. A complete list of Drawings and Titles is given on the Title Sheet of the Drawings.

B. Where “as shown”, “as indicated”, “as noted”, “as detailed”, “as scheduled”, or words of like meaning are used in these Contract Documents, it shall be understood that the reference to the foregoing Drawings is being made, unless otherwise specified.

C. When reference to the work “plans” is made anywhere in the Contract Documents, it shall be understood that such reference refers to the Drawings.

##### 1.05 SPECIFICATION LANGUAGE

These Specifications are written in imperative and abbreviated form. This imperative language of the technical sections is directed at the Contractor, unless specifically noted otherwise. Incomplete sentences shall be completed by inserting “shall”, “the Contractor shall”, and “shall be”, and similar mandatory phrases by inference in the same manner as they are applied to notes on the drawings. The words “shall be” shall be supplied by inference where a colon (:) is used within sentences or phrases. Except as worded to the contrary, fulfill (perform) all indicated requirements whether stated imperatively or otherwise.

1.06 SUBSTITUTION OF MATERIALS AND EQUIPMENT

- A. Request for substitution shall be submitted within the time designated in the RFQ instructions to bidders.
- B. All submittals, excepting for samples and documents requiring original signature, shall be e-mailed to Kelbert Yoshida at the Department of Hawaiian Home Lands Office at E-Mail: [kelbert.h.yoshida@hawaii.gov](mailto:kelbert.h.yoshida@hawaii.gov). The "Subject of e-mail request shall begin with the RFQ number. Samples and documents requiring original signature shall be mailed or delivered to the Land Development Division Office, Department of Hawaiian Home Lands, 91-5420 Kapolei Parkway, Kapolei, HI 96707.
- C. E-mailed request shall be submitted together with electronic technical brochures and be accompanied by a statement of variances as shown on the attached "Sample Request for Substitution." Only "Request for Substitution" using the attached sample format will be considered.

The statement of variances shall list all features of the proposed substitution which differ from the plans, specifications and/or product(s) specified and shall further certify that the substitute has no other variant features. The brochures shall be clearly marked showing make, model, size, options, etc., and shall include sufficient evidence to enable the Department to evaluate each feature listed as a variance. All submittal with insufficient information for evaluation shall be rejected. Should an unlisted variance be discovered after installation of the product, the penalty shall be immediate replacement with the original specified item at no cost to the Department.

If sufficient evidence from which a determination can be made for a particular model does not accompany a request for substitution, the request shall be denied. The decision of the Department will be final.

- D. When submitting request for substitutions, if the Contractor elects to use materials and/or equipment other than those shown on the plans and/or specifications, the Contractor shall be responsible to revise existing conditions and to coordinate work with other trades as many be necessary because of the substituted product. Any additional cost to implement such a change shall be borne by the Contractor at no cost to the Department.
- E. Bidders are cautioned to review the Technical Specifications carefully and thoroughly. Questions to or request for clarification of the specifications shall be made on HlePro and to Kelbert Yoshida at the Department of Hawaiian Home Lands at E-Mail: [kelbert.h.yoshida@hawaii.gov](mailto:kelbert.h.yoshida@hawaii.gov), no later than fourteen (14) consecutive calendar days prior to the scheduled bid opening date. The submittal of a bid shall be considered as acceptance of the specifications as published. The "Subject of e-mail request shall begin with the RFQ number. Protest concerning the Technical Specifications lodged after bid opening shall not be considered.

1.07 PATENTED DEVICES, MATERIALS AND PROCESSES: If the Contractor is required or desires to use any design, device, material, or process covered by letters of patent or copyright, the right for such use shall be processed by the Contractor from the patentee or owner. The Contractor and Surety shall indemnify and hold harmless the State and its Departments and Agencies, and affected third party, Designer of Record (Architect/Engineer), or political subdivision from any and all claims for infringement by reason of the trademark or copyright in connection with the work to be performed under the contract, shall indemnify the State and its Department and Agencies, and Designer of Record (Architect/Engineer) for any costs, expenses and damages which it may be obligated to pay by reason of any infringement at any time during the prosecution of after the completion of the work.

1.08 DESCRIPTION OF BID ITEM

The work includes all labor, materials, tools, equipment necessary to complete the pressure testing and chlorination of the water system indicated at the location shown on the plans. Work items include clearing and excavation at the testing sites, repairing any leaks, replacing any defective valves or pipes, chlorination, flushing, backfill, paving, and any incidental related work to turn over water system to the Department of Water Supply, County of Hawaii

PART 2 – PRODUCTS

Not used.

PART 3 – EXECUTION

Not used.

SAMPLE

Date: \_\_\_\_\_

Department of Hawaiian Home Lands  
Land Development Division  
91-5420 Kapolei Parkway  
Kapolei, Hawaii 96707  
E-Mail: [kelbert.h.yoshida@hawaii.gov](mailto:kelbert.h.yoshida@hawaii.gov)

To Whom It May Concern:

Subject:           REQUEST FOR SUBSTITUTION

Project Title: \_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_

In accordance with the GENERAL REQUIREMENTS, I hereby submit for substitution with the technical brochures and statement of variances for your review and approval for the item(s) shown below:

<u>SECTION/SPECIFIED</u> <u>ITEM</u>	<u>SUBSTITUTE OR</u> <u>ALTERNATE BRAND</u>	<u>VARIANT <sup>3/</sup></u> <u>FEATURES</u>
---	--	---

I further certify that my request for substitution of the above item(s) has no other variant features and complies with the plans and specifications for subject project.

\_\_\_\_\_  
SIGNATURE

- NOTE: 1. Please use own letterhead.  
2. Submit by E-Mail: [kelbert.h.yoshida@hawaii.gov](mailto:kelbert.h.yoshida@hawaii.gov)  
3. If no variant feature, then indicate "None."

END OF SECTION

## SECTION 02050 – DEMOLITION AND REMOVAL WORK

### PART 1 – GENERAL

#### 1.01 GENERAL CONDITIONS

As specified in Section 02010.

#### 1.02 PERMIT AND FEES

The Contractor shall obtain and pay for all necessary permits for work in the County “Right of Way” prior to commencement of work.

#### 1.03 WORK DESCRIPTION

The work to be performed under this section shall include the furnishing of all labor, tools, equipment, and incidentals necessary to perform all demolition and removal work as needed for the pressure testing and chlorination of the existing lines as specified. This includes, but is not limited to, demolition and removal of existing asphalt, curb, gutter, road and pavements, and demolition and removal required for any adjustment, extension, or protection of existing utilities.

#### 1.04 JOB CONDITIONS

- A. Condition of Existing Improvements: The Department assumes no responsibility for the actual condition of items or portions of structures to be removed. **Call 811 before you dig.**
- B. Interference with Adjacent Occupied Spaces: Maintain free and safe passage to and from occupied spaces. Provide temporary barricades and other forms of protection as required to protect the public from injury due to demolition and/or removal work.
- C. Storage or sale of removed items on site will not be permitted.
- D. Protection: Provide temporary barricades and other forms of protection as required to protect the public from injury due to selective removal work and to maintain security.
  - 1. Provide interior and exterior shoring, bracing, or support to prevent movement, settlement, or collapse of structure or elements to be removed, and adjacent facilities or work to remain.

2. Protect from damage existing finish work that is to remain in place and becomes exposed during demolition operations.
  3. Life safety procedures and provisions shall be in conformance with all applicable Federal, State, and City and County regulations, including OSHA.
- E. Damages: Promptly repair damages caused to adjacent facilities or areas by removal work at no cost to the Department.
- F. Traffic: Conduct demolition operations and debris removal in a manner to ensure minimum interference with roads, streets, walks, and other adjacent occupied or used facilities. Do not close, block, or otherwise obstruct streets, walks or other occupied or used facilities without written permission from authorities having jurisdiction. Provide alternate routes around closed or obstructed traffic ways if required by governing regulations.
- G. Use of explosives will not be permitted.
- H. Dust and Erosion Control: Contractor shall comply with requirements set forth in Section 01567 – POLLUTION CONTROL.

## PART 2 – PRODUCTS

Not Used.

## PART 3 - EXECUTION

### 3.01 CONSTRUCTION REQUIREMENTS

The Contractor shall exercise every precaution to preserve and protect existing improvements to remain or to be removed by others.

### 3.02 EXISTING UTILITY LINES

- A. The existence of underground utility lines other than those shown is not definitely known. The Contractor shall be responsible for toning, probing, obtaining as-built drawings, etc., to determine existing utility locations prior to any demolition work. The Contractor shall promptly repair all damaged utilities at no cost to the Department.
- B. The Contractor shall serve proper notice and consult with the Engineer regarding any temporary disconnections of electrical or other utility lines in the area which may be required for the removal

work, and all such lines where necessary shall be properly disconnected before commencing with the work.

### 3.03 DEMOLITION

- A. All work shall be executed as indicated on the plans, with due consideration for all items to remain.
- B. Limits of asphalt concrete pavement removal shall be as shown on the as-built plans or as directed by the PM. Saw cut along the excavation line to provide clean and straight joint lines.
- C. If required, removal of existing signs includes foundations below grade.
- D. Any open trenches, holes, depressions, and pits left open at the end of the working day shall be covered by steel plates.
- E. If unanticipated mechanical, electrical, or structural elements which conflict with intended function or design are encountered, investigate and measure both nature and extent of the conflict. Submit report to Engineer in written, accurate detail. Pending receipt of directive from Engineer rearrange selective demolition schedule as necessary to continue overall job progress without delay.

### 3.04 DISPOSITION OF MATERIAL

- A. All materials resulting from removal work, except as indicated or specified otherwise, shall become the property of the Contractor, and shall be removed from the limits of Department property. Remove rubbish and debris from the jobsite daily, unless otherwise directed; do not allow accumulations inside or outside any buildings or roadways. The Contractor shall transport and legally dispose of materials off site. Remove and transport debris and rubbish in a manner that will prevent spillage on streets or adjacent areas.
- B. If hazardous materials are encountered during demolition operations, comply with applicable State, Federal and local regulations, laws, and ordinances concerning removal, handling, and protection against exposure or environmental pollution.
- C. Burning of removed materials is not permitted on project site.

### 3.05 CLEAN-UP AND REPAIR

- A. Any disturbance to road beds, landscaped areas, brick pavers, etc., shall be restored to original condition. The Contractor shall take care to avoid damage to immediate and surrounding areas and protect property and vehicles.
- B. In landscaped areas, remove grass in a manner that will allow replacement close to its original condition. Always use a drop cloth or similar ground cover to contain and hold removal of earth and plantings, whether on concrete, asphalt, lawn, and/or landscaped areas.
- C. Any concrete, asphalt, or brick pavers removed shall be replaced in as close to original condition as possible, and within the limits of generally accepted trade standards. When regrassing is required, the grass used shall match the surrounding area.
- D. Damage resulting from removal work shall be repaired by the Contractor at his/her expense. The condition of all existing exposed surfaces shall be equal to or better than that which existed before the removal work. Where the method of repair work is not indicated or specified, the Contractor shall perform the repair work in accordance with the limits of generally accepted trade standards.

END OF SECTION



## SECTION 02110 – CLEARING AND GRUBBING

### PART 1 - GENERAL

#### 1.01 GENERAL CONDITIONS

As specified in Section 02010.

#### 1.02 WORK DESCRIPTION

The work covered in this section shall consist of furnishing all labor, materials, equipment, tools, and incidentals necessary for clearing and grubbing as shown on the plans and specified herein.

#### 1.03 PERMITS AND FEES

The Contractor shall obtain and pay for all necessary permits required to perform this work.

### PART 2 – PRODUCTS

Not used.

### PART 3 - EXECUTION

#### 3.01 PROTECTION OF ITEMS TO REMAIN

The Contractor shall continually maintain adequate protection of trees, shrubbery, topographic features, and all other items indicated to remain.

#### 3.02 CLEARING AND GRUBBING

- A. The overall limits of the clearing and grubbing is limited, as shown on the plans and may be into the edge of the property line.
- B. The Contractor shall clear the area within the grading limits of all vegetative material and obstructions necessary for the proper reception, construction, execution, and completion of other work specified in contract. Vegetative material includes trees, logs, stumps, roots of downed trees, brush, grass, and weeds. Obstructions include buildings, lumber, fences, trash piles and other unwanted materials.
- C. Within the grading limits and where indicated on the drawings, grub only as needed ground surface of all grass, weeds, stumps, roots, and other objectionable materials to clear the area of work.
- D. No excavation or filling shall be undertaken until area has been cleared and grubbed.

- E. The Contractor shall protect from injury and damage all surrounding plants, pavements, buildings, utilities, etc., and shall leave all in as good a condition as at present. Any damage to existing improvements shall be repaired or replaced by the Contractor to the satisfaction of the Engineer.

### 3.03 DISPOSITION OF MATERIAL

- A. All materials resulting from the clearing and grubbing work, shall be removed from the limits of Department property. Remove rubbish and debris from the jobsite daily, unless otherwise directed; do not allow accumulations inside or outside any lots or roadways. The Contractor shall transport and legally dispose of materials off site. Remove and transport debris and rubbish in a manner that will prevent spillage on streets or adjacent areas.
- B. If hazardous materials are encountered during the clearing and grubbing operations, comply with applicable State, Federal and local regulations, laws, and ordinances concerning removal, handling, and protection against exposure or environmental pollution.
- C. Burning of removed materials is not permitted on the project site.

### 3.04 INSPECTION AND APPROVAL

Prior to the construction of any new work, the Engineer and DWS Inspector shall inspect the area that has been cleared and grubbed. The Contractor shall not proceed until the clearing and grubbing work has been approved by the Engineer. Should the Contractor install any new work without the Engineer or DWS approval, the Contractor may be required to expose area for DWS Inspector for reinspection.

END OF SECTION

## SECTION 02200 – EARTHWORK

### PART 1 - GENERAL

#### 1.01 GENERAL CONDITIONS

As specified in Section 02010.

#### 1.02 WORK DESCRIPTION

Furnish all labor, materials, tools, and equipment necessary for site excavation, trench excavation, structural excavation, filling, backfilling, rough and finish grading, and related items necessary to complete all work shown on the Drawings and/or specified herein.

#### 1.03 STANDARDS

Work shall be in accordance with the “Standard Specifications for Public Works Construction”, dated 1986 as amended, and the “Water System Standards”, dated 2002 as amended, except as shown in the plans and specifications herewith. (Paragraphs concerning Measurement and Payment in the Sections are not applicable to this project.)

#### 1.04 COORDINATION WITH OTHER SECTIONS

- A. Demolition and removal as specified in Section - 02050  
DEMOLITION AND REMOVAL WORK.
  
- B. Clearing and grubbing as specified in Section 02110 - CLEARING  
AND GRUBBING.

#### 1.05 ORDINANCES AND PERMITS

- A. The Contractor shall comply with all applicable ordinances and regulations and obtain the required permits. All grading work shall comply with Chapter 10 of the Hawaii County Code, as amended.
  
- B. The Contractor shall comply with the provisions of Chapter 11-55 Water Pollution Control and Chapter 11-54 Water Quality Standards of the Hawaii Administrative Rules, Department of Health, State of Hawaii.

#### 1.06 EXISTING UTILITY LINES

The existence of active underground utility lines within the construction area is not definitely known other than those indicated in their approximate

locations on the Drawings. Should any unknown line be encountered during excavation, the Contractor shall immediately notify the Department of such discovery. The Department shall then investigate and issue instructions for the preservation or disposition of the unknown line. Authorization for extra work shall be issued by the Department only as it is deemed necessary.

#### 1.07 LAYOUT OF PROJECT

The Contractor shall verify all lines, levels, elevations, and improvements indicated on the drawings before any excavation begins. All lines and grades shall be verified by a Surveyor or Civil Engineer licensed in the State of Hawaii. Any discrepancy shall be immediately brought to the attention of the Department and any change shall be made in accordance with his instruction. Commencement of clearing and grubbing operations shall be construed to mean that the Contractor agrees that the existing grades and improvements are essentially correct as shown. The Contractor shall not be entitled to extra payment if existing grades and improvements are in error after his verification thereof, or if he fails to report the discrepancies before proceeding with any work whether within the area affected or not.

#### 1.08 SUBMITTALS

- A. Soil Testing Lab Accreditation: The Contractor shall retain and pay for an independent soil testing laboratory with at least one Licensed Civil Engineer specializing in Geotechnical Engineering to provide monitoring and testing services. The soil testing laboratory shall be accredited by the American Association of State Highway and Transportation Officials (AASHTO) or the American Association for Laboratory Accreditation and shall be accredited in the soils tests required under this contract. The soil testing laboratory shall meet the requirements of ASTM D 3740 - Standard Practice for Minimum Requirements for Agencies Engaged in the Testing and/or Inspection of Soil and Rock as used in Engineering Design and Construction.

The Contractor shall furnish to the Department for approval, a copy of the Certificate of Accreditation and Scope of Accreditation and latest directory of the accrediting organization for accredited laboratories. The scope of the laboratory's accreditation shall include the test methods required by the Contract.

The Contractor shall submit certified test results to the Department for review and approval. All test results must be approved before

the Contractor can proceed with placing subsequent layers or materials.

Should imported fill be utilized on this project, a sample of the proposed material should be submitted to the independent soil testing laboratory for testing. A letter from the testing laboratory stating that the imported material meets the requirements of this section shall be submitted to the Department prior to delivery of the material to the job site.

- B. Field density tests shall be taken to determine whether the specified levels of compaction are being consistently attained. Testing shall be done as indicated.
  - 1. Sub-grade for Asphalt Concrete Pavements: Testing shall be as specified in Section 02510 - ASPHALTIC CONCRETE PAVEMENT.
  - 2. Structural and Yard Fill: One (1) compaction test for every 1500 square feet of each lift.
  - 3. Trench Backfill: One (1) Compaction test per lift for every 200 lineal feet with a minimum of one (1) test per lift for each line.
- C. The Contractor shall have the following documents available for the use of the Department's inspector at the job site:
  - 1. Grading Ordinance (Chapter 10 of the Hawaii County Code).
  - 2. Hawaii Administrative Rules, Chapter 11-55 Water Pollution Control and Chapter 11-54 Water Quality Standards, Department of Health, State of Hawaii.
  - 3. ASTM D1557.

## PART 2 - PRODUCTS

### 2.01 MATERIALS

- A. Fill and Backfill Material
  - 1. Yard fill: Yard fill shall be used for all areas where no concrete slabs or A.C. pavements are to be constructed. Fill materials shall be non-expansive soil, free from debris, perishable or combustible materials, sod, and stones larger

than 6 inches in maximum dimension and shall have a plasticity index not greater than 20. Any rock shall be well distributed in earth or other fine material with all voids filled and shall not be placed within 3 feet of the finished grade.

The excavated basalt rock fragments may be reused in compacted yard fills provided the material is crushed to a relatively well-graded consistency and rock fragments larger than 6-inch in diameter are removed. Occasional 12-inch size fragments may be allowed provided the boulders are not nested together forming voids between rock fragments. For the upper 3 feet of fill, the compacted fill should consist of 3-inch minus material.

In the event that insufficient amount of yard fill is delivered from earthwork operations, the Contractor shall import the necessary materials without any additional cost to the Department. Such imported materials shall be subject to approval by the Department and shall meet the requirements as specified for yard fill.

2. Structural fill: Structural fill shall be used in areas where new concrete or A.C. paving is to be constructed and shall be non-expansive, granular, well-graded material with a 3-inch maximum particle size and less than 20 percent by weight passing the No. 200 sieve. The fill material shall be free from clumps of soil, organic debris, adobe, or other deleterious matter.

The plasticity index for that portion of soil passing the #40 sieve shall not be greater than 10. The CBR expansion value shall be no greater than 1%. Recycled asphalt pavement shall not be used as structural fill.

The excavated basalt rock fragments may be reused in compacted structural fills provided the material is crushed to a relatively well-graded consistency and rock fragments larger than 3-inch in diameter are removed. For the upper 3 feet of fill, the compacted fill should consist of 3-inch minus material.

3. Trench and Structure Backfill: Backfill shall conform to the requirements of the "Standard Specifications for Public Works Construction", Department of Public Works, County of Hawaii, September 1986".
  4. Cushion material for drain pipes and structures shall be #67 Crushed Rock (ASTM C-33 Size No. 67), unless otherwise shown.
  5. Cushion material for ductile iron water lines shall be 3-B fine basecourse.
- B. Temporary perimeter control shall have the following properties:
1. Compost Filter Sock: Compost filter sock shall utilize an outer layer of filtration mesh, and an inner layer of containment netting. All layers shall collectively enclose the compost filtration media. Compost filter sock shall be installed as 12" nominal diameter as indicated on the project drawings, or as approved by the Department. Compost filter socks shall be BioSock™ as manufactured by EnviroTech BioSolutions, or approved equal.
  2. Compost Filtration Media: Compost quality is an important consideration when designing a compost filter sock. Use of sanitized, mature compost will ensure that the compost filter sock performs as designed and has no identifiable feedstock constituents or offensive odors. The compost used in filter socks should meet all local, state, and Federal quality requirements. Biosolids compost must meet the Standards for Class A biosolids outlined in 40 Code of Federal Regulations (CFR) Part 503.
  3. Wood Anchor Stakes: Wood anchor stakes shall have an nominal classification of ¾ by ¾ inch and minimum length 16 inches. Larger sized wood anchor stakes may be installed at the discretion of the installer, or as specified by the Project Engineer. Do not use rebar or other metal rods. Where ground is rocky, use gravel bags to hold filter sock in place.

## PART 3 - EXECUTION

### 3.01 GENERAL

- A. No excavation or filling shall be undertaken until the area has been cleared and grubbed.
- B. Install temporary perimeter control where shown on the drawing or ordered by the Department. Remove perimeter control upon completion of permanent BMP controls.
- C. All excavation shall be protected and guarded against danger to life, limb, and property.
- D. Shoring, cribbing, and lagging, as required to safely preserve the excavations and earth banks from damages resulting from the work, shall be provided, and installed by the Contractor.
- E. The Contractor shall at all times control the grading around building areas so that the ground is adequately sloped to prevent any water from flowing into building areas and open trench excavations. All excavations shall be kept free from standing water. The Contractor shall do all pumping and draining that may be necessary to remove water to the extent required in carrying on the work. The Contractor shall obtain the National Pollutant Discharge Elimination System (NPDES) permit from the State Department of Health for any dewatering activities.

Lowering or raising of water table in areas where ground settlement or other detrimental effects may be induced is expressly prohibited. In such areas, the excavated spaces shall be sealed prior to the pumping of water or other approved means employed by the Contractor. The Contractor shall be responsible for disposal of the pumped liquids. Water from dewatering and other construction operations shall not be discharged directly into the storm drainage system. The method of discharge shall comply with Department of Health Regulations.

Construction equipment which require water in their operation shall not be used in the vicinity or within the building area without the approval of the Department.

- F. Caution shall be exercised in all excavation work adjacent to existing trees which are to remain. All exposed fibrous and branch-type roots shall be carefully pruned or saw-cut to the extent required for excavation work. Every effort shall be taken to preserve the existing trees designated to remain and to minimize damage to said trees.



- G. The Contractor shall use the best management practices to reduce the amount of soil erosion resulting from the grading work. Requirements of the National Pollutant Discharge Elimination System (NPDES) Permit, site specific Best Management Plan (BMP) shall become part of these specifications by reference.

The work areas and haul roads, including roadways leading to the project site, shall be continuously watered to prevent the generation of dust. Granular materials shall be spread over all unpaved haul routes. An 8-inch thick layer of #2 crushed rock shall be installed at delivery access points to reduce tracking mud onto public roadways.

All truck tires shall be free of mud before leaving the job site and entering a public roadway. The Contractor will clean all roads of mud and dirt resulting from his operations at no additional cost to the Department.

- H. Landscaped areas shall be graded to conform to finish contours with allowance for the specified depth of topsoil, except at cut slopes 1 horizontal to 1 vertical or steeper.

I. Laying Out

1. The laying out of base lines, establishment of grades and staking out the entire work shall be done by a surveyor or a civil engineer licensed in the State of Hawaii, at the Contractor's expense. The Contractor shall be solely responsible for their accuracy. The Contractor shall erect and maintain substantial batterboards showing construction of lines and levels.
2. Should any discrepancies be discovered in the dimensions given in the plans, the Contractor shall immediately notify the Department before proceeding any further with the work. The Contractor shall be responsible for re-establishing property corners or survey control points which are destroyed by his operations.

### 3.02 EXCAVATION

A. General Requirements

1. Excavation shall be done to obtain the elevations shown on Drawings, allowing for fill, grading, topsoil and

drainage directed towards inlets. Provide swales as indicated.

2. The Contractor shall check for electrical lines before excavation of any trenches.
3. Usable Materials as approved by the Department shall be stockpiled (for later use as fill material) in a location approved by the Department. Crushing basalt fragments may be necessary prior to reuse in compacted fills.
4. Non-usable Material such as mud, soft material, and expansive soils and excess materials shall become the property of the Contractor and shall be disposed of outside the project boundary limits at locations that have been approved by the County of Hawaii.
5. Blasting as a means of excavation shall not be permitted.
6. Unsuitable subgrade soil, as determined by the Department, shall be excavated, and removed by the Contractor.

B. Structural Excavation

1. Unless otherwise shown, all footings shall be founded on 12 inches minimum of compacted structural fill. In cut areas, the existing basalt rock shall be over-excavated to allow for the 12-inch fill layer.
2. Excavation for footings and foundation shall have level beds, with stepped levels where necessary; localized soft spots shall be over-excavated and removed and the resulting void backfilled with approved structural fill properly compacted in accordance with these specifications.
3. Trenching for foundation footings and grade beams shall be made to the depth and dimensions called for on the Drawings. Bottom of trenches shall be level, solid and free from loose material. All foundation and footings must be carried to the depth shown on the plans. Over-excavation shall be corrected as specified, for which no extra compensation will be allowed.
4. When suitable bearing for foundations is not encountered at the elevation indicated on Drawings, the Contractor shall immediately notify the Department and shall not proceed any

further until the necessary instructions for resumption of work have been received.

5. Lava tubes and cavities may be encountered during excavation. Contractor shall inform the Department immediately of each discovery and work shall be done in accordance with his instructions.

C. Trench Excavation

1. The Contractor shall do all necessary trench excavation to the depth required by the plans, including the excavation for pipe cushion. The excavation shall be unclassified and shall be performed regardless of the material encountered.
2. The minimum width of the trench at the top of the pipe, when placed, shall be a width which will permit the proper construction of joints and compaction of backfill around the pipe. The sides of the trench shall be vertical, unless otherwise approved by the Department. the maximum allowable width of the trench from the bottom of the excavation to a height of 12 inches above the pipe shall not exceed 12 inches on each side of the pipe when placed, unless otherwise approved by the Department.
3. When unsuitable material is encountered at the excavation, the Contractor shall be responsible for hauling and disposing of the material. The hauling and disposing shall be considered incidental to the excavation work. The Department shall determine if the excavation material is unsuitable.
4. The Contractor shall properly sheet and brace all trenches and excavations to render it safe and secure from possible slides and erosion. Sheet piling and bracing of trenches shall be considered as incidental to the excavation work.
5. All trenches shall be kept free from surface run-off and any water during the trenching and installation, testing and backfilling of pipe. Discharge from dewatering operations shall not be drained directly onto any roadway or into any drainage system. The Contractor shall obtain the National Pollutant Discharge Elimination System (NPDES) permit from the State Department of Health for any dewatering activities.

6. All open trenches shall be covered or barricaded during non-working hours. Traffic bearing covers shall be provided where applicable. No open trenches shall be allowed within the Maku'u roadways during non-working hours.
7. All excavated material shall be piled or stored so that it does not obstruct vehicular traffic or pedestrian walkways.

### 3.03 FILL AND BACKFILL

#### A. General Requirements

1. Filling operations shall be performed to bring the entire project area to the finished grades to match existing, allowing for topsoil, or A.C. paving and base course.
2. At the time of compaction, the moisture content of fill and backfill material shall be such that the relative compactions specified can be obtained with the compacting equipment being used. At all times, it shall be the responsibility of the Contractor to employ such means as may be necessary to obtain a uniform optimum moisture content throughout the material being compacted.
3. Soft or loose soils that do not readily compact should be excavated and replaced with compacted structural fill at no cost to the Department.
4. All areas to receive fill shall be scarified, moisture conditioned to near optimum moisture content and compacted to a minimum of 95 percent relative compaction as determined by ASTM D1557 for a minimum depth of eight (8) inches.
5. In areas with gravelly material, the exposed gravelly material should be scarified to a depth of 6 inches and recompacted to a minimum of 95 percent compaction, as determined by ASTM D 1557, prior to placement of the fill.

B. Yard Fill

Yard fill shall be placed in layers, 8 inches or less in loose thickness, and compacted to 95 percent of maximum density as determined by the ASTM D1557 procedure. Yard fill using 6-inch minus material shall be compacted as approved by the Geotechnical Engineer.

C. Structural Fill for Pavement Areas

Structural fill shall be placed in layers, 8 inches or less in loose thickness, moisture conditioned to near optimum moisture content, and compacted to at least 95 percent of maximum density as determined by ASTM D1557 procedure.

D. Trench Backfill

1. Bottom of Excavation to Midpoint of Pipe

All trenches and excavations shall be backfilled within a reasonable time after the pipes are installed. The backfill material from the bottom of the excavation to the midpoint of the pipe shall be pipe cushion material. The backfill shall be placed in loose layers not to exceed 6 inches in depth along each side of the pipe and shall be compacted. Special care shall be taken to secure thorough compaction under the haunches and at the sides of the pipe and to ensure that the backfill material is in continuous and uniform contact with the pipe. Backfilling shall be done in a manner which avoids causing any movement of the pipe sections.

2. Midpoint of Pipe to 6 Inches Above Pipe

- a) For corrugated polyethylene pipe, the backfill material shall be pipe cushion material.

- b) The backfill shall be placed in loose layers not to exceed 6 inches in depth along each side of the pipe and compacted with hand or pneumatic tampers. The backfill shall be brought up evenly on each side of the pipe to an elevation of 6 inches over the top of the pipe, or such elevation as directed by the Department. Backfilling shall be done in a manner which avoids causing any movement of the pipe sections.

2. From 6 Inches Above Pipe to Surface

Backfill from 6 inches above the pipe barrel to finished grade shall be native material which contains less than 50 percent rock or hard lumps of earth. The greatest dimensions of rock or earth lumps permitted shall be 6 inches. Adobe, expansive soils or other unsuitable or deleterious materials shall not be used for backfill. For roadway areas, the upper 2 feet of the trench backfill shall be compacted to 95 percent of its maximum density and shall meet the requirements of the roadway pavement structure.

3.04 FINISH GRADING

Outdoor areas not covered by pavement or other finish surfaces shall be graded to finish grade and contours, with an allowance for gravel as shown on the plans or topsoil as specified.

3.05 TOPSOIL

Topsoil shall be placed as specified. The Contractor shall deposit and spread a layer of topsoil at all areas other than A.C. paved or concrete areas as shown on the drawings. The topsoil shall be lightly compacted to the finish elevations shown on the Drawings. The topsoil shall meet the requirements as defined in Section 02920 – LAWNS AND GRASS.

3.06 CLEAN UP

Clean up and remove all debris accumulated from construction operations from time to time, when and as directed by the Department. Upon completion of the construction work and before final acceptance of the work, remove all surplus materials, equipment, etc., and leave entire job site clean and neat.

END OF SECTION

## SECTION 02362 - SOIL TREATMENT FOR VEGETATION CONTROL

### PART 1 - GENERAL

#### 1.01 GENERAL CONDITIONS

As specified in Section 02010.

#### 1.02 GENERAL REQUIREMENTS

This work shall consist of applying weed killer on all asphalt areas prior to placement of any fill material, topsoil, or aggregate base courses and to treat existing pavements prior to resurfacing work.

#### 1.03 SUBMITTALS

Prior to the start of work, the Contractor shall submit to the Department the material product data and Material Safety Data Sheets for the material proposed for use.

### PART 2 - PRODUCTS

#### 2.01 MATERIALS

Weed Killer shall be "Casoron 10G", "Casoron 4G", or "Norosac 4G", for under asphalt application on new or rebuilt pavement, and shall be "Hyvar X", "Roundup" or "Glyphosate" for application to existing weeds for resurfacing jobs.

### PART 3 - EXECUTION

#### 3.01 APPLICATION

The weed killer shall be mixed and uniformly spread using calibrated application equipment at the maximum rates permitted and in strict accordance with the manufacturer's label.

The Contractor shall notify the Department one week before application of weed killer.

END OF SECTION

## SECTION 02510 – ASPHALTIC CONCRETE PAVEMENT

### PART 1 – GENERAL

#### 1.01 GENERAL CONDITIONS

As specified in Section 02010.

#### 1.02 GENERAL REQUIREMENTS

Sections 29, 30, 31, 33, and 34 of the “Standard Specifications for Public Works Construction” County of Hawaii, Department of Public Works, September 1986, as amended, is hereby incorporated into and made part of these specifications by reference unless otherwise modified hereinafter with the exception of paragraphs “Method of Measurement” and “Basis of Payment.”

Sections 304, 305, 306, 312, and 401 of the “Hawaii Standard Specifications for Road and Bridge Construction, 2005”, Department of Transportation, Highways Division, as amended, is hereby incorporated into and made part of these specifications by reference unless otherwise modified hereinafter with the exception of paragraphs “Method of Measurement” and “Basis of Payment.”

#### 1.03 WORK DESCRIPTION

The work to be performed under this section shall consist of furnishing all labor, materials, equipment, tools, and incidentals necessary to construct complete in place asphalt concrete pavements and trench restoration of existing asphalt concrete pavements in accordance with the contract drawings.

#### 1.04 COORDINATION WITH OTHER SECTIONS

- A. Earthwork is specified in Section 02200 - EARTHWORK.
- B. Soil treatment is specified in Section 02362 – SOIL TREATMENT FOR VEGETATION CONTROL.

#### 1.05 SUBMITTALS

- A. The Contractor shall furnish to the Engineer the affidavits and data from the supplier for the following:
  - 1. Design Mix for asphalt concrete pavement.



2. Base Course Material.
  3. Sub-base Course Material.
  4. Untreated Permeable Base Course Material.
- B. Testing laboratory accreditation data.

#### 1.06 SAMPLING AND TESTING

- A. The Contractor shall retain and pay for an independent soil testing laboratory with at least one Licensed Civil Engineer specializing in Geotechnical Engineering to provide monitoring and testing services. The soil testing laboratory shall be accredited by the American Association of State Highway and Transportation Officials (AASHTO) or the American Association for Laboratory Accreditation, and shall be accredited in the tests required under this contract. The soil testing laboratory shall meet the requirements of ASTM D 3740 - Standard Practice for Minimum Requirements for Agencies Engaged in the Testing and/or Inspection of Soil and Rock as used in Engineering Design and Construction.

The Contractor shall furnish to the Department for approval, a copy of the Certificate of Accreditation and Scope of Accreditation and latest directory of the accrediting organization for accredited laboratories. The scope of the laboratory's accreditation shall include the test methods required by the Contract.

The Contractor shall submit certified test results to the Department in accordance with Section 01300 - SUBMITTALS. All test results must be approved before the Contractor can proceed with placing subsequent layers or material.

- B. Density tests shall be taken to determine whether the specified levels of compaction are being consistently attained. Testing shall be done as indicated.
1. Sub-Grade: One (1) Compaction test per lift for every 5,000 square feet of prepared subgrade where basalt rock is not exposed.
  2. Aggregate Base: One (1) compaction test per lift for every 2,500 square feet of aggregate base.

3. Aggregate Sub-Base: One (1) compaction test per lift forevery 2,500 square feet of aggregate sub-base.
- C. Compaction and thickness testing for asphaltic concrete paving shall be performed at a rate of one (1) test per lift every 500 lineal feet of roadway. Sampling shall be as specified in Section 34 the “Standard Specifications for Public Works Construction”, County of Hawaii, Department of Public Works, September 1986.

PART 2 – PRODUCTS

2.01 MATERIALS

- A. Materials shall conform to the below-listed sections of the “Standard Specifications for Public Works Construction”, County of Hawaii, Department of Public Works, September 1986 except as amended in the plans and/or specifications herewith. (Paragraphs concerning Measurements and Payments in the Sections are not applicable to this project.)

- |    |                                  |            |
|----|----------------------------------|------------|
| 1. | Subgrade                         | Section 29 |
| 2. | Select Borrow for Subbase Course | Section 30 |
| 3. | Base Course                      | Section 31 |
| 4. | Prime Coat for Pavement          | Section 33 |
| 5. | Tack Coat for Pavement           | Section 33 |
| 6. | Asphalt Concrete Pavement        | Section 34 |

- B. Materials shall conform to the below listed sections of the “Standard Specifications for Road and Bridge Construction”, State of Hawaii, 2005 except as amended in the plans specifications herewith. (Paragraphs concerning Measurements and Payments in the Sections are not applicable to this project.)

- |    |                                 |             |
|----|---------------------------------|-------------|
| 1. | Aggregate Base Course           | Section 304 |
| 2. | Aggregate Subbase Course        | Section 305 |
| 3. | Untreated Permeable Base Course | Section 306 |
| 4. | Hot Mix Asphalt Pavement        | Section 401 |

- C. Aggregate Base Course shall have a minimum CBR value of 85.

### PART 3 – EXECUTION

#### 3.01 NEW PAVEMENT CONSTRUCTION

- A. Asphalt concrete shall match the existing and shall be constructed in accordance with Section 34 of the “Standard Specifications for Public Works Construction”, County of Hawaii, Department of Public Works (DPW), September 1986. Hawaii, base and sub-base courses shall be compacted to a minimum 95% compaction as determined by ASTM D1557, and constructed in accordance to Section 31 and 30, respectively, of the DPW Standard Specifications.
- B. Demolition and removal of existing pavement is indicated on the plans and specified in Section 02050 - DEMOLITION AND REMOVAL.
- C. Prior to placement of the base course, the subgrade shall be scarified to a depth of about eight (8) inches, moisture conditioned to above the optimum moisture content, and recompactd to a minimum of 95 percent relative compaction. In areas where dense clinker materials or basalt rock formations are exposed, the subgrade should be proof-rolled with a minimum 10-ton vibratory roller or similar heavy equipment for a minimum of six passes to help detect and collapse near surface cavities in lieu of scarification and compaction.
  - 1. Prime coat shall be applied as specified in Section 33 of the “Standard Specifications for Public Works Construction”, County of Hawaii, Department of Public Works, September 1986.

#### 3.02 TRENCH RESTORATION OF EXISTING PAVEMENTS

- A. Trench restoration of existing pavements within the Maku’u subdivision shall be as specified on the plans and in Section 11 and Section 38 of the “Standard Specifications for Public Works Construction”, County of Hawaii, Department of Public Works, September 1986.

#### 3.03 CLEAN UP AND REPAIR

- A. Any existing asphaltic concrete pavements including roads, gutters and driveways that have been damaged by construction activities shall be repaired and restored to original condition or better to the

the satisfaction of the Department. Damage done by the heavy equipment, especially on roads not stable for such equipment, shall be repaired to the original condition and to the satisfaction of the Department. Curbs and driveways that have been cracked or damaged by the Contractor's equipment or delivery trucks shall be reconstructed.

- B. Repair work may consist of asphalt concrete resurfacing, scarifying, and removing the existing pavement and reconstructing pavement of equivalent thickness, and reconstruction of curbs and driveways.

END OF SECTION

## SECTION 02665 – WATER SYSTEM

### PART 1 – GENERAL

#### 1.01 GENERAL CONDITIONS

As specified in Section 02010.

#### 1.02 GENERAL REQUIREMENTS

A. The following construction standards, with certain modifications as hereinafter specified, are hereby incorporated into, and made a part of these specifications by reference and shall be applicable to all work performed by the Contractor under this section.

1. "Water System Standards", dated 2002 of the Department of Water Supply, County of Hawaii, as amended. Paragraphs relating to Measurement and Payment in the Sections are not applicable to the project.
2. Specific sections of the "Standard Specifications for Public Works Construction", Department of Public Works, County of Hawaii, September 1986 (hereinafter referred to as "DPW Standard Specifications") as amended, with deletion of subsections relating to measurement and payment in all sections incorporated herein and further modifications to such sections as hereinafter provided.
3. Specific sections of the "Hawaii Standard Specifications for Road and Bridge Construction, 2005", Department of Transportation, Highways Division, as amended and as it pertains to construction within the Maku'u Streets right-of-way, is hereby incorporated into and made part of these specifications. Paragraphs relating to Measurement and Payment in the Sections are not applicable to the project.

#### 1.03 WORK DESCRIPTION

The work to be performed under this section shall consist of furnishing all labor, materials, equipment, tools and incidentals necessary to pressure test and chlorinate water system as indicated on the Plans and specified herein.

#### 1.04 SUBMITTALS

A. Certificates:

1. The Contractor shall furnish to the Department affidavits and descriptive literature from the manufacturers of pipe, pipe coating, fittings, valves, cast iron castings, backflow preventer, pressure regulating valves and other appurtenances furnished and installed under this section certifying that such materials delivered to the project conform to the requirements of this section. Certificate of disinfection shall also be submitted to the Department.

B. Shop Drawings:

1. Submit shop drawings as needed for:
  - a. Meter or Valve Boxes
  - b. Meter or Valve Box Covers

C. The Contractor shall have the following documents available for the use of the County's inspector at the jobsite:

1. Water System Standards dated 2002 of the Department of Water Supply, County of Hawaii, as amended.
2. AWWA Standard C600.
3. AWWA Standard C651.

1.05 COORDINATION WITH OTHER SECTIONS

- A. Trench Excavation and Backfill specified in Section 02200-EARTHWORK.
- B. Concrete work is specified in Section 03300 - CAST-IN-PLACE CONCRETE.

1.06 DEPARTMENT OF WATER SUPPLY CHARGES

- A. The Department of Water Supply "Water System Facilities Charges", if any, shall be paid directly to the Department of Water Supply by the Owner.
- B. The Contractor shall pay for all charges for the water meter and inspection by the Department of Water Supply.

1.07 EMERGENCY NOTIFICATIONS

- A. The Contractor shall notify the Department of Water Supply and the Department of all water system shut downs 2 weeks in advance.
- B. In addition, the Contractor shall notify the Fire Department 72 hours in advance if any fire hydrant is to be shut off.

PART 2 – PRODUCTS

2.01 MATERIALS

- A. All materials shall be in accordance with the appropriate sections of Division 200 of the Water System Standards as listed below. All materials specified herein and as specified in the Water System Standards that are in contact with potable water shall be lead free in accordance with the Reduction of Lead in Drinking Water Act.

:

- 1. Ductile Iron Pipe, Fittings and Special Castings.....Section 202
- 2. Valves and Appurtenances.....Section 205
- 3. Meter Box and Valve Box Covers and Frames .....Section 207
- 4. Service Lateral and Appurtenances .....Section 208
- 5. Pre-Molded Filler, Crushed Rock, Pipe Cushion, Backfill Material and Bricks.....Section 209
- 6. Brass Products .....Section 211
- 7. Miscellaneous.....Section 212
- 8. Piping Accessories:
  - a. Pressure gauge shall be a 3-1/2 inch diameter dial, Ashcroft Type 1009, or approved equal, with a scale range approximately 2 times the operating pressure.
  - b. Ball Valves: Bronze Ball valves shall be rated for the pressure and temperature of the service fluid. Materials of construction for valves shall be compatible with service fluid.

- c. Strainers: Strainer shall be of Y-pattern, bronze body, with 80 mesh screen.
  - d. Dielectric Unions shall separate all ferrous and nonferrous metals in all piping systems. Unions shall be copper with bronze body, 200 psig, except that of metal-to-metal contact shall be avoided. For pipes 2" and smaller use ground joint, for pipes 2-1/2" and larger used flanged face. Where flanges are used, the bolts shall be electrically insulated from the body of the flange.
  - e. Escutcheons: Brass body, chrome-plated finish. Of sizes sufficient to cover pipe openings through the floor, wall, or ceiling. Escutcheons shall be secured in place by either spring clips or setscrews.
  - f. Pipe Sleeve: Schedule 40 Type 316 stainless steel pipe sleeves in concrete, 18-gauge Type stainless steel sheet metal sleeves in other construction. Sleeves shall be sized to provide a minimum of 1/4" clearance around bare or insulated piping or as otherwise required by Code.
  - g. Hose Bibb: Watts No. 11-4 with vacuum breaker, 3/4" hose thread outlet, removable key handle.
- B. COPPER TUBING: Water pipe 4" in diameter and smaller for water lines shall be Copper Water Tube Type K, soft temper, conforming to ASTM Designation B-88. Solder-joint fittings shall be cast bronze or wrought copper conforming to ANSI B-16. Solder shall be 1/8" diameter, 95% Tin-5% Antimony and shall not contain any lead.
- C. BACKFLOW PREVENTER: The Backflow Preventer shall operate on a reduced pressure principle to prevent back-siphonage and back pressure backflow of water into the potable water supply. The device shall consist of a pressure differential relief valve located in a zone between two positive seating check valves. The relief valve shall contain a separate means whereby free air will enter the zone and contained water will be discharged to atmosphere when the valve is fully open. The assembly shall include two tightly closing



shut-off valves before and after the device, test cocks and a protective strainer upstream of the gate valve. The device shall be suitable for service in either cold or hot water (to 210°F) and shall meet the requirements of ASSE Std. 1013; AWWA Std. C506-78 or USCFCC Manual for Cross Connection Control. The backflow preventer shall be a Watts Series 909QTS or approved equal.

## PART 3 - EXECUTION

### 3.01 GENERAL

- A. The Contractor shall be responsible for laying out the various exterior utility lines shown on the Drawings as provided. The location shown on the Drawings of the various existing utility lines which the pressure testing are to cross over or under or connect to were determined on the basis of the best information available; however, no assurance can be made that the actual locations will be as shown on the Drawings. The Contractor shall tone, locate and verify all existing utilities crossing the new water line prior to the pressure testing and chlorination of the water line.

In performing all work, the Contractor shall exercise due care and caution necessary to avoid any damage to and impairment in the use of any existing utility lines. Any damage to on existing lines resulting from the Contractor's operation shall be immediately repaired and restored as directed by the Department at the Contractor's expense.

### 3.02 EQUIPMENT

- A. All equipment necessary and required for the proper construction of the water lines shall be on the project, in first class working condition, and approved by the Department before construction is permitted to start.
- B. The Contractor shall provide hand tampers and pneumatic tampers to obtain the required compaction of the pipe bed and the backfill, as specified.

### 3.03 TRAFFIC CONTROL

- A. Traffic warning and construction signs shall be installed and

detours provided as required when working in roadways. The Contractor shall provide, install, and maintain all other necessary signs, lights, flares, barricades, markers, cones, and other protective facilities and shall take all necessary precautions for the protection and the convenience and safety of the public traffic. All such protective facilities and precautions to be taken shall conform with the "Rules and Regulations Governing the Use of Traffic Control Devices at Work Sites on or Adjacent to Public Streets and Highways" adopted by the Director, Department of Transportation, and the U.S. Federal Highway Administration "Manual on Uniform Traffic Control Devices for Streets and Highways, Part VI - Traffic Control for Highway Construction and Maintenance Operation", dated 2003.

- B. All detour plans shall be submitted to the Department for approval prior to implementation of the detour changes in traffic patterns shall be provided to users as directed by the Department.

#### 3.04 TRENCH EXCAVATION AND BACKFILL

- A. The Contractor shall do all necessary trench excavation to the depth required by the plans, including the excavation for pipe cushion. "Water System Standards", dated 2002 of the Department of Water Supply, County of Hawaii, and Section 02200 - EARTHWORK.
- B. When unsuitable material is encountered at the excavation the Contractor shall be responsible for hauling and disposing of the material and filling the excavation with crushed rock cushion material.

#### 3.05 INSTALLATION

- A. All work shall be in accordance with the appropriate Sections of Division 300 of the WATER SYSTEM STANDARDS.
- B. Concrete reaction blocks shall be provided at all bends and plugged ends in accordance with the WATER SYSTEM STANDARDS for ductile iron pipes. The minimum bearing area shall be for Class 250 pipe and Type B soil condition for located within volcanic ash soils or Type F condition for pipes located within the basalt stratum.

#### 3.06 DETECTION OF WATER LINES

- A. Warning and Identification Tape:
  - 1. Provide warning and identification tape for both non-metallic and metallic water lines.

1. The warning and identification tape shall be buried directly above the centerline of the utility pipe, approximately 12" below the finish grade. Where the utility pipe is under pavements and slabs, the tape shall be buried approximately 6" below the top of the subgrade.

### 3.07 DETAILS

Standard Details shall be in accordance with Section 403 of the WATER SYSTEM STANDARDS or as shown on the plans.

### 3.08 CONNECTING,- TESTING,- CHLORINATION

- A. The new lines shall be installed, but not connected until pressure testing and disinfecting is completed. Connecting shall be done at the discretion of the Department of Water Supply. Pressure testing and, flushing of valves and mains shall be carried out in accordance with the "Water System Standards". The Contractor shall submit the results of such test to the Department for approval. All charges for services by the Department of Water Supply shall be paid for by the Contractor.
- B. The shut-off of water service shall be done during the working hours. The Department of Water Supply and the Department shall be notified 72 hours in advance of any shut-off of the water service. The Contractor shall notify the Fire Department of any shut-off involving existing fire hydrants.
- C. Disinfection of Water Lines
  1. Flush out water lines to remove foreign matter. After flush water runs clear, disinfect the lines with chlorine in accordance with AWWA Standard C651, pertaining to methods, concentrations, and contact times. Flush out until residual is reduced to 0.3 ppm. Submit to the Department a certificate of completion for this work from a contractor experienced and licensed to do disinfecting work.
  2. Obtain two water samples from selected points and submit them to a licensed laboratory for bacteriological testing. Water shall meet Federal water purity standards. Submit to the Department a laboratory report or a certification of satisfactory completion of disinfection. All costs of testing shall be borne by the Contractor. Notify the Department in writing if the County Water Supply to the site exceeds maximum permissible limits for coliform content.

### 3.09 RESTORE PAVEMENTS AND OTHER IMPROVEMENTS

- A. All trenches within pavements shall be repaved in accordance with the plans and specific sections of the standard DPW Specifications Section 38 - RESTORING PAVEMENTS AND OTHER IMPROVEMENTS shall apply. All striping and pavement markings shall be repainted in their entirety should any portion of the stripe or markings need repainting.
- B. All trenches within yard areas shall be covered with 6 inches of topsoil and the area regrassed in accordance with Section 02920 – LAWNS AND GRASS.
- C. All curbs, gutters, sidewalks, and other miscellaneous improvements removed or damaged by the work shall be reconstructed.

### 3.10 FINAL INSPECTION

At the time of final inspection of the work performed under the contract, the water system shall be complete in every respect and operating as designed. All surplus materials in every character resulting from the work of this section shall have been removed. All defects discovered in the utilities subsequent to this inspection shall be corrected prior to final acceptance.

END OF SECTION

## SECTION 03200 – CONCRETE REINFORCING

### PART 1 – GENERAL

#### 1.1 DESCRIPTION:

- A. This item of work consists of furnishing of labor, tools, equipment, and materials necessary to complete this item of work, in place complete, as shown on the plans and as specified in DIVISION 300 - CONSTRUCTION, Section 303.04 REINFORCING STEEL, and Section 303.05 WELDED WIRE FABRIC of the Water System Standards, 2002, and as amended hereinafter as they apply to this project.

#### 1.2 SUBMITTALS:

- A. The Contractor shall furnish shop bending diagrams, placing lists, and drawings of all reinforcement steel before fabrication.
- B. Details of reinforcement steel for fabrication and erection shall conform to ACI 315 and the requirements indicated. The shop bending diagrams shall show the actual lengths of bars, to the nearest inch, measured to the intersection of the extensions (tangents for bars of circular cross section) of the outside surface. The shop drawings shall include bar placement diagrams which clearly indicate the dimensions of each bar splice.
- C. Where mechanical couplers are required or permitted to be used to splice reinforcement steel, the Contractor shall submit manufacturer's literature including instructions and recommendations for installation for each type of coupler used; certified test reports which verify the load capacity of each type and size of coupler used; and shop drawings which show the location of each coupler with details of how they are to be installed in the formwork.
- D. If reinforcement steel is spliced by welding at any location, the Contractor shall submit mill test reports which shall include the information necessary to determine if the carbon equivalent is as specified in AWS D1.4. The Contractor shall submit a written welding procedure for each type of weld for each size of bar which is to be spliced by welding; a mere statement that AWS procedures will be followed will not be acceptable.

### PART 2 – MATERIALS

#### 2.1 MATERIALS:

- A. Reinforcing steel shall conform to ASTM A615, Grade 60, typical.

- B. All welded reinforcement, specifically detailed or otherwise indicated, shall be below-alloy grade 60 deformed bars conforming to the requirements of ASTM A706.
- C. Spiral reinforcement shall be cold-drawn steel wire conforming to the requirements of ASTM A82.
- D. Tie wire shall be Annealed Steel, 16 gauge minimum.
- E. The use of re-rolled rail steel or cold twisted bars is not permitted.
- F. Mechanical Couplers:
  - 1. Mechanical couplers shall be provided where indicated and where approved by the Manager. The couplers shall develop a tensile strength that exceeds 125 percent of the yield strength of the reinforcement bars being spliced at each splice.
  - 2. Where the type of coupler used is composed of more than one component, all components required for a complete splice shall be supplied.
  - 3. The reinforcement steel and coupler used shall be compatible for obtaining the required strength of the connection. Straight threaded type couplers shall require the use of the next larger size reinforcing bar or shall be used with reinforcing bars with specially forged ends which provide upset threads which do not decrease the basic cross section of the bar.

### PART 3 – EXECUTION

#### 3.1 GENERAL:

- A. All reinforcement steel, welded wire fabric, couplers, and other appurtenances shall be fabricated, and placed in accordance with the requirements of the ACI 318 and the supplementary requirements indicated herein.
- B. Fabrication and Delivery:
  - 1. The Contractor shall conform to CRSI MSP, Chapters 6 and 7, except as otherwise indicated or specified. The Contractor shall bundle reinforcement and tag with suitable identification to facilitate sorting and placing, and transport and store at site so as not to damage material. The Contractor shall keep a sufficient supply of tested, approved, and proper reinforcement at site to avoid delays.
  - 2. Bending and Forming: The Contractor shall bend bars of indicated size and accurately form in accordance with the requirements of ACI 315 and

ACI 318 to shapes and lengths indicated on drawings and required by methods not injurious to materials. The Contractor shall not heat reinforcement for bending. Bars with kinks or bends not scheduled will be rejected.

3. Fabricating tolerance: All fabrication of reinforcing bars shall meet the requirements of ACI 117.

C. Placing:

1. Reinforcement steel shall be accurately positioned and shall be supported and wired together to prevent displacement, using annealed iron wire ties or suitable clips at intersections. All reinforcement steel shall be supported by concrete, plastic or metal supports, spacers or metal hangers which are strong and rigid enough to prevent any displacement of the reinforcement steel. Where concrete is to be placed on the ground, supporting concrete blocks (or dobies) shall be used, in sufficient numbers to support the bars without settlement, but in no case shall such support be continuous. All concrete blocks used to support reinforcement steel shall be tied to the steel with wire ties which are embedded in the blocks. For concrete over formwork, the Contractor shall furnish concrete, metal, plastic, or other acceptable bar chairs and
2. Limitations on the use of bar support materials shall be as follows:
  - a. Concrete Dobies: Permitted at all locations except where architectural finish is required.
  - b. Wire Bar Supports: Permitted only at slabs over dry areas, interior dry wall surfaces, and exterior wall surfaces.
  - c. Plastic Bar Supports: Permitted at all locations except on grade.
3. Tie wires shall be bent away from the forms to provide the specified concrete coverage.
4. Bars additional to those shown which may be found necessary or desirable by the Contractor for the purpose of securing reinforcement in position shall be provided by the Contractor at no additional cost to the owner.
5. Unless otherwise specified, reinforcement placing tolerances shall be within the limits specified in Section 7.5 of ACI 318.
6. Bars may be moved as necessary to avoid interference with other reinforcement steel, conduits, or embedded items. If bars are moved more than one bar diameter, or enough to exceed the above tolerances,

the resulting arrangement of bars shall be subject to the approval of the Manager.

7. Accessories supporting reinforcing bars shall be spaced such that there is no deflection of the accessory from the weight of the supported bars. When used to space the reinforcing bars from wall forms, the forms and bars shall be located so that there is no deflection of the accessory when the forms are tightened into position.

### 3.2 MINIMUM OVERLAP:

- A. Minimum overlap for lapped splices shall be 40 bar diameters, but not less than 2'-0". Splices shall be staggered at least 24 inches.

### 3.3 SPLICES:

- A. Splicing shall be in accordance with ACI-318, unless otherwise noted on Drawings.
- B. Vertical Bars. Except as specifically detailed or otherwise indicated, splicing of vertical bars in concrete is not permitted, except at the indicated or approved horizontal construction joints or as otherwise specifically detailed.
- C. Horizontal Bars. Except as specifically detailed or otherwise indicated, splicing of horizontal bars in concrete is not permitted.
- D. Mechanical Couplers. Only allowed with prior written approval by the Manager. Follow manufacturer's requirements for installation.
- E. Welded splices shall be provided where indicated and where approved by the Manager. All welded splices of reinforcement steel shall develop a tensile strength which exceeds 125 percent of the minimum yield of the reinforcing bars.

## PART 4 – PAYMENT

No separate payment for will be made; compensation for such work shall be deemed to be included in the Lump Sum Bid for the item of which it is a part.

END OF SECTION



## SECTION 03300 – CAST-IN-PLACE CONCRETE

### PART 1 – GENERAL

#### 1.1 DESCRIPTION:

- A. Furnish all materials, labor and equipment required to accomplish all concrete work specifically for the concrete reservoir tank, as shown on the plans and as specified in DIVISION 300 - CONSTRUCTION, Section 303.03 CONCRETE WORK, of the Water System Standards, 2002, and as amended hereinafter as they apply to this project.

#### 1.2 QUALITY ASSURANCE:

- A. Installer Qualifications: A qualified installer who employs on Project personnel qualified as ACI-certified Flatwork Technician and Finisher and a supervisor who is an ACI-certified Concrete Flatwork Technician.
- B. Manufacturer Qualifications: A firm experienced in manufacturing ready-mixed concrete products and that complies with ASTM C 94/C 94M requirements for production facilities and equipment.
  - 1. Manufacturer certified according to NRMCA's "Certification of Ready Mixed Concrete Production Facilities."
- C. Testing Agency Qualifications: An independent agency, qualified according to ASTM C 1077 and ASTM E 329 for testing indicated.
  - 1. Personnel conducting field tests shall be qualified as ACI Concrete Field-Testing Technician, Grade 1, according to ACI CP-1 or an equivalent certification program.
  - 2. Personnel performing laboratory tests shall be ACI-certified Concrete Strength Testing Technician and Concrete Laboratory Testing Technician - Grade I. Testing Agency laboratory supervisor shall be an ACI-certified Concrete Laboratory Testing Technician - Grade II.
- D. Source Limitations: Obtain each type or class of cementitious material of the same brand from the same manufacturer's plant, obtain aggregate from single source, and obtain admixtures from single source from single manufacturer.
- E. Welding Qualifications: Qualify procedures and personnel according to AWS D1.4/D 1.4M, "Structural Welding Code - Reinforcing Steel."
- F. ACI Publications: Comply with the following unless modified by requirements in the Contract Documents:
  - 1. ACI 301, "Specifications for Structural Concrete,"

2. ACI 117, "Specifications for Tolerances for Concrete Construction and Materials."

G. Concrete Testing Service: Engage a qualified independent testing agency to perform material evaluation tests and to design concrete mixtures.

### 1.3 SUBMITTALS:

A. Product Data: For each type of product indicated.

B. Design Mixtures: For each concrete mixture. Submit alternate design mixtures when characteristics of materials, Project conditions, weather, test results, or other circumstances warrant adjustments.

1. Mix design shall list quantities to be used for a cubic yard of concrete. List all admixtures and proposed quantity to be used for each admixture. Specify range of slump and water-cement ratio. List sources of aggregates to be used and provide sieve analysis of each aggregate demonstrating compliance with Water System Standards gradations listed in Table 300-7 and 300-8.

C. Steel Reinforcement Shop Drawings: Placing drawings that detail fabrication, bending, and placement. Include bar sizes, lengths, material, grade, bar schedules, stirrup spacing, bent bar diagrams, bar arrangement, splices and laps, mechanical connections, tie spacing, hoop spacing, and supports for concrete reinforcement.

D. Formwork Shop Drawings: Prepared by or under the supervision of a qualified professional engineer detailing fabrication, assembly, and support of formwork.

1. Shoring and Reshoring: Indicate proposed schedule and sequence of stripping formwork, shoring removal, and reshoring installation and removal.

2. All false work and forming requirements for support systems must be designed by an engineer registered in the State of Hawaii. The drawings, with supporting calculations, must each be signed and sealed by the engineer. No work shall be started until the support system and form design has been submitted. The false work design engineer must visit the site and approve the erection of all shoring prior to the placement of any concrete.

E. Construction Joint Layout: Indicate proposed construction joints required to construct the structure.

1. Location of construction joints is subject to approval of the Engineer.

F. Qualification Data: For Installer, manufacturer, and testing agency.

H. Material Certificates: For each of the following, signed by manufacturers:

1. Cementitious materials.
2. Admixtures.
3. Form materials and form-release agents.
4. Steel reinforcement and accessories.
5. Curing compounds.
6. Bonding agents.
7. Adhesives.
8. Vapor retarders.
9. Semirigid joint filler.
10. Joint-filler strips.
11. Repair materials.

I. Material Test Reports: For the following, from a qualified testing agency, indicating compliance with requirements:

1. Aggregates.

#### 1.4 DELIVERY, HANDLING, STORAGE

- A. Steel Reinforcement: Deliver, store, and handle steel reinforcement to prevent bending and damage.
- B. Cement and aggregates shall be stored in a manner to prevent deterioration or the intrusion of foreign matter. Any material which has deteriorated or that has been damaged shall not be used for concrete and shall be promptly removed from the batching site.

### PART 2 – MATERIALS

#### 2.1 CEMENT, WATER & AGGREGATES:

- A. General: Materials shall be in conformance with County of Hawaii, Standard Specifications for Public Works Construction, September 1986, Section 39.
- B. Portland Cement: ASTM C 150, Type I or Type II.
- C. Normal-Weight Aggregate: ASTM C 33, uniformly graded, and as follows:
  1. Class: Moderate weathering region, but not less than 3M.
  2. Aggregate Size: No. 57 (1 inch to 3/8 inch).
- D. Water: Potable and complying with ASTM C 94 or non-potable meeting ASTM C-94 Acceptance Criteria for Questionable Water Supply. Use only potable water for job site mixing.

## 2.2 ADMIXTURES:

### A. Retarding Densifiers

1. All 'DWS 4000' concrete used for wall construction, shall also contain DARATARD-17, as manufactured by Grace Const. Products, Cambridge, MA or MBL-82, as manufactured by Master Builders, Cleveland OH in the amounts recommended by the additive manufacturer whenever the air temperature during the pour exceeds 85° F.
2. To be considered as equal, any alternate product offered for consideration shall contain no calcium chloride and shall be compatible with air-entrained cements and air-entraining admixtures conforming to the applicable ASTM, AASHO, ANSI and Federal specifications.
3. Contractor shall certify that admixtures do not contain calcium chlorides or other corrosive materials.

### B. Air-Entraining Agents

1. Unless specifically required by the Department of Water Supply, 'DWS 4000' concrete shall not be air entrained. Unless otherwise specified, all other concrete may be air-entrained at the option of the Contractor.
2. Air-entraining agents shall meet ASTM C-260, ASTM C-233 and ASTM C-457.

### C. Water-Reducing Admixtures

1. In addition to air-entrainment, approved water reducing additives, which do not affect the ultimate performance of any steel in any way, may be added to maintain the maximum water content below that specified herein. Water reducing additives shall conform to ASTM C494, Type A.
2. The use of water reducing additives shall not permit a reduction in the minimum specified cement content or in the specified amount of air-entrainment.
3. Admixtures shall contain no calcium chloride, tri-ethanol amine, or fly ash. All admixtures shall be from the same manufacturer.
4. Superplasticizers, if allowed by the Manager, shall conform to ASTM C494, Type F or G, batch plant added using second or third generation only.

### D. Shrinkage-Reducing Admixture

1. Shrinkage reducing admixture shall not contain any expansive material but reduces material shrinkage by chemical action to reduce the surface tension of water. The admixture shall provide a minimum 50% reduction in the ultimate shrinkage at the dosage proposed.

2. Subject to these Specifications, consideration will be given to the following products: BASF "TETRAGUARD AS 20", GRACE "ELIPSE PLUS", or approved equal.

E. Crystalline Waterproofing Admixture: Admixture shall be designed to be added during concrete batching, the product reacts with moisture in fresh concrete and by-products of cement hydration to cause a catalytic reaction that generates a non-soluble crystalline formation throughout the pores and capillary tracts of the concrete permanently sealing the concrete.

### 2.3 CONCRETE CLASSES:

A. DWS 3000 – Pipe jackets, and all building concrete, and for items specifically noted on Drawings. The maximum water-cement ratio shall be 0.46.

B. DWS 2500 - All other concrete where strength is not indicated or shown, it shall be minimum 3,000 psi at 28 days.

## PART 3 – EXECUTION

### 3.1 HOT WEATHER CONCRETING:

#### A. General

1. General Practices and Measures; The following list of practices and measures, as described in ACI 305, may be used to reduce, or avoid the potential problems of hot weather concreting:
  - a. Use concrete materials and proportions with satisfactory records in field use under hot weather conditions.
  - b. Use cool concrete.
  - c. Use a concrete consistency that permits rapid placement and effective consolidation.
  - d. Transport, place, consolidate, and finish the concrete with least delay.
  - e. Plan the job to avoid adverse exposure of the concrete to the environment; schedule placing operations during times of the day or night when weather conditions are favorable.
  - f. Always protect the concrete against moisture loss during placing and during its curing period.

B. Batching and Mixing

1. Concrete mix water shall be refrigerated or up to 100 percent of the water requirement may be ice added to the concrete mix. Ice, when introduced into the mixer, shall be in such form that it will completely melt and dispersed into the mix at the completion of the mixing time. The mixing time shall be held to the minimum practicable consistent with producing concrete meeting the specified requirements
2. All methods and equipment for cooling water and aggregate shall be subject to the approval of the Manager and shall conform to ACI 305.

C. Concrete Temperature: The temperature of concrete, as delivered at the time and location of placement, shall not exceed 100°F under any conditions. The temperature of concrete as delivered at the time and location of placement under the following combined ambient conditions, except concrete that will be deposited within wall or column forms, shall not exceed the following temperatures:

Relative Humidity less than %	Ambient Temperature greater than °F	Maximum Concrete Temperature, °F
80	90	100
70	90	95
60	90	90
50	90	85
40	90	80
30	80	75

D. Delivery: Concrete shall be placed in the Construction within 90 minutes after the completion of mixing.

E. Preparation for Placing: Forms and reinforcing steel for boxes and jacket members shall be free of standing water prior to placing concrete.

F. Placing: Concrete shall be placed in shallower layers than under normal weather conditions, if necessary, to assure coverage of the previous layer while it is still in plastic state and will respond readily to vibration.

### 3.2 FIELD TESTING

- A. Three-cylinder samples shall be taken for each class of concrete poured each day and for every 10 cubic yards of each class or fraction thereof. Two (2) cylinders shall be tested at age of seven (7) days and twenty-eight (28) days in accordance with ASTM C39, "Standard Method of Test for Compressive Strength of Cylindrical Concrete Specimens". The last sample shall be held in reserve for use to verify suspect test results or a spoiled test sample.
- B. Slump tests shall be conducted on each ready-mix concrete truck discharging on-site for project site.

### 3.3 FORM WORK

#### A. General:

Forms shall be so constructed that they can be removed without hammering on, or prying against, the concrete and shall be removed in such a manner as to prevent damage to the concrete and to insure the complete safety of all parts of the structure. Forms previously used shall be thoroughly cleaned of all dirt, mortar, and foreign matter before being reused.

END OF SECTION