

DIVISION OF STATE PARKS

State of Hawaii
DEPARTMENT OF LAND AND NATURAL RESOURCES
ENGINEERING DIVISION
Honolulu, Hawaii

BOARD OF LAND AND NATURAL RESOURCES

Suzanne D. Case
Chairperson

CONTRACT SPECIFICATIONS AND PLANS

Job No. H87C836C
Kekaha Kai State Park
Kua Bay Improvements
North Kona, Hawaii

Civil Engineer:	Okahara & Associates, Inc.
Mechanical Engineer:	Okahara & Associates, Inc.
Architect:	Richard Matsunaga & Associates Architects, Inc.

April 2016

State of Hawaii
DEPARTMENT OF LAND AND NATURAL RESOURCES
ENGINEERING DIVISION
Honolulu, Hawaii

CONTRACT SPECIFICATIONS AND PLANS

Job No. H87C836C
Kekaha Kai State Park
Kua Bay Improvements
North Kona, Hawaii

Approved:



CURT A. COTTRELL
Administrator
Division of State Parks

Approved:



CARTY S. CHANG, P.E.
Chief Engineer
Engineering Division

April 2016

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PLANS (Bound Separately)

DEPARTMENT OF LAND AND NATURAL RESOURCES INTERIM GENERAL
CONDITIONS, DATED OCTOBER 1994 (Bound Separately)

NOTICE TO BIDDERS
(Chapter 103D, HRS)

COMPETITIVE BIDS for Job No. H87C836C, Kekaha Kai State Park, Kua Bay Improvements, North Kona, Hawaii shall be submitted to the Department of Land and Natural Resources, Engineering Division on the specified date and time through the Hawaii State e-Procurement (HIePRO). HIePRO is accessible through the State Procurement Office website at www.spo.hawaii.gov.

The Department of Land and Natural Resources Interim General Condition, dated October 1994, as amended, and the General Conditions –AG008, latest revision shall be made part of the specifications.

The project is located in North Kona, Hawaii at TMK: (3) 7-2-004: 019.

The work shall generally consist of various site improvements and repairs such as installation of new speed bumps along the access road, repairs to the existing comfort station, installing new showers, new concrete walkway and stairs accessing the beach, and ADA picnic tables with concrete slab.

Due to the nature of work contemplated, bidders must possess a valid State Contractor's license, classification "A".

The estimated cost of construction is \$160,000.

The award of the contract, if it be awarded, will be subject to the availability of funds.

This project is subject to preference to Hawaii Products established by Section 103D, Hawaii Revised Statutes. The Hawaii Product List may be examined at the State Procurement Office website.

Since the estimated value of the cost of construction is less than \$250,000, the apprenticeship agreement preference pursuant to Hawaii Revised Statutes §103-55.6 (ACT 17, SLH 2009) shall not apply.

Should there be any questions, please refer to the HIePRO solicitation.

INFORMATION AND INSTRUCTIONS TO BIDDERS

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INFORMATION AND INSTRUCTIONS TO BIDDERS

- A. PROJECT LOCATION AND SCOPE OF WORK: The project location and scope of work shall be as generally described in the Notice to Bidders.
- B. PROPOSALS: Bidders shall submit their bid, including the completed proposal form, bid bond, and any other documents required by the solicitation as part of their bid through the State of Hawaii e-Procurement System (HIePRO). See Item D, PROPOSAL FORM.
- C. GENERAL CONDITIONS: The Department of Land and Natural Resources Interim General Conditions dated October 1994, as amended, shall be made a part of these contract specifications and are referred to hereafter as the General Conditions.
- D. PROPOSAL FORM: **The Bidders shall fill out and upload the electronic copy of the proposal form to the HIePRO website when submitting the bid. Bid Proposals shall not be mailed, faxed or delivered to the State, unless requested to do so after the designated closing date. The successful Bidder shall fill out and print a hard copy of the proposal form, sign and submit the form with the contract award package.**
- E. OMISSIONS OR ERASURES: Any proposal which contains any omission or erasure or alteration not properly initialed, or conditional bid, or other irregularity may be rejected by the Board of Land and Natural Resources (Board).
- F. NOTICE OF INTENT TO BID AND QUESTIONNAIRE:
A Notice of Intent to Bid is not required for this project. In compliance with HRS Section 103D-310, the lowest responsive and responsible bidder may be required to complete a questionnaire. When requested by the State, the completed questionnaire shall be submitted to the Chief Engineer for evaluation. Failure to furnish the requested information within the time allowed may be grounds for a determination of non-responsibility, in accordance with HRS Section 103D-310 and HAR Section 3-122-108.
- G. BID SECURITY: A bid security will be furnished by each bidder as provided in sub-section 2.7 of the General Conditions. The successful bidder's bid security will be retained until Contract execution and furnished a performance and payment bond in an amount equal to one hundred percent (100%) of the total Contract price, including an amount estimated to be required for extra work, is furnished.

The Board reserves the right to hold the bid securities of the four lowest bidders until the successful bidder has entered into a contract and has furnished the required performance bond. All bid securities will be returned in accordance with sub-section 3.5 of the General Conditions.

Should the successful bidder fail to enter into a contract and furnish a satisfactory performance bond within the time stated in the proposal, the bid security shall be forfeited as required by law.

- H. CONTRACTOR'S LICENSE REQUIRED: The Board will reject all bids received from contractors who have not been licensed by the State Contractors License Board in accordance with Chapter 444, HRS; Title 16, Chapter 77, Hawaii Administrative Rules; and statutes amendatory thereto.
- I. IRREGULAR BIDS: No irregular bids or propositions for doing the work will be considered by the Board.
- J. WITHDRAWAL OF BIDS: No bidder may withdraw his bid between the time of the opening thereof and the award of contract.
- K. SUCCESSFUL BIDDER TO FILE PERFORMANCE AND PAYMENT BONDS: The successful bidder will be required to file performance and payment bonds each; in the amount equal to the total contract price, including amounts estimated to be required for extra work, as provided in sub-section 3.6 of the General Conditions.
- L. NUMBER OF EXECUTED ORIGINAL COUNTERPARTS OF CONTRACT DOCUMENTS: If requested by the Board, six copies of the Contract, performance and payment bonds shall be executed.
- M. CHANGE ORDERS: No work of any kind in connection with the work covered by the plans and specifications shall be considered as change order work, or entitle the Contractor to extra compensation, except when the work has been ordered in writing by the Chief Engineer (Engineer) and in accordance with sub-section 4.2 of the General Conditions.

The Contractor shall clearly identify and inform the Engineer in writing of any deviations from the contract documents at the time of submission and shall obtain the Engineer's written approval to the specified deviation prior to proceeding with any work.

- N. WAGES AND HOURS: In accordance with sub-sections 7.3 to 7.9 of the General Conditions relative to hours of labor, minimum wages and overtime pay, the current minimum wage rates promulgated by the Department of Labor and Industrial Relations (DLIR) shall be paid to the various classes of laborers and mechanics engaged in the performance of this contract on the job site. The minimum wages shall be increased during the performance of the contract in an amount equal to the increase in the prevailing wages for those kinds of work as periodically determined by the DLIR.

The Department of Land and Natural Resources will not recognize any claim for additional compensation because of the payment by the Contractor of any wage rate in excess of the said minimum wage rates. The possibility of wage increase is one of the elements to be considered by the Contractor in determining his bid, and will not, under any circumstances, be considered as the basis of a claim against the Department under this Contract.

No work shall be done on Saturdays, Sundays, legal State holidays, and/or in excess of eight (8) hours each day without the written consent of the Engineer. Should permission be granted to work at such times, the Contractor shall pay for all inspection administrative costs thereof. No work shall be done at night unless authorized by the Engineer.

- O. PERMITS: The State will process permit applications whenever possible, and the Contractor shall procure the pre-processed permits and pay the required fees. If permit applications are not processed by the State, the Contractor shall process the permit applications, permits and licenses, and pay all charges and fees. In all cases, the Contractor shall give all notices necessary and incident to the due and lawful prosecution of the work.
- P. PROPERTY DAMAGE: It shall be the responsibility of the contractor to respect State property and to prevent damage to existing improvements. The Contractor will be responsible for damages resulting from construction operations. Immediately upon discovery, the Contractor shall repair such damage to the satisfaction of the Engineer.

All trees and shrubbery outside the excavation, embankment or construction limits shall be fully protected from injury.

- Q. TIME: The time of completion is specified in the Proposal. It is the Board's intention to insist the Contractor diligently prosecute the work to completion within the specified time.

Prospective bidders are reminded that the State has the option to proceed with or abandon a project depending on whether the project can be completed for occupancy in the specified time.

It is the bidder's responsibility to check the availability of all materials before bidding. The bidder shall select sub-contractors and suppliers who can warrant availability and delivery of all specified or qualified materials to assure project completion within the specified time.

The successful bidder must assume all risks for completing the project by the specified date. There shall be no extension of time for any reason except for delays caused by acts of God, labor disputes involving unions, or actions of the State. If for any reason the project falls behind schedule, the Contractor shall at its own cost, take necessary remedial measures to get the project back on schedule, i.e., working overtime, air freighting all materials, etc. In addition, if the Contractor fails to fully complete the project by the completion date, Contractor will be required to make the facility usable at its own cost.

- R. BIDDER'S RESPONSIBILITY TO PROVIDE PROPER SUPERINTENDENCE: The successful low bidder shall designate in writing to the Engineer the name of its authorized superintendent (Superintendent), who will be present at the job site whenever any work is in progress. The Superintendent shall be responsible for all work, receiving and implementing instructions from the Engineer in a timely manner. The cost for superintendence shall be considered incidental to the project.

If the Superintendent is not present at the site of work, the Engineer shall have the right to suspend the work as described under sub-section 5.5 c. and 7.20 - Suspension of Work of the General Conditions.

- S. LIQUIDATED DAMAGES: Liquidated damages in the amount specified in the Proposal will be assessed for each and every calendar day from and after the expiration of the time period stated in the Contract for the completion of the project.

- T. HIRING OF HAWAII RESIDENTS: The Contractor shall comply with Act 68, SLH 2010, in the performance and for the duration of this contract. The Contractor shall ensure that Hawaii residents compose not less than eighty percent of the workforce employed to perform the contract work on the project. The eighty percent requirement shall be determined by dividing the total number of hours worked on the contract by Hawaii residents, by the total number of hours worked on the contract by all employees of the Contractor in the performance of the contract. The hours worked by any Subcontractor of the Contractor shall count towards the calculation for this section. The hours worked by employees with shortage trades, as determined by the Department of Labor and Industrial Relations (DLIR), shall not be included in the calculation for this section.

The requirements shall apply to any subcontract of \$50,000 or more in connection with the Contractor, that is, such Subcontractors must also ensure that Hawaii residents compose not less than eighty percent of the Subcontractor's workforce used to perform the subcontract.

- U. WATER AND ELECTRICITY: The Contractor shall make all necessary arrangements and pay all expenses for water and electricity used in the construction of this project.
- V. PUBLIC CONVENIENCE AND SAFETY: The Contractor shall conduct construction operations with due regard to the convenience and safety of the public at all times. No materials or equipment shall be stored where it will interfere with the safe passage of public traffic. The Contractor shall provide, install, and maintain in satisfactory condition, all necessary signs, flares and other protective facilities and shall take all necessary precautions for the protection of the work and the convenience and safety of the public. The Engineer shall have the right to suspend the performance of the work in accordance with sub-section 7.20 - Suspension of Work of the General Conditions.
- W. WORK TO BE DONE WITHOUT DIRECT PAYMENT: Whenever the contract that the Contractor is to perform work or furnish materials of any kind for which no price is fixed in the contract, it shall be understood that the Contractor shall perform such work or furnish said materials without extra charge or allowance or direct payment of any sort. The cost of performing such work or furnishing said material is to be included by the Contractor in a unit price for the appropriate item unless it is expressly specified that such work or material is to be paid for as extra work.
- X. AS-BUILT DRAWINGS: As-built drawings, the intent of which is to record the actual in-place construction so that any future renovations or tie-ins can be anticipated accurately, shall be required. All authorizations given by the Engineer to deviate from the plans shall be drawn on the job site plans. All deviations from alignments, elevations and dimensions which are stipulated on the plans shall be recorded on the as-built drawings. Final as-built drawings shall be submitted to the Engineer for review and approval. After the Engineer approves the as-built drawings, the contractor shall submit an electronic copy in Adobe PDF format on CD ROM.
- Y. ASBESTOS CONTAINING MATERIALS: The use of asbestos containing materials or equipment is prohibited. The Contractor shall insure that all materials and equipment incorporated in the project are asbestos-free

- Z WORKER SAFETY: The Contractor shall provide, install and maintain in satisfactory condition all necessary protective facilities and shall take all necessary precautions for the protection and safety of its workers in accordance with the Occupational Safety and Health Standards for the State of Hawaii. The Engineer shall have the right to suspend the performance of the work in accordance with sub-section 7.20 - Suspension of Work of the General Conditions.
- AA. TOILET FACILITIES: All toilet facilities constructed at the project site shall be in accordance with the Public Health Regulations of the State Department of Health (DOH). All necessary precautions shall be observed at the project site. The use of sanitary facilities shall be strictly enforced and workers violating these provisions shall be promptly discharged.
- BB. SIGNS: Whenever the project involves closing or obstructing any public thoroughfare, the Contractor shall provide traffic signs conforming to the applicable provisions of the current edition of the "Manual on Uniform Traffic Control Devices for Streets and Highways", published by the Federal Highway Administration as directed by the Engineer for the purpose of diverting or warning traffic prior to the construction area. All traffic signs shall bear proper wording stating thereon the necessary information as to diverting or warning traffic.
- When indicated in the Proposal, the Contractor shall provide a project sign, size 4'-0" x 7'-0" to be placed as directed by the Engineer. The sign shall be constructed in accordance with Section 01581 - Project Sign of these specifications and approved by the Engineer. All wording, type and size of lettering and color selection shall be as specified in these specifications or as approved by the Engineer.
- All signs shall be kept neat and clean, and properly erected at all times.
- CC. FIELD OFFICE AREA FOR DEPARTMENT: When indicated in the Proposal, the Contractor shall provide a housed working area of at least 100 square feet adjacent to the Contractor's office for the Department's use. This area will be used by the Engineer to perform tests and to store equipment. As a minimum, the field office shall include the following: standard sized office desk and chair, lighting, ventilation, window-type air conditioning rated at 5,000 BTU, door and window with locking hardware, electrical outlets, and working communications facilities (a cellular telephone is acceptable). The Department will pay for all long distance toll charges made by the Engineer.
- DD. QUANTITIES: All bids will be compared on the basis of quantities of work to be done as shown in the Proposal; the quantities shown in the Unit Price items are estimated, being given as a basis for comparison of bids. The Board reserves the right to increase or decrease the quantities given under the items or delete items entirely as may be required during the progress of the work.
- EE. OTHER HEALTH MEASURES: Forms of work site exposure or conditions which may be detrimental to the health or welfare of workers or of the general public shall be eliminated or reduced to safe levels as required by the DOH codes, standards, and regulations. Suitable first aid kits and a person qualified to render first aid, as specified in the DOH regulations, shall be provided at all times when work is scheduled.

FF. HAWAII BUSINESS OR COMPLIANT NON-HAWAII BUSINESS REQUIREMENT:
Bidders (Contractors) shall be incorporated or organized under the laws of the State or be registered to do business in the State as a separate branch or division that is capable of fully performing under the contract, as stipulated in §3-122-112 HAR.

GG. COMPLIANCE WITH §3-122-112 HAR:

As a condition for award of the contract and as proof of compliance with the requirements of 103D-310(c) HRS, the apparent low bidder shall furnish the required documents to the Department. If the valid required certificates are not submitted on a timely basis for award of a contract, a bidder otherwise responsive and responsible may not receive the award. Bidder is responsible to apply for and submit the following documents to the Department.

- A. TAX CLEARANCE REQUIREMENTS (HRS Chapter 237): Bidder shall obtain a tax clearance certificate from the Hawaii State Department of Taxation (DOTAX) and the Internal Revenue Service (IRS). The certificate is valid for six months from the most recently approved stamp date on the certificate; the certificate must be valid on the date received by the Department.
- B. Department of Labor (DLIR) “**Certificate of Compliance**”. (HRS Chapter 383 - Unemployment Insurance, Chapter 386 - Workers’ Compensation, Chapter 392 - Temporary Disability Insurance, and 393 – Prepaid Health Care): Bidder shall obtain a certificate of compliance from the Hawaii State Department of Labor and Industrial relations (DLIR). The certificate is valid for six months from the date of issue; certificates must be valid on the date received by the Department.
- C. Department of Commerce and Consumer Affairs (DCCA), Business Registration Division (BREG) “**Certificate of Good Standing**”. Bidder shall obtain a certificate of good standing issued by the Department of Commerce and Consumer Affairs (DCCA), Business Registration Division (BREG). The certificate of good standing is valid for six months from the date of issue; certificates must be valid on the date received by the Department.

Alternately, instead of separately applying for these certificates at the various state agencies, bidder may choose to use the Hawaii Compliance Express (HCE), which allows businesses to register online through a simple wizard interface at <http://vendors.ehawaii.gov> to acquire a “Certificate of Vendor Compliance” indicating the bidder’s status is compliant with the requirements of §103D-310(c), HRS, and shall be accepted for contracting and final payment purposes. Bidders that elect to use the new HCE services will be required to pay an annual fee of \$12.00 to the Hawaii Information Consortium, LLC (HIC). Bidders choosing not to participate in the HCE program will be required to provide the paper certificates as instructed in the previous paragraphs.

PROPOSAL

FOR

DEPARTMENT OF LAND AND NATURAL RESOURCES
ENGINEERING DIVISION
State of Hawaii

JOB NO. H87C836C
KEKAHA KAI STATE PARK
KUA BAY IMPROVEMENTS
NORTH KONA, HAWAII

_____, 2016

Chief Engineer
Engineering Division
Department of Land and Natural Resources
State of Hawaii
Honolulu, Hawaii

Dear Sir:

The undersigned, having carefully examined the local conditions and all available records and information covering conditions which may affect the cost of the work to be performed, and having carefully examined the Plans and Specifications, and other contract documents, hereby proposes to furnish and pay for all materials, tools, equipment, labor and other incidental work necessary to construct repairs to the existing access road and install additional parking areas as indicated in the plans, as required or called for in this Proposal, all according to the true intent and meaning of the Notice to Bidders, Information and Instructions to Bidders, Proposal, Detailed Specifications, Interim General Conditions, Plans, and any and all addenda for:

JOB NO. H87C836C
KEKAHA KAI STATE PARK
KUA BAY IMPROVEMENTS
NORTH KONA, HAWAII

on file in the office of the Engineering Division for the TOTAL BASE BID (Items 1 to 47) of:

_____ Dollars (\$_____)

and will fully complete all work under this contract within 90 consecutive calendar days from the date of written notice to proceed, including date of said order, said total sum being itemized on the following pages.

Item No.	Quantity	Unit	Description	Unit Price	Total
<u>GENERAL</u>					
1.	38	CY	Earthwork (excavation/embankment) required for installation of proposed improvements.	\$ _____	\$ _____
2.	1	LS	Temporary Erosion Control Measures (silt fence, etc.), in place complete.		\$ _____
3.	1	LS	Orange Fencing for Archaeological Site Protection, in place complete.		\$ _____
4.	1	Each	Project Sign.	\$ _____	\$ _____
5.	1	Allow	Field Office.		\$ <u>5,000.00</u>
<u>OUTDOOR SHOWER</u>					
6.	6	CY	6" Thick Concrete Shower Pad, in place complete.	\$ _____	\$ _____
7.	5	CY	4" Thick Concrete Swale for Showers, in place complete.	\$ _____	\$ _____
8.	1	LS	Aluminum Shower Support Column (two 10"x5" aluminum square tubing, 1½" grabrail) , in place complete.		\$ _____
9.	30	LF	1¼" Copper, Type "K", in place complete.	\$ _____	\$ _____
10.	20	LF	1" Copper, Type "K", in place complete.	\$ _____	\$ _____
11.	40	LF	½" Copper, Type "K", in place complete.	\$ _____	\$ _____
12.	60	LF	½" Brass Pipe, in place complete.	\$ _____	\$ _____
13.	8	EA	½" Stop Cock, in place complete.	\$ _____	\$ _____
14.	2	EA	½" Hose Bibb, in place complete.	\$ _____	\$ _____
15.	10	EA	½" Shower Valve, in place complete.	\$ _____	\$ _____
16.	2	LS	Connect to Exist. PE		\$ _____
17.	30	LF	Trenching & Backfilling	\$ _____	\$ _____
18.	1	LS	Sterilization (Chlorination)		\$ _____
19.	1	LS	Pressure Testing (Water)		\$ _____
20.	1	LS	Cleanup		\$ _____

<u>STAIRS AND WALKWAY</u>						
21.	1	LS	Demolition and Removal of Obstructions (CRM ramp).			\$ _____
22.	4	CY	4" Thick Concrete Walkway, in place complete.	\$ _____		\$ _____
23.	4	CY	Concrete Stairs, in place complete.	\$ _____		\$ _____
24.	2	CY	CRM Retaining Wall (for stairway), in place complete.	\$ _____		\$ _____
25.	1	LS	1¼" Diameter Stainless Steel Handrails, in place complete.			\$ _____
<u>PICNIC TABLES</u>						
26.	2	Each	4" Thick Concrete Pad for Picnic Table, in place complete.	\$ _____		\$ _____
27.	2	Each	Wood Picnic Table, in place complete.	\$ _____		\$ _____
<u>SPEED HUMPS</u>						
28.	3	Each	Rubber Speed Hump, in place complete.	\$ _____		\$ _____
29.	6	Each	Traffic Sign with Post, in place complete.	\$ _____		\$ _____
30.	1	LS	Traffic Control (for speed hump installation).			\$ _____
<u>COMFORT STATION REPAIR WORK</u>						
31.	1	LS	Job Supervision.	\$ _____		\$ _____
32.	1	LS	Dumpster Rental.	\$ _____		\$ _____
33.	4	Each	Remove Grab Bars.	\$ _____		\$ _____
34.	2	Each	Remove CMU Wing Walls.	\$ _____		\$ _____
35.	107	SF	Remove Tile Wainscot.	\$ _____		\$ _____
36.	1	LS	Remove / Reinstall Miscellaneous Obstructions.			\$ _____
37.	8	LF	Concrete Bench, in place complete.	\$ _____		\$ _____
38.	1	LS	Patch/Repair Concrete.			\$ _____
39.	1	LS	Saw Cut CMU.			\$ _____
40.	1	LS	CMU Stem Wall, in place complete.			\$ _____
41.	1	LS	Patch/Repair CMU.			\$ _____
42.	2	Each	Security Gate, Frame, & HW, in place complete.	\$ _____		\$ _____
43.	1,234	SF	Clean Tile Floor & Waiscot.	\$ _____		\$ _____

44.	3,560	SF	Exterior Painting.	\$ _____	\$ _____
45.	1	EA	Accessible portable toilet that meets ADA standards for the duration of restroom closure for renovations. Toilet shall be serviced a min. of four times a week (Sun, Mon, Wed, Fri) and shall be maintained in accordance with the Public Health Regulations of the Dept. of Health.	\$ _____	\$ _____
46.	2	EA	Standard toilet that for the duration of restroom closure for renovations. Toilet shall be serviced a min. of four times a week (Sun, Mon, Wed, Fri) and shall be maintained in accordance with the Public Health Regulations of the Dept. of Health.	\$ _____	\$ _____
SUBTOTAL BASE BID (Items 1-46 Inclusive)					\$ _____
47.	1	LS	Mobilization and Demobilization (not to exceed 10% of the Subtotal Base Bid)	\$ _____	\$ _____
TOTAL BASE BID (Items 1-47 Inclusive)					\$ _____

HAWAII PRODUCTS PREFERENCE AND/OR USE OF HAWAII PRODUCTS

In accordance with Act 175, SLH 2009, the Hawaii products preference is applicable to this solicitation. Hawaii products may be available for items noted on the Offer Form. The Hawaii Products List is available on the SPO webpage at <http://hawaii.gov/spo>. Click on *Procurement of Goods, Services and Construction-Chapter 103D, HRS*; under *Procurement* click on *Preferences, Hawaii Products* and select *Hawaii Products List* to view.

Bidder offering a Hawaii product (“HP”) shall identify the HP in the table below. Any person desiring a Hawaii product preference shall have the product(s) certified and qualified, if not currently on the Hawaii Products List, prior to the deadline for receipt of offer(s) specified in the procurement notice and solicitation. The responsibility for certification and qualification shall rest upon the person requesting the preference.

Persons desiring to qualify their product(s) not currently on the Hawaii Product List, shall complete Form SPO-38, *Certification for Hawaii Product Preference*, and submit the completed form to the Procurement Officer providing any additional information required by the Procurement Officer. One form shall be completed and submitted for each product. Form SPO-38 is available on the SPO webpage at <http://hawaii.gov/spo>, under the *Quicklinks* menu click on *Forms for Vendors/Contractors/Services Providers*.

For the purpose of selecting the low bid when a solicitation contains both HP and non-HP, the price offered for a HP item shall be decreased by subtracting 10% for the class I or 15% for the class II HP item(s) offered. The lowest total offer, taking the preference into consideration, shall be awarded the contract, unless the offer provides for additional award criteria. The contract amount of any contract awarded, however, shall be the amount of the price offered, exclusive of the preferences.

In the event of any change that materially alters the bidder’s ability to supply the Hawaii product(s), the bidder shall immediately notify the procurement officer in writing and the parties shall enter into discussions for the purpose of revising the contract or terminating the contract for convenience.

Item No.	Pre-Approved Hawaii Product Description & Manufacturer	Class (I or II)	Quantity	Unit Measure	Unit Price	Total Price

RECYCLED PRODUCTS PREFERENCE

This project allows a 10% price preference for recycled products in accordance with HRS 103D-1005. Please indicate your selection of recycled or non-recycled product by indicating its cost FOB jobsite unloaded in the schedule below, including applicable General Excise & Use Taxes.

<u>DESCRIPTION</u>	<u>RECYCLED PRODUCT COST</u>	<u>NONRECYCLED PRODUCT COST</u>
_____	\$ _____	\$ _____
_____	\$ _____	\$ _____
_____	\$ _____	\$ _____
_____	\$ _____	\$ _____

The bidder requesting a recycled product preference shall also complete and submit the form “CERTIFICATION OF RECYCLED CONTENT” as shown in the Interim General Conditions and provide all supporting information with this proposal. Additional information may be requested to qualify a product.

The following definitions are applicable to the CERTIFICATION OF RECYCLED CONTENT form:

"Post-consumer recovered material" means any product used by a consumer, including a business that purchases the material, that has served its intended end use, and that has been separated or diverted from the solid waste stream for the purpose of use, reuse, or recycling.

"Product" includes materials, manufactures, supplies, merchandise, goods, wares, and foodstuffs.

"Recovered material" means waste material and by-products that have been separated, diverted, or removed from the solid waste stream after a manufacturing process for the purpose of use, reuse, or recycling. Recovered material does not include those materials and by-products that are generated and normally reused on-site or within original manufacturing processes (such as mill broke, in the case of paper products).

"Recycled content" means the percentage of a product composed of recovered material, or post-consumer recovered material, or both.

"Recycled product" means a product containing recovered material, or post-consumer recovered material, or both.

The bidder agrees that preference for recycled products shall be taken into consideration to determine the low bidder in accordance with said Section and the rules promulgated, however, the award of contract will be in the amount of the bid offered exclusive any preference.

CONTRIBUTIONS BY STATE AND COUNTY CONTRACTORS PROHIBITED

Contractors are hereby notified of the applicability of Section 11-355, HRS, which states that campaign contributions are prohibited from specified State or county government contractors during the term of the contract if the contractors are paid with funds appropriated by a legislative body.

CONDITION OF AWARD

It is understood that the award of the contract will be made on the basis of the lowest responsible Total Base Bid (Items 1 to 47) selected by the Board of Land and Natural Resources. Write the total of bid items 1 to 47 on page P-1.

It is understood and agreed that the Board of Land and Natural Resources reserves the right to reject any and/or all bids and waive any defects when, in the Board's opinion, such rejection or waiver will be for the best interest of the State of Hawaii.

In the event all bids exceed available funds certified by the appropriate fiscal officer, the head of the purchasing agency responsible for the procurement in question is authorized in situations where time or economic considerations preclude resolicitation of work of a reduced scope to negotiate an adjustment of the bid price, including changes in the bid requirements, with the low responsible and responsive bidder, in order to bring the bid within the amount of available funds. It is understood and agreed upon that the head of the purchasing agency may delete a portion or all of any item(s) in the proposal at the stated unit or lump sum price as necessary to stay within the available funding. The bidder is responsible to make an earnest effort to represent the actual cost of each item, including all materials, labor, equipment, overhead and profit in their bid proposal to preclude claims of anticipated profit or loss of profit because of an unbalanced bid proposal.

It is also understood that if a mutually agreeable cost for the reduced scope of work necessitated by a lack of available funds cannot be agreed upon between the bidder and the head of the purchasing agency within 14 calendar days after the bid opening, then the bid may be rejected in the best interest of the purchasing agency, and the head of the purchasing agency may negotiate in progressive order (lowest to highest) with the next lowest responsible and responsive bidder.

It is also understood and agreed that the award of the contract shall be conditioned upon funds being made available for this project and further upon the right of the Board of Land and Natural Resources to hold all bids received for a period of sixty (60) days from the date of the opening thereof, unless otherwise required by law, during which time no bid may be withdrawn.

It is also understood that Notice to Proceed may be delayed up to one (1) year after the bid opening date, and that no additional compensation will be provided for any claim for escalation or delay for issuance of Notice to Proceed on or before that date.

It is also understood and agreed that the quantities given herewith are approximate only and are subject to increase or decrease, and that the undersigned will perform all quantities of work as either increased or decreased, in accordance with the provisions of the Contract Specifications.

It is also understood and agreed that the estimated quantities shown for the items for which a UNIT PRICE is asked in this Proposal are only for the purpose of comparing on a uniform basis, bids offered for the work under this contract, and the undersigned agrees that he is satisfied with and will at no time, dispute said estimated quantities as a means of claims for anticipated profit or loss of profit, because of a difference between the quantities of the various classes of work done or the materials and equipment installed, and the said estimated quantities. On UNIT PRICE bids, payment will be made only for the actual number of units incorporated into the finished project at the contract UNIT PRICE.

After the proposals are opened and read, the figures will be extended and/or totaled in accordance with the bid prices of the acceptable proposals and the totals will be compared. In the comparison of bids, words written in the proposal shall govern over figures and unit prices will govern over totals. Until

the award of the contract, however, the right will be reserved to reject any and all proposals and to waive any defects or technicalities as may be deemed best for the interest of the State.

It is also understood and agreed that liquidated damages in the amount of One Hundred Fifty and 00/100 Dollars (\$150.00) for each and every calendar day in excess thereof prior to completion of the contract shall be withheld from payments due to the Contractor.

It is also understood and agreed that if this bid is accepted, the successful bidder must enter into and execute a contract with the Board of Land and Natural Resources and furnish a Performance and Payment Bond, as required by law. These bonds shall conform to provisions of Section 103D-324 and 325, Hawaii Revised Statutes and any law applicable hereto.

It is also understood and agreed that the successful bidder will provide all necessary labor, materials, tools, equipment, and other incidentals necessary to do all the work and furnish all the materials specified in the contract in the manner and time herein prescribed, and according to the requirements of the Engineer as therein set forth.

It is understood that by submitting this proposal, 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 two years.

It is understood that by submitting this proposal in accordance with HAR 3-122-192, the undersigned is declaring that the price submitted is independently arrived without collusion.

It is also understood that by submitting this proposal, a Certification for Safety and Health Programs for bids in excess of \$100,000 (in accordance with HRS 396-18), the undersigned certifies that his organization will have a written safety and health plan for this project that will be available and implemented by the Notice to Proceed date of this project. Details of the requirements of this plan may be obtained from the Department of Labor and Industrial Relations, Occupational, Safety and Health Division (HIOSH).

It is further understood and agreed that the successful bidder shall comply with paragraph 3.1.a "SUBCONTRACTING" of the General Provisions which requires that the contractor shall perform with his own organization and with the assistance of workmen under his immediate superintendence, work of a value not less than twenty percent (20%) of the value of all work embraced in the Contract, except that certain contract items of work, if specifically referred to in the special provisions, will be exempted from said twenty percent requirement.

Compliance with §103-310 HRS. As a condition of award all bidders shall comply with all laws governing entities doing business in the State, including Chapter 237 HRS (general excise tax); Chapter 383 HRS (employment security – unemployment insurance); Chapter 386 HRS (workers compensation); Chapter 392 HRS (temporary disability insurance); and Chapter 393 HRS (pre-paid health care), and shall produce all documents to the State (DLNR, Engineering Division) required to demonstrate compliance with these subsections. Any bidder making a false affirmation or certification under this subsection shall be suspended and may be debarred from further offerings or awards pursuant to §103D-702 HRS.

RECEIPT OF ADDENDA

The bidder also acknowledges receipt of any and all addenda issued by the Engineering Division, by recording the date of receipt of the respective addenda in the space provided below:

<u>Addendum</u>	<u>Date Received</u>	<u>Addendum</u>	<u>Date Received</u>
No. 1	_____	No. 5	_____
No. 2	_____	No. 6	_____
No. 3	_____	No. 7	_____
No. 4	_____	No. 8	_____

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

It is also understood and agreed that if this Proposal is accepted and the undersigned should fail or neglect to contract as aforesaid, the Board may determine that the bidder has abandoned the Contract, and thereupon, forfeiture of the security accompanying his proposal shall operate and the same shall become the property of the Board.

JOINT CONTRACTORS OR SUBCONTRACTORS
TO BE ENGAGED ON THIS PROJECT

The Bidder agrees that the following is a complete listing of all joint contractors or subcontractors covered under Chapter 444, Hawaii Revised Statutes (HRS), who will be engaged by the Bidder on this project to perform the required work indicated pursuant to Section 103D-302, HRS. It is the sole responsibility of the contractor to review the requirements of this Project and determine the appropriate licenses that are required to complete the Project. The Bidder certifies that the completed listing of joint contractors or subcontractors fulfills the requirements for the project and the Bidder, together with the listed subcontractors or joint contractors have all the specialty contractor's licenses to complete the work, except as provided for in HRS §103D-302(b). Failure of the Bidder to comply with this requirement may be just cause for rejection of the bid.

“A” General Engineering Contractors and “B” General Building Contractors are reminded that due to the Hawaii Supreme Court’s January 28, 2002 decision in Okada Trucking Co., Ltd. v. Board of Water Supply, et al., 97 Haw. 450 (2002), they are prohibited from undertaking any work, solely or as part of a larger project, which would require the general contractor to act as a specialty contractor in any area in which the general contractor has no license. Although the “A” and “B” contractor may still bid on and act as the “prime” contractor on an “A” or “B” project (See, HRS §444-7 for the definitions of an “A” and “B” project.), respectively, the “A” and “B” contractor may only perform work in the areas in which they have the appropriate contractor’s license (*An “A” or “B” contractor obtains “C” specialty contractor’s licenses either on its own, or automatically under HAR § 16-77-32*). The remaining work must be performed by appropriately licensed entities.

General Engineering “A” Contractors automatically have these “C” specialty contractor’s licenses: C-3, C-9, C-10, C-17, C-24, C-31a, C-32, C-35, C-37a, C-37b, C-38, C-43, C-49, C-56, C-57a, C-57b and C-61.

General Building “B” Contractors automatically have these “C” specialty contractor’s licenses: C-5, C-6, C-10, C-12, C-24, C-25, C-31a, C-32a, C-42a and C-42b.

In completing the Joint Contractors or Subcontractors List, describe the specialty contractor’s nature and scope of work to be performed for this project and provide the complete firm name of the joint contractor or subcontractor in the respective columns. If the Bidder is a general contractor and providing the work of the required specialty contractor, fill in the Bidder’s (general contractor’s) name and nature and scope of work to be performed on this project.

List only one joint contractor or subcontractor per required specialty contractor’s classification, unless within the same specialty, the work of each joint contractor or subcontractor can be described so that there is no overlap in work descriptions.

If a contractor’s license is required by law for the performance of the work which is called for in this bid, the bidder and all subcontractors must have the required license before the submission of the bidder’s proposal in the case of a non-federal aid project, and for federal-aid projects, the bidder must have the required license prior to the award of the project and all subcontractors prior to the start of the subcontracted work.

COMPLETE FIRM NAME OF JOINT CONTRACTOR OR SUBCONTRACTOR	NATURE AND SCOPE OF WORK TO BE PERFORMED

Enclosed herewith is a:

- 1. Surety Bond (*1))
- 2. Legal Tender (*2))
- 3. Cashier's Check (*3))
- 4. Certificate of Deposit (*3)) in the
- 5. Certified Check (*3)) amount
- 6. Official Check (*3)) of
- 7. Share Certificate (*3))
- 8. Teller's Check (*3))
- 9. Treasurer's Check (*3))

(Cross Out Those Not Applicable)

Dollars (\$ _____)

as required by law.

Respectfully submitted,

Name of Company, Joint Venture
or Partnership

Contractor's License No.

By _____
Signature (*4)

Title _____

Print Name _____

Date _____

Address _____

Telephone No. _____

E-Mail Address _____

NOTES:

1. Surety bond underwritten by a company licensed to issue bonds in this State;
2. Legal tender; or
3. A certificate of deposit; share certificate; or cashier's, treasurer's, teller's, or official check drawn by, or a certified check accepted by, and payable on demand to the State by a bank, a savings institution, or credit union insured by the Federal Deposit Insurance Corporation or the National Credit Union Administration.
 - A. These instruments may be utilized only to a maximum of \$100,000.
 - B. If the required security or bond amount totals over \$100,000, more than one instrument not exceeding \$100,000 each and issued by different financial institutions shall be accepted.
4. 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.
5. Fill in all blank spaces with information asked for or bid may be invalidated. PROPOSAL MUST BE INTACT, MISSING PAGES MAY INVALIDATE YOUR BID.

End of Proposal

SPECIAL PROVISIONS

Amend INTERIM GENERAL CONDITIONS, dated October 1994, as follows:

Section 2 – Proposal Requirements and Conditions

1. **AMEND** Section 2.1 Qualification of Bidder with the following:

Written Notice of Intent to Bid or Offer: A written Notice of Intent to Bid is not required for the Solicitation.

Standard Qualification Questionnaire: Bidders may be required to complete a standard qualifications questionnaire. When requested, the information shall be furnished within two working days or longer at the discretion of the Engineer. Failure to furnish the requested information within the time allowed may be grounds for a determination of non-responsibility, in accordance with HRS Section 103D-310 and HAR Section 3-122-108.

Hawaii Business or Compliant Non-Hawaii Business Requirement: Bidders shall be incorporated or organized under the laws of the State or be registered to do business in the State as a separate branch or division that is capable of fully performing under the contract, as stipulated in §3-122-112 HAR. A certified letter is not required prior to bid opening.

Compliance with §3-122-112 HAR: As a condition for award of the contract and as proof of compliance with the requirements of 103D-310(c) HRS, the apparent low bidder shall furnish the required documents to the Department. If the valid required certificates are not submitted on a timely basis for award of a contract, a bidder otherwise responsive and responsible may not receive the award. Bidder is responsible to apply for and submit the following documents to the Department.

- A. Tax Clearance (HRS Chapter 237): Bidder shall obtain a tax clearance certificate from the Hawaii State Department of Taxation (DOTAX) and the Internal Revenue Service (IRS). The certificate is valid for six months from the most recently approved stamp date on the certificate; the certificate must be valid on the date received by the Department.
- B. Department of Labor (DLIR) “Certificate of Compliance”. (HRS Chapter 383 - Unemployment Insurance, Chapter 386 - Workers’ Compensation, Chapter 392 - Temporary Disability Insurance, and 393 – Prepaid Health Care): Bidder shall obtain a certificate of compliance from the Hawaii State Department of Labor and Industrial relations (DLIR). The certificate is valid for six months from the date of issue; certificates must be valid on the date received by the Department.
- C. Department of Commerce and Consumer Affairs (DCCA), Business Registration Division (BREG) “Certificate of Good Standing”. Bidder shall obtain a certificate of good standing issued by the Department of Commerce and Consumer Affairs (DCCA), Business Registration Division (BREG). The certificate of good standing is valid for six months from the date of issue; certificates must be valid on the date received by the Department.

Hawaii Compliance Express. Alternately, instead of separately applying for these certificates at the various state agencies, bidder may choose to use the Hawaii Compliance Express (HCE), which allows businesses to register online through a simple wizard interface at <http://vendors.ehawaii.gov> to acquire a “Certificate of Vendor compliance” indicating that bidder’s status is compliant with requirements of §103D-310(c), HRS, shall be accepted for contracting and final payment purposes.

Bidders that elect to use the new HCE services will be required to pay an annual fee of \$15.00 to the

Hawaii Information Consortium, LLC (HIC). Bidders choosing not to participate in the HCE program will be required to provide the paper certificates as instructed in the previous paragraphs.

2. **ADD** Section 2.4a, Pre-Bid Conferences

Required Pre-bid Conferences: For construction and design-build projects with an estimated value of \$500,000 or more and solicited under the competitive sealed bid method (103D-302 HRS); and for construction and design-build projects with an estimated value of \$100,000 or more and solicited under the competitive sealed proposal method (103D-303 HRS); a pre-bid conference is required.

Other Pre-Bid Conferences: The Department may require a pre-bid conference for construction or design-build projects that are below the dollar threshold listed in above or when projects have special or unusual requirements.

Other Conditions: The Department may require the prospective Bidders to make a physical inspection of the project site and make attendance at the pre-bid conference a condition for submitting an offer.

Nothing stated at the pre-bid conference shall change the solicitation unless a change is made by written addendum.

3. **DELETE** Section 2.5, Addenda and Interpretations, in its entirety and replace with the following:

“Discrepancies, omissions, or doubts as to the meaning of drawings and specifications should be communicated using the question and answer section on the HIEPRO solicitation for interpretation and must be received in the time frame set in the HIEPRO solicitation. Any interpretation, if made and any supplemental instructions will be in the form of written addenda to the plans and specifications and made available prior to the offer due date. It shall be the prospective bidder’s sole responsibility to verify and obtain any said addenda. Failure of any bidder to receive any such addendum or interpretation shall not relieve such bidder from any obligation under his bid as submitted. All addenda so issued shall become part of the contract documents.”

Section 3 – Award and Execution of Contract

1. **AMEND** Section 3.3, Award of Contract, by deleting “sixty (60)” and replacing with “ninety (90)” in the first paragraph.

2. **AMEND** Section 3.3, Award of Contract, by adding the following after the first paragraph:

“If the contract is not awarded within the ninety (90) days, the Department may request the successful Bidder to extend the time for the acceptance of its bid. The Bidder may reject such a request without penalty; and in such case, the Department may at its sole discretion make a similar offer to the next lowest responsive and responsible bidder and so on until a bid is duly accepted or until the Department elects to stop making such requests.”

3. **AMEND** Section 3.9, Notice to Proceed, by deleting “180 days” and replacing with “one (1) year” in the last paragraph.

4. **ADD** Section 3.10, Protests:

“3.10 PROTESTS—Pursuant to Section 103D-701, Hawaii Revised Statutes, an actual or prospective offeror who is aggrieved in connection with the solicitation or award may submit a protest. Any protest

shall be submitting in writing to the Chairperson, Department of Land and Natural Resources, 1151 Punchbowl Street, Honolulu, Hawaii 96813, or designee as specified in the solicitation.

A protest shall be submitted in writing within five (5) working days after the aggrieved person knows or should have known the facts giving rise thereto; provided that a protest based upon the content of the solicitation shall be submitted in writing prior to the date set for receipt of offers. Further provided that a protest of an award or proposed award shall be submitted within five (5) working days after the posting of the award of the contract.

The notice of award, if any, resulting from this solicitation shall be posted on the Procurement System on the SPO website: <http://hawaii.gov/spo2/>.

Section 5 – Control of Work

AMEND Section 5.8 Value Engineering Incentive by deleting “\$100,000” and replacing with “\$250,000” in the first paragraph.

Section 6 – Substitution of Materials and Equipment

ADD the following to Section 6.3 Sub-paragraph b:

4. If the substitution meets all the requirements of the specifications and plans.

Section 7 – Prosecution and Progress

1. **DELETE** Section 7.2d in its entirety and replace with the following:

“d. Insurance Requirements

1. Obligation of Contractor

The Contractor shall not commence any work until it obtains, at its own expense, all required insurance. Such insurance must have the approval of the Department as to limit, form and amount and must be maintained with a company authorized by law to issue such insurance in the State of Hawaii.

All insurance described herein will be maintained by the Contractor for the full period of the contract and in no event will be terminated or otherwise allowed to lapse prior to written certification of final acceptance of the work by the Department.

Certificate(s) of Insurance acceptable to the Department shall be filed with the Engineer prior to commencement of the work. These certificates shall contain a provision that coverages afforded under the policies will not be canceled or changed until at least thirty days written notice has been given to the Engineer by registered mail. The insurance policies shall name the State of Hawaii, its officers and employees as an additional insured and such coverage shall be noted on the Certificate. Should any policy be canceled before final acceptance of the work by the Department, and the Contractor fails to immediately procure replacement insurance as specified, the Department, in addition to all other remedies it may have for such breach, reserves the right to procure such insurance and deduct the cost thereof from any money due to the Contractor.

Nothing contained in these insurance requirements is to be construed as limiting the extent of Contractor's responsibility for payment of damages resulting from its operations under this contract, including the Contractor's obligation to pay liquidated damages, nor shall it affect the Contractor's separate and independent duty to defend, indemnify and hold the Department harmless pursuant to other provisions of this contract. In no instance will the Department's exercise of an option to occupy and use completed portions of the work relieve the Contractor of its obligation to maintain the required insurance until the date of final acceptance of the work.

All insurance described herein shall cover the insured for all work to be performed under the contract, all work performed incidental thereto or directly or indirectly connected therewith, including traffic detour work or other work performed outside the work area, and all change order work.

The Contractor shall, from time to time, furnish the Engineer, when requested, satisfactory proof of coverage of each type of insurance required or a copy of the actual policies covering the work. Failure to comply with the Engineer's request may result in suspension of the work, and shall be sufficient grounds to withhold future payments due the Contractor and to terminate the contract for Contractor's default.

2. Types of Insurance

The Contractor shall purchase and maintain insurance described below which shall provide coverage against claims arising out of the Contractor's operations under the contract, whether such operations be by the Contractor itself or by the subcontractor or by anyone directly or indirectly employed by any of them or by anyone for whose acts any of them may be liable.

- (a) Worker's Compensation. The Contractor and all subcontractors shall obtain full worker's compensation insurance coverage for all persons whom they employ or may employ in carrying out the work under this contract. This insurance shall be in strict conformity with the requirements of the most current and applicable State of Hawaii Worker's Compensation Insurance laws in effect on the date of the execution of this contract and as modified during the duration of the contract.
- (b) Commercial General Liability Insurance and Automobile Insurance. Contractor's commercial general liability insurance and automobile liability insurance shall both be obtained in a combined, single limit of not less than \$1,000,000 per occurrence that shall include coverage for bodily injury, sickness, disease or death of any person, arising directly or indirectly out of, or in connection with, the performance of work under this contract.

The Contractor's property damage liability insurance shall provide for a single combined limit of not less than \$1,000,000 for all damages arising out of injury to or destruction of property of others including the Department's, arising directly or indirectly out of or in connection with the performance of the work under this contract including explosion or collapse.

The Contractor shall either:

- i. Require each of its subcontractors to procure and to maintain during the life of its subcontract, subcontractors' comprehensive general liability, automobile liability

and property damage liability insurance of the type and in the same amounts specified herein; or

- ii. Insure the activities of its subcontractors in its own policy.

The Contractor will be permitted, in cooperation with insurers, to maintain a self insured retention for up to 25% of the per occurrence combined single limits of the commercial general liability and the automobile liability policies. The existence of the self insured retention must be noted on the certificate of insurance coverage submitted to the Department or else it will be understood that the insurer is providing first dollar coverage for all claims. For all claims within the self-insured retention amount, the rights, duties and obligations between the Contractor and the Department shall be identical to that between a liability insurer and the Department, as an additional insured, as if there was no self-insured retention.

- (c) **Builder's Risk Insurance.** Unless included in the Specifications of this project, the Contractor shall not be required to provide builder's risk insurance. If required as noted in the Specifications, builder's risk insurance shall be provided during the progress of work and until final acceptance by the Department upon completion of the contract. It shall be "All Risk" (including but not limited to earthquake, windstorm and flood damage) completed value insurance coverage on all completed work and work in progress to the full replacement value thereof. Such insurance shall include the Department as additional name insured. The Contractor shall submit to the Engineer for its approval all items deemed to be uninsurable. The policy may provide for a deductible in an amount of up to 25% of the amount insured by the policy. With respect to all losses up to any deductible amount, the relationship between the Contractor and the Department shall be that of insurer and additional insured as if no deductible existed".

2. DELETE Section 7.16 in its entirety and replace with the following:

"RESPONSIBILITY FOR DAMAGE CLAIMS; INDEMNITY – The Contractor shall indemnify the State and the Department against all loss of or damage to the State's or the Department's existing property and facilities arising out of any act or omission committed in the performance of the work by the Contractor, any subcontractor or their employees and agents. Contractor shall defend, hold harmless and indemnify the Department and the State, their employees, officers and agents against all losses, claims, suits, liability and expense, including but not limited to attorneys' fees, arising out of injury to or death of persons (including employees of the State and the Department, the Contractor or any subcontractor) or damage to property resulting from or in connection with performance of the work and not caused solely by the negligence of the State or the Department, their agents, officers and employees. The State or the Department may participate in the defense of any claim or suit without relieving the Contractor of any obligation hereunder. The purchase of liability insurance shall not relieve the Contractor of the obligations described herein.

The Contractor agrees that it will not attempt to hold the State and its Departments and Agencies and their officers, representatives, employees or agents, liable or responsible for any losses or damages to third parties from the action of the elements, the nature of the work to be done under these specifications or from any unforeseen obstructions, acts of God, vandalism, fires or encumbrances which may be encountered in the prosecution of the work.

The Contractor shall pay all just claims for materials, supplies, tools, labor and other just claims against the Contractor or any subcontractor in connection with this contract and the surety bond will not be

released by final acceptance and payment by the Department unless all such claims are paid or released. The Department may, but is not obligated to, withhold or retain as much of the monies due or to become due the Contractor under this contract considered necessary by the Engineer to cover such just claims until satisfactory proof of payment or the establishment of a payment plan is presented.

The Contractor shall defend, indemnify and hold harmless the State and its Departments and Agencies and their officers, representatives, employees or agents from all suits, actions or claims of any character brought on account of any claims or amounts arising or recovered under the Worker's Compensation Laws or any other law, by-law, ordinance, order or decree.

Section 8 – Measurement and Payment

1. **DELETE** Section 8.7a in its entirety and replace with the following:

- a. Tax Clearances from the State of Hawaii Department of Taxation and Internal Revenue Service, subject to section 103D-328, HRS, current within two months of issuance date indicating that all delinquent taxes levied or accrued under State Statutes against the contractor have been paid.

2. **ADD** Section 8.7d, Certificate of Compliance:

- d. A Certification from the Contractor affirming that the Contractor has, as applicable, remained in compliance with all laws as required by Section 103D-310, HRS, and Section 3-122-112, HAR. A contractor making a false affirmation shall be suspended and may be debarred pursuant to section 103D-702, HRS.
 - 1. Certification of Compliance for Final Payment, State Procurement Office Form-22. Must be Signed Original.

3. **ADD** Section 8.7e, Hawaii Compliance Express:

- e. In lieu of submitting the tax clearances from Taxation and IRS, and SPO Form -22, the Contractor may choose to use the Hawaii Compliance Express as described on page SP-1 of this Special Provisions.

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SECTION 01019

GENERAL SPECIFICATIONS

PART 1 - GENERAL

1.1 GENERAL REQUIREMENTS

Work shall consist of furnishing all labor, tools, materials and equipment necessary and required to construct in place complete all work as indicated on the drawings and as specified herein.

1.2 GENERAL

- A. Examination of Premises: The Contractor shall contact the Engineer and obtain permission before visiting the site.
- B. All lines and grades shall be established by a licensed surveyor , or licensed Civil Engineer, registered in the State of Hawaii. The Contractor shall submit evidence of current and valid registration.
- C. Notices: The Contractor shall notify the Engineer and give at least three (3) working days notice before starting any work.
- D. Disruption of Utility Services: All work related to the temporary disconnection of electrical system shall be pre-arranged with the Engineer so that any disruption of such services will be kept to a minimum. In the event temporary power hook-up is required, the Contractor shall provide the necessary services.
- E. Contractor's Operations
 - 1. The Contractor must employ, insofar as possible, such methods and means of carrying out the work so as not to cause any interruption or interference to the facility's operations. Where the Contractor's operations would result in interruptions which would hamper the operations of the facilities, the Contractor shall rearrange the schedule of work accordingly.
 - 2. The Contractor shall maintain safe passageway to and from the facility for the user agency personnel and the public at all times.
- F. Lead Paint
 - 1. When the project includes paint to be disturbed that was applied prior to 1980, it shall be assumed to contain lead. The Contractor shall inform its employees, subcontractors, and all other persons engaged in the project that lead containing paints are present in the existing buildings at the job site and to follow the

requirements of the Department of Labor and Industrial Relations, Division of Occupational Safety and Health, Title 12, Subtitle 8, Chapter 148, Lead Exposure in Construction, Hawaii Administrative Rules (Chapter 12-148, HAR).

G. Parking Policy for Contractor

1. The Contractor and its employees will not be allowed to park in zones assigned to facility personnel.
2. Areas to be used by the Contractor shall be as designated by the Engineer. Any lawn damaged by the Contractor shall be restored as instructed by the Engineer at no cost to the State.

H. Toilet Accommodations: The Contractor may use the existing toilet facilities if so designated by the Engineer; however, it is the Contractor's responsibility to keep same clean and in a sanitary condition at all times.

I. Protection of Property: The Contractor shall continually maintain adequate protection of all its work from damage and shall protect all property, including but not limited to buildings, equipment, furniture, grounds, vegetation, material, utility systems located at and adjoining the job site. The Contractor shall repair, replace or pay the expense of repair of damages resulting from its operations.

J. Use of Power Driven Equipment: The Contractor is cautioned to take all necessary safety precautions to protect the facility personnel, and the public whenever power driven equipment is used.

K. Safety: The Contractor shall carefully read and strictly comply with the requirements of the Hawaii Occupational Safety and Health Law, Chapter 396, Hawaii Revised Statutes, as amended, is applicable and made a part of the Contract.

L. Clean Up Premises: The Contractor shall clean up and remove from premises all debris accumulated from operations as necessary or as directed. See also Section 7.25 of the General Conditions.

M. Responsibility

1. The State will hold the Contractor liable for all the acts of Subcontractors and shall deal only with the prime Contractor in matters pertaining to other trades employed on the job. The Contractor shall be responsible for coordinating the work of all trades on the job.
2. Should the Contractor discover any discrepancy in the plans or specifications, the Contractor shall immediately notify the Engineer before proceeding any further with the work, otherwise, the Contractor will be held responsible for any cost involved in correction of work placed due to such discrepancy.

N. Cooperation With Other Contractors: The State reserves the right at any time to contract for or otherwise perform other or additional work within the contract zone limits of this Contract. The Contractor of this project shall, to the extent ordered by the State, conduct its work so as not to interfere with or hinder the progress or completion of the work performed by other contractors.

O. Division of the 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.

P. Drawings and Specifications

1. The Contractor shall not make alterations in the drawings and specifications. In the event the contractor discovers any errors or discrepancies, the Contractor shall immediately notify the Engineer in accordance with the General Conditions.
2. Where devices, or items, or parts thereof are referred to in the singular, it is intended that such reference shall apply to as many such devices, items or parts as are required to properly complete the work.
3. Specifications and drawings are prepared in abbreviated form and include incomplete sentences. Omission of words or phrases such as "the Contractor shall", "as shown on the drawings", "a", "an", and "the" are intentional. Omitted words and phrases shall be provided by inference to form complete sentences.

Q. Required Submittals

1. Required submittals as specified in the Technical Sections of these specifications include one or more of the following: Shop drawings; color samples; material samples; technical data; schedules of materials; schedules of operations; guarantees; operating and maintenance manuals; and as-built drawings.
2. The Contractor shall make a comprehensive list of the required submittals, by Specification Section, and submit this list to the Engineer within 15 days after notice to proceed.
3. As-Built Drawings: When as-built drawings are required for submittal, the following shall apply:
 - a. As-built drawings, the intent of which is to record the actual in-place construction so that any future renovations or tie-ins can be anticipated accurately, shall be required.
 - b. All deviations from alignments, elevations and dimensions which are

stipulated on the plans shall be recorded in red on the as-built drawings.

- c. The following procedure shall be followed:
- 1) Immediately after these changes are constructed in place, the Contractor shall record them on the field office plans.
 - 2) Within two weeks after final inspection of the project, the Contractor shall transfer the changes marked on the field office plans onto a clean copy of plans using a red pencil. Any deletions shall be so noted and redrawn as necessary. The Contractor shall stamp or mark the tracings "AS-BUILT", and also sign and date each drawing so marked.
 - 3) The Contractor shall submit the as-built drawings to the Engineer for review and approval. After the Engineer approves the as-built drawings, the Contractor shall submit an electronic copy in Adobe PDF format on CD ROM.
 - 4) Any as-built drawing which the Engineer determines does not accurately record the deviation shall be corrected by the State, and the Contractor shall be charged for the services.

END OF SECTION

SECTION 01090

STANDARD REFERENCES

PART 1 - GENERAL

Wherever used in the project, the following abbreviations will have the meanings listed:

<u>Abbreviation</u>	<u>Company</u>
AA	Aluminum Association Incorporated 818 Connecticut Avenue, N.W. Washington, D.C. 20006
AASHTO	American Association of State Highway and Transportation Officials 444 North Capitol Street, N.W., Suite 225 Washington, D.C. 20001
ACI	American Concrete Institute P.O. Box 19150 Detroit, MI
AEIC	Association of Edison Illuminating Companies 51 East 42nd Street New York, NY 10017
AFBMA	Anti-Friction Bearing Manufacturer's Association 60 East 42nd Street New York, NY 10017
AGA	American Gas Association 8501 East Pleasant Valley Road Cleveland, OH 44131
AGMA	American Gear Manufacturer's Association 1330 Massachusetts Avenue, N.W. Washington, D.C.
AISC	American Institute of Steel Construction 101 Park Avenue New York, NY 10017
AISI	American Iron and Steel Institute 1000 16th Street, N.W. Washington, D.C. 20036

<u>Abbreviation</u>	<u>Company</u>
AITC	American Institute of Timber Construction 333 West Hampden Avenue Englewood, CO 80110
AMCA	Air Moving and Conditioning Association, Inc. 30 West University Drive Arlington Heights, IL 60004
ANSI	American National Standards Institute, Inc. 1430 Broadway New York, NY 10018
APA	American Plywood Association 1119 A Street Tacoma, WA 98401
API	American Petroleum Institute 1801 K Street N.W. Washington, DC 20006
ARI	Air-Conditioning and Refrigeration Institute 1814 North Fort Myer Drive Arlington, VA 22209
ASCE	American Society of Civil Engineers 345 East 47th Street New York, NY 10017
ASCII	American Standard Code for Information Interchange United States of America Standards Institute 1430 Broadway New York, NY 10018
ASE Code	American Standard Safety Code for Elevators, Dumbwaiter and Escalators American National Standards Institute 1430 Broadway New York, NY 10018
ASHRAE	American Society of Heating, Refrigeration and Air Conditioning Engineers United Engineering Center 345 East 47th Street New York, NY 10017

<u>Abbreviation</u>	<u>Company</u>
ASME	American Society of Mechanical Engineers 345 East 47th Street New York, NY 10017
ASTM	American Society for Testing and Materials 1916 Race Street Philadelphia, PA 19103
AWPA	American Wood Preservers Association 1625 Eye Street Washington, DC 20006
AWS	American Welding Society 2501 N.W. 7th Street Miami, FL 33125
AWWA	American Water Works Association 6666 West Quincy Avenue Denver, CO 80235
CBM	Certified Ballast Manufacturers 2120 Keith Building Cleveland, OH 44115
CMAA	Crane Manufacturers Association of America, Inc. (Formerly called: Overhead Electrical Crane Institute - OEI) 1326 Freeport Road Pittsburgh, PA 15238
CRSI	Concrete Reinforcing Steel Institute 180 North La Salle Street Chicago, IL 60601
CSA	Canadian Standards Association 178 Rexdale Boulevard Rexdale, Ontario, M9W IR3, Canada
DEMA	Diesel Engine Manufacturer's Association 122 East 42nd Street New York, NY 10017

<u>Abbreviation</u>	<u>Company</u>
DIS	Division of Industrial Safety California Department of Industrial Relations 2422 Arden Way Sacramento, CA 95825
EI	Edison Electric Institute 90 Park Avenue New York, NY 10016
EIA	Electronic Industries Association 2001 Eye Street N.W. Washington, DC 20006
EJMA	Expansion Joint Manufacturer's Association 331 Madison Avenue New York, NY 10017
ESO	Electrical Safety Orders, California Administrative Code, Title 8, Chap. 4, Subarticle 5 Office of Procurement, Publications Section P.O. Box 20191 8141 Elder Creek Road Sacramento, CA 95820
FEDSPEC	Federal Specifications General Services Administration Specification and Consumer Information Distribution Branch Washington Navy Yard, Bldg. 197 Washington, DC 20407
FEDSTDS	Federal Standards (see FEDSPECS)
FM	Factory Mutual Research 1151 Boston-Providence Turnpike Norwood, MA 02062
HEI	Heat Exchange Institute 122 East 42nd Street New York, NY 10017

<u>Abbreviation</u>	<u>Company</u>
HI	Hydraulic Institute 1230 Keith Building Cleveland, OH 44115
IAPMO	International Association of Plumbing and Mechanical Officials 5032 Alhambra Avenue Los Angeles, CA 90032
ICBO	International Conference of Building Officials 5360 South Workman Mill Road Whittier, CA 90601
ICEA	Insulated Cable Engineers Association P.O. Box P South Yarmouth, MA 02664
IEEE	Institute of Electrical and Electronics Engineers, Inc. 345 East 47th Street New York, NY 10017
IES	Illuminating Engineering Society C/O United Engineering Center 345 East 47th Street New York, NY 10017
ISA	Instrument Society of America 400 Stanwix Street Pittsburgh, PA 15222
JIC	Joint Industrial Council 7901 Westpark Drive McLean, VA 22101
MILSPEC	Military Specifications Naval Publications and Forms Center 5801 Tabor Avenue Philadelphia, PA 19120
MSS	Manufacturers Standardization Society of the Valve and Fittings Industry, Inc. 127 Park Street, N.E. Vienna, VA 22180

<u>Abbreviation</u>	<u>Company</u>
NAAMM	National Association of Architectural Metal Manufacturers 100 South Marion Street Oak Park, IL 60302
NACE	National Association of Corrosion Engineers P.O. Box 986 Katy, TX 77450
NEC	National Electric Code National Fire Protection Association 470 Atlantic Avenue Boston, MA 02210
NEMA	National Electrical Manufacturer's Association 155 East 44th Street New York, NY 10017
NESC	National Electric Safety Code American National Standards Institute 1430 Broadway New York, NY 10018
NFPA	National Forest Products Association (Formerly called: National Lumber Manufacturer's Association) 1619 Massachusetts Avenue, N.W. Washington, DC 20036
OSHA	Occupational Safety and Health Act U.S. Department of Labor San Francisco Regional Office 450 Golden Gate Avenue, Box 36017 San Francisco, CA 94102
PPIC	The Plumbing & Piping Industry Council, Inc. Suite 402 510 Shatto Place Los Angeles, CA 90020
SAE	Society of Automotive Engineers 2 Pennsylvania Street New York, NY 10001

<u>Abbreviation</u>	<u>Company</u>
SAMA	Scientific Apparatus Makers Association One Thomas Circle Washington, DC 20005
SBCC	Southern Building Code Congress 1116 Brown-Marx Building Birmingham, AL 35203
SMACNA	Sheet Metal and Air Conditioning Contractors National Association, Inc. 8224 Old Courthouse Road Tysons Corner Vienna, VA 22180
SSPWC	Standard Specifications for Public Works Construction Building News, Inc. 3055 Overland Avenue Los Angeles, CA 90034
TEMA	Tubular Exchanger Manufacturer's Association 331 Madison Avenue New York, NY 10017
UBC	Uniform Building Code Published by ICBO
UL	Underwriters Laboratories Inc. 207 East Ohio Street Chicago, IL 60611
UMC	Uniform Mechanical Code Published by ICBO
UPC	Uniform Plumbing Code Published by IAPMO
USBR	Bureau of Reclamation U.S. Department of Interior Engineering and Research Center Denver Federal Center, Building 67 Denver, CO 80225
WWPA	Western Wood Products Association (Formerly called: West Coast Lumberman's Association - WCLA) Yeon Building Portland, CA 97204

PART 2 - PRODUCTS (NOT USED)

PART 3 - EXECUTION (NOT USED)

- END OF SECTION -

SECTION 01100

ARCHAEOLOGICAL PROTECTION

PART 1 - GENERAL

- 1.1 This section covers the requirements for the protection and preservation of historical sites and values.

PART 2 - PRODUCTS (NOT USED)

PART 3 - EXECUTION

- 3.1 **CONSTRUCTION METHOD:** Representatives of the State will from time to time examine the area as work proceeds. If historical values are noted, the State may order a halt to the work in the vicinity of the historical values until the State can examine further. The Contractor shall notify the State if he finds anything he suspects to be of historic significance and shall discontinue further work in the vicinity of the find until the State can examine the area. In either case, further work in the vicinity of such historical or suspected historical values may proceed only upon approval by the State. Such approval can be normally expected within one week and shall in no case require more than one month.

END OF SECTION

SECTION 01300

SUBMITTALS

PART 1 - GENERAL

1.1 SUBMITTALS

A. Shop drawings shall be required for:

1. Division 16 - Electrical Work.
2. Any others as called for in the plans, specifications or by the Engineer.

B. Other required submittals shall include:

1. Piping Layout.
2. Manufacturer's Data.
3. Certificates of Warranty.
4. Any others as called for in the plans, specifications, or by the Engineer.

1.2 BIDDER'S SPECIAL RESPONSIBILITY FOR COORDINATING CONTRACTUAL WORK AND SUBMITTALS:

A. The Contractor is responsible for the coordination of all contractual work and submittals.

B. The Contractor shall have a rubber stamp made up in the following format:

CONTRACTOR NAME

PROJECT: _____

JOB NO: _____

THIS SUBMITTAL HAS BEEN CHECKED BY THIS GENERAL CONTRACTOR. IT IS CERTIFIED CORRECT, COMPLETE, AND IN COMPLIANCE WITH CONTRACT DRAWINGS AND SPECIFICATIONS. ALL AFFECTED CONTRACTORS AND SUPPLIERS ARE AWARE OF, AND WILL INTEGRATE THIS SUBMITTAL INTO THEIR OWN WORK.

DATE RECEIVED _____

SPECIFICATION SECTION _____
SPECIFICATION PARAGRAPH _____
DRAWING NUMBER _____
SUBCONTRACTOR NAME _____
SUPPLIER NAME _____
MANUFACTURER NAME _____

CERTIFIED BY: _____

- C. This stamp, "filled in", should appear on the title sheet of each shop drawing, on a cover sheet of submittals in an 8-1/2" x 11" format, or on one face of a cardstock tag (min. 3" x 6") tied to each sample. The tag on the samples should state what the sample is so that, if the tag is accidentally separated from the sample, it can be matched up again. The back of this tag will be used by the Engineer for his receipt, review, and log stamp and for any comments that relate to the sample.
- D. All submittals for material, equipment, and shop drawings listed in the contract documents, including dimensioned plumbing shop drawings, shall be required and shall be reviewed by the Engineer, prior to any ordering of materials and equipment.
- E. Unless otherwise noted, the Contractor shall submit to the Engineer for his review eight copies of all shop drawings, piping layout, and/or catalog cuts for fabricated items and manufactured items (including mechanical and electrical equipment) required for the construction. Drawings shall be submitted in sufficient time to allow the Engineer not less than twenty regular working days for examining the drawings.
- F. The drawing shall be accurate, distinct, and complete and shall contain all required information, including satisfactory identification of items, units and assemblies in relation to the contract drawings and specifications.
- G. Unless otherwise approved by the Engineer, shop drawings shall be submitted only by the Contractor, who shall indicate by a signed stamp on the drawings or other approved means that the Contractor has checked the shop drawings and that the work or equipment shown is in accordance with contract requirements and has been checked for dimensions and relationship with work of all other trades involved. All deviations from the plans and specifications shall be listed. The practice of submitting incomplete or unchecked shop drawings for the Engineer to correct or finish will not be acceptable, and shop drawings which, in the opinion of the Engineer, clearly indicate that they have not been checked by the Contractor will be considered as not complying with the intent of the contract documents and will be returned to the Contractor for resubmission in the proper form.
- H. When the shop drawings have been reviewed by the Engineer, two sets of submittals will be returned to the Contractor appropriately stamped. If major changes or corrections are necessary, the drawing may be rejected and one set will be returned to the Contractor with such changes or corrections indicated, and the Contractor shall correct and resubmit

eight copies of the drawings, unless otherwise directed by the Engineer. No changes shall be made by the Contractor to the resubmitted shop drawings other than those changes indicated by the Engineer. The resubmittal shall be so indicated on the shop drawing.

- I. The review of such drawings and catalog cuts by the Engineer shall not relieve the Contractor from responsibility for correctness of the dimensions, fabrication details, and space requirements or for deviations from the contract drawings and specifications, unless the Contractor has called attention to such deviations, in writing, by a letter accompanying the drawings and the Engineer approved the change or deviations, in writing, at the time of submission; nor shall review by the Engineer relieve the Contractor from the responsibility for errors in the shop drawings. When the Contractor does call such deviations to the attention of the Engineer, he shall state in his letter whether or not such deviations involve any deduction or extra cost adjustment.
- J. The approval of the above drawings, lists, prints, specifications, or other data shall in no way release the Contractor from his responsibility for the proper fulfillment of the requirements of this contract nor for fulfilling the purpose of the installation nor from his liability to replace the same should it prove defective or fail to meet the specified requirements.

PART 2 - PRODUCTS (NOT USED)

PART 3 - EXECUTION (NOT USED)

END OF SECTION

SECTION 01505

MOBILIZATION AND DEMOBILIZATION

PART 1 - GENERAL

1.1 GENERAL REQUIREMENTS

A. Description: This section covers the requirements for mobilization and demobilization.

1.2 MOBILIZATION: Mobilization shall consist of the transporting, assembling, constructing, installing, and making ready for use at the job site, all the equipment, machinery, structures, utilities, materials, labor, and incidentals necessary to do the work covered by this contract.

1.3 DEMOBILIZATION: Demobilization shall consist of the dismantling and removal of the above-mentioned equipment, machinery, structures, utilities, materials, and incidentals, and the cleaning up of the site.

PART 2 - PRODUCTS (NOT USED)

PART 3 - EXECUTION

3.1 GUIDELINES: If the Contractor utilizes private lands other than the sites provided by the Department for mobilization purposes, the provisions of this section shall apply, and the mobilization and demobilization work on said private lands shall be in accordance with the agreement between the Contractor and the land owner.

Any and all additional mobilization or demobilization costs in excess of the maximum amounts specified in the Proposal shall be included in the appropriate unit prices bid in the Proposal. The Contractor shall not receive any compensation for mobilization and demobilization in addition to those specified in the Proposal.

All equipment, machinery, buildings, utilities and incidentals mobilized and demobilized under this section shall remain the property of the Contractor.

END OF SECTION

SECTION 01530

BARRICADES

PART 1 - GENERAL

1.1 GENERAL REQUIREMENTS

- A. Description. This work shall consist of furnishing, installing and maintaining barricades in accordance with the requirements of the contract.

Barricade application shall be provided for in the latest edition of the FHWA publication, Manual on Uniform Traffic Control Devices for Streets and Highways (MUTCD), and as amended.

PART 2 - PRODUCTS

2.1 MATERIALS

- A. Lumber: Lumber for rails, frames and braces shall be dry, sound, undamaged, well seasoned, and free from any defect which may impair their strength and durability.
- B. Hardware: Nails shall be galvanized wire nails. As many and as large a size as is practicable shall be used.
- C. Paints: Paints shall be exterior enamel paint of the best grade or first line as made by approved manufacturers.
- D. Sheet Reflecting Material: Sheet reflecting material shall conform to the applicable requirements of Subsection 712.20(C) of the "Standard Specifications for Road and Bridge Construction".
- E. Alternate Designs: Alternate barricade designs such as plastic molded barricades may be used subject to the Engineer's approval. The Contractor shall submit shop drawings or catalog cuts for approval.

PART 3 - EXECUTION

3.1 CONSTRUCTION REQUIREMENTS

- A. General: Barricades shall be constructed in a first class, workmanlike manner in accordance with details shown on the plans and as specified herein.

Barricades shall be in good condition and approved by the Engineer for use within the project limits. Barricade application and installation shall be as shown on the plans and as directed by the Engineer in accordance with the guidelines provided in the latest edition of

the FHWA publication, Manual on Uniform Traffic Control Devices for Streets and Highways (MUTCD), and any amendments or revisions thereof as may be made from time to time.

Sand bags or other approved weights shall be provided where required or as directed by the Engineer. Sand bags or other approved weights shall not be placed on any striped barricade rail.

Steady burn and/or flashing lamps shall be required on selected barricades used during hours of darkness. Locations shall be as shown on the plans and as directed by the Engineer. Lamps shall be attached on the barricade ends closest to the traveled way and shall be visible to the motorist.

Barricades furnished and paid for as provided for as provided herein may be used for temporary detours, construction phasing, or other temporary traffic control work.

Barricades furnished and paid for use in temporary detours or construction phasing may be used for permanent location called for on the plans.

Upon completion of the construction work, barricades shall be left in place, relocated, or removed and disposed of as shown on the plans or as directed by the Engineer. Barricades left in place, or relocated to new permanent locations shall become the property of the State. Barricades directed to be removed and disposed of shall become the property of the Contractor.

- B. Painting: Wooden rails, frames and braces shall be given a prime coat and 2 finish coats of new white exterior enamel paint. Rail faces to be reflectorized may be left unpainted unless otherwise specified or directed.
- C. Reflectorization: Reflectorization of barricade rails shall be done in a first class, workmanlike manner and the attachment of reflective sheeting shall be as shown on the plans, specified herein, or as directed and approved by the Engineer.

Both vertical faces of each barricade rail shall be reflectorized as shown on the plans.

Wooden rails shall be reflectorized with one of the following:

1. Reflective sheeting specified in Subsection 712.20(C)(4) of the "Standard Specifications for Road and Bridge Construction" and backed with a 26 gage galvanized steel sheet, or
2. a hardened aluminum backed reflective sheeting as specified in Subsection 712.20(C)(5) of the "Standard Specifications for Road and Bridge Construction."

D. Color: Rails, frames and braces shall be white.

The front and back faces of barricade rails shall have 6-inch wide alternative colored and white striped sloping downward toward the traveled way at an angle of 45 degrees with the vertical. The colored stripes shall be either orange or red in accordance with the following requirements:

1. Orange and white stripes shall be used in the following conditions:
 - a. Construction work.
 - b. Detours.
 - c. Maintenance work.
2. Red and white stripes shall be used in the following conditions:
 - a. On roadways with no outlet (ie. dead-ends, cul-de-sacs).
 - b. Ramps or lanes closed for operational purposes.
 - c. Permanent or semipermanent closure or termination of a roadway.

E. Maintenance: Barricades shall be kept in good condition throughout their usage during construction until the end of the contract.

F. The Contractor shall repair, repaint, clean or replace the barricades as required and as directed by the Engineer to maintain their effectiveness and appearance.

The Constructor shall immediately replace all lost, stolen or damaged barricades, lamps, sand bags and other approved weights.

Barricades used during construction phasing, temporary detours or other temporary traffic control work shall be cleaned and repaired as necessary, prior to being relocated to a permanent location shown on the plans or as directed.

No extra payment will be made for any repair work, repainting, or cleaning of barricades. The Engineer shall determine the suitable condition of each barricade and shall determine when each barricade shall be repaired, repainted or cleaned.

END OF SECTION

SECTION 01567

POLLUTION CONTROL

PART 1 - GENERAL

1.1 GENERAL REQUIREMENTS

A. Rubbish Disposal

1. No burning of debris and/or waste materials shall be permitted on the project site.
2. No burying of debris and/or waste material except for materials which are specifically indicated elsewhere in these specifications as suitable for backfill shall be permitted on the project site.
3. All unusable debris and waste material shall be hauled away to an appropriate off-site dump area. During loading operations, debris and waste materials shall be watered down to allay dust.
4. No dry sweeping shall be permitted in cleaning rubbish and fines which can become airborne from floors or other paved areas. Vacuuming, wet mopping or wet or damp sweeping is permissible.
5. Enclosed chutes and/or containers shall be used for conveying debris from above to ground floor level.
6. Clean-up shall include the collection of all waste paper and wrapping materials, cans, bottles, construction waste materials and other objectionable materials, and removal as required. Frequency of clean-up shall coincide with rubbish producing events.

B. Dust

1. The Contractor shall prevent dust from becoming airborne at all times including non-working hours, weekends and holidays in conformance with the State Department of Health, Administrative Rules, Title 11, Chapter 60 - Air Pollution Control.
2. The method of dust control and costs shall be the responsibility of the Contractor. Methods of dust control shall include the use of water, chemicals or asphalt over surfaces which may create airborne dust.
3. The Contractor shall be responsible for all damage claims in accordance with Section 7.16 - "Responsibility for Damage Claims" of the GENERAL CONDITIONS.

C. Noise

1. Noise shall be kept within acceptable levels at all times in conformance with the State Department of Health, Administrative Rules, Title 11, Chapter 46 - Community Noise Control for Oahu. The Contractor shall obtain and pay for the Community Noise Permit from the State Department of Health when the construction equipment or other devices emit noise at levels exceeding the allowable limits.
2. All internal combustion engine-powered equipment shall have mufflers to minimize noise and shall be properly maintained to reduce noise to acceptable levels.
3. Pile driving operations shall be confined to the period between 9:00 a.m. and 5:30 p.m., Monday through Friday. Pile driving will not be permitted on weekends and legal State and Federal holidays.
4. Starting-up of construction equipment meeting allowable noise limits shall not be done prior to 6:45 a.m. without prior approval of the Engineer. Equipment exceeding allowable noise levels shall not be started-up prior to 7:00 a.m.

D. Erosion

1. During interim grading operations, the grade shall be maintained so as to preclude any damage to adjoining property from water and eroding soil.
2. Temporary berms, cut-off ditches and other provisions which may be required because of the Contractor's method of operations shall be installed at no cost to the State.
3. Drainage outlets and silting basing shall be constructed and maintained as shown on the plans to minimize erosion and pollution of waterways during construction.

E. Others

1. Wherever trucks and/or vehicles leave the site and enter surrounding paved streets, the Contractor shall prevent any material from being carried onto the pavement. Waste water shall not be discharged into existing streams, waterways, or drainage systems such as gutters and catch basins unless treated to comply with the State Department of Health water pollution regulations.
2. Trucks hauling debris shall be covered as required by PUC Regulation. Trucks hauling fine materials shall be covered.
3. No dumping of waste concrete will be permitted at the job-site.

4. Except for rinsing of the hopper and delivery chute, and for wheel washing where required, concrete trucks shall not be cleaned on the job-site.
5. Except in an emergency, such as a mechanical breakdown, all vehicle fueling and maintenance shall be done in a designated area. A temporary berm shall be constructed around the area when runoff can cause a problem.
6. When spray painting is allowed such spray painting shall be done by the "airless spray" process. Other types of spray painting will not be allowed.

F. Suspension of Work

1. Violations of any of the above requirements or any other pollution control requirements which may be specified in the Technical Specifications herein shall be cause for suspension of the work creating such violation. No additional compensation shall be due the Contractor for remedial measures to correct the offense. Also, no extension of time will be granted for delays caused by such suspensions.
2. If no corrective action is taken by the Contractor within 72 hours after a suspension is ordered by the Engineer, the State reserves the right to take whatever action is necessary to correct the situation and to deduct all costs incurred by the State in taking such action from monies due the Contractor.
3. The Engineer may also suspend any operations which he feels are creating pollution problems although they may not be in violation of the above-mentioned requirements. In this instance, the work shall be done by force account as described in Subsection 4.2b - "Additional Work" of the GENERAL CONDITIONS and paid for in accordance with Subsection 8.4b - "Force - Account Work" therein. The count of elapsed working days to be charged against the contract in this situation shall be computed in accordance with Subsection 7.18 - "Contract Time" of the GENERAL CONDITIONS.

PART 2 - PRODUCTS (NOT USED)

PART 3 - EXECUTION (NOT USED)

END OF SECTION

SECTION 01581

PROJECT SIGN

PART 1 - GENERAL

1.1 GENERAL REQUIREMENTS

Furnish all labor, materials and equipment necessary to construct and install all project sign as specified hereinafter.

1.2 SUBMITTAL

The contractor shall provide the Engineer with six (6) shop drawings of the project sign for review and approval by the Engineer prior to ordering the sign.

1.3 LETTER STYLE

Copy is centered and set in Adobe Type Futura Heavy. If this specific type is not available, Futura Demi Bold may be substituted. Copy should be set and spaced by a professional typesetter and enlarged photographically for photo stencil screen process.

1.4 ART WORK

Constant elements of the sign layout - frame, outline, stripe, and official state information - may be duplicated following drawing measurements, or be reproduced and enlarged photographically using a layout template if provided. The "STATE OF HAWAII" masthead should be reproduced and enlarged as specified, using the artwork provided.

1.5 TITLES

The specific major work of the project under construction is emphasized by using 3-3/4" type, all capitals. Secondary information such as location or buildings uses 2-1/4" type, all capitals. Other related information of lesser importance uses letter heights as indicated on 01581-3, upper / lower case letters.

Design should follow the example on page 01581-3.

PART 2 - PRODUCTS

2.1 MATERIALS

A. LUMBER

1. Panel is 3/4" exterior grade high density overlaid plywood, with resin-bonded surfaces on both sides.
2. 4"x4" sign posts shall be Douglas Fir No. 1 or better.

B. PAINTS & INKS

Screen print inks are matte finish. Paints are satin finish, exterior grade. References to Ameritone Color Key Paint are for color match only.

COLOR:	1.	1BL10A	Bohemian Blue
	2.	2H16P	Softly (White)
	3.	2VR2A	Hot Tango (Red)
	4.	1M52E	Tokay (Gray)

C. CONCRETE

Concrete shall be class B with a 2,500 psi 28-day compressive strength.

PART 3 - EXECUTION

3.1 GENERAL

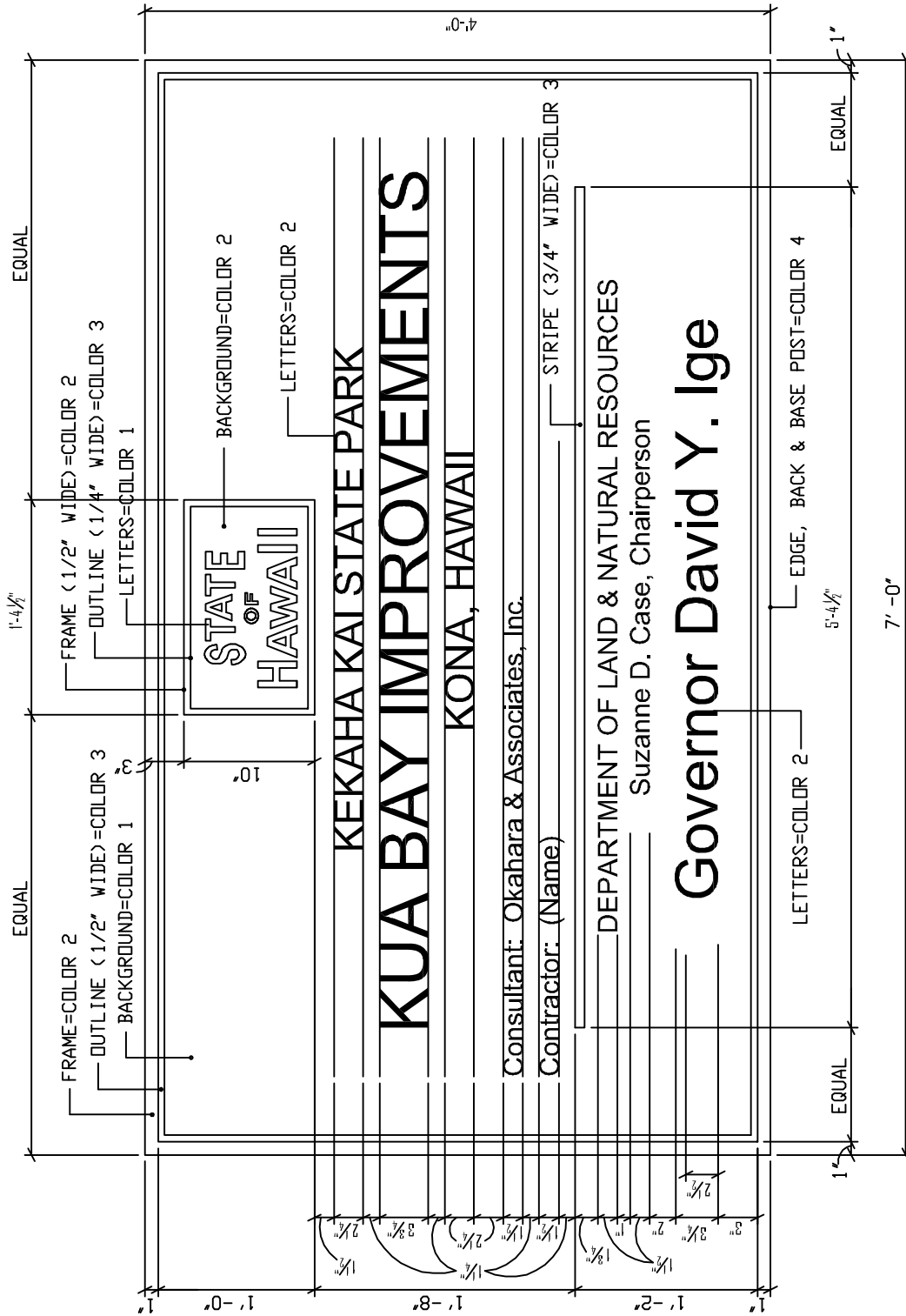
- A. The Project Sign shall be constructed with new materials as specified above.
- B. The Project sign shall be installed at the location indicated on the drawings or as designated by the Engineer. The project sign shall be erected upon commencement of work.

3.2 MEASUREMENTS AND PAYMENT

The construction of the project sign, including all equipment, labor and material necessary to furnish and install the project sign will be paid for under the "Project Sign" proposal item.

END OF SECTION

Project Sign
01581-2



NOTE: Number of signs required 1

DIVISION 2 - SITE CONSTRUCTION

SECTION 02070

SELECTIVE DEMOLITION

PART 1 - GENERAL

1.1 SUMMARY

- A. Extent of selective demolition work is indicated on drawings. Selective demolition work includes but is not limited to removal and subsequent disposal of all non- hazardous materials indicated or required to be removed.
- B. It shall be the responsibility of the Contractor to examine the project site and determine the existing conditions.
- C. Execute all work in an orderly and careful manner with due consideration for all items of work to remain.
- D. Obvious conditions which exist at the site shall be accepted as part of the work, even though they may not be clearly indicated on the Drawings and/or described herein, or may vary therefrom.
- E. All debris of any kind accumulated from the work of this Section shall be disposed off the site.
- F. Protect all building interior at all times from damage during construction work. Coordinate with roofing work to provide temporary cover, weather protection, waterproofing, etc. as required over unfinished work area at the end of each day and during rain to prevent damage.
- G. Protect all existing conditions surrounding the work area, including but not limited to walkways, parking, landscaping, etc. at all times from damage.
- H. Any damage as a result of demolition work and any neglect to provide protection shall be fixed new at no cost to the State.
- I. Demolish and remove work as indicated on the drawings and as required to perform work under this project.
- J. Temporarily disconnect and remove all existing overhead utilities if required during renovation work. Obtain State's written approval of all utility outages prior to performing work. Re-install and reconnect utility service when new work is complete.
- K. Burning of any debris on-site will not be permitted.

- L. Permits, Notice, Etc.:
 - 1. The Contractor shall procure and pay for all necessary permits, certificates, or approvals that may be required in connection with this work.
 - 2. The Contractor shall serve proper notice and consult with the Contracting Officer regarding any temporary barricades and disconnections of electrical or other utility lines in the area which may interfere with the removal work, and all such lines where necessary shall be properly disconnected or relocated before commencing with the work.
 - M. Related Work Described Elsewhere: Contractor shall review SECTION 01715 - EXISTING CONDITIONS -ASBESTOS/LEAD/HAZARDOUS MATERIAL SURVEY.
- 1.2 SUBMITTALS
- A. Submit in accordance with SECTION 01300 – SUBMITTALS.
 - B. Schedule: Submit two copies of schedule indicating proposed methods and sequence of operations for selective demolition work to the Contracting Officer for review prior to commencement of work. Include coordination for temporary shut-off and continuation of utility services as required, together with details for weather protection, dust and noise control protection.
- 1.3 JOB CONDITIONS
- A. Condition of Structure: The State assumes no responsibility for actual condition of items or portions of structure to be demolished.
 - B. Existing Conditions: Conditions existing at time of commencement of contract will be maintained by the State insofar as practicable.
 - C. Occupied Spaces: Do not interfere with use of adjacent occupied spaces. Maintain free and safe passage to and from occupied spaces.
 - D. Partial Demolition and Removal: Items indicated to be removed but of salvageable value to Contractor, may be removed as work progresses. Transport salvaged items from site as they are removed. Storage or sale of removed items on site will not be permitted.
 - E. Explosives: Use of explosives will not be permitted.
 - F. Utility Services: The existence of exposed and concealed utility line other than those shown on the drawings is not definitely known. Should any other utility lines be encountered, the Contractor shall immediately notify the Contracting Officer and follow his direction as to procedure. Maintain existing utilities indicated.
 - G. Protections: Provide temporary barricades and other forms of protection as required to protect the general public, staff, and students from injury due to selective demolition work.
 - 1. Provide interior and exterior shoring, bracing, or support to prevent movement, settlement, or collapse of elements to be demolished, 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 & County regulations, including HIOSH.
 4. Provide accessibility around temporary structures conforming to 2010 ADA, Chapter 2 and other chapters as specified in Chapter 2.
 5. Remove protections, obstructions, and barricades at completion of work.
 6. Where barriers are erected or placed to facilitate the work, barriers shall not affect or impact the facility's fire exiting route or alarm systems.
- H. Traffic: Conduct selective 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 the Contracting Officer. Provide alternate routes around closed or obstructed traffic ways if required by governing regulations, as directed by the Contracting Officer.
- I. Dust Control:
1. Keep dust within acceptable levels at all times, including non-working hours, weekends and holidays, in conformance with Chapter 60.1 – Air Pollution Control of the State Department of Health, Public Health Regulations, latest edition.
 2. Only wet grinding or cutting of concrete will be allowed on exterior surfaces.
 3. Mechanical dry sweeping not permitted. Vacuuming, wet mopping, approved limited dry hand, wet or damp sweeping is acceptable.
 4. During loading operations, water down debris and waste materials to allay dust.
 5. The method of dust control and all costs incurred thereof shall be the responsibility of the Contractor.
- J. Noise Control: As specified in SECTION 01567 – POLLUTION CONTROL.
- K. Fire Safety: Fire safety during demolition shall comply with Chapter 16 of the 2006 NFPA 1 – Fire Code, as amended and Chapter 1 of the 2009 NFPA 241.
- L. Demolition Work: Conform to State of Hawaii, Occupational Safety and Health Standards; Subtitle 8, Division of Occupational Safety and Health; Part 3, Construction Standards; Chapter 131.1, Demolition.
- M. Other Controls:
1. Wherever trucks and/or vehicles leave the site and enter surrounding paved streets, the Contractor shall prevent any material from being spilled onto the pavement.

Waste water shall not be discharged into existing streams, waterways, or drainage systems such as gutter and catch basins unless treated to comply with Department of Health pollution regulations.

2. Trucks hauling materials shall be covered as required by PUG regulation. Trucks hauling fine materials shall be covered.
- N. Existing Conditions: The Contractor shall be responsible for protection of existing conditions for the entire duration of the project. Damage to the existing conditions as a result of the work if this section shall be corrected at no additional cost to the State.

PART 2 – PRODUCTS (NOT USED)

PART 3 -EXECUTION

3.1 GENERAL

A. Existing Conditions

1. The Drawings show general information only. Examine the site to determine the exact existing conditions, character, extent of the work to be performed and demolition operations required to complete the new work.

B. Existing Utilities

1. The existence of underground utility lines other than those shown on the Drawings is not definitely known. Verify all utility line locations prior to the start of any work.
2. It is understood and agreed that certain lines cannot be or have not been located and no indication is contained on any of the Drawings or referred to in the specifications (i.e. storm drainage, electrical, plumbing, sewer, water, or telephone); therefore, exercise extreme caution during demolition and like work. Should any such lines be encountered, written notice shall be given to the Engineer, and no further work in the area shall proceed until adequate investigation has been made, the line identified, and instructions are issued as to how to proceed.
3. The Contractor is liable for any and all damages associated with his activities, which may disrupt services as a result of any utility line damage.

C. Equipment: The use of proper equipment is the responsibility of the Contractor.

D. Protection of Utilities: Preserve in operating condition all active utilities traversing or within and about the site; protect all such property and items. Promptly repair and notify the affected utility company of any damage to such utility or work caused by work under this Contract.

E. Protection of Bodies of Water: The Contractor shall be responsible for conducting his/her operations so as not to impact environmentally sensitive water bodies (the ocean and any ponds) in the vicinity of the proposed improvements. It is the Contractor's

responsibility to know the locations of the certified shoreline, shoreline set back, tidal fluctuation zones, and to ensure that all operations within these areas comply with applicable regulations and do not adversely impact these water bodies. The Contractor shall ensure that no debris or silt runoff is deposited into the ocean or any existing pond on the project site. The Contractor shall be responsible for any remediation measures necessary to mitigate water pollution caused by the Contractor's operations.

- F. Protection of Archaeological Sites: State of Hawaii, Department of Land and Natural Resources, State Parks Archaeology Branch has determined that archaeological sites exist on the project site. The Contractor shall contact Tracy Tam-Sing of the Archaeology Branch prior to construction, and shall follow all requirements of these documents to protect said archaeological sites. The Contractor shall not remove, modify, or damage any archaeological site identified to be protected during the course of the work and shall be solely responsible for any negative impacts to such sites caused by the construction work.

3.2 INSPECTION

- A. Prior to commencement of selective demolition work, inspect areas in which work will be performed. Inventory existing conditions of structure surfaces, equipment or surrounding properties which could be misconstrued as damage resulting from selective demolition work; photograph, video or otherwise document and file with the Contracting Officer prior to starting work.
- B. Test all equipment that is to be relocated or reinstalled prior to disconnection. File a list of discrepancies with the Contracting Officer prior to disconnection and relocation. Allow the Contracting Officer 5 working days to verify discrepancies prior to removal.

3.3 PREPARATION

- A. Provide temporary security type weatherproof enclosures for exterior openings resulting from demolition work.

3.4 BARRICADES AND ENCLOSURES

- A. As specified in SECTION 01530 - BARRICADES.

3.5 SELECTIVE DEMOLITION

- A. All work shall be executed as indicated on the plans, with due consideration for all items to remain.
- B. Limits of pavement removal shall be as shown on the plans or as directed by the Engineer. Saw cut along the excavation line to produce a uniform break line both vertically and horizontally. Remove paving so as to prevent spalling, cracking or other damage to adjacent paving which is to remain. The Contractor shall at his own expense remove and replace damaged pavement outside the limits of removal. Reuse of demolished concrete or asphalt paving, as rubble fill shall not be permitted.
- C. Removal of existing signs or bollards includes foundations below grade.
- D. Cover any open trenches, holes, depressions and pits left open at the end of the working day with steel plates.

- E. Plug or cap all existing utilities to be abandoned and not interfering with the work. Remove and dispose of existing piping within the limits of new work.
 - F. Perform selective demolition work, including all exterior improvements indicated on the drawings, in a systematic manner. Use such methods as required to complete work indicated on drawings in accordance with demolition schedule and governing regulations.
 - 1. Provide services for effective air and water pollution controls as required by local authorities having jurisdiction. All dust shall be suppressed by a fog spray or other approved method.
 - 2. Water and sewer facilities shall be available for the remainder of the building and in operating condition at all times.
 - 3. Extent of demolition and removal as shown are minimum requirements. Contractor shall be responsible for the extent of work required to properly accommodate the methods of construction required for the new work. Additional work required to accommodate construction shall be considered incidental to the new work and shall be done at no additional cost to the State.
 - G. 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 the Contracting Officer in written, accurate detail. Pending receipt of directive from the Contracting Officer rearrange selective demolition schedule as necessary to continue overall job progress without delay.
- 3.6 DISPOSAL OF DEMOLISHED MATERIALS
- A. Remove debris, rubbish, and other materials resulting from demolition operations from building site daily. Transport and legally dispose of materials off site.
 - B. Burning of removed materials is not permitted on project site.
- 3.7 HAZARDOUS MATERIALS
- A. If additional hazardous materials are encountered during demolition operations, comply with applicable regulations, laws, and ordinances concerning removal, handling, and protection against exposure or environmental pollution.
- 3.8 CLEAN UP AND REPAIR
- A. Upon completion of demolition work, remove tools, equipment, and demolished materials from site. Remove protections and leave areas broom clean.
 - B. Repair demolition performed in excess of that required. Return structures and surfaces to remain to condition existing prior to commencement of selective demolition work. Repair adjacent construction or surfaces soiled or damaged by selective demolition work.

- C. All existing grass areas disturbed or damaged due to construction or ingress or egress to the site shall be repaired to original conditions. Grass areas shall be recultivated, topsoiled, and then grassed with the same kind and type of material as existing, in a manner approved by and to the satisfaction of the Contracting Officer.

END OF SECTION

SECTION 02100

CLEARING AND GRUBBING

PART 1 - GENERAL

1.1 GENERAL REQUIREMENTS

- A. 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.

1.2 REFERENCES

- A. Section 201 of the “Standard Specifications for Road and Bridge Construction”, State of Hawaii, Department of Transportation, Highways Division, dated 2005 or as amended, is hereby incorporated into and made part of these specifications by reference unless otherwise modified hereinafter with the exception of paragraphs “Measurement” and “Payment”.
- B. Hazardous Material Survey Report for Kekaha Kai State Park Improvement Project by Myounghee Noh & Associates dated June 5, 2013.
- C. Soil Investigation Report for Kekaha Kai State Park Improvement Project by Myounghee Noh & Associates dated June 10, 2013.
- D. Special Management Area Use Permit No. SMA 15-000062 and Shoreline Setback Variance No. SSV 15-000010.

1.3 PERMITS AND FEES

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

1.4 SUBMITTALS

- A. Submit in accordance with SECTION 01300 – SUBMITTALS.

PART 2 – PRODUCTS (NOT USED)

PART 3 - EXECUTION

3.1 PROTECTION OF ITEMS TO REMAIN

- A. The Contractor shall continually maintain adequate protection of trees, shrubbery, topographic features and all other items indicated to remain.
- B. Protection of Bodies of Water: The Contractor shall be responsible for conducting his/her operations so as not to impact environmentally sensitive water bodies (the ocean and any ponds) in the vicinity of the proposed improvements. It is the Contractor’s responsibility to

know the locations of the certified shoreline, shoreline set back, tidal fluctuation zones, and to ensure that all operations within these areas comply with applicable regulations and do not adversely impact these water bodies. The Contractor shall ensure that no debris or silt runoff is deposited into the ocean or any existing pond on the project site. The Contractor shall be responsible for any remediation measures necessary to mitigate water pollution caused by the Contractor's operations.

- C. Protection of Archaeological Sites: State of Hawaii, Department of Land and Natural Resources, State Parks Archaeology Branch has determined that archaeological sites exist on the project site. The Contractor shall contact Tracy Tam-Sing of the Archaeology Branch prior to construction, and shall follow all requirements of these documents to protect said archaeological sites. The Contractor shall not remove, modify, or damage any archaeological site identified to be protected during the course of the work and shall be solely responsible for any negative impacts to such sites caused by the construction work.
- D. Hazardous Materials: A hazardous material survey and soil investigation report have been conducted for the project site. While insignificant levels of hazardous materials were found at the project site, Contractor shall be responsible for familiarizing him/herself with these reports and adhering to all recommendations.
- E. Special Management Area (SMA) Use Permit: Contractor shall comply with all requirements of the SMA Permit for this project.

3.2 CLEARING AND GRUBBING

- A. The overall limits of the clearing and grubbing, as shown on the plans, shall be staked prior to construction.
- 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 this 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 the entire ground surface of all grass, weeds, stumps, roots and other objectionable materials down to at least 12 inches below the existing ground surface.
- 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.

3.3 DISPOSITION OF MATERIAL

- A. All materials resulting from the clearing and grubbing work, shall be removed from the project limits. 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 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.

3.4 INSPECTION AND APPROVAL

- A. Prior to the construction of any new work, the Engineer 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's approval, the Engineer may require the Contractor to remove the installed work for inspection and reconstruct at no additional cost to the State. The State may inspect the cleared and grubbed area in place of the Engineer.

END OF SECTION

SECTION 02200

EARTHWORK

PART 1 - GENERAL

1.1 GENERAL REQUIREMENTS

- A. Furnish all labor, materials, tools, and equipment necessary to complete the site excavation, filling, backfilling, rough and finish grading, overhauling, stockpiling, trench excavation and backfilling, and related items necessary to complete the site grading for the project.

1.2 COORDINATION WITH OTHER SECTIONS

- A. Clearing and grubbing as specified in SECTION 02100 – CLEARING AND GRUBBING.

1.3 REFERENCES

- A. Section 203 – Excavation and Embankment of “Hawaii Standard Specifications for Road and Bridge Construction, 2005” 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”.
- B. Hazardous Material Survey Report for Kekaha Kai State Park Improvement Project by Myounghee Noh & Associates dated June 5, 2013.
- C. Soil Investigation Report for Kekaha Kai State Park Improvement Project by Myounghee Noh & Associates dated June 10, 2013.
- D. Special Management Area Use Permit No. SMA 15-000062 and Shoreline Setback Variance No. SSV 15-000010.

1.4 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. The Contractor shall also be responsible for acquisition and payment for permits under the National Pollutant Discharge Elimination System (NPDES) as required.

1.5 UNFORESEEN CONDITIONS BELOW GRADE

- A. Soil borings have not been performed for this project. Bidders shall examine the site and shall draw their own conclusions therefrom as to the character of materials to be encountered.

- B. 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 Contracting Officer of such discovery. The Contracting Officer shall then investigate and issue instructions for the preservation or disposition of the unknown line. The Contracting Officer shall issue authorization for extra work only as he deems necessary.
- C. Unforeseen Subsurface Conditions
 - 1. If any conditions not described in the Contract Documents (such as perched water, seepage, and/or lenticular or confined strata of a potentially adverse nature) are encountered during grading, these conditions shall be immediately brought to the attention of the Engineer so that supplemental recommendations may be made to treat these problems.
 - 2. Should excavations encounter loose or unsuitable conditions, lava tubes, or voids, the Contractor shall notify the Engineer immediately so that supplemental recommendations may be given.

1.6 LAYOUT OF PROJECT

- A. 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 Engineer and any change shall be made in accordance with his instruction. Starting 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.
- B. The Contractor shall be responsible for performing his/her own field verification of the topographic survey to familiarize him/herself with any conditions that may have changed since the date the survey was taken.

1.7 PROTECTION OF BODIES OF WATER

- A. The Contractor shall be responsible for conducting his/her operations so as not to impact environmentally sensitive water bodies (the ocean and any ponds) in the vicinity of the proposed improvements. It is the Contractor's responsibility to know the locations of the certified shoreline, shoreline set back, tidal fluctuation zones, and to ensure that all operations within these areas comply with applicable regulations and do not adversely impact these water bodies. The Contractor shall ensure that no debris or silt runoff is deposited into the ocean or any existing pond on the project site. The Contractor shall be responsible for any remediation measures necessary to mitigate water pollution caused by the Contractor's operations.

1.8 ARCHAEOLOGICAL SITES

- A. State of Hawaii, Department of Land and Natural Resources, State Parks Archaeology Branch has determined that archaeological sites exist on the project site. The Contractor shall contact Tracy Tam-Sing of the Archaeology Branch prior to construction, and shall follow all requirements of these documents to protect said archaeological sites. The Contractor shall not remove, modify, or damage any archaeological site identified to be protected during the course of the work and shall be solely responsible for any negative impacts to such sites caused by the construction work.

1.9 HAZARDOUS MATERIALS

- A. A hazardous material survey and soil investigation report have been conducted for the project site. While insignificant levels of hazardous materials were found at the project site, Contractor shall be responsible for familiarizing him/herself with these reports and adhering to all recommendations.

1.10 SPECIAL MANAGEMENT AREA (SMA) USE PERMIT:

- A. Contractor shall comply with all requirements of the SMA Permit for this project.

1.11 SUBMITTALS

- A. Submit in accordance with SECTION 01300 – SUBMITTALS.
- B. 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 Engineer 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 Engineer in accordance with Section 01300-SUBMITTALS. 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 Engineer prior to delivery of the material to the job site.

- C. 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. Structural and Yard Fill: One (1) compaction test for every 1500 square feet of each lift.
2. Trench Backfill: One (1) Compaction test per lift for every 100 lineal feet with a minimum of one (1) test per lift for each line.

1.12 DOCUMENTS

- A. The Contractor shall have the following documents available for the use of the Contracting Officer 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.
 4. Grubbing or Grading Permit from the County of Hawaii, if required.
 5. NPDES Permit Application and Nationwide General Permit Coverage Letter (NGPC), if required.
 6. Hawaii Standard Specifications for Road, Bridge, and Public Works Construction, dated 2005 with the latest applicable amended sections.

PART 2 - PRODUCTS

2.1 MATERIALS

- A. All materials excavated shall be considered to be unclassified and shall be paid for as such, whether earth, boulders, solid rock, concrete, steel, rubbish, wood, or other materials.
- B. 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.
 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.

3. Base Course/Cushion Fill under concrete slabs and stairs: All concrete slabs on grade and stairways shall be underlain by a cushion of clean #3 Fine gravel (ASTM C33, Size No. 67), with thickness as shown on the Plans.
- C. Temporary geotextile silt fencing shall have the following properties:
1. Geotextile shall be a woven fabric made of polypropylene fibers.
 2. Minimum Roll Width: 3 ft.
 3. Grab Tensile Strength: 100 lbs. (ASTM D-4632)
 4. Elongation: 15% (ASTM D-4632)
 5. Mullen Burst Strength: 275 psi (ASTM D-3786)
 6. Coefficient of Water Permeability: 15 gal/min/SF
 7. Trapezoidal Tear Strength: 50 lbs. (ASTM D-4533)
 8. Puncture Strength: 60 lbs. (ASTM D-4833)

PART 3 - EXECUTION

3.1 GENERAL

- A. No excavation or filling shall be undertaken until the area has been cleared and grubbed.
- B. Install temporary erosion, dust and siltation control measures as shown on the Drawings or ordered by the Engineer. Other types of BMP measures equal to silt fencing are allowed. Remove temporary measures after permanent measures have been established.
- C. All excavation shall be protected and guarded against danger to life, limb and property.
- D. Excavation, embankment and grading shall comply with the Ordinances of the County of Hawaii, as amended, and as specified herein.
- E. 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.
- F. 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 NOI (Notice of Intent) 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 Engineer.

- G. The Contractor shall use the best management practices to reduce the amount of soil erosion resulting from the grading work.

The work areas and haul roads, including any unpaved 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 or a stabilized construction entrance as shown on the Drawings shall be installed as necessary 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 State.

H. 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 batter boards 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 Engineer before proceeding any further with the work, otherwise he will be held responsible for any costs involved in correction of construction placed due to such discrepancies. The Contractor shall be responsible for re-establishing property corners or survey control points that are destroyed by his operations.

3.2 EXCAVATION

A. General Requirements

1. Excavation shall be done so as to obtain the elevations called for on Drawings, allowing for fill, grading, topsoil and drainage away from buildings as necessary.

2. Usable Materials as approved by the Engineer shall be stockpiled (for later use as fill material) in a location designated by the Engineer. Crushing basalt fragments may be necessary prior to reuse in compacted fills. This material may also be excavated directly to fill at the Contractor's option, provided that the materials conform to the requirements of the intended use as specified hereinbefore and sub grade preparation requirements have been met in the fill areas.
3. Non-usable Material such as mud, soft material, volcanic ash, 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.
4. Blasting shall not be permitted on this project.

B. Structural Excavation

1. 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. All clayey silt/volcanic ash under slabs, walks and road pavements shall be removed and replaced with structural fill consisting of 3-inch minus granular material.
2. Unless specified otherwise in the plans, the excavation shall allow for four inches minimum of compacted cushion fill under all concrete walkways and slabs-on-grade.
3. 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.
4. 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.
5. When suitable bearing for foundations is not encountered at the elevation indicated on Drawings, the Contractor shall immediately notify the Engineer and shall not proceed any further until the necessary instructions for resumption of work have been received.
6. Lava tubes and cavities may be encountered during excavation. Contractor shall inform Engineer immediately of each discovery and work shall be done in accordance with his instructions.

3.3 FILL AND BACKFILL

A. General Requirements

1. Filling operations shall be performed so as to bring the entire project area to the finished grades shown on the Drawings, allowing for topsoil, concrete slab, 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 and/or volcanic ash should be excavated and replaced with compacted structural fill at no cost to the State.
4. All non-basalt 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 recompact to a minimum of 95 percent compaction, as determined by ASTM D 1557, prior to placement of the fill.
6. All fill slopes shall be at 2:1 or flatter as shown on plans, unless otherwise noted. Fill slopes exceeding 15 feet in height shall include benches a minimum of 8 feet in width with the benches constructed at intervals not exceeding 15 feet in vertical height.
7. Fill placed in areas which existing slopes are steeper than 5:1 (horizontal to vertical) shall be continually benched as the fill is brought up in lifts.

B. Yard Fill

1. 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.

C. Structural Fill for Pavement Areas

1. Structural fill is required under all slabs and pavement areas and 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. Placing, Spreading, and Compacting Fill Material

1. When moisture content of the fill material is below optimum, water shall be added until the moisture content is optimum to ensure that the proper compaction can be obtained. When the moisture content of the fill material is above optimum, the fill material shall be aerated until the optimum moisture content is obtained.
2. Recompaction: Where test results indicate that the moisture content of the fill is not suitable, or that insufficient compaction has been obtained, the fill shall be reconditioned and recompact prior to placing additional fill material. The Contractor shall be responsible for placing and compacting approved fill material in accordance with these Specifications. If the Contractor fails to meet the compaction requirements, he shall stop hauling or reduce his rate of haul, furnish additional

spreading, watering and/or compaction equipment as may be required, or make any other adjustments necessary to produce a satisfactory compacted fill. When the work is stopped by rain, filling shall not resume until the Engineer has verified that the moisture content and the density of the fill surface are satisfactory.

3. During construction, all fill surfaces shall be sloped to provide positive surface drainage and to prevent ponding of water. If it appears that rain is imminent, the Contractor shall roll the surface with smooth rollers or rubber-tired equipment to seal the surface against excessive infiltration of water. Temporary surface drains and ditches shall be provided by the Contractor as necessary to expedite runoff and to prevent erosion.

E. Slopes and Final Grading

1. The Contractor will be required to obtain a minimum relative compaction of 95 percent of maximum dry density out to the finish fill slope face. Fill slopes shall be constructed by over-building and cutting-back to the finished grades to expose a well-compacted surface.
2. Excavation and embankment shall be finished with all slopes cut true and straight, in accordance with the lines and grades shown in the Drawings. All slopes, whether old or new, shall be maintained with true and smooth surfaces. Over breaks shall be trimmed smoothly and neatly. The tops and ends of all slopes shall be flared and rounded.
3. All cut and fill slopes shall be protected from erosion by approved methods immediately upon their completion.
4. Cut Slopes
 - a. If any conditions not anticipated, such as perched water, seepage, lenticular or confined strata of a potentially adverse nature are encountered during grading, these conditions shall be analyzed by the Engineer and recommendations shall be made to treat these problems. The Contractor shall halt the grading work in such areas until the recommendations are made.
 - b. Unless otherwise specified in the Drawings, no cut shall be excavated higher or steeper than that allowed by the County Ordinances. If there are substantial discrepancies in the elevations of the existing ground at the top of the slope which could result in a higher or steeper slope or could affect the location of the toe of slope, the Contractor shall immediately inform the Engineer of such conditions, so that the Drawings can be revised accordingly.
 - c. Cut slopes shall be 2H:1V or flatter, unless otherwise recommended by the Engineer.

3.4 GRADING TOLERANCES

- A. All graded surfaces shall be finished to within 0.10 feet from the grades and cross sections indicated on the plans.

3.5 PROTECTION

- A. Protect benchmarks, property monuments, fences, and roads.
- B. Protect any above and below grade utilities that are to remain.
- C. Protect newly graded surfaces from traffic and erosion; keep areas free of trash and debris. Repair and re-establish grades in settled, rutted, and eroded areas.
- D. Repair all damages caused by and resulting from construction activities in accordance with the requirements these specifications and as directed by the Engineer.

3.6 CLEAN UP

- A. Clean up and remove all debris accumulated from construction operations from time to time, when and as directed by the Engineer. 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 02577

TRAFFIC SIGNAGE AND SPEED HUMPS

PART 1 – GENERAL

1.1 GENERAL REQUIREMENTS

- A. The work shall consist of furnishing all labor, materials, and equipment, and installing complete in place traffic signage and speed humps in accordance with the plans and specifications.

1.2 RELATED DOCUMENTS

- A. Traffic signage shall conform to the latest edition of the Manual on Uniform Traffic Control Devices for Streets and Highways, as amended.

1.3 SUBMITTALS

- A. Submit in accordance with SECTION 01300 – SUBMITTALS.
- B. Submit for approval the manufacturer's certificates of compliance and data sheets for all materials herein specified.
- C. Submit a traffic control plan for approval prior to beginning any work.

PART 2 – PRODUCTS

2.1 MATERIALS

- A. Signs: Signs shall be high intensity grade sheeting and conform to the requirements of the Manual on Uniform Traffic Control Devices for Streets and Highways, as amended, by the Federal Highway Administration.
- B. Sign Posts: Sign posts shall be 2-inch square tubing, galvanized iron.
- C. Speed Humps: Speed humps shall be made of rubber material, with capability to bolt to paved road surface. Speed humps shall be able to conform to the dimensions shown on the plans, whether by interlocking module construction or other fabrication method. Speed humps shall have a minimum three year warranty on all components installed per manufacturer's instructions.

PART 3 – EXECUTION

3.1 TRAFFIC SIGNS

- A. Each sign shall be carefully installed at the approximate locations shown on the plans and in accordance with the mounting details indicated. The State shall approve final locations prior to installation.
- B. Sign posts shall be vertical and there shall be a minimum of 7 feet clearance to the bottom of the sign.

3.2 SPEED HUMPS

- A. Speed humps shall be installed in accordance with the manufacturer's instructions. The State shall approve final locations prior to installation.
- B. There shall be minimal closure time of the access road as a result of speed hump installation. The Contractor shall coordinate speed hump installation work and any necessary road closures and/or traffic control plans with the State.

END OF SECTION

DIVISION 3 - CONCRETE

SECTION 03100

CONCRETE FORMWORK

PART 1 - GENERAL

1.1 GENERAL REQUIREMENTS

- A. This section covers the requirements for furnishing all materials, tools, labor and equipment necessary for providing concrete formwork.

1.2 SUBMITTALS

- A. Submit in accordance with SECTION 01300 – SUBMITTALS.
- B. Material Certificates: Signed by manufacturers certifying that each of the following items complies with requirements:
 - 1. Form materials and form-release agents.

PART 2 - PRODUCTS

2.1 MATERIALS

- A. Plywood shall be commercial-standard Douglas Fir, moisture resistant concrete form plywood not less than 5-ply and at least 5/8" thick.
- B. Metal forms may be used if they will produce surfaces equal to those specified for wood forms.
- C. Forms of other materials shall not be used unless approved by the Engineer.
- D. Metal clamps and ties shall be used. Form ties for exposed concrete shall be removable either completely or to a minimum depth of 1" from the face of the concrete.
- E. Form-Release Agent: Commercially formulated form-release agent that will not bond with, stain, or adversely affect concrete surfaces and will not impair subsequent treatments of concrete surfaces. Form oils or waxes shall not be used for concrete surfaces intended to be painted.
 - 1. Formulate form-release agent with rust inhibitor for steel form-facing materials.

PART 3 - EXECUTION

3.1 TOLERANCES

A. Forms shall be constructed so that the concrete surfaces do not deviate from established lines, grades and dimensions in excess of the tolerances listed below:

1. Variations from plumb:

a. In the lines and surfaces of columns, walls, pedestals, and in arises:

In any 10 ft. of height: 1/4"

Max. for the entire height
of structure: 1"

2. Variation in cross-sectional dimensions of columns, pedestals, beams, and in thickness of slabs and walls:

Minus 1/4"

Plus 1/2"

3. Footings: Tolerances apply to concrete dimensions only, not to positioning of vertical reinforcing steel, dowels, or embedded items:

a. Variations in dimensions in plan:

Minus 1/2"

Plus 2"

b. Misplacement or eccentricity:

2% of the footing width in
the direction of misplacement
but not more than 2"

c. Thickness:

Decrease in specified
thickness 5%

Increase in specified
thickness No limit

3.2 INSERTS, FASTENING DEVICES AND CONDUITS

A. Install inserts, reglet strips, hangers, metal ties, anchors, bolts, nailing strips, blocking, grounds and other fastening devices as required for attachment of other work. Properly

locate all embedded items in cooperation with other trades and secure in position before concrete is placed.

- B. All electrical and mechanical conduits and fittings shall be located such that they do not impair the strength of the concrete member and shall be subject to acceptance by the Engineer. Conduits referred to in the items below include pipes, ducts, and electrical conduits. Conduits and fittings shall conform to the following, unless shown on structural drawings:

1. Concrete Pedestals:

- a. Electrical conduits and other pipes and fittings may not be embedded in a pedestal if they will displace more than 4% of the cross-sectional area of the pedestal.
- b. Conduits in pedestals shall not be larger in outside diameter than 1/3 the least dimension of the pedestal.

2. Concrete Slabs on Grade:

- a. Conduits shall not be embedded within the thickness of any concrete slab on grade.
- b. Conduits may be placed in the subgrade below the bottom surface of slabs on grade, but not within the thickness of the basaltic termite barrier.
- c. Where a number of pipes are intended to penetrate a structural member at a location which may unduly impair the strength of the member, such as near the face of a column or pedestal, the Engineer shall be informed and his approval must be obtained before concrete is placed.
- d. The Contractor shall coordinate the installation of all embedded items and penetrations. Cost of any added reinforcement required at pipe and conduit penetration and embedment shall be borne by the Contractor.

3.3 CONSTRUCTION OF FORMS

- A. All concrete forms shall be placed with metal clamps and ties. Locate ties level and plumb in horizontal rows and vertical tiers.
- B. Where soil conditions will permit excavation to accurate sizes without bracing, side forms for footings may be omitted only if approved by the Engineer.
- C. Temporary access openings to forms for cleaning prior to depositing of concrete shall be provided.
- D. Unless otherwise called for on the plans, all exposed concrete surfaces and/or all surfaces designated as "Architectural Concrete" on the plans shall be formed with plywood. The arrangement of the plywood sheets shall be orderly and symmetrical and shall be of 4'x8' size wherever practicable.

Only new or unmarred plywood shall be used. A 3/4" x 3/4" chamfer shall be provided at external corners of exposed concrete beams, girders, columns, pedestals, and pilasters

unless otherwise indicated on the plans. Metal forms may be used if they will produce surfaces equal to those specified for wood forms.

- E. Rough concrete finish may be used for all unexposed concrete surfaces. Rough concrete finish shall be obtained by using clean, straight lumber or metal forms.
- F. Forms for architectural concrete surfaces or on exposed surfaces which are to receive a finishing material shall be either wetted thoroughly immediately before placing concrete or coated with a bond-breaking material compatible with the finishing material and/or its adhesive prior to the placement of reinforcing steel. Forms for unexposed surfaces may be coated with form oil. However, any surplus oil on the form surfaces and any oil on the reinforcing steel shall be removed by wiping with dry rags.
- G. Forms which cannot be removed shall be of material other than wood and must be approved by the Engineer.
- H. All forms other than for the non-removable form described under the preceding subparagraph shall be constructed so that they can be removed without hammering or prying against the concrete.
- I. Forms shall not be removed before the expiration of the minimum lapsed time from concrete pour shown below unless information and/or data justifying a request for a shorter period is submitted to and approved by the Engineer. Even with such approval, however, the Contractor shall be fully responsible to repair any damages which may result from the early removal.

Walls, Columns, Pedestals and Side

Forms of Beams 3 days

Footing Side Forms 24 hours

No construction loads exceeding the structural design live loads shall be supported upon any unshored portion of the structure under construction. No construction load shall be supported upon, nor any shoring removed from any part of the structure under construction until the portion of the structure has attained sufficient strength to support safely its weight and the loads placed thereon. This strength may be demonstrated by job-cured test specimens and by a structural analysis considering the proposed loads in relation to this test strength. Such analysis and test data shall be furnished by the Contractor to the Engineer.

- J. To maintain the tolerances specified in Paragraph 3.01, the formwork shall be cambered to compensate for anticipated deflections in the formwork prior to hardening of the concrete.
- K. Screeds for Slabs:
 - 1. Edge forms and intermediate screed strips shall be set accurately to produce the designated elevations and contours of the finished surface, and shall be sufficiently strong to support vibrating screeds or roller pipe screeds if the nature of the finish specified requires the use of such equipment.

The concrete surface shall be aligned to the contours of screed strips by the use of strike-off templates or approved compacting type screeds. Screeds shall be set

adjacent to all walls and in parallel rows not to exceed 8 feet on center. Penetrations of the moisture barrier shall be held to a minimum.

2. At walks, screeds shall be set at the sides to serve as forms and additional screeds, if required, shall be spaced not exceeding 8 feet on center.

END OF SECTION

SECTION 03200

CONCRETE REINFORCEMENT

PART 1 - GENERAL

1.1 GENERAL REQUIREMENTS

- A. This section covers the requirements for furnishing all materials, tools, labor and equipment to provide concrete reinforcement.

1.2 SUBMITTALS

- A. Submit in accordance with SECTION 01300 – SUBMITTALS.
- B. Submit certified mill test results or laboratory test results for all reinforcing steel indicating the following: bar size; yield strength; ultimate tensile strength; elongation; and bend test. Rebar chemical composition shall be provided for rebars which are to be welded.
- C. Steel Reinforcement Shop Drawings: Details of fabrication, bending, and placement, prepared according to ACI 315, “Details and Detailing of Concrete Reinforcement.” Include material, grade, bar schedules, stirrup spacing, bent bar diagrams, arrangement, and supports of concrete reinforcement. Include special reinforcement required for openings through concrete structures.

1.3 DELIVERY, STORAGE, AND HANDLING

- A. Deliver, store, and handle steel reinforcement to prevent bending and damage.
 - 1. Avoid damaging coatings on steel reinforcement.
 - 2. Repair damaged epoxy coatings on steel reinforcement according to ASTM D 3963/D 3963M.

PART 2 - PRODUCTS

2.1 MATERIALS

- A. Epoxy coated reinforcing steel shall be deformed bars conforming to ASTM A615, grade 60 with coating conforming to ASTM A775 and comply with requirements of ACI 318.21.2. Bars shall be free of heavy rust scales and flakes, or other bond-reducing coatings.
- B. Plain-Steel Wire: ASTM A 82, galvanized.
- C. Epoxy-Coated Wire: ASTM A 884/A 884M, Class A coated, deformed-steel wire.

2.2 REINFORCEMENT ACCESSORIES

- A. Bar Supports: Bolsters, chairs, spacers, and other devices for spacing, supporting, and fastening reinforcing bars and welded wire fabric in place that will not puncture the vapor retarder. Use plastic straps or brightly colored tie wires to secure reinforcing. Manufacture bar supports according to CRSI's "Manual of Standard Practice" from steel wire, plastic, or precast concrete or fiber-reinforced concrete of greater compressive strength than concrete, and as follows: For epoxy-coated reinforcement, use epoxy-coated or other dielectric-polymer-coated wire bar supports.

PART 3 - EXECUTION

3.1 TOLERANCES

- A. Bars used for concrete reinforcement shall meet the following requirements for fabricating tolerances:

Sheared length: ± 1 inch

Depth of truss bars: $+0, -1/2$ "

Overall dimensions of stirrups, ties, and spirals: $\pm 1/2$ "

All other bends: ± 1 inch

- B. Bars shall be accurately placed and adequately supported before the concrete is placed and shall be secured against displacement within the following tolerances:

Clear distance to formed soffits (exposed underside of beams and slabs): $-1/4$ "

Minimum distance between bars: $-1/4$ "

Where d is less than or equal to 8":

Tolerance on d : $\pm 3/8$ "

Tolerance on the minimum concrete cover: $-3/8$ ".

Note: The tolerance for cover shall not exceed minus one third the minimum concrete cover required under Section 3.2 H.

Where d is greater than 8":

Tolerance on d : $\pm 1/2$ "

Tolerance on the minimum concrete cover: $-1/2$ ".

Note: The tolerance for cover shall not exceed minus one third the minimum concrete cover required under Section 3.2 H.

d = Distance from the extreme compression fiber to the centroid of tension reinforcement.

Longitudinal location of bends and ends of reinforcement: ± 2 " except at discontinuous ends of members where tolerance shall be $\pm 1/2$ ".

Bars may be moved as necessary to avoid interference with other reinforcing 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 approval by the Engineer.

3.2 REINFORCEMENT

- A. Reinforcing steel bars, wire and wire fabric shall be provided in the sizes, lengths and configurations as indicated on the plans and shall be thoroughly cleaned, before placing, of loose mill scale, loose flaky rust, oil, and all coatings that will destroy or reduce bond. If necessary, they shall be cleaned again before placing concrete. All items shall be fabricated, positioned and secured in place as indicated in the plans and as herein specified. Annealed steel wire shall be used to secure reinforcement. Reinforcement shall be placed in specified positions not exceeding the tolerances listed in Subsection 3.1. Unless otherwise noted, cleaning, bending and placing of reinforcement shall be done in accordance with the standard practice of the Concrete Reinforcement Steel Institute.
- B. Concrete or metal support and spacers shall be used to secure the proper spacing of reinforcement over formwork. Stirrups shall be accurately and securely wired to the bars at both top and bottom. At slabs, footings and beams in contact with earth, pre-cast concrete blocks (not bricks or hollow tile) or chairs shall be used to hold reinforcement at a proper distance above earth.
- C. Bars shall be tied at all intersections, and distances from forms shall be maintained by means of pre-cast concrete blocks, ties, hangers, chairs or other approved supports.
- D. Bars shall be bent cold to the shapes shown on the plans. Bends shall be made around a pin having a diameter not less than 6 times the bar diameter except that for bars of larger than 1 inch diameter, the pin diameter shall be 8 times the bar diameter. If required, bars may be bent in the field using a "hickey" bar.
- E. All reinforcing steel bars shall be furnished in the lengths indicated on the plans. Splicing of bars, except where shown, will not be permitted without the approval of the Engineer. Splices where permitted shall be staggered as far as possible, wired together in such a manner as to maintain the clear depth of the member and the minimum clear distance to the surface of concrete. Unless otherwise shown on the plans, splices shall be lapped in lengths as follows:
 - #11 bars and smaller: 48d or 24 inches, whichever is larger.Welded splices only shall be used when bar size exceeds #11.
Welding shall conform to AWS D1.4, Structural Welding Code - Reinforcing Steel. The Contractor shall notify the Engineer 48 hours prior to making any welded splices.
- F. Vertical bars in columns shall be offset at least one bar diameter at splices.
- G. Unless permitted by the Engineer, reinforcement shall not be bent after being partially embedded in hardened concrete. Improperly and/or excessively bent bars shall be replaced.

- H. Minimum concrete protective covering for reinforcement, except for extremely corrosive atmosphere, other severe exposures, or fire protective covering shall be as follows:

Concrete deposited against the ground: 3 inches (except 6 inches where deposited below water table).

Formed surfaces exposed to weather or in contact with the ground: 2 inches for reinforcing bars #6 or larger; 1-1/2" for reinforcing bars less than #6; except not less than 1-1/2 times maximum size of aggregate for column spirals or ties.

Interior surfaces: 1-1/2" for beams, girders, and columns; 3/4" for slabs, walls and joists with #11 bars or smaller, and 1-1/2" with #14 and #18 bars.

- I. Dowels (minimum #3 @ 24 inches o.c. unless otherwise shown in the plans) shall be installed in all concrete to which masonry walls abut.
- J. All reinforcement shall be inspected and approved by the Engineer prior to the closing of forms. This approval, however, shall not be construed to relieve the Contractor of his responsibility to place all reinforcement in accordance with the plans.

END OF SECTION

SECTION 03300

CAST-IN-PLACE CONCRETE

PART 1 – GENERAL

1.1 GENERAL REQUIREMENTS

- A. This section covers the requirements for furnishing all materials, tools, labor and equipment for installation of the concrete work as shown on the Plans.

1.2 REFERENCES

- A. Section 601 of the "2005 Hawaii Standard Specifications for Road and Bridge Construction" 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".

1.3 STORAGE OF MATERIALS

- A. Cement and aggregates shall be stored in such a manner as to prevent their deterioration or the intrusion of foreign matter. Any material which has deteriorated or which has been damaged shall not be used for concrete and shall be promptly removed from the site.

1.4 SUBMITTALS

- A. Submit in accordance with SECTION 01300 – SUBMITTALS.
- B. Design Mixes: For each concrete mix, clearly identifying the specific concrete work item(s) the mix design applies to and the associated specification section references. Include alternate mix designs when characteristics of materials, project conditions, weather, test results, or other circumstances warrant adjustments. Indicate amounts of mix water to be withheld for later addition at Project site. Mix design submittals will be rejected if this information is not included with the submittal.
- C. Material Certificates: Signed by manufacturers certifying that the following item complies with requirements:
 - 1. Bonding agents.

1.5 TESTS

- A. Slump: Standard slump tests as described in ASTM C143 shall be made periodically during the placement of concrete by the Contractor to ensure that the slump for which the concrete has been designed is met. Any concrete batch tested and showing slumps exceeding the specified tolerance shall be rejected. Any concrete placed prior to slump testing shall be the sole responsibility of the Contractor and shall be rejected should the subsequent slump test of the batch in question indicate that the slump tolerance is being exceeded. All rejected concrete shall be promptly removed and properly replaced. All costs resulting therefrom shall be borne by the Contractor.

B. Compressive Strength: During the progress of the work compressive strength tests of concrete shall be made in accordance with ASTM C39. 6-inch x 12-inch cylinders shall be taken from each major pour by the Contractor at the rate of 3 cylinders for each 100 cubic yards. Notwithstanding this established rate, however, the Contractor shall take concrete cylinders in whatever quantity the Engineer deems fit and/or necessary from any concrete pour. For pours of less than 25 cubic yards and with the approval of the Engineer, the Contractor may omit the taking of cylinders.

1. The Contractor will make and identify all test cylinders. The Contractor shall provide the equipment, such as a shovel and a wheelbarrow to make and move the cylinders, and shall also provide the labor and equipment to deliver the cylinders to a certified testing laboratory.
2. Cost of all laboratory concrete testing, including cylinder tests, shall be borne by the Contractor.
3. The standard age for testing the cylinders shall be 28 days. However, 7-day tests may be made for indication of final 28-day strengths.
4. All cylinders shall be made and cured in accordance with ASTM C31.
5. In all cases where the strength of any group of cylinders falls below the minimum compressive strength specified, the Engineer shall have the right to require that test specimens be cut from the structure. Specimens shall be selected by the Engineer from the location in the structure represented by the test specimen of specimens which failed. Specimens shall be secured, prepared, and tested in accordance with ASTM C42 within a period of 60 days after placing the concrete. The testing shall be done by a laboratory approved by the Engineer. Concrete in the area represented by the core tests will be considered structurally adequate if the average strength of 3 cores is no less than 85% and the strength of a single core is no less than 75% of the 28-days strength specified. Should laboratory analysis indicate, however, that the proper concrete mix has not been used by the Contractor, all such concrete placed using the improper mix shall be subject to rejection. The cost of cutting specimens from the structure, patching the resulting holes, and making the analysis, including laboratory and consultation costs, shall be borne by the Contractor.

The holes from which the cored samples are taken shall be packed solid with no-slump concrete proportioned in accordance with the ACI 211.3 "Standard Practice for Selecting Proportions of No-Slump Concrete". The patching concrete shall have an "extremely dry" consistency and the same design strength as the specified concrete.

6. If the strength of the specimens cut from the structure falls below the requirements stipulated above, the Engineer shall have the right to require any and all defective concrete to be replaced, and all costs resulting therefrom shall be borne by the Contractor.

1.6 QUALITY ASSURANCE

A. Manufacturer Qualifications: A firm experienced in manufacturing ready-mixed concrete products complying with ASTM C 94 requirements for production facilities and equipment.

- B. Testing Agency Qualifications: An independent testing agency, acceptable to authorities having jurisdiction, qualified according to ASTM C 1077 and ASTM E 329 to conduct the testing indicated, as documented according to ASTM E 548. 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.
- C. Source Limitations: Obtain each type or class of cementitious material of the same brand from the same manufacturer's plant, each aggregate from one source, and each admixture from the same manufacturer.

PART 2 - PRODUCTS

2.1 MATERIALS

- A. Portland Cement shall conform to the requirements of ASTM C150, Type I, for all concrete work.
- B. Concrete Aggregates:
 - 1. Fine Aggregates shall be calcareous or basalt sands, or a combination thereof. They shall meet the grading requirements of ASTM C33 unless the concrete producer can provide past data that shows that a proposed non-conforming gradation will produce concrete with the required strength and suitable workability.

If manufactured sands are used in the concrete mix, the Contractor may select and use a water-reducing and/or an air-entraining admixture as specified hereinafter to provide satisfactory workability in the concrete. The cement content of a mix shall be as specified hereinafter, and the use of an admixture shall in no way result in the reduction of the cement factor.
 - 2. Coarse Aggregates shall be crushed close-grained, blue lava rock meeting the grading requirements of sizes 57 or 67 (ASTM D448) or both. The maximum size of aggregate shall not be larger than 1/5 of the narrowest dimensions between sides of the forms of the member for which the concrete is to be used nor larger than 3/4 of the minimum clear spacing between individual reinforcing bars or bundles of bars.
- C. Water used in mixing concrete shall be clean and free from injurious amounts of oils, acids, alkalis, salts, organic materials or other substances that may be deleterious to concrete or reinforcement. Non-potable water shall not be used.
- D. Admixture, if used, shall conform to ASTM C494 or ASTM C260 and shall be mixed in proper amount in accordance with directions of manufacturer.
- E. Curing Compound shall be compatible with the floor finish to be applied. Unless otherwise required by the floor finish, the compound shall conform to the requirements of ASTM C309.
- F. Pervious Sheeting shall be burlap or other acceptable absorbent material, free from substances that will harm the concrete or cause discoloration.

2.2 RELATED MATERIALS

- A. Joint-Filler Strips: ASTM D 1751, asphalt-saturated cellulosic fiber.
- B. Bonding Agent: ASTM C 1059, Type II, non-redispersible, acrylic emulsion or styrene butadiene.
- C. Epoxy-Bonding Adhesive: ASTM C 881, two-component epoxy resin, capable of humid curing and bonding to damp surfaces, of class and grade to suit requirements, and as follows:
 - 1. Types I and II, non-load bearing, for bonding hardened or freshly mixed concrete to hardened concrete.

PART 3 - EXECUTION

3.1 DESIGN OF CONCRETE MIXES

- A. Ingredients for concrete shall be Portland cement, fine and coarse aggregates and water.
- B. Normal weight concrete shall meet the requirements outlined in Subsection C, D, and E below.
- C. Concrete shall be designed so that the concrete materials will not segregate nor cause excessive bleeding. Slump shall be 4 inches. A tolerance of 1" above the indicated slump will be allowed for individual batches.

For concrete used in ramps or other sloping construction, the slump tolerance shall be waived.

- D. For each class of concrete up to Class 4,500, the test results for 28-day compressive strength shall meet the following requirements:

28-Day Compressive Strength Test Results

Class	Min. Average for 3 Cylinders, psi	Min. Average for 2 Cylinders, psi
4,500	4,500	4,250
4,000	4,000	3,750
3,000	3,000	2,750
2,500	2,500	2,250

Slabs-on-grade shall have a maximum water-cement ratio of 0.50 and shall contain 4% ± 1-1/2% entrained air.

- E. The Contractor shall submit for approval by the Engineer the mixes he intends to use at least 14 days before the actual concrete placing operations.

- F. The Contractor shall use only approved mixes.
- G. All concrete shall be Class 3000 having a minimum cement content of 5.6 sacks (100 lb/sack) per cubic yard and maximum water – cement ratio of 0.55, unless specified otherwise. Class A concrete when called for on the plans shall be equivalent to Class 3000.

3.2 JOINTS

- A. Construction joints shall be provided as detailed at locations indicated on the plans. Construction joints not shown on the plans shall be made as to least impair the strength of the structure and shall be approved by the Engineer.
- B. All reinforcing steel shall be continuous across construction joints. Keys and/or inclined dowels shall be provided as required. Longitudinal keys at least 1-1/2” deep shall be provided in all joints in walls and between walls and slabs or footings, unless shown otherwise in the contract documents. Unless otherwise indicated, joints shall be sealed with joint sealing compound.
- C. Expansion joints shall be provided as detailed where slabs or walkways abut curbs, buildings, platforms and other fixed structures, and at locations indicated on the plans. Reinforcement or other embedded metal items bonded to the concrete (except dowels in floors or walls bonded on only one side of joint) shall not be permitted to extend continuously through any expansion joint. Joints shall be sealed with expansion joint filler and sealing compound at least 3/8” deep.
- D. Contraction/control joints shall be provided where shown or called for on the plans and shall be ¼ the depth of the slab or a minimum of 1” deep. Unless otherwise indicated on the plans, joints may either be tooled, formed-in-place or saw-cut. When saw-cut joints are provided, cutting shall be timed properly with the set of the concrete so that it is firm enough not to be torn or damaged by the cutting blade and before random shrinkage cracking can form in the slab. In any case, cutting shall be completed no later than 12 hours after the concrete is placed and finished. Unless otherwise indicated on the plans, joints shall be sealed with joint sealing compound.

3.3 MIXING CONCRETE

- A. All concrete throughout shall be either job or plant mixture in an approved type of power operated mixer that will ensure uniformity and homogeneity of the concrete produced. The Contractor shall provide a sufficient number of mixers to continuously carry on the work.
- B. Mixing at jobsite shall be done in accordance with ACI 304 and as follows:
 - 1. Concrete shall be thoroughly mixed in a batch mixer of an approved type and size which will insure a uniform distribution of materials throughout the mass. The machine shall have a control device to prevent materials from being discharged until they have been mixed for the specified minimum time.
 - 2. The entire contents of the drum shall be discharged before materials of the succeeding batch are placed therein. No mixer shall be used which has a rated capacity of less than 1-sack batch and no mixer shall be charged in excess of its rated capacity.

3. The first batch of materials placed in the mixer after the machine has been cleaned shall contain a sufficient excess of cement, sand and water to coat the inside of the drum without reducing the required mortar content of the mix. Upon cessation of mixing, the mixer shall be thoroughly cleaned.
- C. Ready Mixed and Mixed-In-Transit Concrete shall be mixed to conform to the provisions of ASTM C94 and as follows:
1. The plant shall have sufficient capacity and transportation equipment to deliver concrete at the rate desired. The interval between batches for a pour shall not exceed 30 minutes.
 2. The time elapsed between the introduction of the mixing water to the cement and aggregates or the cement to the aggregates, and the placing of concrete in its final position shall not exceed 90 minutes.
 3. In hot weather (more than 90 degrees Fahrenheit ambient temperature) or under conditions contributing to quick stiffening of the concrete, the elapsed time in 2. shall not exceed 60 minutes, if no retarding admixture is used. If an ASTM C494 Type B or D admixture is added to the concrete, the elapsed time in 2. shall remain at 90 minutes.
- D. Concrete shall be mixed only in such quantity as is required for immediate use. No retempering will be permitted and concrete that has started to harden shall be discarded and promptly removed from the job.
- E. Admixtures conforming to Paragraph 2.1 may be used in the concrete as recommended by the supplier and approved by the Engineer.
- F. Hand mixing of concrete will not be permitted except to make up shortages for fence post footings, sidewalks, thresholds, flag pole foundations, curbs and gutters, and thrust blocks.

3.4 PLACING CONCRETE

- A. No concrete shall be placed in the absence of the Engineer or his representative who shall be given one day advance notice of starting time of concrete pour.

Place no concrete until foundation, forms, reinforcing steel, pipes, conduits, sleeves, hangers, anchors, inserts, waterproofing, termite treatment and/or basaltic termite barrier and other work required to be built into or placed ahead of concrete placing have been inspected and approved by the Engineer. Concrete placed without such notice and approval shall be rejected.

- B. Preparation:

1. All sawdust, chips and other construction debris and extraneous matter shall be removed from interior of forms. Struts, stays, bracing, or blocking serving temporarily to hold forms in correct shape or alignment shall be removed when the concrete placing has reached an elevation rendering their services unnecessary.
2. Concrete shall be placed upon clean, damp surfaces with no free water, or upon properly compacted fills but never upon soft mud or dry, porous earth. Before pouring

footings or foundations, bottoms of excavations shall be properly leveled off and tamped.

3. Before depositing new concrete on or against concrete which has set, all accumulations of mortar splashed upon reinforcing steel and the surfaces of forms shall be removed and the forms shall be retightened. The surfaces of previously set concrete shall be thoroughly roughened and cleaned of all foreign matter and laitance, saturated with water and slushed with a coat of cement grout. New concrete shall be placed before the grout has attained its initial set.

C. Conveying:

1. Concrete shall be conveyed from mixer to forms as rapidly as practicable by methods that will prevent segregation.
2. Concrete shall be deposited as nearly as practicable in its final position. Extensive spading as a means of transportation shall be avoided and in no case shall vibrators be used to transport concrete inside the forms.
3. Open troughs and chutes shall have a slope not to exceed 1 vertical to 2 horizontal and not less than 1 vertical to 3 horizontal. Chutes more than 20 feet long and chutes not meeting the slope requirements may be used provided they discharge into a hopper before distribution.
4. The concrete shall not be allowed to drop freely more than 6 feet except where specifically authorized by the Engineer. When placing operations would involve the dropping of concrete from a height of more than 6 feet, it shall be conveyed through pipes or flexible drop chutes.
5. If any appreciable segregation occurs through the conveying methods employed, their use shall be ordered discontinued by the Engineer and some other satisfactory method of placing concrete shall be used.
6. All chutes, troughs, pipes and other means of conveyances shall be kept clean and free from coatings of hardened cement or concrete by thoroughly cleaning with water and chipping after each pour. Water used for flushing shall be discharged away from the vicinity of the concrete or forms already in place.

D. Depositing:

1. Unless adequate protection is provided, concrete shall not be placed during rain. Rainwater shall not be allowed to increase the mixing water nor to damage the surface finish. Fresh concrete that has been deposited but has not attained its initial set shall be protected in the event of rain.
2. Concrete shall be placed so as to avoid segregation of the materials and the displacement of the reinforcing. As nearly as practicable, the concrete shall be dropped vertically without hitting reinforcement, sleeves or forms into its final position in order to avoid segregation of coarse aggregates from concrete. After the initial set of concrete, the forms shall not be jarred and no strain shall be placed on the projecting reinforcing.

3. Formed concrete shall be deposited in horizontal layers not deeper than 2 feet avoiding inclined layers and inclined construction joints. The depth of layers shall be shallow enough so that the succeeding layer will be placed before the previous layer has attained its initial set.

Concrete shall not be allowed nor shall it be caused to flow horizontally or on slopes in the form. Concrete placing on a slope shall begin at the lower end of the slope and progress upward.

4. Construction joints shall be made only where located on the plans unless approved otherwise by the Engineer. Pours shall be planned to provide for the continuous placing of concrete from one construction joint to another. The face edges of all joints that are exposed to view shall be carefully finished true to line and elevation.
5. In slab construction, placing of the concrete shall be started at the far end of the work so that each batch will be dumped against previously placed concrete, not away from it. The concrete shall not be dumped in separate piles and the piles then leveled and worked together.
6. Columns and pedestals shall be placed in approximately 4-foot sections, with each section being vibrated and compacted as placed.
7. If depositing of concrete must be stopped short of a full placement, it shall be leveled to a horizontal plane or stopped against a vertical bulkhead. Such bulkhead or horizontal plane shall be located only as approved by the Engineer.

E. Compaction:

1. All concrete shall be consolidated by vibration so that the concrete is thoroughly worked around the reinforcement, around embedded items, and into corners of forms, eliminating all air or stone pockets which may cause honeycombing, pitting, or planes of weakness. All compaction shall be done by use of high frequency internal vibrators. Where the vibrator cannot be inserted into the concrete, compaction shall be done by spading, rodding or forking.
2. Frequency of vibrator shall be not less than 7,000 impulses per minute. The Contractor shall provide a sufficient number of vibrators to properly consolidate all concrete immediately after placing. At least one standby vibrator shall be on hand at all times during placement of the concrete.
3. Vibration shall not be applied through contact with reinforcement of forms. Vibration shall penetrate previously deposited concrete sufficiently to prevent pockets or voids or construction joints from occurring between pours, but must not be applied to concrete which has set up sufficiently to cease to be plastic under vibration.

3.5 REPAIR OF DEFECTS

- A. After forms have been removed, any concrete which is not constructed as shown on the plans or is out of alignment or level beyond required tolerances or which shows a defective

surface which in the opinion of the Engineer cannot be properly repaired or patched shall be removed.

- B. Where cast-in-place concrete which is exposed to view or designated architectural requires repairing or patching, the texture of the surface of such repair or patch shall closely match that of the surrounding surface. If the concrete is to remain unpainted, the surface color shall also be closely matched to that of the surrounding surface.
- C. All tie holes and all repairable defective areas shall be patched immediately after form removal as follows:

- 1. All honeycombed concrete shall be chipped out to sound concrete but in no case to a depth of less than 1 inch. If possible, edges of the chipped-out areas shall be undercut.
- 2. Rock pockets, form tie holes, deep holes not too large in area, other holes with relatively high ratio of depth to area, and similarly confined areas shall be dry packed.

After the area to be patched has been thoroughly cleaned and dampened, mortar, which shall consist of 1 part cement, 2-1/2 parts sand passing a #16 screen, and only enough water to produce a mortar that will stick together upon being molded into a ball by slight pressure of the hands, shall be placed in the holes in layers having a compacted thickness of about 3/8". Each such layer shall be solidly rammed over its entire surface using a hardwood stick and a hammer.

- 3. Shallow depressions where lateral restraint cannot be obtained, voids behind reinforcement, and holes extending through concrete sections shall be patched using a commercially prepared bonding agent, a stiff mortar mix of 1 part cement and not more than 2-1/2 parts sand.

For filling holes in exterior surfaces, an epoxy bonding agent shall be used. Application of the bonding agent shall be in strict conformance with the manufacturer's instructions.

- 4. An epoxy-and-sand mixture may be used in lieu of the mortar-and-bonding agent mixture for any of the patching above. The preparation of the surface to receive the patch, as well as the mixture proportions of the epoxy-and-sand, shall be in strict conformance with the manufacturer's instructions.

- D. Except for concrete required to be removed under Paragraph 3.4A, any concrete which is not constructed as shown on the plans or is out of alignment and/or level beyond allowable tolerances may be patched using an epoxy-and-sand mixture.

The proportions of the mix and the preparation of the surface to receive the patch shall be in strict conformance with the manufacturer's instructions except as or unless otherwise specified herein. The minimum thickness of the patch shall be 1/4". No "feathering" to a lesser thickness will be permitted.

Misalignment which requires correction more than 1 inch thickness shall be repaired in the following manner:

1. The surface of the affected area shall be chipped, etched, or otherwise cleaned and roughened to provide a sound surface for bonding;
2. Concrete nails or other fasteners which can provide positive mechanical bonding of the patch shall be set into the surface at about 18 inches on center in all directions with a minimum of 2 rows;
3. Wire mesh reinforcement as approved by the Engineer shall be installed in those portions of the patch which exceed 2-inch thickness;
4. A bonding agent suitable for use in the repair location (epoxy required for exterior use) shall be applied over the entire surface to be patched;
5. Formwork to the true lines called for shall be installed over the area requiring the patch; and
6. Concrete or grout with aggregate sized appropriately for the cavity and which will provide strength equivalent to that of the base surface shall be placed in the form, properly compacted and suitably cured.

3.6 SURFACE FINISHES

- A. All exposed concrete shall have a broom finish that meets the requirements of ADAAG unless otherwise specified.

3.7 CURING AND PROTECTION

- A. All concrete shall be cured for a period of not less than 7 days by one of the methods listed below. During this curing period, the concrete shall be maintained with minimal moisture loss at a relatively constant temperature. Fresh concrete shall be protected from heavy rains, flowing water, mechanical injury, and injurious action of the sun. Curing method selected must be compatible with the finish to be applied to the concrete.

Curing shall immediately follow the finishing operation.

- B. **Water Curing:** If cured with water, concrete shall be kept wet by mechanical sprinklers, by ponding, or by any other method which will keep the surfaces continuously wet.
- C. **Saturated Sand Curing:** Surfaces cured with sand shall be covered with a minimum of 1-inch thickness of sand which shall be kept uniformly distributed and continuously saturated during the entire curing period.
- D. **Pervious Sheeting:** Overlap sheeting edges approximately 6 inches and keep sheets continuously wet throughout the curing period.
- E. **Curing Compound:** Curing compounds used on concrete surfaces that are to receive floor covering, paint or colored finish or acid stain shall be as recommended by the manufacturer to be compatible with the applied finish.

The Contractor shall submit to the Engineer a letter certifying that the curing compound is compatible with the applied finish. Application shall be in accordance with the

manufacturer's recommendations. If curing, sealing or other compounds are used which are incompatible with applied finish, such compound shall be thoroughly removed by grinding with a terrazzo grinder or other means approved by the Engineer.

3.8 JOINT FILLING

- A. Prepare, clean, and install joint filler according to manufacturer's written instructions. Defer joint filling as long as possible. Do not fill joints until construction traffic has permanently ceased.
- B. Remove dirt, debris, saw cuttings, curing compounds, and sealers from joints; leave contact faces of joint clean and dry.
- C. Install semi-rigid epoxy joint filler full depth in saw-cut joints and at least 2 inches deep in formed joints. Overfill joint and trim joint filler flush with top of joint after hardening.

3.9 CLEAN-UP

- A. Contractor shall clean up all concrete and cement materials, equipment and debris upon completion of any portion of the concrete work and upon completion of the entire concrete and related work.

END OF SECTION

DIVISION 4 - MASONRY

SECTION 04410

CEMENT RUBBLE MASONRY

PART 1 - GENERAL

1.1 GENERAL REQUIREMENTS

- A. The work covered in this section shall consist of furnishing all labor, materials, equipment, tools and incidentals necessary for installing cement rubble masonry walls as shown on the plans and specified herein.

1.2 REFERENCES

- A. Section 508 of the "Standard Specifications for Road and Bridge Construction", State of Hawaii, Department of Transportation, Highways Division, dated 2005 or as amended, is hereby incorporated into and made part of these specifications by reference unless otherwise modified hereinafter with the exception of paragraphs "Measurement" and "Payment".

1.3 SUBMITTALS

- A. Submit in accordance with SECTION 01300 – SUBMITTALS.

PART 2 – PRODUCTS

2.1 MATERIALS

- A. Materials for Cement Rubble Masonry shall be in accordance with Section 508.02 of the HDOT Standard Specifications.
- B. Stones used for CRM walls shall resemble and match as closely as possible the types of stones used in the existing stone walls on site.

PART 3 - EXECUTION

3.1 INSTALLATION

- A. Installation of Cement Rubble Masonry shall be in accordance with Section 508.03 of the HDOT Standard Specifications.
- B. The Contractor shall be responsible for precisely laying out the Cement Rubble Masonry walls.

END OF SECTION

DIVISION 4 - MASONRY

SECTION 04810

UNIT MASONRY ASSEMBLIES

PART 1 - GENERAL

1.1 SUMMARY

A. Section includes unit masonry assemblies consisting of the following:

1. Concrete masonry units.
2. Mortar and grout.
3. Reinforcing steel.
4. Masonry joint reinforcement.
5. Ties and anchors.
6. Miscellaneous masonry accessories.

B. Related Sections include the following:

1. SECTION 07920 - JOINT SEALANTS.
5. SECTION 09902 - REPAINTING testing for moisture and alkalinity.

1.2 DEFINITIONS

A. Reinforced Masonry: Masonry containing reinforcing steel in grouted cells.

1.3 SUBMITTALS

A. Product Data: For each different masonry unit, strength classification, additive, accessory, and other manufactured product specified.

1. Reinforcing steel - Certified mill test results or laboratory test results. Indicate bar size, yield strength, ultimate tensile strength, elongation and bend test. Provide chemical composition for rebars that are to be welded.

B. Shop Drawings: Show fabrication and installation details for the following:

1. Reinforcing Steel: Detail bending and placement of unit masonry reinforcing bars. Comply with ACI 315, "Details and Detailing of Concrete Reinforcement."

C. List of Materials Used in Constructing Sample Panels: List generic product names together with manufacturers, manufacturers' product names, model numbers, lot numbers, batch numbers, source of supply, and other information as required to identify materials used. Include mix proportions for mortar and grout and source of aggregates.

E. Qualification Data: For firms and persons specified in "Quality Assurance" Article.

- F. Material Certificates: Signed by manufacturers certifying that each of the following items complies with requirements:
 - 1. Each cement product required for mortar and grout, including name of manufacturer, brand, type, and weight slips at time of delivery.
 - 2. Grout mixes. Include description of type and proportions of ingredients to assure compliance with the compressive strength in UBC Table 21-D
 - 3. Each material and grade indicated for reinforcing bars.
 - 4. Each type and size of joint reinforcement.
 - 5. Each type and size of anchor, tie, and metal accessory.
 - G. Test Reports:
 - 1. Manufacturer's tests shall be in accordance with ASTM C140 for conformance with the requirements of ASTM C90.
 - H. Quality Control Inspection Documents: Provide one copy of the following industry documents for use by contracting officer.
 - 1. NCMA TEK 8-2A (1998): Removal of Stains from Concrete Masonry Walls
- 1.4 QUALITY ASSURANCE
- A. Source Limitations for Masonry Units: Obtain exposed masonry units of a uniform texture and color, or a uniform blend within the ranges accepted for these characteristics, through one source from a single manufacturer for each product required.
 - 1. Block plant shall maintain a quality control program to monitor and control block chloride ion content. Soluble chloride ion content should not exceed 0.30 per cent by volume of the cement material in the block, based on ACI 318-02 Table 4.4.1.
 - B. Source Limitations for Mortar Materials: Obtain mortar ingredients of a uniform quality, including color for exposed masonry, from one manufacturer for each cementitious component and from one source or producer for each aggregate.
- 1.5 DELIVERY, STORAGE, AND HANDLING
- A. Store masonry units on elevated platforms in a dry location. Carefully stack and handle masonry units so as to prevent chipping, marring or cracking of corners, edges and faces.
 - B. Store cementitious materials on elevated platforms, under cover, and in a dry location. Do not use cementitious materials that have become damp.
 - C. Store aggregates where grading and other required characteristics can be maintained and contamination avoided.
 - D. Deliver preblended, dry mortar mix in moisture-resistant containers designed for lifting and emptying into dispensing silo. Store preblended, dry mortar mix in delivery containers on

elevated platforms, under cover, and in a dry location or in a metal dispensing silo with weatherproof cover.

- E. Store masonry accessories, including metal items, to prevent corrosion and accumulation of dirt and oil.

1.6 PROJECT CONDITIONS

- A. Protection of Masonry: In rainy locations and conditions, cover tops of walls, projections and sills with waterproof sheeting to repel water.
- B. Do not apply uniform floor or roof loads for at least 12 hours and concentrated loads for at least three (3) days after building masonry walls or columns.
- C. Stain Prevention: Protect to prevent stain damage to mar final finish or finishing techniques. Prevent grout, mortar, and soil from staining the face of masonry to be left exposed, stained or painted
- D. Hot-Weather Requirements: Protect unit masonry work when temperature and humidity conditions produce excessive evaporation of water from mortar and grout. Provide artificial shade and wind breaks and use cooled materials as required.
 - 1. When ambient temperature exceeds 90 deg F with a wind velocity greater than 8 mph, do not spread mortar beds more than 48 inches ahead of masonry. Set masonry units within one minute of spreading mortar.

PART 2 - PRODUCTS

2.1 CONCRETE MASONRY UNITS

- A. General: Provide shapes indicated and as follows:
 - 1. Provide special shapes for lintels, corners, jambs, sash, headers, bonding, and other special conditions.
 - 2. Provide square-edged units for outside corners, unless indicated as bullnose.
 - 3. Provide "H" blocks for below grade foundation walls and scheduled to be fully grouted.
- B. Concrete Masonry Units: ASTM C-90 and as follows:
 - 1. Units shall be load-bearing units with minimum average net-area compressive strength of 1900 psi, and shall conform to the requirements of UBC Standard No. 21-4 (1997 Ed.), Grade N-11. Units shall be 2-core type, 8-inch nominal height, 16-inch nominal length and width as indicated on the plans. Units for jamb, corner sill, lintel and other special shapes shall be provided as required.
 - 2. All units shall be sound, free of cracks, straight and true. They shall be either steam-cured or cured under atmospheric conditions for a minimum of 30 days. Color shall be standard with manufacturer.

2.2 MORTAR AND GROUT MATERIALS

- A. Portland Cement: ASTM C 150, Type I or II. Provide natural color or white cement as required to produce mortar color indicated.
- B. Mortar Cement: UBC Standard 21-14 Type as scheduled in mix designs in Article 2.11.
- C. Masonry Cement: UBC Standard 21-11. Type as scheduled in mix designs in Article 2.11.
- D. Aggregate for Mortar: ASTM C 144.
- E. Aggregate for Grout: ASTM C 404, with grading in accordance with ASTM D-448, No. 10.
- F. Plasticizer Additive:
 - 1. Acceptable for use in UBC Standard 21-14 Mortar Cement as a substitute for hydrated lime in masonry mortar.
 - a. Powder Type: Proprietary pozzolanic mortar plasticizer.
 - b. Liquid Type: Proprietary mixture of resins.
- H. Water for use in mixing Mortar and Grout: Potable and complying with ASTM C 94. Clean and free from injurious amounts of oils, acids alkalis, salts, organic materials or other substances that may be deleterious to both mortar and reinforcement.

2.3 REINFORCING STEEL

- A. Epoxy-Coated Reinforcing Steel: ASTM A 615/A 615M, Grade 60 unless otherwise indicated on the drawings; epoxy coated to comply with ASTM A 775/A 775M.

2.4 MASONRY JOINT REINFORCEMENT

- A. General: UBC Standard 21-10 and ACI 530. 2.4C and as follows:
 - 1. Hot-dip galvanized, carbon-steel wire for both interior and exterior walls.
 - 2. Wire Size for Side Rods: No. 9 0.14-inch diameter.
 - 4. Provide in lengths of not less than 10 feet. Provide prefabricated corner and tee units in lengths not less than two feet where indicated.
- B. For single-wythe masonry, provide either ladder or truss type with single pair of side rods and cross rods spaced not more than 16 inches o.c.

2.5 TIES AND ANCHORS, GENERAL

- A. General: Provide ties and anchors, specified in subsequent articles, made from materials that comply with this Article, unless otherwise indicated.
- B. Hot-Dip Galvanized Carbon-Steel Wire: ASTM A 82; with ASTM A 153, Class B-2 coating.
- C. Stainless-Steel Wire: ASTM A 580/A 580M, Type 316.
- D. Stainless-Steel Sheet: ASTM A 666, Type 316.

2.8 MISCELLANEOUS ANCHORS

- A. Unit Type Inserts in Concrete: Cast-iron or malleable-iron inserts of type and size indicated.
- B. Dovetail Slots: Furnish dovetail slots with filler strips, of slot size indicated, fabricated from 0.0336-inch (20 gauge), galvanized steel sheet.
- C. Anchor Bolts: Steel bolts complying with ASTM A 307, Grade A (ASTM F 568, Property Class 4.6); with ASTM A 563 (ASTM A 563M) hex nuts and, where indicated, flat washers; stainless steel; of diameter and length indicated and in the following configurations:
 - 1. Headed bolts.
 - 2. Non-headed bolts, bent in manner indicated.
 - 4. Corrosion Protection: Carbon-steel components zinc plated to comply with ASTM B 633, Class Fe/Zn 5 (5 microns) for Class SC 1 service condition (mild).
 - 5. Corrosion Protection: Stainless-steel components complying with ASTM F 593 and ASTM F 594, Alloy Group 1 or 2 (ASTM F 738M and ASTM F 836M, Alloy Group 1 or 4) for bolts and nuts; ASTM A 666 or ASTM A 276, Type 316, for anchors.
 - 6. For Post-installed Anchors in Concrete: Capability to sustain, without failure, a load equal to four times the loads imposed.

2.9 MISCELLANEOUS MASONRY ACCESSORIES

- A. Bond-Breaker Strips: Asphalt-saturated, organic roofing felt complying with ASTM D 226, Type I (No. 15 asphalt felt).
- B. Reinforcing Bar Positioners: Commercial plastic or wire units designed to fit into mortar bed joints spanning masonry unit cells with loops for holding reinforcing bars in center of cells. Units are formed from 0.187-inch steel wire, hot-dip galvanized after fabrication. Commercial plastic units are fabricated for the intended purpose.
 - 1. Provide units with either two loops or four loops as needed for number of bars indicated.
 - 2. Other suitable devices: Other suitable devices may be used, upon proper submittal to and approval by Contracting Officer.
- C. Adhesive: Type recommended by insulation board manufacturer for application indicated.

2.10 MASONRY CLEANERS

- A. Job-Mixed Detergent Solution: Solution of 1/2-cup dry measure tetrasodium polyphosphate and 1/2-cup dry measure laundry detergent dissolved in 1-gallon of water.
- B. Proprietary Acidic Cleaner: Manufacturer's standard-strength cleaner designed for removing mortar or grout stains, efflorescence, and other new construction stains from new masonry without discoloring or damaging masonry surfaces. Use product expressly approved for intended use by cleaner manufacturer and manufacturer of masonry units being cleaned.

2.11 MORTAR AND GROUT MIXES

- A. General: Do not use admixtures, including pigments, air-entraining agents, accelerators, retarders, water-repellent agents, antifreeze compounds, or other admixtures, unless otherwise indicated.
 - 1. Do not use calcium chloride in mortar or grout.

- B. Pre-blended, Dry Mortar Mix: Furnish dry mortar ingredients in the form of a pre-blended mix. Measure quantities by weight to ensure accurate proportions, and thoroughly blend ingredients before delivering to the job site.

- C. Mortar for Unit Masonry:
 - 1. The proportioning of materials for mortar and grout shall be by volume and done in such manner that the specified proportions can be controlled and accurately maintained. Measure fine aggregate in a damp loose condition. Mix materials in a mechanical batch mixer for at least 3 minutes for mortar and 5 minutes for grout, but do not mix more than 10 minutes. Hand mixing is permitted only for small batches of 3 cubic feet or less.
 - 2. Prepare Mortar Mix Design 1 with sufficient water to provide a workable consistency. Use and place mortar within 1-1/2 hours after mixing.
 - 3. Prepare Mortar Mix Designs 2 through 5 strictly in accordance with the admixture manufacturer's instructions. Place mortar within 2-1/2 hours after mixing. No materials which start to set shall be retempered.

- E. Grout for Unit Masonry: Sufficient water shall be used to produce a consistency just fluid enough for pouring or pumping without segregation. Grout shall be used and placed in final position within 90 minutes after mixing, but shall in no case be used after initial set has occurred. This time limitation is permitted to be waived, if the grout is of such slump that it can be placed without addition of water.
 - 1. Grout shall attain not less than 2,500 psi 28-day compressive strength per ASTM C 1019 unless noted otherwise on drawings.
 - 2. Use plasticizers additives for below grade foundation walls scheduled to be grouted to ensure full dispersal of mix.

- F. Grout Mixed Onsite: conform to ASTM C476 for grout mixed on-site. Prepare and uniformly mix grout in the following proportion:
 - 1. Fine Grout

1 part	Portland cement
Fine Aggregate:	2-1/4 to 5 times the sum of the volumes of the cementitious materials
 - 2. Ready-mix Grout: Conform to ASTM C-476 for grout designed by ready-mix suppliers.

PART 3 - EXECUTION

3.1 EXAMINATION

- A. Examine conditions, with Installer present, for compliance with requirements for installation tolerances and other conditions affecting performance.
 - 1. For the record, prepare written report, endorsed by Installer, listing conditions detrimental to performance.
 - 2. Verify that floor levels, footing levels or foundations are within tolerances specified.
 - 3. Verify that reinforcing dowels are properly placed.
 - 4. Proceed with installation only after unsatisfactory conditions have been corrected.
- B. Before installation, examine rough-in and built-in construction to verify actual locations of piping connections.

3.2 INSTALLATION, GENERAL

- A. General: All masonry units shall be clean and handled to protect and minimize chipping, spalling and cracking. All bed on which masonry is to be laid shall be clean.
- B. Masonry units shall not be wetted prior to use. Units which have become wet shall be allowed to dry thoroughly before laying. If water is splashed on the block and a color difference does not occur (from the water) then the block units are too wet to be laid. (Source: Reinforced Concrete Masonry Construction Inspector's Handbook, Fourth Edition, paragraph 12.3.4)
- C. Build chases and recesses to accommodate items specified in this Section and in other Sections of the Specifications.
- D. Cut masonry units with motor-driven saws to provide clean, sharp, unchipped edges. Cut units as required to provide a continuous pattern and to fit adjoining construction. Where possible, use full-size units without cutting. Allow units cut with water-cooled saws to dry before placing, unless wetting of units is specified. Install cut units with cut surfaces and, where possible, cut edges concealed.
- F. Select and arrange units for exposed unit masonry to produce a uniform blend of colors and textures.

3.3 CONSTRUCTION TOLERANCES

- A. Comply with the tolerances in the national concrete masonry association Specification for Structures ACI 530-02/ASCE 6/TMS 602 as applicable to climate indigenous to Hawaii and as noted.
- B. For vertical lines, such as external corners, door jambs, reveals, and expansion and control joints, do not vary from plumb by more than 1/4-inch in 20 feet, nor 1/2-inch maximum.

- C. For vertical alignment of exposed head joints, do not vary from plumb by more than 1/4-inch in 10 feet, nor 1/2-inch maximum.
- D. For horizontal lines, such as exposed lintels, sills, parapets, and reveals, do not vary from level by more than 1/4-inch in 20 feet, nor 1/2-inch maximum.
- E. For exposed bed joints, do not vary from thickness indicated by more than plus or minus 1/8-inch, with a maximum thickness limited to 1/2-inch. Do not vary from bed-joint thickness of adjacent courses by more than 1/8-inch.
- F. For exposed head joints, do not vary from thickness indicated by more than plus or minus 1/8-inch. Do not vary from adjacent bed-joint and head-joint thicknesses by more than 1/8-inch.

3.4 LAYING MASONRY WALLS

- A. Lay out walls in advance for accurate spacing of surface bond patterns with uniform joint thicknesses and for accurate location of openings, movement-type joints, returns, and offsets. Avoid using less-than-half-size units, particularly at corners, jambs, and, where possible, at other locations.
- B. When foundation is at specified levels, lay first course masonry units in a mortar bed not exceeding 3/4-inch thick. Bed webs of adjoining cells that contain reinforcement in mortar to prevent escape of grout.
- C. Stopping and Resuming Work: In each course, rack back one-half-unit length for one-half running bond or one-third-unit length for one-third running bond; do not tooth. Clean exposed surfaces of set masonry, wet clay masonry units lightly if required, and remove loose masonry units and mortar before laying fresh masonry.
- D. Built-in Work: As construction progresses, build in items specified under this and other Sections of the Specifications. Fill in solidly with masonry around built-in items.
- E. Where built-in items are to be embedded in cores of hollow masonry units, place a layer of metal lath in the joint below and rod mortar or grout into core.
- F. Fill all cores in hollow concrete masonry units solidly with grout.

3.5 MORTAR BEDDING AND JOINTING

- A. Lay hollow masonry units as follows:
 - 1. With full mortar coverage on horizontal and vertical face shells.
 - 2. Bed webs in mortar in starting course on footings and in all courses of piers, columns, and pilasters, and where adjacent to cells or cavities to be filled with grout.
 - 3. For starting course on footings where cells are not grouted, spread out full mortar bed, including areas under cells.
 - 4. Bed cross webs.

- B. Lay horizontal-cell units with full bed joints, unless otherwise indicated. Keep drainage channels, if any, free of mortar. Form head joints with sufficient mortar so excess will be squeezed out as units are placed in position. Butter both sides of units to be placed, or butter one side of unit already in place and one side of unit to be placed.
 - C. Maintain joint thicknesses indicated, except for minor variations required to maintain bond alignment. If not indicated, lay walls with 1/4- to 3/8-inch thick joints.
 - D. Tool exposed joints slightly concave when thumbprint hard, using a jointer larger than the joint thickness, unless otherwise indicated.
- 3.6 BONDING OF MASONRY
- A. Intersecting and Abutting Walls: Unless vertical expansion or control joints are shown at juncture, bond walls together as follows:
 - 1. Provide individual metal ties not more than 16 inches o.c.
 - 2. Provide continuity with masonry joint reinforcement by using prefabricated “T” units.
- 3.7 ANCHORING MASONRY TO STRUCTURAL MEMBERS
- A. Anchor masonry to structural members where masonry abuts or faces structural members to comply with the following:
 - 1. Provide an open space not less than 1-inch in width between masonry and structural member, unless otherwise indicated. Keep open space free of mortar or other rigid materials.
 - 2. Anchor masonry to structural members with flexible anchors embedded in masonry joints and attached to structure.
 - 3. Space anchors as indicated, but not more than 24 inches o.c. vertically and 36 inches o.c. horizontally.
- 3.8 REINFORCED UNIT MASONRY INSTALLATION
- A. Placing Reinforcement: Comply with requirements ACI 530 Sec 3.4/ASCE 6/TMS 602.
 - B. Grouting: Do not place grout until entire height of masonry to be grouted has attained sufficient strength to resist grout pressure.
 - 1. Comply with requirements of ACI 530 Sec. 3.5/ASCE 6/TMS 602 for cleanouts and for grout placement, including minimum grout space and maximum pour height.
- 3.9 REPAIRING, POINTING, AND CLEANING
- A. Remove and replace masonry units that are loose, chipped, broken, stained, or otherwise damaged or that do not match adjoining units. Install new units to match adjoining units; install in fresh mortar, pointed to eliminate evidence of replacement.
 - B. Pointing: During the tooling of joints, enlarge voids and holes, except weep holes, and completely fill with mortar. Point up joints, including corners, openings, and adjacent construction, to provide a neat, uniform appearance. Prepare joints for sealant application.

- C. In-Progress Cleaning: Clean unit masonry as work progresses by dry brushing to remove mortar fins and smears before tooling joints.
- D. Final Cleaning: After mortar is thoroughly set and cured, clean exposed masonry as follows:
 - 1. Remove large mortar particles by hand with wooden paddles and nonmetallic scrape hoes or chisels.
 - 2. Test cleaning methods on sample wall panel; leave one-half of panel uncleaned for comparison purposes. Obtain Contracting Officer's approval of sample cleaning before proceeding with cleaning of masonry.
 - 3. Protect adjacent stone and non-masonry surfaces from contact with cleaner by covering them with liquid strippable masking agent, polyethylene film, or waterproof masking tape.
 - 4. Wet wall surfaces with water before applying cleaners; remove cleaners promptly by rinsing the surfaces thoroughly with clear water.
 - 5. Clean concrete masonry by cleaning method indicated in NCMA TEK 8-2 applicable to type of stain on exposed surfaces.

END OF SECTION

DIVISION 5 - METALS

SECTION 05500

METAL FABRICATIONS

PART 1 - GENERAL

1.1 GENERAL REQUIREMENTS

- A. Provide all miscellaneous metal fabrication work as indicated on the drawings, including but not limited to shower pipe column, grab rails, hand rails, sign posts, security gates, miscellaneous framing and supports (include all anchors, angles, bolts for items, and other accessories), and all others required for the complete installation of all work.
- B. Related Work Specified Elsewhere: SECTION 09902 – REPAINTING: Metal painting.

1.2 SUBMITTALS

- A. Submit in accordance with SECTION 01300 – SUBMITTALS.
- B. Product Data: Submit manufacturer's specifications, anchor details and installation instructions for products used in metal fabrications, including paint products and grouts.
- C. Shop Drawings: Submit shop drawings as required for all work in accordance with the contract drawings. Shop Drawings are intended to show accurate fabrication and installation methods reflecting true site conditions. Contractor shall verify that all the details shown in the shop drawings does indeed show actual site conditions/dimensioning prior to start of work. Shop drawings shall be referenced to sheet and detail being depicted. Show manner in which Contractor intends to fabricate work; show size and extent of all welds, anchors, etc. Include plans, elevations, component details, and attachments to other Work. Indicate materials and profiles of each metal member, fittings, joinery, finishes, fasteners, anchorages, and accessory items. Include setting drawings, templates, and directions for installing anchor bolts and other anchorages.
- D. Samples for Verification: Submit samples for each profile and pattern of fabricated metal and for each type of metal finish required, prepared on metal of same thickness and alloy indicated for the Work. If finishes involve normal color and texture variations, include sample sets, consisting of two or more units, showing the full range of variations expected. Include 6-inch-long samples of linear shapes.
- E. Qualification Data: Submit data for firms and persons specified in "Quality Assurance" Article to demonstrate their capabilities and experience. Include lists of completed projects with project names and addresses, names and addresses of architects and owners, and other information specified.

- F. Conformance: Where materials or fabrications are indicated to comply with certain requirements for design loading and system performance, include structural computations, material properties, and other information needed to verify conformance.
 - G. Certifications: Submit certificates of asbestos-free, lead-free, zinc-chromate-free, strontium-chromate-free, cadmium-free, and mercury free paint.
- 1.3 QUALITY ASSURANCE
- A. Shop Assembly: Preassemble items in shop to greatest extent possible to minimize field splicing and assembly. Disassemble units only as necessary for shipping and handling limitations. Clearly mark units for reassembly and coordinated installation.
 - B. Fabricator Qualifications: A firm experienced in producing metal fabrications similar to those indicated for this Project and with a record of successful in service performance, as well as sufficient production capacity to produce required units.
 - C. Qualifications of Welders: Only welders certified in the arc welding process shall perform work in connection with the work in this section. Comply with AMERICAN WELDING SOCIETY, AWS B3.0 for welding procedure and performance qualification.
- 1.4 SYSTEM PERFORMANCES
- A. Structural Performances: Provide assemblies which, when installed, comply with the following minimum requirements for structural performance, unless otherwise indicated.
 - 1. Gates: Intermediate grillage panels capable of withstanding a horizontal concentrated load of 200 lbf applied to one sq. ft. at any point in system, including intermediate rails, balusters or other elements composing infill area.
- 1.5 PROJECT CONDITIONS
- A. Field Measurements: Where metal fabrications are indicated to fit walls and other construction, verify dimensions by field measurements before fabrication and indicate measurements on Shop Drawings. Coordinate fabrication schedule with construction progress to avoid delaying the Work.
 - 1. Established Dimensions: Where field measurements cannot be made without delaying the Work, establish dimensions and proceed with fabricating metal fabrications without field measurements. Coordinate construction to ensure that actual dimensions correspond to established dimensions. Allow for trimming and fitting.
- 1.6 COORDINATION
- A. Coordinate installation of anchorages for metal fabrications. Furnish setting drawings, templates, and directions for installing anchorages, including sleeves, concrete inserts, anchor bolts, and items with integral anchors, that are to be embedded in concrete or masonry. Deliver such items to Project site in time for installation.
- 1.7 GUARANTEE
- A. Provide a two (2) year guarantee, which shall commence from Project Acceptance Date.
 - B. The Surety shall not be held liable beyond two (2) years of the Project Acceptance Date.

PART 2 - PRODUCTS

2.1 MATERIALS AND COMPONENTS

- A. Metal Surfaces, General: For metal fabrications exposed to view in the completed Work, provide materials selected for their surface flatness, smoothness, and freedom from surface blemishes. Do not use materials with exposed pitting, seam marks, roller marks, rolled trade names, or roughness.
- B. Stainless Steel Pipe: Type 316 stainless steel, standard weight (schedule 40), satin finish, with sizes and configurations as shown on the Drawings.
- C. Stainless-Steel Bars and Shapes: ASTM A276, Type 316L.
- D. Steel Plates, Shapes and Bars: ASTM A36/A36M, hot-dip galvanized.
- E. Steel Pipe: ASTM A53/A53M, Grade B, minimum yield stress of 35,000 psi, hot dip galvanized, standard weight (Schedule 40), unless otherwise indicated.
- F. Steel Tube: ASTM A500 or ASTM A501, hot-dip galvanized.
- G. Steel Wire Mesh Screen: Plain Square Mesh Weave 1 inch center to center openings and 0.250 inch Wire with 56.3 percent free area, hot-dip galvanized.
- H. Slotted Channel Framing: Cold-formed metal box channels (struts) complying with MFMA-4.
 - 1. Size of Channels: As indicated.
 - 2. Material: Galvanized steel, ASTM A653/A653M, commercial steel, Type B, with G90 (Z275) coating.
 - 3. Material: Cold-rolled steel, ASTM A1008/A1008M, commercial steel, Type B hot-dip galvanized after fabrication.
- I. Aluminum Extruded Bars and Tubes: ASTM B221, alloy 6063-T5/T52, clear anodized.
- J. Aluminum Plates and Sheets: ASTM B209, alloy 6061-T6, clear anodized.
- K. Brackets, Flanges, and Anchors: Cast or formed metal of the same type material and finish as supported rails, unless otherwise indicated.
- L. Non-shrink, Nonmetallic Grout: Factory-packaged, non-staining, noncorrosive, nongaseous grout complying with ASTM C1107. Provide grout specifically recommended by manufacturer for interior and exterior applications.

2.2 FASTENERS

- A. General: Unless otherwise indicated, provide Type 304 stainless-steel fasteners for exterior use. Select fasteners for type, grade, and class required.
- B. Steel Bolts: Regular hexagon-head type, ASTM A307, hot-dip galvanized.
- C. Stainless Steel Bolts and Screws: ASTM F593, Type 304.
- D. Stainless Steel Nuts: ASTM F594, Type 304.
- E. Lag Bolts and Screws: ASME B18.2.1, hot-dip galvanized.
- F. Washers and Nuts: Same material and finish as bolts.
- G. Expansion Anchors:
 - 1. Anchor Bolt and Sleeve: Anchor bolt and sleeve assembly of carbon steel components zinc-plated to comply with ASTM B633, Class Fe/Zn 5 with capability to sustain without failure, a load equal to 6 times the load imposed when installed in unit masonry and equal to 4 times the load imposed when installed in concrete as determined by testing per ASTM E488 conducted by a qualified independent testing agency.
 - 2. Metal Anchor Bolts, Straps, Hangers, Brackets and Other Inserts: Furnish to other trades the anchor bolts, straps, hangers, brackets and other inserts which are necessary for the final installation of work under this and other trades, where not specified to be furnished under the other sections of the specifications. This trade shall also furnish templates if required by others and shall check the installation of all bolts and inserts for accuracy. Anchor bolts and washers of same quality as bolt. All items shall be galvanized except use stainless steel at aluminum metals.
- H. Cast-in-Place Anchors in Concrete: Threaded or wedge type; galvanized ferrous castings, either ASTM A47/A47M malleable iron or ASTM A27/A27M cast steel. Provide bolts, washers, and shims as required, hot-dip galvanized, ASTM A153/ A153M.
- I. Toggle Bolts: FS FF-B-588, tumble-wing type, class and style as required, hot dipped galvanized.

2.3 FABRICATION, GENERAL

- A. Workmanship: Use materials of size and thickness shown or, if not shown, of required size and thickness to produce strength and durability in the finished product. Work to dimensions shown or accepted on the shop drawings, using proven details of fabrication and support. Use type of materials shown or specified for the various components of the Work.
- B. Form exposed work true to line and level, with accurate angles and surfaces and with straight sharp edges. Ease exposed edges to a radius of approximately 1/32-inch unless otherwise shown. Form bent-metal corners to smallest radius possible without causing grain separation or otherwise impairing work.

- C. Weld corners and seams continuously, complying with AWS recommendations. At exposed connections, grind exposed welds smooth and flush to match and blend with adjoining surfaces. Provide welds behind finish surfaces without distorting or discoloring exposed side.
 - D. Form exposed connections with hairline joints, flush and smooth, using concealed fasteners wherever possible. Use exposed fasteners of type indicated or, if not indicated, Phillips flat head (countersunk) screws or bolts.
 - E. Provide for anchorage of the type shown, coordinate with supporting structure. Fabricate and space anchoring devices to provide adequate support for intended use.
 - F. Cut, reinforce, drill, and tap miscellaneous metal work to receive finish hardware and similar items.
 - G. Fabricate joints which will be exposed to weather in a manner to exclude water or provide weep holes where water may accumulate.
 - H. Galvanizing: Provide all steel fabrications with hot-dip galvanized coating (G90), unless otherwise indicated, as follows:
 - 1. ASTM A153/A153M for galvanizing iron and steel hardware.
 - 2. ASTM A123/A123M for galvanizing rolled, pressed, and forged steel shapes, plates, bars, and strip 1/8-inch thick and heavier, and assembled steel products.
- 2.4 CORROSION PROTECTION
- A. Where metals are incompatible to other materials, the contact areas of these materials shall be back coated before erection with an approved bituminous paint or other insulation coating as recommended by the metal fabricator.
- 2.5 ROUGH HARDWARE
- A. Furnish bent or otherwise custom fabricated bolts, plates, anchors, hangers, dowels and other miscellaneous steel and iron shapes as required for framing and supporting woodwork, and for anchoring or securing woodwork to concrete or other structures.
 - B. Fabricate items of sizes, shapes and dimensions required. Furnish steel washers.
- 2.6 EQUIPMENT AND MISCELLANEOUS FRAMING SUPPORTS
- A. Provide equipment and miscellaneous framing and supports, as required to complete work.
 - B. Fabricate equipment and miscellaneous framing and supports to sizes, shapes and profiles indicated. Except as otherwise shown, fabricate from steel shapes, plates, and steel bars, for supports, of welded construction using mitered joints for field connection.
 - C. Galvanize all miscellaneous units and supports unless otherwise specified.

- D. Equip units with integrally welded anchors for casting into concrete or building into masonry. Furnish inserts if units must be installed after concrete is placed. Galvanize all miscellaneous frames and supports.

2.7 METAL GATES

- A. Fixed grillage gate and frames, unless otherwise indicated, shall consist of tubular steel for perimeter frames and horizontal intermediate members with vertical steel rods. Miter and weld all corners; butt weld horizontal rails to frame members and vertical rods to tubular steel members. Grind all welds smooth. Provide cutout in vertical gate frame for lockset. Provide 1-1/2 pair steel hinges welded to gate frame and jamb member, sized to support weight of gate leaf. Provide eyelets for padlocks to secure gates in open position. Hot-dip galvanize panels and gates after fabrication.
- B. Re-galvanizing of Zinc-Coated Surfaces: Re-galvanizing surfaces with galvanizing repair method and paint conforming to ASTM A780 (Standard Practice for Repair of Damaged and Uncoated Areas of Hot-Dip Galvanized Coatings) and SSPC – Paint 20 (Specification for Zinc-Rich Primer).

PART 3 - EXECUTION

3.1 PREPARATION

- A. Prior to all work of this section, the Contractor shall carefully inspect the installed work of all other trades and verify that all such work is complete to the point where fabrication and installation of the work of this section may properly commence.
- B. The Contractors shall make all required measurements in the field to ensure proper and adequate fit of all metal fabrication items.
- C. Installer must examine the areas and conditions under which metal fabrication items are to be installed and notify the Contractor in writing of conditions detrimental to the proper and timely completion of the Work. Do not proceed with the work until unsatisfactory conditions have been corrected in a manner acceptable to the Installer.

3.2 INSTALLATION

- A. Fastening to In-Place Construction: Provide anchorage devices and fasteners where necessary for securing miscellaneous metal fabrications to in-place construction; including threaded fasteners for concrete and masonry inserts, toggle bolts, through-bolts, lag bolts, wood screws, and other connectors as required.
- B. Cutting, Fitting, and Placement: Perform cutting, drilling, and fitting required for installation of miscellaneous metal fabrications. Set work accurately in location, alignment, and elevation, plumb, level, true, and free from rack, measured from established lines and levels. Provide temporary bracing or anchors in formwork for items which are to be built into concrete, masonry or similar construction.
- C. Connections: Fit exposed connections accurately together to form tight hairline joints. Weld connections which are not to be left as exposed joints, but cannot be shop welded

because of shipping size limitations. Grind exposed joints smooth, and touch-up repair paint. Do not weld, cut, or abrade the surfaces of units which have been hot-dip galvanized after fabrication and are intended for bolted or screwed field connections.

- D. Field Welding: Comply with AWS Code for procedures of manual shielded metal-arc welding, appearance and quality of weld made, and methods in correcting welding work.
 - 1. Clean areas to be repaired and remove slag from welds. Heat surfaces to which stick or paste material is applied, with a torch to a temperature sufficient to melt the metallic in stick or paste; spread molten material uniformly over surfaces to be coated and wipe off excess material.
- E. Grouting: Mix the specified and accepted grout with potable water and in the consistency recommended by the manufacturer in a non-contaminating container. Mix only the amount of grout that will be placed within the specified pot life of the material. Any grout that has set shall be discarded. Pour the grout in small amounts from one side only, tamping between pours to eliminated air pockets. Cure grout as recommended by the manufacturer.

3.3 CLEAN UP

- A. After installation, all surfaces shall be cleaned and ready to receive final treatment. All unused materials, tools and equipment shall be removed from the project site.
- B. All rubbish, debris, fines, etc., accumulated from the work of this section shall be removed from the project site and the area left neat and clean.

END OF SECTION

DIVISION 7 - THERMAL AND MOISTURE PROTECTION

SECTION 07920

JOINT SEALANTS

PART 1 - GENERAL

1.01 SUMMARY

- A. Provide all sealants to completely close all joints indicated on the drawings or specified to be sealed to a watertight condition, including the following:
- B. Related Work Specified Elsewhere:
 - 1. SECTION 09902 – REPAINTING: Coordinate work.

1.02 SUBMITTALS

- A. Submit in accordance with SECTION 01300 – SUBMITTALS.
- B. Product Data: Submit copies of manufacturer's product data and specifications for type of sealant required for approval.
- C. Material Safety Data Sheets (MSDS): Submit MSDS for each sealant product.
- D. Color Samples: Submit three (3) sets each of color finish samples of each sealant for approval.
- E. Guaranty: Submit guaranty as noted under item entitled "GUARANTY" herein below.

1.03 GUARANTY

- A. The Contractor shall submit a written guaranty on the sealant for a two (2) year period after the project acceptance date. The guaranty shall provide for the repair of all leaks as well as repair and replacement of sealant and damage to the building and/or its finishes at no cost to the State.
- B. The Surety shall not be liable beyond two (2) years from the project acceptance date.

1.04 QUALITY ASSURANCE

- A. Installer Qualifications: An experienced installer who has specialized in installing joint sealants similar in material, design, and extent to those indicated for this Project and whose work has resulted in joint-sealant installations with a record of successful in-service performance.
- B. Source Limitations: Obtain each type of joint sealant through one source from a single manufacturer.

- C. Preconstruction Compatibility and Adhesion Testing: Use manufacturers standard test methods to determine whether priming and other specific joint preparation techniques are required to obtain rapid, optimum adhesion of joint sealants to joint substrates.

1.05 PERFORMANCE REQUIREMENTS

- A. Provide elastomeric joint sealants that establish and maintain watertight and airtight continuous joint seals without staining or deteriorating joint substrates.

1.06 PRODUCT HANDLING

- A. Delivery: Deliver sealants to the jobsite in sealed containers labeled to show the designated name, formula, or specification number, lot number, color, date of manufacture, shelf life, curing time, manufacturer's directions, and name of manufacturer.
- B. Storage: Store and handle materials in compliance with manufacturer's written instructions to prevent their deterioration or damage due to moisture, high temperatures, contaminants, or other causes.
- C. All sealant materials shall be installed prior to expiration of shelf life.

1.07 PROJECT CONDITIONS

- A. Inspection: Examine joint surfaces and backing, and their anchorage to the structure, and conditions, under which joint sealer work is to be performed, and notify Contractor in writing of conditions detrimental to proper completion of the work and performance of sealers. Do not proceed with joint sealer work until unsatisfactory conditions have been corrected in a manner acceptable to Installer. On surfaces to be painted, install sealants prior to painting. Coordinate with SECTION 09902 - REPAINTING.
- B. Weather Conditions: Do not proceed with installation of sealants under adverse weather conditions. Proceed with the work only when forecasted weather conditions are favorable for proper cure and development of high early bond strength.

PART 2 - PRODUCTS

2.01 MATERIALS

- A. Sealant Backer Rod: Compressible rod stock of polyethylene foam, polyethylene-jacketed polyurethane foam, butyl rubber foam, neoprene foam or other flexible, permanent, durable, non-absorptive material as recommended for compatibility with sealant by the sealant manufacturer to control the joint depth for sealant placement, to break bond of sealant at bottom of joint, to form optimum shape of sealant bead on back side, and to provide a highly compressible backer which will minimize the possibility of sealant extrusion when joint is compressed. Do not use oakum or other types of absorptive materials as backstops.
- B. Bond-Breaker Tape: Polyethylene tape or other plastic tape as recommended by sealant manufacturer for preventing sealant from adhering to rigid, inflexible joint filler materials or joint surfaces at back of joint where such adhesion would result in sealant failure.

- C. Primer for Sealants: Non-staining, as recommended by the sealant manufacturer.
- D. Masking Tape: Non-staining, non-absorbent material compatible with joint sealants and surfaces adjacent to joints.
- E. Sealants:
 - 1. Sealant No. 1, At Exterior Vertical and Overhead Joints: One-part polyurethane-based sealant, conforming to ASTM C 920, Type S, Grade NS, Use NT, Class 25 as applicable. Provide one of the following, or approved equal products of other manufacturers:
 - a. Cherm-Calk 900; Bostik Inc.
 - b. Dymonic; Tremco.
 - c. Dynatrol I; Pecora Corp.
 - d. Sikaflex 1a; Sika Corp.
 - e. NP-1; Sonneborn
 - 2. Sealant No. 2, At Interior Vertical and Overhead Joints: Non-Elastomeric Sealant; acrylic-emulsion type, conforming to ASTM C 834. Provide one of the following, or approved equal products of other manufacturers:
 - a. AC-20 Acrylic Latex; Pecora Corp.
 - b. Tremflex 834; Tremco, Inc.
 - c. Chem-Calk 600; Bostik Construction Products Div.
 - d. Sonolac; Sonneborn.
 - 3. Sealant No. 3, At All Horizontal Traffic-Bearing Joints: Two-part polyurethane-based sealant, conforming to ASTM C 920, Type M, Grade P, Use T, Class 25. Provide one of the following, or approved equal products of other manufacturers:
 - a. Chem-Calk 550; Bostik Inc.
 - b. Urexpan NR-200; Pecora Corp.
 - c. SL 2; Sonneborn
 - 4. Sealant No. 4, Silicone Sealant: Mildew-resistant, conforming to ASTM C 920; Type S; Grade NS; Class 25; Use NT, formulated with fungicide; intended for sealing interior joints between plumbing fixtures and wall surfaces. Provide one of the following or approved equal products of other manufacturers:
 - a. Dow Corning 786 Mildew Resistant; Dow Corning Corp.
 - b. SCS 1702 Sanitary; General Electric Co.

- c. 898 Silicone Sanitary Sealant; Pecora Corp.
 - d. Tremsil 600 White; Tremco.
- F. Bedding Compound: For installation of thresholds and similar items indicated to be bedded in sealant, use a preformed butyl-polyisobutylene sealant tape. Size of tape as required for the specific application. Provide one of the following, or approved equal:
- 1. Extru-Seal; Pecora Corp.
 - 2. 440 Tape; Tremco, Inc.
 - 3. Chem-Tape 40; Bostik Construction Products Div.

PART 3 - EXECUTION

3.01 MANUFACTURER'S INSTRUCTIONS

- A. Comply with manufacturer's printed instructions except where more stringent requirements are shown or specified, and except where manufacturer's technical representative directs otherwise.

3.02 EXAMINATION

- A. Examine joints indicated to receive joint sealers, with Installer present, for compliance with requirements for joint configuration, installation tolerances and other conditions affecting joint sealer performance. Do not proceed with installation of joint sealers until unsatisfactory conditions have been corrected.

3.03 PREPARATION

- A. Surface Cleaning of Joints: Clean out joints immediately before installing joint sealers to comply with recommendations of joint sealer manufacturers and the following requirements:
 - 1. Remove all foreign material from joint substrates which could interfere with adhesion of joint sealer, including dust; paints, except for permanent, protective coatings tested and approved for sealant adhesion and compatibility by sealant manufacturer; oil; grease; waterproofing; water repellants; water; and surface dirt.
 - 2. Clean concrete, masonry, and similar porous joint substrate surfaces, by brushing, grinding, mechanical abrading, or a combination of these methods to produce a clean, sound substrate capable of developing optimum bond with joint sealers. Remove loose particles remaining from above cleaning operations by vacuuming or blowing out joints with oil-free compressed air.
 - 3. Remove laitance and form release agents from concrete.
 - 4. Steel Surfaces in Contact with Sealant: Scrape and wirebrush to remove loose mill scale. Remove dirt, oil, or grease by solvent cleaning, and wipe surfaces with clean cloths.

5. Clean metal, glass, glazed surfaces of hard tile; and other nonporous surfaces by chemical cleaners or other means which are not harmful to substrates or leave residues capable of interfering with adhesion of joint sealers.
- B. Joint Priming: Prime joint substrates where indicated or where recommended by joint sealer manufacturer based on preconstruction joint sealer-substrate tests or prior experience. Apply primer to comply with joint sealer manufacturer's recommendations. Confine primers to areas of joint sealer bond, do not allow spillage or migration onto adjoining surfaces.
 - C. Masking Tape: Use masking tape where required to prevent contact of sealant with adjoining surfaces which otherwise would be permanently stained or damaged by such contact or by cleaning methods required to remove sealant smears. Remove tape immediately after tooling without disturbing joint seal.

3.04 INSTALLATION OF JOINT SEALERS

- A. General: Comply with joint sealant manufacturers' printed installation instructions applicable to products and applications indicated, except where more stringent requirements apply. Do not apply sealants on wet surfaces or when the surface temperature exceeds 130 degrees F.
- B. Sealant Installation Standard: Comply with recommendations of ASTM C 1193 for use of joint sealants as applicable to materials, applications and conditions.
- C. Latex Sealant Installation Standard: Comply with requirements of ASTM C 1193 for use of latex sealants.
- D. Installation of Sealant Backings: Install sealant backings to comply with the following requirements:
 1. Install joint fillers of type indicated to provide support of sealants during application and at position required to produce the cross-sectional shapes and depths of installed sealants relative to joint widths which allow optimum sealant movement capability.
 - a. Do not leave gaps between ends of joint fillers.
 - b. Do not stretch, twist, puncture, or tear joint fillers.
 - c. Remove absorbent joint fillers which have become wet prior to sealant application and replace with dry material.
 2. Install bond breaker tape between sealants and joint fillers, compression seals, or back of joints where adhesion of sealant to surfaces at back of joints would result in sealant failure.
 3. Install compressible seals serving as sealant backings to comply with requirements indicated above for joint fillers.
- E. Primer: Immediately prior to application of the sealant, clean out all loose particles from joints. Where recommended by sealant manufacturer, apply primer to joints in concrete,

masonry units, wood, and other porous surfaces in accordance with compound manufacturer's instructions. Do not apply primer to exposed finish surfaces.

- F. Installation of Sealants: Install sealants by proven techniques that result in sealants directly contacting and fully wetting joint substrates, completely filling recesses provided for each joint configuration, and providing uniform, cross sectional shapes and depths relative to joint widths which allow optimum sealant movement capability.
- G. Tooling of Non-sag Sealants: Immediately after sealant application and prior to time skinning or curing begins, tool sealants to form smooth, uniform beads of configuration indicated, to eliminate air pockets, and to ensure contact and adhesion of sealant with sides of joint. Remove excess sealants from surfaces adjacent to joint. Do not use tooling agents which discolor sealants or adjacent surfaces or are not approved by sealant manufacturer.
 - 1. Provide concave joint configuration per Figure 5A in ASTM C 1193, unless otherwise indicated.
 - 2. Provide flush joint configuration per Figure 5B in ASTM C 1193, where indicated.

3.05 JOINT SEALANT SCHEDULE

- A. Sealant and Location: Install sealants indicated in joints fitting descriptions and locations as well as in locations where sealant is typically applied and as shown on the drawings, including but limited to, the following locations.
- B. Sealant No. 1:
 - 1. Exterior joints and recesses formed where frames of windows and doors adjoin masonry, concrete, or metal frames. Use sealant at both exterior and interior surfaces of exterior wall penetrations.
 - 2. Metal-to-metal joints where sealant is required, indicated, or specified.
 - 3. Exterior locations, not otherwise indicated or specified.
- C. Sealant No. 2:
 - 1. Small voids between walls or partitions and adjacent casework, shelving, door frames, built-in or surface-mounted equipment and fixtures, and similar items.
 - 2. Perimeter of frames at doors and windows which adjoin exposed interior concrete and masonry surfaces.
 - 3. Interior locations, not otherwise indicated or specified, where small voids exist between materials specified to be painted.
- D. Sealant No. 3:
 - 1. Seats of metal thresholds for exterior doors.
 - 2. Control and expansion joints in floors, slabs, flooring, and walkways.

- E. Sealant No. 4:
 - 1. Joints between plumbing fixtures and adjoining surfaces.
 - 2. Joints occurring where substrates change.
- 3.06 CLEANING
 - A. Immediately scrape off fresh sealant compound that has been smeared on masonry or porous surfaces and rub clean with a solvent as recommended by the compound manufacturer. Upon completion of sealant compound application, remove all remaining smears and stains resulting therefrom and leave the work in a clean, uniform, and neat condition.
- 3.07 PROTECTION
 - A. Protect areas adjacent to joints from compound smears. Masking tape may be used for this purpose if removed 5 to 10 minutes after the joint is filled.
 - B. Protect joint sealers during and after curing period from contact with contaminating substances or from damage resulting from construction operations or other causes so that they are without deterioration or damage at time of project acceptance. If, despite such protection, damage or deterioration occurs, cut out and remove damaged or deteriorated joint sealers immediately and reseal joints with new materials to produce joint sealer installations with repaired areas indistinguishable from original work.

END OF SECTION

DIVISION 09 – FINISHES

SECTION 09902

REPAINTING

PART 1 - GENERAL

1.01 SUMMARY

- A. Surface preparation and field application of paints and coatings to new and existing surfaces.

- B. Areas (Surfaces) to be Painted:
 - 1. Interior surfaces to be painted: All existing interior painted surfaces shall be painted unless otherwise indicated on the plans and/or specifically deleted in these specifications. Interior surfaces are defined as those surfaces not exposed to weather in an area enclosed by 4 walls, and also a surface painted with a color matching the existing interior color.

Extent of treatment for special items is as follows:
 - a. All interior surfaces, walls, ceiling, trims, etc.

 - b. Closets and cabinets with doors - interior surfaces shall not be treated unless specifically noted otherwise.

 - c. Doors (including closet) - both faces, top, bottom, and side edges. Cabinet doors - both faces and all edges.

 - d. Wood slats/pickets - refer to exterior work.

 - e. PVC pipes, G.I. Pipes and conduits, electrical boxes, and similar appurtenances.

 - f. Light fixture stems and uni-strut.

 - 2. Exterior Surfaces to be Painted: All existing exterior painted surfaces shall be painted unless otherwise indicated on the plans and/or specifically deleted in these specifications. Exterior surfaces to be painted shall be any surface exposed to weather in an area not enclosed by 4 walls and a roof. Also, a surface shall be considered and painted as an exterior surface whenever the color is that of the existing exterior color.

Extent of treatment for special items is as follows:
 - a. Wood slats/pickets - all surfaces inside and outside.

 - b. Exterior doors - both faces, top, bottom and side edges.

 - c. Grille work or mesh - both sides and inside openings. Galvanized steel security screens and related steel framing and attachments. (Do not paint existing anodized aluminum security screens).

- f. G.I., metal, copper, and PVC pipes and conduits, electric boxes, exhaust ducts, fan housing and similar appurtenances - exposed surfaces.
 - g. PVC, metal, and copper flashings, gutters, downspouts, drain lines and brackets.
 - h. Eaves and all surfaces (including undersides) of overhangs, brows, and similar exterior architectural features of the buildings.
 - i. Guardrail walls, guardrails and handrails, fixed benches, and similar separate but permanent features of the buildings.
 - j. Security gates and similar exterior architectural features of the buildings.
 - k. All areas damaged during construction.
 - l. Exterior structures such as benches, enclosures, etc.
3. Surfaces Not to be Painted:
- a. Metal surfaces of anodized aluminum, stainless steel and similar finished metal surfaces shall not require painting unless previously painted or otherwise scheduled.
 - b. Factory/Pre-finished Items: When factory finishing or installer-finishing is specified, such items shall not require painting unless otherwise scheduled.
 - d. Labels: Do not paint over any code-required labels, such as Underwriters' Laboratories, or any equipment identification, performance rating, name, or nomenclature plates.
 - e. NSSB data equipment cable connection.
4. "Paint" as used herein means all coating system materials, including primers, enamels, sealers, stains, varnish, and fillers, and other applied materials whether used as prime, intermediate or finish coats, except as specifically noted herein.

1.02 RELATED SECTIONS

A. SECTION 07920 - SEALANTS.

B. Divisions 15, identification marking of painting of mechanical equipment and apparatus.

1.03 REFERENCES

A. ASTM D16 - Definition of terms relating to Paint, Varnish, Lacquer and Related Products.

B. ASTM D2016 - Test Method for Moisture Content of Wood.

C MPI (Master Painter's Institute) - Approved Product List.

D. PCA (Portland Cement Association) - Painting Concrete.

- E. PCDA (Painting and Decorating Contractors of America - Painting - Architectural Specification Manual.
 - F. SSPC (Steel Structures Painting Council) - Steel Structures Painting Manual.
- 1.04 DEFINITIONS
- A. Conform to ASTM D16 for interpretation of terms used in this section.
- 1.05 SUBMITTALS
- A. Submit in accordance with SECTION 01300 - SUBMITTALS.
 - B. Product Data:
 - 1. Materials List: Provide an inclusive list of required patching and coating materials. Indicate each material and cross-reference specific coating, finish system, and application. Identify each material by manufacturer's catalog number and general classification.
 - a. For products with premixed colors, provide manufacturer's standard color chips for selection by Contracting Officer.
 - 2. Manufacturer's Information: Provide data on all listed materials, including:
 - a. Thinning and mixing instructions
 - b. Application instructions and required mil film thicknesses.
 - c. Manufacturer's Material Safety Data Sheets.
 - C. Certifications: Provide a letter certifying paints and coatings are free of asbestos, lead, zinc-chromate, strontium chromate, cadmium, and mercury and mercury compounds. Provide a letter certifying the amounts of mildewcide added by both the paint manufacturer and paint supplier. Provide a letter certifying that abrasive blast media are free of crystalline silica.
 - D. Schedule of Finishes: Provide finish schedule including paint spread rates required to achieve final dry film thickness indicated in the schedule.
 - E. Schedule of Operations: Provide a work schedule showing sequence of operation and installation dates.
 - F. Samples:
 - 1. Submit color and finish samples, at manufacturers normal paint chip size illustrating range of colors and textures available for each surface finishing product scheduled.
 - 2. Submit paint finish samples, 8.5 inches x 11 inches in size illustrating selected colors and textures for each selection. Divide sample in horizontal strips showing prime and overlapping second and finish coats. Show coat tinting. Prepare transparent finish samples on same material as that on which coating will be applied. Identify each sample.
 - G. Manufacturer's Instructions: Indicate special surface preparation procedures, and substrate conditions requiring special attention. Refer to Part 3 EXAMINATION Section

- H. Qualification Data: For Applicator.
- 1.06 REGULATORY REQUIREMENTS
- A. Comply with State OSHL (Occupancy Safety and Health Law) and pollution controls regulations of the State Department of Health and EPA.
- 1.07 QUALITY ASSURANCE
- A. Applicator Qualifications: A firm or individual experienced in applying paints and coatings similar in material, design, and extent to those indicated for this Project, whose work has resulted in applications with a record of successful in-service performance.
- B. Source Limitations: Obtain block fillers and primers for each coating system from the same manufacturer as the finish coats.
1. Exception: Alkali resistant primers if compatible with the intermediate coat paint products.
- C. In addition, the Contracting Officer shall have the right to require the immediate removal of any paint applicator who demonstrates negligence, lack of competence or repeated non-compliance with the contract requirements.
- 1.08 DELIVERY STORAGE AND HANDLING
- A. Deliver materials to Project site in manufacturer's original, unopened packages and containers bearing manufacturer's name and label and the following information:
1. Product name or title of material.
 2. Product description (generic classification or binder type).
 3. Manufacturer's brand name and lot number and date of manufacture.
 4. Contents by volume, for pigment and vehicle constituents.
 5. Thinning instructions.
 6. Application instructions and coverage.
 7. Color name and number.
 8. VOC content.
- B. Storage
1. Non-flammable Materials: Store materials not in use in tightly covered containers in a well-ventilated area. Maintain storage containers in a clean condition, free of foreign materials.
 2. Flammable Materials: Store in such a manner as to prevent damage. No paint material, empty cans, paint brushes and rollers may be stored in the building(s). Store these items in separate storage facilities away from the building(s). Contractor may furnish a separate job site storage structure, if the structure complies with the requirements of the local Fire Department. Keep the storage

area shall clean. Lock any storage structures when not in use or when no visual supervision is possible.

C. All rejected materials shall be removed from the job site immediately.

1.09 PROJECT CONDITIONS

- A. Do not apply materials when surfaces and ambient temperatures are outside the ranges required by the paint product manufacturer. Do not apply exterior coatings during rain or when relative humidity is outside the humidity ranges required by the paint product manufacturer.
- B. Protect public, pedestrians and tenants from injury. Provided, erect and maintain safety barricades around scaffolds, hoists and where construction operations create hazardous conditions.
- C. Completed Work: Provide necessary protection for wet paint surfaces.
- D. Protective Covering and Enclosures: Provide and install clean sanitary drop cloth or plastic sheets to protect furniture, equipment, floor and other areas that are not scheduled for treatment. Remove any paint applied to surfaces not scheduled for treatment.
- E. Fire Safety: Contractor and its employees shall not to smoke in the vicinity of the paint storage area. Exercise precautions against fire at all times and remove waste rags, plastic (polyester sheets), empty cans, and other similar items from the site at the end of each day.
- F. Safeguarding Property: Safeguard the work and also the property of the State and other individuals in the vicinity of Contractor's work. Make good on any damages and for losses to work or property caused by Contractor or its employee's negligence. Where damaged property cannot be cleaned and restored to its original condition (i.e. prior to being damaged) replace it with a new product of equal quality. No proration or use of "used" products will be permitted.
1. For painting operation, assume that cars will not be temporarily relocated from parking areas during the painting operations.
- H. Other Incidental Work to be Performed by Contractor:
1. Unless otherwise specified, the Contractor is responsible for moving about all equipment to provide himself with sufficient working space.
- The Contractor shall protect these items and make good any damage to them at no cost to the State. After the painting is completed, the Contractor shall replace all equipment to their original locations.
- I. Trim back shrubbery and plants shall 6-inches from surfaces to be painted.

1.10 COMPATIBILITY OF PAINTING SYSTEMS AND SUBSTRATES

- A. The Contractor shall ensure that painting systems specified are compatible with existing painted surfaces. Alkyd paints shall not be applied over existing latex coating. Alkyd paints shall not be used over cementitious surfaces. Latex paints shall not be applied directly over alkyd paints without proper conditioner and approval by the Contracting Officer.

- B. Field Tests for Alkyd or Latex Paints: The Contractor shall perform the following field tests for compatibility of substrates to new paint systems prior to ordering paint:
1. Latex films will dissolve when wiped with rubbing alcohol; alkyd films will not.
 2. When sanded, latex films will "clog" sandpaper; alkyd films will sand clean.
 3. Alkyds will soften after applying a 10 percent solution of Drano in water; latex films will not soften.
 4. Alkyds will burn when exposed to a flame; latex film will not burn.
 5. Paints which do not respond to 2 or more of these tests are probably epoxy, urethane, or other type of coating.
 6. Provide a packaged swab test in accordance with the package directions.
 7. Existing paint identified or suspect of having lead-containing paint shall be tested in a manner that does not produce airborne or uncontrolled lead debris.
- C. Should there be any discrepancies between the specified Schedule of Finishes and the existing paint systems, the Contractor shall notify the Contracting Officer in writing of any incompatible systems specified and submit a revised Schedule of Finishes for approval when necessary. With the approval of the revised Schedule of Finishes, the Contractor shall make any corrections and/or revisions necessary to resolve the discrepancies and/or inconsistencies. The Contractor shall not proceed with any painting systems that are incompatible, although specified otherwise, until all incompatible conditions detrimental for the proper application and performance of the painting systems have been corrected. The failures due to the application of the incompatible paint systems shall be corrected at no additional cost to the State. Proceeding with the work shall imply acceptance of the specified Schedule of Finishes and the compatibility with the existing painted surfaces by the Contractor.

1.11 MINIMUM PAINTING WORK

- A. Unless noted otherwise, minimum interior painting work area shall be the complete inside surfaces of one room. Minimum exterior painting work area shall be one side of a single story building or one side of one story on multiple story buildings.

1.12 WARRANTY

- A. Contractor shall provide a two (2) year guarantee that the work performed under this section conforms to the contract requirements and is free of any defect of material or workmanship.

1.13 EXTRA MATERIAL

- A. Provide extra paint in each of the different colors, types and surface textures of exterior and interior paint to the user/school upon completion of the project. Paint shall be in unopened one gallon containers and labeled with color, type, texture, room locations, and date in addition to manufacturer's label.
1. Provide 5 gallons of each color for paint used over large areas, such as the exterior of the building and in several classrooms.
 2. Provide one gallon of each color for all other areas.

PART 2 - PRODUCTS

2.01 PAINT MATERIALS, GENERAL

- A. Material Compatibility: Provide block fillers, patching materials, primers, and finish-coat materials that are compatible with one another and with the substrates indicated under conditions of service and application, as demonstrated by manufacturer based on testing and field experience.
- B. Material Quality: Provide manufacturer's best-quality paint material of the various coating types specified that are factory formulated and recommended by manufacturer for application indicated. Paint-material containers not displaying manufacturer's product identification will not be acceptable.
 - 1. Proprietary Names: Use of manufacturer's proprietary product names in the Paint Systems Schedule in Part 3 below to designate colors or materials, is not intended to imply that products named are required to be used to the exclusion of equivalent products of other manufacturers. Furnish manufacturer's material data and certificates of performance for proposed products to be used.
 - 2. Equivalency: Equivalent products to the specified products are listed in the Master Painter's Institute's "Architectural Painting Specification Manual."
 - 3. Substitution: Requests for substitution of a product or product if a manufacturer is not on the Approved product list will be evaluated for equivalency based on product test results per the test criteria of the Master Painter's Institute.
- C. Colors: As indicated in the drawings.
- D. Hazard Materials: Do not use paint or paint products containing asbestos, lead, mercury or mercury compounds, zinc chromates, strontium-chromate, or cadmium. Do not use abrasive blast media that contain crystalline silica.
- E. Mildew Stains: Provide spot priming of product equal to Bulls Eye Odorless or Cover Stain, as required for existing stains.
- F. Exterior Paints: Provide semi-gloss unless scheduled otherwise.
 - 1. Exterior Acrylic Semi-Gloss Paint complete with tint bases to color as scheduled or to match existing including dark and specialty colors (not limited to green, blue, red, yellow, and brown), products must meet or exceed the following:
 - a. Acrylic semi-gloss, exterior finish for wood, masonry, metal, plaster, and drywall.
 - b. Semi-gloss/satin finish: Gloss at 60 degrees 45-50.
 - c. Resin: 100 percent acrylic.
 - d. Pigment: Minimum 90 percent titanium dioxide.
 - f. Viscosity: 95 - 105 KU.
 - g. Percent Solids by Volume: 35 percent minimum.

- h. Weight per Gallon: 10.5 pounds minimum.
 - i. To be as scheduled, except Sherwin Williams Super Paint Exterior Gloss and Semi-Gloss with accepted deviations of above performance requirements is accepted as an equal.
- G. Primers: Provide universal type that is capable of being used over existing alkyd and latex substrates or primers that are specifically compatible with each existing substrate.
- 1. Typical Primer/Sealer including tinting to match color of finish paint:
 - a. Primer, interior/exterior, oil base, all purpose for wood, concrete, clean galvanized metal, aluminum, plaster, drywall, and hardboard.
 - b. Undercoat for gloss latex or alkyd enamels.
 - c. Able to sand and recoat in one hour.
 - d. Virtually VOC free product.
 - e. Tinting: Light to mid-tone.
 - f. Stain killer.
 - g. To be Zinsser Cover Stain, Sherwin Williams PrepRite Quick Seal Y24W980, or equal.
 - 2. Odorless Interior Primer/Sealer including tinting to match color of finish paint:
 - a. Primer, interior, oil base, for wood, plaster, drywall, hardboard, paneling, stucco, and metal.
 - b. Odorless.
 - c. Undercoat for gloss latex or alkyd enamels.
 - d. Able to sand and recoat in 2 hours.
 - e. Virtually VOC free product.
 - f. Tinting: Light to mid-tone.
 - g. Stain killer.
 - h. To be Zinsser Bulls Eye Odorless, Sherwin Williams PrepRite ProBlock Odorless B49W20, or equal.
 - 3. Special Primers: Provide special primers for uncoated copper, PVC, or other metals as required and recommended by the paint manufacturer for each condition required.
- H. Except for metal primers all paint shall contain the maximum amount of mildewcide per gallon of paint permitted by the mildewcide manufacturer without adversely

affecting the quality of the paint. Contractor shall pre-mix mildewcide into all interior and exterior paints and primers except as specified otherwise. Mercurial fungicide shall not be used.

2.02 MISCELLANEOUS MATERIALS

- A. Provide patching and repair materials. Compatible with paint finishes and substrates. Use weather resistant materials for exterior surfaces and surfaces exposed to moisture.
- B. Accessories
 - 1. General: Provide other materials not specifically indicated but required to achieve the finishes specified, of commercial quality.
 - 2. Thinners: Thinning of paint shall be done using material recommended by the manufacturer. Mix proprietary products according to manufacturer's requirements. Do not use compound thinner, mineral oil, kerosene, refined linseed oil, or gasoline for thinning.

PART 3 - EXECUTION

3.01 EXAMINATION

- A. Examine substrates, areas, and conditions, with Applicator present, for compliance with requirements for paint application. Comply with procedures specified in PDCA P4.
 - 1. Proceed with paint application only after unsatisfactory conditions have been corrected and surfaces receiving paint are thoroughly dry.
 - a. Ensure that concrete and masonry surfaces are cured, are within acceptable alkalinity and dried to meet paint manufacturer's recommendations.
 - b. Measure moisture content of surfaces using an electronic moisture meter. Do not apply finishes unless moisture content of surfaces are below the following maximums:
 - 1) Plaster and Gypsum Wallboard: 12 percent.
 - 2) Masonry, Concrete and Concrete masonry units: 12 percent.
 - 3) Interior Wood: 15 percent, measured in accordance with ASTM D2016.
 - 4) Exterior Wood: 15 percent, measured in accordance with ASTM D2016.
 - c. Start of painting will be construed as Applicator's acceptance of surfaces and conditions within a particular area.

3.02 COORDINATION OF WORK

- A. Review other Sections in which primers are provided to ensure compatibility of the total system for various substrates. On request, furnish information on characteristics of finish materials to ensure use of compatible primers.
- B. Notify Contracting Officer about anticipated problems when using the materials specified over substrates primed by others.

3.03 PREPARATION

- A. General: Remove hardware and hardware accessories, plates, machined surfaces, lighting fixtures, and similar items already installed that are not to be painted. If removal is impractical or impossible because of size or weight of the item, provide surface-applied protection before surface preparation and painting.
 - 1. After completing painting operations in each space or area, reinstall items removed using workers skilled in the trades involved.

- B. Cleaning: Before applying paint or other surface treatments, clean substrates of substances that could impair bond of the various coatings. Remove oil and grease before cleaning.
 - 1. Schedule cleaning and painting so dust and other contaminants from the cleaning process will not fall on wet, newly painted surfaces.

- C. Surface Preparation: Clean and prepare surfaces to be painted according to manufacturer's written instructions for each particular substrate condition and as specified.
 - 1. General: Correct defects and clean surfaces which affect work of this section. Remove existing coatings that exhibit loose surface defects.
 - a. Provide barrier coats over marks, patches, and other imperfections which may bleed through surface finish.
 - b. Remove from surfaces to be repainted all foreign matter such as nails, screws, staples, tape and gum.
 - c. Remove all loose, blistered, scaled, crazed or chalky finish to an existing tight and firm finish.
 - d. Remove mildew as noted in PREPARATION Article.
 - e. Spot prime areas where bare wood, concrete, masonry, plaster, fill, seal or patched material is exposed with the specified primer and feather out onto adjacent paint.
 - 2. Wash all surfaces with a solution of tri-sodium phosphate and water or other appropriate solution to remove any accumulated film of wax, oil, grease, smoke, dust, dirt, chalking or other foreign matter which would impair the bond of, or bleed through the new paint finish. After washing, rinse the surface with potable water and allow to thoroughly dry. Rinsing may be performed by high pressure water washing as noted in PREPARATION Article.
 - a. Surfaces shall dry a minimum of 24 hours before the application of primers. For wood surfaces drying shall continue until the moisture content of the wood is less than 15 percent. For concrete and concrete masonry surfaces test for alkali and moisture.
 - 3. Lightly sand the surface where existing finish remains tight and firm. Where the paint has been removed, sand the edges of scarred areas to a smooth feathered edge.
 - 4. Fill holes (nail, tack, staple, and other similar items), cracks, open joints and other imperfections with appropriate compound and allow to set (door and trim included). Seal all openings which will permit the entrance of water. Sealing

compounds shall be compatible with the substrate, primer and paint. Apply and allow sealants to set in accordance with the manufacturer's recommendations.

5. Cementitious Materials: Seal all cracks hairline to 1/8 inch in width with concrete patching compound. All cracks over 1/8 inch in width and holes 1/4 inch diameter or greater shall be sealed with a latex modified or epoxy modified reinforced patching system before paint application. All patching shall be done in accordance with the patching manufacturer's recommendations and instructions. Apply texture, if required, to match existing textured surfaces.
 - a. Surfaces where ceramic tile are to be removed, remove all mortar and foreign material (mechanically and/or manually). Surface must be free of laitance, concrete dust, dirt, and mortar. Fill holes, air pockets and other voids with a cement-patching compound (per ASTM D4261).
6. Plaster Surfaces: Scarred plaster areas shall be patched with appropriate plaster materials. Fill holes, cracks, open joints and damaged areas with vinyl base or latex modified patching system. Apply texture, if required, to match existing textured surfaces.
7. Wood:
 - a. Exterior: Wash glu-laminated wood with solvent to remove grease and dirt prior to sealing.
 - b. Seal knots, pitch streaks, and sappy sections with sealer. Fill fastener holes and cracks after priming has dried; sand between coats.
8. Ferrous and Galvanized Metal Surfaces:
 - a. Comply with preparation requirements of the Steel Structures Painting Council (SSPC) Standard SP3.
 - b. Remove rust, loose mill scale and blistering / loose paint by power tool chipping, de-scaling, sanding, wire brushing and grinding down to bare metal. Only tightly adhering surface rust, mill scale and paint which cannot be removed with a dull putty knife may remaining. Do not burnish the surfaces during cleaning.
 - c. Completely wipe surfaces with mineral spirits or other appropriate solution to remove accumulated film of wax, oil, grease, smoke, dust, dirt, chalky or other foreign matter which would impair the bond of, or bleed through the new paint finish. Patch imperfections, holes, dents to form a smooth surface.
 - d. Lightly sand the surface where existing finish remains tight and firm. Where the paint has been removed, sand the edges of scarred areas to a smooth feathered edge. Allow the surfaces to thoroughly dry and immediately spot prime bare metal areas with the specified primer and feather out onto adjacent paint.
9. Aluminum Surfaces Scheduled for Paint Finish:
 - a. Remove surface contamination by steam or high pressure wash.
 - b. Remove oxidation with acid etch and solvent washing.

- c. Apply etching primer immediately following cleaning.
10. Copper Surfaces Scheduled for Paint Finish:
- a. Remove contamination by steam, high pressure wash, or solvent clean.
 - b. Apply vinyl etch primer immediately following cleaning.
- D. High Pressure Water Washing Preparation:
- 1. High pressure water washing may be used in lieu of brush washing to remove loose paint material, chalking, dirt, and debris from exterior wood, concrete and masonry surfaces to be painted. Use skilled mechanics experienced in the use and operation of the sprayer equipment.
 - 2. High pressure water washing does not replace proper preparatory work such as sanding of the substrate prior to painting. Remove surface contaminants and loose paint material remaining after pressure washing by other means.
 - 3. Ensure the pressure rating of the sprayer equipment will not damage the substrate. Ensure the nozzle type and size is appropriate to clean the surface without damaging the substrate. Restore or repair any damage surfaces to its original condition.
 - 4. Take precautions prevent over-spray and water infiltration into the building through doors, windows, vents, louvers, cracks and other building openings. Seal openings. Immediately clean water and debris that entered the building. Restore or repair any damage surfaces to its original condition.
 - 5. For mildew removal, use high pressure washing only to wash the surface after it has first been sterilized with a mildew treatment solution.
- E. Mildew Removal Preparation:
- 1. Remove mildew and sterilize the surface to be painted using one of the following methods:
 - a. Apply a commercial mildew remover applied per manufacturer's instructions.
 - 2. Following treatment, clean the surface with potable water and allow to thoroughly dry before priming, painting or applying sealing and caulking compounds.
- F. Material Preparation: Mix and prepare paint materials according to manufacturer's written instructions.
- 1. Maintain containers used in mixing and applying paint in a clean condition, free of foreign materials and residue.
 - 2. Stir material before application to produce a mixture of uniform density. Stir as required during application. Do not stir surface film into material. If necessary, remove surface film and strain material before using.
 - 3. Use only thinners approved by paint manufacturer and only within recommended limits.

4. Tinting: Tint each undercoat a lighter shade to simplify identification of each coat when multiple coats of same material are applied. Tint undercoats to match the color of the finish coat, but provide sufficient differences in shade of undercoats to distinguish each separate coat.

3.04 APPLICATION

- A. General: Apply paint according to manufacturer's written instructions. Use applicators and techniques best suited for substrate and type of material being applied.
 1. Paint colors, surface treatments, and finishes are indicated in the paint schedules.
 2. Do not paint over dirt, rust, scale, grease, moisture, scuffed surfaces, or conditions detrimental to formation of a durable paint film.
 3. Provide finish coats that are compatible with primers used.
 4. The term "exposed surfaces" includes areas visible when permanent or built-in fixtures, grilles, covers, and similar components are in place. Extend coatings in these areas, as required, to maintain system integrity and provide desired protection.
 5. Paint surfaces behind movable equipment and furniture the same as similar exposed surfaces. Before final installation of equipment, paint surfaces behind permanently fixed equipment or furniture with prime coat only, unless otherwise noted.
 6. Paint back sides of access panels and removable or hinged covers to match exposed surfaces.
 7. Finish exterior doors on tops, bottoms, and side edges the same as exterior faces.
 8. Sand lightly between each succeeding enamel or varnish coat.
 9. Ensure primers are top coated within the times required by the paint manufacturers. Top coats not applied within the recoating window may be rejected.
- B. Scheduling Painting: Apply first coat to surfaces that have been cleaned, pretreated, or otherwise prepared for painting as soon as practicable after preparation and before subsequent surface deterioration.
 1. The number of coats and film thickness required are the same regardless of application method. Do not apply succeeding coats until previous coat has cured as recommended by manufacturer. If sanding is required to produce a smooth, even surface according to manufacturer's written instructions, sand between applications.
 2. If undercoats, stains, or other conditions show through final coat of paint, apply additional coats until paint film is of uniform finish, color, and appearance. Give special attention to ensure that edges, corners, crevices, welds, and exposed fasteners receive a dry film thickness equivalent to that of flat surfaces.

3. Allow sufficient time between successive coats to permit proper drying. Do not recoat surfaces until paint has dried to where it feels firm, and does not deform or feel sticky under moderate thumb pressure, and until application of another coat of paint does not cause undercoat to lift or lose adhesion.
 4. Be aware of the requirements and restrictions of PROJECT CONDITIONS Article on spray painting.
- C. Application Procedures: Apply paints and coatings by brush, roller, or other applicators according to manufacturer's written instructions.
1. Brushes: Use brushes best suited for type of material applied. Use brush of appropriate size for surface or item being painted.
 2. Rollers: Use rollers of carpet, velvet-back, or high-pile sheep's wool as recommended by manufacturer for material and texture required.
- D. Minimum Coating Thickness: Apply paint materials no thinner than manufacturer's recommended spreading rate to achieve dry film thickness indicated. Provide total dry film thickness of the entire system as recommended by manufacturer.
- E. Mechanical and Electrical Work: Painting of mechanical and electrical work is limited to items exposed in equipment rooms and occupied spaces.
- F. Block Fillers: Apply block fillers to concrete masonry block at a rate to ensure complete coverage with pores filled.
- H. Prime Coats: Before applying finish coats, apply a prime coat, as recommended by manufacturer, to material that is required to be painted or finished and that has not been prime coated by others. Recoat primed and sealed surfaces where evidence of suction spots or unsealed areas in first coat appears, to ensure a finish coat with no burn-through or other defects due to insufficient sealing.
- I. Pigmented (Opaque) Finishes: Completely cover surfaces as necessary to provide a smooth, opaque surface of uniform finish, color, appearance, and coverage. Cloudiness, spotting, holidays, laps, brush marks, runs, sags, ropiness, or other surface imperfections will not be acceptable.
- J. Transparent (Clear) Finishes: Use multiple coats to produce a glass-smooth surface film of even luster. Provide a finish free of laps, runs, cloudiness, color irregularity, brush marks, orange peel, nail holes, or other surface imperfections.
1. Provide satin finish for final coats.
 2. Stipple Enamel Finish: Roll and redistribute paint to an even and fine texture. Leave no evidence of rolling, such as laps, irregularity in texture, skid marks, or other surface imperfections.
- K. Completed Work: Match approved samples for color, texture, and coverage. Remove, refinish, or repaint work not complying with requirements.

3.05 FIELD QUALITY CONTROL TESTING

- A. Inspection and Approvals: Unless directed otherwise by the Contracting Officer, obtain written approval upon completion of each phase of work (phases of work are:

surface preparation and spot prime, prime, first finish coat, second finish coat) before proceeding into the next phase or work. For any particular area of work that deviates from the submitted work schedule, notify the Contracting Officer one day in advance when completing any phase of work. Provide access to areas to be inspected.

- B. Failure to obtain approval of any phase of work for a work area may result in redoing the operation at no cost to the State.
- C. Right of Rejection: Non conforming work will be rejected by the Contracting Officer. Remove rejected material from the job site immediately. Redo rejected work at no cost to the State.
 - 1. Where the required paint thickness is deficient, provide additional coats to the affected surface(s) to meet the required paint thickness.

3.06 CLEANING

- A. Cleanup: At the end of each workday, remove empty cans, rags, rubbish, and other discarded paint materials from Project site.
 - 1. After completing painting, clean glass and paint-spattered surfaces. Remove spattered paint by washing and scraping without scratching or damaging adjacent finished surfaces.

3.07 PROTECTION

- A. Protect work of other trades, whether being painted or not, against damage from painting. Correct damage by cleaning, repairing or replacing, and repainting, as approved by Contracting Officer.
- B. Provide “Wet Paint” signs to protect newly painted finishes. After completing painting operations, remove temporary protective wrappings provided by others to protect their work.
 - 1. After work of other trades is complete, touch up and restore damaged or defaced painted surfaces. Comply with procedures specified in PDCA P1.

3.08 EXTERIOR PAINT SCHEDULE

- A. The Schedule of Finishes is made for the convenience of the Contractor and indicates the types and quality of finishes to be applied to the surfaces. Provide additional systems for surfaces to be painted not listed hereinafter.
- B. Concrete: Provide the following finish systems over exterior concrete:
 - 1. Acrylic Finish: Two finish coats over a primer.
 - a. Primer: Exterior concrete primer: MPI 3.
 - b. Finish Coats: Exterior acrylic paint. MPI 11.
 - c. Finish Coat Gloss Level: Semi-gloss.
 - d. System DFT: 4.5 mils

- C. Concrete Unit Masonry: Provide the following finish systems over exterior concrete unit masonry:
 - 1. Acrylic Finish: Two finish coats over a block filler.
 - a. Block Filler: Concrete unit masonry block filler: MPI 4.
 - b. Finish Coats: Exterior acrylic paint. MPI 11.
 - c. Finish Coat Gloss Level: Semi-gloss.
 - d. System DFT: 11 mils
- D. Exterior Wood: Provide the following finish systems exterior wood surfaces:
 - 1. Acrylic Finish: Two finish coats over a primer.
 - a. Primer: Exterior wood primer for acrylic enamels. MPI 5.
 - b. Finish Coats: Exterior acrylic paint. MPI 11.
 - c. Finish Coat Gloss Level: Semi-gloss.
 - d. System DFT: 5 mils
- E. Ferrous Metal and Copper: Provide the following finish systems over exterior ferrous metal. Primer is not required on shop-primed items.
 - 1. Alkyd Finish: Two finish coats over a primer.
 - a. Primer: Exterior ferrous-metal primer. MPI 23.
 - b. Finish Coat: Exterior alkyd paint. MPI 94.
 - c. Finish Coat Gloss Level: Semi-gloss.
 - d. System DFT: 5 mils
- G. Zinc-Coated Metal: Provide the following finish systems over exterior zinc-coated metal surfaces:
 - 1. Alkyd Finish: Two finish coats over a galvanized metal primer.
 - a. Primer: Exterior galvanized metal primer. MPI 134
 - b. Finish Coat: Exterior acrylic paint. MPI 11.
 - c. Finish Coat Gloss Level: Semi-Gloss
 - d. System DFT: 4.5 mils

END OF SECTION

DIVISION 10 – SPECIALTIES

SECTION 10440

SIGNAGE

PART 1 – GENERAL

1.01 SUMMARY

- A. Provide all signage as shown and as specified herein, including the following:
 - 1. Fiberglass Signs
 - 2. International Symbol of Accessibility
- B. Sign Locations: As indicated and scheduled

1.02 SUBMITTALS

- A. Submit in accordance with SECTION 01300 -SUBMITTALS.
- B. Manufacturer's Data: Include manufacturer's construction details relative to materials, dimensions of individual components, profiles, and finishes for each type of sign required.
- C. Shop Drawings: Provide shop drawings for fabrication and erection of signs. Include plans, elevations, and large-scale sections of typical members and other components. Show anchors, grounds, reinforcement, accessories, layout, and installation details.
 - 1. Provide message list for each sign required, including large-scale details of wording and layout of lettering.
 - 2. For signs supported by or anchored to permanent construction, provide setting drawings, templates, and directions for installation of anchor bolts and other anchors to be installed as a unit of Work in other sections.
- D. Samples: Provide the following samples of each sign component for initial selection of color, pattern and surface texture as required and for verification of compliance with requirements indicated.
 - 1. Samples for initial selection of color, pattern, and texture:
 - a. Fiberglass: Manufacturer's color charts consisting of actual sections of material including the full range of colors available for each material required.
 - b. Aluminum: Samples of each finish type and color, on 6-inch long sections of extrusions and not less than 4-inch squares of sheet or plate, showing the full range of colors available.
 - 2. Samples for Verification of Color, Pattern, and Texture Selected, and compliance with requirements indicated:
 - a. Provide a full size sample panel for each material indicated. Include a panel for each color, texture, and pattern required. On each panel include a representative sample of the graphic image process required, showing graphic style, and colors and finishes of letters, numbers, and other graphic devices.

b. Acceptable samples will be returned and may be used in the work.

1.03 QUALITY ASSURANCE

- A. Single-Source Responsibility: For each separate type of sign required, obtain signs from one source from a single manufacturer.
- B. Design Criteria: The drawings, if available, indicate size, profiles, and dimensional requirements of signs. If drawings are not available, submit manufacturer's standard products incorporated with item entitled "SUBMITTALS" hereinabove.
- C. Braille: The Contractor shall be responsible to have all signs with Braille proofread prior to installation. Any sign that has incorrect Braille information shall be redone at the Contractor's expense.

1.04 SIGN MESSAGE

- A. Provide sign messages as required or as indicated on the drawings. Submit sign message schedule as per item entitled "SUBMITTALS" hereinabove.

1.05 ACCESSIBILITY COMPLIANCE

- A. The 2010 ADA Standards for Accessible Design (2010 ADA).

PART 2 – PRODUCTS

2.01 MATERIALS

- A. General Requirements: Character proportion, color contrast, dimension, depth, and heights of symbols, Grade II braille, and letters, location, and mounting heights of designated signs shall be in accordance with the requirements noted in the 2010 ADA Standards Section 216, and Section 703.
- B. Anchors: Use nonferrous metal or hot-dipped galvanized anchors for installations as required for corrosion resistance. Use toothed steel or lead expansion bolt devices for drilled-in-place anchors.

2.02 FIBERGLASS SIGNS

- A. Fiberglass, non-corrosive, 3-ply laminate, approximately 3/16-inch to 1/4-inch thick with contrasting core color.
- B. Letters, symbols, and borders shall be raised. Individual cutout letters and symbols which are applied to the sign plaque shall not be used.
- C. Where a white or light colored background (core color) is provided, the background surface shall be coated with white or clear graffiti resistant coating as approved by the signage manufacturer. The coating shall provide a finish which is resistant to pencils, pens, felt tip markers, and spray paint.
- D. Signs shall be mounted with one-way, tamper-proof fasteners. Shields shall be provided as required to suit the mounting conditions. Double-stick tape or adhesives shall not be used.

- E. Manufacturers:
 - 1. Architectural Graphics, Inc.
 - 2. Best Manufacturing Company
 - 3. Mohawk Sign Company
 - 4. Signs, Letters & Nameplates, Inc. (SL & N)
 - 5. Approved equal

- 2.03 INTERNATIONAL SYMBOL OF ACCESSIBILITY (ISA)
 - A. Provide "International Symbol of Accessibility" in conformance with ADA Section 703.7 requirements and in locations shown on drawings. See DCAB Interpretive Opinions for further clarification.

 - B. Provide International Symbol of Accessibility at accessible entrances in conformance with ADA Fig. 703.7.2.1.

- 2.04 FINISHES
 - A. Colors and Surface Textures: For exposed sign material that requires selection of materials with integral or applied colors, surface textures or other characteristics related to appearance, provide color matches indicated, or if not indicated, as selected by the Contracting Officer from the manufacturer's standards.

 - B. Metal Finishes: Comply with NAAMM "Metal Finishes Manual" for finish designations and applications recommendations.

PART 3 – EXECUTION

3.01 INSTALLATION

- A. General:
 - 1. Installation of all signage shall be in strict accordance with manufacturer's printed instructions and approved shop drawings. Installation shall be accomplished by experienced mechanics and in a workmanlike manner.

 - 2. Locate sign units and accessories where indicated, using mounting methods of the type described and in compliance with the manufacturer's instructions.

 - 3. Install signs level, plumb, and at the height indicated, with sign surfaces free from distortion or other defects in appearance and designated signs with braille in accordance to ADA Section 216 and Section 703.

- B. Wall Mounted Panel Signs: Attach panel sign!> to wall surfaces using one-way, tamper-proof fasteners. Shields shall be provided as required to suit the mounting conditions. Double-stick tape or adhesives shall not be used.

3.02 CLEANING AND PROTECTION

- A. At completion of the installation, clean soiled sign surfaces in accordance with the manufacturer's instructions. Protect units from damage until acceptance by the Contracting Officer. Remove all tools, equipment, debris, and surplus materials.

END OF SECTION

SECTION 10991

RESTROOM RESTORATION

PART 1 - GENERAL

1.1 SUMMARY

- A. Provide cleaning, disinfections, and removal of grime, dirt, paint, graffiti, calcium build-up, rust, and stains from toilets, urinals, lavatories/sinks, plumbing fixtures, dispensers, mirrors, toilet partitions and urinal screens, light fixtures, windows, walls, and floors.
- B. Remove existing deleterious contaminants from surface of tile and grout. Restore wall grout to overall consistent condition/color. Clean floor tile and grout to clean condition while allowing for existing color distinction from traffic patterns to remain where not corrected by extra-ordinary procedures.
- C. Coat ceramic unglazed wall tiles, floor tiles, and all grout with appropriate protective sealant.
- D. Related Work Described Elsewhere:
 1. Replacement of deteriorated sealant is provided under SECTION 07920 - SEALANTS.
 2. Painting of non-tile walls and ceilings is provided under SECTION 09901 - PAINTING.

1.2 QUALITY ASSURANCE

- A. Restroom Cleaning Company: Restroom cleaning company shall be a professional cleaning company with not less than two (2) years experience in cleaning public restrooms.
- B. Equipment and Materials: Equipment and materials used for the work shall be a combination of professional and general products that are specifically recommended for the surfaces and conditions found in public school restrooms and this project in specific. Contractor shall have available on site various pieces of equipment and materials in varying degrees of complexity and effect on substrate so that procedures and materials that least effect the substrates can be tried first. It is expected that increasing degrees of equipment and material impact on substrates will be required for some cleaning situations and they shall be included as part of the expected work unless specifically noted otherwise or accepted in writing by the Contracting Officer. Acid will not be used on porcelain.

- C. Abrasive materials shall not be applied to glazed surfaces of tile, porcelain, plastic laminate, fiberglass reinforced plastic (FRP), solid phenolic, stainless steel, glass, etc. where use will damage surface.
- D. Safety Precautions: Provide Contractor personnel with and require them to use protective clothing, gloves, face shields and other appropriate clothing necessary to prevent personal injury due to steam, hot water, high pressure water, chemicals, and other equipment and materials to be used.
- E. Ventilation: Provide adequate ventilation during cleaning processes as recommended by the manufacturer of each product used.
- F. Sewer System: Do not allow any chemical not allowed by the County Sewer system to enter the sewer system.

1.3 SUBMITTALS

- A. Submit in accordance with SECTION 01300- SUBMITTALS.
- B. Manufacturer's Data: Submit list of materials to be used for each anticipated condition with manufacturer's technical product data. Update the submittal where project conditions dictate the use of alternate cleaners and sealants.
- C. Restroom Cleaning Experience: Submit documentation of restroom cleaning company's professional experience in accomplishing the work specified herein for acceptance by the Contracting Officer. Include contact names, company name, and telephone numbers of individuals who can verify quality of previous work.
- D. Material Safety Data Sheets (MSDS): Submit MSDS for all materials.

1.4 PRODUCT HANDLING

- A. Delivery and Storage: Keep materials dry at all times. Protect against exposure to weather. Materials that are hazardous shall be stored in appropriate locked storage containers as directed by the Contracting Officer.

PART 2 - PRODUCTS

2.1 MATERIALS

- A. Vapor Steam Cleaner: High temperature steam equipment with controls to adjust temperature and volume.
- B. Hot Water Pressure Washer: Hot water pressure washer with controls to adjust water pressure.
- C. Cleaners: Cleaning compounds, detergents, and other products appropriate for the conditions and recommended for the application intended.
- D. Grout Stain: Permanent stain used topically to provide a uniform grout color where existing grout is discolored. Provide in color to match existing or as required for uniform appearance of grout on the entire surface.

- E. Protective Sealers: Water based inorganic film forming catalyzed siloxanes or reactive silonal type coating system for ceramic tile and grout, which penetrates into porous surfaces leaving a film of protection, MicroGuard or approved equal.

PART 3 - EXECUTION

3.1 EXAMINATION

- A. Before starting the restroom cleaning, examine all surfaces to be cleaned and record the following:
 - 1. Ceramic tile that is loose or that may be damaged by cleaning operations.
 - 2. Existing toilet fixtures with damaged or missing glazing or cracks.
 - 3. Stains, marks, or traffic patterns that cannot be removed.
 - 4. Hardwater build-up that cannot be removed.

3.2 PREPARATION

- A. Protect adjacent surfaces not required to receive the applicable cleaning operation or material from damage by each operation.
- B. Cover drains where materials are not allowed to be introduced into the sewer system.

3.3 INSTALLATION

- A. General: All materials shall be applied in accordance with the manufacturer's written instructions.
- B. Pretreat substrates and use combination of materials and methods to accomplish cleaning work.
- C. Thoroughly clean and disinfect all substrates. Apply grout restoration mix where required for uniform grout coloration. Floor grout discoloration due to previous traffic patterns shall be cleaned, as specified, but total restoration for uniform color throughout, will not be required.
- D. Contracting Officer will conduct an inspection of the substrates prior to application of protective sealer.
- E. After acceptance of substrate cleaning by the Contracting Officer, apply protective sealer as recommended by the manufacturer to all unglazed tile surfaces and all grout joints.

3.4 CLEAN UP

- A. Leave finished restrooms in neat condition with no adverse chemicals remaining and all Contractors' equipment and material removed from the premises.

END OF SECTION

DIVISION 15 – MECHANICAL

SECTION 15011 - GENERAL MECHANICAL PROVISIONS

PART 1 – GENERAL

1.01 SUMMARY

- A. Work Included: Applies to all work of DIVISION 15 - MECHANICAL.

1.02 PLANS

- A. The plans and specifications direct attention to certain required features of the equipment but do not purport to cover all details entering into its design and construction. Nevertheless, the Contractor shall furnish and install the mechanical systems complete in all details and ready for operation. The mechanical systems shall be installed substantially as shown on the plans and as specified herein and shall be designed for installation in the area designated with proper space allowed for clearance and maintenance access.
- B. Attention is directed to the fact that the plans are based upon certain equipment configurations and that equipment components of other approved equal manufacturers may differ from the arrangement indicated on the plans. If other approved equipment is accepted which require an arrangement different from that indicated on the plans or specified, the Contractor shall prepare and submit for approval, detailed architectural, structural, environmental, mechanical and electrical drawings, layouts, calculations, and equipment lists showing all necessary changes and embodying all special features of the equipment which the Contractor proposes to furnish. The cost of such changes shall be borne by the Contractor at no increase in contract price or extension of contract time for the project.

1.03 SUBMITTALS

- A. General Requirements

1. Data Required with the Submittal: The Contractor shall submit all data sufficient to demonstrate conformance to the requirements of the DIVISION 15 - MECHANICAL Technical Specifications. The submittal shall include, but not be limited to, manufacturer's name, catalog number or designation, and the physical characteristics of the equipment. The submittal shall be in the form of printed data sheets, catalog cuts and shop drawings. Reference to manufacturer's literature without enclosing a copy of the referenced document will be considered insufficient.

Submit shop drawings and product data grouped to include complete submittals of related systems, products, and accessories in a single submittal. Incomplete packages will be returned without a review.

2. Approval Requirements: Approval of material and equipment will be based on manufacturer's published data. Where materials or equipment are specified to be constructed and/or tested in accordance with the Standards of the American Society of Mechanical Engineers, National Electrical Manufacturers Association, or Underwriters' Laboratories, Inc.; the Contractor shall submit proof that the items furnished under this specification conform to such requirements. The ASME stamp will be acceptable as

sufficient evidence that the items conform to the requirements of the American Society of Mechanical Engineers. A certificate or published statement that the item is in accordance with the referenced Standard by the manufacturer will be sufficient evidence that the item conforms to the requirements of the Standard. In lieu of such stamp, certificate, or statement, the Contractor may submit a written certificate from any nationally recognized testing agency that the items have been tested and that the units conform to the requirements listed hereinbefore, including methods of testing of the specified agencies.

3. Substitutions
 - a. Substitutions shall be subject to the requirements of the SPECIAL PROVISIONS. Supporting data shall be furnished for all substitutions. Redesign of architectural, structural, mechanical, electrical, or any other feature made necessary by the use of substitutions shall be the responsibility of and at the expense of the Contractor, and subject to approval by the Contracting Officer.
 - b. Where such approved deviation requires a different quantity and arrangement of piping or conduit from that specified or indicated on the drawings, the Contractor shall furnish and install any such piping and conduit, and any other additional equipment required by the system at no additional cost to the State.
4. Samples: When called for in the DIVISION 15 - MECHANICAL Technical Specifications, furnish samples of materials that truly represent the materials to be used. Where samples are specified to demonstrate method of installation, furnish all materials and tools. Samples shall also be furnished when materials are proposed as substitutions for those specified. Materials used in the work shall be identical to samples that have been approved by the Contracting Officer.
- C. List of Material and Equipment: The Contractor shall submit to the Contracting Officer for approval six (6) sets of a complete list of proposed material or equipment. This list shall include manufacturer's name and material or equipment identification such as styles, types, or catalog numbers, to permit ready and complete identification. Catalog numbers specified herein are given for reference only. The Contractor shall furnish the latest model manufactured.
- D. Shop Drawings: The Contractor shall submit to the Contracting Officer for approval six (6) sets of prints of shop drawings in accordance with the requirements of the SPECIAL PROVISIONS. Shop drawings shall be submitted for equipment not completely identifiable by information contained in the list of materials and equipment.
 1. The Contractor shall submit detailed shop drawings of all equipment and all material required to complete the project. No material or equipment may be delivered to the job site or installed until the Contractor has in his possession the approved shop drawings for the particular material or equipment. The shop drawings shall be complete as described herein.
 2. Approval rendered on shop drawings shall not be considered as a guarantee of measurements or building conditions. Where drawings are approved, said approval does not mean that drawings have been checked in detail; said approval does not in any

way relieve the Contractor from his responsibility or necessity of furnishing material or performing work as required by the contract drawings and specifications.

3. Failure of the Contractor to submit shop drawings in ample time for checking shall not entitle him to an extension of contract time, and no claim for extension by reason of such default will be allowed.
4. Shop drawings shall be submitted for, but not limited to, the following:
 - a. Plumbing System.
 - b. All items described in specifications.
 - c. Other items as the Contracting Officer may direct.
5. Shop drawings shall include as applicable:
 - a. Identification of each piece of equipment and component.
 - b. Dimensioned layouts and arrangement of equipment.
 - c. Operating performance.
 - d. Foundation and mounting data.
- E. MSDS: The Contractor shall submit to the Contracting Officer for approval six (6) sets of MSDS sheets for materials used in this project. Contractor shall perform all work in accordance with the recommendations of the MSDS, including all tests.
- F. As-Built Drawings: The Contractor shall submit to the Contracting Officer one (1) reproducible set of all Contract Drawings corrected to reflect the "AS-BUILT" conditions of the installation. The drawings shall be kept up to date as the job progresses and shall be available for inspection at all times.
- G. Certificates: The Contractor shall submit to the Contracting Officer for approval six (6) copies of certificates, acceptance and compliance with regulations of agencies having jurisdiction. Work shall not be deemed complete until such certificates have been delivered to the Contracting Officer. Certificates shall include the following:
 1. Sterilization of domestic water lines.
 2. Pressure testing of domestic water piping.
 3. Solder and fluxes used in the potable water system are lead-free.
 4. Paint primer used are free of asbestos, lead, zinc-chromate, mercury, strontium chromate, crystalline silica, and cadmium.
- H. One Year Guarantee

1. Contractor shall submit six (6) copies of a written Guarantee that all work is as specified, and shall be bound to replace material or equipment defective due to workmanship or materials. Contractor shall not be responsible, however, for defects proven to the Contracting Officer's satisfaction to be due to misuse, accident, lack of maintenance, improper operation, or negligence by other parties.
2. Further, Contractor shall be held responsible for all damages to any part of the premises, building or contents caused by leaks or other defect in pipe, equipment or materials provided under this specification.
3. Terms of this Guarantee are in addition to other guarantee provisions of the specifications, and do not substitute for other more stringent terms, if any.
4. The Guarantee shall commence immediately after the Project Acceptance Date, and extend for a period of one year commencing after thirty (30) consecutive days of trouble-free operation after the Project Acceptance Date. The Guarantee shall include all labor, materials, equipment and parts necessary to service the complete system, so as to assure proper operation and function of the system. All costs for repairs, including emergency calls, shall be borne by the Contractor. Should equipment fail and require repair, the guarantee shall be extended by the period of time it takes to repair the equipment.
5. Trouble-free operation is defined as a non-disabling condition or a non-recurring failure or disruption and the following:
 - a. The system shall be free of all discrepancies, contamination and debris.
 - b. The system is maintaining operational conditions and other parameters as measured during the acceptance test.

PART 2 – PRODUCTS

2.01 ASBESTOS PROHIBITION

- A. No asbestos containing materials shall be used. The Contractor shall insure that all materials incorporated in the project are asbestos-free unless specifically approved.

2.02 MATERIALS AND EQUIPMENT

- A. Materials and equipment shall conform to the requirements of applicable Technical Specifications and publications specified therein and shall be as shown. Materials and equipment shall be new and shall be the products of manufacturers regularly engaged in the manufacture of such products. All items shall essentially duplicate materials and equipment that have been in satisfactory use at least two (2) years prior to bid opening and shall be supported by a service organization that is, in the opinion of the Contracting Officer, reasonably convenient to the site of installation.

2.03 TOOLS AND SUPPLIES

- A. Where specified in the DIVISION 15 - MECHANICAL Technical Specifications, special tools and supplies shall be provided. The items shall be packaged or boxed to provide

protection in storage, and shall be identified as to use. Tools and supplies shall be accompanied by information as to source of supply.

PART 3 – EXECUTION

3.01 QUALITY CONTROL

- A. The work shall be performed by workmen skilled in the type of work involved, under experienced supervision. Where methods of application or installation are specified by commercial standards in the DIVISION 15 - MECHANICAL Technical Specifications, no departures will be permitted except as specified or as directed by the Contracting Officer.

3.02 INSPECTION & TESTS

- A. The Contractor shall give the Contracting Officer written notice a minimum of seven (7) consecutive calendar days prior to inspection and tests. Tests shall be performed as required in the DIVISION 15 - MECHANICAL Technical Specifications. All work rejected by the Contracting Officer shall be repaired or replaced by the Contractor at no additional cost to the State.

3.03 VERIFICATION OF DIMENSIONS

- A. The Contractor shall check all dimensions at the site and shall establish all lines and levels. Equipment shall be located to assure proper grade for piping. The Contractor shall be responsible for correctness of all dimensions and fitting of piping and equipment into the available space. Should field measurements show conditions that require relocation of any work, such conditions shall be reported to the Contracting Officer in advance of installation, and the work shall proceed in accordance with his decisions.

3.04 PROTECTION DURING STORAGE

- A. All materials and equipment shall be stored in a safe manner, secured from weather. All materials shall be stored above the ground or floor level to avoid damage by moisture.

3.05 PROTECTION OF WORK IN PROGRESS

- A. Pipe openings shall be closed with caps or plugs until connections are made. Equipment shall be securely covered for protection against physical or chemical damage. In areas exposed to weather, materials unused at the end of each day's work shall be stored in weather-protected locations. Damage to materials or equipment due to the Contractor's neglect shall be repaired or replaced to the satisfaction of the Contracting Officer by, and at the expense of, the Contractor. Trenches and excavations shall be properly shored, protected and covered if left open.

3.06 PROGRESS OF WORK AND COORDINATION

- A. The work shall be coordinated with the work of other contractors and other trades to avoid interferences, preserve headroom and operating clearances, and to expedite completion of the project.

3.07 INSTALLATION OF EQUIPMENT

- A. Installation and adjustments shall be in accordance with the equipment supplier's written instructions. All accessories required shall be properly installed and connected. Supports shall be adequately anchored.

3.08 PERMITS, LICENSES AND INSPECTIONS

- A. The Contractor shall obtain all permits and licenses required to perform the work, and pay all required fees, and shall cooperate with all inspections required by authorities having jurisdiction. Inspections specified in the DIVISION 15 - MECHANICAL Technical Specifications shall be permitted without interference. Corrections to work as a result of inspections shall be made promptly.

3.09 FIELD TESTS

- A. The Contractor shall be responsible for testing of the installed work, shall provide all labor, equipment and instruments, and shall conduct pressure tests and operating tests on the piping systems and equipment. During pressure tests, all items in piping systems not designed for test pressures shall be removed from, or isolated from the system and shall be reconnected or unblocked after tests are completed. Should operating tests require the presence of manufacturer's representatives, the Contractor shall cooperate with them and shall place at their disposal all assistance, materials and services required to perform such tests. Testing shall be as specified hereinafter.

3.10 PAINTING

- A. The Contractor shall be responsible for complete coverage in painting all ferrous metal that has not been factory finished coated. Painting shall be in accordance with SECTION 09901 - PAINTING as applicable for ferrous metal surfaces.
- B. The Contractor shall patch and touch-up paint all surfaces damaged and/or disturbed due to Contractor's operations. All patching and touch-up painting shall match existing surrounding surfaces.

3.11 PLUMBING SYSTEMS TEST

- A. Test plumbing work as specified herein and according to local Code Regulations. Latter shall govern if they conflict with former.
- B. Provide test pump, gages, and other instruments, materials and labor as required.
- C. Clean piping, equipment and specialties before testing.
- D. Water-Supply System Test: Service pipe shall be subjected to water test under pressure and for duration as directed by agency having jurisdiction. Conduct tests when the roughing-in is completed and before insulation is applied and fixtures are set. The cold water piping system shall be tested at a hydrostatic pressure of not less than 80 pounds per square inch gauge, and proved tight at this pressure for not less than 30 minutes in order to permit inspection of all joints. Where a portion of the water piping system is to be concealed before completion, this portion shall be tested separately as specified for the entire system.

- E. Defective Work: If inspection or test shows defects, such defective work or materials shall be replaced or repaired as necessary and inspection and test repeated. Repairs to piping shall be made with new materials. No caulking of screwed joints or holes will be acceptable.
- F. Make adjustments, repairs, and alterations, as required to meet specified test results. Correct defects disclosed by test or inspection. In case of pipe defect, replace with same length as defective piece. Repeat tests after defects have been corrected and parts replaced, as directed until pronounced satisfactory.

3.12 OPERATING TEST

- A. After installation work has been completed, tested and approved, test equipment and fixtures under normal operating conditions for periods as directed to check capacities and other details as required demonstrating that they fulfill requirements of the plans and specifications, and that they operate satisfactorily.
- B. Where evidence of stoppage appears in piping, disconnect, clean, repair, and reconnect obstructed parts. Contractor shall bear costs of cutting, patching adjoining work necessitated by such cleaning and repairing.

END OF SECTION

SECTION 15400

PLUMBING

PART 1 – GENERAL

1.1 GENERAL REQUIREMENTS

- A. Contractor shall inform Contracting Officer of testing date a minimum of seven (7) consecutive calendar days prior to testing system and backfilling trenches.
- B. Provide all necessary labor, materials, operations, tools and techniques required to furnish and install complete the plumbing systems as and within the limits indicated.
- C. Submit written request for interruption of the existing plumbing system not less than seven (7) consecutive calendar days prior to the time for which the interruption is requested.
- D. Existing conditions, materials, sizes and dimensions shown on these drawings represent the best available information obtained from existing drawings and field investigations. Prospective bidders shall visit the premises and familiarize themselves with all work details and conditions before submitting a bid. Reasonable modifications to indicated arrangements to suit actual conditions shall not constitute a basis for requesting additional funds from the State.
- E. Prior to ordering materials and equipment, the Contractor shall verify all existing conditions, materials, sizes and dimensions that affect their work, and shall coordinate their work with all trades involved.
- F. Obtain all permits and pay the costs thereof. Arrange for inspections when required, in sufficient time to avoid delay to the project. Provide copies of inspection reports and disinfection certificates.

1.2 SCOPE OF WORK

- A. Exterior column shower piping and trim.
- B. Installation and connection of State-furnished equipment and other items as indicated.
- C. Related Work Specified Elsewhere
 - 1. SECTION 05500 - METAL FABRICATIONS
 - 2. SECTION 15011 - GENERAL MECHANICAL PROVISIONS

1.3 LAWS, RULES, REGULATIONS, REFERENCES

- A. The entire installation shall comply with the latest applicable rules and regulations of the County, the State of Hawaii, and any other applicable laws, codes, rules and regulations whether or not specifically mentioned hereinafter.

- B. Codes
 - 1. Plumbing Code, County of Hawaii
 - 2. Building Code, County of Hawaii
 - 3. Hawaii County Code, Chapter 5 – Building
 - 4. Hawaii Administrative Rules, Title 11, Chapter 11, Sanitation
 - 5. Water System Standards, 2002
 - 6. Americans With Disabilities Act Accessibility Guidelines (ADAAG), 36 CFR Part 1191

- C. References
 - 1. American Society for Testing and Materials (ASTM) Publications
 - a. B32-08 Standard Specification for Solder Metal
 - b. B62-09 Standard Specification for Composition Bronze or Ounce Metal Castings
 - c. B88-03 Standard Specification for Seamless Copper Water Tube
 - d. CGSB-41-GP-25M Standard for Pipe, Polyethylene, for the transport of liquids
 - e. CSA B137.1 Polyethylene Pipe, Tubing and Fittings for Cold Water Pressure Services.
 - f. D-1248 Standard Specification for Polyethylene Plastics Molding and Extrusion Materials
 - g. D-3035 Standard Specifications for Polyethylene (PE) Plastic Pipe (SDR-PR). Based on Controlled Outside Diameter
 - h. D-3350 Standard Specifications for Polyethylene Plastics Pipe and Fittings
 - i. F-714 Standard Specification for Polyethylene (PE) Plastic Pipe (SDR-PR). Based on outside diameter.

2. American Society of Mechanical Engineers (ASME) Publications
 - a. B16.18-01 Cast Copper Alloy Solder Joint Pressure Fittings
 - b. B16.22-01 Wrought Copper and Copper Alloy Solder Joint Pressure Fittings
3. American Water Works Association (AWWA) Publications
 - a. C550-05 Protective Epoxy Interior Coatings for Valves and Hydrants
4. Manufacturers Standardization Society (MSS) Publications
 - a. SP 110-96 Ball Valves Threaded, Socket-Welding, Solder Joint, Grooved and Flared Ends
5. NSF International (NSF) Publications
 - a. 61-09 Drinking Water System Components – Health Effects

1.04 SUBMITTALS

- A. General: The Contractor shall submit submittals in accordance with the SECTION 15011 - GENERAL MECHANICAL PROVISIONS.
- B. Shop Drawings: The Contractor shall submit shop drawings showing the entire work with inverts, sleeves and dimensions. Contractor shall check project [and reference] drawings to avoid interferences with structural features and with work of other trades. No plumbing or piping work shall commence until such plans have been approved and accepted by the Contracting Officer. Any deviations from the shop drawings shall require approval by the Contracting Officer.
- C. Submit the following:
 1. Manufacturer's product data
 2. Shop drawings
 3. MSDS sheets
 4. As-built drawings
 5. Certificates
 6. One-Year Guarantee

PART 2 – PRODUCTS

2.01 WATER PIPING, BURIED

- A. Copper Tubing: ASTM B88, NSF 61, Type K, annealed with ASME B16.18 or ASME B16.22 solder joint copper fittings. Provide lead free solder.

2.02 POLYETHYLENE ENCASEMENT

- A. Polyethylene Encasement shall be AWWA C105 polyethylene tube or sheet.

2.03 UNIONS AND COUPLINGS

- A. Pipe Size 2-Inches and Under: Malleable iron unions for threaded ferrous piping; bronze unions for soldered copper pipe joints.

2.04 BALL VALVES

- A. Up to 2-Inches: Two piece bronze body, 150 psi steam working pressure, 600 psi nonshock cold working pressure, full port, chrome plated brass ball, Teflon seats and stuffing box ring, blowout-proof stems, stainless steel lever handle, threaded ends. Valves shall comply with MSS SP-110.

2.05 PLUMBING FIXTURES

- A. Furnish all items as required for installation and connection of fixtures and equipment furnished under this or other sections. Coordinate with other trades and disciplines as required.
- B. For each item specified, products of one manufacturer are identified to establish a standard of comparison. Products of other manufacturers will be considered if submitted for approval.
- C. Installation of accessible fixtures and equipment shall conform to ADAAG.
- D. Controls and operating mechanisms shall be operable with one hand and shall not require tight grasping, pinching, or twisting of the wrist.
- E. Fixtures List:
 - 1. Exterior Hose Bib shall be rough solid brass, with 1/2-inch MPT inlet, 3/4-inch hose thread outlet, equipped with factory installed non-removable vandal resistant vacuum breaker and loose key handle.

<u>Item</u>	<u>Manufacturer</u>	<u>Model</u>
Hose Bib	Arrowhead	251-BFP

2.06 PIPING IDENTIFICATION AND WARNING

- A. Buried Piping: Polyethylene plastic and metallic core or metallic-faced, acid- and alkali-resistant, polyethylene plastic warning tape manufactured specifically for

warning and identification of buried utility line. Provide tape in rolls, 6-inches minimum width, color coded as stated below for the intended utility with warning and identification imprinted in bold black letters continuously and repeatedly over the entire tape length. Warning and identification to read, "CAUTION BURIED (intended service) LINE BELOW" or similar working. Color and printing is to be permanent, unaffected by moisture or soil.

Warning Tape Color Code

Blue: Potable water.

2.07 MISCELLANEOUS METALS

- A. Other metal components not specified elsewhere shall be in accordance with SECTION 05500 - METAL FABRICATIONS.

PART 3 – EXECUTION

3.01 WORKMANSHIP

- A. Comply with applicable codes of the County of Hawaii and with regulations of the State of Hawaii.
- B. Defective work or materials shall be removed by the Contractor and corrected without extra compensation.

3.02 PREPARATION

- A. Ream pipe and tube ends. Remove burrs.
- B. Remove scale and dirt, on inside and outside piping before assembly.
- C. Verify adjacent construction is ready to receive rough-in work of this Section.
- D. Locate existing water lines and proposed points of connection thereto, and verify that the lines can be connected to the existing piping. Connect new piping to existing laterals approximately where indicated.

3.03 INSTALLATION

- A. Install all plumbing work as indicated and as specified herein.
- B. Installation of plumbing systems including fixtures, materials and workmanship shall be in accordance with the Plumbing Code, County of Hawaii.
- C. Install items furnished under other sections but specified for installation under this section.
- D. Completely encase buried copper water piping with polyethylene tube or sheet in accordance with AWWA C105.

- E. Copper pipe shall be insulated from direct contact with ferrous piping connections by approved insulating (dielectric) unions or couplings.
- F. Install specialties in accordance with manufacturer's instructions.
- G. Have piping treated, inspected and approved before it is furred in, buried or otherwise hidden.
- H. Excavation, Backfill and Concrete Work: All excavation and backfill in connection with plumbing work shall be accomplished in accordance with the Plumbing Code. Provide proper support along the pipe length and where rocks are encountered, provide a minimum of 3-inches of backfill properly tamped for pipe. Pipes shall be buried a minimum of 12-inches below and 3-feet horizontally from all footings.

3.04 APPLICATION

- A. Install brass male adapters each side of valves in copper piped system. Sweat solder adapters to pipe.

3.05 DOMESTIC WATER LINES

- A. Domestic waterlines shall be disinfected by one of the methods prescribed in the plumbing code. Disinfection may be limited to new work only if existing piping is not contaminated during construction. Contractor shall submit certificate of disinfection completed by a licensed testing laboratory to the State.

3.06 PROTECTION

- A. Damage to materials, equipment or building due to the Contractor's neglect shall be repaired or replaced to the satisfaction of the Contracting Officer by, and at the expense of, the Contractor. Be prepared to immediately repair any damage that does occur during any operations, so as to avoid damage to building or contents or interruption of State's operations.

3.07 INSPECTION

- A. Acceptance of the work will not take place until after discrepancies noted by the Engineer have been corrected to the satisfaction of the Engineer.

3.08 CLEANUP

- A. Upon completion of this work, remove all debris and excess materials, tools, etc., resulting from this work from the job site and leave the location of this work broom-clean in an acceptable manner as per the Engineer. All work including plumbing fixtures shall be thoroughly cleaned and ready for use.

END OF SECTION