DIVISION OF STATE PARKS

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

BOARD OF LAND AND NATURAL RESOURCES

Dawn N.S. Chang
Chairperson

CONTRACT SPECIFICATIONS AND PLANS

Job No. F48C612A
Keaiwa Heiau State Recreation Area Water System Improvements
Aiea, Hawaii

Civil Engineer: Akinaka & Associates, Ltd.
Structural Engineer: KAI Hawaii, Inc.

April 2026

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

CONTRACT SPECIFICATIONS AND PLANS

Job No. F48C612A
Keaiwa Heiau State Recreation Area Water System Improvements
Aiea, Hawaii

Approved: _____
ALAN B. CARPENTER
Acting Administrator
Division of State Parks

Approved: _____
DINA U. LAU, P.E.
Acting Chief Engineer
Engineering Division

April 2026

NOTICE TO BIDDERS
(Chapter 103D, HRS)

COMPETITIVE BIDS for Job No. F48C612A, Keaiwa Heiau State Recreation Area Water System Improvements, Aiea, 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 at Keaiwa Heiau State Recreation Area, Aiea, Hawaii.

The work shall consist of replacement of an existing water line, water bladder tanks, tank enclosure building and related site work.

To be eligible to submit a bid, the Bidder must possess a valid State of Hawaii Contractor's license classification "A".

A voluntary virtual pre-bid conference will be held on May 12, 2026 at 10 a.m. Interested attendees shall send an email request for invitation to valerie.s.suzuki@hawaii.gov at least twenty-four (24) hours in advance of the meeting day. The email shall have " Job No. F48C612A - Pre-Bid Conference" in the subject line and shall contain the following information: Name(s) attending, Company Name, Phone Number, and Email Address. Agenda and link to the virtual pre-bid conference shall be sent as part of response to requestor.

The estimated cost of construction for the Total Base Bid is $700,000.00

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

Since the estimated cost of construction is $250,000 or more, the apprenticeship agreement preference pursuant to Hawaii Revised Statutes §103-55.6 (ACT 17, SLH 2009) shall apply.

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

INFORMATION AND INSTRUCTIONS TO BIDDERS

CONTENTS

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.

P R O P O S A L

FOR

DEPARTMENT OF LAND AND NATURAL RESOURCES
ENGINEERING DIVISION
State of Hawaii

Job No. F48C612A
Keaiwa Heiau State Recreation Area Water System Improvements
Aiea, Hawaii

_____, 2026

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. The work shall consist of replacement of an existing water line, new water bladder tanks, new tank enclosure building and related site work, 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. F48C612A
Keaiwa Heiau State Recreation Area Water System Improvements
Aiea, Hawaii

on file in the office of the Engineering Division for the TOTAL BASE BID (Items 1-27) of:

_____

_____Dollars ($_____)
and will fully complete all work under this contract within 300 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.

PROPOSAL

Item No.	Quantity	Unit	Description	Unit Price	Total
BASE BID					
1.		LS	Clearing and grubbing	$	$
2.	14	SY	1-1/2" thick asphaltic concrete pavement (State Mix No. IV) inclusive of surface preparation, in place complete	$	$
3.	14	SY	6" thick base course for A.C. Pavement inclusive of compaction, in place complete	$	$
4.	4087	LF	Root Barrier	$	$
5.		LS	Arborist Services	$	$
6.	4,211	LF	Furnish and install 3-inch SCH 80 PVC waterline inclusive of excavation, backfill, solvent weld, detector wire, couplings, and appurtenances in place complete.	$	$
7.	2	EA	New 2-inch Copper lateral to existing comfort station including removing existing valve boxes, and installation of new WSS Type "B" Meter box and valves.	$	$
8.	13.75	CY	Controlled Low Strength Material CLSM for backfill of waterlines under roads.	$	$
9.	3	EA	3"x3"x2" PVC SCH 80 Tee, Solvent Welded	$	$
10.	2	EA	3"x3"x1" PVC SCH 80 Tee, Solvent Welded	$	$
11.	20	EA	3" PVC SCH 80 1/32 Bend, Solvent Welded	$	$
12.	21	EA	3" PVC SCH 80 1/16 Bend, Solvent Welded	$	$
13.	12	EA	3" PVC SCH 80 1/8 Bend, Solvent Welded	$	$
14.	6	EA	3" Gate Valve & Box, in place complete	$	$
15.	1	EA	2" Cover and Cap, in place complete	$	$
16.	1	EA	1" Air Relief Valve Unit and Box, in place Complete	$	$

PROPOSAL

Item No.	Quantity	Unit	Description	Unit Price	Total
		BASE BID			
17.	4	EA	Install new 80 Gallon Bladder Tank including 3-inch manifold and 1-1/4" ball valve.	$	$
18.	1	EA	3/4 inch hose bibb with vacuum breaker, including 56 - LF copper piping, fittings, excavation, backfill. straps and all appurtenances, in place complete.	$	$
19.	4.6	CY	DWS 2,500 concrete for reaction blocks, test blocks, concrete beams, slabs, inclusive of necessary structural struts, straps, rods, reinforcing steel and appurtenances, with Geotextile Fabric for abrasion resistance, in place complete.	$	$
20.		LS	Site BMP measures for water pollution and erosion and sediment control during construction phase of project, including installation, maintenance, and removal at end of project	LS	$
21.		LS	Demolition of existing structure, including salvaging Redwood.	LS	$
22.	13	CY	Unclassified excavation for Tank Building, including 2' over excavation.	$	$
23.		LS	Bladder Tank Building, in place complete.	LS	$
24.	0.6	CY	Concrete for sidewalk in place complete including reinforcing steel.	$	$
25.	1	EA	Project Sign	$	$
26.	Allowance		Field Office	Allowance	$ 10,000.00
				Subtotal Base Bid (Items 1-26)	$
27.		LS	Mobilization and Demobilization (not to exceed 10% of the Subtotal Base Bid)	LS	$
				Total Base Bid (Items 1-27)	$

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.

DESCRIPTION	RECYCLED PRODUCT COST	NONRECYCLED PRODUCT COST
_____	$_____	$_____
_____	$_____	$_____
_____	$_____	$_____
_____	$_____	$_____

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.

APPRENTICESHIP AGREEMENT PREFERENCE

1. If applicable to this project, any bidder seeking the preference must be a party to an apprenticeship agreement registered with the State Department of Labor and Industrial Relations (DLIR) at the time the bid is submitted for each apprenticeable trade the bidder will employ to construct the project. "Employ" means the employment of a person in an employer-employee relationship.

    a. The apprenticeship agreement shall be registered with the DLIR and conform to the requirements of Hawaii Revised Statutes Chapter 372.

    b. Subcontractors do not have to be a party to an apprenticeship agreement for the bidder to obtain preference.

    c. The bidder is not required to have apprentices in its employ at the time the bid is submitted to qualify for the preference.

2. A bidder seeking the preference must state the apprenticeable trade the bidder will employ for each trade to be employed to perform the work by submitting a completed signed original *Certification Form 1* verifying participation in an apprenticeship program registered with DLIR. "Apprenticeable trade" shall have the same meaning as "apprenticeable occupation" pursuant to Hawaii Administrative Rules (HAR) §12-30-5.

    a. The *Certification Form 1* shall be authorized by an apprenticeship sponsor listed on the DLIR list of registered apprenticeship programs. "Sponsor" means an operator of an apprenticeship program and in whose name the program is approved and registered with the DLIR pursuant to HAR §12-30-1.

    b. The authorization shall be an original signature by an authorized official of the apprenticeship sponsor.

    c. The completed signed original *Certification Form 1* for each trade must be submitted with the bid. Previous certifications shall not apply.

    d. When filling out the *Certification Form 1*, the name of Apprenticeable Trade and Apprenticeship Sponsor must be the same as recorded in the List of Construction Trades in Registered Apprenticeship Programs that is posted on the DLIR website. "Registered apprenticeship program" means a construction trade program approved by the DLIR pursuant to HAR §12-301 and §12-30-4.

    e. The *Certificate Form 1* and the List of Construction Trades in Registered Apprenticeship Programs is available on the DLIR website at: http://hawaii.gov/labor/wdd.

3. Upon receiving the *Certification Form 1*, the Procurement Officer will verify that the apprenticeship program is on the List of Construction Trades in Registered Apprenticeship Programs and that the form is signed by an authorized official of the Apprenticeship Program Sponsor. If the programs and signature are not confirmed by the DLIR, the bidder will not qualify for the preference.

4. If the bidder is certified to participate in an apprenticeship program for each trade which will be employed by the bidder for the project, a preference will be applied to decrease the bidder's bid

amount by five percent (5%) for evaluation purposes.

5. Should the bidder qualify for other preferences, all applicable preferences shall be applied to the bid price.

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 27) selected by the Board of Land and Natural Resources. Write the total of bid items 1 to 27 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 one hundred eighty (180) 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 three hundred and sixty-five (365) calendar days 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 HIePRO bid due date and time, 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 Two Hundred and No/100 dollars ($200.00) 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:

Addendum	Date Received	Addendum	Date Received
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.

Exact Legal Name of Company, Joint Venture or Partnership

Company is:
☐ Sole Proprietor ☐ Partnership ☐ Corporation ☐ Joint Venture ☐ Other _____

Contractor's License No.: _____

Federal I.D. No.: _____

Hawaii General Excise Tax License I.D. No.: _____

Payment address (other than street address below): _____

City, State, Zip Code: _____

Business Address (street address): _____

City, State, Zip Code: _____

Respectfully submitted,

By _____
Authorized (Original) Signature (*4)

Title: _____

Print Name: _____

Date: _____

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 "one hundred eighty (180)" 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 one hundred eighty (180) 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 replacing the last paragraph with the following:

In the event the Notice to Proceed is not issued within three hundred and sixty-five (365) calendar days after the date of bid opening, the Contractor may submit a claim for increased labor and materials costs (but not overhead costs). The claim shall be for labor and material

costs incurred after 365 days and the full duration of the contract time allowed for the performance of the work (as specified on Page P-1 of the [Bid] PROPOSAL) have elapsed. Such claims shall be accompanied with the necessary documentation to justify the claim. No payments will be made for escalation costs that are not fully justified as determined by the State.

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 HIePRO website.

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. Proof of Insurance Coverage

A Certificate of Insurance or other documentary evidence, to the satisfaction of the Engineer, that the Contractor has in place all insurance coverage required by the contract. The Certificate of Insurance shall contain wording which identifies the Project number and Project title for which the certificate of insurance is issued. Refer to the following for insurance requirements:

1. Insurance Requirements

(a) Obligation of Contractor - Contractor shall not commence any work until it obtains, at its own expense, all required herein 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 laws of the State to issue such insurance in the State of Hawaii. Coverage by a "Non-Admitted" carrier is permissible provided the carrier has a AM Best's Rating of "A-VII" or better.

(b) 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.

(c) Certificate(s) of Insurance acceptable to the Department shall be filed with the Engineer prior to commencement of the work. Certificates shall identify if the insurance company is a "captive" insurance company or a "Non-Admitted" carrier to the State of Hawaii. The Best's Rating must be stated for the "Non-Admitted" carrier. Certificates shall contain a provision that coverages afforded under the policies will not be canceled or changed until at least thirty (30) 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.

(d) 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.

(e) All insurance described herein shall be primary and 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.

(f) 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.

(g) If the Contractor is self-insured, it shall furnish, upon the request and the satisfaction of the Engineer, any documentation to demonstrate the ability to self-insure itself. The Engineer, from time to time, can conduct an audit to determine the ability of the Contractor to be self-insured. Failure to comply with the Engineer's request will be considered a material breach of the contract, and at the discretion of the Engineer, may be sufficient grounds to terminate the contract, suspend any work or withhold future payments.

(h) It is the responsibility of the Contractor to notify the Department of any changes to its insurance policies or if the Contractor receives a notice of cancellation of any of its insurance policies. The Contractor will immediately provide written notice to the Department should the insurance policies evidenced on its Certificate of Insurance form be cancelled, limited in scope, or not renewed upon expiration.

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 worker's compensation insurance for all persons whom they employ or may employ in carrying out the work under this contact. 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. The Contractor shall obtain General Liability insurance with a limit of not less than $1,000,000 per occurrence and $2,000,000 aggregate. The insurance policy shall contain the following clauses: 1) "The State of Hawaii is added as an additional insured as respects to operations performed for the State of Hawaii."; and 2) "It is agreed that any insurance maintained by the State of Hawaii will apply in excess of, and not contributed with, insurance provided by this policy." The required limit of insurance may be provided by a single policy or with a combination of primary and excess polices."

(c) Comprehensive Automobile Liability. The Contractor shall obtain Auto Liability insurance covering all owned, non-owned and hired autos with a combined single Limit of not less than $1,000,000 per accident for bodily injury and property damage. The insurance policy shall contain the following clauses: 1) "The State of Hawaii is added as an additional insured as respects to operations performed for the State of Hawaii."; and 2) "It is agreed that any insurance maintained by the State of Hawaii will apply in excess of, and not contributed with, insurance provided by this policy." The required limit of insurance may be provided by a single policy or with a combination of primary and excess polices.

Furthermore, the Contractor's commercial general liability insurance and automobile liability insurance 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 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.

(d) 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 insurance policy shall contain the following clauses: 1) "The State of Hawaii is added as an additional insured as respects to operations performed for the State of Hawaii."; and 2) "It is agreed that any insurance maintained by the State of Hawaii will apply in excess of, and not contributed with, insurance provided by this policy." The required limit of insurance may be provided by a single policy or with a combination of primary and excess polices.

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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DIVISION 12 – FURNISHINGS
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DIVISION 13 –SPECIAL CONSTRUCTION
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NOT USED

DIVISION 15 –MECHANICAL
NOT USED

DIVISION 16 –ELECTRICAL
NOT USED

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 water 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 water line bypass 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:

Abbreviation	Company
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

Abbreviation	Company
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

Abbreviation	Company
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 - OECI) 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

Abbreviation	Company
DIS	Division of Industrial Safety California Department of Industrial Relations 2422 Arden Way Sacramento, CA 95825
EEI	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, Sub article 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
HI	Hydraulic Institute 1230 Keith Building Cleveland, OH 44115

Abbreviation	Company
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

Abbreviation	Company
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

Abbreviation	Company
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 2 – Site Work

2. Division 3 – Concrete

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 landowner.

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.

Sandbags or other approved weights shall be provided where required or as directed by the Engineer. Sandbags 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 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. Reflectorizing: Reflectorizing 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 (i.e. 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, sandbags 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 wastepaper and wrapping materials, cans, bottles, construction waste materials and other objectionable materials, and removal as required. Frequency of cleanup 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. Wastewater 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 ARTWORK

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" signposts 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

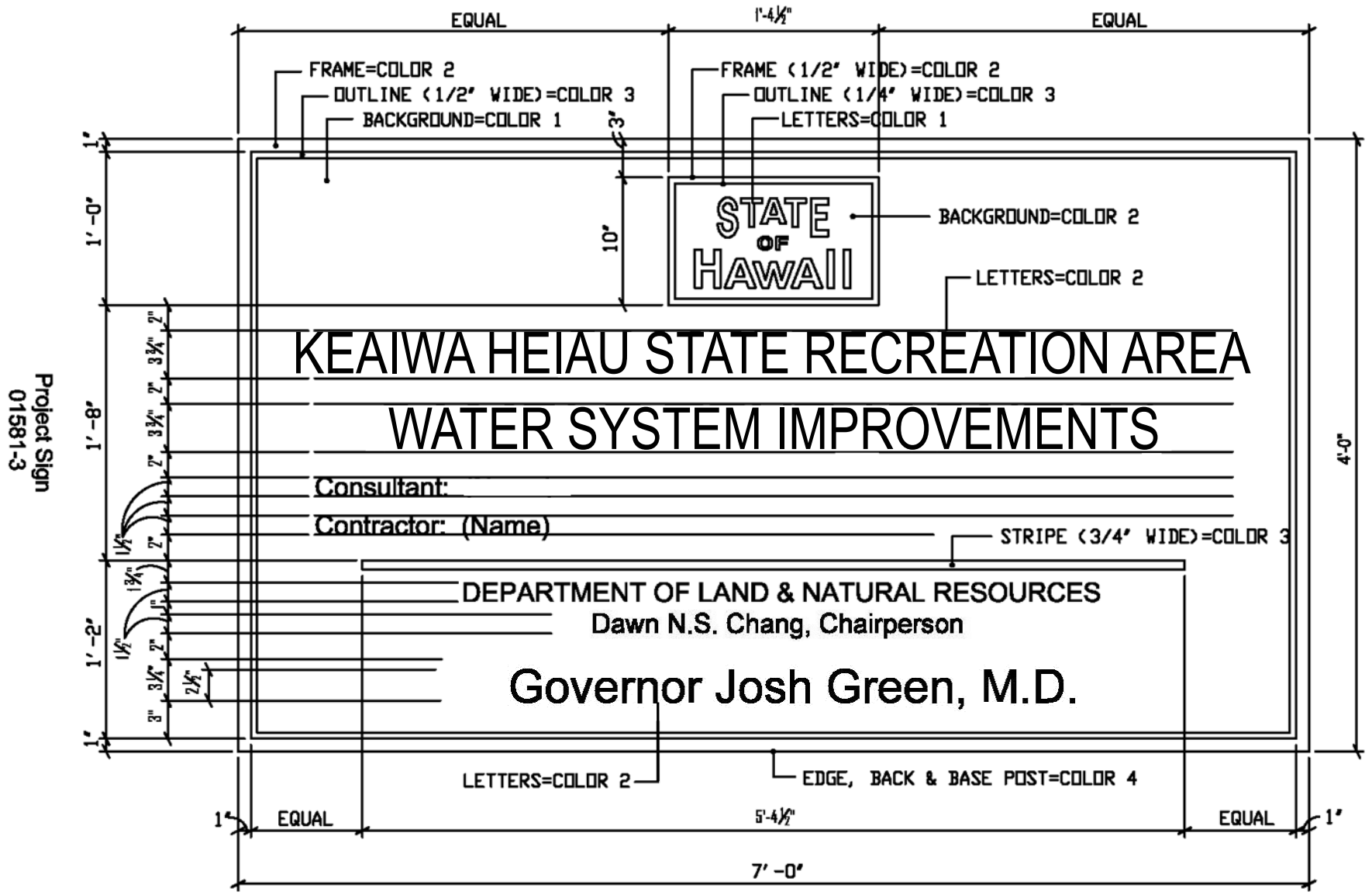
A. The Project Sign shall be constructed with new materials as specified above.

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

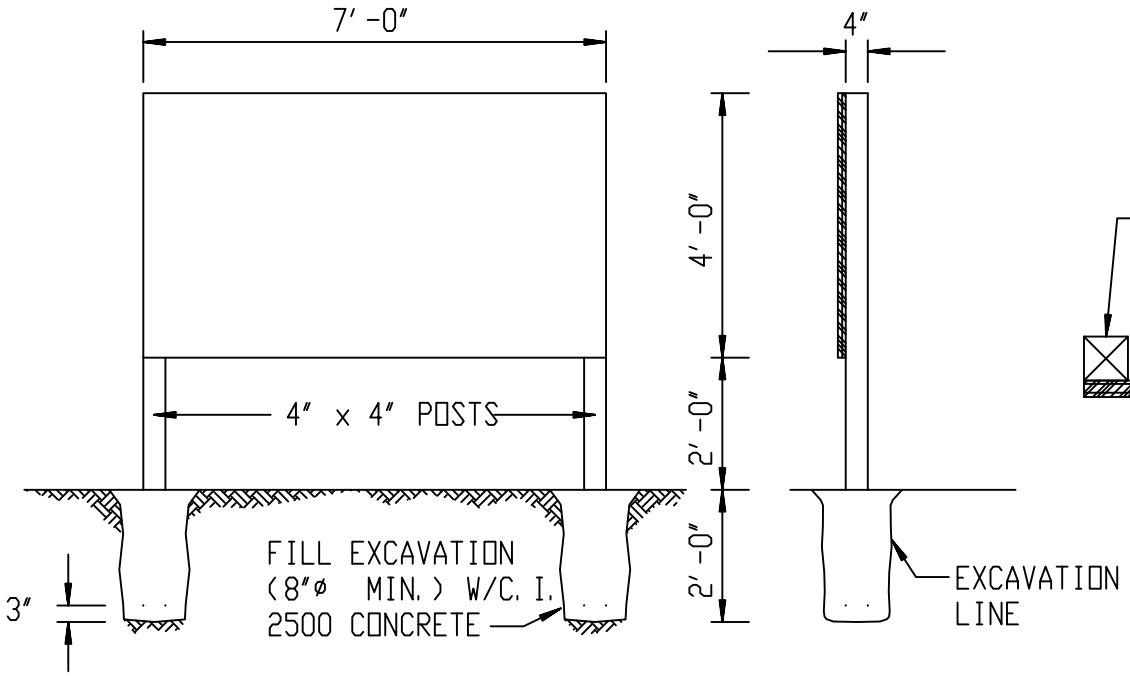
The construction of the project sign, including all equipment, labor and material necessary to furnish and install the project sign will be paid for under the "Project Sign" proposal item.

END OF SECTION



NOTE: Number of signs required 1

Project Sign
01581-4



FRONT ELEVATION

NOT TO SCALE

SIDE ELEVATION

NOT TO SCALE

PLAN

NOT TO SCALE

SECTION 02050

DEMOLITION

PART 1 - GENERAL

1.1 GENERAL REQUIREMENTS

The work includes demolition and removal as indicated in the plans or specified herein. All materials resulting from demolition work, except as indicated or specified otherwise, shall become the property of the Contractor and shall be removed from the limits of State property. Remove rubbish and debris from the job site daily, unless otherwise directed. Store materials that cannot be removed daily in areas specified by the Contracting Officer. The Contractor shall pay for all necessary permits and certificates that may be required in connection with this work.

1.2 COORDINATION WITH OTHER SECTIONS

A. Submit in accordance with SECTION 01300 – SUBMITTAL PROCEDURES.

B. Submit proposed demolition and removal procedures to the Contracting Officer for approval before work is started. Procedures shall provide for coordination with other work in progress and a detailed description of methods and equipment to be used for each operation, and sequence of operations.

1.3 DUST CONTROL

A. Take appropriate action to check the spread of dust to the surrounding area and to avoid the creation of a nuisance in the surrounding area. Do not use water if it results in hazardous or objectionable conditions, such as flooding or pollution. Comply with all dust regulations imposed by local air pollution agencies

1.4 PROTECTION

A. Existing Improvements: Protect existing improvements that are to remain in place, that are to be reused, or that is to remain the property of the State by temporary covers, shoring, bracing, and supports. Repair items damaged during performance of the work or replace with new to the satisfaction of the Contracting Officer. Do not overload structural elements. Provide new supports or reinforcement for existing construction weakened by demolition, removal, and relocation work. Construction equipment and vehicles shall neither be permitted on, nor shall be stored on the existing work that is to remain in place.

B. Public Safety: Where pedestrian safety is endangered in the work or storage areas, use barricades with flashing lights. Notify the Contracting Officer prior to beginning any such work. The Contractor shall conduct operations with minimum interference to roadways, driveways, sidewalks, and passageways, etc.

C. Trees: The Contractor shall coordinate with DLNR Division of Forestry and Wildlife to determine any protected species in the area and appropriate mitigation measures.

a. During Hawaiian Hoary Bat Or ʻŌPEʻAPEʻA (LASIURUS CINEREUS SEMOTUS) pup rearing season (June 1 to September 14), no plants taller than 15 feet shall be disturbed.

b. If any Hawaiian Hoary Bats or Elepaio are detected or any nests are discovered, all work shall stop and the Contractor shall contact the DLNR Division of Forestry and Wildlife.

D. Explosions: Use of explosives will not be permitted.

E. Hazardous Materials: The presence of hazardous materials including, but not limited to, asbestos and lead based paint is not anticipated for this project. If, during the course of his initial site assessment and prior to any actual construction work, the Contractor considers that hazardous materials may be present, he shall conduct sampling and testing to determine whether those hazardous materials actually exist. Sampling and testing shall be in accordance with all State, Federal, and Local codes, rules, and regulations and shall be paid for by the State.

If the test results indicate that hazardous materials exist at the site, the Engineer shall provide further direction to the Contractor on how to proceed with his work

1.5 TREE TRIMMING AND REMOVAL

A. The Contractor shall pay for and retain a qualified arborist who has been certified for at least 5 years by the International Society of Arboriculture conducting, supervision, and consultation of work to be performed on the existing trees

B. The qualified arborist shall provide consulting services and perform quality assurance duties during the contract period of work.

C. The qualified arborist shall coordinate with the Engineer on all tree protection matters.

PART 2 - PRODUCTS (NOT USED)

PART 3 - EXECUTION

3.1 PREPARATION

A. Examine all areas prior to the start of demolition operations to assure that selected procedures are the most appropriate for accomplishing the work.

B. Utility Toning: Above and below ground utilities shown on drawings are based on available as-built drawings or site observation. Contractor shall tone for existing underground utilities along the alignment of underground utilities shown on drawings. Notify the Engineer immediately for directions if uncharted or incorrectly charted utilities are found.

3.2 DEMOLITION

A. Demolish and remove existing features as necessary to complete the work required for this project. Existing features that are required to be demolished and removed but not indicated on the plans shall be considered incidental to the work unless otherwise indicated by the Engineer.

B. Existing pavements, slabs, and other manmade features that were previously constructed or installed and which are encountered within the grading limits shall be demolished and removed unless otherwise indicated on the plans or directed by the Engineer.

C. Existing underground utilities that may interfere with the park improvements shall be completely removed and/or realigned if still in use. The remaining portions of lines that are left in-place should be properly cut and plugged.

D. The existing underground utilities to remain shall be secured and remain intact.

E. Where demolition occurs adjacent to utilities and structures to remain, the contractor shall provide adequate protection in accordance with Section 01019 – GENERAL SPECIFICATIONS.

F. Demolish and remove existing trees as indicated on the plans. Use controlled falling to prevent injury or damage to structures, other trees, property, or the general public.

G. Tree removal shall include topping and other operations necessary to safely remove the assigned trees.

H. For trees to be demolished and removed, the Contractor shall remove surface roots and stump grind tree trunks 18 inches below the finish grade.

I. Where demolition results in the creation of voids or depressions at the ground surface, fill with structural fill and compact as indicated in Section 02200 – EARTHWORK.

J. Demolition of the existing Redwood Tank will salvage any redwood on site and in coordination with DLNR Division of State Parks.

3.3 SAFETY

A. Work shall be done in accordance with safety provisions of the Manual of Accident Prevention in Construction, published by the Associated General Contractors of America and the Department of Labor and Industrial Relations, Occupational, Safety and Health Division (HIOSH).

3.4 DISPOSAL OF MATERIALS

A. Title to Materials: Title to all materials and equipment to be removed, except as specified otherwise, is vested in the Contractor upon receipt of notice to proceed. The Engineer will not be responsible for the condition or loss of, or damage to, such property after notice to proceed. Materials and equipment shall not be viewed by prospective purchasers or sold on the site. Burning or burying of materials on the site will not be permitted.

B. When removing the materials from the property, truck loads shall be trimmed and loaded as to prevent spillage.

C. All waste material shall be hauled to an appropriate off-site disposal area. The Contractor shall provide to the Engineer disposal receipts for all disposed materials.

3.5 REPAIR OF DAMAGES

A. Any work which is to remain, and which is damaged as a result of demolition work shall be restored to its original condition or as otherwise directed by the Engineer at no cost to the State.

3.6 CLEANUP

A. Debris and Rubbish: Remove and transport debris and rubbish in a manner that will prevent spillage into ocean or adjacent areas. Cleanup spillage from ocean and adjacent areas. The Contractor shall leave the premises clean, neat, and orderly

B. Regulations: Comply with Federal, State, and Local hauling and disposal regulations.

END OF SECTION

SECTION 02100

SITE PREPARATION

PART 1 - GENERAL

1.1 GENERAL REQUIREMENTS

The work to be performed under this section shall include clearing the premises of all obstacles and obstructions, the removal of which will be necessary for the proper reception, construction, execution and completion of the other work included in this contract.

1.2 COORDINATION WITH OTHER SECTIONS

A. Earthwork is specified in Section 02200 - EARTHWORK.

PART 2 - PRODUCTS (NOT USED)

PART 3 - EXECUTION

3.1 GENERAL

A. Maintenance of Traffic: The Contractor shall conduct operations with minimum interference to streets, driveways, sidewalks, passageways, etc.

When necessary, the Contractor shall provide and erect barriers, etc., with special attention to protection of personnel.

B. Protection: Throughout the progress of the work, protection shall be provided for all property and equipment, and temporary barricades shall be provided as necessary. Work shall be done in accordance with the safety provisions of the Manual of Accident Prevention in Construction, published by the Associated General Contractors of America, and the State of Hawaii's Occupational Safety and Health Standards, Rules and Regulations.

C. Fires: No burning of fires of any kind will be allowed.

D. Reference Points: Benchmarks, etc., shall be carefully maintained, but if disturbed or destroyed, shall be replaced as directed, at the Contractor's expense.

E. Disposal: All materials resultant from operations under this Section shall become the property of the Contractor and shall be removed from the site. Loads of materials shall be trimmed to prevent droppings.

3.2 EXISTING UTILITY LINES

A. 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 Engineer of such discovery. The Engineer shall then investigate and issue instructions for the preservation or disposition of the unknown line. Authorization for extra work shall be issued by the Engineer only as he deems necessary.

3.3 CLEARING AND GRUBBING

A. The Contractor shall clear the premises of all obstacles and obstructions, the removal of which will be necessary for the proper reception, construction, execution and completion of other work included in this contract.

B. After clearing has been completed, the entire site shall be stripped of the organically contaminated near-surface soils to a minimum depth of 6 inches. Remove trees and roots to a minimum of 3 feet below existing ground level. Remove all large roots in excess of 2 inches in diameter and backfill and compact the resulting depression. All debris accumulated from this operation shall be completely removed from the premises by the Contractor.

C. The Contractor shall protect from injury and damage all surrounding trees, plants, etc., and shall leave all in as good as condition as at present. Any damage to existing improvement shall be repaired or replaced by the Contractor to the satisfaction of the Engineer.

3.4 CLEAN UP OF PREMISES

A. Clean up and remove all debris accumulated from building operations from time-to-time as directed. Upon completion of the construction work and before final acceptance of the contract work, remove all surplus materials, equipment, scaffoldings, etc., and leave entire job site raked clean and neat to the satisfaction of the Engineer.

END OF SECTION

SECTION 02110

CLEARING AND GRUBBING

PART 1 - GENERAL

1.1 GENERAL REQUIREMENTS

This section covers the requirements for clearing and grubbing, within the areas shown on the plan or as directed by the Engineer. The above work shall include the removal and disposal of designated trees outside the clearing limits. Also included is the protection from injury or defacement of trees and other objects designated to remain and treatment or removal of damaged trees.

PART 2 - PRODUCTS (NOT USED)

PART 3 - EXECUTION

3.1 CLEARING AND GRUBBING WORK:

A. The area to be cleared shall be to the dimensions shown on the plans or one foot beyond toe of fill and top of cut, whichever is greater.

B. All debris, trees, logs, limbs, branches, brush, plants, and other protruding obstructions within the clearing limits shall be removed and disposed of, except the following:

1. Live, sound, and firmly rooted trees with diameter of 4 inches or larger.

2. Live brush, herbaceous plants, and trees between the trail bed and clearing limits that are less than 12 inches in height.

C. Except as provided above, all limbs and branches more than 1/2 inch in diameter that extend into the cleared area shall be cut flush with the tree trunks or stems or cut at the ground surface.

D. Felling, cutting, and trimming methods shall not cause bark damage to standing timber. If damage does occur to standing trees, the injured area shall be treated with a coat of tree-surgery asphalt-based paint. Trees with major roots exposed by construction that are rendered unstable shall be felled and disposed of as specified herein.

E. All stumps within the trail bed shall be removed. Stumps located between the edge of the trail bed and clearing limits that cannot be cut flush with the finished slope, or are not tightly rooted, shall be removed.

F. All logs, limbs, lopped tops, brush, and grubbed stumps and roots shall be scattered on the downhill side of and outside the clearing limits, with the following exceptions:

1. Limbs, brush, and lopped tops from trees felled on the uphill side of the clearing limits shall be scattered below the trailway, except where the existing side slope above the trail is less than 20 percent; such material may be scattered above the trail.

2. Logs may be left on the uphill side of the trail if they are placed so that they will not move into the clearing limits.

G. Debris from clearing and grubbing operations shall not be placed in streams, water courses or at locations that will impede flow of the natural drainage pattern.

END OF SECTION

SECTION 02200

EARTHWORK

PART 1 - GENERAL

1.1 GENERAL REQUIREMENTS

This section covers the requirements for earthwork.

A. It shall be the responsibility of the Contractor to examine the project site and determine for himself the existing conditions.

B. Obvious conditions of the site existing on the date of the bid opening 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.

C. All debris of any kind accumulated from clearing shall be disposed of from the site, and the whole area left clean. The Contractor shall be required to make all necessary arrangements relative to the proposed place of disposal.

1.2 REMOVAL AND REPAIR WORK

A. General

The Contractor shall exercise every precaution to preserve and protect all structures, walkways or utility improvements which are to remain or be relocated. Portions of walkway and pavement which are to remain shall be saw cut neat and true to line. Restore all pavement and curbs upon completion of the work.

1.3 SEQUENCE OF WORK

All sequence of work shall be subject to the approval of the Engineer.

1.4 PROTECTION

A. Barricade: Erect temporary barricade to prevent people from entering into project area, to the extent as approved by the Engineer. Such barricade shall be as defined in Section 01530 - BARRICADES. The extent of barricades may be adjusted as necessary with the approval of the Engineer. This work shall be accomplished at no extra cost to the State of Hawaii.

B. Take all precautions and safety measures as required to protect the State of Hawaii free and harmless from liability of any kind. Conduct operations with minimum interference to streets, driveways, sidewalks passages, etc.

C. Adequate precautions shall be taken before commencing and during the course of the work to ensure the protection of life, limb, and property.

D. The Contractor shall protect from damage all surrounding structures, trees, plants, grass, walks, pavements, etc. Any damage will be repaired or replaced by the Contractor to the satisfaction of the Engineer at no cost to the State.

1.5 PERMITS

The Contractor shall obtain and pay for necessary permits prior to the commencement of work.

1.6 MAINTAINING TRAFFIC

A. The Contractor shall conduct operations with minimum interference to streets, driveways, sidewalks, traffic activities, etc.

B. When necessary, the Contractor shall provide, erect and maintain lights, barriers, etc., as required by traffic and safety regulations with special attention to protection of life.

1.7 CONSTRUCTION LINES, LEVELS AND GRADES

A. The Contractor shall verify all lines, levels and elevations indicated on the drawings before any clearing, excavation or construction begins. Any discrepancy shall be immediately brought to the attention of the Engineer, and any changes shall be made in accordance with his instructions. The Contractor shall not be entitled to extra payment if he fails to report the discrepancies before proceeding with any work whether within the area affected or not.

B. The laying out of base lines, establishment of grades and staking out the entire work shall be done by a licensed Surveyor or a licensed Civil Engineer, registered in the State of Hawaii. He shall be solely responsible for their accuracy. Erect and maintain substantial batter boards showing construction lines and levels.

1.8 CLEANUP

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

PART 2 - PRODUCTS

2.1 MATERIALS

A. Yard Fill: Fill materials shall be soil with expansion value not greater than 3%, free from debris, perishable or combustible materials, sod and stones larger than 6" in maximum dimension. Rock or broken masonry shall be well distributed in earth or other fine material with voids filled and shall be placed within three feet of finished grades.

B. Structural Fill: New structural fill below interior and exterior concrete slabs or paving, with allowance for depth of cushion fill, shall be select borrow material. This material shall be granular with an expansion value not greater than 3% non-adobe and with a plasticity index less than ten. Decayed rubbish, debris, or rocks greater than 3" in diameter shall not be allowed as fill material. Certificate of compliance shall be submitted to the Engineer for approval prior to filling.

C. Topsoil: Imported, fertile, friable soil of loamy character having normal amounts of natural humus, free from subsoil, clay, refuse roots, weeds, noxious seeds, nematodes or other deleterious matter, and free from toxic amounts of either acid or alkaline elements and capable of sustaining healthy plant life. Stones and earth lumps shall not be greater than one inch in largest dimension. Red humic latosol soils, or types known as "Palolo clay" or Lualualei clay" are unacceptable. Topsoil is subject to approval by Engineer.

PART 3 - EXECUTION

3.1 EXCAVATION

A. Protective Measures

1. All excavation shall be protected and guarded against danger to life, limb and property.

2. Shoring, cribbing and logging, as required to safely preserve the excavations and earth banks, free from damages resulting from the work shall be provided and installed by the Contractor.

3. 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. Grading shall be controlled so that the ground surface is properly sloped to prevent water run-off into structural foundations and open trenching excavations.

4. The underground utilities lines traversing the construction area known to exist by the designer are indicated on the plans. Should any be encountered during excavation, the Contractor shall not disconnect same without authorization from the Engineer but shall inform the latter immediately of each discovery. The Engineer shall investigate and issue proper authorization for procedure.

B. General

1. Excavation shall be done to the lines and grades indicated. Concrete slabs, concrete curbs, asphaltic concrete pavement, etc., not indicated to remain shall be removed or broken up into pieces of sizes permitted in other paragraphs of this section. When incorporated in fill, broken up pieces shall be well mixed with finer materials filling all spaces between the pieces.

2. Excavation for footings, foundation, etc., shall have level beds on unfilled, undisturbed, firm bearing, with stepped level where necessary. Small soft spots shall be compacted to unyielding firmness.

   If soil conditions are suitable and approved, footing cuts may be made to exact size of footing.

3. Structural excavations carried below specified level shall be filled with concrete to the proper level at the expense of the Contractor.

4. Excavated materials declared unusable by Engineer shall be removed from the site at the Contractor's expense.

3.2 BACKFILL

A. Yard Area

1. Yard fill where no concrete slab occurs shall be in 6" layers (compacted thickness) compacted to 90% of maximum density as determined by ASTM Test, Method D-1557.

2. The areas not covered by asphalt paving or concrete slab shall be graded to conform to finish contours, with allowance for depth of topsoil. Rough grading shall prevent the drainage of water into construction areas.

B. Structural Fill

1. In advance of preparing the subgrade or depositing a specified layer of material, existing material within the area where such materials is to be placed, which in the opinion of the Engineer is unsuitable as a subgrade foundation, shall be removed and the resulting space refilled with approved material and compacted.

2. Backfilling shall progress so that excessive unbalanced load is not introduced against any structure.

3. New structural fill material shall be placed in layers not to exceed 6" per compacted layer and compacted to a compaction of 90% as determined by ASTM Test, Method D-1557.

4. Materials and compaction of all yard and structural fill shall be tested by an independent testing agency approved by the Engineer and all after-compaction test results submitted to the Engineer for approval. All cost of testing shall be borne by the Contractor. Testing shall be made throughout the area for each 6" compacted layer as directed by the Engineer. All test results must be approved before proceeding with placing of topsoil, cushion fill or base course.

5. In the event insufficient amount of structural fill or yard fill is derived from earthwork operations, import the necessary materials without any additional cost to the State. Such imported material shall meet the requirements as specified for each category of materials.

6. The ground shall be scarified 6" below existing grade and recompacted to 90% compaction. Fill shall conform to structural fill.

7. Under interior and exterior slabs, the cushion fill as specified shall be compacted to a level surface to 95% compaction as determined by modified ASTM Test Method, D-1557.

C. Grading

1. Rough Grading: The areas not covered by asphalt paving or concrete slab up to the contract zone limit shall be graded to topsoil. Contractor shall take the necessary precautions to prevent the drainage of water into construction area.

2. Finish Grading: Outdoor areas not covered by buildings shall be graded to finish grade and contours with allowance for a 4" layer of topsoil as required. Grading shall conform with the ordinances of the applicable County issuing the Grading Permit and as amended. Areas to be topsoiled to 85% of maximum density before placing topsoil. Topsoil shall be spread evenly, compacted lightly and raked to a uniform place at required contours and grades.

3.3 GRASSING

A. Replant graded and damaged areas with grass similar to adjoining area.

B. Grass shall be maintained. Maintenance shall include watering, weeding, mowing, repairing, regrassing and protection, and be performed until the entire project is accepted but in any event for a period not less than 60 days after planting of grass. At the time of acceptance, the grass shall have been well-established and shall be give a final weeding and a final mowing to a height of 1 inch. If the maintenance period has expired before acceptance of the entire project, the Contractor shall continue to maintain the grass until acceptance of the entire project. If the maintenance period should extend beyond

acceptance of the entire project, the Contractor shall continue to maintain the grass until the end of the specified period of time required for maintenance.

END OF SECTION

SECTION 02225

TRENCHING, BACKFILLING, AND COMPACTING

PART 1 - GENERAL

1.1 GENERAL REQUIREMENTS

This section covers the requirements for trenching, backfilling, and compacting.

A. Work included: Trench, backfill, and compact as specified herein and as needed for installation of underground utilities associated with the Work.

B. Related Work:

1. Documents affecting work of this Section include, but are not necessarily limited to, General Conditions, Supplementary Conditions, and Sections in Division 1 of these Specifications.

1.2 QUALITY ASSURANCE

A. Use adequate numbers of skilled workers who are thoroughly trained and experienced in the necessary crafts and who are completely familiar with the specified requirements and the methods needed for proper performance of the work of this Section.

B. Use equipment adequate in size, capacity, and numbers to accomplish the work in a timely manner.

C. In addition to complying with requirements of governmental agencies having jurisdiction, comply with the directions of the Engineer.

D. Compaction requirements are defined by American Society for Testing and Materials (ASTM) publication D-1557 "Moisture-Density Relations of Soils and Soil-Aggregate Mixtures using 10-lb Rammer and 18-inch Drop."

1.3 SUBMITTALS

A. Shoring and sheeting plan: Describe materials of shoring system to be used. Indicate whether or not components will remain after filling or backfilling. Provide plans, sketches, or details along with calculations by a professional engineer registered in Hawaii. Indicate sequence and method of installation and removal.

B. Dewatering plan: Describe methods for removing collected water from open trenches and diverting surface water or piped flow away from work area. Describe equipment and procedures for installing and operating the dewatering system indicate.

1.4 PERMITS

A. Obtain necessary permits required from applicable agencies. All permit fees will be considered incidental to the work and a separate payment shall not be made.

PART 2 - PRODUCTS

2.1 BACKFILL MATERIALS

A. Select Material: Backfill from the bottom of the trench to six inches above the top of the pipe shall be select material. Sand graded crushed rock (commonly known as "rock sand") or excavated granular or sandy material shall be used for select material provided that all rocks or lumps of material over one inch in its longest dimension have been removed. Select material shall be free from salt, ashes, refuse, organic material or other material which, in the opinion of the Engineer, is unsuitable.

All material to be used as select material backfill shall be approved by the Engineer. If in the opinion of the Engineer the excavated material does not meet the grading requirements of select material, the Contractor shall be required to screen the material prior to its use as select material backfill.

B. Ordinary Material: Material used in the upper portion of the backfill from six inches above the top of the pipe to the surface of the ground or subgrade of the road shall not contain stone, rock or other material larger than six inches in its longest dimensions. No wood, vegetable matter or other material which, in the opinion of the Engineer, is unsuitable, shall be included in the backfill. No "adobe" or other materials determined to be deleterious by the Engineer shall be included in the backfill.

C. Controlled Low Strength Material: Backfill within roadways will be compacted Controlled Low Strength Material (CLSM) for the length of the road crossing conforming to Section 302-9A of the “Water System Standards,” 2002 as amended.

D. The Contractor shall obtain the approval of the Engineer of all backfill material.

2.2 OTHER MATERIALS

A. Provide other materials, not specifically described but required for a complete and proper installation, as selected by the Contractor subject to the approval of the Engineer.

PART 3 - EXECUTION

3.1 SURFACE CONDITIONS

A. Examine the areas and conditions under which the work of this Section will be performed. Correct conditions detrimental to timely and proper completion of the Work. Do not proceed until unsatisfactory conditions are corrected.

3.2 FINISH ELEVATIONS AND LINES

A. All material excavated from trenches shall be considered unclassified, whether consisting of earth, lava, soft rock, decomposed rock, solid rock, boulders, or coral. The trench shall be so dug that the pipe can be properly installed to the alignment and grade specified. Excavation shall commence at the point directed by the Engineer and shall be carried on in an orderly manner. No trench shall be opened more than 500 feet in advance of the installed pipe without the approval of the Engineer. No jumps or spaces will be permitted unless approved by the Engineer. Before proceeding with any excavation under asphaltic concrete and concrete pavements, the Contractor shall cut the edges of the excavation with a power saw to insure a neat cut along the pavement.

B. Trench Widths:

1. The widths of trenches for all pipes and appurtenances shall be as shown on the Drawings.

2. Increases in widths over those shown due to sheeting, bracing, or other necessities of construction, may be made by the Contractor with the approval of the Engineer but no additional compensation will be allowed for such extra width.

3. Bell holes shall be provided at each joint to permit the jointing of pipes to be made properly.

C. Trench Depths:

1. In general, trench depths for all pipes and appurtenances shall be as shown on the Drawings.

2. Where necessary, the Engineer reserves the right to raise or lower the grades or to change alignments from those shown on the Drawings.

D. Excavation Below Grades:

1. Any part of the trench excavated below grade by the Contractor shall be corrected with select material, thoroughly compacted in place at no cost to the State.

3.3 PROCEDURES

A. Utilities:

1. All excavated areas shall be toned prior to excavation.

2. Unless shown to be removed, protect lines shown on the drawings or otherwise made known to the Contractor prior to trenching. If damaged, repair or replace at no additional cost to the State.

3. If active utility lines are encountered and are not shown on the Drawings or otherwise made known to the Contractor, promptly take necessary steps to assure that service is not interrupted.

4. If service is interrupted as a result of work under this Section, immediately restore service by repairing the damaged utility at no additional cost to the State.

5. Expose existing utilities to confirm clearances as initial trenching work. If existing utilities are found to interfere with the permanent facilities being constructed under this Section, immediately notify the Engineer and secure his instructions.

6. Do not proceed with permanent relocation of utilities until written instructions are received from the Engineer.

B. Protection of persons and property:

1. Barricade open holes and depressions occurring as part of the Work, and post warning lights on property adjacent to or with public access.

2. Operate warning lights during hours from dusk to dawn each day and as otherwise required.

3. Protect structures, utilities, sidewalks, pavements, and other facilities from damage caused by settlement, lateral movement, washout, and other hazards created by operations under this Section.

C. Blasting:

1. Blasting shall not be permitted.

D. Dewatering:

1. Remove water by pumping or other methods to prevent the softening of surfaces exposed by excavation, prevent hydrostatic uplift, and provide a stable trench condition for installation of the utility. Use screens and gravel packs or other filtering systems on the dewatering devices to prevent the removal of fines from soil.

2. Dispose water at an approved location by pumps, drains, and other approved methods.

E. During the period of construction, the Contractor shall protect the public against mud, dust and similar nuisances and shall take steps to abate such nuisances.

F. Convenient access to buildings along the line of work shall be maintained and temporary approaches shall be provided and kept in order. Temporary bridges for pedestrian traffic shall have handrails securely fastened to them. Handrails shall be free from any projecting nails, splinters, and rough edges.

G. Storing of excavated material alongside the trench shall be done in such a manner as not to obstruct traffic. Whenever, in the opinion of the Engineer, proper storage of excavated material cannot be made alongside the pipe trench, the material shall be hauled away from the work site. If the excavated material meets the requirements for backfill material and proper storage cannot be made alongside the pipe trench, the material shall be stockpiled at convenient locations for later use in backfill.

H. Surplus Material:

1. Unless otherwise specified in the Plans or Specifications, or ordered by the Engineer, surplus excavated material shall become the Contractor's property and shall be removed from the work site and disposed of at no cost to the State.

3.4 TRENCHING

A. Provide sheeting and shoring necessary for protection of the Work, to prevent undermining existing facilities and for the safety of personnel.

1. Prior to backfilling, remove all sheeting.

2. Do not permit sheeting to remain in the trenches except when, in the opinion of the Engineer, field conditions or the type of sheeting or methods of construction such as use of concrete bedding are such as to make removal of sheeting impracticable. In such cases, the Engineer may permit portions of sheeting to be cut off and remain in the trench.

B. Excavation:

1. Short sections of a trench may be tunneled if, in the opinion of the Engineer, the conduit can be installed safely and backfill can be compacted properly into such tunnel.

2. Where it becomes necessary to excavate beyond the limits of normal excavation lines in order to remove boulders or other interfering objects, backfill the voids remaining after removal of the objects at no additional cost to the State, as directed by the Engineer.

3. When the void is below the subgrade for the utility bedding, use select materials and compact to the relative density directed by the Engineer, but in no case to a relative density less than 90%.

4. When the void is in the side of the utility trench or open cut, use suitable earth or sand compacted or consolidated as approved by the Engineer, but in no case to a relative density less than 80%.

5. Excavating for appurtenances:

   a. Excavate for manholes and similar structures to a distance sufficient to leave at least 12" clear between outer surfaces and the embankment or shoring that may be used to hold and protect the banks.

   b. Overdepth excavation beyond such appurtenances that has not been directed will be considered unauthorized. Fill with sand, gravel, or lean concrete as directed by the Engineer, and at no additional cost to the State.

C. Depressions:

1. Dig bell holes and depressions for joints after the trench has been graded. Provide uniform bearing for the pipe on prepared bottom of the trench.

2. Except where rock is encountered, do not excavate below the depth indicated or specified.

3. Where rock is encountered, excavate rock to a minimum overdepth of 4" below the trench depth indicated or specified.

D. Where trenching occurs in existing lawns, remove turf in sections and keep damp. Replace turf upon completion of the backfilling.

E. Cover:

1. Provide a minimum cover over the top of the pipe as indicated on the drawings.

2. Where the minimum cover is not provided, jacket the pipes in concrete as indicated. Provide concrete with a minimum 28-day compressive strength of 2500 psi.

3.5 BEDDING

A. Provide bedding as indicated on the Drawings.

3.6 BACKFILLING

A. General

1. All backfill material shall be placed in the trench by hand or by approved mechanical methods. The compaction of backfill material shall be done by tamping hand tools or approved pneumatic tampers, by using vibratory compactors, by puddling if the backfill material can be suitably drained, or by any combination of the three. The method of compaction shall be approved by the Engineer, and all compaction shall be done to the satisfaction of the Engineer.

2. When removal of unsuitable excavated material creates a shortage of backfill material, the Contractor shall, at no cost to the State, furnish material as specified in this section in the amount required to complete the backfill.

3. When backfill material is delivered by trucks, the material shall not be dumped directly into the trench, but the fall of the material shall be broken at the edge of the trench. The backfill material shall then be deposited by hand or by approved mechanical methods.

4. Ensure that no damage is done to structures or their protective coatings.

B. Backfilling Around Pipe:

1. Select material shall be used to backfill the trench from its bottom to one foot above the pipe. Prior to the laying of the pipe, the select material cushion shall be deposited in the trench and shall be leveled off, compacted, and shaped to obtain a smooth compacted bed providing firm uniform bearing along the laying length of the pipe.

2. After the pipe is installed, but prior to testing the line, select material shall be deposited in the trench evenly on both sides and along the full length of the pipe in 6-inch maximum loose lifts. If necessary, additional select material can be deposited over the center of each length of pipe to prevent undue movement during testing of the line. Ensure that initially placed material is tamped firmly under pipe haunches. The bell holes at the pipe joints shall not be backfilled at this time.

3. The pipeline shall then be tested. After the pipeline has passed the test, the Contractor shall backfill the bell holes with select material. The select material, which had been previously deposited over the pipe in the trench, shall be leveled and compacted.

C. Backfilling to Grade:

1. From an elevation one foot above the top of the pipe to grade, the backfill material shall be placed in layers not to exceed 12 inches in loose lifts, each lift shall be compacted to a relative density not less than 90%.

2. If the trench section is flooded, no further backfill shall be placed for two (2) days. After this period, the backfill shall again be thoroughly compacted to a relative density of not less than 90% by a method and with equipment approved by the Engineer.

3. The Contractor shall reconstruct the base course and pavement of roadway damaged by the construction of the pipeline as covered elsewhere in these Detailed Specifications.

4. Other improvements such as driveways, sidewalks, curbs, gutters, stonewalls, fences and other structures damaged during construction shall be replaced or repaired to their original condition or better as approved by the Engineer.

3.7 FIELD QUALITY CONTROL

A. The Engineer will inspect and approve open cuts and trenches before installation of pipeline or structures, and will make the following tests:

1. Assure that trenches are not backfilled until all tests have been completed.

2. Check bedding for proper layer thickness and compaction.

3. Verify that test results conform to the specified requirements, and that sufficient tests are performed.

4. Assure that defective work is removed and properly replaced.

END OF SECTION

SECTION 02230

AGGREGATE BASE COURSE

PART 1 - GENERAL

1.1 GENERAL REQUIREMENTS

A. Description. This work shall consist of furnishing and placing one or more courses of aggregate base on a prepared surface in accordance with the requirements of the contract.

PART 2 - PRODUCTS

2.1 MATERIALS

Materials shall meet the requirements specified in the following Subsections of Division 700 Materials of the "Standard Specifications for Road and Bridge Construction."

Aggregate	703.06
Water	712.01

PART 3 - EXECUTION

3.1 CONSTRUCTION REQUIREMENTS

A Placing

1. The base material shall be placed on the prepared surface without segregation. Segregated materials shall be remixed until a uniform distribution is obtained. The material shall not be dumped in piles on the prepared surface.

2. Depositing and spreading shall commence at that part of the work farthest from the point of loading the material and shall progress continuously without breaks, unless otherwise directed by the Engineer.

3. If the required compacted depth of the base course exceeds 6 inches, the base shall be constructed on 2 or more layers of approximately equal thickness. The maximum compacted thickness of any one layer shall not exceed 6 inches.

4. If the contractor uses a vibratory roller weighing 9 tons or more, the lift thickness may be increased to 7 inches.

5. Spreading of binder material over the surface of the compacted base will not be permitted. Additional material if required shall be incorporated uniformly throughout the thickness of the compacted material by scarifying and blading. The combined material shall meet all quality requirements as specified.

B. Shaping and compacting

1. The Contractor shall perform such shaping work as necessary and such that the finished base shall conform to the required grade and cross-section. The finished base where not controlled by adjacent structures or features shall not vary more than 0.04 foot above or below the theoretical grade.

2. Compaction of each layer shall continue until a density of not less than 95 percent of the maximum density, determined in accordance with the requirements of Subsection 106.09 - Special Test Methods, of the "Standard Specifications for Road and Bridge Construction, has been achieved. Field density determination will be made in accordance with Hawaii Test Method HWY-TC 1. The surface of each layer shall be maintained during the compaction operations in such a manner that a uniform texture is produced and the aggregates firmly keyed. Water shall be uniformly applied over the base materials during compaction in the quantity necessary for proper consolidation.

3. Should high or low spots develop during rolling operations, such spots shall be smoothed out by blading with a self-propelled and pneumatic-tired motor grader having a wheelbase not less than 15 feet long and a blade not less than 10 feet long.

4. Each layer shall be compacted initially by rolling with three-wheel rollers followed by intermediate rolling with pneumatic-tired rollers. Final rolling shall be done with three-wheel rollers.

C. Equipment. Three-wheel rollers and pneumatic-tired rollers shall conform to the requirements specified in Subsection 401.03(B)(4) - Rollers.

END OF SECTION

SECTION 02577

PAVEMENT MARKING

PART 1 - GENERAL

1.1 GENERAL REQUIREMENTS

This section consists of the furnishing and installing pavement striping as shown on the plans or as directed by the Engineer.

PART 2 - PRODUCTS

2.1 MATERIALS AND CONSTRUCTION METHODS shall conform to the "Manual on Uniform Traffic Control Devices for Streets and Highways, 2009," and to Section 629 - Pavement Markings, of the "Hawaii Standard Specifications for Road and Bridge Construction, 2005" of the State Department of Transportation, Highways Division.

PART 3 - MEASUREMENT AND PAYMENT

Measurement and payment for the pavement marking specified in this section, including furnishing materials and tools, equipment and labor, will be paid based on the contract unit price set forth in the proposal.

END OF SECTION

SECTION 02605

VALVE BOXES, MANHOLES & MARKERS

PART 1 - GENERAL

1.1 GENERAL REQUIREMENTS

This section shall apply to furnishing and installing valve boxes, manholes and markers. Unless otherwise noted, reference made to the Standard Details shall be the Approved Material List and Standard Details for Water System Standards for the State of Hawaii 2002 as Amended.

1.2 VALVE BOXES

Valve boxes for gate valves, air relief valves and butterfly valves and cleanouts shall be installed in accordance with the Standard Details.

1.3 MANHOLES

Manholes shall be constructed wherever specified on the plans. Manholes shall be constructed in accordance with the Standard Details or as shown on the plans.

Manhole in lieu of valve box shall be constructed over any valve whenever the depth from the finish grade of the pavement or ground to the top of the stem of the valve exceeds five (5) feet unless directed otherwise by the Manager.

1.4 MARKERS

Valve markers for establishing the location of valves shall be installed at the locations shown on the plans or as directed by the Manager. Markers shall conform with the dimensions and notes shown on the Standard Details.

PART 2 - PRODUCTS

2.1 GENERAL

A. Cast iron for frames and covers shall conform to ASTM Designation A-48.

B. All castings shall be of tough, close-grained, gray iron, sound, smooth, clean, and free from blisters, blowholes, shrinkage, and cold shuts.

C. Allowance shall be made in the patterns so that the finished castings shall have the specified dimensions.

D. The seats of manhole and valve box frames and covers shall be machined, not ground to secure FLAT AND TRUE SURFACES. Castings for Cover and Reading Lid seats shall be chipped and ground where necessary to secure FLAT AND TRUE SURFACES.

E. All castings shall be thoroughly cleaned and painted before leaving the shop with one coat of high-grade asphaltum.

2.2 MANHOLE COVERS AND FRAMES

All manhole covers and frames shall be made in accordance with the dimensions and notes shown on the Standard Details.

2.3 MANHOLE RUNGS

Manhole rungs shall be 3/4-inch in diameter, hot-dipped galvanized carbon steel, or stainless steel, Type 302, 304, or 315, or an approved equal.

A. Rungs shall be fabricated in accordance with the dimensions and notes shown on the Standard Details.

2.4 VALVE BOX COVERS AND FRAMES AND STANDPIPES

Valve box covers and frames shall be made in accordance with the dimensions and notes shown on the Standard Details.

Valve box standpipes shall be either cast iron pipe, R.C.P., PVC, or approved equal. Standpipes shall be as shown on the Standard Details.

PART 3 - EXECUTION

3.1 VALVE BOXES

The standpipe shall be set plumb and centered over the valve stem. Backfill around the valve and standpipe shall be made by hand to 8 inches below the surface of the ground and compacted. Compaction of backfill shall be done with approved pneumatic tampers.

The cast iron frame and cover shall set firmly to grade. The 4-inch thick DWS 2500 concrete slab shall be poured to secure the frame.

All cast iron covers shall be close fitting to avoid rattling due to the passing traffic. All defective frames and covers shall be replaced to the satisfaction of the Manager.

Upon completion of installation, valve box frames and covers shall be cleaned and painted with one coat of approved asphaltum paint.

Existing valve boxes to be reconstructed to the required elevation shall be done in accordance with the applicable provisions of the Water System Standards. The existing standpipe shall be replaced with one having the correct length to bring the valve box to the required elevation. The existing standpipe may be reused if so, approved by the Manager.

3.2 MANHOLES

A. Upon completion, all manholes, including reconstructed or adjusted manholes, shall be thoroughly cleaned of all debris and the frames and covers painted with one coat of approved asphaltum paint.

B. Manhole walls shall be constructed of concrete, brick, or hollow block with reinforcing as required in accordance with standard masonry practice. The sizes and dimensions shall be as shown on the Standard Details.

C. A space of at least 2 inches shall be left between the wall and the upper half of the barrel of the pipe. This space shall be filled with asphalt or pre molded asphaltic filler.

D. If any portion of the manhole is below the 4-foot elevation, City and County Datum, or where water is encountered, that portion thereof shall be given a plaster coating of cement mortar 5/8-inch thick on the inside and outside. The plaster coating shall be composed of one part Portland cement and three parts of fine aggregate by volume. Hydrated lime may be used in the mortar but shall not exceed 10% by volume.

E. Manhole top and bottom slabs shall be of concrete with reinforcing steel and shall be constructed in accordance with the dimensions and notes shown on the Standard Details.

END OF SECTION

SECTION 02616

POLYVINYL CHLORIDE (PVC) PIPE

PART 1 - GENERAL

1.1 GENERAL REQUIREMENTS

This section covers the requirements for furnishing, installing and testing the polyvinyl chloride (PVC) pipe and fittings.

PART 2 - PRODUCTS

2.1 MATERIALS:

A. PVC Pipes: All water laterals shall be PVC and manufactured from virgin material and all materials shall be Type I, Grade 1, with hydrostatic design stress of 2,000 psi for water at 73.4EF (23EC) designated as PVC 1120, Schedule 80, Solvent Weld pipe, except as noted as schedule 80 on the plans.

B. PVC Fittings: All water lateral fittings shall be PVC, Schedule 80, and manufactured and in a manner from materials meeting the requirements of PVC pipes except as noted as schedule 80 on the plans.

C. Solvent Cement: The solvent cement for solvent-welding PVC water laterals and fittings shall be recommended by the manufacturer, shall be compatible with the type of pipe used and shall be of proper consistency, ready for use.

D. Inspection and Certification: All material furnished under these specifications shall be inspected and tested prior to shipment for conformance to the "Water System Standards," 2002 as Amended. Each length or every five feet of pipe, whichever is shorter, shall be marked with the following information:

1. Nominal pipe size
2. Type of plastic pipe material (designation code)
3. Standard thermoplastic pipe dimension
4. Commercial Standard designation
5. Manufacturer's name and code
6. Seal of approval of the National Sanitation Foundation (NSF).

The manufacturer of the pipe and fittings shall submit to the Engineer a sworn statement that the inspection and all tests for the pipe have been made and met as specified. The manufacturer shall also submit a warranty guaranteeing his product against production or material defects. This warranty shall be of one year, from date of final acceptance of this project, replacing free of charge all defective materials only. Failure to obtain this material warranty shall be just cause for the rejection of all pipe installed by the Contractor.

E. Crushed Rock: Shall be manufactured from sound, durable lava rock and shall be free from vegetable matter and other deleterious substances. The wear when tested under AASHTO TEST METHOD T96 shall not exceed 50 percent at 500 revolutions. For crushed rock gradations, see Table 1-15 on page 26, Section 15-crushed rock, in the "Standard Specifications for Public Works Construction" dated September 1986.

F. Controlled Low Strength Material: Controlled Low Strength Material (CLSM) shall be used in lieu of standard backfill material and pipe cushion material in accordance to the plans and specifications. CLSM shall conform the section 302-9A of the "Water System Standards," 2002 as amended.

G. Hydro-Pneumatic Tanks: Hydro pneumatic tanks shall all be "bladder tanks" with a minimum capacity of 80-gallons. Tanks hall be composed of High Strength Steel and Heavy Duty Butyl diaphragm. System connect shall be a 1.25" NPTF and the tank shall have a 302-32 charging valve.

PART 3 - EXECUTION

3.1 INSTALLATION

A. PVC pipe in general shall be installed and jointed in accordance with the manufacturer's directions and the International Association of Plumbing and Mechanical Officials (IAPMO) installation standards dated August 1989. Specifically, the following shall also apply:

1. All joints shall be rubber ring gasket type for 4" and larger pipes and cemented for 3" and smaller pipes unless shown otherwise on the contract drawings. Threading of PVC pipe will not be allowed.

2. All connections shall be watertight under all conditions of service. The Contractor shall follow the manufacturer's recommendations relative to installation procedure including allowances for expansion and contraction.

3. Connection valves, cocks, existing pipes, and other threaded devices shall be made with plastic adapter fittings.

4. During transportation, installation and all other handling of PVC pipe, care shall be taken to avoid scratches and nicks.
5. Minor curvature may be achieved by deflecting the pipe lengths at the joints with the Engineer's approval. Bending PVC pipe will not be allowed.

B. Trench excavation and backfill are covered in another section of these specifications. Backfilling of the PVC pipe shall be done only when the pipe is filled with water and under test pressure. Under no circumstances shall backfill material be placed over empty PVC pipe.

C. Warning Tape with electro-physical properties shall be installed with all PVC pipe installed below ground level and with a continuous length in excess of 30 feet, with the exception of service laterals less than 1" nominal diameter. Warning tape shall be blue and imprinted with the following: "CAUTION WATER LINE BELOW" or "CAUTION SEWER LINE BELOW." Tapes shall be two inches in width.

All tape shall be installed continuous and a maximum of 24 inches and a minimum of 12 inches below finished grade. In no instance will the tape be installed in the roadway structure including select borrow, base course or wearing surface. The tape shall be installed on top of a compacted layer of trench backfill material and placed as close as practical to a position directly above the installed pipe.

D. Detection Wire composed of insulated on-piece (single strand) Copper wire, No. 10 ga. (0.1019" diameter) minimum (American or Brown and Sharpe Gauge). Where wires must be joined, the ends shall be tied in a knot and a splice made which provides electrical continuity across the wires.

The conducting cable shall be buried directly above the centerline of the pipe at a distance of approximately 6" above the top of the pipe. The wire shall extend continuously along the entire length of pipe. The wire shall be insulated along the entire length.

3.2 TESTING

After the PVC water laterals have been assembled, the following tests shall be conducted in the presence of the Engineer. Testing will be considered incidental to the installation of the waterlines.

A. Hydrostatic Test: A separate test shall be made on each section of the pipeline whenever any section of the work is installed in such a manner as to permit its isolation as a unit. The maximum length of each test section shall be 1,000 feet or as directed by the Engineer. The Contractor shall install, at no cost to the Department, the necessary plugs or caps, properly braced and tied to withstand the required test pressure. When a section of the pipeline is ready for testing, a 1/2-inch corporation cock shall be tapped into the main and shall be connected by suitable piping to a test pump. The location of the tap shall be determined by the Engineer. Between the corporation cock and pump a stopcock shall be installed and between the stopcock and the corporation cock and approved pressure gage shall be installed. The pressure gage shall be tested for accuracy before it is used in the tests. The section of pipe to be tested shall be completely filled with water and care shall be taken to insure that no air pockets exist. The stopcock shall be opened and the hydrostatic pressure raised to the required pressure.

All PVC pipe and appurtenances shall be tested to one and one-half times the designed working pressure of the system or to the design pressure of the pipe. All valves, traps or other apparatus which may be damaged by the test pressure shall be removed before the tests are made.

At the required test pressure, the stopcock shall then be shut and the gage observed for three minutes. During this period, the pressure shall not drop more than 10 pounds. While the pipeline is under test all joints shall be carefully inspected and all leaks shall be stopped. The testing of the pipeline shall be done after the solvent-welded joints have been cured for twenty-four (24) hours.

END OF SECTION

SECTION 02646

SERVICE LATERALS

PART 1 - GENERAL

1.1 GENERAL REQUIREMENTS

This section covers the requirements for furnishing and installing service laterals.

A. The Contractor shall furnish and install all service laterals, copper or plastic pipes and appurtenances as shown on the plans.

B. Unless otherwise specified, the term "appurtenances" shall include all fittings, valves, corporation stops, stopcocks and any corrosion protection device, e.g., dielectric coupling which may be required.

PART 2 - PRODUCTS

2.1 COPPER TUBING

A. Copper Service Lateral shall be soft temper Type "K" and shall conform to ASTM Designation B-88.

B Solder-joint fittings shall be cast bronze or wrought copper and shall conform with ANSI B-16. Cast bronze shall conform with ASTM Designation B-62. Wrought copper fittings shall be made of commercially pure copper conforming with ASTM Designation B-251 or 85-5-5-5 composition brass.

C. Compression fittings shall be of cast bronze or stainless steel and conform to applicable AWWA, ANSI, and/or ASTM Standards.

D. Fittings required for the various sizes and combination of service laterals and connections shall be as shown on the Standard Details.

E. Nipples shall be of the same quality as copper pipe.

F. Solder shall be 1/8-inch diameter, and shall not contain more than 0.2 percent lead.

G Flux shall be ‘LA-CO’ Flux Regular Stay-Clean Flux, Oatey Paste Flux, #95 Tinning Flux, General Purposed Soldering Flux or approved equal. Flux shall conform with Federal specifications O-F-506C Type I.

H. Solder and flux shall be delivered in their original containers.

I. Conform to “Water System Standard” Division 500 corrosion control as required.

2.2 CORPORATION STOPS

A. Corporation stops shall have"Mueller" type taper threads and following dimensions:

1/2"Corp. Stop shall have 1/2" waterway and 3/4" I.P.T. outside

3/4"Corp. Stop shall have 3/4" waterway and 1" I.P.T. outside

1" Corp. Stop shall have 1" waterway and 1-1/4" I.P.T. outside

1-1/4" Corp. Stop shall have 1-1/4" waterway and 1-1/2" I.P.T. outside

1-1/2" Corp. Stop shall have 1-1/2" waterway and 2" I.P.T. outside

2" Corp. Stop shall have 2" waterway and 2-1/2" I.P.T. outside

B. The metal composition of the corporation stop shall be as specified in ASTM Designation B-62.

C. Unless otherwise specified, Corporation stops shall conform to the requirements of AWWA C-800-84.

2.3 STOPCOCKS

A. Stopcocks shall be as shown on the Standard Details. The metal composition of the stopcock shall be as specified in ASTM Designation B-62. Cocks shall be carefully cored to insure evenly balanced walls. The keys shall be properly machined and ground. The stopcocks shall have either a raised boss on the head or a groove cut into the head to indicate the open and closed position of the stopcock. The taper of the plug of the stopcock shall be approximately 1-5/8 inches to the foot. Suitable markings on all stopcocks must be made to indicate the manufacturer.

2.4 BALLCOCKS AND BALLCORPS

Ballcocks and ballcorps designed and manufactured in accordance with AWWA Standard C800 shall be acceptable in lieu of plug type stopcocks and corporation stops.

2.5 PRECAST CONCRETE METER BOX

A. Precast concrete meter boxes shall be made in accordance with the dimensions and notes shown in the Standard Details.

B. The cement shall be Portland cement conforming to ASTM Designation C150, Type I. Fine and coarse aggregates shall conform to ASTM Designation C-33 or C-330. Mixing water shall be clean and free from injurious amounts of oils, acids, alkalis, organic materials, or other deleterious substances. An admixture which increases durability and reduces permeability, and when used properly is in no way detrimental to the concrete, may be used.

The combined aggregates shall be of such composition of sizes so that the surface of the finished product shall be continuous and of a uniform texture.

C. The maximum density of the concrete in the finished product shall be 115 pounds per cubic foot, and the maximum absorption shall be 15 pounds per cubic foot. The compressive strength of the concrete shall be at least 2500 psi to be determined in a manner and at intervals satisfactory to the Department.

D. The hydrant connection using an elbow as shown on the Standard Details shall depend on the space available between main and hydrant.

PART 3 - EXECUTION

3.1 SERVICE LATERALS AND CONNECTIONS

A. Location: Service laterals and connections shall be constructed in accordance with the Standard Details as part of the project. Where practicable, laterals shall not be located adjacent to electric and telephone lines leading into the property to be served.

B. The stopcock at the beginning of the branch of the service lateral serving two or more meter sites shall be located in front of the boundary line between lots. Usually, the stopcock shall be on a prolongation of this boundary line.

C. Where the street is of unusual width or where it is not permissible to connect laterals directly to the main, the Engineer may require the installation of service mains in the sidewalk area parallel to the main. This installation should not be confused with a parallel main in the paved area.

3.2 COVER

A. Laterals shall have a minimum cover of 18-inches or as specified elsewhere herein.

3.3 DIAMETER

A. Diameters of service laterals and connections are identified by a code numbering system (see Standard Details). Appropriate codes shall be indicated on the Construction Plans.

3.4 TYPE OF LATERAL AND CONNECTION

A. Laterals and connection shall be of copper pipe or approved plastic tubing with appropriate valves, stops and fittings as described and as shown in the Standard Details. In special cases, subject to special design, 2-1/2-inch copper or larger ductile iron laterals and connections may be installed.

3.5 CONNECTION TO MAIN

A. Laterals shall be connected to the various types of mains as shown in the Standard Details and as specified in Table A, subject to the following conditions:

1. The connection to the main shall be by a corporation stop with Mueller (tapered) threads tapped into the main. Main shall not be tapped closer than 36 inches center to center.

2. Laterals shall not be connected to 16-inch or larger mains unless specifically permitted by the Engineer.

3. Direct taps into asbestos cement pipe or plastic pipe shall not be permitted.

4. Where the size of the corporation stop is larger than allowed in Table A, service saddle, or double hub tee with boss (tapped with Mueller threads) as listed in Table A, shall be installed to receive the corporation stop. Double hub crosses are not permitted.

3.6 SERVICE LATERALS, CONNECTIONS, AND PIPES

A. Upon completion of excavation, the trench bottom shall be brought up to the required invert grade by backfilling and compacting the trench.

B. All pipe and appurtenances shall be thoroughly inspected and tested prior to installation. The various types and sizes of service laterals and connections shall be installed at the locations shown on the plans in accordance with the Standard details.

C. Copper Service Laterals and Pipes: All Joints and fittings for copper pipe or copper service laterals and connections shall be of the soldered type, or other types as approved by the Manager.

In making solder joints, the following procedure shall be followed:

1. Copper tube shall be cut to the desired length with a tube cutter or fine hack saw (32-tooth blade). Burrs shall be removed with a file or scraper.

2. The outside of the end that fits into the solder cup of the fitting shall be cleaned with sandcloth or sandpaper. Dark spots shall be removed.

3. The solder cup of the fitting shall be cleaned carefully with a wire brush, sandcloth or sandpaper. Dark spots shall be removed.

4. Flux shall be ‘LA-CO’ Flux Regular Stay-Clean Flux, Oatey Paste Flux, #95 Tinning Flux, General Purposed Soldering Flux or approved equal. Flux shall conform with Federal specifications O-F-506C Type I.

5. The tube shall be inserted into the fitting as far as it will go and turned back and forth a few times to distribute the flux evenly. THE JOINTS SHALL NOT BE WIPED (TINNED) BEFORE INSERTING INTO PLACE.

6. The fitting shall be heated uniformly with a torch until the solder melts on contact with the heated fitting. The flame shall be removed from the fitting. Solder shall be fed to the joint at only one or two points and not around the full circumference of the tube. When a ring of solder appears around the tube at the fitting, the feeding of solder shall be stopped. The excess solder shall be wiped off with a cloth.

7. For tubes 1-1/4 inch and larger, the fitting shall be moved on the tube or tapped with a tool handle or mallet as the solder is fed. This will break surface tension and help insure even distribution of the solder.

D. Testing

Tests: All pipes, laterals and appurtenances shall be hydrostatically tested r in conjunction with the water main.

Upon completion of the test, the trench shall be backfilled as specified.

Testing is considered incidental to the installation of service laterals.

END OF SECTION

SECTION 02675

TESTING AND CHLORINATION

PART 1 - GENERAL

1.1 GENERAL REQUIREMENTS

This section covers the requirements for testing and chlorination requirements for potable water mains.

A. Upon completion of the installation of the water system and pressure testing, the Contractor shall flush and disinfect the water system.

PART 2 - PRODUCTS (NOT USED)

PART 3 - EXECUTION

3.1 PIPE PRESSURE TESTS

A. All water mains and appurtenances, including service laterals and service connection shall be subjected to a hydrostatic pressure test as shown on the plans by the Contractor in the presence of the Engineer.

B. A separate test shall be made on each section of the pipeline and its appurtenances whenever any section of the work can be segregated as a unit. If valves are available at each end of the section, the test shall be made between the valves. If valves are not available, a plug or cap shall be installed and properly braced to withstand the required test pressure. When a section of the work is ready for testing, the corporation stop shall be installed in accordance with the Standard Details, shall be connected by suitable pipeline to the test pump. A stopcock shall be installed between the tap and pump. A pressure gage furnished by the Engineer shall be installed between the stopcock and the tap.

C. The section of pipe to be tested shall be completely filled with water. Care shall be taken to insure that no air pockets exist. The stopcock shall be opened and the hydrostatic pressure raised to the required pressure called for on the plans.

D. The stopcock shall be shut and the gauge observed for 30 minutes. During the 30 minutes, the pressure shall not drop more than 10 psi.

E. The Engineer may require tests to cover any section or any combination of sections and may require additional tests to be made at any time.

F. All equipment and material necessary for tests shall be furnished and installed by the Contractor.

G. After all leaks have been stopped and the test is completed, brass Mueller plugs shall be furnished and installed by the Contractor in holes made for testing purposes.

3.2 CHLORINATION OF WATER PIPELINES

A. The Contractor shall install temporary risers adjacent to certain valves for disinfection purposes prior to the start to backfill. After the water mains have been certified by the department or otherwise directed by the Engineer, the Contractor shall remove the risers. The excavation necessary to expose these risers and the final backfill shall be performed by the Contractor.

The Contractor shall expose all service connections for chlorination. After completion of the chlorination and flushing, the Contractor shall backfill the connections.

B. Disinfection Procedure. The Contractor shall perform all work necessary for the disinfection of water pipelines under the supervision of the Engineer or his authorized representative.

C. Preliminary Flushing. Where conditions permit, mains shall be flushed with maximum available pressure and velocity. Adequacy of turnovers shall be determined by the absence of particles. During all flushing operations, the Engineer or his authorized representative shall determine the rate of water use.

D. Chlorination. The Contractor shall submit to the Engineer, for approval, a sketch showing locations of sampling points and a plan or schedule delineating the method or steps he proposes to use to accomplish the work. The following method for chlorination may be used:

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

2. Flush main with fresh water until all chlorine has been flushed out as evidenced by the N,N-diethyl-p-phenylenediamine (DPD) test, then collect a water sample while continuing to flush the main.

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

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

E. Sampling. Unless otherwise directed, microbiological samples shall be taken in all cases after all chlorine has been flushed out as evidenced by the ortho-tolidine test. Sampling shall be done by the Contractor under the coordination of the department's inspector with sampling bottles furnished by the department. Under no circumstances shall sample bottles be rinsed out.

F. Disposal of Chlorinated Water. The Contractor shall be responsible for the proper disposal of chlorinated water to safeguard public health and environment in accordance with applicable Department of Health requirements.

G. Certification. New mains shall be certified after two (2) samples that are collected 24 hours apart in unchlorinated areas, and one (1) sample that is collected in normally chlorinated areas shows the absence of no total or fecal coliform and less than 200 colony forming units (CFU) of total bacteria.

Repetition of Procedure. Disinfection of mains shall be repeated until samples show absence of coliforms as outlined in Section 3.2 (G).

Water samples that show the presence of atypical colonies, debris or results inconsistent with existing water are subject to reconfirmation. The manager reserves the right to request and test additional water samples in the interest of safeguarding public health and safety at no additional cost to the department.

H. Procedure Guideline. The disinfection procedures hereinabove are guidelines only and the department does not guarantee certification after one application.

END OF SECTION

SECTION 03210

REINFORCING STEEL

PART 1 – GENERAL

1.1 DESCRIPTION

This section describes furnishing, storing, and placing reinforcing steel (also referred to as rebar, bar, or reinforcement).

1.2 SUBMITTALS

A. Submit six copies of shop drawings showing layout of rebar cages in pilecaps, abutments.

PART 2 - PRODUCTS

2.1 MATERIALS

A. General: Reinforcement bar shall have a minimum chromium composition as indicated in paragraph C. "Material Composition" Table 1; and have either a minimum yield strength of 100,000 psi for Grade 100 by using the 0.2% offset test method of ASTM A370.

B. Manufacturer Process and Bar Sizes: Reinforcement bar shall be hot rolled from properly identified mold or stand cast steel.

C. Material Composition: Steel reinforcement bars shall meet the requirements of Table 1.

Table 1. Maximum Chemical Constituents (Weight %)

Element	Carbon	Chromium	Manganese	Nitrogen	Phosphorus	Sulfur	Silicon
Maximum Amount[1]	0.15%	8 to 10.9%	1.5%	0.05%	0.035%	0.045%	0.5%

Note [1] – Maximum unless range indicated'

D. Bar weight, dimensions, spacing, height, and cover depth shall be as noted in Contract Documents.

E. Reinforcement bars shall conform to the weight, dimensions and deformation spacing, height, and gap requirements prescribed in ASTM A1035 Table 1

F. Permissible Variation in Weight: Reinforcement bars shall conform to the requirements for bar deformations in ASTM A1035 Section 11.

G. Tensile Properties:

1. Reinforcement bars shall conform to the requirements for tensile properties prescribed in Table 2.

2. The yield strength shall be determined by the offset method (0.2% offset), described in Test Methods and Definitions A370.

Table 2. Tensile Properties Requirements

	Grade 100
Tensile Strength, min, psi	150,000
Yield Strength (0.2% Offset), min, psi	100,000
Bar Designation No.	
3 through 11	7
14, 18	6

H. Bend Test Properties: Reinforcement bar bent test specimens shall withstand being bent around a pin without cracking on the outside radium of the bent portion. The requirements for degree of bending and sizes of pins are prescribed in Table 3. When material is furnished in coils, the test sample shall be straightened prior to placement in the bent tester.

Table 3. Bend Test Requirements

Bar Designation No.	Pin Diameter[1]
3, 4, 5	3½d[2]
6, 7, 8	5d
9, 10, 11	7d
14, 18 (90°)	9d

Note[1] – Test bends 180° unless otherwise noted in ( ).
Note[2] – d = nominal diameter of specimen.

I. Bar identification:

1. Reinforcement bars shall meet the requirements of ASTM A615 Grade-100, ASTM A1035-13. Reinforcement bars, except plain round bars, which shall be tagged for grade, shall be identified by distinguishing set of marks legibly rolled onto the surface of one side of the bar to denote the specification in the following order:

a. Bar Identifiers – Bars shall have an identification mark to distinguish between manufacturer products.

b. Point of Origin – Letter or symbol established as the manufacturer's mill designation.

c. Size Designation – Arabic number corresponding to bar designation number of Table 2.

d. Type of Steel – Letters "CS" indicating that the bar was produced to ASTM A1035 Type CS specifications. Letters "CM" indicating that the bar was produced to ASTM A1035 Type CM. Letters "CL" indicating that the bar was produced to ASTM A1035 Type CL.

e. Minimum Yield Designation – For Grade 100, either the number 100 or three continuous longitudinal lines through at least five spaces offset each direction from the center of the bar.

PART 3 - EXECUTION

3.01 ORDER LISTS AND BENDING DIAGRAMS

Submit six copies of reinforcing steel order lists and a "certificate of compliance" shall be furnished for each shipment of epoxy coated bar. Six copies of shop drawings of bending diagrams and steel placement shall be submitted to the Engineer prior to fabrication. Assume absolute responsibility for accuracy of lists and diagrams.

3.02 STORAGE, SURFACE CONDITION, AND PROTECTION OF REINFORCEMENT

Store reinforcing steel above ground surface on platforms, skids, or other supports. All visible damage to coatings caused by shipping, handling, or installation shall be repaired as required for repairing coating damaged before shipment confirming to the requirements in ASTM A934. When placed in the work, reinforcing steel shall be free

from dirt, loose rust or scale, mortar, paint, grease, oil, or other coatings that would destroy or reduce bond. Reinforcing steel shall be free from injurious defects such as cracks and laminations. When the extent of coating damage prior to repair exceeds 2 present of the bar in one foot length, repair of the bar will be not be allowed, and the coated bar will be rejected.

3.03 FABRICATION

A. Bending**:** Reinforcing steel may be field bent.

B. All damaged coating due to fabrication or handling shall be repaired with epoxy patching material that is compatible with the coated bars. Repaired areas shall have a minimum coating thickness of 7 mils. When coated bars are sheared, saw-cut or cut by other means during the fabrication or construction process, the cut ends shall be coated with the epoxy patching material. Coated steel bars shall not be flame cut.

C. Hooks and Bend Dimensions**:** Dimensions of hooks and diameters of bends shall be in accordance with the contract documents. When dimensions of hooks or diameter of bends are not indicated in the contract documents, they shall conform to ACI 318-11, Articles 7.1-7.3.

D. Identification: Ship reinforcing steel in standard bundles. Tag bundles of reinforcing bars showing quantity, grade, size, and identification that allows for checking, sorting, and placing. Tag bundles of welded wire fabric reinforcement showing quantity, style designation, width, and length.

E. Placing and Fastening: Place and fasten reinforcing steel bars in accordance with recommended practices and procedures in CRSI *Placing Reinforcing Bars*. Accurately place reinforcing steel and hold firmly in position indicated in the contract documents by wiring at intersections and splices; and by using bar supports accepted by the Engineer that have sufficient strength to resist crushing under applied loads.

Maintain proper clearance between reinforcing steel and boundaries of concrete by precast concrete bar supports of equal compressive strength as concrete to be placed around them, and of shape and dimensions accepted by the Engineer.

Unless otherwise indicated in the contract documents, bar supports and their spacing shall conform to recommendations in Chapter 3 – Bar Supports of CRSI *Manual of Standard Practice* (*MOSP*). Steel wire bar supports shall be Class 1 (plastic-protected) bar supports, as described in CRSI *MOSP*. All-plastic bar supports will be allowed for vertical construction only.

Separate bar layers using precast concrete blocks or other bar supports accepted by the Engineer. Use of pebbles, pieces of broken stone or brick, metal pipes, or wooden blocks will not be allowed.

Maintain minimum 2-1/2 bar diameters for center-to-center spacing of parallel bars.

Minimum clear distance between bundles of bars and adjacent bundles or single bars shall be not less than the following: bundles of two bars, 2 times diameter of larger bar; bundles of three bars, 2-1/2 times diameter of largest bar; bundles of four bars, 3 times diameter of largest bar.

In no case shall clear distance between bars or bundles of bars be less than 1-1/2 times maximum coarse aggregate size or less than 1-1/2 inches, whichever is greater.

Except in decks where parallel reinforcing steel is placed in two or more layers, with clear distance between layers not exceeding 6 inches, place bars in upper layers directly above those in bottom layer, and maintain clear distance between layers of not less than 1 inch or the nominal bar diameter, whichever is greater.

Tie bundled bars together at a distance of not more than 6 feet on centers along length of bar. Limit maximum number of bars in bundle to two bars for No. 14 and No. 18 bars and four bars for other sizes. Bundling bars by tack welding will not be allowed.

Individual bars in bundle that are cut off within span of member shall be terminated at different points, with at least a 40-bar diameter stagger.

3.04 MEASUREMENTS AND PAYMENT

The cost to furnish, fabricate, and install reinforcing steel will not be measured by the Engineer. Payment for the furnishing, fabricating and installing reinforcing steel shall be incidental to the various contract proposal items.

END OF SECTION

SECTION 03300

CAST-IN-PLACE CONCRETE

PART 1 - GENERAL

1.01 RELATED DOCUMENTS

A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 1 Specification Sections, apply to this Section.

1.02 SUMMARY

A. Section includes cast-in-place concrete, including formwork, reinforcement, concrete materials, mixture design, placement procedures, and finishes, for the following:

1. Footings.
2. Pile Caps.
3. Ramp.

B. Related Sections:

1. Division 2 Section "Earthwork" for foundation excavation.

1.03 DEFINITIONS

A. Cementitious Materials: Portland cement alone or in combination with one or more of the following: blended hydraulic cement, fly ash and other pozzolans, ground granulated blast-furnace slag, and silica fume; subject to compliance with requirements.

1.04 SUBMITTALS

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

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

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

1. Cementitious materials.
2. Admixtures.

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

1. Aggregates.

1.05 QUALITY ASSURANCE

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

B. Testing Agency Qualifications: An independent agency qualified according to ASTM C 1077 and ASTM E 329 for testing indicated.

1. Personnel conducting field tests shall be qualified as ACI Concrete Field Testing Technician, Grade 1, according to ACI CP-1 or an equivalent certification program.
2. Personnel performing laboratory tests shall be ACI-certified Concrete Strength Testing Technician and Concrete Laboratory Testing Technician - Grade I. Testing Agency laboratory supervisor shall be an ACI-certified Concrete Laboratory Testing Technician - Grade II.

C. Source Limitations: Obtain each type or class of cementitious material of the same brand from the same manufacturer's plant, obtain aggregate from single source, and obtain admixtures from single source from single manufacturer.

D. ACI Publications: Comply with the following unless modified by requirements in the Contract Documents:

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

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

1.06 DELIVERY, STORAGE, AND HANDLING

A. Steel Reinforcement: Deliver, store, and handle steel reinforcement to prevent bending and damage.

PART 2 - PRODUCTS

2.01 FORM-FACING MATERIALS

A. Smooth-Formed Finished Concrete: Form-facing panels that will provide continuous, true, and smooth concrete surfaces. Furnish in largest practicable sizes to minimize number of joints.

1. Plywood, metal, or other approved panel materials.

B. Rough-Formed Finished Concrete: Plywood, lumber, metal, or another approved material. Provide lumber dressed on at least two edges and one side for tight fit.

C. Chamfer Strips: Wood, metal, PVC, or rubber strips, 3/4 by 3/4 inch minimum.

D. Rustication Strips: Wood, metal, PVC, or rubber strips, kerfed for ease of form removal.

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.

1. Formulate form-release agent with rust inhibitor for steel form-facing materials.

F. Form Ties: Factory-fabricated, removable or snap-off metal or glass-fiber-reinforced plastic form ties designed to resist lateral pressure of fresh concrete on forms and to prevent spalling of concrete on removal.

2.02 CONCRETE MATERIALS

A. Cementitious Material: Use the following cementitious materials, of the same type, brand, and source, throughout Project:

1. Portland Cement: ASTM C 150,Type I/II

B. Normal-Weight Aggregates: ASTM C 33, Class 3S coarse aggregate or better, graded. Provide aggregates from a single source.

1. Maximum Coarse-Aggregate Size: 3/4 inch nominal.
2. Fine Aggregate: Free of materials with deleterious reactivity to alkali in cement.

C. Water: ASTM C 94/C 94M.

2.03 ADMIXTURES

A. Chemical Admixtures: Provide admixtures certified by manufacturer to be compatible with other admixtures and that will not contribute water-soluble chloride ions exceeding those permitted in hardened concrete. Do not use calcium chloride or admixtures containing calcium chloride.

B. Corrosion-Inhibiting Admixture: Commercially formulated, anodic inhibitor or mixed cathodic and anodic inhibitor; capable of forming a protective barrier and minimizing chloride reactions with steel reinforcement in concrete. A corrosion inhibiting admixture shall be included in the concrete mix for all concrete. The corrosion inhibiting admixture shall contain a minimum of 30% calcium nitrate by mass and shall be added at a dosage rate of 4.0 gallons per cubic yard of concrete. The admixture shall be Rheocrete CNI calcium nitrate-based corrosion inhibitor, DCI S corrosion inhibitor or an approved equal. Addition of corrosion inhibiting admixture shall be as recommended by the manufacturer.

2.04 CONCRETE MIXTURES, GENERAL

A. Prepare design mixtures for each type and strength of concrete, proportioned on the basis of laboratory trial mixture or field test data, or both, according to ACI 301.

1. Use a qualified independent testing agency for preparing and reporting proposed mixture designs based on laboratory trial mixtures.

B. Cementitious Materials: Use fly ash, pozzolan (ASTM 616 Type N or F), ground granulated blast-furnace slag, and silica fume as needed to reduce the total amount of portland cement, which would otherwise be used, by not less than 40 percent.

C. Admixtures: Use admixtures according to manufacturer's written instructions.

D. Footings: Proportion normal-weight concrete mixture as follows:

1. Minimum Compressive Strength: 4000 psi at 28 days.
2. Maximum Water-Cementitious Materials Ratio: 0.45.
3. Slump Limit: 4 inches, plus or minus 1 inch.

2.05 FABRICATING REINFORCEMENT

A. Fabricate steel reinforcement according to CRSI's "Manual of Standard Practice."

2.06 CONCRETE MIXING

A. Ready-Mixed Concrete: Measure, batch, mix, and deliver concrete according to ASTM C 94/C 94M, and furnish batch ticket information.

1. When air temperature is between 85 and 90 deg F reduce mixing and delivery time from 1-1/2 hours to 75 minutes; when air temperature is above 90 deg F, reduce mixing and delivery time to 60 minutes.

PART 3 - EXECUTION

3.01 FORMWORK

A. Design, erect, shore, brace, and maintain formwork, according to ACI 301, to support vertical, lateral, static, and dynamic loads, and construction loads that might be applied, until structure can support such loads.

B. Construct formwork so concrete members and structures are of size, shape, alignment, elevation, and position indicated, within tolerance limits of ACI 117.

C. Construct forms tight enough to prevent loss of concrete mortar.

D. Fabricate forms for easy removal without hammering or prying against concrete surfaces. Provide crush or wrecking plates where stripping may damage cast concrete surfaces. Provide top forms for inclined surfaces steeper than 1.5 horizontal to 1 vertical.

1. Install keyways, reglets, recesses, and the like, for easy removal.
2. Do not use rust-stained steel form-facing material.

E. Chamfer exterior corners and edges of permanently exposed concrete.

F. Clean forms and adjacent surfaces to receive concrete. Remove chips, wood, sawdust, dirt, and other debris just before placing concrete.

3.02 EMBEDDED ITEMS

A. Place and secure anchorage devices and other embedded items required for adjoining work that is attached to or supported by cast-in-place concrete. Use setting drawings, templates, diagrams, instructions, and directions furnished with items to be embedded.

1. Install anchor rods, accurately located, to elevations required and complying with tolerances in Section 7.5 of AISC's "Code of Standard Practice for Steel Buildings and Bridges."

3.03 REMOVING AND REUSING FORMS

A. General: Formwork for sides of beams, walls, columns, and similar parts of the Work that does not support weight of concrete may be removed after cumulatively curing at not less than 50 deg F 24 hours after placing concrete. Concrete has to be hard enough to not be damaged by form-removal operations and curing and protection operations need to be maintained.

3.04 STEEL REINFORCEMENT

A. General: Comply with CRSI's "Manual of Standard Practice" for placing reinforcement.

B. Clean reinforcement of loose rust and mill scale, earth, ice, and other foreign materials that would reduce bond to concrete.

C. Accurately position, support, and secure reinforcement against displacement. Locate and support reinforcement with bar supports to maintain minimum concrete cover. Do not tack weld crossing reinforcing bars.

D. Set wire ties with ends directed into concrete, not toward exposed concrete surfaces.

3.05 CONCRETE PLACEMENT

A. Before placing concrete, verify that installation of formwork, reinforcement, and embedded items is complete and that required inspections have been performed.

B. Do not add water to concrete during delivery, at Project site, or during placement unless approved by Engineer.

C. Hot-Weather Placement: Comply with ACI 301 and as follows:

1. Maintain concrete temperature below 90 deg F at time of placement. Chilled mixing water or chopped ice may be used to control temperature, provided water equivalent

of ice is calculated to total amount of mixing water. Using liquid nitrogen to cool concrete is Contractor's option.

2. Fog-spray forms, steel reinforcement, and subgrade just before placing concrete. Keep subgrade uniformly moist without standing water, soft spots, or dry areas.

3.06 FINISHING FORMED SURFACES

A. Rough-Formed Finish: As-cast concrete texture imparted by form-facing material with tie holes and defects repaired and patched. Remove fins and other projections that exceed specified limits on formed-surface irregularities.

3.07 CONCRETE PROTECTING AND CURING

A. General: Protect freshly placed concrete from premature drying and excessive cold or hot temperatures. Comply with ACI 306.1 for cold-weather protection and ACI 301 for hot-weather protection during curing.

B. Unformed Surfaces: Begin curing immediately after finishing concrete. Cure unformed surfaces.

C. Cure concrete according to ACI 308.1, by one or a combination of the following methods:

1. Moisture Curing: Keep surfaces continuously moist for not less than seven days with the following materials:

    a. Water.
    b. Continuous water-fog spray.
    c. Absorptive cover, water saturated, and kept continuously wet. Cover concrete surfaces and edges with 12-inch lap over adjacent absorptive covers.

3.08 FIELD QUALITY CONTROL

A. Testing and Inspecting: Contractor to perform field tests and inspections and prepare test reports.

B. Testing and Inspecting: Contractor to engage a qualified testing and inspecting agency to perform tests and inspections and to submit reports.

C. Inspections:

1. Steel reinforcement placement.
2. Verification of use of required design mixture.
3. Concrete placement, including conveying and depositing.
   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.

D. Concrete Tests: Testing of composite samples of fresh concrete obtained according to ASTM C 172 shall be performed according to the following requirements:

4. Testing Frequency: Obtain one composite sample for each day's pour of each concrete mixture exceeding 5 cu. yd. but less than 25 cu. yd., plus one set for each additional 50 cu. yd or fraction thereof.

5. Slump: ASTM C 143/C 143M; one test at point of placement for each composite sample, but not less than one test for each day's pour of each concrete mixture. Perform additional tests when concrete consistency appears to change.

6. Compressive-Strength Tests: ASTM C 39/C 39M; test one set of two laboratory-cured specimens at 7 days and one set of two specimens at 28 days.

    a. Test one set of two field-cured specimens at 7 days and one set of two specimens at 28 days.
    b. A compressive-strength test shall be the average compressive strength from a set of two specimens obtained from same composite sample and tested at age indicated.

7. When strength of field-cured cylinders is less than 85 percent of companion laboratory-cured cylinders, Contractor shall evaluate operations and provide corrective procedures for protecting and curing in-place concrete.
8. Strength of each concrete mixture will be satisfactory if every average of any three consecutive compressive-strength tests equals or exceeds specified compressive strength and no compressive-strength test value falls below specified compressive strength by more than 500 psi.
9. Test results shall be reported in writing to Engineer, concrete manufacturer, and Contractor within 48 hours of testing. Reports of compressive-strength tests shall contain Project identification name and number, date of concrete placement, name of concrete testing and inspecting agency, location of concrete batch in Work, design compressive strength at 28 days, concrete mixture proportions and materials, compressive breaking strength, and type of break for both 7- and 28-day tests.
10. Nondestructive Testing: Impact hammer, sonoscope, or other nondestructive device may be permitted by Engineer but will not be used as sole basis for approval or rejection of concrete.
11. Additional Tests: Testing and inspecting agency shall make additional tests of concrete when test results indicate that slump, air entrainment, compressive strengths, or other requirements have not been met, as directed by Engineer. Testing and inspecting agency may conduct tests to determine adequacy of concrete by cored cylinders complying with ASTM C 42/C 42M or by other methods as directed by Engineer
12. Additional testing and inspecting, at Contractor's expense, will be performed to determine compliance of replaced or additional work with specified requirements.
13. Correct deficiencies in the Work that test reports and inspections indicate do not comply with the Contract Documents.

END OF SECTION

SECTION 04810

UNIT MASONRY ASSEMBLIES

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 1 Specification Sections, apply to this Section.

1.2 SUMMARY

A. Section Includes:

1. Concrete masonry units.
2. Mortar and grout.
3. Steel reinforcing bars.

B. Related Sections:
1. Division 3 Section "Cast-in-Place Concrete" for installing dovetail slots for masonry anchors.

1.3 DEFINITIONS

A. CMU(s): Concrete masonry unit(s).

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

1.4 PERFORMANCE REQUIREMENTS

A. Provide structural unit masonry that develops indicated net-area compressive strengths at 28 days.

1. Determine net-area compressive strength of masonry from average net-area compressive strengths of masonry units and mortar types (unit-strength method) according to Tables 1 and 2 in ACI 530.1/ASCE 6/TMS 602.

1.5 SUBMITTALS

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

B. Shop Drawings: For the following:

1. Masonry Units: Show sizes, profiles, coursing, and locations of special shapes.

2. Stone Trim Units: Show sizes, profiles, and locations of each stone trim unit required.
3. Reinforcing Steel: Detail bending and placement of unit masonry reinforcing bars. Comply with ACI 315, "Details and Detailing of Concrete Reinforcement

C. Qualification Data: For testing agency.

D. Certificates: For each type and size of the following:

1. Masonry units.

2. Cementitious materials. Include brand, type, and name of manufacturer.
3. Preblended, dry mortar mixes. Include description of type and proportions of ingredients.
4. Grout mixes. Include description of type and proportions of ingredients.
5. Reinforcing bars.
6. Joint reinforcement.
7. Anchors, ties, and metal accessories.

E. Mix Designs: For each type of mortar and grout. Include description of type and proportions of ingredients.

F. Statement of Compressive Strength of Masonry: For each combination of masonry unit type and mortar type, provide statement of average net-area compressive strength of masonry units, mortar type, and resulting net-area compressive strength of masonry determined according to Tables 1 and 2 in ACI 530.1/ASCE 6/TMS 602.

1.6 QUALITY ASSURANCE

A. Testing Agency Qualifications: Qualified according to ASTM C 1093 for testing indicated.

B. 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, from single source from single manufacturer for each product required.

C. Source Limitations for Mortar Materials: Obtain mortar ingredients of a uniform quality, including color for exposed masonry, from single manufacturer for each cementitious component and from single source or producer for each aggregate.

D. Masonry Standard: Comply with ACI 530.1/ASCE 6/TMS 602 unless modified by requirements in the Contract Documents.

1.7 DELIVERY, STORAGE, AND HANDLING

A. Store masonry units on elevated platforms in a dry location. If units are not stored in an enclosed location, cover tops and sides of stacks with waterproof sheeting, securely tied. If units become wet, do not install until they are dry.

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 use with dispensing silos. Store preblended, dry mortar mix in delivery containers on elevated platforms, under cover, and in a dry location or in covered weatherproof dispensing silos.

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

1.8 PROJECT CONDITIONS

A. Protection of Masonry: During construction, cover tops of walls, projections, and sills with waterproof sheeting at end of each day's work. Cover partially completed masonry when construction is not in progress.

B. Do not apply uniform floor or roof loads for at least 12 hours and concentrated loads for at least three days after building masonry walls or columns.

C. Stain Prevention: Prevent grout, mortar, and soil from staining the face of masonry to be left exposed or painted. Immediately remove grout, mortar, and soil that come in contact with such masonry.

1. Protect base of walls from rain-splashed mud and from mortar splatter by spreading coverings on ground and over wall surface.
2. Protect sills, ledges, and projections from mortar droppings.
3. Protect surfaces of window and door frames, as well as similar products with painted and integral finishes, from mortar droppings.
4. Turn scaffold boards near the wall on edge at the end of each day to prevent rain from splashing mortar and dirt onto completed masonry.

D. Hot-Weather Requirements: Comply with hot-weather construction requirements contained in ACI 530.1/ASCE 6/TMS 602.

PART 2 - PRODUCTS

2.1 MASONRY UNITS, GENERAL

A. Defective Units: Referenced masonry unit standards may allow a certain percentage of units to contain chips, cracks, or other defects exceeding limits stated in the standard. Do not use units where such defects will be exposed in the completed Work.

2.2 CONCRETE MASONRY UNITS

A. CMUs: ASTM C 90.

1. Unit Compressive Strength: Provide units with minimum average net-area compressive strength of 2800 psi.

2.3 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. Portland Cement-Lime Mix: Packaged blend of portland cement and hydrated lime containing no other ingredients.

C. Mortar Cement: ASTM C 1329.

D. intended for use with CMUs containing integral water repellent by same manufacturer.

E. Water: Potable.

2.4 REINFORCEMENT

A. Uncoated Steel Reinforcing Bars: ASTM A 615/A 615M or ASTM A 996/A 996M, Grade 60.

2.5 TIES AND ANCHORS

A. Materials: Provide ties and anchors specified in this article that are made from materials that comply with the following unless otherwise indicated.
   1. Hot-Dip Galvanized, Carbon-Steel Wire: ASTM A 82/A 82M; with ASTM A 153/A 153M, Class B-2 coating.
   2. Steel Sheet, Galvanized after Fabrication: ASTM A 1008/A 1008M, Commercial Steel, with ASTM A 153/A 153M, Class B coating.

2.6 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. Mortar for Unit Masonry: Comply with ASTM C 270, Specification. Provide the following types of mortar for applications stated unless another type is indicated.
   1. For reinforced masonry, use Type N.

C. Grout for Unit Masonry: Comply with ASTM C 476.

   1. Use grout of type indicated or, if not otherwise indicated, of type (fine or coarse) that will comply with Table 1.15.1 in ACI 530.1/ASCE 6/TMS 602 for dimensions of grout spaces and pour height.
   2. Proportion grout in accordance with ASTM C 476
   3. Provide grout with a slump of 8 to 11 inches as measured according to ASTM C 143/C 143M.

PART 3 - EXECUTION

3.1 EXAMINATION

A. Examine conditions, with Installer present, for compliance with requirements for installation tolerances and other conditions affecting performance of the Work.
   1. Verify that foundations are within tolerances specified.
   2. Verify that reinforcing dowels are properly placed.

B. Before installation, examine rough-in and built-in construction for piping systems to verify actual locations of piping connections.

C. Proceed with installation only after unsatisfactory conditions have been corrected.

3.2 INSTALLATION, GENERAL

A. Thickness: Build cavity and composite walls and other masonry construction to full thickness shown. Build single-wythe walls to actual widths of masonry units, using units of widths indicated.

B. Build chases and recesses to accommodate items specified in this and other Sections.

C. Leave openings for equipment to be installed before completing masonry. After installing equipment, complete masonry to match the construction immediately adjacent to opening.

D. Use full-size units without cutting if possible. If cutting is required to provide a continuous pattern or to fit adjoining construction, cut units with motor-driven saws; provide clean, sharp, unchipped edges. Allow units to dry before laying unless wetting of units is specified. Install cut units with cut surfaces and, where possible, cut edges concealed.

E. Select and arrange units for exposed unit masonry to produce a uniform blend of colors and textures.

   1. Mix units from several pallets or cubes as they are placed.

3.3 TOLERANCES

A. Dimensions and Locations of Elements:

   1. For dimensions in cross section or elevation do not vary by more than plus 1/2 inch or minus 1/4 inch.
   2. For location of elements in plan do not vary from that indicated by more than plus or minus 1/2 inch.
   3. For location of elements in elevation do not vary from that indicated by more than plus or minus 1/4 inch in a story height or 1/2 inch total.

B. Joints:

1. For 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 .
2. For exposed bed joints, do not vary from bed-joint thickness of adjacent courses by more than 1/8 inch .
3. For head and collar joints, do not vary from thickness indicated by more than plus 3/8 inch or minus 1/4 inch.
4. For exposed head joints, do not vary from thickness indicated by more than plus or minus 1/8 inch.

3.4 ANCHORING MASONRY TO STRUCTURAL STEEL AND CONCRETE

A. Anchor masonry to structural steel and concrete where masonry abuts or faces structural steel or concrete to comply with the following:

1. Provide an open space not less than 1/2 inch wide between masonry and structural steel or concrete unless otherwise indicated. Keep open space free of mortar and other rigid materials.
2. Anchor masonry with anchors embedded in masonry joints and attached to structure.

3.5 REINFORCED UNIT MASONRY INSTALLATION

A. Temporary Formwork and Shores: Construct formwork and shores as needed to support reinforced masonry elements during construction.

1. Construct formwork to provide shape, line, and dimensions of completed masonry as indicated. Make forms sufficiently tight to prevent leakage of mortar and grout. Brace, tie, and support forms to maintain position and shape during construction and curing of reinforced masonry.
2. Do not remove forms and shores until reinforced masonry members have hardened sufficiently to carry their own weight and other loads that may be placed on them during construction.

B. Placing Reinforcement: Comply with requirements in ACI 530.1/ASCE 6/TMS 602.

C. Grouting: Do not place grout until entire height of masonry to be grouted has attained enough strength to resist grout pressure.

1. Comply with requirements in ACI 530.1/ASCE 6/TMS 602 for cleanouts and for grout placement, including minimum grout space and maximum pour height.
2. Limit height of vertical grout pours to not more than 60 inches.

3.6 FIELD QUALITY CONTROL

A. Testing and Inspecting: Contractor will engage special inspectors to perform tests and inspections and prepare reports. Allow inspectors access to scaffolding and work areas, as needed to perform tests and inspections. Retesting of materials that fail to comply with specified requirements shall be done at Contractor's expense.

B. Inspections: special inspections according to the "International Building Code."

1. Begin masonry construction only after inspectors have verified proportions of site-prepared mortar.
2. Place grout only after inspectors have verified compliance of grout spaces and of grades, sizes, and locations of reinforcement.
3. Place grout only after inspectors have verified proportions of site-prepared grout.

C. Testing Prior to Construction: One set of tests.

D. Testing Frequency: One set of tests for each 5000 sq. ft. of wall area or portion thereof.

E. Mortar Aggregate Ratio Test (Proportion Specification): For each mix provided, according to ASTM C 780.

F. Grout Test (Compressive Strength): For each mix provided, according to ASTM C 1019.

3.7 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, where indicated.

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. Protect adjacent stone and nonmasonry surfaces from contact with cleaner by covering them with liquid strippable masking agent or polyethylene film and waterproof masking tape.
3. Wet wall surfaces with water before applying cleaners; remove cleaners promptly by rinsing surfaces thoroughly with clear water.
4. Clean concrete masonry by cleaning method indicated in NCMA TEK 8-2A applicable to type of stain on exposed surfaces.

3.8 MASONRY WASTE DISPOSAL

A. Salvageable Materials: Unless otherwise indicated, excess masonry materials are Contractor's property. At completion of unit masonry work, remove from Project site.

B. Waste Disposal as Fill Material: Dispose of clean masonry waste, including excess or soil-contaminated sand, waste mortar, and broken masonry units, by crushing and mixing with fill material as fill is placed.

C. Excess Masonry Waste: Remove excess clean masonry waste that cannot be used as fill, as described above, and other masonry waste, and legally dispose of off Owner's property.

END OF SECTION

SECTION 07540

FLUID APPLIED ROOFING COATING SYSTEM

PART 1 – GENERAL

1.1 DESCRIPTION OF WORK

A. Application of fluid applied roof coating system in accordance with specifications, herein.

B. Related Work:

1. Section 07900 – Sealants and Caulking.

1.2 SUBMITTALS

A. Submit in accordance with Section 01300 – Submittals.

B. Product Data: Manufacturer's literature on each product to be used, including:

1. Manufacturer's Literature: Submit literature on the protective coating, as well as related primers, sealants, reinforcement, etc., shall be submitted for review in a single submittal package in accordance with requirements specified in the Section 01300 Submittals. Include material specifications, physical properties (including ASTM test methods utilized), estimated application rate for required dry film thickness per warranty requirements and MSDS information.

2. Manufacturer's Installation Instructions: Submit data sheets from the manufacturer on the installation of the roofing system applicable to the work.

3. Manufacturer's Certificate: Submit certification that products meet or exceed specified requirements.

4. Manufacturer's Warranty: Submit a copy of the roofing and deck coating manufacturer's warranty to meet project specifications.

5. Manufacturer Storage and Handling: Submit storage and handling requirements and recommendations.

C. Verification Samples: For each finished product specified, two samples, minimum size 6 inches square, represent actual product, color, and patterns.

D. Shop Drawings: Contractor shall submit a scaled drawing showing the layout of joint reinforcing and all flashing details at penetrations, joints and roof edges.

1.3 QUALITY ASSURANCE

A. Manufacturer Qualifications:

1. Manufacturer of the fluid-applied coating system shall have a proven 15-year track record of successful installations.

B. Installer Qualifications:

1. The contractor shall be approved by the coatings manufacturer and shall have a minimum of three years of experience in the application of high-solids roof coatings.

2. Proof of this qualification shall be provided in written form by the Contractor. A signed certificate from the Manufacturer stating that the Contractor is an approved installer of the Manufacturer's Fluid Applied Roofing System.

3. The contractor shall provide a list of three project references, including contact name and telephone numbers.

4. An Approved Applicator (as designated by manufacturer) shall be on site during all applications of any manufacturer's products.

5. Contractor shall acknowledge in writing that they are responsible to protect all substrates, insulation, recovery board, and coating from pollutants that may act as a bond-breaker between the various applications of coating. These pollutants include (but not limited to) foot traffic residue, metal shavings, tire tracks, markings caused by hoses and electrical cords, insulation adhesive, sealants, and cementitious materials. All pollutants shall be removed prior to the application of any coatings.

C. Product Standards:

1. Container labels shall include this information, or the container shall be rejected at the jobsite. Manufacturer's name, product name, type, and class of material. Batch or lot number, mixing and application instructions, and precautions.

D. Codes and Standards: The contractor shall be thoroughly familiar with all codes, regulations, and standards governing the specified work. Any contradiction between the manufacturer's requirements and these specifications shall be brought to the attention of the manufacturer and the Engineer.

E. Deviations: There shall not be any deviations from these specifications unless the deviation is submitted in writing per the General Conditions prior to submittal of bid. The request for

deviation shall have a letter from the roofing manufacturer technical department approving the details of the deviation.

1.4 DELIVERY, STORAGE, AND HANDLING

A. Delivery of Materials: Materials shall be delivered to the jobsite in manufacturer's original, sealed containers with labels legible and intact.

1. Deliver materials bearing the following information:

a. Name of manufacturer.

b. Name of contents and products code.

c. Lot or batch number.

B. Storage of Materials: Store materials at 75°F/23°C. Handle products to prevent damage to container. All materials shall be stored in compliance with local fire and safety requirements. Avoid high temperatures and direct sunlight.

C. Material Handling: Materials shall be handled, stored, and installed per manufacturer's instructions and all applicable safety regulatory requirements.

D. Damaged Materials:

1. Contaminated, damaged, or unsealed materials, or materials not conforming to the specifications, shall be rejected. Rejected materials shall be immediately removed from the jobsite and replaced at no additional cost to the State.

2. Materials that have been installed and damaged prior to issuance of warranty shall be rejected and removed from the jobsite. This includes materials not protected from unprotected foot traffic, materials that were unprotected and used as a staging platform or storage area, materials that have been polluted with dirt, debris, metal shavings, and other roofing materials, and or materials damaged by water intrusion.

1.5 PROJECT CONDITIONS

A. Install all materials in strict accordance with manufacturer's published safety requirements and weather precautions.

B. Do not apply materials over dirt, oil, grease, or other pollutants (this includes foot traffic or markings caused by hoses, electrical cords or tires). All dirt or markings shall be removed prior to the installation of the various applications of coating used to produce the fluid applied roof system.

C. Do not apply coating system components if weather conditions will not permit complete cure before rain, dew, fog, or freezing temperatures occur.

D. Do not spray-apply if the wind velocity exceeds 10 mph (16 kph) without taking precautions to eliminate warranty.

E. Take all measures necessary to protect unrelated surfaces from coating overspray or spillage.

F. The contractor is responsible for any adverse conditions, which may result from applying coatings while the weather is rising during the morning hours, which might result in moisture being pulled upwards from the deck, which can result in vapor pockets forming.

1.6 WARRANTY

A. Project Warranty: Project Warranty: Submit Contractor's warranty, signed jointly by Roofing Installer covering the work of this section, including all components of the roof systems, in which roof installer and manufacturer(s) agree to repair or replace components of the roofing system that fail in materials or workmanship for the warranty period specified below.

1. Failures include, but are not limited to, the following: Structural failures, loose parts, and delamination, buckling, water leakage, deterioration of finishes beyond normal weathering, including non-uniformity of color or finish and leakage that occurs between dissimilar materials.

2. Project Warranty Period: Five (5) years from the Project Acceptance Date. The Surety shall not be held liable beyond two (2) years from the Project Acceptance Date.

3. Warranty shall cover repairs or replacement of damages to the building and its finishes due to leaks.

4. Warranty shall state the Manufacturer's acceptance that the roof was installed in accordance with the contract requirements and that the State's personnel were properly instructed in the maintenance procedures.

5. In the event of a failure State, Contractor, Roofing Installer, Contracting Officer and Manufacturer shall mutually agree and determine roof system failures and remedies.

B. Roof Guarantee: Manufacturer's standard form, without money limitation, in which manufacturer agrees to repair leaks through the coatings products on the roof caused by manufacturing defects, natural deterioration of, or workmanship in applying, the coatings roofing system.

1. Warranty Coverage: Labor and materials.

2. Warranty Duration: twenty years.

PART 2 – PRODUCTS

2.1 MANUFACTURERS

A. Acceptable Manufacturer: Manufacturer that meets all of the required requirements of this specification including but not limited to the following:

Neogard
2728 Empire Central
Dallas, TX 75235
Phone: 833-443-6735
or approved equal.

B. High-solids silicon coatings HS C roof coating system shall be used or approved equal.

C. Substitutions: See General Interim Conditions Section 6.3 for Substitution of Materials and Equipment.

D. Primers and Sealers:

1. As recommended by manufacturer.

G. Biodegradable Cleaner:

1. All cleaners shall be biodegradable as recommended by the manufacturer.

PART 3 – EXECUTION

3.1 EXAMINATION

A. Do not begin installation until substrates have been properly prepared.

B. If substrate preparation is the responsibility of another installer, notify the State of unsatisfactory preparation before proceeding. Proceeding with work will imply acceptance of the conditions by the roofing contractor/installer.

C. Verify that all penetrations, rooftop units, are secured to roof system.

3.2 SURFACE INSPECTION

A. Roof substrate shall be clean, dry, structurally sound, stable and well secured.

B. The roof substrate shall be dry (free of water).

C. Inspect condition of flashing details adjacent to protrusions, penetrations, roof mounted equipment, curbs, walls, parapets, drains and roof edge to ensure that details are acceptable and will maintain a weather-tight installation after being properly detailed and coated.

3.3 PREPARATION OF ROOF DECK

A. All surfaces shall be clean and dry, and free of any dirt, dust, gravel, oil, surface chemicals or other contaminants that may interfere with optimum adhesion.

B. The roof substrate (concrete or concrete topping) shall meet the manufacturer's roughness finish level for proper adhesion of materials and cracks shall be treated per manufacturer's recommendations.

3.4 Application of Roof Coating (20 year warranty)

A. Primer: Apply 7797/7798 urethane primer at a rate of 1/3 gallon per 100 square feet (300 sf/gal) and allow to cure until primer will not transfer when touched. If 7870 silicone cannot be applied over primer within 24 hours, reprime.

B. First Coat: Thoroughly mix and apply 7870 at a rate of 70 sf/gal (1.4 gal/100 sf or 23 wet mils) to yield 20 dry mils. Allow to cure.

C. Second Coat: Thoroughly mix and apply 7870 at a rate of 70 sf/gal (1.4 gal/100 sf or 23 wet mils) to yield 20 dry mils. Allow to cure.

D. Coating Thickness Requirements: Total coating system thickness shall be 40 dry mils. Exposed Face Color: Color to as selected from manufacturers standard colors.

3.5 CLEANUP

A. Maintain work and work areas in a clean, safe condition at all times during coating installation. Remove excess materials, trash, and debris from the jobsite daily.

B. At the completion of the project, clean area of any spills and containers, and clean up all roofing debris, leaving jobsite in a clean and orderly condition.

C. As a condition of the project's completion and acceptance, deliver to the Officer-in-Charge a copy of the full executed, specified warranty from the coating manufacturer, following individual warranty guidelines.

3.6 PROTECTION

A. Protect installed products until completion of project.

B. Touch-up, repair, or replace damaged products before Substantial Completion.

END OF SECTION

SECTION 07900

SEALANTS AND CAULKING

PART 1 - GENERAL

1.1 GENERAL REQUIREMENTS

This section covers the requirements for furnishing and installing sealants and caulking.

A. Caulk periphery of openings and other locations where building joints occur outside and/or inside, and crevices requiring sealing to provide weatherproof closures.

1.2 REFERENCES

A. American Society for Testing and Materials (ASTM):

C 834-76 (86)	Latex Sealing Compounds.
C 920-86	Elastomeric Joint Sealants.
C 962-81	Guide for Use of Elastomeric Joint sealants.

B. Federal Specifications (FS):

TT-S-00230 C	Sealing Compound, Elastomeric Type, Single Component (for Caulking,Sealing, and Glazing in Buildings).
TT-S-01543 A	Sealing Compound, Silicone or Rubber Base (for Caulking, Sealing and Glazing in Building).

C. International Conference of Building Officials (ICBO):

1985	Uniform Building Code.

D. Sealand and Waterproofer's Institute (SWI)

1984	Sealants: The Professional's Guide.
1977	Guide to Joint Sealant for Concrete Structures.
1977	Manual of Good Practice in Sealant Application.

1.3 QUALITY ASSURANCE

A. Qualification of Installer:

1. Installation personnel shall be skilled and competent. They shall be familiar with materials and nature of work.

2. Contractor shall be authorized by the product manufacturer for work.

B. Codes and Standards:

1. Comply with codes, specifications and standards referred to in this specification, except where provisions in this specification or drawings exceed such requirements.

2. Material and workmanship shall conform to:

a. ASTM C 962.

b. SWI Recommendations.

3. Sealants and caulking shall conform with following ASTM or FS:

Types

Urethanes - Two Part:

2A-Self-Leveling	ASTM C 920, Type M Grade P, Class 25.
2B-Non-Sag	ASTM C 920, Type M Grade NS, Class 25.

One Part:

2C-Self-Leveling	ASTM C 920, Type S Grade P, Class 25.
2D-Non-Sag	ASTM C 920, Type S Grade NS, Class 25.

Silicones: ASTM C 920, Type S Grade NS, Class 25.
New Designation now in consideration by ASTM Committee C24.

Acrylics, One Part: ASTM C 834

Acrylic Latex, One Part: ASTM C 834

Triethylene Rubber: FS TT-S-00230, Type 2, Class A.

Ethylene Copolymer: FS TT-S-01543

4. Material shall be ICBO listed.

5. Material shall be non-staining.

1.4 QUALITY CONTROL

A. Service of Manufacturer's Representative: Manufacturer's Representative shall be present at job site as often as he deems necessary to assure that surface preparation and application of the product is in accordance with manufacturer's direction.

1.5 SUBMITTALS

A. Product Data:

1. Manufacturer's product data showing references to industry standards, with application instructions and indicated uses and given limitations.

2. Manufacturer's health and safety data information.

B. Material Samples and Samples for Color Selection:

1. Samples of manufacturer's color range for caulking compound.

2. Caulking compound. Install sample between 2 strips of material representative of typical surfaces where sealant or compound will be used, held apart to represent typical joint widths.

3. Material sample of each component used.

C. Certificates: Manufacturer's certificate indicating that materials comply with requirements of this specification and the named ASTM or FS and are suitable for intended use.

1.6 WARRANTY/GUARANTY

A. Warranty for minimum five (5) years against defects resulting from use of defective or inferior materials, equipment or workmanship on caulking system.

B. Roofing work shall be guarantied jointly with modified bitumen sheet roofing, flashing and sheetmetal work, and sealant and caulking work to be in a watertight condition for a period of minimum two (2) years. Contractor shall agree to repair or replace work which leaks water, deteriorates excessively or otherwise fails to perform as required due to failures of materials or workmanship. Contractor shall further agree to repair and replace damages to building resulting from such leaks, at no cost to State.

1.7 PRODUCT HANDLING

A. Deliver caulking and sealing compounds to job in unbroken, sealed containers bearing manufacturer's directions. Store materials in sealed containers in a dry protected area above ground or floor.

B. Protect caulking materials before, during and after installation.

C. Do not use caulking materials that have been stored for a period of time exceeding the maximum recommended shelf life of materials.

1.8 PROTECTION

A. Protect installed work of other trades during installation.

PART 2 - PRODUCTS

2.1 MANUFACTURERS

A. Products of following manufacturer's or approved equal are acceptable, provided they meet materials specified:

General Electric Company, Standard Drywall Products, Inc., Thorospan, Pecora Corp., Sonneborn-Contech, Thiocol Corp., 3M, Woodmont, Geocel Corp., Sika.

2.2 MATERIALS

A. Asbestos Prohibition: No asbestos containing materials shall be used under this section. The Contractor shall insure that all materials incorporated in the project are asbestos-free unless specifically approved in writing by the Engineer.

B. Caulking compound shall be one (1) or two (2) component, gun grade, color as approved by Engineer, and shall be urethanes, silicone, acrylics, acrylic latex, triethylene rubber or ethylene copolymer or polysulfide rubber sealant compound.

C. Materials of other compositions may be accepted if approved by Engineer.

D. Material shall be as recommended by Sealant and Caulking Manufacturer and the manufacturer which products are to be sealed or caulked for its intended use.

E. Joint Primer: Suitable to substrate surfaces as recommended by sealant manufacturer.

F. Joint Backing: Preformed compressible, resilient, non-waxing, non-extruding, non-staining strips of close cell neoprene as recommended by sealant manufacturer. Backing shall be of sizes and shapes to suit various conditions, minimum twice as wide as joint to be caulked, and shall be compatible with sealant, primers and substrates.

G. Bond Breaker: As recommended by sealant manufacturer.

H. Cleaning Agent: As recommended by sealant manufacturer.

I. One component caulking compound shall be used for typical conditions, two component caulking compound shall be used for continuous water immersed conditions.

J. Silicone compound shall not be used when compound is to be painted.

PART 3 - EXECUTION

3.1 INSPECTION

A. Installer shall examine surfaces and conditions under which sealants and caulking are to be installed. Should any condition be found unsuitable, no work shall be done until unsuitable conditions have been corrected and are acceptable to Installer. Proceeding with work will imply acceptance of conditions by Installer.

3.2 PRE-INSTALLATION MEETING

A. Prior to installation of sealant, and at General Contractor's direction, a meeting shall be held at project site to review material selections, joint preparations, installation procedures and coordination with other trades.

B. Meeting shall include Sealant Installer, General Contractor, and representatives of other trades or subcontractors affected by sealant installation. Sample installations shall be examined which have been prepared and it shall be determined and recorded whether everyone present is in agreement that the proposed installations are likely to perform as required.

3.3 PREPARATION

A. Field Verification: Verify measurements in field as required. Check with related trade's shop drawing details and provide corrective work as may be necessary.

B. Surface Preparation:

1. Primer: Thoroughly clean joints and apply primer, as recommended by sealant manufacturer, to dry surfaces. Apply primer prior to application of joint backing, bond breaker or sealants.

2. Joint Backing: In joints where depth of joint exceed required depth of sealant, install joint backing to provide backing and uniform depth of sealant. Install joint backing with approximately 30% compression. Do not stretch, twist, puncture or tear joint backing. Butt joint backing at intersections.

3. Bond Breaker Tape: Install bond breaker tape smoothly at back of joint where joint backing is not required or cannot be installed. Sealant shall adhere only to sides and not to back of joint so as to eliminate three-sided adhesion.

4. Surface Condition: Joint surfaces to receive a sealant shall be sound, smooth, clean, dry and free of visible contaminants. Applications of non-visible coatings or contaminants to surfaces of rabbet area prior to application of sealant shall be controlled by Contractor in consultation with sealant manufacturer's representative.

3.4 PRECAUTION

A. Weather Conditions: Do not proceed with installation of sealants under adverse weather conditions, or when temperatures are below or above manufacturer's recommended limitations for installation. Proceed only when forecasted weather conditions are favorable for proper cure and development of high early bond strength. Do not proceed when heavy wind loads are forecast during period required for initial or nominal cure of elastomeric sealants.

B. Health Precautions: Follow manufacturer's health and safety information and instruct workers accordingly.

SECTION 09900

PAINTING

PART 1 - GENERAL

1.1 GENERAL REQUIREMENTS

This section covers the requirements for furnishing and installing of paints.

1.2 RELATED DOCUMENTS

The General Provisions of the Contract, including General and Special Provisions and General Requirements of the Specifications, apply to the work specified in this section.

1.3 SUBMITTALS

A. Schedule of Finishes

1. 4 sets of proposed painting finish schedules shall be submitted to the Engineer for approval.

B. Color Samples

1. 3 sets of each color Finish sample shall be submitted to the Engineer for approval.

2. After the color finish sample has been approved, one set of color finish samples painted onto 8-1/2"x 11" cardboard shall be submitted to the Engineer. The cardboard shall be divided into 4 horizontal strips and painted as follows:

   a. Prime 3 strips starting from the bottom.
   b. 1st coat bottom 2 strips.
   c. 2nd coat bottom strip.

C. Schedule of Operations

1. Before work on the project is commenced, 4 complete sets of a work schedule showing his sequence of operations and dates shall be submitted by the Contractor to the Engineer.

D. Guarantee

1. 3 copies of a written guarantee shall be submitted to the Engineer.

1.2 ANALYZING AND TESTING

All paints shall be subject to laboratory tests whenever the Engineer deems necessary to determine conformation to the requirements of these specifications. Cost of testing will be borne by the State. All rejected materials shall be removed from the job site immediately. Surfaces painted with rejected material shall be redone at no additional cost to the State.

1.4 GUARANTEE

A. The Contractor shall guarantee that the work performed under this section conforms to the contract requirements and is free of any defect of material or workmanship performed by the Contractor. Such guarantee shall continue for a period of 2 years from the date of project acceptance during which period the Contractor shall remedy at his own expense any such failure to conform or any such defect.

B. The State shall notify the Contractor in writing within a reasonable time after discovery of any failure or defect.

C. Should the Contractor fail to remedy any failure or defect described in Paragraph A above within 10 working days after receipt of notice thereof, the State shall have the right to repair or otherwise remedy such failure or damage at the Contractor's expense.

1.5 SPECIAL REQUIREMENTS

A. Codes

1. The Contractor shall comply with the State OSHL (Occupational Safety and Health Law) and all pollution control regulations of the State Department of Health.

2. Any violations of the above regulations or codes shall be dealt with as mentioned in the Special Provisions Section and the Environmental Protection Section of these specifications.

B. Protection

1. Persons

a. The Contractor shall take all necessary precautions to protect public pedestrians including tenants from injury.

b. The Contractor shall provide, erect and maintain safety barricades around scaffolds, hoists and wherever Contractor's operations create hazardous conditions in order to properly protect the public and tenants.

2. Completed Work: The Contractor shall provide all necessary protection for wet paint surfaces.

3. Protective Covering: The Contractor shall provide and install protective covering over furniture, equipment, floor and other areas that are not scheduled for treatment. Protective covering shall be clean sanitary drop cloth or plastic sheets. Paint applied to surfaces not scheduled for treatment shall be completely removed and surfaces shall be returned to original condition.

4. Safeguarding of Property: The Contractor shall take whatever steps may be necessary to safeguard his work and the property of the State and other individuals in the vicinity of his work area during the execution of this Contract. He shall be responsible for and make good on all damages and for losses to work or property caused by his or his employee's negligence. Also see "Protection of Property" in the Special Provision Section.

5. Fire Safety: The Contractor shall always direct his employees not to smoke in the vicinity and exercise precautions against fire. Waste rags, plastic (polyester sheets), empty cans, etc. shall be removed from the site at the end of each day.

C. Storage Area for Materials: No paint material, empty cans and paint brushes and rollers may be stored in buildings but shall be stored in separate storage facilities away from the buildings.

The Contractor may furnish a job site storage facility. Such facility shall comply with requirements of the local Fire Department. The storage area shall be kept clean and facility shall be locked when not in use or when no visual supervision is possible.

D. Right of Rejection: The Engineer shall have the right to reject all work which is not in compliance with the plans and specifications. Rejected work will be redone at no additional cost to the State.

E. Sequence of Operations: The sequence of operations shall divide the surfaces into work areas and present a schedule for:

1. Surface preparation and spot prime.

2. Prime coat.

3. First finish coat.

4. Second finish coat.

Minimum interior work area shall be the complete inside surfaces of one room. Minimum exterior work area shall be one side of a single-story building or one side of one story on multiple story buildings.

F. Inspection and Approvals: The Contractor shall obtain written approval from the Engineer 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 work. The Contractor shall give the Engineer one day (24 hours minimum) advance notice of completion of any phase of work for an area only when he deviates from the previously-submitted work schedule. The Contractor shall provide necessary access to areas to be inspected.

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.

PART 2 - PRODUCTS

2.1 PROHIBITION OF HAZARDOUS MATERIALS

A. Lead Content: Do not use coatings having a lead content over 0.06 percent by weight of nonvolatile content.

B. Chromate Content: Do not use coatings containing zinc-chromate or strontium-chromate.

2.2 PAINTS

A. Materials shall be equal in quality to that specified under the Schedule of Finishes and any given finish shall be as labeled by one manufacturer.

B. All materials shall be delivered to the job site in undamaged original containers beating the manufacturer's label and shall be stored in such a manner as to prevent damage. All rejected materials shall be removed from the job site immediately.

C. Sinclair paint is indicated for standard of quality and color, only. Comparable high-quality top line paints manufactured by Devoe, Fuller O'Brien, Benjamin Moore, Sinclair, Spectra-Tone or approved equal.

D. Thinning of paint shall be done using material recommended by the manufacturer. Mix proprietary products according to manufacturer's printed specifications. Compound thinner, mineral oil, kerosene, refined linseed oil, or gasoline shall not be used for thinning.

E. Except for metal primers, all paint shall contain mildewcide equal in strength to 2 oz. of Super Ad-It per gallon of paint pre-mixed by supplier.

F. The supplier shall submit a signed certification that the paint materials contains mildewcide equal in strength to 2 oz. of Super Ad It.

2.3 SCHEDULE OF FINISHES

A. The Schedule of finishes is made for the convenience of the Contractor and indicates the types and quality of finished to be applied to the surfaces.

B. Any surface not specifically noted in the finish schedule shall be finished to match adjoining work.

2.4 SCHEDULE - EXTERIOR SURFACES

A. Concrete Masonry Unit (CMU):

1. First Coat - 4000 Bloxfil Heavy Duty Acrylic Block Filler, 50-75 sq. ft. per gal
2. Second Coat - Devoe DR17XX Wonder-Shield Exterior Acrylic Paint, 1.5 mil dry each coat.

B. Steel - Galvanized (Fuller O'Brien Specifications)

1. Pretreatment - 321-60 Vinyl wash primer
2. First Coat - 221-12 Zinc rich primer
3. Second Coat - 312-XX Heavy duty enamel
4. Third Coat - 312-XX Heavy duty enamel

C. Color of paints shall be as approved by the Engineer.

PART 3 - EXECUTION

3.1 PREPARATION OF SURFACES

A. Wood surfaces: Fill nail holes, cracks, open joints and other imperfections with appropriate compound and allow to set. Caulk all openings which will permit the entrance of water.

B. Ferrous Metal and Galvanized Metal:

1. Remove from surface to be painted all foreign matter such as tape, gum, and burrs.

2. Remove all rust to bare metal. Remove all loose, blistered, scaled, crazed, chalky finish to a tight and firm finish.

3.2 PAINT APPLICATION

A. General

1. All work shall be done in a workmanlike manner by skilled and experienced mechanics and shall conform to the best painting practices.

2. All materials shall be applied in accordance with the manufacturer's specifications and the finished surfaces shall be free from runs, sags, drops, ridges, waves, laps, streaks, brush marks and variations in color, texture and finish (glossy or dull). The coverage shall be complete, and each coat shall be so applied as to produce a film of uniform thickness. No paint, varnish or enamel shall be applied until the preceding coat is thoroughly dry and approved.

3. No exterior painting of unprotected surfaces shall be done in rainy, damp weather. Coats shall be applied only to surfaces that are thoroughly dry.

B. Application: Shall be by brush or roller only. Airless spraying may be permitted, but only with the approval of the Engineer for otherwise inaccessible areas.

C. Colors: Each coat shall be tinted a different shade from the preceding coat. Colors shall be as selected by the Engineer.

D. All surfaces adjacent to areas being finished shall be protected and left clean of paints, stains, etc. Clean drop cloths shall be used until completion of job.

E. All mixing shall be done outside the building.

3.3 CLEAN-UP

A. During the progress of the work, all debris, empty crates, waste, drippings, etc. shall be removed by the Contractor and the grounds about the areas to be painted shall be left clean and orderly at the end of each work day.

B. Upon completion of the work, staging, scaffolding, containers and all other debris shall be removed from the site. All paint, shellac, oil, or stains splashed or spilled upon adjacent surfaces not requiring treatment (hardware, fixture, floor, glass) shall be removed and the entire job left clean and acceptable.

END OF SECTION

3.5 INSTALLATION

A. General: Apply sealing compound in strict accordance with manufacturer's printed directions.

B. Sealant Application: Apply sealant in accordance with manufacturer's application manual and instructions, using hand guns or pressure equipment, with proper nozzle size, on clean, dry, properly prepared substrates. Force sealant into joint and against sides of joint to make uniform. Avoid pulling of sealant from sides. Fill sealant space completely with sealant.

C. Tooling: Tooling is required to ensure firm full contact with interfaces of joint. Tool joints to form smooth, uniform beads with slightly concave surfaces. Finish joints shall be straight, uniform, smooth and neatly finished. Remove any excess sealant from adjacent surfaces of joint, leaving work in a neat, clean condition. Use only tooling agents if recommended by sealant manufacturer.

D. Masking Tape: Where an irregular surface or sensitive joint border exists apply masking tape at edge of joint to insure joint neatness and protection. Remove tape after sealant is applied.

3.6 CLEANING

A. Clean compound from adjacent surfaces immediately and leave work in neat, clean condition.

3.7 REPAIR DURING GUARANTY PERIOD

A. Repair and replace defective work, and work damaged during term of guaranty.

B. Following types of failures will be adjudged defective work: Leakage, hardening, cracking, crumbling, melting, chalking, shrinking, or running of caulking compound, not bonding to adjacent surfaces or staining of adjoining work.

END OF SECTION