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. F59A626A
State Wayside Park Improvements
Hana, Maui, Hawaii

Civil Engineer:	The Limtiaco Consulting Group, Inc.
Architect:	Uchiyama Erskine Architects LLC
Structural Engineer:	Iwamoto Engineering Consultants, Inc.
Landscape Architect:	Collective Land Design LLC

April 2026

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

CONTRACT SPECIFICATIONS AND PLANS

Job No. F59A626A
State Wayside Park Improvements
Hana, Maui, Hawaii

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

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

April 2026

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NOTICE TO BIDDERS
(Chapter 103D, HRS)

COMPETITIVE BIDS for Job No. F59A626A, State Wayside Park Improvements, Hana, Maui 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. Electronic copies of the General Conditions are available on the State Procurement Office website.

The work shall generally consist of construction of picnic areas with rain shelters, concrete walkway, concrete swale, rain waterlines and hose bibb, rain garden, asphalt concrete pavement and landscaping at Kaumahina State Wayside Park, Hana, Island of Maui, Hawaii, as required or called for in this Proposal, Specifications, Plans, Permitting Documents, and any and all addenda related to this solicitation.

Due to the nature of work contemplated, bidders must possess a valid State Contractor's license, Classification "A" and "C-27".

A voluntary pre-bid meeting will be held via Microsoft Teams on May 7, 2026, at 10:00 am, and will be about thirty (30) minutes long. Anyone interested in attending must email the contact person listed in HIePRO, and provide the names, company they represent and their contact information at least one day prior to the conference. The attendees listed will be emailed a Microsoft Teams meeting invitation for the conference.

All interested parties are also invited to visit the project site anytime to conduct independent site investigation. The site visit is not mandatory; however, Bidders are strongly encouraged to visit the site to gain a better understanding of the project site.

Bidders are advised that anything discussed at the pre-bid conference does not change any part of this solicitation. Any questions or discussions at the pre-bid conference are not official and all questions shall be submitted through the HIePRO solicitation or emailed to the contract person listed in HIePRO. All changes and/or clarifications to this solicitation will be done in the form of an addendum.

The estimated cost of construction for Total Base Bid excluding any Additives is $1,100,000.

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

Since the estimated value of the 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

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INFORMATION AND INSTRUCTIONS TO BIDDERS

A. PROJECT LOCATION AND SCOPE OF WORK: The project location and scope of work shall be as generally described in the Notice to Bidders.

B. PROPOSALS: Bidders shall submit their bid, including the completed proposal form, bid bond, and any other documents required by the solicitation as part of their bid through the State of Hawaii e-Procurement System (HIePRO). See Item D, PROPOSAL FORM.

C. GENERAL CONDITIONS: The Department of Land and Natural Resources Interim General Conditions dated October 1994, as amended, shall be made a part of these contract specifications and are referred to hereafter as the General Conditions.

D. PROPOSAL FORM: The Bidders shall fill out and upload the electronic copy of the proposal form to the HIePRO website when submitting the bid. Bid Proposals shall not be mailed, faxed or delivered to the State, unless requested to do so after the designated closing date. The successful Bidder shall fill out and print a hard copy of the proposal form, sign and submit the form with the contract award package.

E. OMISSIONS OR ERASURES: Any proposal which contains any omission or erasure or alteration not properly initialed, or conditional bid, or other irregularity may be rejected by the Board of Land and Natural Resources (Board).

F. NOTICE OF INTENT TO BID AND QUESTIONNAIRE:
A Notice of Intent to Bid is not required for this project. In compliance with HRS Section 103D-310, the lowest responsive and responsible bidder may be required to complete a questionnaire. When requested by the State, the completed questionnaire shall be submitted to the Chief Engineer for evaluation. Failure to furnish the requested information within the time allowed may be grounds for a determination of non-responsibility, in accordance with HRS Section 103D-310 and HAR Section 3-122-108.

G. BID SECURITY: A bid security will be furnished by each bidder as provided in sub-section 2.7 of the General Conditions. The successful bidder's bid security will be retained until Contract execution and furnished a performance and payment bond in an amount equal to one hundred percent (100%) of the total Contract price, including an amount estimated to be required for extra work, is furnished.

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

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

H. CONTRACTOR'S LICENSE REQUIRED: The Board will reject all bids received from contractors who have not been licensed by the State Contractors License Board in accordance with Chapter 444, HRS; Title 16, Chapter 77, Hawaii Administrative Rules; and statutes amendatory thereto.

I. IRREGULAR BIDS: No irregular bids or propositions for doing the work will be considered by the Board.

J. WITHDRAWAL OF BIDS: No bidder may withdraw his bid between the time of the opening thereof and the award of contract.

K. EVALUATION OF CRITERIA:

1. The Total Base Bid (Items 1 to 26) and Additive 1 to 4 (Item 27 to 52) will be adjusted to reflect the applicable preferences

2. After adjusting for applicable preferences, the additive is added to the Total Base Bid. This (these) sum(s) are compared to the project control budget and must be within the project control budget.

3. The responsive bidder with the lowest aggregate amount, within the project control budget, for the Total Base Bid plus Additive(s) which may be selected is the "Low Bidder" and is designated for award.

4. If adding the additive would make the aggregate amount exceed the project control budget for all bidders, then the bid proposals will be evaluated based on the Total Base Bid.

5. In the event the Total Base Bid of all bidders exceeds the project budget, the State reserves the right to make an award to the responsive bidder with the lowest Total Base Bid if additional funds are available or by reducing the scope of work through negotiation.

L. METHOD OF AWARD:

1. The contract will be awarded to the lowest responsive Bidder whose bid (including any additive which may be selected) meets the requirements and criteria set forth in the solicitation documents and as determined by the Comptroller.

2. In the event the lump sum base bid of all bidders exceeds the project control budget, the Department reserves the right to make an award to the bidder with the lowest total lump sum base bid, after application of the preferences is designated, if additional funds are available or by reducing the scope of work through negotiation.

M. 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.

N. 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.

O. 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.

P. 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.

Q. 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.

R. 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.

S. 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.

T. 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.

U. 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.

V. 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.

W. 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.

X. 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.

Y. 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.

Z. 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.

AA. 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.

BB. 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.

CC. 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.

DD. 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.

EE. 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.

FF. 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.

GG. 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.

HH. 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.

II. 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 $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.

P R O P O S A L

FOR

DEPARTMENT OF LAND AND NATURAL RESOURCES
ENGINEERING DIVISION
State of Hawaii

JOB NO. F59A626A
STATE WAYSIDE PARK IMPROVEMENTS
HANA, MAUI, HAWAII

_____, 20_____

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

Dear Sir or Ma'am:

The undersigned, having carefully examined the local conditions and all available records and information covering conditions which may affect the cost of the work to be performed, and having carefully examined the Plans and Specifications, and other contract documents, hereby proposes to furnish and pay for all materials, tools, equipment, labor and other incidental work necessary to install five (5) picnic areas with rain shelters, concrete walkway, concrete swale, rain waterlines and hose bibb, rain garden, asphalt concrete pavement and landscaping 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. F59A626A
STATE WAYSIDE PARK IMPROVEMENTS
HANA, MAUI, HAWAII

on file in the office of the Engineering Division for the TOTAL BASE BID (Items 1 to 26) of:

_____

_____Dollars ($_____)
and will fully complete all work under this contract within _365_ consecutive calendar days from the date of written notice to proceed, including date of said order, said total sum being itemized on the following pages.

Item No.	Quantity	Unit	Description	Unit Price	Total
BASE BID					
GENERAL REQUIREMENTS					
1.		LS	Project Sign, including installation and all incidentals in place complete	$	$
2.		LS	Construction survey and layout, utility toning survey, and all incidentals	$	$
3.		LS	Temporary Erosion Control Measures including installation, maintenance and removal of BMPs including ingress/egress pads, filter socks, drain inlet protection, and all incidentals, in place complete	$	$
4.		LS	Barriers; including installation, maintenance and removal of vehicle and pedestrian access control, and all incidentals, in place complete	$	$
5.		LS	Clearing and Grubbing; light vegetation	$	$
6.		LS	Demolition and removal of existing pavements, slabs, utilities, etc. necessary to construct improvements as indicated on the plans.	$	$
7.		LS	Lawns and Grasses, including grass sod, 1-inch deep soil amendments, and all incidentals, in place complete	$	$
8.		LS	Temporary Irrigation System; including installation, maintenance and removal, and all incidentals, in place complete	$	$
9.		LS	60-day Landscape Maintenance Period for Lawns and Grass	$	$
PICNIC AREAS 1 AND 2, UNCOVERED PICNIC AREA, AND CONCRETE WALKWAYS					
10.	618	CY	Excavation, including hauling and all incidentals, in place complete.	$	$
11.	113	CY	Embankment including hauling and all incidentals, in place complete.	$	$

Item No.	Quantity	Unit	Description	Unit Price	Total
12.	2	EA	Each; Picnic Area 1 and 2, inclusive, including 5-inch minimum thickness concrete pad with steel reinforcement, structural fill, gravel, posts, framing, and roofing, and all incidentals, in place complete	$	$
13.	1	EA	Each; Uncovered Picnic Area, inclusive, including 5-inch minimum thickness concrete pad with steel reinforcement, structural fill, gravel, and all incidentals, in place complete	$	$
14.	3	EA	Picnic Table, 8-foot-long with treated lumber and concrete anchor straps and all incidentals, in place complete	$	$
15.	41	SY	Concrete walkway; 4-inch-thick, including synthetic fiber reinforcement, 6-inch aggregate base course, 12-inch structural fill, and all incidentals, in place complete	$	$
16.	72	LF	Concrete curb at Picnic Areas 1 and 2, 6-inch-high, including aggregate base, and all incidentals, in place complete	$	$
ASPHALT CONCRETE PARKING LOT AND WALKWAY REPAVEMENT					
17.	915	SY	Asphalt concrete pavement ; 4-inch thick asphalt concrete, including excavation, 6-inch untreated aggregate base course, pavement markings, and all incidentals, in place complete	$	$
18.	12	SY	Concrete Swale, 6-foot-wide, 6-inch-thick including excavation, steel reinforcement and 6-inch aggregate base, and all incidentals, in place complete	$	$
19.	2	EA	Each; ADA Signage and Sign Post, and all incidentals, in place complete	$	$
20.	17	EA	Each; Concrete Wheel Stops; 6-foot-long, and all incidentals, in place complete	$	$

Item No.	Quantity	Unit	Description	Unit Price	Total
21.	2	EA	Each; Concrete Wheel Stops; 3-foot-long, and all incidentals, in place complete	$	$
WATER SYSTEM RELOCATION					
22.	138	LF	2-inch PVC water lateral, including pipe and fittings, excavation, backfill, pipe bedding, testing, chlorination, and all incidentals, in place complete.	$	$
23.	2	EA	Connection to existing 2-inch water lateral, including excavation, backfill, PVC pipe, fittings, pipe bedding, and all incidentals, in place complete.	$	$
24.	76	LF	3/4-inch PVC water lateral, including pipe and fittings, excavation, backfill, pipe bedding, testing, chlorination, and all incidentals, in place complete.	$	$
25.	2	EA	Each; Hose Bibb; including concrete post and pad, and all incidentals, in place complete	$	$
			Subtotal Base Bid (Items 1 - 25)		**$**
26.		LS	Mobilization and Demobilization (not to exceed 10% of the Subtotal Base Bid)		$
			TOTAL BASE BID (Items 1 - 26)		**$**

Item No.	Quantity	Unit	Description	Unit Price	Total
ADDITIVE 1 BID					
PICNIC AREA 3					
27.	24	CY	Excavation, including hauling and all incidentals, in place complete.	$	$
28.	1	EA	Each; Picnic Area 3, inclusive, including 5-inch minimum thickness concrete pad with steel reinforcement, structural fill, gravel, posts, framing, and roofing, and all incidentals, in place complete	$	$
29.	1	EA	Picnic Table, 8-foot-long with treated lumber and concrete anchor straps and all incidentals, in place complete	$	$
30.	31	LF	2.17-foot-high Concrete Wall with Simulated Stone Veneer at Picnic Area 3, and all incidentals, in place complete	$	$
31.	31	LF	Retaining wall foundation drain; including excavation, 3-Inch HDPE perforated pipe, outlet, and pipe bedding and all incidentals, in place complete	$	$
32.	9	SY	Concrete walkway; 4-inch thick, including synthetic fiber reinforcement, 6-inch aggregate base course, 12-inch structural fill, and all incidentals, in	$	$
Subtotal Additive 1 Bid (Items 27 - 32)					**$**
33.		LS	Mobilization and Demobilization (not to exceed 10% of the Subtotal Additive 1 Bid)		$
TOTAL ADDITIVE 1 BID (Items 27 - 33)					**$**

Item No.	Quantity	Unit	Description	Unit Price	Total
ADDITIVE 2 BID					
PICNIC AREA 4					
34.	23	CY	Excavation, including hauling and all incidentals, in place complete.	$	$
35.	1	EA	Each; Picnic Area 4, inclusive, including 5-inch minimum thickness concrete pad with steel reinforcement, structural fill, gravel, posts, framing, and roofing, and all incidentals, in place complete	$	$
36.	1	EA	Picnic Table, 8-foot-long with treated lumber and concrete anchor straps and all incidentals, in place complete	$	$
37.	23	LF	Concrete curb at Picnic Area 4, 6-inch-high, including aggregate base, and all incidentals, in place complete	$	$
38.	4	SY	Concrete walkway; 4-inch thick, including synthetic fiber reinforcement, 6-inch aggregate base course, 12-inch structural fill, and all incidentals, in place complete	$	$
Subtotal Additive 2 Bid (Items 34 - 38)					**$**
39.		LS	Mobilization and Demobilization (not to exceed 10% of the Subtotal Additive 2 Bid)		$
TOTAL ADDITIVE 2 BID (Items 34 - 39)					**$**

Item No.	Quantity	Unit	Description	Unit Price	Total
ADDITIVE 3 BID					
PICNIC AREA 5					
40.	17	CY	Excavation, including hauling and all incidentals, in place complete.	$	$
41.	1	EA	Picnic Area 5, inclusive, including 5 inch minimum thickness concrete pad with steel reinforcement, structural fill, gravel, posts, framing, and roofing, and all incidentals, in place complete	$	$
42.	1	EA	Picnic Table, 8-foot-long including treated lumber and concrete anchor straps and all incidentals, in place complete	$	$
43.		LS	2.17-foot-high Concrete Wall with Simulated Stone Veneer at Picnic Area 3, and all incidentals, in place complete		$
44.	31	LF	Retaining wall foundation drain; including excavation, 3-Inch HDPE perforated pipe, outlet, and pipe bedding and all incidentals, in place complete	$	$
45.	12	SY	Concrete walkway; 4-inch thick, including synthetic fiber reinforcement, 6-inch aggregate base course, 12-inch structural fill, and all incidentals, in place complete	$	$
Subtotal Additive 3 Bid (Items 40 - 45)					**$**
46.		LS	Mobilization and Demobilization (not to exceed 10% of the Subtotal Additive 3 Bid)		$
TOTAL ADDITIVE 3 BID (Items 40 - 46)					**$**

Item No.	Quantity	Unit	Description	Unit Price	Total
ADDITIVE 4 BID					
RAIN GARDEN					
47.	17	CY	Excavation, including hauling and all incidentals, in place complete.	$	$
48.		LS	Temporary Irrigation System; including installation, maintenance and removal, and all incidentals, in place complete		$
49.		LS	Landscaping including plants and ground covers, 18-inch deep soil mix, 1-inch deep black cinder, and all incidentals, in place complete		$
50.		LS	Lawns and Grasses, including grass sod, 1-inch deep soil amendments, and all incidentals, in place complete		$
51.		LS	60-day Landscape Maintenance Period for Rain Garden		$
Subtotal Additive 4 Bid (Items 47 - 51)					**$**
52.		LS	Mobilization and Demobilization (not to exceed 10% of the Subtotal Additive 4 Bid)		$
TOTAL ADDITIVE 4 BID (Items 47 - 52)					**$**

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 (e.g. Hawaii Products), 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 26) selected by the Board of Land and Natural Resources. Write the total of bid items 1 to 26 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 two hundred seventy (270) 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 eighteen (18) months after the bid opening date, and that no additional compensation will be provided for any claim for escalation or delay for issuance of Notice to Proceed on or before that date.

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

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

After the proposals are opened and read, the figures will be extended and/or totaled in accordance with the bid prices of the acceptable proposals and the totals will be compared. In the comparison of bids, words written in the proposal shall govern over figures and unit prices will govern over totals. Until the award of the contract, however, the right will be reserved to reject any and all proposals and to waive any

defects or technicalities as may be deemed best for the interest of the State.

It is also understood and agreed that liquidated damages in the amount of three hundred dollars and no/100 ($300.00) 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.

BASE BID

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

JOINT CONTRACTORS OR SUBCONTRACTORS LIST FOR THE ADDITIVE(S):

Bidder agrees that for projects with additives(s), the Bidder, joint contractor or subcontractor listed in the completed "Joint Contractors or Subcontractors List for the Additives(s)" will perform work for the respective additives.

ADDITIVE 1 BID

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

ADDITIVE 2 BID

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

ADDITIVE 3 BID

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

ADDITIVE 4 BID

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 "two hundred seventy (270)" 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 two hundred seventy (270) days, the Department may request the successful Bidder to extend the time for the acceptance of its bid. The Bidder may reject such a request without penalty; and in such case, the Department may at its sole discretion make a similar offer to the next lowest responsive and responsible bidder and so on until a bid is duly accepted or until the Department elects to stop making such requests."

3. **AMEND** Section 3.9, Notice to Proceed, by deleting "180 days" and replacing with "eighteen (18) months" in the last paragraph.

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

"**3.10 PROTESTS**—Pursuant to Section 103D-701, Hawaii Revised Statutes, an actual or prospective

offeror who is aggrieved in connection with the solicitation or award may submit a protest. Any protest shall be submitting in writing to the Chairperson, Department of Land and Natural Resources, 1151 Punchbowl Street, Honolulu, Hawaii 96813, or designee as specified in the solicitation.

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

The notice of award, if any, resulting from this solicitation shall be posted on the 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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TECHNICAL SPECIFICATIONS **SECTION NO.**

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TECHNICAL SPECIFICATIONS **SECTION NO.**

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.

Any discrepancy shall be immediately brought to the attention of the Engineer. The Contractor shall not be entitled to extra payment for failing to report the discrepancies before proceeding with any work whether within the area affected or not.

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 five (5) working days' notice before starting any work.

D. Disruption of Utility Services: All work related to the temporary disconnection of utility systems shall be pre-arranged with the Engineer so that any disruption of such services will be kept to a minimum. In the event temporary power hook-up is required, the Contractor shall provide the necessary services.

E. Contractor's Operations

1. The Contractor must employ, insofar as possible, such methods and means of carrying out the work so as not to cause any interruption or interference to the facility's operations. Where the Contractor's operations would result in interruptions which would hamper the operations of the facilities, the Contractor shall rearrange the schedule of work accordingly.

2. The Contractor shall maintain safe passageway to and from the facility for the user agency personnel and the public at all times.

F. Staging and Storage: The Contractor shall coordinate staging and storage areas with the Engineer prior to mobilization.

1. No staging or storage shall occur within 50 feet of the shoreline as shown in the drawings.

2. No staging or storage shall occur within the State highway right-of-way or perform work that will (a) unnecessarily obstruct traffic; (b) obstruct the sight lines and distances and view corridors along the highway; (c) otherwise constitute a hazard to users of the highway; and/or (d) obstruct highway operations.

3. Any damages resulting from the Contractor's use shall be restored as instructed by the Engineer at no cost to the State.

G. Parking Policy for Contractor

1. The Contractor and its employees will not be allowed to park in zones assigned to park personnel or patrons.

2. Areas to be used by the Contractor shall be as designated by the Engineer. Any damage 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. Should the Contractor not maintain the sanitary facilities in same clean and sanitary conditions, the Engineer may revoke use of the onsite facilities. The Contractor shall than be responsible to provide their own sanitary facilities at no additional cost to the State.

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 the notice to proceed.

3. As-Built Drawings

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 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.

PART 2 – PRODUCTS (NOT USED)

PART 3 – EXECUTION (NOT USED)

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
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
ADAAG	Americans with Disabilities Act Accessibility Guidelines Published by the Department of Justice
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
AITC	American Institute of Timber Construction 333 West Hampden Avenue Englewood, CO 80110
ANSI	American National Standards Institute, Inc. 1430 Broadway New York, NY 10018
APA	American Plywood Association 1119 A Street Tacoma, WA 98401
ASTM	American Society for Testing and Materials 1916 Race Street Philadelphia, PA 19103
AWPA	American Wood Preservers Association 1625 Eye Street Washington, DC 20006

Abbreviation	Company
AWS	American Welding Society 2501 N.W. 7th Street Miami, FL 33125
AWWA	American Water Works Association 6666 West Quincy Avenue Denver, CO 80235
CRSI	Concrete Reinforcing Steel Institute 180 North La Salle Street Chicago, IL 60601
EJMA	Expansion Joint Manufacturer's Association 331 Madison Avenue New York, NY 10017
HODAAG	Hawaii Outdoor Developed Areas Accessibility Guidelines Disability and Communication Access Board 919 Ala Moana Boulevard, Room 101 Honolulu, Hawaii 96814
ICBO	International Conference of Building Officials 5360 South Workman Mill Road Whittier, CA 90601
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
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
SBCC	Southern Building Code Congress 1116 Brown-Marx Building Birmingham, AL 35203

Abbreviation	Company
SSPWC	Standard Specifications for Public Works Construction Building News, Inc. 3055 Overland Avenue Los Angeles, CA 90034
UBC	Uniform Building Code Published by ICBO
UL	Underwriters Laboratories Inc. 207 East Ohio Street Chicago, IL 60611
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

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SECTION 01230

ADDITIVE BID ITEMS

PART 1 - GENERAL

1.1 SUMMARY

A. This Section includes administrative and procedural requirements for additive bid items.

B. The description of additive bid items is not intended to give a detailed description of all additional work required by the additive bid item(s), as only the principal features of such additional work are listed.

C. Should any or all of the additive bid items become a part of the contract, the cost of all additional work required by the additive bid item(s), even though not specifically mentioned herein, are included in the lump sum bid price.

1.2 DEFINITIONS

A. Additive Bid Item: An amount proposed by Bidders (Offerors) and stated on the Proposal Form for certain work defined in the Bidding Requirements that may be added to the Total Lump Sum Base Bid Price amount if the State decides to accept a corresponding change either in the amount of construction to be completed or in the products, materials, equipment, systems, or installation methods described in the Contract Documents.

B. The cost for each additive bid item is the net addition to the Contract Sum to incorporate additive bid item into the Work. No other adjustments are made to the Total Lump Sum Base Bid Price.

1.3 PROCEDURES

A. Coordination: Modify or adjust affected adjacent work as necessary to completely integrate work of the additive bid item into the Project.

B. Include as part of each additive bid item, miscellaneous devices, accessory objects, and similar items incidental to or required for a complete installation whether or not indicated as part of additive bid item.

C. Notification: Immediately following award of the Contract, notify each party involved, in writing, of the status of each additive bid item. Indicate if additive bid items have been accepted, rejected, or deferred for later consideration.

D. Execute accepted bid items under the same conditions as other work of the Contract.

E. Schedule: A Schedule of Additive Bid Items is included at the end of this Section. Specification Sections referenced in schedule contain requirements for materials necessary to achieve the work described under each additive bid item.

PART 2 - PRODUCTS (NOT USED)

PART 3 - EXECUTION

3.1 SCHEDULE OF ADDITIVE BID ITEMS

Additive #1 Bid Items
Additive Bid Item 1: Picnic Area #5
Additive Bid Item 3: Concrete Wall with Simulated Stone Veneer
Additive Bid Item 4: 4-foot-wide Concrete Walkway

Additive #2 Bid Items
Additive Bid Item 1: Rain garden

END OF SECTION

SECTION 01300

SUBMITTALS

PART 1 - GENERAL

1.1 SUBMITTALS

A. Shop drawings, manufacturer's catalog data, material safety and data sheets (MSDS), safety program and other documents shall be required as called for in the plans, specifications or by the Engineer.

B. Other required submittals shall include:

1. Proposed Layouts.

2. Certificates of Warranty.

3. Operations and Maintenance Manuals

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, 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, layouts, 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 (20) 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

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SECTION 01505

MOBILIZATION AND DEMOBILIZATION

PART 1 - GENERAL

1.1 GENERAL REQUIREMENTS

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

1.2 MOBILIZATION

A. 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

A. 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

A. The Contractor shall coordinate staging and stockpiling areas for equipment or materials with the Engineer prior to mobilization.

B. 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.

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

END OF SECTION

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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.

1.2 REFERENCES

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

B. The "Hawaii Standard Specifications for Road and Bridge Construction", dated 2005, as revised, of the State of Hawaii Department of Transportation, hereafter referred to as the "STATE DOT STANDARD SPECIFICATIONS", or as herein specified. (Paragraphs concerning Measurement and Payment are not applicable to this project).

PART 2 - PRODUCTS

2.1 MATERIALS

A. Plastic Enclosure Fence: Industry standard 4-feet high plastic fencing with metal (or wood) post supports at 10-feet on center connected with a top and bottom 12-gauge soft annealed galvanized tie wires securely connected to posts. Posts shall be capable of resisting a lateral load of 100 pounds measured at the top of the post.

B. Requirements for Warning Sign

1. General Requirements: Furnish all labor, materials and equipment necessary to construct and install warning signs as specified hereinafter.

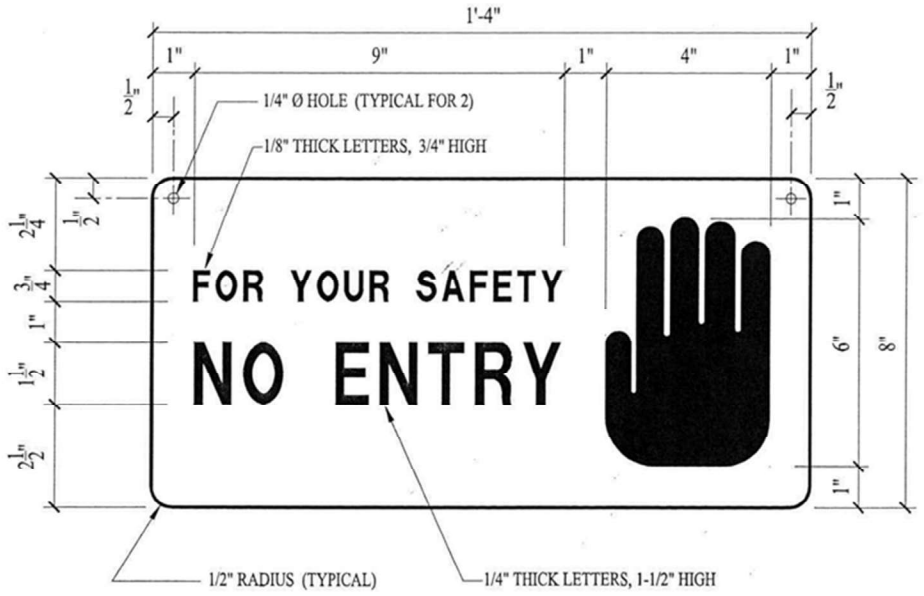
2. Materials

a. Backing: Backing shall be 6061-T6 aluminum 0.032-inch minimum thickness.

b. Paint: Paint shall be satin finish, exterior grade or factory baked enamel or a combination thereof.

3. Colors: Signs shall have white background. Remaining items shall be similar to Rust-Oleum Federal Safety Red.

4. Requirements for Warning Sign: Message configuration and dimensions shall be in accordance with the following illustration.



5. Installation

   a. Signs shall be located at all entrances to the project site.

   b. Signs shall be attached to the rope barrier, rope barrier supports, individual sign supports or buildings. Do not use nails to attach signs to building(s).

6. Clean-up: Remove all signs upon completion of project. Repair any damages caused by sign mounting and removal.

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.

1. Barricades shall be in good condition and approved by the Engineer for use within the project limits. Barricade application and installation shall be in accordance with the guidelines provided in the latest edition of the MUTCD, and any amendments or revisions thereof as may be made from time to time.

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

3. Steady burn and/or flashing lamps shall be required on selected barricades used during hours of darkness. Locations shall be 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.

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

5. Upon completion of the construction work, barricades shall be removed and disposed of and 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 by the Engineer.

C. Reflectorization: Reflectorization of barricade rails shall be done in a first class, workmanlike manner and the attachment of reflective sheeting shall be as specified herein, or as directed and approved by the Engineer.

Both vertical faces of each barricade rail shall be reflectorized with one of the following:

1. Reflective sheeting specified in Subsection 712.20(C)(4) of the "STATE DOT STANDARD SPECIFICATIONS" 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 "STATE DOT STANDARD SPECIFICATIONS".

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

The front and back faces of barricade rails shall have 6-inch-wide alternating 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. Lanes closed for operational purposes.

c. Permanent or semi-permanent closure or termination of a roadway.

E. Maintenance

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

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

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

4. 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. The Contractor shall provide to the Engineer disposal receipts for all material dropped off-site.

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. Clean-up shall include the collection of all waste paper and wrapping materials, cans, bottles, construction waste materials and other objectionable materials, and removal as required. Frequency of clean-up shall coincide with rubbish producing events.

B. Dust

1. The Contractor shall prevent dust from becoming airborne at all times including non-working hours, weekends and holidays in conformance with the State Department of Health, Administrative Rules, Title 11, Chapter 60 - Air Pollution Control.

2. The method of dust control and costs shall be the responsibility of the Contractor. Methods of dust control shall include the use of water, chemicals or asphalt over surfaces which may create airborne dust.

3. The Contractor shall be responsible for all damage claims in accordance with Section 7.16 - "Responsibility for Damage Claims" of the GENERAL CONDITIONS.

C. Noise

1. Noise shall be kept within acceptable levels at all times in conformance with the State Department of Health, Hawaii Administrative Rules (HAR) 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 construction-related vehicles traveling on roadways shall meet the vehicular noise level requirements set by HAR Chapter 42, Vehicular Noise Control for Oahu.

3. All internal combustion engine-powered equipment shall have mufflers to minimize noise and shall be properly maintained to reduce noise to acceptable levels.

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. Best Management Practices (BMPs) to control erosion and sediment shall also comply with Section 02370 – SEDIMENT AND EROSION CONTROL.

2. During interim grading operations, the grade shall be maintained so as to preclude any damage to adjoining property from water and eroding soil.

3. 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.

4. 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. Hydrotesting

1. Hydrotesting of installed water lines shall be done in accordance with Section 02510 – WATER SYSTEM.

2. The Contractor shall be responsible for handling and disposal of all hydrotesting effluent. If the Contractor’s construction activity will require coverage under the NPDES General Permit Authorizing Discharges of Hydrotesting Waters, the Contractor shall apply for and obtain NPDES General Permit coverage at no additional cost to the State and no additional contract time. The Contractor shall comply with the terms, conditions, and requirements of the approved (Notice of General Permit Coverage (NGPC) issued by the DOH and be held liable for any

associated violations and penalties at no additional cost to the State and no additional contract time.

F. Wastewater Discharge/Spills Prevention and Mitigation

1. The Contractor shall be liable for any treatment of discharges that is required before disposal and for any fines, clean-up costs and damages which may occur through the violation of any federal, state or local law which may be applicable.

2. The Contractor shall be liable for all clean-up costs, fines and damages resulting from wastewater spills related to any construction activities.

3. 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 of Hawai'i, Department of Health water pollution regulations.

G. 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.

2. Trucks hauling debris shall be covered as required by Public Utilities Commission 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.

7. Compliance with the provisions of this section by the subcontractors will be the responsibility of the Contractor.

H. 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

A. Installation and maintenance of temporary BMPs to control erosion and sediment shall comply with Section 02370 – SEDIMENT AND EROSION CONTROL.

B. Installation of the water system and management of hydrotesting effluent shall comply with Section 02510 – WATER SYSTEM.

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 SUBMITTALS

A. Submit in accordance with Section 01300 – SUBMITTALS.

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

1.3 LETTER STYLE

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

1.4 ART WORK

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

1.5 TITLES

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

Design should follow the examples on pages 01581-3 and 01581-4.

PART 2 - PRODUCTS

2.1 MATERIALS

A. LUMBER

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

B. PAINTS & INKS

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

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

C. CONCRETE

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

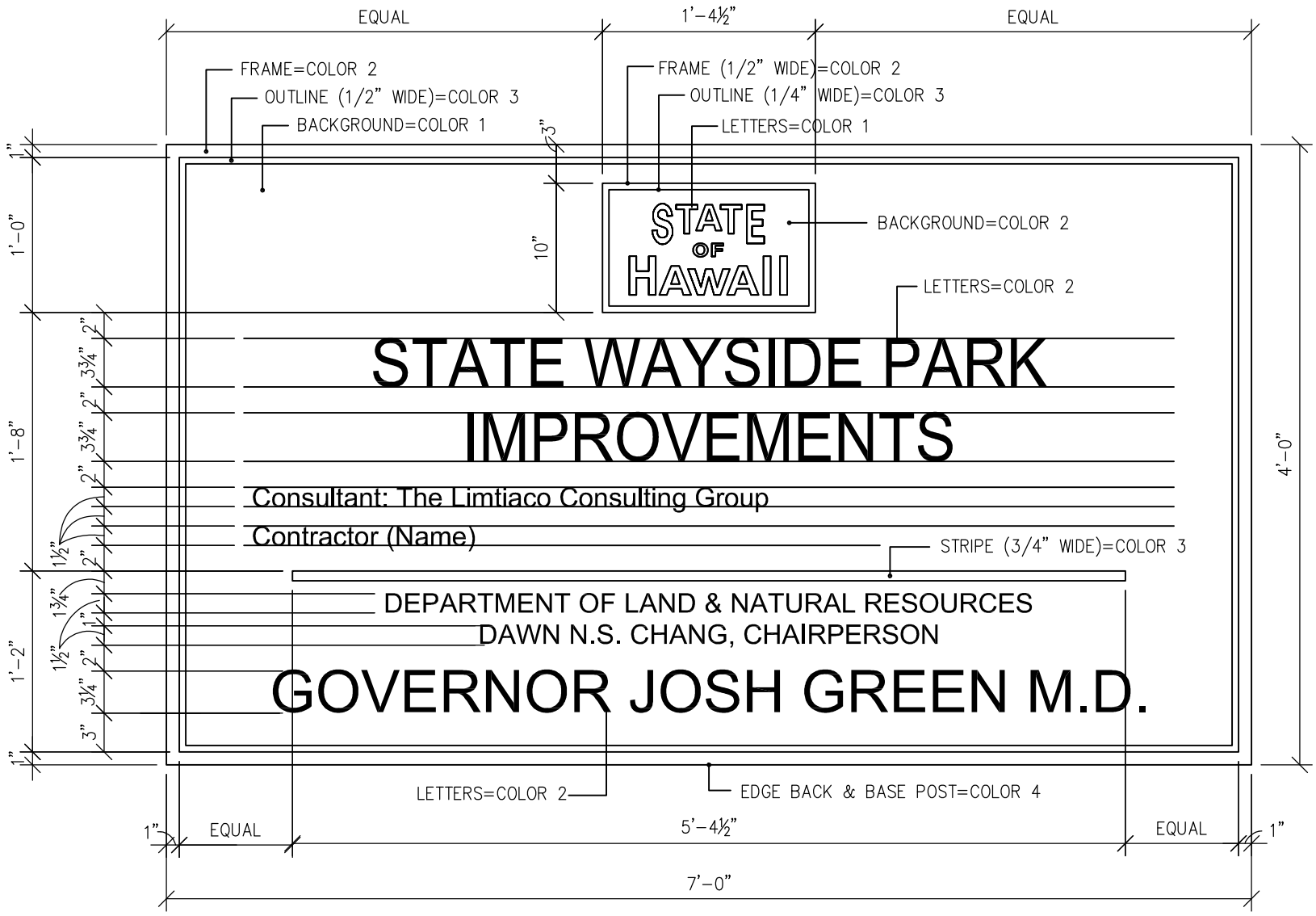
PART 3 - EXECUTION

3.1 GENERAL

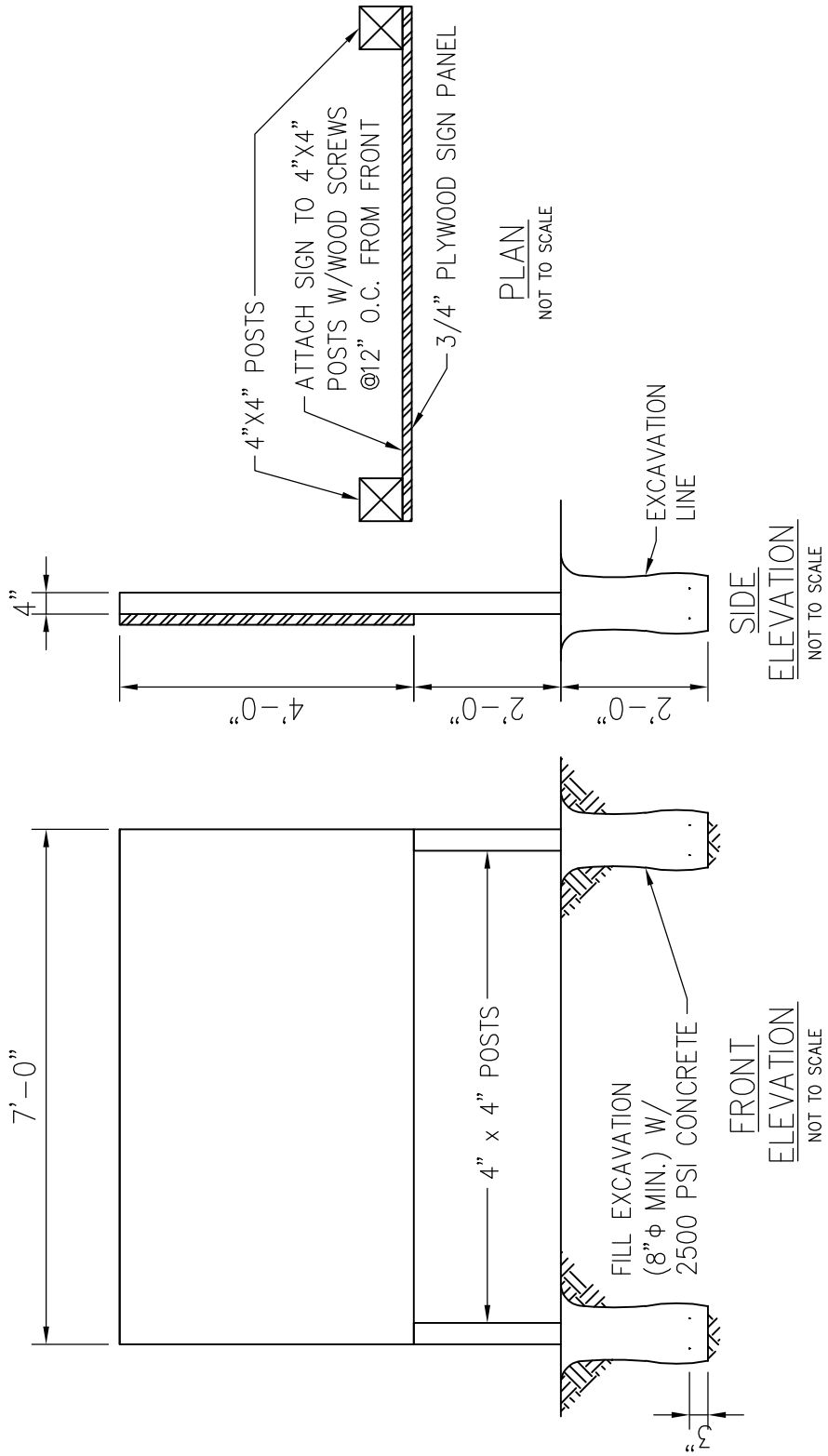
A. The Project Sign shall be constructed with new materials as specified above.

B. The Project sign shall be installed at the location as designated by the Engineer. The project sign shall be erected upon commencement of work.

Project Sign
01581-3



NOTE: Number of signs required 1.



END OF SECTION

SECTION 02050

DEMOLITION

PART 1 - GENERAL

1.1 GENERAL REQUIREMENTS

A. The work includes demolition and removal of items 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 the property. Remove rubbish and debris from the job site daily, unless otherwise directed. Store materials which cannot be removed daily in areas specified by the Engineer. The Contractor shall pay for all necessary permits and certificates that may be required in connection with this work.

B. Related Work

1. Section 02200 – EARTHWORK

1.2 SUBMITTALS

A. Submit in accordance with Section 01300 – SUBMITTALS.

B. Submit proposed demolition and removal procedures to the Engineer 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 Engineer by temporary covers, shoring, bracing, and supports. Repair items damaged during performance of the work or replace with new to the satisfaction of the Engineer. 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. All work shall be executed in an orderly and careful manner, with due consideration for all items to remain, and the Contractor shall be strictly responsible for any damages thereto.

C. Trees

1. Protect trees within the project site which might be damaged during the demolition work with temporary plastic safety fence as indicated on the plans.

2. Woody plants greater than 15 feet tall shall not be disturbed, removed or trimmed during the bat birthing and pup rearing season (June 1 through September 15).

3. Site clearing shall be timed to avoid disturbance to Hawaiian hoary bats in the project area.

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

E. Explosives: Use of explosives will not be permitted.

F. 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.

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.ar

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.

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.

A. Related Work

1. Section 01530 – BARRICADES

2. 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, park users, campgrounds, etc. When necessary, the Contractor shall provide signs and erect barriers, etc. in conformance with the current edition of the Federal Highway Administration's "Manual on Uniform Traffic Control Devices for Streets and Highways" (MUTCD) to prevent vehicles from entering active construction areas.

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

D. Take all precautions and safety measures as required to protect the State free and harmless from liability of any kind. Conduct operations with minimum interference to existing park operations.

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

F. The Contractor shall protect from damage all surrounding buildings, structures, roads, embankments, walls, fences, utilities, trees, walks, pavements, etc. Any damage shall be repaired or replaced by the Contractor to the satisfaction of the Engineer at no additional cost to the State.

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

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

I. 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. Clear and grub the site in accordance with Section 02200 – EARTHWORK.

3.4 CLEAN UP OF PREMISES

B. 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, etc., and leave entire job site raked clean and neat to the satisfaction of the Engineer.

END OF SECTION

SECTION 02200

EARTHWORK

PART 1 - GENERAL

1.1 GENERAL REQUIREMENTS

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

B. Licensed Geotechnical Engineer: The Contractor shall retain and pay for the services of a geotechnical engineer to monitor earthwork and perform testing during the earthwork operations. The geotechnical engineer shall be a licensed civil engineer licensed in the state of Hawaii and specializing in geotechnical engineering with at least five (5) years of licensed experience in geotechnical engineering work.

C. Related Work

1. Section 02320 – TRENCHING, BACKFILLING, AND COMPACTING

2. Section 02370 – SEDIMENT AND EROSION CONTROL

1.2 REFERENCES

A. A geotechnical report entitled, “Geotechnical Engineering Exploration Site Improvements at Kaumahina State Wayside Park, Honomanu, Maui, Hawaii, December 23, 2025”, was prepared by Kōkua Geotech, LLC. for the design of this project.

The subsurface information and data furnished are for the Contractor’s convenience only. They represent the subsurface conditions at the specific boring locations and at the time of exploration only. There is no guarantee, either expressed or implied, that the subsurface conditions indicated are representative of those existing throughout the work. No assurance is given that these conditions are representative of the conditions at other locations of the project site or at other times. The Contractor is solely responsible for any and all assumptions, deductions, or conclusions which he may make or derive from his examination of the subsurface information and data provided herein. The State and its Consultants assume no responsibility for the Contractor’s interpretation of such data.

B. The “Standard Specifications for Public Works Construction”, September 1986, of the Department of Public Works, including all revisions, as applicable to the County of Maui, hereafter referred to as the “DPW STANDARD SPECIFICATIONS”, or as herein specified. (Paragraphs concerning Measurement and Payment are not applicable to this project.)

1.3 QUALITY ASSURANCE

A. Source Quality Control: Test import and on-site materials proposed for use to demonstrate that the materials conform to the specified requirements. Tests shall be performed by a qualified independent testing laboratory and paid for by the Contractor.

B. The Contractor shall verify testing and reporting requirements with the Engineer prior to the start of earthwork operations.

1.4 SUBMITTALS

A. Submit in accordance with Section 01300 – SUBMITTALS.

B. Test Reports: Submit test reports as directed by the Engineer. Contractor shall verify all requirements prior to the start of earthwork operations.

C. 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 structural engineer registered in Hawaii and retained and paid for by the Contractor. Indicate sequence and method of installation and removal.

D. Test for Moisture – Density Relations: Submit test results for each material at least 7 days prior to compacting of each material.

E. Certification of Compaction: An independent geotechnical testing laboratory working under the supervision of a licensed civil engineer licensed in Hawaii shall test and certify all compaction work and be paid for by the Contractor. Certifications and test results shall be submitted to the Engineer within three (3) days of the test.

F. Field Dry Density and Moisture Content Tests: Submit field test data not listed above sufficiently in advance of construction so as not to delay work. Furnish a drawing showing test locations, test numbers, test elevations, and test results. Submit test results within three (3) days of test date.

G. Manufacturer's product literature: Submit manufacturer's product literature including description of material and physical properties and laboratory test data for bedding material, sub-bedding material, general fill, and structural fill to the Engineer for approval at least 15 calendar days prior to construction.

1.5 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.

1.6 CONTRACTOR'S RESPONSIBILITIES

A. All clearing, site preparation or earthwork performed on the project up to the approximate finish grade or subgrades shall be conducted by the Contractor under the inspection of the Licensed Geotechnical Engineer retained and paid for by the Contractor.

B. It is the responsibility of the Contractor to assess the soil and ground water conditions presented in the plans and specifications and to employ suitable measures to permit construction to proceed.

C. It is the Contractor's responsibility to perform all quality control testing at no additional cost to the State.

D. It is the Contractor's responsibility to prepare the ground surface to receive fill and to place, spread, mix, moisture condition, and compact the fill in accordance with the specifications herein. The Contractor shall also remove all unsuitable and deleterious materials.

E. Suitable fill, backfill materials, and bedding materials in the quantities required are not available at the site. Import fill material as necessary at no additional cost to the State. Imported material shall be subject to approval by the Engineer and shall meet the requirements specified for the use intended.

F. It is also the Contractor's responsibility to have suitable and sufficient compaction equipment on the job site to handle the amount of fill being placed. If necessary, excavation equipment shall be shut down to allow completion of compaction. Sufficient watering apparatus will also be provided by the Contractor with due consideration for the fill material, rate of placement, and the time of year.

G. Blasting as a means for removal of material is not allowed.

H. The Licensed Geotechnical Engineer shall promptly notify both the Contractor and the Engineer verbally of any failing compaction tests and the results of such tests to the extent the tests show a lack of compliance with specifications. These items shall also be documented by the Licensed Geotechnical Engineer.

I. If field density tests indicate inadequate compaction or moisture content, the Contractor shall moisture condition and recompact and retest until adequate compaction and adequate moisture content is achieved.

Relative compaction in these Specifications is defined as the dry density of the compacted material expressed as a percentage of the maximum dry density of the same material based on ASTM D1557 test method. Optimum moisture is the water content (percentage dry weight) corresponding to the maximum dry density.

J. During construction, drainage shall be provided to minimize ponding of water adjacent to or on foundation and pavement areas. Ponded areas shall be drained immediately. Any subgrade soil that has become soft due to ponding shall be removed to firm material and replaced with properly compacted structural fill at no additional cost to the State.

1.7 CONSTRUCTION LINES, LEVELS AND GRADES

A. The Contractor shall verify all lines, levels and elevations indicated on the drawings or as directed by the Engineer 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 establishment of grades and staking out the entire work shall be done by a licensed Surveyor or a licensed Civil Engineer retained and paid for by the Contractor, 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 BID ADDITIVE WORK

A. The contract may include any or all of the bid additive work indicated on the plans. The Contractor shall grade to the extents indicated on the plans for the respective bid additives included in the contract work and provide a smooth transition to the existing ground condition at the slopes indicated on the plans.

PART 2 – PRODUCTS

2.1 MATERIALS

A. Onsite Fill Material

1. All on-site and imported materials shall be tested and approved by the Contractor's Licensed Geotechnical Engineer and approved by the Engineer prior to their use in fills at the site. An adequate number of field density tests shall be performed to check that the required degree of compaction has been achieved.

2. Oversized rock particles greater than 6-inch in maximum dimension resulting from the excavation process shall not be re-used as backfill unless it can be crushed and screened to provide a well graded, fine to coarse granular mixture conforming to the structural fill or structural backfill requirements stated herein.

3. In general, on-site soils may be reused as a source of general fill material, provided they are free of vegetation, deleterious materials, and rock fragments greater than 6 inches in maximum dimension. On-site soil may constantly be in a very moist to wet condition. Drying or aerating the excavated materials may be necessary prior to their use as general fill.

B. Structural Fill and Structural Backfill

1. Structural fill and structural backfill shall be non-expansive granular material such as crushed coral or basalt. It shall be well-graded from coarse to fine with no particles larger than 3 inches in maximum dimension. It shall have a California

Bearing Ratio (CBR) value of at least 20, and a CBR swell of 1 percent or less when tested in accordance with ATM D1883. It shall be contain between 10 to 30 percent of particles passing a U.S. No. 200 standard sieve.

2. Fill shall be free of vegetation, debris, trash, concrete, old pavements, and particles larger than 6 inches in maximum dimension.

C. Untreated Aggregate Base Course

1. Aggregate base course shall meet the material requirements as specified in Sections 31 of the DPW STANDARD SPECIFICATIONS.

D. Untreated Aggregate Subbase

1. The untreated aggregate subbase shall conform to the requirements of Section 30 of the DPW STANDARD SPECIFICATIONS.

PART 3 - EXECUTION

3.1 SITE PREPARATION

A. All areas within the limits of grading as indicated on the plans shall be cleared of trees, vegetation, and deleterious materials such as rubbish roots and organics and disposed of off-site. This removal shall be completed prior to excavating and filling.

B. Any abandoned underground structures such as cesspools, cisterns, tunnels, septic tanks, wells, pipelines, or other structures shown or not shown on the drawings that are discovered shall be removed and the resulting depression or void backfilled and compacted in accordance with this section.

C. Saturation and subsequent yielding of exposed subgrade due to inclement weather and poor drainage may require over-excavating the soft areas and replacing these areas with well-compacted structural fill. The Contractor's Licensed Geotechnical Engineer shall evaluate the need for over-excavation due to soft subgrade soil conditions.

3.2 EXCAVATION

A. Protective Measures: 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.

B. General

1. All earthwork shall be performed and supported in accordance with applicable State, Federal, and local safety regulations, including current OSHA excavation and trench safety standards. The Contractor shall retain qualified structural and

geotechnical engineers and registered in the State of Hawaii to design the excavation support and dewatering system.

2. The Contractor shall comply with all applicable safety codes and regulations relating to open cut excavations and the use of sheeting and shoring to protect their workers and surrounding properties where necessary. The Contractor's excavation shoring and sheeting shall be designed to protect against excavation instability, boiling, blowout, and/or heave of the excavation bottoms.

3. Provide for the collection and disposal of surface and subsurface water encountered during construction. Surface water shall be directed away from excavations and construction areas to prevent erosion and undermining of foundations and softening of subgrade. Completely drain construction site during periods of construction to keep soil materials sufficiently dry.

4. Groundwater flowing toward or into excavations shall be controlled to prevent sloughing of excavation slopes and walls, boils, uplift and heave in the excavation and to eliminate interference with orderly progress of construction. Control measures shall be taken by the time the excavation reaches the water level in order to maintain the integrity of the in-situ material. While the excavation is open, the water level shall be maintained continuously, at least 1-1/2 feet below the working level.

5. Design and equip dewatering system with proper filters, screens, and gravel packs to minimize the removal of fines from soil during pumping. Repair all damages that occur to the satisfaction of the Engineer at no additional cost to the State.

6. Excavate to contours and dimensions and depths indicated on the Plans. Notify the Engineer immediately in writing in the event that it becomes necessary to remove material to a depth greater than indicated. Refill excavations cut below the depths indicated with structural fill and compact as specified herein. Excavate soil disturbed or weakened by construction operations or soils softened from exposure to weather at no additional cost to the State. Refill with structural fill and compact as specified herein. Excavated slopes and backfill surfaces shall be protected to prevent erosion and sloughing.

7. Unauthorized excavations carried below specified levels shall be filled with concrete or structural fill to the proper level as directed by the Engineer at the Contractor's expense.

8. All pumped water from dewatering operations shall be properly treated, filtered, discharged, and disposed of in accordance with applicable State, Federal, and local discharge regulations. The Contractor shall obtain any appropriate permits prior to making the discharges. No extra payment will be made for preparation of the dewatering plan, dewatering costs, or for obtaining the necessary permits.

3.3 SURPLUS MATERIAL

A. Unless otherwise specified in the Plan 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 additional cost to the State.

3.4 SUBGRADE PREPARATION

A. The subgrade in areas to receive fill shall be scarified to a depth of at least ten (10) inches, moisture conditioned to above the optimum moisture content, and compacted to a relative compaction of at least 90 percent. Any soft or yielding soils revealed during the subgrade compaction shall be excavated to underlying firm materials and backfilled with structural fill material compacted to a minimum of 90 percent relative compaction.

B. Protect compacted subgrade from exposure to weather elements. If shrinkage cracks appear on the excavated or compacted subgrade, the subgrade shall be scarified and thoroughly moisture conditioned and recompacted to provide a firm base and to close all cracks.

C. All foundation subgrades should be checked by the Contractor’s Licensed Geotechnical Engineer for suitable bearing materials, cleaning, and compaction before placement of steel and concrete.

3.5 FILL PLACEMENT

A. At minimum, the top 12 inches of fill directly under the cushion level of slabs-on-grade, and pavements shall consist of properly compacted non-expansive structural fill.

B. Structural fill and structural backfill shall be placed in not more than 8-inch-thick loose lifts, moisture conditioned to above the optimum moisture content for these materials and compacted to a relative compaction of at least 90 percent.

C. Aggregate base course and subbase course materials shall be placed in not more than 8-inch-thick loose lifts, moisture conditioned to above the optimum moisture content for these materials and compacted to a relative compaction of at least 95 percent

D. Fill in landscape and non-structural areas shall be placed in not more than 8-inch-thick loose lifts, moisture conditioned to above the optimum moisture content and compacted to a relative compaction of at least 90 percent for granular material.

E. Moisten or aerate material as necessary to provide the moisture content that will readily facilitate obtaining the specified compaction with the equipment used. Do not place fill on surfaces that are saturated or muddy. Compact with equipment well suited to the soil being compacted. Compact each lift as specified before placing the overlaying lift. Compaction shall be accomplished continuously over the entire area.

F. Permanent cut and fill slopes shall not be steeper than 3H:1V.

G. Fill placed on slopes steeper than 5H:1V shall be continuously keyed and benched into the existing slopes.

H. All permanent fill slopes shall be overbuilt and trimmed back to expose firm, compacted material at finish grade. Track-rolling of slopes shall not be permitted. If over-cutting of slope occurs, keying and benching shall be implemented instead of backfilling the slope to the design grade with sliver fills.

I. Provide protective slope covers over the material to reduce overall erosion rates.

3.6 ROADWAYS, PAVEMENTS, AND PARKING LOTS

A. Pavement subgrade soils shall be scarified to a minimum depth of 8 inches, moisture-conditioned to above the optimum moisture content, and compacted to at least 95 percent relative compaction.

B. The limits of the base course shall extend horizontally at least 12 inches beyond the edges of the roadway or parking lot limits.

3.7 GRADING

A. Landscaped areas shall be graded with an allowance for a thickness of screened topsoil and conditioner as required in Section 02900 – LANDSCAPING.

B. The complete excavation and fill surface shall be true to grade and elevation and shall provide a firm base. Tolerances shall be 0.10 feet.

C. Provide protective slope covers over exposed materials for erosion control.

3.8 FIELD QUALITY CONTROL

A. Subgrade areas shall not receive fill material until approved by the Engineer.

B. Perform field density tests in randomly selected locations using ASTM D1556 or ASTM D6938 as follows:

1. One test per 400 square feet or fraction thereof for subgrade and in each lift or fill under a picnic structure, but not less than two (2) tests on subgrade and two (2) tests on each lift of fill.

2. One test per 3,500 square feet or fraction thereof for subgrade and in each lift of fill under pavement, but not less than two (2) tests on subgrade and two (2) tests on each lift of fill.

3. Where ASTM D6938 is used to test field compaction densities, verify the results of the tests by performing at least one test per day using ASTM D1556 at a location already tested by ASTM D6938 and at least one additional test using ASTM D1556 for every 10 tests performed with a nuclear device, also at locations already checked by ASTM D6938.

C. Where compaction and minimum relative compaction are indicated, test backfill and fill material for moisture-density relations in accordance with ASTM D 1557. Perform at least one moisture-density relations test for each material used and provide additional tests for each change of source. Furnish a plan showing test location, test number, elevation, and test results to the Engineer within 3 days of the test date. If field density tests indicate inadequate compaction, the Contractor shall re-compact and retest until adequate compaction is achieved. Verify that test results conform to the specified requirements, and that sufficient tests are performed.

D. Any work determined to be not in compliance shall be removed and properly replaced at no additional cost to the State.

3.9 CLEAN UP

A. Clean up and remove all debris accumulated from construction operations from time to time and when 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.

END OF SECTION

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SECTION 02243

GEOTEXTILE

PART 1 - GENERAL

1.1 GENERAL REQUIREMENTS

A. This specification covers the furnishing and installing of geotextile fabric.

1.2 SUBMITTALS

A. Submit in accordance with Section 01300 – SUBMITTALS.

B. Product Data: The Contractor shall furnish to the Engineer manufacturer's printed product data, clearly marked, indicating proposed materials.

1.3 WARRANTY

A. The Bidder shall provide the State of Hawaii with a one (1) year warranty against manufacturing defects, in accordance with this specification.

1.4 TEST REQUIREMENTS

A. The geotextile fabrics shall comply with all applicable American Society of Testing Materials (ASTM).

1.5 SUBSTITUTIONS

A. Substitution requests shall be made in accordance with Section 6.3 of the General Conditions.

PART 2 - PRODUCTS

2.1 MATERIALS

A. The geotextile fabric shall be inert to biological degradation.

B. Acceptable geotextile fabrics are:

1. For retaining wall drainage and utility lines: Non-woven polypropylene geotextile fabric (Mirafi 180N, or approved substitute).

2. For parking lot areas, driveways, and concrete walkways: Woven geotextile fabric (Mirafi HP570, or approved substitute).

C. Any request to substitute an equivalent filter fabric shall be subject to review and approval by the Engineer.

D. Geotextile fabrics shall meet or exceed the following property criteria:

Fabric Property	Unit	Test Method	Woven Fabric	Non-Woven Fabric
Grab Tensile Strength	lb	ASTM D4632	475	180
Grab Tensile Elongation, MD / CD	%	ASTM D4632	11/4	50/50
Trapezoid Tear Strength	lb	ASTM D4533	180	75
CBR Puncture Strength	lb	ASTM D6241	2000	450
Apparent Opening Size (U.S. Standard Sieve)		ASTM D4751	30	70
Permittivity	sec-1	ASTM D4491	0.4	0.8
Flow Rate	gal/min/ft2	ASTM D4491	30	105
UV Resistance (@ 500 hours)	% Strength retained	ASTM D4355	80	70

PART 3 - EXECUTION

3.1 DELIVERY

A. The geotextile fabric shall be delivered in a protective wrapping which shall protect the fabric from ultraviolet radiation and from abrasion during shipping and handling.

B. Any damaged geotextile fabric that does not meet the required physical property requirements in this specification shall be immediately replaced by the Contractor.

3.2 INSTALLATION

A. The geotextile fabric shall be installed in accordance with the manufacturer's specifications or as indicated on the Plans.

END OF SECTION

SECTION 02320

TRENCHING, BACKFILLING, AND COMPACTING

PART 1 - GENERAL

1.1 GENERAL REQUIREMENTS

A. Furnish all labor, materials and equipment necessary for the trenching, backfilling, and compaction for installation of utilities as shown on the Plans and specified herein.

B. Related Work:

1. Section 02200 – EARTHWORK

2. Section 02370 – SEDIMENT AND EROSION CONTROL

3. Section 02243 - GEOTEXTILE

1.2 REFERENCES

A. A geotechnical report entitled, "Geotechnical Engineering Exploration Site Improvements at Kaumahina State Wayside Park, Honomanu, Maui, Hawaii, December 23, 2025", was prepared by Kōkua Geotech, LLC. for the design of this project.

The subsurface information and data furnished are for the Contractor's convenience only. They represent the subsurface conditions at the specific boring locations and at the time of exploration only. There is no guarantee, either expressed or implied, that the subsurface conditions indicated are representative of those existing throughout the work. No assurance is given that these conditions are representative of the conditions at other locations of the project site or at other times. The Contractor is solely responsible for any and all assumptions, deductions, or conclusions which he may make or derive from his examination of the subsurface information and data provided herein. The State and its Consultants assume no responsibility for the Contractor's interpretation of such data.

B. The "Standard Specifications for Public Works Construction", September 1986, of the Department of Public Works, including all revisions, as applicable to the County of Maui, hereafter referred to as the "DPW STANDARD SPECIFICATIONS", or as herein specified. (Paragraphs concerning Measurement and Payment are not applicable to this project.)

1.3 QUALITY ASSURANCE

A. Design of all excavation support systems shall be performed by a structural engineer licensed in the State of Hawaii and paid for by the Contractor. The Contractor's Licensed Geotechnical Engineer shall verify the actual subsurface conditions are consistent with the subsurface conditions used in their excavation support design and shall make modifications to the excavation support and dewatering systems where necessary.

B. 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.

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

1.4 SUBMITTALS

A. Submit in accordance with Section 01300 – SUBMITTALS.

1. Test Reports: Submit test reports as directed by the Engineer. Contractor shall verify all requirements prior to the start of trenching operations.

2. 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 structural engineer registered in Hawaii and retained and paid for by the Contractor. Indicate sequence and method of installation and removal.

3. Test for Moisture – Density Relations: Submit test results for each material at least 7 days prior to compacting of each material.

4. Certification of Compaction: An independent geotechnical testing laboratory working under the supervision of a licensed civil engineer licensed in Hawaii shall test and certify all compaction work and be paid for by the Contractor. Certifications and test results shall be submitted to the Engineer within three (3) days of the test.

5. Field Dry Density and Moisture Content Tests: Submit field test data not listed above sufficiently in advance of construction so as not to delay work. Furnish a drawing showing test locations, test numbers, test elevations, and test results. Submit test results within three (3) days of test date.

6. Manufacturer's product literature: Submit manufacturer's product literature including description of material and physical properties and laboratory test data for bedding material, select granular fill, select structural fill, and woven and non-woven fabric, etc. to the Engineer for approval at least 15 calendar days prior to construction.

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

1.5 CONTRACTOR'S RESPONSIBIITIES

A. Excavation and trench stability are the responsibility of the Contractor. The Contractor's excavation support shall protect against excavation instability, settlement and/or movement in existing buildings, structures, utilities and pavements.

B. The Contractor shall retain and pay for the services of a Licensed Geotechnical Engineer to monitor and perform testing during the trenching and backfilling operations. The Geotechnical Engineer shall meet the qualifications listed in Section 02200 – EARTHWORK.

C. It is the Contractor's responsibility to perform all quality control testing at no additional cost to the State.

D. The Contractor's Geotechnical Engineer shall promptly notify both the Contractor and the Engineer verbally of any failing compaction tests and the results of such tests to the extent the tests show a lack of compliance with the Specifications. These items shall also be documented by the Contractor's Licensed Geotechnical Engineer.

E. If field density tests indicate inadequate compaction or moisture content, the Contractor shall moisture condition and re-compact and retest until adequate compaction and adequate moisture content is achieved.

Relative compaction in these Specifications is defined as the dry density of the compacted material expressed as a percentage of the maximum dry density of the same material based on ASTM D1557 test method. Optimum moisture is the water content (percentage by dry weight) corresponding to the maximum dry density.

F. During construction, drainage shall be provided to minimize ponding of water adjacent to or on foundations, roadways, and parking areas. Ponded areas shall be drained immediately. Any subgrade soil that has become soft due to ponding shall be removed to firm material and replaced with compacted structural fill.

PART 2 – PRODUCTS

2.1 MATERIALS

A. Backfill, base course, subbase, and granular fill shall meet the criteria of Section 02200 – EARTHWORK.

2.2 PIPE BEDDING

A. Bedding material for utility lines shall be granular bedding consisting of open-graded gravel, such as No.3 fine gravel, meeting the gradation requirements of ASTM C33, No. 67 size.

2.3 INTERMEDIATE BACKFILL

A. Intermediate trench backfill above the bedding material may consist of structural fill or excavated on-site granular soils, free of organics, debris, pavements, expansive soils, and particles larger than 6 inches in maximum dimension.

2.4 FILTER FABRIC

A. Geotextile fabric shall conform to Section 02243 – GEOTEXTILE.

PART 3 - EXECUTION

3.1 DEWATERING PLAN

A. Prior to any trenching or excavation work, the Contractor shall prepare and submit a proposed dewatering plan to the Engineer for review and approval. The Contractor shall not proceed with trenching or excavation until the dewatering plan has been approved. Preparation and obtaining approval of the dewatering plan shall be done at no cost to the State.

3.2 SITE PREPARATION

A. Prior to trenching for new utility lines or other structures within existing paved areas, the areas along the proposed locations should be prepared by saw-cutting and removing the existing pavements. All old pavements shall be demolished and removed off-site by the Contractor at his own expense in compliance with all regulatory agency requirements.

B. The locations of existing utilities shown on the Plans are approximate. The Contractor shall physically verify the location and elevation of the existing utilities indicated prior to starting construction. The Contractor shall scan the project site with electromagnetic and sonic equipment and mark the surface of the ground where existing underground utilities are discovered.

C. Any existing underground utilities and structures that may interfere with new installations shall be immediately brought to the attention of the Engineer. At the discretion of the Engineer, the Contractor shall remove and/or relocate existing utilities, if still in use. The remaining portions of any lines to be abandoned and left in-place shall be properly cut and plugged.

3.3 EXCAVATION

A. Excavation and dewatering shall be conducted in accordance with Section 02200 – EARTHWORK.

B. The trench width shall be kept to a minimum to reduce the potential for ground settlements.

3.4 PIPE SUBGRADE TREATMENT

A. Prior to the placement of bedding for new utilities, the bottom of the utility trenches above the water table shall be compacted to a minimum of 90 percent relative compaction.

B. Where soft and/or loose soils are encountered at or near the invert of the pipes, a stabilization layer consisting of an additional 18 inches of open-graded gravel wrapped in a non-woven filter fabric shall be provided below the bedding layer for uniform support.

C. All trenches shall be backfilled as soon as practical after the utility lines have been properly installed and tested to reduce exposure of the trench to weather elements.

3.5 BACKFILL, PLACEMENT AND COMPACTION

A. Place bedding material from at least 6-inches below the pipe invert to at least 12-inches above the crown of the pipe.

B. Pipe bedding material shall be placed and tamped, supplemented by hand shoveling, to provide full contact with the entire periphery of the pipes. The bedding material shall be placed in not more than 8-inch thick loose lifts and mechanically densified to a relatively firm and unyielding surface.

C. Care shall be taken to protect the pipes from damage during the backfilling operations.

D. Jetting of the bedding and trenching backfill shall not be allowed.

E. The trench backfill above the bedding material shall be placed in not more than 8-inch thick loose lifts, moisture conditioned to above the optimum moisture, and compacted to a relative compaction of at least 90 percent.

F. The top at least 24 inches of the trench backfill below roadway, gravel road, slabs, and parking lot areas shall consist of base course and structural fill. Trench backfill placed within 24 inches beneath the subgrade of the roadway and parking lot areas shall be compacted to a relative compaction of at least 95 percent for structural fill, base course, and subbase.

3.6 FIELD QUALITY CONTROL

A. Trenches shall not be backfilled until approved by the Engineer.

B. Where compaction and minimum relative compaction are indicated, test trench backfill for moisture-density relations in accordance with ASTM D 1557. Perform at least one moisture-density relations test for each material used and provide additional tests for each change of source. Perform one field density and moisture content test in accordance with ASTM D 1556 or ASTM D 6938 per 150 feet or fraction thereof of trench backfill in each lift but not less than one test per lift. Furnish a plan showing test location, test number, elevation, and test results to the Engineer within 3 days of the test date. If field density tests indicate inadequate compaction, the Contractor shall re-compact and retest until

adequate compaction is achieved. Verify that test results conform to the specified requirements, and that sufficient tests are performed.

C. Any work determined to be not in compliance shall be removed and properly replaced at no additional cost to the State.

3.7 PROTECTION OF PERSONS AND PROPERTY

A. Barricade open trenches, holes, and depressions occurring as part of the Work, and post warning lights at areas adjacent to or with public access.

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

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

D. Storage of excavated material alongside the trench shall be done in such a manner as not to obstruct vehicular or pedestrian traffic. Whenever, in the opinion of the Engineer, proper storage of excavated material cannot be made, the material shall be hauled away from the work site.

END OF SECTION

SECTION 02370

SEDIMENT AND EROSION CONTROL

PART 1 - GENERAL

1.1 GENERAL REQUIREMENTS

A. The work to be performed under this section shall include furnishing all labor, materials and equipment necessary for the installation and maintenance of the construction sediment and erosion control measures.

B. All erosion and sediment control measures are to be placed prior to any ground disturbance caused by construction activities. The Contractor shall ensure that erosion and sediment control measures are implemented and maintained as necessary.

C. Additional or revised erosion and sediment control features, not shown on the Erosion and Sediment Control Plan (ESCP) may be required depending on the Contractor's methods of operation and schedule.

D. Related Work

1. Section 02200 – EARTHWORK

2. Section 02320 – TRENCHING, BACKFILLING AND COMPACTING

1.2 SUBMITTALS

A. Submit in accordance with Section 01300 – SUBMITTALS.

B. Product Data: The Contractor shall furnish to the Engineer manufacturer's printed product data, clearly marked, indicating proposed materials.

PART 2 – PRODUCTS

2.1 MATERIALS

A. All materials for temporary erosion and sediment control measures shall comply with the State Department of Health.

B. Filter Sock

1. The filter sock shall be BioSock Manufactured by BioSocks Hawaii, Inc. or an approved substitute.

2. Filter sock shall be manufactured with a composite – layered tubular knit outer sock with a polypropylene multi-filament fiber material and shall also have the following properties:

Parameter	**Value**
Recycled Content	99% Post-Consumer Recycled Materials
Filament Count	60-120
Melting Point	330
UV Protection	Photodegradable/UV Stabilized
UV Resistance (ASTM D4355)	150 Hours 100% 300 Hours 96.5% min. 500 Hours 89.5% min.
Approx. Life Expectancy	18 to 24 months
Static Puncture (ASTM D6241)	2400 N

C. Drain Inlet Filter

1. The drain inlet filter shall be Dandy Sack manufactured by Dandy Products, Inc. or an approved substitute.

2. The drain inlet filter shall be a sewn geotextile fabric unit fitted to the individual grates and completely enclosing the grates. It shall have lifting devices to allow manual inspection of the storm drain system. The fabric of the protection device shall have the following characteristics:

Fabric Property	**Test Method**	**Units**	**Value**
Grab Tensile Strength	ASTM D4632	lb	450 x 300
Grab Tensile Elongation	ASTM D4632	%	40 x 25
Puncture Strength	ASTM D4833	lb	130
Mullen Burst Strength	ASTM D3786	psi	600
Trapezoid Tear Strength	ASTM D4533	lb	165 x 150
Apparent Opening Size (AOS)	ASTM D4751	US Sieve	30
Permittivity	ASTM D4491	sec^{-1}	3.5
Permeability	ASTM D4491	cm/sec	0.25
Flow Rate	ASTM D4491	$gal/min/ft^2$	250
UV Resistance (at 500 hours)	ASTM D4355	% strength retained	70

PART 3 - EXECUTION

3.1 CONSTRUCTION

A. Prior to starting any construction, the Contractor shall install the temporary BMPs as indicated on the Plans and per manufacturer's specifications to prevent silt and debris from leaving the project site. The most stringent requirements shall apply.

B. Catch Basin and Drain Inlet Protection

1. Protection devices shall be installed per manufacturer's instructions at all storm drain inlets as indicated on the plans.

2. Inlet protection devices shall be removed during periods of above normal rainfall and replaced after the event has passed.

C. Filter Socks

1. Filter socks shall be installed per manufacturer's instructions or the following, wherever is more stringent.

2. Overlap: Where multiple sections of filter socks are required to form a continuous run, the sections shall have a minimum overlap of 6 inches.

3. Anchoring: The contractor shall anchor the filter sock as required using sandbags placed every 6 feet.

3.2 MAINTENANCE

A. Sediment control measures shall remain in place until the upstream area is permanently stabilized.

B. Maintain a record of all inspections and repairs made. Update records continuously for the duration of the project and submit to the Engineer as requested.

3.3 CONFORMANCE

A. Failure to conform to the above requirements and regulations will be cause for temporary or permanent suspension of operations. If operations are suspended due to the Contractor's failure to conform, the Contractor shall maintain the project during the period of suspension at no cost to the State.

B. Any fines, penalties, or violations assessed to the project by the City or State as a result of the Contractor's actions, negligence, or inactivity shall be paid for by the Contractor at no additional cost to the State.

END OF SECTION

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SECTION 02500

CONCRETE WALKWAYS

PART 1 – GENERAL

1.1 GENERAL REQUIREMENTS

A. Furnish all labor, materials and equipment necessary for the installation of concrete walkways as indicated on the drawings and as specified within.

B. Related Work

1. Section 02200 – EARTHWORK

2. Section 03300 – CAST-IN-PLACE CONCRETE

1.2 REFERENCES

A. The "Standard Specifications for Public Works Construction", September 1986, of the Department of Public Works, as applicable to the County of Maui, hereafter referred to as the DPW STANDARD SPECIFICATIONS, or as herein specified. (Paragraphs concerning Measurement and Payment are not applicable to this project.)

1.3 SUBMITTALS

A. Submit in accordance with Section 01300 – SUBMITTALS.

B. The Contractor shall furnish to the Engineer affidavits from the manufacturer or supplier certifying that types of materials being supplied meet the requirements of these specifications.

C. Certificates

1. The Contractor shall furnish to the Engineer affidavits from the manufacturer or supplier certifying that types of materials being supplied meet the requirements of these specifications.

2. The Contractor shall furnish to the Engineer affidavits from the concrete supplier certifying that the approved synthetic fiber reinforcement materials at the rate of 7.5 lbs. per cubic yard were added to each batch of concrete to be used for concrete walkways delivered to the project site.

3. Average Residual Test (ASTM 1399) shall be performed by test lab that has proper equipment to adequately perform (ARS) test. Fiber manufacturer shall provide test results with letter of certification from test lab pertaining to the following:

a. Fiber configuration

b. Chemistry

c. Contents-dosage rate

d. Length

D. Design Mixtures: For each concrete mix. Submit alternate design mixtures when characteristics of materials, project conditions, weather, test results, or other circumstances warrant adjustments. Indicate amounts of mix water to be withheld for later addition at project site.

E. Product Data: The Contractor shall furnish to the Engineer manufacturers printed product data, clearly marked, indicating proposed synthetic fiber reinforcement materials.

F. Field quality-control test and inspection reports.

G. Transit Mix Delivery Slips:

1. Keep records showing time and place of each pour of concrete, together with transit mix delivery slips certifying contents of the pour. The contractor shall ensure that all stamps and log data are accurate, clear and legible, including the time stamp upon leaving the yard, the time of arrival at the job site, the time at the start of the unloading, the time unloading is finished, and the time of departure from the job site.

2. Deliver the records and delivery slips to the County upon completion of the concrete placement work.

H. Manufacturer's printed batching and mixing instructions

1.4 QUALITY ASSURANCE

A. Density testing shall be the responsibility of the Contractor at no additional expense to the State. Perform testing at an independent laboratory licensed in the State of Hawaii.

B. Contractor shall arrange and pay for concrete tests to be made by an independent testing laboratory acceptable to the Engineer. Submit five (5) copies of test reports to the Engineer. Testing shall comply with ASTM C94.

1. Strength Tests: Strength tests shall be made from each 100 cubic yards of concrete or fraction thereof each day. For each test, three (3) cylinders shall be molded, one to be used for a 7-day test.

2. Air Content and Slump Tests: At the time samples are taken for strength tests, the laboratory shall make slump and air content tests.

PART 2 – PRODUCTS

2.1 MATERIALS

A. Concrete Walkways: Concrete shall have a minimum 28-day compressive strength of 3,000 psi and conform to Section 03300 – CAST-IN-PLACE-CONCRETE.

B. Materials for concrete walkways shall also include synthetic fiber reinforcement.

C. Synthetic Fiber Reinforcement

1. Fibrillated polypropylene fibers engineered and designed for use in concrete, complying with ASTM C1116 Type III shall be a minimum of two (2) times the length of the largest aggregate. The manufacturer or Contractor shall prepare a plan indicating proposed joint spacing and detail if not indicated on Drawings or if required to be modified by the type and dosage of fiber reinforcement. Average Residual Strength as tested per ASTM C1399 shall be not less than 200 psi. The manufacturer shall submit a letter attesting to the correct dosage and type based on the aforementioned parameters. Maximum Water-Cementitious Material Ratio of concrete used shall be not greater than 0.50.

2. Physical Characteristics

a. Fiber lengths: 2 ¼ inches.

b. Tensile strength: 86-110 ksi.

PART 3 – EXECUTION

3.1 MIXING SYNTHETIC FIBER WITH CONCRETE

A. Add synthetic fiber reinforcement to concrete materials at the time concrete is batched in amounts in accord with approved submittals for each type of concrete required.

B. Mix batched concrete in strict accord with synthetic fiber reinforcement manufacturer's instruction, and recommendations for uniform and complete dispersion.

3.2 INSTALLATION

A. Construct concrete walkways in accordance with Section 42 – CONCRETE SIDEWALK of the DPW STANDARD SPECIFICATIONS, unless otherwise indicated by the Plans or Specifications.

B. The Contractor shall stake out area of new walkways using wooden stakes on which final finish elevations, base course and subgrade elevations are clearly marked. All such stakes and elevations shall be approved by the Engineer before any work is done.

C. Excavate to required depth and remove any soft, yielding material and replace with select fill in accordance with Section 02200 - EARTHWORK.

D. Compact subgrade and place base course material in accordance with Section 02200 – EARTHWORK. Maintain subgrade in a compacted condition until base course material is placed.

E. Moisten base course and forms immediately before placing concrete.

F. After placement of concrete, install construction joints and contraction joints as indicated in the Plans.

G. Synthetic fiber reinforcement shall not be visible at finished concrete surfaces.

H. The finished concrete walkway shall be cured as specified under Section 03300 – CAST-IN-PLACE CONCRETE. The Contractor shall be responsible for proper curing of concrete especially during hot and/or windy weather conditions.

I. Concrete Walkway Repair: Concrete walkways that have been damaged by construction activities shall be repaired to the original condition and to the satisfaction of the Engineer.

3.3 FINAL QUALITY CONTROL

A. The contractor shall test samples of concrete containing synthetic fiber reinforcement in accordance with Section 03300 – CAST-IN-PLACE CONCRETE. A minimum of one test shall be taken for each day's pour of each concrete

3.4 FINAL INSPECTION

A. At the time of final inspection of the work performed under the Contract, the work covered by this Section shall be complete in every respect. Any defects discovered in the work, subsequent to this inspection, shall be corrected prior to final acceptance.

END OF SECTION

SECTION 02510

WATER SYSTEM

PART 1 - GENERAL

1.1 GENERAL REQUIREMENTS

A. Furnish all labor, materials and equipment necessary to install water system as indicated on the Plans and specified herein.

B. Work included: Installation, disinfection, and testing of potable waterlines and appurtenances.

C. Related Work

1. Section 02320 – TRENCHING, BACKFILLING, AND COMPACTING

1.2 REFERENCES

A. The "Water System Standards," dated 2002, of the Department of Water Supply (DWS), County of Maui, including all revisions and addendums (hereafter referred to as the "DWS WATER SYSTEM STANDARDS") unless otherwise indicated in the Plans or Specifications.

1. Paragraphs concerning Measurement and Payment are not applicable to this project.

2. Where an installation detail is not indicated on the drawings, the standard detail in the DWS WATER SYSTEM STANDARDS shall be followed.

B. The "Uniform Plumbing Code", 1997 edition, of the International Association of Plumbing and Mechanical Officials.

1.3 SUBMITTALS

A. Submit in accordance with Section 01300 – SUBMITTALS.

B. Shop Drawings: The Contractor shall submit six (6) copies of shop drawings and brochures or catalog cuts for review and reply prior to start of work. Drawings shall show complete dimensioned installation, including all piping, fittings, and valves. Contractor shall check project drawings to avoid interferences with structural features and with work of other trades. No plumbing or piping work shall commence until plans have been reviewed by the Engineer. Any deviations from the shop drawings shall require prior approval by the Engineer.

C. Certificates: The Contractor shall furnish to the Engineer affidavits from the manufacturers of pipe, fittings, valves, etc., furnished and installed under this section

certifying that such materials delivered to the project conform to the requirements of this section. Certificate of disinfection shall also be submitted to the Engineer.

D. Warranty: The Contractor shall furnish to the Contracting Officer warranties from the manufacturers of pipe, fittings, valves, etc., furnished and installed under this section.

E. Test Results: The Contractor shall submit test reports for all tests conducted.

F. As-Built Drawings: Contractor shall furnish as-built drawings of the water system upon completion of construction.

1.4 PERMITS

A. The Contractor shall be responsible for all permits required to install, test, and disinfect the water system including all applications, charges, fees, and taxes. The Contractor shall apply for and obtain necessary permits at no additional cost to the State and no additional contract time. The Contractor shall comply with the terms, conditions, and requirements set forth in the approved permits and be held liable for any associated violations and penalties at no additional cost to the State and no additional contract time.

PART 2 – PRODUCTS

2.1 MATERIALS

A. Unless otherwise indicated, materials for potable waterlines and appurtenances shall be in accordance with the below listed sections of the DWS WATER SYSTEM STANDARDS.

1. General

a. All materials shall be new and free from defects and shall be of the make and type specified or approved equal.

b. Pipe and fittings shall conform to NSF International Standard 61 or the health effects portion of NSF Standard 14.

2. Pipes smaller than 4-inches

a. Copper Tubing, Type “K”, ASTM B88 – Section 208.01

3. Piping appurtenances such as, but not limited to, reaction blocks, fasteners, etc. shall be in accordance with the DWS WATER SYSTEM STANDARDS.

4. Valves and Appurtenances

a. Valves less than 3 inches in size – Section 205

5. Filler, Crushed Rock, Pipe Cushion, Backfill Material and Bricks – Section 209

6. Hose Bibbs

a. Interior: Chicago No.952 chrome plated sill faucet with integral vacuum breaker, 3/4" hose thread outlet, lock shield cap, No. 293-6 loose key tee handle and 1/2" I.P.S. female inlet. Chicago No. 1771 built-in chrome plated straightway loose key shutoff valve with 1/2" I.P.S. female inlet and outlet and wall flange.

b. Exterior: Chicago No. 998 rough chrome plated exterior sill faucet with integral vacuum breaker, 3/4" hose thread outlet, No. 293-6 removable tee handle, lock shieled cap, 3/4" I.P.S. female inlet, Hays 4000 or Lunkenheimer 454-3/4" bronze square head service cock.

7. Corporation Stop: Brass, conforming to AWWA C800.

B. Warning Tape

1. Warning tape shall be made of polyethylene plastic, acid- and alkali-resistant, manufactured specifically for warning and identification of buried utility lines.

2. Construction: Two layers of impervious plastic film not less than 3 inches wide. Total thickness of tape shall not be less than 4 mils plus minus 10 percent manufacturing tolerances, with a strength of 1,500 psi lengthwise and 1,250 psi crosswise, and maximum elongation of 350 percent.

3. Imprint: 3/4-inch or larger bold black letters.

4. Legend" Identify buried utility line tape with imprint such as "Caution: Sewer Line Below". Repeat identification at approximately 24-inch intervals over the entire length of the tape.

Color	Utility
Orange	Electric
Blue	Water System
Green	Sanitary Sewer

PART 3 - EXECUTION

3.1 GENERAL

Installation, disinfection, and testing of waterlines and appurtenances shall be in accordance with the applicable sections of the DWS WATER SYSTEM STANDARDS unless otherwise indicated in the Plans and/or Specifications herewith.

3.2 HAULING, UNLOADING AND DISTRIBUTION OF MATERIALS

A. During loading, transportation and unloading, every precaution shall be taken to prevent damage to the materials. Any pipe damaged shall be replaced at no additional cost to the State.

B. Store fittings indoors in their original containers. Pipes shall be stored out of direct sunlight.

C. Store solvent cement indoors or, if outdoors, shade from direct sunlight exposure. Do not use solvent cements which have exceeded the shelf life marked on the storage container.

D. The Contractor shall visually inspect all pipes, bells, gaskets, spigots, and appurtenances prior to their installation to ensure that they are clean and free of dirt, foreign objects, or defects. The Contractor shall assume full responsibility for the soundness of the pipes and appurtenances installed.

3.3 INSTALLATION

A. The Contractor shall be responsible for precisely laying out the water lines and appurtenances as shown on the plans.

B. Water service to existing structures shall be provided as indicated on the plans. The Contractor shall verify the location of the existing water lateral and make the connection as required to re-establish water service. Cut and plug the existing water lateral to be abandoned with minimum 3,000 psi concrete.

C. The Contractor shall exercise due care and caution necessary to avoid any damage to existing utilities. Any damage caused by the Contractor's operations shall be repaired immediately as directed by the Engineer and at no expense to the State.

D. No pipe shall be buried or otherwise hidden until it has been inspected, tested and approved by the Engineer.

E. Any pipe or appurtenance that has been installed and proven defective shall be removed and replaced by the Contractor at no additional cost to the State.

F. Excavation, backfilling and compacting shall comply with Section 02320 – TRENCHING, BACKFILLING, AND COMPACTING.

G. Based on site soil conditions, the Contractor shall size and install concrete reaction blocks in accordance with the DWS WATER SYSTEM STANDARDS.

3.4 CONNECTING, TESTING, FLUSHING AND DISINFECTING

A. The new lines shall be installed, but not connected until pressure testing and disinfecting is completed. Connecting shall be done at the discretion of the Engineer.

B. Pressure testing of water lines and service laterals shall be performed in accordance with the DWS WATER SYSTEM STANDARDS.

C. Flushing of valves and mains, disinfection of the system shall be carried out in accordance with the DWS WATER SYSTEM STANDARDS. The Contractor shall submit the results of such test to the Engineer for approval.

D. The Contractor shall furnish all equipment for tests and any required retests and pay for all cost of repairing any damage resulting from such tests. Contractor shall adjust systems until they are approved. Tests shall be performed in the presence of, and to the satisfaction of, the Engineer and inspector of the official agency involved.

1. Any re-testing required as directed by the Engineer shall be performed by the Contractor at no additional cost to the State.

2. All charges for services by the Department of Water Supply during this period shall be paid for by the Contractor.

3.5 INSPECTION

A. At the time of final inspection of the work performed under the contract, the water system shall be complete in every respect and operating as designed. All surplus materials resulting from the work of this section shall have been removed.

B. All defects discovered in the water system prior to or subsequent to this inspection shall be corrected prior to final acceptance at no additional cost to the State.

3.6 CLEAN UP

Debris shall not be allowed as a result of this work. Upon completion of this work, remove all debris and excess materials, tools, etc., and leave the project site cleaned in an acceptable manner as approved by the Engineer.

END OF SECTION

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SECTION 02570

ASPHALTIC CONCRETE PAVEMENT

PART 1 - GENERAL

1.1 GENERAL REQUIREMENTS

A. Asphaltic concrete shall consist of a mixture of aggregate and bituminous material, mixed at a central plant in the proportions hereinafter specified and spread and compacted on a prepared subgrade surface.

B. Related Work:

1. Section 02200 – EARTHWORK

2. Section 02577 – PAVEMENT MARKINGS

1.2 REFERENCES

A. The "Standard Specifications for Public Works Construction", September 1986, of the Department of Public Works, including all revisions, as applicable to the County of Maui, hereafter referred to as DPW STANDARD SPECIFICATIONS, or herein specified. (Paragraphs concerning Measurement and Payment are not applicable to this project)

1.3 SUBMITTALS

A. Submit in accordance with Section 01300 – SUBMITTALS.

B. Submit the job-mix formula, affidavits from the manufacturers or suppliers of all materials proposed to be furnished and installed under this section, certify that such material delivered to the project conforms to the requirements of these specifications and provide the Material Product Data and Material Safety Data for the materials proposed for use for the Engineer's approval.

C. Test Reports: Submit test reports as directed by the Engineer. Contractor shall verify all requirements prior to the start of earthwork operations.

D. Certification of Compaction: An independent geotechnical testing laboratory working under the supervision of a licensed civil engineer licensed in Hawaii shall test and certify all compaction work. Certifications and test results shall be submitted to the Engineer within three (3) days of the test.

PART 2 – PRODUCTS

2.1 MATERIALS

A. Aggregate base course and select borrow for subbase course shall meet the respective material requirements as specified in Sections 31 and 30 the DPW STANDARD SPECIFICATIONS.

B. Hot Mix Asphalt Pavement shall use County Mix IV and be in accordance to DPW STANDARD SPECIFICATIONS Section 34.

C. Tack Coat shall conform to AASHTO M 140, Type SS-1, SS-1h, CSS-1, or CSS-1h, emulsified asphalt.

PART 3 - EXECUTION

3.1 INSTALLATION

A. The Contractor shall stake out the areas to be paved, using grade stakes on which the final finish elevations, base course and subgrade elevations are clearly marked. All such stakes and elevations shall be approved by the Engineer before any work is done.

B. Excavation and embankments shall be done in accordance with Section 02200 – EARTHWORK.

C. The exposed subgrade shall be scarified to a minimum depth of 8 inches, moisture conditioned to above the optimum moisture content and compacted to a minimum of 95 percent compaction as determined by ASTM D 1557.

D. The relatively moist condition of the prepared subgrade shall be maintained prior to placement of base course. The subgrade soils shall not be allowed to dry significantly prior to placement of the pavement structural section.

E. Soft and yielding areas encountered during subgrade preparation should be over-excavated to expose firm material, and the resulting excavation should be backfilled with structural fill material and compacted to a minimum 95 percent relative compaction. The excavated soils should be properly disposed of off-site and/or used in landscape areas, as appropriate and approved of by the Engineer.

F. The base course shall be compacted to a minimum 95 percent compaction as determined by ASTM D 1557.

G. Place asphalt pavement in accordance with Section 34 of the “DPW STANDARD SPECIFICATIONS”.

H. Where new asphalt pavement abuts existing asphalt pavement, provide smooth riding connection as indicated on the Plans.

3.2 TESTING

A. Compaction testing of subgrade and base course sections shall be performed by an independent testing agency retained by the Contractor and all test results submitted to the Engineer for approval.

B. All costs for testing shall be borne by the Contractor. Testing shall be made throughout the area for each compacted layer. All test results shall be approved before the Contractor can proceed with placing of base course or hot mix asphalt. Testing shall be in accordance with ASTM D1557.

C. Compaction tests shall be performed separately for each of the subgrade and base course layer. One (1) compaction test shall be taken per lift per 3,500 square feet or fraction thereof at each driveway location. The locations of testing shall be determined by the Engineer.

D. Obtaining and testing of pavement samples shall be done in accordance with Section 34 of the DPW STANDARD SPECIFICATIONS.

3.3 PAVEMENT MARKINGS

A. Striping and pavement markings shall be installed per Section 02577 – PAVEMENT MARKINGS.

3.4 FINAL INSPECTION

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

B. Any existing asphaltic concrete pavements or surrounding surfaces that have been damaged by construction activities shall be repaired to the original condition and to the satisfaction of the Engineer at no cost to the State.

END OF SECTION

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SECTION 02577

PAVEMENT MARKINGS

PART 1 - GENERAL

1.1 GENERAL REQUIREMENTS

Furnish all labor, materials and equipment necessary to provide thermoplastic pavement markings on new asphalt pavement and concrete pavement as indicated on the drawings and as specified herein.

A. Related Work

1. Section 02570 – ASPHALTIC CONCRETE PAVEMENT

2. Section 03300 – CAST-IN-PLACE CONCRETE

1.2 REFERENCES

A. The "Hawaii Standard Specifications for Road and Bridge Construction", dated 2005, as revised, of the State of Hawaii Department of Transportation, hereafter referred to as the "STATE DOT STANDARD SPECIFICATIONS", or as herein specified. (Paragraphs concerning Measurement and Payment are not applicable to this project.)

1.3 SUBMITTALS

A. Submit in accordance with Section 01300 – SUBMITTALS.

B. Product Data: Material Safety Data Sheets.

C. Product Certificates: Certificates from manufacturers or suppliers to verify that types of materials being supplied meet the requirements of these specifications.

1.4 DELIVERY AND STORAGE

A. Deliver thermoplastic compound pavement markings, paints and paint material in original sealed containers that plainly show the designated name, specification number, batch number, color, date of manufacture, manufacturer's directions, and name of manufacturer. Pro-vide storage facilities at the job site for maintaining materials at temperature recommended by the manufacturer.

PART 2 – PRODUCTS

2.1 MATERIALS

A. The State DOT Standard Specifications shall govern all work in this section except for subsections on Measurement and Payment which shall not be applicable.

B. Retroreflective thermoplastic compound pavement markings shall conform to DOT Standard Specifications Section 755.05.

C. Paint shall be in sealed containers that plainly show the designated name, formula or specification number, batch number, color, date of manufacture, manufacturer's formulation number and directions, and name of the manufacturer, all of which shall be plainly legible at the time of use.

D. The paint shall be homogeneous, easily stirred to a smooth consistency, and shall show no hard settlement or other objectionable characteristics.

E. Paint shall conform to the State DOT Standard Specifications Section 708 – Paints and Section 755 – Pavement Marking Materials.

F. Pavement Markings shall include, but not limited to, striping, letters, numbers and raised pavement markers.

2.2 EQUIPMENT

A. All equipment, tools and machinery used in the performance of the work covered by this section of the specifications shall be suitable for pavement markings installation and removal, and shall be maintained in satisfactory operating condition at all times.

1. Paint Applicator

a. The equipment for applying paint to pavements shall be a self-propelled or mobile-drawn pneumatic spraying machine with suitable arrangements of atomizing nozzles and controls to obtain the specified results. The machine shall be capable of applying the stripe widths indicated on the drawings, shall have a speed during application of not less than five miles per hour, and shall be capable of applying the paint at the coverage rate specified hereinafter and at an even uniform thickness with clear-cut edges.

b. The paint applicators shall have a paint reservoir of sufficient capacity and suitable gages to apply paint as specified herein. The reservoirs shall be equipped with suitable air-driven mechanical agitators. The spray mechanism shall be equipped with quick-action valves conveniently located, and shall include necessary pressure regulators and gages in full view and reach of the operator.

c. Paint strainers shall be installed in the paint supply lines to ensure freedom from residue and foreign matter that may cause malfunction of the spray

guns. The paint applicator shall be readily adaptable for attachment of an air-actuated dispenser for the reflective media.

2. Pneumatic spray guns shall be provided for hand application of paint in areas where the mobile paint applicator cannot be used.

PART 3 - EXECUTION

3.1 SURFACE PREPARATION

A. Bituminous Pavements: New asphalt concrete pavement shall be allowed to cure for a period of not less than seven days before the application of marking materials unless directed otherwise by the Engineer.

B. Dust, clay, silt and sand shall be removed from the pavement to be marked before application of paint by sweeping, blow with compressed air, rinsing with water or a combination of these methods as required.

C. Rubber deposits, surface laitance and other substances adhering to the pavement shall be removed with stiff brooms, scrapers, wire brushes, sandblasting or mechanical abrasion.

D. Marker adhesives and paints shall not be applied when moisture or foreign matter is present on the pavement surface or when wind conditions are such as to cause dust to be deposited on the prepared areas or to prevent satisfactory application of the paint.

3.2 CONTROL POINTS

A. The Contractor shall establish and space control points, satisfactory to the Engineer, at intervals that will ensure accurate location of pavement markings.

3.3 TRAFFIC CONTROL

A. The Contractor shall furnish, install and maintain suitable warning and directional signs, barricades and other traffic control devices near the beginning and well ahead of the work site.

B. Traffic control devices shall be placed along the newly painted lines to control traffic and to prevent damage to the newly painted surfaces.

3.4 INSTALLATION

A. Installation of pavement striping and markings shall be in accordance with of the State DOT Standard Specifications Section 629 – Pavement Markers.

3.5 INSPECTION AND ACCEPTANCE

A. Pavement markings shall always be subject to rigid inspection and provisions of this specification will be strictly enforced.

B. Painting will not commence in any area until pavement surfaces have been inspected, and the Engineer's approval is given to the Contractor to proceed. Such approval will be obtained each day and after periods of precipitation.

C. If the Engineer determines that the painted markings have not dried sufficiently in 90 minutes, painting shall be discontinued until the cause of slow drying is determined and corrected.

D. Areas found to be deficient in accordance with this specification will be rejected and complete replacement or repainting will be required.

E. Completed work will meet the Engineer approval in all respects. Final acceptance will be contingent upon conformance with specification requirements outlined in this specification.

3.6 PROTECTION

A. Newly painted surfaces shall be protected from damage by vehicles and inadvertent contact during the time required for paint to harden sufficiently to withstand traffic or physical contact.

B. During periods of high winds, painting will be discontinued.

C. Any damage to newly painted markings due to Contractor's failure to provide adequate protection will be repaired at no additional cost to the State.

3.7 CLEANING

A. Any spilled paints will be cleaned from the paved areas to the satisfaction of the Engineer.

B. The Contractor will keep the premises clean at all times. Paint, empty containers, and other material or equipment will not be stored or allowed to accumulate on or near the paved areas.

END OF SECTION

SECTION 02890

TRAFFIC SIGNS

PART 1 - GENERAL

1.1 GENERAL REQUIREMENTS

A. This section covers the requirements for the furnishing and installing traffic signs, including all materials, labor, equipment and services necessary to complete this work.

1.2 REFERENCES

A. "Manual on Uniform Traffic Control Devices, 2021 Edition", including all revisions, of the U.S. Department of Transportation Federal Highway Administration.

B. The "Standard Specifications for Public Works Construction", September 1986, as amended, of the County of Maui, hereafter referred to as the "DPW STANDARD SPECIFICATIONS", or as herein specified. (Paragraphs concerning Measurement and Payment are not applicable to this project.)

1.3 SUBMITTALS

A. Submit in accordance with Section 01300 – SUBMITTALS.

B. Product Data: The Contractor shall furnish to the Engineer manufacturers printed product data and warranty information, clearly marked, indicating proposed sign materials.

PART 2 – PRODUCTS

2.1 MATERIALS

A. Sign and Anchor Posts

1. The sign and anchor posts shall be 12-gauge (0.105", U.S.S. Gauge) steel tube material conforming with ASTM designation A-446 Grade A for Cold-Rolled Carbon Steel Sheet commercial quality, ASTM designation A-570 for Hot-Rolled Carbon Steel Sheet commercial quality, or ASTM designation A787-94 for Hot-Rolled Carbon Steel structure.

2. Size: Sign posts shall be 2" x 2" square. The anchor post shall be a 2-1/4" x 2-1/4" square tube. Length of sign and anchor posts shall be in accordance with the Drawings.

3. Perforation: All sides shall have evenly spaced pre-drilled 7/16" diameter holes spaced 1" on-center on four sides along the length of the tube.

4. Fabrication: The sign and anchor posts shall be straight and shall have a smooth uniform finish. It shall be possible to telescope consecutive sizes of tubes freely with a minimum amount of play. All holes and cut off ends shall be free from burrs.

5. Finish: The sign and anchor posts shall be either hot dipped galvanized conforming to ASTM designation A-525 or triple coated by an in-line application of hot dipped galvanized zinc per AASHTO M-120 followed by a chromate conversion coating and a cross-linked polyurethane acrylic coating on the exterior with the inside surface given corrosion protection by an in-line application of a full zinc base organic coating testing in accordance with ASTM B-117.

B. Fastening Hardware: All fastening hardware shall be anti-theft resistant as specified in the Drawings.

C. Signs: Signs and sign finishings shall conform to requirements in Section 60 – Street Name Signs of the DPW STANDARD SPECIFICATIONS, and in accordance with the Drawings.

D. Concrete Footing: Concrete sign post footing types shall be Class B and shall conform to Section 39 of the DPW STANDARD SPECIFICATIONS, and in accordance with the Drawings.

PART 3 - EXECUTION

3.1 INSTALLATION

A. Provide new materials including sign, sign posts, anchor posts, anti-theft resistant fastening hardware and concrete footing as shown in the Drawings and as required in these Specifications.

B. Signs: Signs shall be set level. Sign face shall be parallel or perpendicular to the edge of pavement as shown on the Drawings unless otherwise indicated. “Stop” signs shall be oriented parallel to the adjacent stop bars.

C. Sign and Anchor Posts: Sign posts shall be plumb and secure within the anchor post. Sign posts, anchor posts and all fastening hardware shall not be deformed or have any deterioration in their finish.

D. Concrete Footing: Top of concrete footing shall be crowned to shed rain water. Exposed surfaces shall be smooth and shall have no cracks.

END OF SECTION

SECTION 02900

LANDSCAPING

PART 1 - GENERAL

1.1 GENERAL REQUIREMENTS

A. The work to be performed under this section shall include all labor, materials, appliances, tools, equipment, facilities, transportation and services necessary for, and incidental to performing all operations in connection with furnishing, delivery, and installation of plant (also known as "landscaping") complete as shown on the drawings and as specified herein. Items not specifically shown in the drawings or specified, but normally required to conform to such intent are considered part of the work.

B. Related Work

1. Section 02920 – LAWNS AND GRASSES

1.2 CODES AND STANDARDS

A. Perform work in accordance with applicable laws, codes, and regulations required by authorities having jurisdiction over such work and provide for inspections and permits required by Federal, State and local authorities in furnishing, transporting and installing materials.

1.3 SUBMITTALS

A. Submit in accordance with Section 01300 – SUBMITTALS.

B. Product Data: The Contractor shall furnish to the Engineer manufacturer's printed product data, clearly marked, indicating proposed materials.

C. Samples: At least 60 days prior to placement, Contractor shall submit one (1) cubic foot of the specified Rain Garden Soil Mix to the Engineer. Contractor shall not place any soil mix on the project site until the Engineer has given the Contractor written notification to proceed. Rejected materials shall be immediately removed from the site at Contractor's expense.

D. Herbicide and Pesticide Application Records

1. Records shall be kept by Contractor of dates of application, type of herbicide/pesticide used, quantities, and areas that were covered.

2. Records shall indicate if rates and amounts of applications have deviated from the manufacturer's specifications.

3. Records shall be submitted to the Engineer within twenty-four (24) hours of application

E. Construction Schedule: At the preconstruction meeting, provide a written projected planting schedule noting the estimated completion date, number of working days required and any special coordination requirements.

F. Delivery receipts and copies of invoices for material used will be subject to checking by the Engineer.

1.4 SELECTION, TAGGING AND ORDERING PLANT MATERIAL

A. Plants shall be subject to inspection and rejection by the Engineer at place of growth and after delivery for conformity to specifications.

B. New trees shall be pre-approved at the nursery by the Engineer prior to purchasing. Notify the Engineer at least two (2) weeks prior to schedule an inspection.

1.5 WARRANTY

A. Warranty the plants under this contract for a period of 90 calendar days after completion of the landscape maintenance period. Immediately replace plants that decline or die during the warranty period, using the same kind and size as originally planted. Furnish, plant and maintain replacement plants as specified for original planting. The Contractor is not responsible for replacement of plants which decline or die after the maintenance period, as a result of inadequate maintenance by the State, vandalism, negligence by others, or acts of God, including high winds or flooding.

B. Warranty the plants for a period of two (2) years following completion and approval of the landscape maintenance period for species, hybrid, flower color and/or variety specified. If after acceptance of the project, any warranted plant material proves to be of a different species, hybrid, flower color and/or variety not initially determinable, replace that plant with a new plant of the originally specified species, hybrid, flower color and/or variety. The new plant shall be equal in size to that of the incorrect plant at the time of its removal. The new plant shall meet the quality standards, be subject to the warranty, and be installed according to the specifications. This warranty does not include plants reverting to the general species. The Engineer will determine the nonconformance of the plant materials and notify the Contractor in writing, of the required replacement work. Materials and work shall be at the expense of the Contractor. Work shall be completed within ten (10) working days from the date of notification by the Engineer.

PART 2 – PRODUCTS

2.1 PLANT MATERIALS

A. Botanical and common names of plants specified on the Drawings conform to names given in *Plants for Tropical Landscapes* by Fred D. Rauch and Paul R. Weissich, and *In Gardens of Hawaii* by Marie C. Neal. Names not included therein conform to names generally accepted in the local nursery trade.

B. Plant material shall conform to recommendations and requirements of the most recent edition of the American Standard of Nursery Stock, published by the American Association of Nurseryman Inc., except as supplemented or modified by these specifications or the drawings.

C. Plant material shall have a habit of growth that is normal for the species and shall be healthy, and free from insects and injuries. Trees and shrubs shall have normal, well-developed branching, together with vigorous root systems. Roots must fill containers, but show no evidence of being or having been root bound. Any tree or shrub with a weak, thin trunk not capable of supporting itself when planted in the open will be rejected. Plants shall equal or exceed measurements specified on planting plan, which will be the minimum acceptable sizes after pruning.

2.2 SUBSTITUTIONS

A. Substitution of plant materials will be permitted only upon submission of application. Any request for substitutions shall be submitted, in writing, for review by the Landscape Architect and subsequently, approval by the Engineer. Substitutions shall be the nearest obtainable size or variety of plant having the same essential characteristics. Approval of requestor's substitution and any changes as a result of this approval shall be at no additional cost.

2.3 FERTILIZERS

A. Use fertilizers suitable to the plant type and to sustain optimal growth.

B. Commercial fertilizer shall be slow release, encapsulated, coarse granular form, and shall bear the manufacturer’s guaranteed statement of analysis.

C. Fertilizers shall be delivered to the site in original, unopened containers. Any fertilizer which becomes caked or otherwise damaged, making it unsuitable for use, will not be accepted. Unsuitability shall be as determined by the Engineer.

2.4 HERBICIDES

A. Use only State Department of Agriculture approved herbicides. The herbicide shall be currently licensed for distribution and sale in Hawaii.

B. Manufacturer’s instructions for applying herbicide shall be followed. Adjustments shall be made for field conditions. Chemical herbicide shall be applied using photosensitive dye that does not stain concrete or painted surfaces, will not injure plants and animals, and disappears within three (3) days after spraying. Spraying shall not be done when wind is brisk or when raining or when rain is expected. Avoid spraying areas where herbicide can enter storm drainage systems or receiving waters. Records shall be kept by Contractor of dates of application, type of herbicide or pesticide used, quantities, and areas that were covered. Records shall be submitted to the Engineer within twenty-four (24) hours of application.

PART 3 - EXECUTION

3.1 GENERAL

A. Inspect the substrates and conditions under which work of this section will be performed. Do not proceed until unsatisfactory conditions have been corrected.

B. Immediately notify the Engineer of any discrepancy between the drawings and actual site conditions. Do not proceed with work within affected area until the Engineer has resolved discrepancies.

C. It is the responsibility of the Contractor to be aware of all surface and subsurface conditions, and to notify the Engineer, in writing, of any circumstances that would negatively impact the health of plantings. Do not proceed with work until unsatisfactory conditions have been corrected.

D. Should subsurface drainage or soil conditions be encountered which would be detrimental to growth or survival of plant material, the Contractor shall notify the Engineer, in writing, stating the conditions and submit a proposal covering cost of corrections.

E. Obtain all necessary approvals, including, but not limited to: Excavation Permit; Street Usage Permit and/or Trenching Permit.

3.2 JOB CONDITIONS

A. Underground Utilities and Obstructions: Verify the location of all underground utilities and other obstructions that may affect the work. Any obstructions encountered shall be reported to the Engineer. Repair all damage to any known utility line or other underground obstruction at no additional cost. Report damage to any unknown utilities to the Engineer.

B. Protection.

1. Provide necessary safeguards and exercise caution against injury or defacement of existing site improvements. Prevent vehicles of any kind from passing over sidewalks, curbs, etc., unless adequate protection if provided.

2. Protection of Existing Trees. Do not allow parking, movement, or storage of any vehicle or equipment within ten (10) feet of the tree's canopy. Soil compaction over the tree's root zone may kill the tree. Dumping of chemicals on the site is not allowed. Do not cut, fill or form other grade changes around the root zone of existing trees.

3. Be responsible for any damage resulting from landscape planting operations. Repair all damages and restore the area to the previous condition at Contractor's expense.

3.3 PREPARATION OF PLANTING AREA

A. Clear planting areas of debris and foreign material. Remove rocks exceeding one (1) inch in largest dimension, weeds, and vegetation not designated to remain.

B. Protect all existing plants from damage.

C. All construction operations of soil transportation, spreading and fine grading shall conform to the Maui County Code 20.08 –Soil Erosion, and Sedimentation Control. Contractor shall not perform any construction work so as to cause falling rocks, soil, or debris in any form to fall, slide or flow onto adjoining properties, streets, natural watercourses, or drainage facilities. The Contractor shall also be responsible for conformity with the applicable provisions of Chapter 54, Water Quality Standards, and Chapter 55, Water Pollution Control, of Title 11, Hawaii Administrative Rules of the State Department of Health. Should a violation occur, the cost incurred for any remedial action shall be at the expense of the Contractor.

D. Dust Control: Contractor shall abide by all Federal, State and City ordinances regarding dust control practices during construction.

3.4 FINE GRADING

A. Adjust finish grading with planting soil as necessary. Grades shall be smooth and even on a uniform plane with no abrupt changes or pockets, and shall slope away from all buildings. Verify the surface drainage of all planting areas, and notify the Engineer of any discrepancies, obstructions, or other conditions considered detrimental to proper execution of work.

B. Landscape work shall be tied to existing conditions and controls such as existing trees and landscape features, utility lines, pavement and curbs, etc. Finished grades shall bear proper relationship to such controls. Adjust all new work as necessary to meet the conditions and fulfill the intention of the drawings.

C. After initial settlement, the finish grade shall be lower than adjacent walks, curbs and headers:

1. Grass: 1/2 inch to 3/4 inch.

2. Shrubs and groundcovers: 2 inches to 2-1/2 inches.

3.5 SPREADING OF PLANTING SOIL

A. Subgrade shall be damp when planting soil is spread.

B. An eighteen (18) inch layer of Rain Garden soil mix shall be added before the placing of ground covers.

C. Areas to receive grass sod shall be tilled with a one-inch layer of soil amendments. Till to a depth of four inches. Do not till if slope is greater than 3:1. Remove sticks, stones, and extraneous matter. Fine grade with drag or rake. Grading shall round out breaks in grade, smooth down lumps and ridges, and fill holes and crevices. Grade shall be maintained until placement of grass sod.

3.6 INSTALLATION OF PLANT MATERIAL

A. Quantities stated on planting plan and in plant list are only approximate. Verify quantities before bidding. Provide sufficient quantities to fulfill intent of plan with plants and other specified materials at locations, spacing, and depths indicated. The planting plan takes precedence over stated quantities.

B. Planting of trees, shrubs, ground covers and grass shall be as indicated on the drawings and specified herein. Plant materials shall be subject to inspection and acceptance by the Engineer prior to delivery and planting at the job site.

C. Caliper measurement shall be taken at a point on the trunk 6 inches above natural ground line for trees up to 4 inches in caliper and at a point 12 inches above the natural ground line for trees over 4 inches in caliper.

D. Plants with small or inadequate root balls will be rejected.

E. Verify locations of utility lines. Arrange and pay for repair of utilities and structures damaged as a result of these operations.

F. Use adequate wrapping and padding to protect trunks and branches from rope, cable, and equipment abrasions during planting operations.

G. Plants shall be handled so that the roots and trunks are protected at all times. Plants, once delivered, shall be watered daily. Under no condition shall un-canned or root ball-and-burlap plants be left unplanted following the day of delivery.

H. Notify Engineer, in writing, of soil or drainage conditions encountered during planting operations in which the Contractor considers detrimental to growth of plant material. If drainage conditions of plant pits appear unsatisfactory, test drainage by filling with water. Conditions permitting the retention of water in planting pits for an excessive period of time shall be brought to the attention of the Engineer.

I. Diameter of plant pits for ground level trees and shrubs shall be at least twice the diameter of the root ball; depth of pits shall be sufficient to accommodate root ball when plant is set at finish grade.

J. Set trees and shrubs on tamped backfill mix with top of root ball flush with finish grade. Set each plant upright and in a position of natural balance and appearance and face to provide the best appearance in relationship to adjacent structures and surroundings.

K. Carefully place backfill around root ball to ensure no air pockets and tamp firmly to prevent settling.

L. Set finish grade of back fill approximately flush with top of root ball.

M. Support trees immediately after planting as shown on drawings. Keep guys taut throughout contract period.

N. Pruning shall be performed by experienced tree trimmers who, through related training and on-the-job experience, are familiar with the techniques and hazards of this work.

O. Limit pruning of trees and shrubs to the minimum necessary to remove dead and broken branches and undesirable growth, and to compensate for loss of roots during transplanting. Prune in a manner that retains the natural habit and shape of the plant.

P. Branches should be cut back above the collar at a healthy limb or bud without leaving a stub that may decay and injure the plant. On larger branches and limbs requiring a saw for removal, a preliminary undercut approximately 1/3 through the limb must be made to prevent ripping and tearing of the bark. On the upper side of the limb, above the first cut, make a second cut to remove the limb. Then remove the remaining stub. Paint cuts over one inch in diameter on limbs or roots with tree paint. Do not paint cuts on palms.

Q. Ground cover shall be planted in neat rows insuring complete coverage of the planting areas.

R. Water each plant deeply and thoroughly, saturating root ball immediately following planting. Keep planting areas moist, but not saturated until completion of maintenance period.

S. Maintain finish grade established prior to planting. Restore finish grade in any area disturbed by erosion or planting operations.

3.7 INSTALLATION OF GRASS

A. Install grass according to Section 02920 – LAWNS AND GRASSES.

3.8 CLEAN UP

A. Remove from the premises, as work progresses, rubbish and debris resulting from this work.

B. Upon completion, leave the entire area in a neat and orderly condition.

C. Promptly remove any soil falling upon pavement as a result of these operations.

D. On a daily basis, pack and remove all trash, including any discarded food, from the premises to prevent negatively affecting the flora and fauna. Discarded food may contain unseen insects, fungus, bacteria, and parasites; and is an attractant for invasive insects.

3.9 LANDSCAPE MAINTENANCE AND INSPECTION

A. This item of work shall consist of the maintenance of all plants and planted areas in optimum growing condition and appearance, and the inspection and acceptance of landscape planting.

B. Pre-Maintenance Inspection:

1. Pre-Maintenance inspection shall be held at the completion of all planting operations and prior to the beginning of the Landscape Maintenance Period.

2. Submit a request for inspection, in writing, to the Engineer at least ten (10) calendar days prior to the anticipated inspection date.

3. At the time of inspection, the Contractor shall have all the areas under the contract free of weeds, dead leaves and trash. All stakes, guy wires, and plant basins shall be in good order.

4. All deficiencies shall be corrected and all plantings shall be accepted by the Engineer before the issuance of a commencement date of the Landscape Maintenance Period.

C. Landscape Maintenance Period:

1. Maintenance shall begin immediately after completion and acceptance of all planting and shall continue for sixty (60) calendar days thereafter. The care of plants prior to completion of all planting shall not be considered as part of the maintenance period but only as an incidental to landscape work.

2. Maintain plants and planted areas in optimum growing conditions and appearance. Maintenance shall include watering, weeding, trimming, fertilizing, replacing, pruning, maintaining of grades and elevations in landscaped areas, and other operations necessary to maintain work. Remove from the site leaves, trash, and debris that accumulate in planting areas.

3. Irrigate as necessary to secure maximum growth of plants. Regulate irrigation as required to avoid runoff and soil erosion.

4. Keep planting areas free of weeds and undesirable grasses through daily weeding, if required. Remove entire root system of weeds. Dispose of all weeds in appropriate trash containers.

5. Spread fertilizer over planting areas as needed. Notify Engineer one day prior to application of fertilizer.

6. Promptly wash off any fertilizer that adheres to foliage. Irrigate planting areas following fertilizer application. Promptly sweep off any fertilizer that falls on pavement, retaining walls, wood, or metal surfaces to prevent staining.

7. Examine trees periodically to prevent injury to the bark from tree stakes or tree guy wires.

8. Tree/shrub staking and guying materials shall be maintained and replaced, if necessary, by the Contractor until the tree/shrub is able to stand by itself. Contractor shall remove and dispose of the staking/guying materials at the end of the Landscape Maintenance Period. If the tree is leaning at the end of the Landscape Maintenance Period, the tree will be rejected.

9. Prune trees and shrubs as required or requested by the Engineer.

10. Maintain finish grade established prior to planting. Should any planting areas become eroded or otherwise damaged, repair and re-plant.

11. Protect areas susceptible to pedestrian or vehicular traffic by erecting barricades immediately after planting. Replant areas damaged by pedestrian or vehicular traffic, at no additional expense to the Engineer. Barricades or warning signs erected for protection of landscaping are subject to approval of the Engineer.

12. Immediately remove any dead or dying plants not in a vigorous thriving condition. Replacement shall be the same species and size as specified for the initial planting. Contractor shall not be responsible for replacement of plants that are stolen, killed, or damaged as a result of vandalism, prior to completion of maintenance period.

13. Inspect plants, including lawn, for insect, fungus or disease damage weekly. Replace plants killed or disfigured by insects, fungus or disease. Treat affected material with only State of Hawaii, Department of Education, approved list of pesticides. Obtain approval of the pesticide from the Engineer prior to treatment. Submit application records in accordance with paragraph 1.3 SUBMITTALS, of this section.

D. Final Inspection and Acceptance:

1. At the completion of all planting operations and the Landscape Maintenance Period, an inspection shall be performed.

2. The Contractor shall request the inspection, in writing, to the Engineer ten (10) calendar days prior to the completion of the maintenance period in order that a mutually agreeable time for inspection may be arranged.

3. The Contractor and the Engineer shall be present at the inspection.

4. Any plant material found not to be in healthy growing condition shall be immediately replaced by the Contractor.

5. Acceptance of the sodded lawn after the Landscape Maintenance Period shall be contingent upon a healthy, well-rooted, even-colored, viable lawn that has been free of weeds, open joints, bare areas and surface irregularities. Grass shall be at least three inches tall.

6. If at the final inspection, the Engineer is of the opinion that all or certain portions of the work is not acceptable as to the intent of the drawings and specifications, an additional thirty (30) days maintenance period shall be extended at no additional cost. During this period, the Contractor shall meet all requirements and correct all deficiencies, including any additional mowing and fertilizing.

7. If all plant materials are accepted at this inspection by the Engineer, the Contractor shall be relieved of further maintenance.

END OF SECTION

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SECTION 02920

LAWNS AND GRASSES

PART 1 - GENERAL

1.1 GENERAL REQUIREMENTS

A. The work to be performed under this section shall include the furnishing of all materials, equipment, tools and labor necessary for planting of sod.

B. Related Work

1. Section 02900 – LANDSCAPING

1.2 CODES AND STANDARDS

Perform work in accordance with applicable laws, codes, and regulations required by authorities having jurisdiction over such work and provide for inspections and permits required by Federal, State and local authorities in furnishing, transporting and installing materials.

1.3 SUBMITTALS

A. Submit in accordance with Section 01300 – SUBMITTALS.

B. Product Data: The Contractor shall furnish to the Engineer manufacturer's printed product data, clearly marked, indicating proposed materials.

C. Certificate: The Contractor shall furnish to the Engineer a Certificate of Compliance from the sod supplier certifying that the grass is true to its variety.

D. Herbicide and Pesticide Application Records

1. Records shall be kept by Contractor of dates of application, type of herbicide/pesticide used, quantities, and areas that were covered.

2. Records shall indicate if rates and amounts of applications have deviated from the manufacturer's specifications.

3. Records shall be submitted to the Engineer within twenty-four (24) hours of application

1.4 QUALITY ASSURANCE

A. All grass shall comply with Hawaii Department of Agriculture quarantine requirements.

B. Grass shall have a healthy vigorous root system.

C. Sod shall be healthy, thick turf having undergone a program of regular fertilization and a two-month pre-harvest fertilization program.

1.5 DELIVERY, STORAGE AND HANDLING

A. Protect sod before, during, and after installation from over-heating, drying out, and physical damage.

B. Replace damaged or rejected sod at no cost to the State.

1.6 WARRANTY

A. Warranty the grass under this contract in accordance with, Section 02900 - LANDSCAPING, paragraph 1.5 WARRANTY.

PART 2 – PRODUCTS

2.1 GRASS SOD

A. Sod shall be strongly rooted and free of pernicious weeds, 1-1/2 inch minimum root structure, freshly dug, brought to the site and placed immediately. Sod showing discoloration or wilting will be rejected. Sod containing nutgrass, lippie, water sedge, and dollar weed is not acceptable.

B. Machine cut sod at uniform thickness of 3/4 inch ± 1/4 inch, excluding top growth and thatch. Use individual sod pieces strong enough to support their own weight when lifted by ends. Broken pads, irregularly shaped pieces, and torn or uneven ends is not acceptable.

2.2 SUBSTITUTIONS

A. Substitution of grass species will be permitted only upon submission of application. Any request for substitutions shall be submitted, in writing, for review and approval by the Engineer. Substitutions shall be the nearest obtainable grass species having the same essential characteristics. Approval of requestor's substitution and any changes as a result of this approval shall be at no additional cost.

2.3 FERTILIZER FOR ESTABLISHED LAWN

A. N-P-K with a 4-1-2 ratio and a maximum of 1 pound of Nitrogen per 1,000 square feet, or as recommended by the grass supplier. Fertilizer shall be uniform in composition and free-flowing. Deliver to the site in unopened containers, each fully labeled, conforming to the applicable fertilizer laws, and bearing the name or mark of the manufacturer.

2.4 HERBICIDES FOR ESTABLISHED LAWN

A. Herbicides accepted for use shall be in accordance with, Section 02900 – LANDSCAPING, paragraph 2.4 HERBICIDES.

PART 3 - EXECUTION

3.1 JOB CONDITIONS

A. Inspect work of other trades and verify work is complete to the point landscape work may start.

B. Discrepancies. In the event of a discrepancy, immediately notify the Engineer. Do not proceed with installation of materials or plants in areas of discrepancy until such discrepancies have been fully resolved to the satisfaction of the Engineer.

C. It shall be the Contractor's responsibility to thoroughly test the irrigation system before planting. No planting shall be done until the irrigation system is operating properly.

3.2 PREPARATION OF PLANTING AREAS

A. For planting area preparation, refer to Section 02900 – LANDSCAPING, paragraph 3.3 PREPARATION OF PLANTING AREA, paragraph 3.4 FINE GRADING, and paragraph 3.5 SPREADING OF PLANTING SOIL.

3.3 INSTALLATION OF GRASS

A. Verify locations of utility lines. Arrange and pay for repair of utilities and structures damaged as a result of these operations.

B. Maintain finish grade established prior to planting. Restore finish grade in any area disturbed by erosion or planting operations.

C. Notify the Engineer, in writing, of soil or drainage conditions encountered during planting operations in which the Contractor considers detrimental to growth of grass.

D. The Contractor shall notify the Engineer one (1) day before planting grass.

E. Immediately prior to planting operations, planting areas shall be cleared of weeds, debris, rocks over one (1) inch diameter and clumps of earth that will not break up.

F. Sod

1. Sod shall be delivered and installed no more than twelve (12) hours from the time of harvest. Sod and plugs shall be protected during delivery and shall not be allowed to dry out. Water shall be applied as soon as it is laid and then by irrigation zone.

2. Any damage to the finished grades from equipment shall be immediately repaired and hand raked smooth before the installation of the sod.

3. Lay sod to form a solid mass with tightly fitted joints. Butt ends and sides of sod; do not stretch or overlap. Stagger sod strips or pads to offset joints in adjacent courses. Avoid damage to subgrade or sod during installation. Tamp and roll lightly to ensure contact with subgrade, eliminate air pockets, and form a smooth

surface. Work sifted soil or fine sand into minor cracks between pieces of sod. Remove excess soil/fine sand to avoid smother sod and adjacent grass.

a. On slopes 5:1 and steeper, place sod with long edges parallel to contour starting at top of slope.

b. On slopes 2:1 and steeper, and in drainage ditches V-shaped, stake each strip of sod with at least two (2) wooden pegs, spaced as recommended by sod manufacturer, but not less than two (2) anchors per sod strip to prevent slippage.

4. Complete placing, rolling, tamping, and watering within an 8-hour period.

5. Saturate sod with fine water spray within two hours of planting. During the first week, water daily or more frequently as necessary to maintain moist soil to a minimum depth of 1-1/2 inches below sod.

6. Water sodded areas as necessary to establish growth. Keep sod properly watered until final acceptance.

7. Inspect sodded areas for failures and necessary repairs.

8. When Engineer determines stand of turf is inadequate, resod.

9. Protect areas susceptible to traffic by erecting barricades immediately after planting. Submit product literature for barricade type to the Engineer for approval, prior to erecting. A four-feet high safety barrier fence, made of high-density polyethylene, orange in color, meeting OSHA requirements, is recommended.

3.4 CLEAN UP

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, etc., and leave entire job site raked clean and neat to the satisfaction of the Engineer.

3.5 INSPECTIONS

A. Pre-Maintenance Inspection: Make written requests for inspection after all planting operations have been completed. Refer to Section 02900 – LANDSCAPING, paragraph 3.9 LANDSCAPE MAINTENANCE AND INSPECTION.

B. Submit requests for inspections to the Engineer at least ten (10) days prior to the anticipated inspection date.

C. Final Inspection and Acceptance: Make written requests for inspection after the Landscape Maintenance Period is completed. Refer to Section 02900 – LANDSCAPING, paragraph 3.9 LANDSCAPE MAINTENANCE AND INSPECTION.

3.6 MAINTENANCE

A. Maintain and protect grass areas until the end of the Landscape Maintenance Period, in accordance with, Section 02900 – LANDSCAPING, paragraph 3.9 LANDSCAPE MAINTENANCE AND INSPECTION.

B. Contractor shall submit a written schedule for maintenance of all lawn areas.

C. Begin mowing as soon as sod is firmly rooted. Mow to a preferred height of three (3) to four (4) inches. Do not remove more than one-third (1/3) of the leaf growth during a single mowing.

END OF SECTION

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SECTION 03300

CAST-IN-PLACE CONCRETE

PART 1 - GENERAL

1.1 GENERAL REQUIREMENTS

A. Furnish all labor, materials and equipment necessary to provide cast-in-place concrete, including formwork, reinforcement, concrete materials, mix design, placement procedures, and finishes as indicated on the drawings and as specified herein.

B. Related Work

1. Section 02100 - SITE PREPARATION

2. Section 02500 - CONCRETE WALKWAYS

3. Section 09900 – PAINTS AND COATINGS

1.2 DEFINITIONS

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

1.3 SUBMITTALS

A. Submit in accordance with Section 01300 – SUBMITTALS.

B. Product Data: Reinforcing steel. Certified mill test results or laboratory test results. Indicate bar size, yield strength, ultimate tensile strength, elongation and bend test.

C. Design Mixes: For each concrete mix.

1. Include alternate mix designs when characteristics of materials, project conditions, weather, test results, or other circumstances warrant adjustments.

2. Indicate amounts of mix water to be withheld for later addition at project site.

D. Shop Drawings: Steel Reinforcement.

1. Provide details of fabrication, bending, and placement, prepared according to ACI 315, “Details and Detailing of Concrete Reinforcement.”

2. Include material, grade, bar schedules, stirrup spacing, bent bar diagrams, arrangement, and supports of concrete reinforcement. Include special

reinforcement required for openings through concrete structures. Also include location, sizes, and layout of any conduit to be placed within concrete.

3. Shop Drawings shall be originally produced by the contractor. Any reproduction of the contract Drawings being used for shop drawings will be rejected.

E. Certificates: Signed by manufacturers certifying that each of the following items complies with requirements:

1. Form materials and form-release agents.

2. Steel reinforcement and reinforcement accessories.

3. Bonding agents.

4. Adhesives.

5. Joint-filler strips.

6. Repair materials.

1.4 QUALITY ASSURANCE

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

B. Testing Agency Qualifications: An independent testing agency, acceptable to authorities having jurisdiction, qualified according to ASTM C 1077 and ASTM E 329 to conduct the testing indicated, as documented according to ASTM E 548.

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.

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

D. ACI Publications: Comply with the following, unless more stringent provisions are indicated and maintain a copy at the field office.

1. ACI 301, “Specification for Structural Concrete.”

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

3. ACI 347R “Guide to Formwork for Concrete.”

1.5 DELIVERY, STORAGE, AND HANDLING

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

PART 2 – PRODUCTS

2.1 FORM-FACING MATERIALS

A. Smooth-Formed Finished Concrete: Comply with ACI 347R. Provide new or good finish 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 ACI 347R approved panel materials.

B. Rough-Formed Finished Concrete: Plywood, lumber, metal, or another approved material. Provide lumber dressed on at least 2 edges and one side for tight fit.

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

D. 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.

E. 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.

1. Furnish units that will leave no corrodible metal closer than one inch to the plane of the exposed concrete surface.

2. Furnish ties that, when removed, will leave holes not larger than 1 1/2" in diameter in concrete surface.

2.2 STEEL REINFORCEMENT

A. Stainless Steel Reinforcing Bars: ASTM A 955/A 995M, Grade 75, deformed, unless otherwise noted on the drawings.

2.3 REINFORCEMENT ACCESSORIES

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

1. For concrete surfaces exposed to view where legs of wire bar supports contact forms, use CRSI Class 1 plastic-protected or CRSI Class 2 stainless-steel bar supports. Refer to paragraph 3.6 titled "STEEL REINFORCMENT" for chair support spacing.

2.4 CONCRETE MATERIALS

A. Portland Cement: ASTM C 595; Type 1L-Portland Limestone Cement.

B. Pozzolans

1. Fly ash: ASTM C 618, Class C or F.

2. Blended hydraulic cement: ASTM C 595M.

3. Ground granulated blast-furnace slag: ASTM C 989, Grade 100 or 120.

C. Normal-Weight Aggregate: ASTM C 33, uniformly graded, and as follows:

1. Class: Moderate weathering region, but not less than 3M.

2. Aggregate size: No. 57 (One inch to No. 4).

3. Aggregate size: No. 67 (3/4 inch to No. 4).

D. Size of Coarse Aggregate: Except when otherwise specified or permitted, maximum size of coarse aggregate shall not exceed three-fourths of the minimum clear spacing between reinforcing bars (or bundled bars), one-fifth of the narrowest dimension between the sides of forms, or one-third of the thickness of slabs or toppings.

E. Water: Potable and complying with ASTM C 94 or non-potable meeting ASTM C 94 Acceptance Criteria for Questionable Water Supply. Use only potable water for job site mixing.

2.5 ADMIXTURES

A. General: Admixtures certified by manufacturer to contain not more than 0.1% water-soluble chloride ions by mass of cementitious material and to be compatible with other admixtures and cementitious materials. Do not use admixtures containing calcium chloride.

B. Water-Reducing Admixture: ASTM C 494, Type A.

C. High-Range, Water-Reducing Admixture: ASTM C 494, Type F.

D. Water-Reducing and Accelerating Admixture: ASTM C 494, Type E.

E. Water-Reducing and Retarding Admixture: ASTM C 494, Type D.

F. Plasticizing and Retarded Admixture: ASTM C1017/C 1017M, Type II.

G. Non-Set-Accelerating Corrosion-Inhibiting Admixture: Commercially formulated, non-set-accelerating, anodic inhibitor or mixed cathodic and anodic inhibitor; capable of forming a protective barrier and minimizing chloride reactions with steel reinforcement in concrete.

2.6 CURING MATERIALS AND EVAPORATION RETARDERS

A. Evaporation Retarder: Waterborne, monomolecular film forming, manufactured for application to fresh concrete.

B. Absorptive Cover: AASHTO M 182, Class 2, burlap cloth made from jute or kenaf, weighing approximately 9 oz/sq yd dry.

C. Moisture-Retaining Cover: ASTM C 171, polyethylene film or white burlap-polyethylene sheet.

D. Water: Potable.

E. Clear, Solvent-Borne, Membrane-Forming Curing Compound: ASTM C 309, Type 1, Class B.

F. Clear, Waterborne, Membrane-Forming Curing Compound: ASTM C 309, Type 1, Class B, 18% to 22% solids.

G. Clear, Solvent-Borne, Membrane-Forming Curing and Sealing Compound: ASTM C 1315, Type 1, Class A.

H. Clear, Waterborne, Membrane-Forming Curing and Sealing Compound: ASTM C 1315, Type 1, Class A.

2.7 VAPOR RETARDERS

A. Plastic Vapor Retarder: ASTM E 1745, Class B. Include Manufacturer's recommended adhesive or pressure-sensitive tape.

B. Products: Stego Industries, LLC – Stego Wrap, 15 mils or approved substitute.

2.8 RELATED MATERIALS

A. Joint-Filler Strips: ASTM D 1751, asphalt-saturated cellulosic fiber.

B. Bonding Agent: ASTM C 1059, Type II, non-redispersible, acrylic emulsion or styrene butadiene.

C. Epoxy-Bonding Adhesive: ASTM C 881, 2 component epoxy resin, capable of humid curing and bonding to damp surfaces, of class and grade to suit requirements, and as follows:

1. Type II, non-load bearing, for bonding freshly mixed concrete to hardened concrete.

2. Types I and II, non-load bearing, for bonding hardened or freshly mixed concrete to hardened concrete.

3. Types IV and V, load bearing, for bonding hardened or freshly mixed concrete to hardened concrete.

D. Cementitious Coatings: Cement based polymer modified concrete finishing material, ProFinish by Bonded Materials or approved substitute.

E. Reglets: Fabricate reglets of not less than (0.0217") thick galvanized steel sheet. Temporarily fill or cover face opening of reglet to prevent intrusion of concrete or debris.

2.9 REPAIR MATERIALS

A. Repair Underlayment: Cement-based, polymer-modified, self-leveling product that can be applied in thicknesses from 1/8" and that can be feathered at edges to match adjacent floor elevations. Products shall contain no added gypsum.

1. Cement binder: ASTM C 50, Portland cement or hydraulic or blended hydraulic cement as defined in ASTM C 219.

2. Primer: Product of underlayment manufacturer recommended for substrate, conditions, and application.

3. Aggregate: Well-graded, washed gravel, 1/8" to 1/4" or coarse sand as recommended by underlayment manufacturer.

4. Compressive Strength: Not less than 4000 psi (27.6 MPa) at 28 days when tested according to ASTM C 109/C 109M.

B. Repair Topping: Traffic-bearing, cement-based, polymer-modified, self-leveling product that can be applied in thicknesses from 1/4". Products shall contain no added gypsum.

1. Cement binder: ASTM C 150, Portland cement or hydraulic or blended hydraulic cement as defined in ASTM C 219.

2. Primer: Product of topping manufacturer recommended for substrate, conditions, and application.

3. Aggregate: Well-graded, washed gravel, 1/8" to 1/4" or coarse sand as recommended by topping manufacturer.

4. Compressive strength: Not less than 5500 psi (39 MPa) at 28 days when tested according to ASTM C 109/C 109M.

2.10 CONCRETE MIXES

A. Prepare design mixes for each type and strength of concrete determined by either laboratory trial mix or field test data bases, as follows:

1. Proportion normal-weight concrete according to ACI 211.1 and ACI 301.

B. Footings: Proportion normal-weight concrete mix as follows:

1. Compressive strength (28 Days): 4,000 psi.

C. Walls: Proportion normal weight concrete mix as follows:

1. Compressive strength (28 Days): 4,000 psi.

D. Slabs-on-Grade: Proportion normal-weight concrete mix as follows:

1. Compressive strength (28 Days): 4,000 psi.

2. No fly ash shall be used in mixes for interior concrete floor slabs.

E. Cementitious Materials: Limit percentage, by weight, of cementitious materials other than Portland cement in concrete as follows:

1. Combined fly ash and pozzolan: 10%.

2. Combined fly ash or pozzolan and ground granulated blast-furnace slag: 50%.

3. Portland cement minimum, with fly ash or pozzolan not exceeding 10%.

F. Maximum Water-Cementitious Materials Ratio: 0.45 for all other concrete.

G. Do not add air entrainment to concrete of trowel-finished interior floors and suspended slabs. Do not allow entrapped air content to exceed 3%.

H. Limit water-soluble, chloride-ion content in hardened concrete per ACI 318 Chapter 4 for corrosion protection of reinforcing steel.

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

1. Use water-reducing admixture or high-range water-reducing admixture (superplasticizer) in concrete, as required, for placement and workability.

2. Use water-reducing and retarding admixture when required by high temperatures, low humidity, or other adverse placement conditions.

3. Use water-reducing admixture in pumped concrete, concrete for heavy-use industrial slabs and parking structure slabs, concrete required to be watertight, and concrete with a water-cementitious materials ratio below 0.50.

2.11 FABRICATING REINFORCEMENT

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

2.12 CONCRETE MIXING

A. Ready-Mixed Concrete: Measure, batch, mix, and deliver concrete according to ASTM C 94, and ASTM C 1116 and furnish batch ticket information. Batch ticket information shall include design mix reference, water that can be added at the job site, and admixtures. For transit mixing, complete not less than 70 revolutions of the drum at the manufacturer's rated mixing speed. Discharge concrete into its final position within 90 minutes after introduction of batch water to the cement. If a retarder admixture is used, the discharge time limit of 90 minutes may be increased by the time specified for retardation by the admixture manufacturer or the concrete supplier. Mix concrete a minimum of one (1) minute at mixing speed immediately prior to discharge.

PART 3 - EXECUTION

3.1 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 concrete 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. Limit concrete surface irregularities, designated by ACI 347R as abrupt or gradual, as follows:

1. Class A, 1/8", for surfaces prominently exposed to public view, where appearance is especially important.

2. Class B, 1/4", for coarse-textured surfaces to receive plaster, stucco or wainscoating.

3. Class C, 1/2", for permanently exposed surfaces without additional finish.

4. Class D, one inch, for surfaces, usually permanently concealed, where roughness is not objectionable.

D. Construct forms to prevent loss of concrete mortar.

E. 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. Kerf wood inserts for forming keyways, reglets, recesses, and the like, for easy removal.

1. Do not use rust-stained steel form-facing material.

F. Set edge forms, bulkheads, and intermediate screed strips for slabs to achieve required elevations and slopes in finished concrete surfaces. Provide and secure units to support screed strips; use strike-off templates or compacting-type screeds. Maintain the integrity of the vapor retarder membrane.

G. Provide temporary openings for cleanouts and inspection ports where interior area of formwork is inaccessible. Close openings with panels tightly fitted to forms and securely braced to prevent loss of concrete mortar. Locate temporary openings in forms at inconspicuous locations.

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

I. Form openings, chases, offsets, sinkages, keyways, reglets, blocking, screeds, and bulkheads required in the work. Determine sizes and locations from trades providing such items.

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

K. Retighten forms and bracing before placing concrete, as required, to prevent mortar leaks and maintain proper alignment.

L. Coat contact surfaces of forms with form-release agent, according to manufacturer's written instructions, before placing reinforcement.

3.2 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 bolts, accurately located, to elevations required.

2. Install reglets to receive top edge of foundation sheet waterproofing.

3. Install dovetail anchor slots in concrete structures as indicated.

4. Install inserts, hangers, metal ties, nailing strips, blocking, grounds and other fastening devices needed for attachment of other work.

B. Locate electrical or mechanical conduits and fittings so that the strength of the concrete member is not impaired. “Conduits” include pipes, ducts, and electrical conduits. Unless required otherwise on the drawings, conform to the following:

1. Concrete slabs-on-grade: Do not embedded conduits within the thickness of any concrete slab on grade. Place conduits in the subgrade below the concrete slabs.

C. Obtain Engineer's approval to install conduit or pipe penetrations that may unduly impair the strength of the structural member (for example, multiple pipe penetrations near the face of a column).

3.3 REMOVING AND REUSING FORMS

A. General: Formwork, for sides of beams and similar parts of the Work, that does not support weight of concrete may be removed after cumulatively curing at not less than 50 degrees F (10 degrees C) for 24 hours after placing concrete provided concrete is hard enough to not be damaged by form-removal operations and provided curing and protection operations are maintained. The 24 hour period may be reduced to 12 hours in compliance with ACI 347R with prior approval from the Engineer.

B. Leave formwork, for beam soffits and other structural elements, that supports weight of concrete in place until concrete has achieved the following:

1. 28-day design compressive strength.

C. Clean and repair surfaces of forms to be reused in the work. Split, frayed, delaminated, or otherwise damaged form-facing material will not be acceptable for exposed surfaces. Apply new form-release agent.

D. When forms are reused, clean surfaces, remove fins and laitance, and tighten to close joints. Align and secure joints to avoid offsets. Do not use patched forms for exposed concrete surfaces unless approved by Engineer.

3.4 VAPOR RETARDERS

A. Vapor Retarder: Place, protect, and repair vapor-retarder sheets according to ASTM E 1643 "Standard Practice for Installation of Water Vapor Retarders" and manufacturer's written instructions. The more stringent shall apply.

1. Use the greatest widths and lengths practical to minimize lap joints. Seal laps joints and edges with tape or materials compatible with the vapor retarder. Remove and replace torn, punctured, or damaged vapor barrier materials, except when minor repairs or patches are allowed by manufacturer's instructions.

2. Do not cut or puncture vapor retarder. No penetrations of the vapor barrier allowed except for reinforcing steel and permanent utilities. Seal all penetrations including pipes and reinforcing. Repair damage and reseal vapor retarder before placing concrete.

3. Do not leave the vapor retarder exposed to ultraviolet radiation for more than a few days prior to the concrete pour. Remove standing water from the vapor retarder prior top concrete pour.

3.5 SHORES AND RESHORES

A. Comply with ACI 318, ACI 318M, ACI 301, and recommendations in ACI 347R for design, installation, and removal of shoring and reshoring.

B. Plan sequence of removal of shores and reshore to avoid damage to concrete. Locate and provide adequate reshoring to support construction without excessive stress or deflection.

3.6 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.

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.

1. Support slab reinforcing bars and welded wire fabric (WWF) as follows:

BAR SIZE	MAXIMUM DISTANCE BETWEEN SUPPORTS
#3	2 feet
#4	3 feet
#5	4 feet
#3 at 12" E.W.	4'-6" o.c. each way

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

E. Install welded wire fabric in longest practicable lengths on bar supports spaced to minimize sagging. Lap edges and ends of adjoining sheets at least one mesh spacing. Offset laps of adjoining sheet widths to prevent continuous laps in either direction. Lace overlaps with wire.

3.7 JOINTS

A. General: Construct joints true to line with faces perpendicular to surface plane of concrete.

B. Construction Joints: Install so strength and appearance of concrete are not impaired, at locations indicated or as approved by the State.

1. Place joints perpendicular to main reinforcement. Continue reinforcement across construction joints, unless otherwise indicated. Do not continue reinforcement through sides of strip placements of floors and slabs.

2. Use epoxy-bonding adhesive at locations where fresh concrete is placed against hardened or partially hardened concrete surfaces.

C. Contraction Joints in Slabs-on-Grade: Form weakened-plane contraction joints, sectioning concrete into areas as indicated. Construct contraction joints for a depth equal to at least one-fourth of concrete thickness, as follows:

1. Sawed joints: Form contraction joints with power saws equipped with shatterproof abrasive or diamond-rimmed blades. Cut 1/8" wide joints into concrete when cutting action will not tear, abrade, or otherwise damage surface and before concrete develops random contraction cracks.

D. Dowel Joints: Install dowel sleeves and dowels or dowel bar and support assemblies at joints where indicated.

1. Use dowel sleeves or lubricate or asphalt-coat one-half of dowel length to prevent concrete bonding to one side of joint.

3.8 CONCRETE PLACEMENT

A. Before placing concrete, verify that installation of formwork, reinforcement, and embedded items is complete and that required inspections have been performed. Provide one day notification to Engineer for each scheduled pour.

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

C. Convey concrete from mixer to the place of final deposit rapidly by methods that prevent segregation or loss of ingredients and will insure the required quality of concrete. Use conveying equipment, conveyors, hoppers, baffles, chutes, pumps that are sized and designed to prevent cold joints from occurring and prevent segregation in discharged concrete. Clean conveying equipment before each placement.

D. Deposit concrete continuously or in layers of such thickness that no new concrete will be placed on concrete that has hardened enough to cause seams or planes of weakness. If a section cannot be placed continuously, provide construction joints as specified. Deposit concrete to avoid segregation.

1. Deposit concrete in forms in horizontal layers of depth not to exceed formwork design pressures and in a manner to avoid inclined construction joints. Place each layer with proper consolidation into previous layers while preceding layer is still plastic, to avoid cold joints.

2. Consolidate placed concrete with mechanical vibrating equipment. Use equipment and procedures for consolidating concrete recommended by ACI 309R.

3. Do not use vibrators to transport concrete inside forms. Insert and withdraw vibrators vertically at uniformly spaced locations no farther than the visible effectiveness of the vibrator. Place vibrators to rapidly penetrate placed layer and

at least 6 inches into preceding layer. Do not insert vibrators into lower layers of concrete that have begun to lose plasticity. At each insertion, limit duration of vibration to time necessary to consolidate concrete and complete embedment of reinforcement and other embedded items without causing mix constituents to segregate.

E. Deposit and consolidate concrete for floors and slabs in a continuous operation, within limits of construction joints, until placement of a panel or section is complete.

1. Consolidate concrete during placement operations so concrete is thoroughly worked around reinforcement and other embedded items and into corners.

2. Maintain reinforcement in position on chairs during concrete placement.

3. Screed slab surfaces with a straightedge and strike off to correct elevations.

4. Slope surfaces uniformly to drains where required.

5. Begin initial floating using bull floats or darbies to form a uniform and open-textured surface plane, free of humps or hollows, before excess moisture or bleed-water appears on the surface. Do not further disturb slab surfaces before starting finishing operations.

F. Hot-Weather Placement: Place concrete according to recommendations in ACI 305R and as follows, when hot-weather conditions exist:

1. Cool ingredients before mixing to maintain concrete temperature below 90 degrees 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. Cover steel reinforcement with water-soaked burlap so steel temperature will not exceed ambient air temperature immediately before embedding in concrete.

3. Fog-spray forms, steel reinforcement, and subgrade just before placing concrete. Keep subgrade moisture uniform without standing water, soft spots, or dry areas.

3.9 CONCRETE SLABS-ON-GRADE

A. For all areas, unless specified elsewhere, place concrete floor slabs directly over granular fill and reinforce slabs as noted in the contract drawings. Provide isolation and contraction joints where detailed and, at intersections, corners and at abutments. Place contraction joints not more than 40 feet apart, unless detailed otherwise.

1. Finish concrete true to grade, section and cross slope for sloped or crowned walks at 1.5% (1% minimum and 2% maximum). Round edges to 1/8" radius except saw-cut joints. Finish steps in connection with walks with same finish as walks.

3.10 FINISHING FORMED SURFACES

A. Rough-Formed Finish: As-cast concrete texture imparted by form-facing material with tie holes and defective areas repaired and patched. Remove fins and other projections exceeding ACI 347R limits for class of surface specified.

B. Smooth-Formed Finish: As-cast concrete texture imparted by form-facing material, arranged in an orderly and symmetrical manner with a minimum of seams. Repair and patch tie holes and defective areas. Remove fins and other projections exceeding 1/8" in height.

1. Apply to concrete surfaces exposed to public view or to be covered with a coating or covering material applied directly to concrete, such as waterproofing, damp proofing, veneer plaster, or painting.

2. Do not apply rubbed finish to smooth-formed finish.

C. Related Unformed Surfaces: At countertops, benches, and similar unformed surfaces adjacent to formed surfaces, strike off smooth and finish with a texture matching adjacent formed surfaces. Continue final surface treatment of formed surfaces uniformly across adjacent unformed surfaces, unless otherwise indicated.

3.11 FINISHING FLOORS AND SLABS

A. General: Comply with recommendations in ACI 302.1R for screeding, restraightening, and finishing operations for concrete surfaces. Do not wet concrete surfaces.

B. Scratch Finish: While still plastic, texture concrete surface that has been screeded and bull-floated or darbied. Use stiff brushes, brooms, or rakes.

1. Apply scratch finish to surfaces indicated and to surfaces to receive concrete floor topping or mortar setting beds for ceramic or quart tile, Portland cement terrazzo, and other bonded cementitious floor finishes.

C. Float Finish: Consolidate surface with power-driven floats or by hand floating if area is small or inaccessible to power driven floats. Restraighten, cut down high spots, and fill low sports. Repeat float passes and restraightening until surface is left with a uniform, smooth, granular texture.

D. Trowel Finish: After applying float finish, apply first trowel finish and consolidate concrete by hand or power-driven trowel. Continue troweling passes and restraighten until surface is free of trowel marks and uniform in texture and appearance. Grind smooth any surface defects that would telegraph through applied coatings or floor coverings.

1. Apply a trowel finish to surfaces indicated and to floor and slab surfaces exposed to view or to be covered with resilient flooring, carpet, ceramic or quarry tile set over a cleavage membrane, paint, or another thin film-finish coating system.

2. Finish surfaces to the following tolerances, measured within 24 hours according to ASTM E 1155/E 1155M for a randomly trafficked floor surface.

   a. Specified overall values of flatness, F(F) 35; and levelness, F(L) 25; with minimum local values of flatness, F(F) 24; and levelness, F(L) 17; for slabs-on-grade.

3. Finish and measure surface so gap at any point between concrete surface and an unleveled freestanding 10-foot-long straightedge, resting on two high spots and placed anywhere on the surface, does not exceed the following:

   a. 1/8 inch.

E. Broom Finish: Apply a broom finish to exterior concrete platforms, walkways, steps, and ramps, and elsewhere as indicated.

1. Immediately after float finishing, slightly roughen trafficked surface by brooming with fiber-bristle broom perpendicular to main traffic route. Coordinate required final finish with Engineer before application.

F. Slip-Resistive Aggregates Finish: Before final floating, apply slip-resistive aggregate finish where indicated and to concrete stair treads, platforms, and ramps. Apply according to manufacturer's written instructions and as follows:

1. Uniformly spread 25 lb/100 sq ft of dampened slip-resistive aggregate over surface in one or 2 applications. Tamp aggregate flush with surface, but do not force below surface.

2. After broadcasting and tamping, apply float finish.

3. After curing, lightly work surface with a steel wire brush or an abrasive stone, and water to expose slip-resistive aggregate.

3.12 MISCELLANEOUS CONCRETE ITEMS

A. Filling In: Fill in holes and openings left in concrete structures, unless otherwise indicated, after work of other trades is in place. Mix, place, and cure concrete, as specified, to blend with in-place construction. Provide other miscellaneous concrete filling indicated or required to complete work..

B. Curbs: Provide monolithic finish to interior curbs by stripping forms while concrete is still green and by steel-troweling surfaces to a hard, dense finish with corners, intersections, and terminations slightly rounded.

C. Electrical Work: Use 3/4" maximum size of aggregates for duct encasement. Unless detailed otherwise, encase underground ducts or conduits as follows:

1. Provide 3 inches minimum concrete cover around ducts or conduits. Use spacers to place and hold ducts. Provide 18 inches minimum earth cover over top of concrete encasement unless otherwise detailed.

2. For future connections, provide a one foot section of ducts or conduits to extend beyond concrete encasement and terminate with a coupling or end cap.

3.13 CONCRETE PROTECTION 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 with recommendations in ACI 305R for hot-weather protection during curing.

B. Evaporation Retarder: Apply evaporation retarder to unformed concrete surfaces before and during finishing operations. Apply according to manufacturer's written instructions after placing, screeding, and bull floating or darbying concrete, but before float finishing.

C. Formed Surfaces: Cure formed concrete surfaces, including underside of beams, supported slabs, and other similar surfaces. If forms remain during curing period, moist cure after loosening forms. If removing forms before end of curing period, continue curing by one or a combination of the curing methods listed in paragraph 3.13.D.

D. Unformed Surfaces: Begin curing immediately after finishing concrete. Cure unformed surfaces, including floors and slabs, concrete floor toppings, and other surfaces, 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.

2. Moisture-retaining-cover curing: Cover concrete surfaces with moisture-retaining cover for curing concrete, placed in widest practicable width, with sides and ends lapped at least 12 inches, and sealed by waterproof tape or adhesive. Cure for not less than 7 days. Immediately repair any holes or tears during curing period using cover material and waterproof tape.

   a. Moist cure or use moisture-retaining covers to cure concrete surfaces to receive floor coverings.

   b. Moist cure or use moisture-retaining covers to cure concrete surfaces to receive penetrating liquid floor treatments.

c. Cure concrete surfaces to receive floor coverings with either a moisture-retaining cover or a curing compound that the manufacturer recommends for use with floor coverings.

3. Curing compound: Apply uniformly in continuous operation by spray or roller according to manufacturer's written instructions. Recoat areas subjected to heavy rainfall within three hours after initial application. Maintain continuity of coating and repair damage during curing period.

4. Curing and sealing compound: Apply uniformly to floors and slabs indicated in a continuous operation by spray or roller according to manufacturer's written instructions. Recoat areas subjected to heavy rainfall within three hours after initial application where recommended by the manufacturer. Repeat process 24 hours later and apply a second coat. Maintain continuity of coating and repair damage during curing period.

3.14 JOINT FILLING

A. Prepare, clean, and install joint filler according to manufacturer's written instructions. Defer joint filling as long as possible. Do not fill joints until construction traffic has permanently ceased.

B. Remove dirt, debris, saw cuttings, curing compounds, and sealers from joints; leave contact faces of joint clean and dry.

3.15 CONCRETE SURFACE REPAIRS

A. Defective Concrete: Repair and patch defective areas. Remove and replace concrete that cannot be repaired and patched to Engineer's approval.

B. Patching Mortar: Mix dry-pack patching mortar, consisting of one part Portland cement to two and one-half parts fine aggregate passing a No. 16 (1.2-mm) sieve, using only enough water for handling and placing.

C. Repairing Formed Surfaces: Surface defects include color and texture irregularities, cracks, spalls, air bubbles, honeycombs, rock pockets, fins and other projections on the surface, and stains and other discolorations that cannot be removed by cleaning.

1. Immediately after form removal, cut out honeycombs, rock pockets, and voids more than 1/2" in any dimension in solid concrete but not less than one inch in depth. Make edges of cuts perpendicular to concrete surface. Clean, dampen with water, and brush-coat holes and voids with bonding agent. Fill and compact with patching mortar before bonding agent has dried. Fill form-tie voids with patching mortar or cone plugs secured in place with bonding agent.

2. Repair defects on surfaces exposed to view by blending white Portland cement and standard Portland cement so that, when dry, patching mortar will match surrounding color. Patch a test area at inconspicuous locations to verify mixture

and color match before proceeding with patching. Compact mortar in place and strike off slightly higher than surrounding surface.

3. Repair defects on concealed formed surfaces that affect concrete's durability and structural performance as determined by Engineer.

D. Repairing Unformed Surfaces: Test unformed surfaces, such as floors and slabs, for finish and verify surface tolerances specified for each surface. Correct low and high areas. Test surfaces sloped to drain for trueness of slope and smoothness; use a sloped template.

1. Repair finished surfaces containing defects. Surface defects include spalls, popouts, honeycombs, rock pockets, crazing and cracks in excess of 0.01" wide or that penetrate to reinforcement or completely through unreinforced sections regardless of width, and other objectionable conditions.

2. After concrete has cured at least 14 days, correct high areas by grinding.

3. Correct localized low areas during or immediately after completing surface finishing operations by cutting out low areas and replacing with patching mortar. Finish repaired areas to blend into adjacent concrete.

4. Correct other low areas scheduled to receive floor coverings with a repair underlayment. Prepare, mix, and apply repair underlayment and primer according to manufacturer's written instructions to produce a smooth, uniform, plane, and level surface. Feather edges to match adjacent floor elevations.

5. Correct other low areas scheduled to remain exposed with a repair topping. Cut out low areas to ensure a minimum repair topping depth of 1/4" to match adjacent floor elevations. Prepare, mix, and apply repair topping and primer according to manufacturer's written instructions to produce a smooth, uniform, plane, and level surface.

6. Repair defective areas, except random cracks and single holes one-inch or less in diameter, by cutting out and replacing with fresh concrete. Remove defective areas with clean, square cuts and expose steel reinforcement with at least 3/4" clearance all around. Dampen concrete surfaces in contact with patching concrete and apply bonding agent. Mix patching concrete of same materials and mix as original concrete except without coarse aggregate. Place, compact, and finish to blend with adjacent finished concrete. Cure in same manner as adjacent concrete.

7. Repair random cracks and single holes one-inch or less in diameter with patching mortar. Groove top of cracks and cut out holes to sound concrete and clean off dust, dirt, and loose particles. Dampen cleaned concrete surfaces and apply bonding agent. Place patching mortar before bonding agent has dried. Compact patching mortar and finish to match adjacent concrete. Keep patched area continuously moist for at least 72 hours.

E. Perform structural repairs of concrete, subject to Engineer's approval, using epoxy adhesive and patching mortar.

F. Repair materials and installation not specified above may be used, subject to Engineer's approval.

3.16 FIELD QUALITY CONTROL

A. Testing: Contractor shall engage and pay for a qualified independent testing and inspecting agency to sample materials, perform tests, and submit test reports during concrete placement according to requirements specified in the paragraphs below.

B. Special Inspections: The Contractor shall engage and pay for a special inspector to perform inspections and prepare special inspection reports.

C. Special Inspection Items:

1. Steel reinforcement placement.

2. Steel reinforcement welding.

3. Headed bolts and studs.

4. Verification of use of required design mixture.

5. Concrete placement including conveying and depositing.

6. Curing procedures and maintenance of curing temperature.

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

1. Testing Frequency: Obtain one composite sample for each day's pour of each concrete mix exceeding 5 cubic yards (4 cubic meters), but less than 25 cubic yards (19 cubic meter), plus one set for each additional 50 cubic yard (38 cubic meter) or fraction thereof.

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

3. Air Content: ASTM C 231, pressure method, for normal-weight concrete; ASTM C 173, volumetric method, for structural lightweight concrete; one test for each composite sample, but not less than one test for each day's pour of each concrete mix.

4. Concrete Temperature: ASTM C 1064; one test hourly when air temperature is 40 degrees Fahrenheit and below and when 80 degrees Fahrenheit and above, and one test for each composite sample.

5. Compression Test Specimens: ASTM C 31; cast and laboratory cure one set of 4 standard cylinder specimens for each composite sample. Cast and field cure one set of 4 standard cylinder specimens for each composite sample.

6. Compressive-Strength Tests: ASTM C 39; test 2 laboratory-cured specimens at 7 days and 2 at 28 days.

   a. Test 2 field-cured specimens at 7 days and 2 at 28 days.

   b. A compressive-strength test shall be the average compressive strength from 2 specimens obtained from same composite sample and tested at age indicated.

E. 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..

F. Strength of each concrete mix will be satisfactory if every average of any 3-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.

G. Test results shall be reported in writing to the 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 mix proportions and materials, compressive breaking strength, and type of break for both 7- and 28-day tests.

H. Nondestructive Testing: Impact hammer, sonoscope, or other nondestructive device may be permitted by the Engineer but will not be used as sole basis for approval or rejection of concrete.

I. Moisture Vapor Emission Test: Standard test method meeting ASTM F 1869.

J. Alkalinity (pH Level) Testing: Standard test required for floor slabs and all wall and ceiling surfaces to receive painted finishes. Testing of concrete to receive paint finish may be conducted under Section 09900 – PAINTS AND COATINGS.

K. 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 or by other methods as directed by the State.

END OF SECTION

SECTION 04700

SIMULATED STONE

PART 1 - GENERAL

1.1 GENERAL REQUIREMENTS

A. The work to be performed under this section shall include furnishing all labor, materials and equipment necessary for the installation of manufactured stone veneer.

B. Related Work

1. Section 03300 – CAST-IN-PLACE CONCRETE

2. Section 07920 – JOINT SEALANTS

1.2 REFERENCES

A. ASTM International:

1. ASTM C 39 – Standard Test Method for Compressive Strength of Cylindrical Concrete Specimens.

2. ASTM C 177 – Standard Test method for Steady-State Heat Flux Measurements and Thermal Transmission Properties by Means of the Guarded-Hot-Plate-Apparatus.

3. ASTM C 192 – Standard Practice for Making and Curing Concrete Test Specimens in the Laboratory.

4. ASTM C 270 – Standard Specification for Mortar for Unit Masonry.

1.3 PERFORMANCE

A. ICC Compliance: All manufactured masonry installed will meet or exceed the requirements of ICC Acceptance Criteria AC51.

1. UBC 26.10, I &IV Compressive Strength: 1,800 psi Av @ 28 days

2. UBC 26.10, I & IV Compressive Strength: 1,800 psi Av @ 27 days

3. Fire Rating: Showed Zero Flame Spread and Zero Smoke Development.

4. ASTM-C67.83 Freeze/Thaw Characteristics: Less Than1%

5. Material Thickness: Average Approximately 2 Inches in Thickness.

6. ASTM.C482 Exceeds Req. by UBC Shear (Adhesion) Strength: >250 psi

7. ASTM.C190 Tensile Strength: 600 psi

8. ASTM.C177-71 Thermal Resistance: R=1.24 W/Lightweight Volcanic Aggregate.

9. UBC No.32.12 Water Absorption: 13%- 15%

B. Design Qualifications: Total wall system will be designed to withstand wind, seismic and structural loading as required by all code bodies having jurisdiction.

1.4 SUBMITTALS

A. Submit under provisions of Section 01300 – Submittals.

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

1. Preparation instructions and recommendations.

2. Storage and handling requirements and recommendations.

3. Installation methods.

C. Detail Drawings: Submit detail drawings depicting proper installation and flashing techniques where required. Coordinate locations with those found on the Contract Drawings.

D. Selection Samples: For each product specified, two (2) samples representing manufacturer's product including textures and colors.

E. Verification Samples: For each finish product specified, two samples, minimum size 12-inches (305mm) square that depict the specified product, color, pattern and texture.

F. Quality Assurance / Product Control Submittals

1. Proof of manufacturer qualifications as described in Article – Quality Assurance.

2. Proof of installer qualifications as described in Article – Quality Assurance.

3. Certification of compliance with all code bodies having jurisdiction.

4. Test Reports for physical properties.

G. Closeout Submittals

1. Maintenance Instructions.

2. Manufacturer's Limited Warranty.

1.5 QUALITY ASSURANCE

A. Manufacturer Qualifications

1. Single manufacturer with at least five (5) years' experience manufacturing and installing the manufactured stone veneer.

B. Installer Qualifications

1. Company with documented experience in installation of the manufactured stone veneer including at least five (5) projects within a 400-mile (650km) radius of project.

C. Mock-Up

1. Provide a mock-up for evaluation of surface preparation techniques and application workmanship.

a. Installation areas to be designated by Engineer and/or others with approval authority.

b. Selected areas may be part of area to receive stone finish.

c. Do not proceed with remaining work until workmanship, color, laying pattern and grout are approved by Engineer and/or others with approval authority.

1.6 DELIVERY, STORAGE AND HANDLING

A. Store products in manufacturer's unopened packaging until ready for installation.

B. Prior to installation protect material from precipitation combined with freezing temperatures. Product with visible frozen moisture should not be installed.

1.7 PROJECT CONDITIONS

A. Maintain environmental conditions (temperature, humidity, and ventilation) within limits recommended by manufacturer for optimum results. Do not install products under environmental conditions outside manufacturer's absolute limits.

1.8 WARRANTY

A. At project close-out, provide to the Owner an executed copy of the manufacturer's standard limited warranty against defects in manufacturing.

1. Duration: 50 years product warranty following date of Final Acceptance.

PART 2 - PRODUCTS

2.1 MANUFACTURER

A. Basis-of-Design Product: Big Rock Fabricators, or approved substitute.

1050 Kikowaena Place, Honolulu, Hawaii 96819
Phone: 808 834-7625; Toll Free: 866-344-7625
Email: info@bigrockhawaii.com
Web: www.bigrockhawaii.com

2.2 BIG ROCK MANUFATURED STONE VENEER VARIETIES

A. BIG ROCK Ocean Reef Coral Veneer

Pattern	Random
Stone Sizes	Variable sizes 12” by 16” to 16” by 24”
Corner Sizes	Variable - 6” to 12" heights with 3” to 10" lengths
Average Thickness	1.75” to 2”
Color	Ocean Reef Coral Cream

B. BIG ROCK Moss Rock Veneer

Pattern	Random
Stone Sizes	Variable sizes 10” x 12” to 18” to 24” +
Corner Sizes	6” to 12” to 18” heights, with 3” to 10” lengths
Average Thickness	1.75” to 2”
Color	Moss Rock Brown

C. BIG ROCK Old Flow Lava Veneer

Pattern	Random
Stone Sizes	Variable sizes 10” x 12” to 18” to 24” +
Corner Sizes	6” to 12” to 18” heights, with 3” to 10” lengths
Average Thickness	1.75” to 2”
Color	Lava Charcoal Black

D. BIG ROCK Ulupalakua Veneer

Pattern	Random
Stone Sizes	Variable sizes 6” x 8” to 12” x 18” +
Corner Sizes	6” to 12” to 18” heights, with 3” to 10” lengths
Average Thickness	2” to 3.5” to 4”
Color	Dark Rust, Brown, Black

E. BIG Pahoehoe Lava Veneer

Pattern	Random
Stone Sizes	Variable sizes 10” x 12” to 18” to 24” +
Corner Sizes	6” to 12” to 18” heights, with 3” to 10” lengths
Average Thickness	1.75” to 2”
Color	Lava Black

F. BIG ROCK Blue Rock Veneer

Pattern	Random

Stone Sizes	Variable sizes 8” x 12” to 18”
Corner Sizes	6” to 12” to 18” heights, with 3” to 10” lengths
Average Thickness	1.75” to 2”
Color	Gray, Black, Rust

2.3 MORTAR

A. Complying with: ASTM C 270.

B. Mortar Mix 4

Type	S Mortar
2 Sacks	Portland Cement
1 Bag	Easy Spread Additive (7 lb.)
9 Cu. Ft.	Mortar Aggregate

C. Mortar Mix 5

Type	S Mortar
1 Sack	Portland Cement
3 Ounces	M.R.F. Additives
to 3 cu ft	Mortar Aggregate

D. Big Rock Mortar Mix (Homeowner Use)

(Coverage 25 sq. ft. area. Refer to Manufacturer’s Retail Instructions.)
½ - 75lb Sack – Masonry Cement (Ultra Mortar)
2 Bags Basalt Masonry Sand (0.5 cu ft at 60 lb.)
Water: Clean and Potable
Mortar Color if desired. (See Below)

E. Optional Mortar Mix

Iron Oxide Pigments: ASTM C 979;
Color: Big Rock Moss Rock of Big Rock Lava
One ½ lb. bag of pre-measured bag iron oxide pigment, used to match mortar color to veneer type.

2.4 ADDITIONAL MATERIALS

A. Wall Underlayment

1. Grade D Kraft waterproof building paper, UBC Standard No. 14-1.

2. Asphalt Saturated Felt meeting or exceeding the requirements of ASTM D 226 Type I.

3. Weather Resistant Barrier meeting the requirements of ICC-ES AC-38.

B. Metal Flashing

1. 24-gauge galvanized steel; ASTM A 653.

C. Metal Lath: Diamond patterned steel mesh meeting or exceeding the requirements of ASTM C 847. Minimum 2.5 lb./sq. yd (1.37 kg/sq. m)

2.5 FIELD FABRICATION

A. Walls: Single Color and Texture throughout.

B. 90 Degree Outside Corners

1. Big Rock Corner Pieces: Corner Stones are manufactured specifically for installation at outside corners. Color to match stones specified.

C. Mortar Joints

1. Tight Fit joints, unless otherwise specified.

D. Windows, Doors, and Wall Openings

1. Butt field stones to wall opening.

2. Sills: Install Sills where located on the Contract Drawings.

E. Caps: Install Capstones where located on the Contract Drawings.

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 Engineer or Owner's representative of unsatisfactory preparation before proceeding.

3.2 SUBSTRATE PREPARATION

A. Prepare surfaces using the methods recommended by the manufacturer for achieving the best result for the substrate under the project conditions.

B. Retaining walls must be adequately sealed before applying the veneer.

C. Inspect metal flashings at all terminations, penetrations, and transitions. Install where damaged or missing.

3.3 INSTALLATION

A. Install in accordance with manufacturer's current application requirements.

B. Keep surfaces moist while installing.

C. Poorly attached stones are considered defective work. After set-up, inspect wall for loose stones. Remove and properly replace prior to project close-out.

D. Seal all joints at wall openings and penetrations with a sealant approved for use with masonry products, if used in or near chlorinated water applications.

3.4 PROTECTION

A. Protect finished work from rain and work on either side of the wall during and for 48 hours following installation.

B. Protect installed products until completion of project. Clean prior to project closeout.

C. Touch-up, repair or replace damaged products, broken edges, before Substantial Completion.

END OF SECTION

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SECTION 06070

WOOD TREATMENT

PART 1 - GENERAL

1.1 GENERAL REQUIREMENTS

A. Plant preservative and insecticide treatment of lumber and other wood products specified in other Sections of this Specification by pressure and dip methods.

B. Field treatment of field cut or drilled lumber.

C. Related Work

1. Section 06100 – ROUGH CARPENTRY

2. Section 06200 – FINISH CARPENTRY

3. Section 09900 – PAINTS AND COATINGS

1.2 REFERENCES

A. American Wood-Preservers' Association

1. AWPA C2-00: Lumber, Timber, Bridge Ties and Mine Ties-Preservative Treatment by Pressure Processes.

2. AWPA C9-00: Plywood-Preservative Treatment by Pressure Processes.

3. AWPA C31-00: Lumber Used out of Contact with the Ground and Continuously Protected from Liquid Water-Treatment by Pressure Processes.

4. AWPA M4-01: Care of Preservative-Treated Wood Products.

5. AWPA C20-99: Structural Lumber- Fire Retardant Treatment by Pressure Process.

6. AWPA N1-01: All millwork, Preservative Treatment by Non-Pressure Process.

7. AWPA N2-00: Composite Wood Products, Preservative Treatment by Non-Pressure Process.

1.3 SUBMITTALS

A. Submit in accordance with Section 01300 – Submittals.

B. Product Data: Provide data on all treatment products, including field application instructions if applicable.

1. Provide manufacturer’s Material Safety Data Sheets on all products, and hazardous materials.

C. Preserver Certifications:

1. Provide a Certificate of Treatment showing compliance with these specifications for the following:

a. Kiln drying

b. Method of treatment performed, including dip treatment.

D. Contractor's Certification: Provide a certification letter stating that all wood used on this job including cuts and penetration were treated and coated with preservatives in compliance with requirements of this contract.

E. Guarantee: Guarantee form for written guarantee.

1.4 REGULATORY REQUIREMENTS

A. Comply with State OSHL (Occupancy Safety and Health Law) and pollution controls regulations of the State Department of Health and EPA.

1.5 QUALITY ASSURANCE

A. Source Limitations for Treated Wood: Obtain treated wood product through one source from a single producer.

B. Comply with the American Wood-Preservers' Association standards as described in the applicable building or residential code. Preservatives shall be EPA registered.

C. Do not use preservatives containing arsenic or other EPA banned chemicals.

D. Do not use Perma-Clear 65 or other zinc naphthenate and permethrin products.

1.6 DELIVERY STORAGE AND HANDLING

A. Protect AWPA C31 inorganic boron treated wood from contact with the ground, rain or other sources of liquid water until permanent installation of covering construction.

1.7 GUARANTEE

A. Provide a two-year guarantee to replace all treated wood which is attacked by subterranean termites.

B. Provide a five-year guarantee to replace all treated wood which is attacked by dry wood termites or deteriorates due to dry rot. This guarantee period supersedes the guarantee provisions of the Interim General Conditions (IGC). The Surety shall not be held liable beyond two years of the project acceptance date.

C. Guarantee periods shall commence on Project Acceptance date.

PART 2 - PRODUCTS

2.1 GENERAL

A. Mill lumber to finish size and shape prior to treating and treat before assembly. Plywood may be treated in regular panel sizes.

B. Mark each treated item with the treatment quality mark of an inspection agency approved by the American Lumber Standards Committee Board of Review.

2.2 PRESSURE TREATMENT WITH WATER-BORNE PRESERVATIVES

A. Treating solutions

1. Copper azole, Type A (CBA-A).

2. Inorganic boron (SBX).

B. Treatment Methods

1. General

a. All water-borne treatment methods require incising of lumber of nominal 2-inch thickness (1-1/2 inches actual dimension).

b. Choice of treatment method and conditions of use of each treating solution shall conform to the treatment schedule contained in Part 3 of this Section.

2. CBA-A: Treatment methods, depth of penetration and treating solution retention shall conform to AWPA C2 for lumber and C9 for plywood.

3. SBX: Treatment method shall conform to AWPA C31. Treating solution retention shall be a minimum of 0.28 pounds per cubic foot (equivalent to 0.42 DOT).

C. Drying

1. Before Treatment

a. CBA-A Treatment: Wood shall be air dried or kiln-dried before treatment to an average moisture content of 28 percent or less per AWPA standards.

b. SBX Treatment: Wood having a moisture content higher than 28% is acceptable when treating with SBX.

2. After Treatment:

a. All 1 inch and 2-inch lumber and all plywood shall be dried to a moisture content of 19 percent or less after treatment.

2.3 PRESERVATION BY DIP TREATMENT

A. Treating Solution

1. Any of the Oil-Borne Preservatives listed above.

2. A solution of 1-quart chlorpyrifos in 55 gallons of a 0.50 percent IPBC solution.

B. Treatment Methods

1. Immersion-treat for a minimum period of 15 minutes.

2. Do not incise lumber scheduled to be left unpainted or receive a clear finish.

C. Drying

1. After Treatment: Wood shall be thoroughly dried and virtually odor-free prior to installation.

2.4 FIELD TREATMENT

A. Treatment Method

1. Treat in accordance with AWPA Standard M4-98 using two heavy brush coats of a treating solution.

PART 3 - EXECUTION

3.1 SCHEDULE OF TREATMENTS

A. Species

1. Treat all wood species except all-heart redwood.

2. All water-borne and oil-borne treatment solutions are applicable to Douglas-fir and hem-fir species except for CBA-A treatment which is acceptable for hem-fir species only.

B. Application

1. Pressure Treatment:

a. General: Unless otherwise stipulated, all lumber shall be pressure treated.

b. SBX treated wood shall not be used in areas exposed to direct precipitation (e.g. exposed decking, trellises, fencing, etc.) unless painted or covered with a finish material.

2. Dip Treatment: All finish lumber under 1-1/2-inch net thickness (except hardwood flooring); finish plywood; and mill work items, such as for cabinet work, shelving and similar woodwork that will be exposed to view in the finished work.

3. Field Cuts: Treat end cuts, notches and penetrations into treated lumber or plywood. Exception: Cuts and penetrations made in SBX treated wood 2 inches or less in nominal thickness need not be field treated.

END OF SECTION

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SECTION 06100

ROUGH CARPENTRY

PART 1 - GENERAL

1.1 GENERAL REQUIREMENTS

Furnish all labor, materials and equipment necessary for framing with dimension lumber, framing with timber, and wood blocking and nailers as indicated on the drawings and as specified herein.

1.2 DEFINITIONS

A. Dimension Lumber: Lumber of 2 inches nominal size or greater but less than 5 inches nominal size in least dimension.

B. Exposed Framing: Framing not concealed by other construction.

C. Timber: Lumber of 5 inches nominal size or greater in least dimension.

1.3 SUBMITTALS

A. Submit in accordance with Section 01300 – SUBMITTALS.

B. Product Data: For each type of process and factory-fabricated product. Indicate component materials and dimensions and include construction and application details.

1. Include data for wood-preservative treatment from chemical treatment manufacturer and certification by treating plant that treated materials comply with requirements. Indicate type of preservative used and net amount of preservative retained.

2. For products receiving a waterborne treatment, include statement that moisture content of treated materials was reduced to levels specified before shipment to Project site.

C. Product Certificates: For dimension lumber specified to comply with minimum allowable unit stresses. Indicate species and grade selected for each use and design values approved by the ALSC Board of Review.

D. Evaluation Reports: For the following, from ICC-ES.

1. Wood-preservative-treated wood.

2. Power-driven fasteners.

3. Metal framing anchors.

1.4 DELIVERY, STORAGE, AND HANDLING

A. Stack wood products flat with spacers beneath and between each bundle to provide air circulation. Protect wood products from weather by covering with waterproof sheeting, securely anchored. Provide for air circulation around stacks and under coverings.

PART 2 – PRODUCTS

2.1 WOOD PRODUCTS, GENERAL

A. Lumber: DOC PS 20 and applicable rules of grading agencies indicated. If no grading agency is indicated, comply with the applicable rules of any rules-writing agency certified by the ALSC Board of Review. Grade lumber by an agency certified by the ALSC Board of Review to inspect and grade lumber under the rules indicated.

1. Factory mark each piece of lumber with grade stamp of grading agency.

2. Dress lumber, S4S, unless otherwise indicated.

B. Maximum Moisture Content of Lumber: 19 percent unless otherwise indicated.

2.2 WOOD-PRESERVATIVE-TREATED LUMBER

A. Preservative Treatment by Pressure Process: AWPA U1; Use Category UC2 for interior construction not in contact with ground, Use Category UC3b for exterior construction not in contact with ground, and Use Category UC4a for items in contact with ground.

1. Preservative Chemicals: Acceptable to authorities having jurisdiction and containing no arsenic or chromium. Do not use inorganic boron (SBX) for sill plates.

2. For exposed items indicated to receive a stained or natural finish, chemical formulations shall not require incising, contain colorants, bleed through, or otherwise adversely affect finishes.

B. Kiln-dry lumber after treatment to a maximum moisture content of 19 percent. Do not use material that is warped or that does not comply with requirements for untreated material.

C. Mark lumber with treatment quality mark of an inspection agency approved by the ALSC Board of Review.

D. Application: Treat all rough carpentry unless otherwise indicated. Insert other items that require treatment but are not likely to be indicated on Drawings.

2.3 DIMENSION LUMBER FRAMING

A. Rafters: No. 2 grade.

1. Species: Douglas fir-larch; WCLIB or WWPA.

B. Posts and Beams: No. 1 grade.

1. Species: Douglas fir-larch; WCLIB or WWPA.

C. All Other Framing Not Listed Above: No. 2 grade.

1. Species: Douglas fir-larch; WCLIB or WWPA.

2.4 TIMBER FRAMING

A. Comply with the following requirements, according to grading rules of grading agency indicated:

1. Species and Grade: Douglas fir-larch, No. 1 grade; NLGA, WCLIB, or WWPA.

2. Additional Restriction: Free of heart centers.

2.5 MISCELLANEOUS LUMBER

A. General: Provide miscellaneous lumber indicated and lumber for support or attachment of other construction, including the following:

1. Blocking.

2. Nailers.

B. Dimension Lumber Items: No. 2 grade lumber of the following species:

1. Douglas fir-larch; WCLIB or WWPA.

C. For blocking and nailers used for attachment of other construction, select and cut lumber to eliminate knots and other defects that will interfere with attachment of other work.

2.6 FASTENERS

A. General: Fasteners shall be of size and type indicated and shall comply with requirements specified in this article for material and manufacture.

1. Provide fasteners of Type 316 stainless steel unless otherwise noted.

B. Nails: Type 304 Stainless Steel.

C. Wood Screws and Lag Screws: Type 316 stainless steel.

D. Post-Installed Anchors: Fastener systems with an evaluation report acceptable to authorities having jurisdiction, based on ICC-ES AC58 or ICC-ES AC308 as appropriate for the substrate.

1. Material: Stainless steel with bolts and nuts complying with ASTM F 593 and ASTM F 594, Alloy Group 1 or 2.

2.7 METAL FRAMING ANCHORS

A. Manufacturers: Subject to compliance with requirements, provide products by the following:

1. Simpson Strong-Tie Co., Inc.

B. Allowable design loads, as published by manufacturer, shall meet or exceed those of products of manufacturers listed. Manufacturer's published values shall be determined from empirical data or by rational engineering analysis and demonstrated by comprehensive testing performed by a qualified independent testing agency. Framing anchors shall be punched for fasteners adequate to withstand same loads as framing anchors.

C. Stainless-Steel Sheet: ASTM A 666, Type 316.

1. Use for interior locations unless otherwise indicated.

PART 3 - EXECUTION

3.1 INSTALLATION, GENERAL

A. Framing Standard: Comply with AF&PA's WCD 1, "Details for Conventional Wood Frame Construction," unless otherwise indicated.

B. Set rough carpentry to required levels and lines, with members plumb, true to line, cut, and fitted. Fit rough carpentry accurately to other construction. Locate nailers, blocking, and similar supports to comply with requirements for attaching other construction.

C. Install metal framing anchors to comply with manufacturer's written instructions. Install fasteners through each fastener hole.

D. Install sill sealer gasket to form continuous seal between sill plates and foundation walls.

E. Do not splice structural members between supports unless otherwise indicated.

F. Provide blocking and framing as indicated and as required to support facing materials, fixtures, specialty items, and trim.

1. Provide metal clips for fastening gypsum board or lath at corners and intersections where framing or blocking does not provide a surface for fastening edges of panels. Space clips not more than 16 inches on centers.

G. Sort and select lumber so that natural characteristics do not interfere with installation or with fastening other materials to lumber. Do not use materials with defects that interfere with function of member or pieces that are too small to use with minimum number of joints or optimum joint arrangement.

H. Comply with AWPA M4 for applying field treatment to cut surfaces of preservative-treated lumber.

1. Use inorganic boron for items that are continuously protected from liquid water.

2. Use copper naphthenate for items not continuously protected from liquid water.

I. Securely attach rough carpentry work to substrate by anchoring and fastening as indicated, complying with the following:

1. Table 2304.10.1, "Fastening Schedule," in ICC's International Building Code (IBC).

2. ICC-ES evaluation report for fastener.

J. Use steel common nails unless otherwise indicated. Select fasteners of size that will not fully penetrate members where opposite side will be exposed to view or will receive finish materials. Make tight connections between members. Install fasteners without splitting wood. Drive nails snug but do not countersink nail heads unless otherwise indicated.

K. For exposed work, arrange fasteners in straight rows parallel with edges of members, with fasteners evenly spaced, and with adjacent rows staggered.

1. Comply with indicated fastener patterns where applicable.

2. Use common nails unless otherwise indicated. Drive nails snug but do not countersink nail heads.

3.2 RAFTER FRAMING INSTALLATION

A. Rafters: Notch to fit exterior wall plates and use metal framing anchors. Double rafters to form headers and trimmers at openings in roof framing, if any, and support with metal hangers. Where rafters abut at ridge, place directly opposite each other and nail to ridge member or use metal ridge hangers.

1. At valleys, provide double-valley rafters of size indicated or, if not indicated, of same thickness as regular rafters and 2 inches deeper. Bevel ends of jack rafters for full bearing against valley rafters.

2. At hips, provide hip rafter of size indicated or, if not indicated, of same thickness as regular rafters and 2 inches deeper. Bevel ends of jack rafters for full bearing against hip rafter.

B. Provide special framing as indicated for eaves, overhangs, dormers, and similar conditions, if any.

3.3 TIMBER FRAMING INSTALLATION

A. Install timber beams with crown edge up and provide not less than 4 inches of bearing on supports. Provide continuous members unless otherwise indicated; tie together over supports as indicated if not continuous.

B. Where beams are framed into pockets of exterior concrete or masonry walls, provide 1/2-inch airspace at sides and ends of wood members.

C. Install wood posts using metal anchors indicated.

D. Treat ends of timber beams and posts exposed to weather by dipping in water-repellent preservative for 15 minutes.

3.4 WOOD BLOCKING, AND NAILER INSTALLATION

A. Install where indicated and where required for attaching other work. Form to shapes indicated and cut as required for true line and level of attached work. Coordinate locations with other work involved.

B. Attach items to substrates to support applied loading. Recess bolts and nuts flush with surfaces unless otherwise indicated.

C. Provide permanent grounds of dressed, pressure-preservative-treated, key-beveled lumber not less than 1-1/2 inches wide and of thickness required to bring face of ground to exact thickness of finish material. Remove temporary grounds when no longer required.

3.5 PROTECTION

A. Protect wood that has been treated with inorganic boron (SBX) from weather. If, despite protection, inorganic boron-treated wood becomes wet, apply EPA-registered borate treatment. Apply borate solution by spraying to comply with EPA-registered label.

B. Protect rough carpentry from weather. If, despite protection, rough carpentry becomes wet, apply EPA-registered borate treatment. Apply borate solution by spraying to comply with EPA-registered label.

END OF SECTION

SECTION 06200

FINISH CARPENTRY

PART 1 - GENERAL

1.1 GENERAL REQUIREMENTS

A. Provide all finish carpentry work as indicated on the drawings, complete, including, but not limited to, the following items.

1. Exterior finish carpentry such as fascia's, trims and bands.

2. Miscellaneous material carpentry.

3. Any other items specified to be installed under this section but furnished under other sections of these specifications.

B. Related Work

1. Section 06100 – ROUGH CARPENTRY

2. Section 07920 – JOING SEALANTS

3. Section 09900 – PAINTS AND COATINGS

1.2 SUBMITTALS

A. Submit in accordance with Section 01300 – Submittals.

B. Shop Drawings: Submit shop drawings showing location of each item, dimensioned plans and elevations. Submit shop drawings for the following:

1. Identify locations of finish carpentry members, including sizes and thicknesses on the dimensioned plans and elevations.

2. Complete shop drawings shall be submitted in a single submittal for this spec section. No partial submittal will be reviewed. Cost of detailing, including correspondence on resolution of requests for information (RFI), shall not be considered incidental to the work in this section and will not be considered for separate payment.

3. Shop drawings shall not be submitted as correspondence for resolution of requests for information (RFI's) or requests for changes in details indicated in the construction documents. All such requests shall be submitted in writing in advance of the shop drawing submission for review and evaluation

C. Samples: Submit materials samples if requested by the Architect or Owner's Representative.

D. Certificate of Qualification: Submit certificate verifying the qualification of the manufacturer.

1.3 QUALITY ASSURANCE

A. Grading Marks: Factory mark each piece of lumber and plywood with type, grade, mill, and grading agency identification. Certificate of inspection and grading by a recognized agency may be submitted with each shipment in lieu of factory marking, at Contractor's option.

B. AWI Quality Standard: Comply with applicable requirements of "Architectural Woodwork Quality Standards" published by Architectural Woodwork Institute (AWI) except as otherwise indicated.

C. Qualified Manufacturer: Manufacturer experienced in producing carpentry work similar to that indicated for this Project and with a record of successful in-service performance, as well as sufficient production capacity to produce required units.

1.4 PRODUCT DELIVERY, STORAGE AND HANDLING

A. Protect finish carpentry materials during transit, delivery, storage and handling to prevent damage, soiling and deterioration.

B. Do not deliver finish carpentry materials until the building is ready to receive the materials for installation and when painting, wet work, grinding and similar operations which could damage, soil or deteriorate carpentry work have been completed in installation areas. If, due to unforeseen circumstances, finish carpentry materials must be stored in other than installation areas, store only in areas meeting requirements specified for installation areas.

PART 2 - PRODUCTS

2.1 WOOD PRODUCT QUALITY STANDARDS

A. Softwood Lumber Standards: Comply with DOC PS 20 and with applicable grading rules of the respective grading and inspection agency for the species and product indicated.

B. Hardwood Lumber Standard: Comply with National Hardwood Lumber Assoc., (NHLA) rules.

C. Plywood Standards: Comply with DOC PS 1 for softwood plywood and HPVA HP-1 for hardwood plywood.

2.2 MATERIALS

A. General

1. Lumber Sizes: Nominal sizes are indicated, except as shown by detailed dimensions. Provide dressed or worked and dressed lumber, as applicable, manufactured to the

actual sizes as required by PS 20 or to actual sizes and pattern as shown, unless otherwise indicated.

2. Moisture Content of Softwood Lumber: Provide kiln-dried lumber having a moisture content from the manufacture until time of installation not greater than values required by the applicable grading rules of the respective grading and inspecting agency for the species and product indicated.

3. Moisture Content of Hardwood Lumber: Provide kiln-dried lumber having a moisture content from time of manufacture until time of installation within a range of 8% to 13% for individual pieces, and an average of 11% for the entire lot.

4. Particleboard, flakeboard, or fiberboard shall not be used for any cabinet component.

B. Exterior Finish Carpentry: Fascias, trims and similar: Douglas Fir, WCLIB, Grade "C & BTR" for paint finish. Plywood closure pieces: Douglas Fir Grade A-C where only one face is exposed.

C. Miscellaneous Materials

1. Hardboard: U.S. Dept. of Commerce PS-58, tempered.

2. Fasteners and Anchorages: Provide nails, screws and other anchoring devices of the proper type, size, material and finish for application indicated to provide secure attachment, concealed where possible, and complying with applicable Federal Specifications.

a. Provide all concealed fasteners and anchorages with a hot-dipped zinc coating (ASTM A 153/A 153M).

b. Provide finish nails and screws with bright plated finish.

c. Coat all exposed fasteners with primer before painting.

3. Moisture Barrier: Provide where indicated, asphalt-saturated roofing felt, ASTM D 226 Type II, No. 30.

2.3 FABRICATION

A. General: Millwork and casework shall be fabricated at the mill in accordance with detailed drawings, in as large units as practicable for shipment and introduction into permanent position in an orderly arrangement for neat and rigid field assembly. All units when erected in place shall be straight, square, plumb, level and free from damage and tool marks; all units shall be belt-sanded at mill and hand-sanded smooth immediately following installation in place. All joints shall be made up with waterproof glue. Nails and screws shall be placed in concealed surfaces to the maximum extent possible.

B. Wood Treatment: Treat all finish carpentry lumber in accordance with Section 06070 - Wood Treatment.

PART 3 - EXECUTION

3.1 INSTALLATION

A. Discard units of material which are unsound, warped, bowed, twisted, improperly treated, not adequately seasoned or too small to fabricate work with minimum of joints or optimum jointing arrangements, or which are of defective manufacturer with respect to surfaces, sizes or patterns.

B. Install the work plumb, level, true and straight with no distortions. Shim as required using concealed shims. Install to a tolerance of 1/8-inch in 8-feet for plumb and level countertops; and with 1/16" maximum offset in flush adjoining 1/8-inch maximum offsets in revealed adjoining surfaces.

C. Scribe and cut work to fit adjoining work and refinish cut surfaces or repair damaged finished at cuts.

D. Install standing and running trims with minimum number of joints possible, using full-length pieces (from maximum lengths of lumber available) to the greatest extent possible. Stagger joints in adjacent and related members. Cope at returns, miter at corners, to produce tight fitting joints with full surface contact throughout length of joint. Use scarf joints for end-to-end joints.

E. Anchor finish carpentry work to anchorage devices or blocking built-in or directly attached to substrates. Secure to grounds, stripping and blocking with countersunk, concealed fasteners and where prefinished matching fasteners heads are required, use fine finishing nail for exposed nailing, countersunk and filled flush with finished surface.

F. Kerf backs of exterior standing and running trims wider than 5-inches.

G. Prior to installation, prime paint lumber for exterior applications to be painted, including both faces and edges.

3.2 ADJUSTMENT, CLEANING, FINISHING AND PROTECTION

A. Repair damaged and defective finish carpentry to eliminate defects functionally and visually; where not possible to repair properly, replace the carpentry. Adjust joinery for uniform appearance. Clean all surfaces.

B. Protection: Protect finish carpentry during remainder of construction period to ensure that work will be without damage or deterioration at time of acceptance.

END OF SECTION

SECTION 07410

METAL ROOFING

PART 1 - GENERAL

1.1 GENERAL REQUIREMENTS

A. The work to be performed under this section shall include furnishing all labor, materials and equipment necessary for the installation of the following:

1. Exposed-fastener, lap-seam metal roof panels.

2. Corrugated metal roof panels.

B. Related Work

1. Section 06100 – ROUGH CARPENTRY

2. Section 06200 – FINISH CARPENTRY

3. Section 09900 – PAINTS AND COATINGS

1.2 REFERENCES

A. American Society for Testing and Materials (ASTM): ASTM B209 – Specification for Aluminum and Aluminum-Alloy Sheet and Plate.

B. Sheet Metal and Air Conditioning Contractors National Association (SMACNA): SMACNA Architectural Sheet Metal Manual.

1.3 SYSTEM DESCRIPTION

A. Performance Requirements: Provide metal roofing that has been manufactured, fabricated and installed to withstand structural and thermal movement, wind loading and weather exposure to maintain manufacturer's performance criteria without defects, damage, failure of infiltration of water.

1.4 QUALITY ASSURANCE

A. Installer Qualifications: Installer experienced in performing work of this section who has specialized in the installation of work similar to that required for this project.

B. Sheet Metal Industry Standard: Comply with Sheet Metal and Air Conditioning Contractors National Association (SMACNA) Architectural Sheet Metal Manual.

C. Pre-Installation Meetings: Conduct pre-installation meeting to verify projects requirements, substrate conditions, Manufacturer's installation instructions and manufacturer's warranty requirements.

1.5 DELIVERY, STORAGE AND HANDLING

A. Ordering: Comply with manufacturer's ordering instructions and lead-time requirements to avoid construction delays.

B. Delivery: Deliver materials in manufacturer's original, unopened, undamaged containers with identification labels intact.

C. Storage and Protection: Store materials protected from exposure to harmful conditions. Store material in dry, above ground location.

1. Stack pre-finished material to prevent twisting, bending, abrasion, scratching and denting. Elevate one end of each skid to allow for moisture to run off.

2. Prevent contact with material that may cause corrosion, discoloration or staining.

1.6 PROJECT CONDITIONS

A. Field Measurements: Verify actual measurements/openings by field measurements before fabrication; show recorded measurements on shop drawings. Coordinate field measurements, fabrication schedule with construction progress to avoid construction delays.

1.7 SUBMITTALS

A. Submit in accordance with Section 01300 – Submittals.

B. Product Literature: Provide panel manufacturer's product literature for components and finishes specified.

C. Shop Drawings:

1. Submit complete shop drawings and erection details, approved by the metal roofing manufacturer, to the Engineer for review. Do not proceed with manufacture of roofing material prior to review of shop drawings and field verification of all dimensions. Do not use drawings prepared by the Engineer for shop or erection drawings.

2. Shop drawings shall show roof plan, elevations, methods of erection, and if applicable, flashing details at each flashing condition area.

D. Samples: Submit selection and verification samples for finishes, colors and textures.

E. Quality Assurance Submittals:

1. Source Limitations: Obtain each type of metal roof panels from single source from single manufacturer.

2. Certificates: Product certificates signed by manufacturer certifying materials comply with specified performance characteristics and physical requirements.

3. Manufacturer’s Instructions: Manufacturer’s installation instructions.

F. Closeout Submittals:

1. Operation and Maintenance Data: Operation and maintenance data for installed products. Include methods for maintaining installed products and precautions against cleaning materials and methods detrimental to finishes and performance.

2. Special Warranty on Finishes: On manufacturer's standard form in which manufacturer agrees to repair finish or replace sheet metal roofing that shows evidence of deterioration of factory-applied finishes within specified warranty period.

   a. Fluoropolymer Finish: Deterioration includes, but is not limited to the following:

      1) Color fading more than 5 Hunter units when tested according to ASTM D 2244.

      2) Chalking in excess of a No. 8 rating when tested according to ASTM D 4214.

      3) Cracking, checking, peeling, or failure of paint to adhere to bare metal.

   b. Finishes Warranty Period: Twenty (20) years from the Project Acceptance Date.

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

   a. Failures include, but are not limited to, the following: Structural failures, loose parts, wrinkling or buckling, including uncontrolled water leakage, deterioration of metals, metal finishes, and other materials beyond normal weathering, including nonuniformity of color or finish, galvanic action between sheet metal roofing and dissimilar materials.

      1) A structural failure is defined as a failure to withstand, without damage, basic wind speeds up to 105 MPH, Exposure B, and Importance Factor 1.00 as defined by the Building Code for the applicable building heights.

   b. Project Warranty Period: Five (5) years from the Project Acceptance Date.

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

      1) 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.

2) In the event of a failure, Owner, Contractor, Roofing Installer, and Manufacturer shall mutually agree and determine roof system failures and remedies.

4. Record Documents: Provide project record documents for installed materials in accordance with the applicable Closeout Procedures section found in Division 1.

PART 2 - MATERIALS

2.1 METAL ROOFING

A. Suggested Manufacturers

1. Custom Metal Roofing, or approved substitute.

2. MBCI; a division of NCI Building Systems, L. P., or approved substitute.

3. CENTRIA Architectural Systems, or approved substitute.

B. Corrugated-Profile, Exposed-Fastener Metal Roof Panels: Formed with alternating curved ribs spaced at 2.67 inches (68 mm) o.c. across width of panel.

C. Metal: Aluminum-Zinc Alloy-Coated Steel Sheet: ASTM A 792/A 792M, Class AZ50 coating designation, Grade 40; in 0.0299 thickness (22 gauge).

D. Finish: Exterior color finish shall be 70% PVDF Durapon 70 with Teflon by Dura Coat Products Inc., with total dry film thickness of 1.0 mil., or approved substitute. Interior color finish shall be 70% PVDF Durapon 70 with Teflon by Dura Coat Products Inc., with total dry film thickness of 1.0 mil., or approved substitute. The color(s) shall be selected by the Engineer from roofing manufacturer's standard stocking colors.

E. Fasteners: Exposed fasteners shall be of the type, size, thickness and material as recommended by roof panel manufacturer. Exposed fasteners shall have a factory-applied coating to match roof panel color. Paint exposed fasteners with primer before adding an additional layer of paint to match roof color.

F. Flashing and Trim: Manufacturer's standard flashing and trim profiles, factory formed, color and finish to match metal roofing panels.

G. Sealants: As recommended by Roofing Panel Manufacturer.

2.2 ACCESSORIES

A. Roof Panel Accessories: Provide components approved by roof panel manufacturer and as required for a complete metal roof panel assembly including trim, copings, fascia, corner units, ridge closures, clips, flashings, sealants, gaskets, fillers, closure strips, and similar items. Match material and finish of metal roof panels unless otherwise indicated.

1. Closures: Provide closures at eaves and ridges, fabricated of same metal as metal roof panels.

2. Closure Strips: Closed-cell, expanded, cellular, rubber or crosslinked, polyolefin-foam or closed-cell laminated polyethylene; minimum 1-inch- (25-mm-) thick, flexible closure strips; cut or pre-molded to match metal roof panel profile. Provide closure strips where indicated or necessary to ensure weathertight construction.

3. Backing Plates: Provide metal backing plates at panel end splices, fabricated from material recommended by manufacturer.

B. Flashing and Trim: Formed from same material as roof panels, pre-painted with coil coating, minimum 0.018 inch thick. Provide flashing and trim as required to seal against weather and to provide finished appearance. Locations include, but are not limited to, ridges, eaves, rakes, corners, bases, framed openings, fascia, and fillers. Finish flashing and trim with same finish system as adjacent metal roof panels.

C. Panel Fasteners: Self-tapping screws, bolts, nuts, self-locking rivets and bolts, end-welded studs, and other suitable fasteners designed to withstand design loads. Provide exposed fasteners with heads matching color of metal roof panels, apply primer and add additional paint layer to match roof panel color. Install plastic caps over fasteners in a color that matches or is similar in color to the roof panels. Provide EPDM, PVC, or neoprene sealing washers.

2.3 FABRICATION

A. Fabricate and finish metal roof panels and accessories at the factory to greatest extent possible, by manufacturer's standard procedures and processes and as necessary to fulfill indicated performance requirements. Comply with indicated profiles and with dimensional and structural requirements

B. Continuous Length: Fabricate panels in one continuous length.

2.4 FINISHES

A. Comply with NAAMM's "Metal Finishes Manual for Architectural and Metal Products" for recommendations for applying and designating finishes.

B. Protect mechanical and painted finishes on exposed surfaces from damage by applying a strippable, temporary protective covering before shipping.

C. Appearance of Finished Work: Noticeable variations in same piece are not acceptable. Variations in appearance of adjoining components are acceptable if they are within the range of approved Samples and are assembled or installed to minimize contrast

PART 3 - EXECUTION

3.1 EXAMINATION

A. Examine substrates, areas, and conditions, with Installer present, for compliance with requirements for installation tolerances, metal roof panel supports, and other conditions affecting performance of the Work.

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

3.2 PREPARATION

A. Coordination: Coordinate metal roofing with other Work (drainage, flashing and trim, deck substrates, parapets, copings, walls) and other adjoining work to provide a non-corrosive and leak-proof installation.

B. Dissimilar Metals: Prevent galvanic action of dissimilar metals.

3.3 INSTALLATION

A. Install panels in single lengths without endlaps. Lap-Seam Metal Roof Panels: Fasten metal roof panels to supports with fasteners at each lapped joint at location and spacing recommended by manufacturer.

1. Apply panels and associated items for neat and weathertight enclosure. Avoid "panel creep" or application not true to line.

2. Lap ribbed or fluted sheets one full rib corrugation.

3. Provide metal-backed neoprene or EPDM washers under heads of exposed fasteners bearing on weather side of metal roof panels.

4. Locate and space exposed fasteners in uniform vertical and horizontal alignment. Use proper tools to obtain controlled uniform compression for positive seal without rupture of washer.

5. Install screw fasteners with power tools having controlled torque adjusted to compress washer tightly without damage to washer, screw threads, or panels. Install screws in predrilled holes.

6. Provide sealant tape at lapped joints of metal roof panels and between panels and protruding equipment, vents, and accessories.

7. Apply a continuous ribbon of sealant tape to weather-side surface of fastenings on end laps, and on side laps of nesting-type panels; on side laps of corrugated nesting-type, ribbed, or fluted panels; and elsewhere as needed to make panels weatherproof to driving rains.

8. At panel end splices, nest panels with minimum 6-inch (150-mm) end lap, sealed with butyl-rubber sealant and fastened together by interlocking clamping plates.

3.4 FIELD QUALITY REQUIREMENTS

A. Site Tests (Post Installation Testing): Owner reserves right to perform post installation testing of installed sheet metal roofing.

B. Manufacturer's Field Services: Upon Owner's request, provide manufacturer's field service consisting of product use recommendations and periodic site visit for inspection of product installation in accordance with manufacturer's instructions.

3.5 CLEANING

A. Remove temporary protective coverings and strippable films, if any, as metal roof panels are installed unless otherwise indicated in manufacturer's written installation instructions. On completion of metal roof panel installation, clean finished surfaces as recommended by metal roof panel manufacturer. Maintain in a clean condition during construction.

B. Replace metal roof panels that have been damaged or have deteriorated beyond successful repair by finish touch-up or similar minor repair procedures

3.6 PROTECTION

A. Protection: Protect installed product from damage during construction.

END OF SECTION

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SECTION 07920

JOINT SEALANTS

PART 1 - GENERAL

1.1 GENERAL REQUIREMENTS

A. Work Included: Completely close with sealants all joints indicated or specified to be sealed to a watertight condition.

B. Related Work

1. Section 04700 – SIMULATED STONE

2. Section 06200 – FINISH CARPENTRY

1.2 SUBMITTALS

A. Submit in accordance with Section 01300 – Submittals.

B. Manufacturer's Data: Submit copies of manufacturer's product data and specifications for type of sealant required.

C. Color Samples: If applicable, submit color finish samples of sealants exposed to view.

1.3 JOB CONDITIONS

A. Examine joint surfaces and backing, and their anchorage to the structure, and conditions under which joint sealer work is to be performed and notify the Engineer in writing of conditions detrimental to proper completion of the work and performance of sealers. Do not proceed with joint sealer work until unsatisfactory conditions have been corrected in a manner acceptable to the Installer.

B. Weather Conditions: Do not proceed with the installation of sealants under adverse weather conditions. Proceed with the work only when forecasted weather conditions are favorable for proper cure and development of high early bond strength.

1.4 PRODUCT HANDLING

A. Delivery: Deliver sealants to the job site in sealed containers labeled to show the designated name, formula, or specification number, lot number, color, date of manufacture, shelf life, curing time, manufacturer's directions, and name of manufacturer.

PART 2 - PRODUCTS

2.1 MATERIALS

A. Sealant Backer Rod: Compressible rod stock of polyethylene foam, polyethylene-jacketed polyurethane foam, butyl rubber foam, neoprene foam or other flexible, permanent, durable, non-absorptive material as recommended for compatibility with sealant by the sealant manufacturer to control the joint for sealant placement, to break bond of sealant at bottom of joint, to form optimum shape of sealant bead on back side, and to provide a highly compressible which will minimize the possibility of sealant extrusion when joint is compressed.

B. Bond-Breaker Tape: Polyethylene tape or other plastic tape as recommended by sealant manufacturer.

C. Primer for Sealants: Non-staining, as recommended by the sealant manufacturer.

D. Sealant

1. At Exterior Vertical and Overhead Joints: One-part polyurethane-based sealant, conforming to ASTM C 920, Type S, Grade NS, Use NT, Class 25 as applicable. Provide one of the following or approved substitute.

   a. Dymonic; Tremco

   b. Chem-Calk 900; Bostic Construction Products Div.

   c. Sikaflex la; Sika Corp.

2. At Interior Vertical and Overhead Joints: Non-Elastomeric Sealant; acrylic-emulsion type, conforming to ASTM C 834. Provide one of the following, or approved substitute:

   a. Rubber Calk 280; PRC.

   b. Acrylic Latex Caulk; Tremco

   c. Chem-Calk 600; Bostik Construction Products Div.

3. At Horizontal Joints: Two-part polyurethane-based sealant, conforming to ASTM C 920, Type M, Grade P, Use T, Class 25. Provide one of the following, or an approved substitute:

   a. THC-900; Tremco

   b. Sikaflex 2c SL; Sika Corp.

4. Acoustical Sealant: Resilient, non-staining, non-shrinking, non-hardening, non-skinning, non-drying, non-sag sealant intended for interior sealing of concealed construction joints; complying with ASTM C 834. Provide one of the following or approved substitute:

a. BA-98; Pecora Corp.

b. Tremco Acoustical Sealant; Tremco

c. "Sheetrock" Acoustical Sealant; U.S. Gypsum Co.

5. Silicone Sealant: Mildew-resistant; Type S; Grade NS; Class 25; Use NT, formulated with fungicide; intended for sealing interior joints between plumbing fixtures and wall surfaces. Provide one of the following or approved substitute:

a. Dow Corning 786; Dow Corning Corp.

b. SCS 1702 Sanitary; General Electric Co.

c. Proglaze White; Tremco

d. Omni Plus; Sonneborn

PART 3 - EXECUTION

3.1 INSTALLATION

A. Examine joints indicated to receive joint sealer, with Installer present, for compliance with requirements for joint configuration, installation tolerances and other conditions affecting joint sealers until unsatisfactory conditions have been corrected.

3.2 PREPARATION

A. Surface Cleaning of Joints: Clean out joints immediately before installing joint sealers to comply with recommendations of joint sealer manufacturers and the following requirements:

1. Remove all foreign material from joint substrates which could interfere with adhesion of joint sealer, including dust; paints, except for permanent, protective coatings tested and approved for sealant adhesion and compatibility by sealant manufacturer; oil; grease; water; and surface dirt.

2. Clean concrete, masonry, unglazed surfaces of ceramic tile and similar porous joint substrate surfaces, by brushing, grinding, blast cleaning, mechanical abrading, or a combination of these methods to produce a clean, sound substrate capable of developing optimum bond with joint sealers. Remove loose particles remaining from above cleaning operations by vacuuming or blowing out joints with oil-free compressed air.

3. Remove laitance and form release agents from concrete.

4. Clean metal, glass, and other non-porous surfaces by chemical cleaners or other means which are not harmful to substrates or leave residues capable of interfering with adhesion of joint surfaces.

B. Joint Priming: Prime joint substrates where indicated or where recommended by joint sealer manufacturer based on preconstruction joint sealer-substrate tests or prior experience. Apply primer to comply with joint sealer manufacturer's recommendations. Confine primers to areas of joint sealer bond, do not allow spillage or migration onto adjoining surfaces.

C. Masking Tape: Use masking tape where required to prevent contact of sealant with adjoining surfaces which otherwise would be permanently stained or damaged by such contact or by cleaning methods required to remove sealant smears. Remove the tape immediately after tooling without disturbing joint seal.

3.3 INSTALLATION OF JOINT SEALERS

A. General: Comply with joint sealer manufacturer's printed installation instructions applicable to products and application indicated, except where more stringent requirements apply.

B. Sealant Installation Standard: Comply with recommendations of ASTM C 1193 for use of joint sealants as applicable to materials, applications and conditions indicated.

C. Latex Sealant Installation Standard: Comply with requirements of ASTM C 790 for use of latex sealants.

D. Acoustical Sealant Application Standard: Comply with recommendations of ASTM C 19 for use of joint sealants in acoustical applications as applicable to materials, applications, and conditions indicated.

E. Installation of Sealant Backings: Install sealant backings to comply with the following requirements:

1. Install joint fillers of type indicated to provide support of sealants during application and at position required to produce the cross-sectional shapes and depths of installed sealants relative to joint widths which allow optimum sealant move capability.

    a. Do not leave gaps between ends of joint fillers.

    b. Do not stretch, twist, puncture, or tear joint fillers.

    c. Remove absorbent joint fillers which have become wet prior to sealant application and replace with dry material.

2. Install bond breaker tape between sealants and joint fillers, compression seals, or back of joints where adhesion of sealant to surfaces at back of joints would result in sealant failure.

3. Install compressible seals serving as sealant backings to comply with the requirements indicated above for joint fillers.

F. Installation of Sealants: Install sealants by proven techniques that result in sealants directly contacting and fully wetting joint substrates, completely filling recesses provided

for each joint configuration, and providing uniform, cross-sectional shapes and depths relative to joint widths which allow optimum sealant movement capability.

G. Tooling of Nonsag Sealants: Immediately after sealant applications and prior to time skinning or curing begins, tool sealants to form smooth, uniform beads of configuration indicated, to eliminate air pockets, and to ensure contact and adhesion of sealant with sides of joint. Remove excess sealants from surfaces adjacent to joint. Do not use tooling agents which discolor sealants or adjacent surfaces or are not approved by sealant manufacturer.

1. Provide concave joint configuration per Figure 5A in ASTM C 1193, unless otherwise indicated.

2. Provide flush joint configuration per Figure 5B in ASTM C 1193, where indicated.

3.4 CLEANING

A. Clean off excess sealants or sealant smears adjacent to joints as work progresses by methods and with cleaning materials approved by manufacturers by joint sealers and of products in which joint occur.

3.5 PROTECTION

A. Protect joint sealers during and after curing period from contact with contaminating substances or from damage resulting from construction operations or other causes so that they are without deterioration or damage at time of Project Acceptance. If, despite such protection, damage or deterioration occurs, cut out and remove damaged or deteriorated joint sealers immediately and reseal joints with new material to produce joint sealer installations with repaired areas indistinguishable from original work.

END OF SECTION

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SECTION 09900

PAINTS AND COATINGS

PART 1 - GENERAL

1.1 SUMMARY

A. This Section includes surface preparation and field painting of exposed exterior and interior items and surfaces.

1. Surface preparation, priming, and finish coats specified in this Section are in addition to shop priming and surface treatment specified in other Sections.

B. Paint exposed surfaces, except where these Specifications indicate that the surface or material is not to be painted or is to remain natural. If an item or a surface is not specifically mentioned, paint the item or surface the same as similar adjacent materials or surfaces. If a color of finish is not indicated, the Engineer will select from standard colors and finishes available.

1. Interior and Exterior surfaces scheduled to be finished.

2. Non-Ferrous metals plated or factory finished items specifically noted to be painted or when such items occur as accessories and appurtenance to surfaces required to be painted.

C. Surfaces not to be finished, unless otherwise indicated.

1. Concrete floors, paving walks, stairs and textured concrete.

2. Finish hardware, unless prime coated.

3. Glass, plastic laminate, and ceramic tile.

4. Acoustical ceilings, unless scheduled to be painted.

5. Integrally colored plaster or EIFS systems.

6. Floor coverings.

7. Plumbing and lighting fixtures, and electrical device plates.

8. Movable furniture such as portable bookshelves, cubicles and cabinets.

D. Unless otherwise specified, do not paint prefinished items, concealed surfaces, finished metal surfaces, operating parts, and labels.

1. Prefinished items include the following factory-finished components:

a. Architectural woodwork.

b. Acoustical wall panels.

c. Metal, phenolic, or plastic toilet enclosures.

d. Metal, phenolic, or plastic lockers.

e. Elevator entrance doors and frames.

f. Elevator equipment.

g. Finished mechanical and electrical equipment.

h. Light fixtures.

2. Concealed surfaces include walls or ceilings in the following generally inaccessible spaces:

a. Foundation spaces.

b. Furred areas.

c. Ceiling plenums.

d. Utility tunnels.

e. Pipe spaces.

f. Duct shafts.

g. Elevator shafts.

3. Finished metal surfaces include the following:

a. Anodized aluminum.

b. Stainless steel.

c. Chromium plate.

d. Copper and copper alloys.

e. Bronze and brass.

4. Operating parts include moving parts of operating equipment and the following:

a. Valve and damper operators.

b. Linkages.

c. Sensing devices.

d. Motor and fan shafts.

5. Labels: Do not paint over UL, FMG, or other code-required labels or equipment name, identification, performance rating, or nomenclature plates.

E. Related Work

1. Section 03300 – CAST-IN-PLACE CONCRETE.

2. Section 06100 – ROUGH CARPENTRY

3. Section 06200 – FINISH CARPENTRY

4. Section 07410 – METAL ROOFING

1.2 REFERENCES

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

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

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

D. PDCA (Painting and Decorating Contractors of America) - Architectural Painting Specification Manual.

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

F. SSPC (Steel Structures Painting Council) - Steel Structures Painting Manual.

1.3 DEFINITIONS

A. General: Standard coating terms defined in ASTM D 16 apply to this Section.

1.4 SUBMITTALS

A. Submit in accordance with Section 01300 – SUBMITTALS.

B. Product Data

1. Materials List: Provide an inclusive list of required patching and coating materials. Indicate each material and cross-reference specific coating, finish system, and application. Identify each material by manufacturer's catalog number and general classification.

a. For products with premixed colors, provide manufacturer's standard color chips for selection by Engineer.

2. Manufacturer's Information: Provide data on all listed materials, including:

a. Thinning and mixing instructions.

b. Application instructions and required mil film thicknesses.

c. Manufacturer's Material Safety Data Sheets.

C. Certifications: Provide a letter certifying paints and coatings are free of asbestos, lead, zinc-chromate, strontium chromate, cadmium, and mercury and mercury compounds. Provide a letter certifying the amounts of mildewcide added by both the paint manufacturer and paint supplier. Provide a letter certifying that abrasive blast media are free of crystalline silica.

D. Schedule of Finishes: Provide finish schedule including paint spread rates required to achieve final dry film thickness indicated in the schedule.

E. Schedule of Operations: Provide a work schedule showing sequence of operation and installation dates.

F. Samples

1. Match existing color and submit paint finish samples, 8.5" x 11" in size illustrating selected colors and textures for each selection. Divide sample in horizontal strips showing prime and overlapping second and finish coats. Show coat tinting. Prepare transparent finish samples on same material as that on which coating will be applied. Identify each sample.

G. Manufacturer's Instructions: Indicate special surface preparation procedures and substrate conditions requiring special attention. Refer to paragraph 3.01.

H. Qualification Data: For Applicator.

I. Delivery Receipts: Provide 3 copies of the delivery receipt, signed by the Engineer attesting to delivery of extra paint as required under paragraph 1.9.

1.5 QUALITY ASSURANCE

A. Applicator Qualifications: A firm or individual experienced in applying paints and coatings similar in material, design, and extent to those indicated for this Project, whose work has resulted in applications with a record of successful in-service performance.

1.6 REGULATORY REQUIREMENTS

A. Comply with State OSHL (Occupational Safety and Health Law) and pollution control regulations of the State Department of Health and EPA.

1.7 DELIVERY, STORAGE, AND HANDLING

A. Deliver materials to Project site in manufacturer's original, unopened packages and containers bearing manufacturer's name and label and the following information:

1. Product name or title of material.

2. Product description (generic classification or binder type).

3. Manufacturer's brand name and lot number and date of manufacture.

4. Contents by volume, for pigment and vehicle constituents.

5. Thinning instructions.

6. Application instructions and coverage.

7. Color name and number.

8. VOC content.

B. Storage

1. Non-flammable Materials: Store materials not in use in tightly covered containers in a well-ventilated area. Maintain storage containers in a clean condition, free of foreign materials and residue.

2. Flammable Materials

a. Store in such a manner as to prevent damage. No paint material, empty cans, paint brushes and rollers may be stored in the building(s). Store these items in separate storage facilities away from the building(s). Contractor may furnish a separate job site storage structure, if the structure complies with the requirements of the local Fire Department. Keep the storage area shall clean. Lock any storage structures when not in use or when no visual supervision is possible.

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

1.8 PROJECT CONDITIONS

A. Do not apply materials when surfaces and ambient temperatures are outside the ranges required by the paint product manufacturer. Do not apply exterior coatings during rain or when relative humidity is outside the humidity ranges required by the paint product manufacturer.

B. Protect public, pedestrians and tenants from injury. Provided, erect and maintain safety barricades around scaffolds, hoists and where constriction operations create hazardous conditions.

C. Completed Work: Provide necessary protection for wet paint surfaces.

D. Protective Covering and Enclosures: Provide and install clean sanitary drop cloth or plastic sheets to protect furniture, equipment, floor and other areas that are not scheduled for treatment. Remove any paint applied to surfaces not scheduled for treatment.

E. Fire Safety: Contractor and its employees shall not to smoke in the vicinity of the paint storage area. Exercise precautions against fire at all times and remove waste rags, plastic (polyester sheets), empty cans, etc. from the site at the end of each day.

F. Safeguarding Property: Safeguard the work and also the property of the Owner and other individuals in the vicinity of Contractor's work. Make good on any damages and for losses to work or property caused by Contractor or its employee's negligence. Where damaged property cannot be cleaned and restored to its original condition (i.e. prior to being damaged) replace it with a new product of equal quality. No prorating or use of "used" products will be permitted.

1.9 EXTRA MATERIALS

A. Provide extra paint in each of the different colors, types and surface textures of exterior and interior paint to the Owner upon completion of the project. Paint shall be in unopened one-gallon containers and labeled with color, type, texture, room locations, and date in addition to manufacturer's label.

1. Provide five (5) gallons of each color for paint used over large areas, such as the exterior of the building and/or field colors.

2. Provide one (1) gallon of each color for all other areas.

1.10 WARRANTY

A. Provide a two-year guarantee that the work performed under this section conforms to the contract requirements and is free of any defect of material or workmanship.

PART 2 - PRODUCTS

2.1 PAINT MATERIALS, GENERAL

A. Material Compatibility: Provide block fillers, primers, and finish-coat materials that are compatible with one another and with the substrates indicated under conditions of service and application, as demonstrated by manufacturer based on testing and field experience.

B. Mildewcide

1. Except for metal primers, provide primer and finish coats with suitable chemical mildewcide to the maximum amount of mildewcide per gallon of paint permitted by the mildewcide manufacturer without adversely affecting the quality of the paint, but not less than one ounce per gallon.

C. Material Quality: Provide manufacturer's best-quality paint material of the various coating types specified that are factory formulated and recommended by manufacturer for application indicated. Paint-material containers not displaying manufacturer's product identification will not be acceptable.

1. Proprietary Names: Use of manufacturer's proprietary product names in the Paint Systems Schedule in Part 3 below to designate colors or materials, is not intended to imply that products named are required to be used to the exclusion of equivalent products of other manufacturers. Furnish manufacturer's material data and certificates of performance for proposed products to be used.

2. Equivalency: Equivalent products to the specified products are listed in the Master Painter's Institute's "Architectural Painting Specification Manual."

3. Substitution: Requests for substitution of a product or product if a manufacturer is not on the "Approved Product List" will be evaluated for equivalency based on product test results per the test criteria of the Master Painter's Institute.

D. Colors: See the drawings.

E. Hazardous Materials: Do not use paint or paint products containing asbestos, lead, mercury and mercury compounds, zinc chromates, strontium-chromate, and cadmium. Do not use abrasive blast media that contain crystalline silica.

2.2 MISCELLANEOUS MATERIALS

A. Provide patching and repair materials. Compatible with paint finishes and substrates. Use weather resistant materials for exterior surfaces and surfaces exposed to moisture.

B. Accessories

1. General: Provide other materials not specifically indicated but required to achieve the finishes specified, of commercial quality.

2. Thinners: Thinning of paint shall be done using material recommended by the manufacturer. Mix proprietary products according to manufacturer's requirements. Do not use compound thinner, mineral oil, kerosene, refined linseed oil, or gasoline for thinning.

PART 3 - EXECUTION

3.1 EXAMINATION

A. Examine substrates, areas, and conditions, with Applicator present, for compliance with requirements for paint application.

1. Proceed with paint application only after unsatisfactory conditions have been corrected and surfaces receiving paint are thoroughly dry.

a. Ensure that concrete and masonry surfaces are cured and dried to meet paint manufacturer's recommendations.

2. Start of painting will be construed as Applicator's acceptance of surfaces and conditions within a particular area.

B. Coordination of Work: Review other Sections in which primers are provided to ensure compatibility of the total system for various substrates. On request, furnish information on characteristics of finish materials to ensure use of compatible primers.

1. Notify Engineer about anticipated problems when using the materials specified over substrates primed by others.

3.2 PREPARATION

A. General: Remove hardware and hardware accessories, plates, machined surfaces, lighting fixtures, and similar items already installed that are not to be painted. If removal is impractical or impossible because of size or weight of the item, provide surface-applied protection before surface preparation and painting.

1. After completing painting operations in each space or area, reinstall items removed using workers skilled in the trades involved.

B. Cleaning: Before applying paint or other surface treatments, clean substrates of substances that could impair bond of the various coatings. Remove dust, oil and grease before cleaning.

1. Schedule cleaning and painting so dust and other contaminants from the cleaning process will not fall on wet, newly painted surfaces.

C. Surface Preparation: Clean and prepare surfaces to be painted according to manufacturer's written instructions for each particular substrate condition and as specified.

1. Provide barrier coats over incompatible primers or remove and reprime.

D. Surface Preparation Cementitious Materials: Prepare concrete, concrete unit masonry, cement plaster, and mineral-fiber-reinforced cement panel surfaces to be painted. Remove efflorescence, chalk, dust, dirt, grease, oils, and release agents. Roughen as required to remove glaze. If hardeners or sealers have been used to improve curing, use mechanical methods of surface preparation.

1. Use abrasive blast-cleaning methods if recommended by paint manufacturer.

2. Determine alkalinity and moisture content of surfaces by performing appropriate tests. Submit test results to Engineer.

a. Prior to painting, concrete and masonry surfaces shall be allowed to cure and dry in accordance with the paint manufacturer's instructions and recommendations.

b. Efflorescence and laitance shall be removed from the surface.

c. Prior to paint application, interior and exterior concrete and masonry (including grout joints) scheduled to receive paint shall be tested to determine the alkalinity level of the surface. Testing shall be performed in strict accordance with the test kit manufacturer's instructions. Submit test results to the Engineer.

d. Where the alkalinity level exceeds the pH level limit of the primer take one of the following three remedies at no additional cost to the State:

1) If new concrete or masonry, wait until alkaline level has dropped below the limit.

2) Substitute a primer that can resist the measured alkalinity and that is compatible with the paint finish. Alkyd based primers and top-coats, or epoxy ester primers shall not be used. Submit the substitute primer to the Engineer for review.

3) Neutralize the surface in accordance with the primer manufacturer's instructions to reduce the alkaline level. However, acid washing is not permitted where the surface has been finished with a cementitious coating.

E. Surface Preparation Wood: Clean surfaces of dirt, oil, and other foreign substances with scrapers, mineral spirits, and sandpaper, as required. Sand surfaces exposed to view smooth and dust off.

1. Scrape and clean small, dry, seasoned knots, and apply a thin coat of white shellac or other recommended knot sealer before applying primer. After priming, fill holes and imperfections in finish surfaces with putty or plastic wood filler. Sand smooth when dried.

2. Prime, stain, or seal wood to be painted immediately on delivery. Prime edges, ends, faces, undersides, and back sides of wood, including cabinets, counters, cases, and paneling.

3. If transparent finish is required, backprime with spar varnish.

4. Backprime paneling on interior partitions where masonry, plaster, or other wet wall construction occurs on back side.

5. Seal tops, bottoms, and cutouts of unprimed wood doors with a heavy coat of varnish or sealer immediately on delivery.

F. Material Preparation: Mix and prepare paint materials according to manufacturer's written instructions.

1. Maintain containers used in mixing and applying paint in a clean condition, free of foreign materials and residue.

2. Stir material before application to produce a mixture of uniform density. Stir as required during application. Do not stir surface film into material. If necessary, remove surface film and strain material before using.

3. Use only thinners approved by paint manufacturer and only within recommended limits.

G. Tinting: Tint each undercoat a lighter shade to simplify identification of each coat when multiple coats of same material are applied. Tint undercoats to match the color of the

finish coat but provide sufficient differences in shade of undercoats to distinguish each separate coat.

3.3 APPLICATION

A. General: Apply paint according to manufacturer's written instructions. Use applicators and techniques best suited for substrate and type of material being applied.

1. Paint colors, surface treatments, and finishes are indicated in the paint schedules.

2. Do not paint over dirt, rust, scale, grease, moisture, scuffed surfaces, or conditions detrimental to formation of a durable paint film.

3. Provide finish coats that are compatible with primers used.

4. The term "exposed surfaces" includes areas visible when permanent or built-in fixtures, grilles, and similar components are in place. Extend coatings in these areas, as required, to maintain system integrity and provide desired protection.

5. Paint surfaces behind movable equipment and furniture the same as similar exposed surfaces. Before final installation of equipment, paint surfaces behind permanently fixed equipment or furniture with prime coat only unless otherwise noted.

6. Paint interior surfaces of ducts with a flat, non-specular black paint where visible through registers or grilles.

7. Paint back sides of access panels and removable or hinged covers to match exposed surfaces.

8. Finish exterior doors on tops, bottoms, and side edges the same as exterior faces.

9. Finish interior of wall and base cabinets and similar field-finished casework to match exterior.

10. Sand lightly between each succeeding enamel or varnish coat.

11. Ensure primers are top coated within the times required by the paint manufacturers. Top coats not applied within the recoating window may be rejected.

B. Scheduling Painting: Apply first coat to surfaces that have been cleaned, pretreated, or otherwise prepared for painting as soon as practicable after preparation and before subsequent surface deterioration.

1. The number of coats and film thickness required are the same regardless of application method. Do not apply succeeding coats until previous coat has cured as recommended by manufacturer. If sanding is required to produce a smooth, even surface according to manufacturer's written instructions, sand between applications.

2. If undercoats, stains, or other conditions show through final coat of paint, apply additional coats until paint film is of uniform finish, color, and appearance. Give special attention to ensure that edges, corners, crevices, welds, and exposed fasteners receive a dry film thickness equivalent to that of flat surfaces.

3. Allow sufficient time between successive coats to permit proper drying. Do not recoat surfaces until paint has dried to where it feels firm and does not deform or feel sticky under moderate thumb pressure, and until application of another coat of paint does not cause undercoat to lift or lose adhesion.

4. Be aware of the requirements for, and restrictions on, spray painting contained in paragraph 1.8 – PROJECT CONDITIONS.

C. Application Procedures: Apply paints and coatings by brush, roller, spray, or other applicators according to manufacturer's written instructions.

1. Brushes: Use brushes best suited for type of material applied. Use brush of appropriate size for surface or item being painted.

2. Rollers: Use rollers of carpet, velvet-back, or high-pile sheep's wool as recommended by manufacturer for material and texture required.

D. Minimum Coating Thickness: Apply paint materials no thinner than manufacturer's recommended spreading rate to achieve dry film thickness indicated. Provide total dry film thickness of the entire system as recommended by manufacturer.

E. Block Fillers: Apply block fillers to concrete masonry block at a rate to ensure complete coverage with pores filled.

F. Prime Coats: Before applying finish coats, apply a prime coat, as recommended by manufacturer, to material that is required to be painted or finished and that has not been prime coated by others. Recoat primed and sealed surfaces where evidence of suction spots or unsealed areas in first coat appears, to ensure a finish coat with no burn-through or other defects due to insufficient sealing.

G. Pigmented (Opaque) Finishes: Completely cover surfaces as necessary to provide a smooth, opaque surface of uniform finish, color, appearance, and coverage. Cloudiness, spotting, holidays, laps, brush marks, runs, sags, ropiness, or other surface imperfections will not be acceptable.

H. Transparent (Clear) Finishes: Use multiple coats to produce a glass-smooth surface film of even luster. Provide a finish free of laps, runs, cloudiness, color irregularity, brush marks, orange peel, nail holes, or other surface imperfections.

1. Provide satin finish for final coats.

2. Completed Work: Match approved samples for color, texture, and coverage. Remove, refinish, or repaint work not complying with requirements.

3.4 CLEANING

A. Cleanup: At the end of each workday, remove empty cans, rags, rubbish, and other discarded paint materials from Project site.

1. After completing painting, clean glass and paint-spattered surfaces. Remove spattered paint by washing and scraping without scratching or damaging adjacent finished surfaces.

3.5 PROTECTION

A. Protect work of other trades, whether being painted or not, against damage from painting. Correct damage by cleaning, repairing or replacing, and repainting, as approved by Engineer.

B. Provide "Wet Paint" signs to protect newly painted finishes. After completing painting operations, remove temporary protective wrappings provided by others to protect their work.

1. After work of other trades is complete, touch up and restore damaged or defaced painted surfaces.

3.6 EXTERIOR PAINT SCHEDULE

A. Concrete, Stucco and Masonry (Other than Concrete Unit Masonry): Provide the following finish systems over exterior concrete, stucco, and brick masonry substrates:

1. Acrylic Finish: Two (2) finish coats over a primer.

a. Primer: Exterior concrete and masonry primer: MPI #3.

b. Finish Coats: Two (2) coats exterior acrylic paint. MPI #15.

c. Finish Coat Gloss Level: Match existing gloss level. For new construction, low-luster or semi-gloss.

B. Concrete Unit Masonry: Provide the following finish systems over exterior concrete unit masonry:

1. Acrylic Finish: Two (2) finish coats over a block filler.

a. Block Filler: Concrete unit masonry block filler: MPI #3.

b. Finish Coats: Two (2) coats exterior acrylic paint. MPI #15.

c. Finish Coat Gloss Level: Match existing gloss level. For new construction, low-luster or semi-gloss.

C. Exterior Gypsum Soffit Board: Provide the following finish systems over exterior gypsum soffit board:

1. Acrylic Finish: Two (2) finish coats over a primer.

    a. Primer: Exterior gypsum soffit board primer. MPI #17.

    b. Finish Coats: Two (2) coats exterior acrylic paint. MPI #81.

    c. Finish Coat Gloss Level: match existing gloss level. For new construction, low-luster or semi-gloss.

D. Smooth Wood: Provide the following finish systems over smooth wood siding, wood trim, and other smooth exterior wood surfaces:

1. Acrylic Finish: Two (2) finish coats over a primer.

    a. Primer: Exterior wood primer for acrylic enamels. MPI #6.

    b. Finish Coats: Two (2) coats exterior acrylic paint. MPI #11.

    c. Finish Coat Gloss Level: match existing gloss level. For new construction, low-luster or semi-gloss.

E. Plywood: Provide the following finish systems over exterior plywood:

1. Acrylic Finish: Two (2) finish coats over a primer.

    a. Primer: Exterior wood primer for acrylic enamels. MPI #6.

    b. Finish Coats: Two (2) coats exterior acrylic paint. MPI #11.

    c. Finish Coat Gloss Level: match existing gloss level. For new construction, low-luster or semi-gloss.

F. Ferrous Metal: Provide the following finish systems over exterior ferrous metal. Primer is not required on shop-primed items.

1. Acrylic Finish: Two (2) finish coats over a rust-inhibitive primer.

    a. Primer: Exterior ferrous-metal primer. MPI #134.

    b. Finish Coat: Exterior acrylic paint. MPI #11.

    c. Finish Coat Gloss Level: match existing gloss level.

END OF SECTION

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SECTION 10910

ACCESSIBLE PICNIC TABLE

PART 1 - GENERAL

1.1 GENERAL REQUIREMENTS

This section covers the requirements for furnishing and installing accessible picnic tables. The type, size, and dimensions shall be as called for in these specifications and as shown on the plans.

1.2 REFERENCES

A. The "Americans with Disabilities Act Accessibility Guidelines" (ADAAG), 2010, of the United States Department of Justice, including all revisions and addendums.

B. The "Hawaii Outdoor Developed Areas Accessibility Guidelines" (HODAAG), January 2, 2017, of the State of Hawaii, Disability and Communication Access Board.

1.3 SUBMITTALS

A. Submit in accordance with Section 01300 – SUBMITTALS.

B. Shop Drawings: Shop drawings for picnic table, showing assembly and erection details, size of members, fastening, supports, anchors, clearances, plastic welding at counter-sunk bolt holes, and any other necessary connections.

C. Project Data: Manufacturer's product data.

D. Material Guarantee.

PART 2 - PRODUCTS

2.1 MATERIALS

A. Asbestos Prohibition: No asbestos containing materials shall be used under this section. The Contractor shall insure that materials incorporated in the project are asbestos-free .

B. Accessible Picnic Table: Picnic tables shall comply with applicable ADAAG and HODAAG requirements including but not limited to table and seat heights, and wheelchair, knee and toe clearances.

1. Approved Product: Pilot Rock WPTS/CB-8TP, manufactured by RJ Thomas Manufacturing Company, Inc. or approved substitute.

2. Frame

   a. One (1)-piece welded steel tubing.

   b. Hot dip galvanized to ASTM A123 to maintain average zinc coating of 2.0 ounce per square foot of surface area.

   c. Finish: Black powder coat.

3. Tabletop and Seat Planks

   a. Total Length: 96 inches; ±1 inch.

   b. Total Width: 60 inches; ±1 inch.

   c. Material: 2-inch-thick pressure treated (Kiln-Dried After Treated (KDAT)) lumber with all exposed edges removed to approximately 3/8-inch radius.

   d. Two (2) pre-galvanized steel end caps shall be provided by same manufacturer to align ends of top planks. Finish shall match frame.

4. Concrete surface mounted anchor system including anchor straps and screws shall be provided by the same manufacturer.

PART 3 - EXECUTION

3.1 DELIVERY

A. The picnic tables shall be delivered in a protective wrapping which shall protect from ultraviolet radiation and from abrasion during shipping and handling.

B. Any picnic table that is damaged shall be replaced by the Contractor.

3.2 INSTALLATION

A. Verify all dimensions including seat height, table top height, clear knee space height, accessible wheelchair clearance and passage, clear floor and ground space are in accordance with sections 305 and 306 of the Americans with Disabilities Act Accessibility Guidelines (ADAAG) and sections H245 and H1011 of the Hawaii Outdoor Developed Areas Accessibility Guidelines (HODAAG) before installation of the accessible picnic table unit.

B. The picnic table and anchor straps shall be installed in accordance with the manufacturer's specifications and as indicated on the Plans.

C. Picnic tables shall be set level upon concrete pad.

3.3 CLEANING

After installation is complete, clean tables, slab surfaces, and surrounding areas to the satisfaction of the Engineer.

END OF SECTION

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