

DIVISION OF FORESTRY AND WILDLIFE

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

BOARD OF LAND AND NATURAL RESOURCES

Suzanne Case
Chairperson

CONTRACT SPECIFICATIONS AND PLANS

KAULANA MANU NATIVE BIRD AND PLANT SANCTUARY
VIEWING AREA AND PARKING LOT
JOB No. D01CH65A
KIPUKA 21, SADDLE ROAD, COUNTY OF HAWAII
TMK: (3) 2-4-08 : 08

CIVIL ENGINEER: DEMPSEY PACIFIC INC.

ARCHITECT: PROJECT DESIGN INC.

STRUCTURAL ENGINEER: PROJECT DESIGN INC.

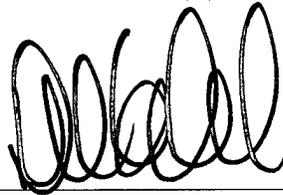
April 2016

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

CONTRACT SPECIFICATIONS AND PLANS

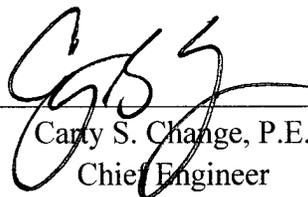
JOB No. D01CH65A
KAULANA MANU NATIVE BIRD AND PLANT SANCTUARY
VIEWING AREA AND PARKING LOT
KIPUKA 21, SADDLE ROAD, SOUTH HILO, ISLAND OF HAWAII, HAWAII
TMK: (3) 2-4-08 : 08

Approved: _____



David Smith
Administrator
Division of Forestry and Wildlife

Approved: _____



Cary S. Change, P.E.
Chief Engineer
Engineering Division

April 2016

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NOTICE TO BIDDERS
(Chapter 103D, HRS)

COMPETITIVE BIDS for Job No. D01CH65A, Kaulana Manu Native Bird & Plant Sanctuary Viewing Area and Parking Lot, Hawaii shall be submitted to the Department of Land and Natural Resources, Engineering Division on the specified date and time through the Hawaii State e-Procurement (HIePRO). HIePRO is accessible through the State Procurement Office website at www.spo.hawaii.gov.

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

The project is located at Kipuka 21, Saddle Road, Upper Waiakea Forest Reserve, South Hilo, Island of Hawaii, Hawaii.

The work shall generally consist of a new viewing platform, composting toilet facility, parking lot and other site improvements.

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

A voluntary pre-bid conference will be held on **Oahu** at the Kalanimoku Building Video Conferencing Center, Basement Level, 1151 Punchbowl Street, Honolulu, and on **Hawaii Island** at the Hilo State Office Building Video Conferencing Center, Basement Level, 75Aupuni Street, Hilo, Hawaii, May 20, 2016 at 9:30 a.m.

The estimated cost of construction is \$600,000.

As a condition of award of the contract and final payment, the vendor shall provide proof of compliance with the requirement of 103D-310(c) HRS. Proof of compliance/documentation is obtained through Hawaii Compliance Express (HCE). Vendors shall register in HCE, a program separate from HIePRO. The annual subscription fee to utilize the HCE service is currently \$12.00. Allow 2 weeks to obtain complete compliance status after initial registration. It is highly recommended that vendors subscribe to HCE prior to responding to a solicitation. The vendor is responsible for maintaining compliance. If the vendor does not maintain timely compliance in HCE, an offer otherwise deemed responsive and responsible may not be awarded. See HIePRO Buyer FAQ on the State Procurement Office website for more information.

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

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

Since the estimated 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. SUCCESSFUL BIDDER TO FILE PERFORMANCE AND PAYMENT BONDS: The successful bidder will be required to file performance and payment bonds each; in the amount equal to the total contract price, including amounts estimated to be required for extra work, as provided in sub-section 3.6 of the General Conditions.
- L. NUMBER OF EXECUTED ORIGINAL COUNTERPARTS OF CONTRACT DOCUMENTS: If requested by the Board, six copies of the Contract, performance and payment bonds shall be executed.
- M. CHANGE ORDERS: No work of any kind in connection with the work covered by the plans and specifications shall be considered as change order work, or entitle the Contractor to extra compensation, except when the work has been ordered in writing by the Chief Engineer (Engineer) and in accordance with sub-section 4.2 of the General Conditions.

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

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

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

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

- O. PERMITS: The State will process permit applications whenever possible, and the Contractor shall procure the pre-processed permits and pay the required fees. If permit applications are not processed by the State, the Contractor shall process the permit applications, permits and

licenses, and pay all charges and fees. In all cases, the Contractor shall give all notices necessary and incident to the due and lawful prosecution of the work.

- P. PROPERTY DAMAGE: It shall be the responsibility of the contractor to respect State property and to prevent damage to existing improvements. The Contractor will be responsible for damages resulting from construction operations. Immediately upon discovery, the Contractor shall repair such damage to the satisfaction of the Engineer.

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

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

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

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

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

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

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

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

- T. HIRING OF HAWAII RESIDENTS: The Contractor shall comply with Act 68, SLH 2010, in the performance and for the duration of this contract. The Contractor shall ensure that Hawaii residents compose not less than eighty percent of the workforce employed to perform the contract work on the project. The eighty percent requirement shall be determined by

dividing the total number of hours worked on the contract by Hawaii residents, by the total number of hours worked on the contract by all employees of the Contractor in the performance of the contract. The hours worked by any Subcontractor of the Contractor shall count towards the calculation for this section. The hours worked by employees with shortage trades, as determined by the Department of Labor and Industrial Relations (DLIR), shall not be included in the calculation for this section.

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

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

General Conditions.

- AA. TOILET FACILITIES: All toilet facilities constructed at the project site shall be in accordance with the Public Health Regulations of the State Department of Health (DOH). All necessary precautions shall be observed at the project site. The use of sanitary facilities shall be strictly enforced and workers violating these provisions shall be promptly discharged.
- BB. SIGNS: Whenever the project involves closing or obstructing any public thoroughfare, the Contractor shall provide traffic signs conforming to the applicable provisions of the current edition of the "Manual on Uniform Traffic Control Devices for Streets and Highways", published by the Federal Highway Administration as directed by the Engineer for the purpose of diverting or warning traffic prior to the construction area. All traffic signs shall bear proper wording stating thereon the necessary information as to diverting or warning traffic.

When indicated in the Proposal, the Contractor shall provide a project sign, size 4'-0" x 7'-0" to be placed as directed by the Engineer. The sign shall be constructed in accordance with Section 01581 - Project Sign of these specifications and approved by the Engineer. All wording, type and size of lettering and color selection shall be as specified in these specifications or as approved by the Engineer.

All signs shall be kept neat and clean, and properly erected at all times.

- CC. FIELD OFFICE AREA FOR DEPARTMENT: When indicated in the Proposal, the Contractor shall provide a housed working area of at least 100 square feet adjacent to the Contractor's office for the Department's use. This area will be used by the Engineer to perform tests and to store equipment. As a minimum, the field office shall include the following: standard sized office desk and chair, lighting, ventilation, window-type air conditioning rated at 5,000 BTU, door and window with locking hardware, electrical outlets, and working communications facilities (a cellular telephone is acceptable). The Department will pay for all long distance toll charges made by the Engineer.
- DD. QUANTITIES: All bids will be compared on the basis of quantities of work to be done as shown in the Proposal; the quantities shown in the Unit Price items are estimated, being given as a basis for comparison of bids. The Board reserves the right to increase or decrease the quantities given under the items or delete items entirely as may be required during the progress of the work.
- EE. OTHER HEALTH MEASURES: Forms of work site exposure or conditions which may be detrimental to the health or welfare of workers or of the general public shall be eliminated or reduced to safe levels as required by the DOH codes, standards, and regulations. Suitable first aid kits and a person qualified to render first aid, as specified in the DOH regulations, shall be provided at all times when work is scheduled.
- FF. HAWAII BUSINESS OR COMPLIANT NON-HAWAII BUSINESS REQUIREMENT: Bidders (Contractors) shall be incorporated or organized under the laws of the State or be registered to do business in the State as a separate branch or division that is capable of fully performing under the contract, as stipulated in §3-122-112 HAR.

GG. COMPLIANCE WITH §3-122-112 HAR:

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

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

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

PROPOSAL

FOR

DEPARTMENT OF LAND AND NATURAL RESOURCES
ENGINEERING DIVISION
State of Hawaii

JOB NO. D01CH65A
KAULANA MANU NATIVE BIRD & PLANT SANCTUARY
VIEWING PLATFORM AND PARKING LOT

_____, 20__

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

Dear Sir:

The undersigned, having carefully examined the local conditions and all available records and information covering conditions which may affect the cost of the work to be performed, and having carefully examined the Plans and Specifications, and other contract documents, hereby proposes to furnish and pay for all materials, tools, equipment, labor and other incidental work necessary to construct the viewing platform, composting toilet facility, parking lot, and other site improvements, 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. D01CH65A
KAULANA MANU NATIVE BIRD & PLANT SANCTUARY
VIEWING PLATFORM AND PARKING LOT

on file in the office of the Engineering Division for the TOTAL BASE BID (Items 1 to 12) of:

_____ Dollars (\$ _____)

and will fully complete all work under this contract within one hundred eighty (180) consecutive calendar days from the date of written notice to proceed, including date of said order, said total sum being itemized on the following pages.

PROPOSAL

Item No.	Quantity	Unit	Description	Unit Price	Total
1.	1	LS	Site Preparation Work; to include erosion control measures, site BMPs, clearing and grubbing, hauling, disposal & relocations as required to construct new improvements.	LS	\$
2.	1	LS	Grading Work, as required to construct new improvements.	LS	\$
3.	1	LS	Parking Lot; to include AC Pavement, Concrete Curbs, Concrete Sidewalks, ADA Ramp, Base Course, in place complete.	LS	\$
4.	1	LS	Striping Work, in place complete.	LS	\$
5.	4	Ea.	Signage & Posts, in place complete.	\$	\$
6.	16	Ea.	Wheel Stops, in place complete.	\$	\$
7.	2	Ea.	Cattle Gate; including foundations, lock, chain, etc. in place complete.	LS	\$
8.	1	LS	New Viewing Platform, in place complete.	LS	\$
9.	1	LS	New Composting Toilet Facility, in place complete.	LS	\$
10.	1	LS	Project Sign, in place complete.	LS	\$
11.	1	LS	Access Road and maintenance area pavement; to include Concrete Pavement, Base Course, in place complete.	LS	\$
Subtotal Base Bid (Items 1-11)					\$
12.	1	LS	Mobilization and Demobilization (not to exceed 10% of the Subtotal Base Bid)		\$
Total Base Bid (Items 1-12)					\$

HAWAII PRODUCTS PREFERENCE AND/OR USE OF HAWAII PRODUCTS

In accordance with Act 175, SLH 2009, the Hawaii products preference is applicable to this solicitation. Bidders offering a Hawaii product (“HP”) shall identify the HP in the table below.

Persons desiring to qualify their product(s) not currently on the Hawaii Product List, shall complete Form SPO-38, *Certification for Hawaii Product Preference*, and submit the completed form no later than the deadline specified in the procurement notice and solicitation. The responsibility for certification and qualification shall rest upon the person requesting the preference. One form shall be completed and submitted for each product. Form SPO-38 is available at <http://hawaii.gov/spo/>

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

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

Item No.	Pre-Approved Hawaii Product Description & Manufacturer	Class (I or II)	Quantity	Unit Measure	Unit Price	Total Price
1.	<i>[Product Description, Manufacturer Name]</i>	(I)				
2.						
3.						
4.						

RECYCLED PRODUCTS PREFERENCE

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

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

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

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

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

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

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

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

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

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

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 12) selected by the Board of Land and Natural Resources. Write the total of bid items 1 to 12 on page P-1.

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

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

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

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

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

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

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

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

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

It is also understood and agreed that liquidated damages in the amount of two hundred dollars (\$ 200.00) for each and every calendar day in excess thereof prior to completion of the contract shall be withheld from payments due to the Contractor.

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

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

It is understood that by submitting this proposal, the undersigned is declaring that his firm has not been assisted or represented on this matter by an individual who has, in a State capacity, been involved in the subject matter of this contract in the past two years.

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

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

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

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

RECEIPT OF ADDENDA

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

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

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

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

JOINT CONTRACTORS OR SUBCONTRACTORS
TO BE ENGAGED ON THIS PROJECT

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

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

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

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

In completing the Joint Contractors or Subcontractors List, describe the specialty contractor's nature and scope of work to be performed for this project and provide the complete firm name of the joint contractor or subcontractor in the respective columns. If the Bidder is a general contractor providing the work of a required specialty contractor, whose license is not automatically held pursuant to HAR 16-77-32, 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.

Enclosed herewith is a:

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

(Cross Out Those Not Applicable)

_____ Dollars (\$ _____)

as required by law.

Respectfully submitted,

Name of Company, Joint Venture
or Partnership

Contractor's License No.

By _____
Signature (*4)

Title _____

Print Name _____

Date _____

Address _____

Telephone No. _____

E-Mail Address _____

NOTES:

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

End of Proposal

SPECIAL PROVISIONS

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

Section 2 – Proposal Requirements and Conditions

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

Section 3 – Award and Execution of Contract

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

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

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

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

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

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

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

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

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

Section 5 – Control of Work

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

Section 6 – Substitution of Materials and Equipment

ADD the following to Section 6.3 Sub-paragraph b:

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

Section 7 – Prosecution and Progress

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

“d. Insurance Requirements

1. Obligation of Contractor

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

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

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

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

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

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

2. Types of Insurance

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

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

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

The Contractor shall either:

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

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

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

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

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

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

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

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

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

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

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

Section 8 – Measurement and Payment

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

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

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

- d. A Certification from the Contractor affirming that the Contractor has, as applicable, remained in compliance with all laws as required by Section 103D-310, HRS, and Section 3-122-112, HAR. A contractor making a false affirmation shall be suspended and may be debarred pursuant to section 103D-702, HRS.

1. Certification of Compliance for Final Payment, State Procurement Office Form-22. Must be Signed Original.

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

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

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SECTION 01019

GENERAL SPECIFICATIONS

PART 1 - GENERAL

1.1 GENERAL REQUIREMENTS

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

1.2 GENERAL

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

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

G. Parking Policy for Contractor

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

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

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

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

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

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

M. Responsibility

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

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

O. Division of the Work: The Divisions and Sections into which these Specifications are divided shall not be considered an accurate or complete segregation of work by trades. This also applies to all work specified within each Section.

P. Drawings and Specifications

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

Q. Required Submittals

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

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

END OF SECTION

SECTION 01090

STANDARD REFERENCES

PART 1 - GENERAL

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

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

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

<u>Abbreviation</u>	<u>Company</u>
ASME	American Society of Mechanical Engineers 345 East 47th Street New York, NY 10017
ASTM	American Society for Testing and Materials 1916 Race Street Philadelphia, PA 19103
AWPA	American Wood Preservers Association 1625 Eye Street Washington, DC 20006
AWS	American Welding Society 2501 N.W. 7th Street Miami, FL 33125
AWWA	American Water Works Association 6666 West Quincy Avenue Denver, CO 80235
CBM	Certified Ballast Manufacturers 2120 Keith Building Cleveland, OH 44115
CMAA	Crane Manufacturers Association of America, Inc. (Formerly called: Overhead Electrical Crane Institute - OECI) 1326 Freeport Road Pittsburgh, PA 15238
CRSI	Concrete Reinforcing Steel Institute 180 North La Salle Street Chicago, IL 60601
CSA	Canadian Standards Association 178 Rexdale Boulevard Rexdale, Ontario, M9W 1R3, Canada
DEMA	Diesel Engine Manufacturer's Association 122 East 42nd Street New York, NY 10017

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

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

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

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

PART 2 - PRODUCTS (NOT USED)

PART 3 - EXECUTION (NOT USED)

- END OF SECTION -

SECTION 01100

ARCHAEOLOGICAL PROTECTION

PART 1 - GENERAL

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

PART 2 - PRODUCTS (NOT USED)

PART 3 - EXECUTION

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

END OF SECTION

SECTION 01300

SUBMITTALS

PART 1 - GENERAL

1.1 SUBMITTALS

A. Shop drawings shall be required for:

1. Fencing and Gate Materials.
2. Railing Materials.
3. Any others as called for in the plans, specifications or by the Engineer.

B. Other required submittals shall include:

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

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

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

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

CONTRACTOR NAME

PROJECT: _____

JOB NO: _____

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

DATE RECEIVED _____

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

CERTIFIED BY: _____

- C. This stamp, "filled in", should appear on the title sheet of each shop drawing, on a cover sheet of submittals in an 8-1/2" x 11" format, or on one face of a cardstock tag (min. 3" x 6") tied to each sample. The tag on the samples should state what the sample is so that, if the tag is accidentally separated from the sample, it can be matched up again. The back of this tag will be used by the Engineer for his receipt, review, and log stamp and for any comments that relate to the sample.
- D. All submittals for material, equipment, and shop drawings listed in the contract documents, including dimensioned plumbing shop drawings, shall be required and shall be reviewed by the Engineer, prior to any ordering of materials and equipment.
- E. Unless otherwise noted, the Contractor shall submit to the Engineer for his review eight copies of all shop drawings, piping layout, and/or catalog cuts for fabricated items and manufactured items (including mechanical and electrical equipment) required for the construction. Drawings shall be submitted in sufficient time to allow the Engineer not less than twenty regular working days for examining the drawings.
- F. The drawing shall be accurate, distinct, and complete and shall contain all required information, including satisfactory identification of items, units and assemblies in relation to the contract drawings and specifications.
- G. Unless otherwise approved by the Engineer, shop drawings shall be submitted only by the Contractor, who shall indicate by a signed stamp on the drawings or other approved means that the Contractor has checked the shop drawings and that the work or equipment shown is in accordance with contract requirements and has been checked for dimensions and relationship with work of all other trades involved. All deviations from the plans and specifications shall be listed. The practice of submitting incomplete or unchecked shop drawings for the Engineer to correct or finish will not be acceptable, and shop drawings which, in the opinion of the Engineer, clearly indicate that they have not been checked by the Contractor will be considered as not complying with the intent of the contract documents and will be returned to the Contractor for resubmission in the proper form.
- H. When the shop drawings have been reviewed by the Engineer, two sets of submittals will be returned to the Contractor appropriately stamped. If major changes or corrections are necessary, the drawing may be rejected and one set will be returned to the Contractor with such changes or corrections indicated, and the Contractor shall correct and resubmit eight copies of the drawings, unless otherwise directed by the Engineer. No changes

shall be made by the Contractor to the resubmitted shop drawings other than those changes indicated by the Engineer. The resubmittal shall be so indicated on the shop drawing.

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

PART 2 - PRODUCTS (NOT USED)

PART 3 - EXECUTION (NOT USED)

END OF SECTION

SECTION 01505

MOBILIZATION AND DEMOBILIZATION

PART 1 - GENERAL

1.1 GENERAL REQUIREMENTS

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

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

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

PART 2 - PRODUCTS (NOT USED)

PART 3 - EXECUTION

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

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

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

END OF SECTION

SECTION 01530

BARRICADES

PART 1 - GENERAL

1.1 GENERAL REQUIREMENTS

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

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

PART 2 - PRODUCTS

2.1 MATERIALS

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

PART 3 - EXECUTION

3.1 CONSTRUCTION REQUIREMENTS

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

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

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

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

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

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

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

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

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

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

Wooden rails shall be reflectorized with one of the following:

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

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

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

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

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

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

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

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

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

END OF SECTION

SECTION 01567

POLLUTION CONTROL

PART 1 - GENERAL

1.1 GENERAL REQUIREMENTS

A. Rubbish Disposal

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

B. Dust

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

C. Noise

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

D. Erosion

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

E. Others

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

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

F. Suspension of Work

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

PART 2 - PRODUCTS (NOT USED)

PART 3 - EXECUTION (NOT USED)

END OF SECTION

SECTION 01581

PROJECT SIGN

PART 1 - GENERAL

1.1 GENERAL REQUIREMENTS

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

1.2 SUBMITTAL

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

1.3 LETTER STYLE

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

1.4 ART WORK

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

1.5 TITLES

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

Design should follow the example on page 01581-3.

PART 2 - PRODUCTS

2.1 MATERIALS

A. LUMBER

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

B. PAINTS & INKS

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

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

C. CONCRETE

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

PART 3 - EXECUTION

3.1 GENERAL

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

3.2 MEASUREMENTS AND PAYMENT

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

SECTION 02100

SITE PREPARATION

PART 1 - GENERAL

1.1 GENERAL REQUIREMENTS

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

1.2 COORDINATION WITH OTHER SECTIONS

- A. Earthwork is specified in Section 02200 - EARTHWORK.

PART 2 - PRODUCTS (NOT USED)

PART 3 - EXECUTION

3.1 GENERAL

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

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

- B. **Protection:** Throughout the progress of the work protection shall be provided for all property and equipment, and temporary barricades shall be provided as necessary. Work shall be done in accordance with the safety provisions of the Manual of Accident Prevention in Construction, published by the Associated General Contractors of America, and the State of Hawaii's Occupational Safety and Health Standards, Rules and Regulations.
- C. **Fires:** No burning of fires of any kind will be allowed.
- D. **Reference Points:** Bench marks, etc., shall be carefully maintained, but if disturbed or destroyed, shall be replaced as directed, at the Contractor's expense.
- E. **Disposal:** All materials resultant from operations under this Section shall become the property of the Contractor and shall be removed from the site. Loads of materials shall be trimmed to prevent droppings.

3.2 EXISTING UTILITY LINES

- A. The existence of active underground utility lines within the construction area is not definitely known other than those indicated in their approximate locations on the Drawings. Should any unknown line be encountered during excavation, the Contractor shall immediately notify the Engineer of such discovery. The Engineer shall then investigate and issue instructions for the preservation or disposition of the unknown line. Authorization for extra work shall be issued by the Engineer only as he deems necessary.

3.3 CLEARING AND GRUBBING

- A. The Contractor shall clear the premises of all obstacles and obstructions, the removal of which will be necessary for the proper reception, construction, execution and completion of other work included in this contract.
- B. After clearing has been completed, the entire site shall be stripped of the organically contaminated near-surface soils to a minimum depth of 6 inches. Remove trees and roots to a minimum of 3 feet below existing ground level. Remove all large roots in excess of 2 inches in diameter, and backfill and compact the resulting depression. All debris accumulated from this operation shall be completely removed from the premises by the Contractor.
- C. The Contractor shall protect from injury and damage all surrounding trees, plants, etc., and shall leave all in as good as condition as at present. Any damage to existing improvement shall be repaired or replaced by the Contractor to the satisfaction of the Engineer.

3.4 CLEAN UP OF PREMISES

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

END OF SECTION

SECTION 02110

CLEARING AND GRUBBING

PART 1 - GENERAL

1.1 GENERAL REQUIREMENTS

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

PART 2 - PRODUCTS (NOT USED)

PART 3 - EXECUTION

3.1 CLEARING AND GRUBBING WORK:

- A. The area to be cleared shall be to the dimensions shown on the plans or one foot beyond toe of fill and top of cut whichever is greater.
- B. All debris, trees, logs, limbs, branches, brush, plants, and other protruding obstructions within the clearing limits shall be removed and disposed of, except the following:
 - 1. Live, sound, and firmly rooted trees with diameter of 4 inches or larger.
 - 2. Live brush, herbaceous plants, and trees between the trailbed and clearing limits that are less than 12 inches in height.
- C. Except as provided above, all limbs and branches more than 1/2 inch in diameter that extend into the cleared area shall be cut flush with the tree trunks or stems or cut at the ground surface.
- D. Felling, cutting, and trimming methods shall not cause bark damage to standing timber. If damage does occur to standing trees, the injured area shall be treated with a coat of tree-surgery asphalt-based paint. Trees with major roots exposed by construction that are rendered unstable shall be felled and disposed of as specified herein.
- E. All stumps within the trailbed shall be removed. Stumps located between the edge of the trailbed and clearing limits that cannot be cut flush with the finished slope, or are not tightly rooted, shall be removed.

- F. All logs, limbs, lopped tops, brush, and grubbed stumps and roots shall be scattered on the downhill side of and outside the clearing limits, with the following exceptions:
1. Limbs, brush, and lopped tops from trees felled on the uphill side of the clearing limits shall be scattered below the trailway, except where the existing sideslope above the trail is less than 20 percent; such material may be scattered above the trail.
 2. Logs may be left on the uphill side of the trail if they are placed so that they will not move into the clearing limits.
- G. Debris from clearing and grubbing operations shall not be placed in streams, water courses or at locations that will impede flow of the natural drainage pattern.

END OF SECTION

SECTION 02200

EARTHWORK

1.0 PART 1 – GENERAL

1.1 DESCRIPTION

- A. Furnish all labor, materials, and equipment necessary for earthwork, site grading, excavation, embankment, trenching, and backfilling to excavate, dispose, and compact fill material within the limits of grading designated on the Contract Drawings.
- B. Clearing and grubbing to be provided within the areas shown on the plan or as directed by the Engineer. Protect trees and other objects designated to remain.

1.2 REFERENCE STANDARDS

- A. ASTM D1557 - Standard Test Methods for Laboratory Compaction Characteristics of Soil Using Modified Effort; Latest Edition.
- B. Hawaii County Code, Chapter 5, as related to building code; 2005 Edition, as amended with latest revisions and ordinances.
- C. Hawaii County Code, Chapter 10, as related to erosion and sedimentation control; 2005 Edition, as amended with latest revisions and ordinances.
- D. Standard Details for Public Works Construction, Department of Public Works, City & County of Honolulu and the Counties of Kauai, Maui and Hawaii; September 1984, as amended with latest revisions.
- E. Standard Specifications for Public Works Construction, Department of Public Works, City & County of Honolulu and the Counties of Kauai, Maui and Hawaii; September 1986, as amended with latest revisions.

1.3 ADMINISTRATIVE REQUIREMENTS

- A. Comply with conditions and requirements shown in the Grading Permit, and Building Permit, including scheduling required inspections and notices with government agencies and inspectors, along with special inspectors, as applicable.

- B. Coordinate with independent Geotechnical Engineer for observation and testing to meet minimum compaction requirements. Cost for compaction testing shall be borne by the Contractor at no cost to the State.

1.4 FIELD CONDITIONS

- A. Perform work in accordance with the grading notes shown on plans.
- B. Grading work shall be carried to the lines and grades as shown on the drawings or as directed by the Engineer.
- C. Adverse Weather: Do not perform earthwork unless acceptable to Engineer and can still meet grading requirements.
- D. As-Built. Provide Engineer with confirmation of any as-built revisions to the grading plans for their use in providing report after grading to close the grading permit. Any revisions shall be cleared with grading inspector for acceptance, or may require re-work to complete according to approved grading plans.

2.0 PART 2 – PRODUCTS

- A. All soil materials shall comply with requirements of the County's grading ordinance.
- B. Material imported or excavated on the property may be utilized in the fill, provided each material conforms to the specifications herein. Roots, tree branches, and other deleterious materials missed during clearing operations shall be removed from the fill. Fill material shall be nonexpansive soil with a plasticity index not greater than 20. It shall be free of rocks and soil clumps greater than 6 inches in diameter and free of organic and other deleterious materials. The deeper natural soils with moisture contents considerably above optimum level shall be aerated or other satisfactory methods to achieve optimum water content and adequate compaction levels.
- C. Rock fragments less than 6 inches in diameter may be utilized in the fill provided:
 - 1. They are not nested; i.e., placed in concentrated pockets.
 - 2. There is sufficient fine grained material to surround the rocks.
 - 3. The distribution and location of the rocks are such that they will not adversely affect the future construction.

- D. Rocks larger than 6 inches in diameter shall be taken offsite or placed in the deeper fill areas suitable for rock disposal. In no case, however, shall these rocks be placed within 3 feet of the finish grade or subgrade or have a minimum soil cover less than the diameter of the rock, whichever is greater. The rocks should not be nested in concentrated pockets.
- E. Material that is spongy, subject to decay or otherwise considered unsuitable shall not be used in the compacted fill.
- F. Representative samples of the materials to be utilized as compacted fill shall be tested in the laboratory by the Engineer to determine their physical properties. Samples of the proposed materials shall be submitted to the Engineer at least seven working days prior to its intended job site delivery.

3.0 PART 3 – EXECUTION

3.1 CLEARING AND GRUBBING WORK

- A. The area to be cleared of vegetation shall be only in those areas shown on the plans. All debris, logs, brush, plants, and other protruding obstructions within the designated clearing area shall be removed and disposed of.
- B. All limbs and branches more than ½ inch in diameter that extend into the cleared area shall be cut flush with the tree trunks or stems or cut at the ground surface.
- C. Debris from clearing and grubbing operations shall not be placed in streams, water courses or at locations that will impede flow of the drainage pattern.

3.2 GRADING PROCEDURES

- D. The Contractor shall finish the excavation and embankment area to smooth and uniform surfaces. The Contractor shall conduct excavation operations so that the Contractor does not disturb the material outside the limits of grading.
- E. The Contractor shall comply with all local, State, and Federal laws, regulations, standards, and guidelines as related to grading, soil erosion, and sediments controls.

3.3 EXCAVATION

- A. Slopes. The Contractor shall finish cut slopes to two (2) horizontal to one (1) vertical or flatter and to the required lines and slopes except where indicated on the Contract Drawings.
- B. The Contractor shall maintain slopes, whether old or new, with true and smooth surfaces.
- C. Each excavated embankment slope bench be as shown on the drawings.
- D. Excavated Material: The Contractor shall use excavated material approved by the Engineer as fill material for the buttress and to fill localized depressions as shown in the Contract Drawings or as ordered by the Engineer.
- E. If the Contractor imports earth fills for use as the buttress fills, the Contractor shall notify the Engineer in writing of the location of the borrow site in sufficient time in advance to allow for samples to be obtained and tests performed to determine the suitability of the proposed alternate fill material.
- F. The Contractor shall hire a geotechnical Engineer licensed in the State of Hawaii to obtain samples and conducts testing to determine the suitability of alternate fill material.
- G. The Contractor shall complete embankments before arranging the disposal of imported earth fills. The Contractor shall not dispose imported earth fills unless authorized by the Engineer.
- H. Imported earth fills authorized by the Engineer for disposal shall become the Contractor's property and be removed from the property. Disposal of imported earth fills shall be considered incidental to the contract items.

I. Embankment Construction

Embankment Construction includes:

- 1. Constructing embankments within the project limits, including preparation of the area receiving the approved fill material.
- 2. Placing and compacting of approved fill material within the project area where unsuitable material was removed; and placing and compacting of

embankment materials in holes, pits, and localized depressions within the project area.

3. The Contractor shall finish fill slopes at two (2) horizontal to one (1) vertical.
4. The Contractor shall use only approved fill material in the construction of embankments and backfills.
5. The Contractor shall not place rocks, boulders, or cobbles greater than six (6) inches in diameter; solid materials; large roots; or organic debris in embankment areas.
6. Benching shall be sufficient width to permit operation of placing and compacting equipment. The Contractor shall begin each horizontal cut at the intersection of the original ground and the vertical sides of the previous cuts.
7. The Contractor shall place embankment of fill material in horizontal layers not exceeding twelve (12) inches in loose thickness and compacted to six (6) lifts at a minimum of 95 percent relative compaction and moisture conditioned to within two (2) percent of optimum water content based on ASTM D-1557 before placing next layer.
8. The Contractor shall construct the center of embankment layers higher than the sides. The Contractor shall construct side hill embankments with the intersection with the original ground as high point of the layer. The Contractor shall uniformly slope to the outer side.
9. Until the final acceptance of the Contract, the Contractor shall maintain embankments to the grade and cross section shown in the Contract Drawings. The Contractor shall be responsible for the stability of the constructed embankments. The Contractor shall replace portions that become displaced or damaged at no cost to the Owner.
10. The Engineer will consider heavy rain a cause for shutting down grading operations.
11. The existing embankment surface shall be keyed and benched prior to placement of rock and / or suitable compacted earth fills as indicated in the Contract Drawings.

12. Placement of fills shall be completed on an excavated slope bench prior to excavation of benches further upslope.
13. The Contractor shall hire a geotechnical engineer licensed in the State of Hawaii to conduct the site soil compaction tests. All cost of sampling and testing shall be borne by the Contractor.

END OF SECTION

SECTION 02230

AGGREGATE BASE COURSE

PART 1 - GENERAL

1.1 GENERAL REQUIREMENTS

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

PART 2 - PRODUCTS

2.1 MATERIALS

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

Aggregate	703.06
Water	712.01

PART 3 - EXECUTION

3.1 CONSTRUCTION REQUIREMENTS

A Placing

1. The base material shall be placed on the prepared surface without segregation. Segregated materials shall be remixed until a uniform distribution is obtained. The material shall not be dumped in piles on the prepared surface.
2. Depositing and spreading shall commence at that part of the work farthest from the point of loading the material and shall progress continuously without breaks, unless otherwise directed by the Engineer.
3. If the required compacted depth of the base course exceeds 6 inches, the base shall be constructed on 2 or more layers of approximately equal thickness. The maximum compacted thickness of any one layer shall not exceed 6 inches.
4. If the contractor uses a vibratory roller weighing 9 tons or more, the lift thickness may be increased to 7 inches.

5. Spreading of binder material over the surface of the compacted base will not be permitted. Additional material if required shall be incorporated uniformly throughout the thickness of the compacted material by scarifying and blading. The combined material shall meet all quality requirements as specified.
- B. Shaping and compacting
1. The Contractor shall perform such shaping work as necessary and such that the finished base shall conform to the required grade and cross-section. The finished base where not controlled by adjacent structures or features shall not vary more than 0.04 foot above or below the theoretical grade.
 2. Compaction of each layer shall continue until a density of not less than 95 percent of the maximum density, determined in accordance with the requirements of Subsection 106.09 - Special Test Methods, of the "Standard Specifications for Road and Bridge Construction, has been achieved. Field density determination will be made in accordance with Hawaii Test Method HWY-TC 1. The surface of each layer shall be maintained during the compaction operations in such a manner that a uniform texture is produced and the aggregates firmly keyed. Water shall be uniformly applied over the base materials during compaction in the quantity necessary for proper consolidation. All cost of testing shall be borne by the Contractor.
 3. Should high or low spots develop during rolling operations, such spots shall be smoothed out by blading with a self-propelled and pneumatic-tired motor grader having a wheel base not less than 15 feet long and a blade not less than 10 feet long.
 4. Each layer shall be compacted initially by rolling with three-wheel rollers followed by intermediate rolling with pneumatic-tired rollers. Final rolling shall be done with three-wheel rollers.
- C. Equipment. Three-wheel rollers and pneumatic-tired rollers shall conform to the requirements specified in Subsection 401.03(B)(4) - Rollers.

END OF SECTION

SECTION 02512

ASPHALTIC CONCRETE

PART 1 - GENERAL

1.1 GENERAL REQUIREMENTS

Asphaltic concrete shall consist of a mixture of mineral aggregate and bituminous material, mixed at a central plant in the proportions hereinafter specified and spread and compacted on a prepared base or existing road surface.

The pavement may consist of a surface course mixture and leveling or base course mixture, as hereinafter specified.

PART 2 - PRODUCTS

2.1 MATERIALS

All materials shall meet the requirements specified in the State of Hawaii, Department of Transportation "Hawaii Standard Specifications for Road and Bridge Construction," latest edition, with the following subsections of Division 700 - Materials.

Bituminous Material (Asphalt Cement, Grades AR 40 or 80)	702.01
Asphalt Paint (Emulsified Asphalt)	702.04
Aggregate	703.09
Filler	703.15
Blending Sand	703.22
Hydrated Lime	712.03

Leveling or base course mixture shall be Mix No. 5, surface wearing course mixture shall be as shown on the plans or called for in the special provision or proposal.

- A. Grading and Composition Requirements: Materials composing the asphalt concrete shall be combined to meet the requirements set forth in Table 1. The grading composition limits specified are based on materials of uniform specific gravity. Correction of grading limits shall be made to compensate for any variations in specific gravity of the individual sizes.

<u>Compacted Thickness Individual Layers</u>	<u>Base and Leveling Course</u>	<u>Roadway Mixes</u>		
		<u>(Std.)</u>	<u>(Dense Grade)</u>	<u>Resurfacing Mix</u>
Minimum	1-1/2"	1-1/4"	1-1/4"	3/4"
Maximum	2-1/2"	2-1/2"	2-1/2"	1-1/2"

TABLE 1-GRADING AND COMPOSITION REQUIREMENTS

MIX NO.	2	3	4	5
<u>SIEVE SIZE</u>	<u>COMBINED AGGREGATE Total Percent Passing by Weight</u>			
1-1/4"	100	-	-	-
1"	85-100	100	-	-
3/4"	-	90-100	100	-
1/2"	60-85	70-90	85-100	100
3/8"	-	-	72-88	80-100
No. 4	36-55	40-57	48-66	55-75
No. 8	26-41	30-47	32-48	35-52
No. 16	17-32	20-36	21-37	22-38
No. 30	12-25	16-28	15-27	14-26
No. 50	8-18	10-22	9-21	8-20
No. 100	5-14	8-17	6-16	6-15
No. 200	1- 8	4-10	4-10	4-10
<u>_Percentage by weight of Asphaltic Cement to be Added</u>	4.5-6.5	5.0-7.0	6.0-8.0	5.0-7.0

The grading within the above tolerances shall be to the percentage of aggregate passing the sieves during any day's run will conform to the following limitations:

Passing No. 4 and larger sieves	7% above or below
Passing No. 8 and No. 100 sieves	4% above or below
Passing No. 200 sieves	2% above or below
Bituminous Binder	0.4% above or below
Temperature of Mixture on Delivery	20°F above or below

PART 3- EXECUTION

3.1 DETAILS

- A. **Mixing:** The asphaltic cement shall be heated in a kettle of approved type, and maintained at a temperature between 275NF and 300NF. The heat must be so applied that there can be no burning of any portion of the asphaltic cement. No live steam shall be injected into the cement. The mineral aggregate shall be heated in an approved appliance to a temperature of not less than 275NF nor more than 320NF.

After heating to the required temperature, the required amount of asphalt cement shall be added to the heated aggregate. This mass shall be introduced into the mixer within 25NF of each other's temperature.

- B. **Prime Coat:** All surfaces on or against which asphalt concrete is to be placed shall first be given an asphaltic cement prime or tack coat as specified in Section 02513, "Prime Coat," of these specifications.

Before applying the prime and tack coat, the Contractor shall prepare the existing surfaces by power brooming to remove all loose particles, dust, sand, and other foreign materials.

- C. **Asphaltic Concrete Interlayer Fabric Membrane:** Immediately after installation of the prime coat and prior to installation of the asphaltic concrete wearing surface the interlayer fabric membrane is to be installed in accordance with Section 02517.

- D. **Laying Wearing Surface:** In advance of placing asphalt concrete over an existing base, surfacing, or pavement, and after the base, surfacing, or pavement has been prepared as herein specified, and if ordered by the Engineer or shown on the plans, a leveling course mixture shall be spread to level irregularities, dips, depressions, sags, and excessive crown, and to provide a smooth base of uniform grade and cross-section in order that the surface course will be of uniform thickness. The above specified material shall not be placed more than one day in advance of placing the surface course. No additional compensation will be allowed for placing leveling course mixture as specified above and full compensation for all work incidental to such operations shall be considered as included in the contract prices or price paid for the asphalt concrete mixture used.

The mixture as prepared above shall be brought to the work in suitable vehicles at a temperature of not less than 250NF. Tarpaulins shall be provided and used upon all loads.

The wearing surface shall be spread with self-propelled mechanical spreading and finishing equipment, provided with a screed or strike-off assembly capable of distributing not less than the full width of a traffic lane. The screed shall be adjustable to the required crown and elevation. Screeding includes any cutting, crowding or other action which is effective on the mixture without tearing, shoving, or gouging, and which produces a finished surface

of an even texture. The equipment shall be provided with rolling, tamping, or other suitable compacting devices, and shall be operated with a forward speed of not more than 20 feet per minute.

If the spreading and finishing equipment leaves ridges, indentations, or other marks in the surface that cannot be eliminated by rolling or prevented by adjustment in operation, its use shall be discontinued and other acceptable equipment shall be furnished by the Contractor.

If more than one course is to be laid in any area, not more than 24 hours shall elapse between the spreading and finishing of any two successive courses in that area.

The self-propelled mechanical spreading and finishing machine shall be capable of propelling the vehicle being unloaded in uniform manner and, if necessary, the load of the haul vehicle shall be so limited that satisfactory spreading will be obtained. While being unloaded, the vehicle shall be firmly attached to the machine and the brakes on the vehicle shall not be depended upon to obtain contact between the vehicle and the machine.

Before placing asphalt concrete wearing surface adjacent to cold transverse construction joints, such joints shall be trimmed to a vertical face in a neat line. The location of the proposed joint shall be tested with a 10-foot straight-edge and cut back such that when the straight-edge is laid on the finished surface parallel with the center line of the street, the surface shall in no place vary from the lower edge of the straight-edge more than 1/8 inch.

Before placing asphalt concrete adjacent to any existing asphalt concrete, the face of the existing asphalt concrete shall be trimmed to a vertical face in a neat line.

Where asphalt concrete wearing surface is placed adjacent to a Portland cement concrete gutter, the asphalt concrete wearing surface shall be so laid that its surface, after compaction, will approximately be 1/4-inch above the surface of the adjacent concrete. The edge of the asphalt concrete wearing surface shall then be smoothed and sealed over a width of approximately 3 inches with hot hand-irons having a self-contained heating unit.

At locations where the width of asphalt concrete mixture to be spread is too narrow to permit the use of self-propelled mechanical spreading and finishing equipment, or where the surfacing is to extend to a featheredge and the use of such a machine is not practicable, the mixture may be spread by hand-raking. Where hand-raking is permitted, the mixture shall be finally shaped and smoothed by means of a wooden float 8 feet long, one-inch thick and 4 inches wide. The float shall be rigidly ribbed, and to insure a true and flat surface on the underside, adjusting screws shall be placed between the rib and float at not more than 24-inch centers. The float shall be operated by means of a long handle, from the side of the area being paved or surfaced, and parallel with the center line of the pavement or surfacing. High spots and irregularities that are transverse to the path of traffic shall be

cut down and the material redistributed over the area. The maximum depth of wearing surface which may be spread and rolled in one course shall not exceed a compacted thickness of 2 inches. Where such thickness exceeds 2 inches, it shall be spread and rolled in courses each not to exceed a compacted thickness of 1-1/2 inches unless otherwise specified in these specifications.

Wearing surface mixture shall not be spread from hauling vehicles.

No wearing surface shall be spread when the atmospheric temperature is below 50°F or during other unsuitable weather, or when the base is wet.

- E. Rolling: Immediately after the wearing surface has been laid as specified above, it shall be compressed with power rollers, smooth running, and in first-class mechanical condition. Initial rolling or tamping shall be performed when the temperature of the mixture is between 220NF and 245NF.

After the first pass of the roller, any low or grainy spots shall be broken up with a hot rake and more material worked in to insure a surface of uniform texture and maximum density. Rolling equipment shall be self-propelled. Initial rolling of asphalt concrete mixtures shall be performed by means of a three-wheeled roller weighing not less than 12 tons and with a compression on the rear wheels of not less than 325 pounds per linear inch of tire width, or in lieu thereof, by means of a three-axle tandem roller weighing not less than 12 tons. For production not exceeding 150 tons per hour, not less than one of the above specified rollers shall be used for initial rolling. For productions in excess of 150 tons per hour, one additional roller of a type designated by the Engineer will be required for each additional 100 tons or fraction thereof of asphalt concrete mixture placed.

Three-axle-tandem type rollers shall be so constructed that the rolls, when locked in position for all treads to be in one plane, are held with a rigidity which will permit the following test under full load. With the weight of the roller supported on the central roll, the tread of the central roll shall not be more than 1/8-inch above the plane tangent to the treads of the end rolls. With the weight of the roller supported on the end rolls, the tread of the central roll shall not be more than 1/4-inch below the plane tangent to the treads of the end rolls.

In general, three-axle tandem roller shall not be used in rolling over a crown or on warped surfaces when the axle is in a locked position.

Finishing rolling of asphalt concrete mixtures shall be performed by means of a tandem roller weighing not less than 10 tons.

Rolling shall continue until the compressed pavement or surfacing has a relative specific gravity of not less than 95 percent of the specific gravity of the combined mixture without voids.

- F. Smoothness: The finished surface of the pavement shall be true to grade and cross-section, free from depressions, or grainy spots, and shall show a uniform distribution of aggregate.

When a straight-edge, 10 feet long, is laid on the finished surface parallel to the center line of the pavement, the surface shall in no place vary from the lower edge of the straight-edge more than $3/16$ of an inch.

No traffic shall be permitted on any course of asphalt concrete until it has cooled and set, except such traffic as may be necessary for construction purposes.

END OF SECTION

SECTION 02513

PRIME COAT

PART 1 - GENERAL

1.1 GENERAL REQUIREMENTS

This section covers the requirements for furnishing and installing of prime coat.

PART 2 - PRODUCTS

2.1 MATERIALS

- A. Bituminous Material: Bituminous material for prime coat shall be a medium curing liquid asphalt, Grade MC-30, conforming to the applicable requirements of Section 702 - Bituminous Materials, State of Hawaii, Department of Transportation "Standard Specifications of Road and Bridge Construction."

The Contractor shall submit a Certificate of Compliance accompanied by test data, conforming to the requirements of ASTM M82-75 Cut-Back Asphalt (Medium Curing Type), for each lot or batch of MC-30. Medium curing liquid asphalt, grade MC-30 will not be accepted without adequate documentation.

The Engineer reserves the right to waive any of the requirements for the MC-30 provided that its performance is not affected.

PART 3 - EXECUTION

3.1 DETAILS

- A. Immediately before applying the prime coat, the surface to be treated shall be swept clean of all loose material, dirt, excess dust or other objectionable material.

Prime coat shall not be applied when the surface to be treated is appreciably damp or when weather conditions are unsuitable.

- B. The material shall be uniformly applied by a vehicle, mounted, pressure operated, sprayer type distributor at an approximate rate of 0.35 of a gallon per square yard. The exact rate of application shall be determined by the Engineer. After the prime coat has penetrated the surface, deficient areas shall receive additional applications and areas of excess bituminous material shall be blotted with clean sand. Traffic shall be kept off the prime coat until the material has been completely absorbed.

- C. Curbs, sidewalks and gutters shall be protected from prime coat. Any material sprayed on adjoining improvements shall be immediately cleaned off. The edges of existing asphalt paving, manholes and catch basin frames, concrete gutters, etc., against which asphaltic concrete pavement is to be placed shall be given a prime coat.

END OF SECTION

SECTION 02514

TACK COAT

PART 1 - GENERAL

1.1 GENERAL REQUIREMENTS

This section covers the requirements for furnishing and installing bituminous tack coat.

PART 2 - PRODUCTS

2.1 All sections or subsections called for in the specifications shall be referred to the State of Hawaii, Department of Transportation, "Hawaii Standard Specifications for Road and Bridge Construction," 1985.

2.2 MATERIALS

Bituminous material for tack coat shall be slow-setting emulsified asphalt, Type SS-1 or Type SS-1H, conforming to the applicable requirements of Section 407 - Bituminous Tack Coat.

Water shall conform to the requirements of Subsection 712.01 - Water.

PART 3 - EXECUTION

3.1 CONSTRUCTION REQUIREMENTS

- A. Weather Limitations: Tack coat shall not be applied on a wet surface or when weather conditions otherwise shall prevent proper construction.
- B. Equipment: The Contractor shall provide equipment for heating and applying the bituminous material. This equipment shall meet the requirements of Subsection 405.03(B) - Equipment.
- C. Preparation of Surface: Immediately before applying the tack coat, the surface to be treated shall be swept clean of all loose material, dirt, excess dust or other objectionable matter. A power broom or power blower, supplemented by hand methods if necessary, shall be used.
- D. Application of Bituminous Material: The emulsified asphalt shall be diluted with water at a rate of one part emulsion to one part of water by volume. The quantity, rate of

application, temperature, and areas to be treated will be approved prior to application.

Tack coat shall be placed only so far in advance of the surface course placement as is necessary for it to cure to the proper condition for placement of such surface course.

Unless otherwise specified, tack coat shall be applied at the rate of 0.05 - 0.15 gallon per square yard on surface of base course.

Tack coat will not be measured for payment. Tack coat will be considered as incidental to the various contract items.

END OF SECTION

Tack Coat
02514-2

SECTION 02577

PAVEMENT MARKING

PART 1 - GENERAL

1.1 GENERAL REQUIREMENTS

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

PART 2 - PRODUCTS

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

Striping shall be provided by thermoplastic extrusion. Traffic paint is not acceptable.

PART 3 - MEASUREMENT AND PAYMENT

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

END OF SECTION

SECTION 02720

CONCRETE CURBS

1.0 PART 1 – GENERAL

1.1 GENERAL REQUIREMENTS

Furnish all labor, materials, and equipment necessary for placement of Concrete Curb as shown in Contract Drawings.

1.2 REFERENCE STANDARDS

- A. Hawaii County Code, Chapter 5, as related to building code; 2005 Edition, as amended with latest revisions and ordinances.
- B. Standard Details for Public Works Construction, Department of Public Works, City & County of Honolulu and the Counties of Kauai, Maui and Hawaii; September 1984, as amended with latest revisions.
- C. Standard Specifications for Public Works Construction, Department of Public Works, City & County of Honolulu and the Counties of Kauai, Maui and Hawaii; September 1986, as amended with latest revisions.

1.3 FIELD CONDITIONS

Perform work in accordance with the Standard Specifications and Details for Public Works Construction.

2.0 PART 2 – PRODUCTS

Materials, construction, and installation for site roadway, driveway, and parking construction shall conform to the applicable sections of the Standard Specifications for Public Works Construction, including the following Sections:

<u>Section</u>	<u>Description</u>
41	Concrete Curb and Gutter

3.0 PART 3 – EXECUTION

3.1 INSTALLATION

- A. Construction and installation shall conform to the applicable sections of the Standard Specifications for Public Works Construction.
- B. Details shall conform to the Standard Details for Public Works Construction.
- C. Provide concrete curbs to the lines and grades as shown in Contract Drawings.

END OF SECTION

SECTION 02730

PARKING BUMPERS

1.0 PART 1 – GENERAL

1.1 GENERAL REQUIREMENTS

Furnish all labor, materials, and equipment necessary for the installation of wheelstops (parking bumpers) as shown in Contract Drawings.

1.2 REFERENCE STANDARDS

- A. Hawaii County Code, Chapter 5, as related to building code; 2005 Edition, as amended with latest revisions and ordinances.
- B. Standard Details for Public Works Construction, Department of Public Works, City & County of Honolulu and the Counties of Kauai, Maui and Hawaii; September 1984, as amended with latest revisions.
- C. Standard Specifications for Public Works Construction, Department of Public Works, City & County of Honolulu and the Counties of Kauai, Maui and Hawaii; September 1986, as amended with latest revisions.

1.3 FIELD CONDITIONS

Submit proposed wheelstop submittal from manufacturer to Engineer for review and approval.

2.0 PART 2 – PRODUCTS

Provide pre-fabricated concrete wheelstops to the sizes and dimensions shown in the plans. Steel dowels to secure wheelstops into parking lot.

3.0 PART 3 – EXECUTION

3.1 INSTALLATION

- A. Provide wheelstops in the locations shown in the Contract Drawings.
- B. Secure wheelstops into parking area by use of steel dowels.

END OF SECTION

SECTION 02800

TRAFFIC SIGNAGE

1.0 PART 1 – GENERAL

1.1 GENERAL REQUIREMENTS

Furnish all labor, materials, and equipment necessary for placement of signs and posts around the road, driveway and parking lot areas as shown in Contract Drawings. Temporary traffic control during construction.

1.2 REFERENCE STANDARDS

- A. Manual on Uniform Traffic Control Devices, Federal Highway Administration, current edition.
- B. Hawaii County Code, Chapter 5, as related to building code; 2005 Edition, as amended with latest revisions and ordinances.
- C. Standard Details for Public Works Construction, Department of Public Works, City & County of Honolulu and the Counties of Kauai, Maui and Hawaii; September 1984, as amended with latest revisions.
- D. Standard Specifications and Special Provisions, Department of Transportation (DOT), 2005, as amended with latest revisions.
- E. Standard Specifications for Public Works Construction, Department of Public Works, City & County of Honolulu and the Counties of Kauai, Maui and Hawaii; September 1986, as amended with latest revisions.

1.3 FIELD CONDITIONS

Submit proposed signage to Engineer for review and approval. Perform work in accordance with the Manual of Uniform Traffic Control Devices and Standard Specifications from DOT.

2.0 PART 2 – PRODUCTS

Provide signs and posts in accordance with the MUTCD and Standard Specifications from DOT, Section 630, Traffic Control Guide Signs, Section 630.02, and Section 631, Traffic Control Regulatory, Warning, and Miscellaneous Signs, Section 631.02.

3.0 PART 3 – EXECUTION

3.1 INSTALLATION

- A. Construction and installation shall conform to the applicable sections of the Standard Specifications for Public Works Construction.
- B. Details shall conform to the Standard Details for Public Works Construction.
- C. Furnish and Install signs and posts in accordance with the Standard Specifications from DOT, Section 630, Traffic Control Guide Signs, Section 630.03, and Section 631, Traffic Control Regulatory, Warning, and Miscellaneous Signs, Section 631.03.
- D. Provide temporary traffic control in accordance with the MUTCD and Standard Specifications from DOT, Section 645 Work Zone Traffic Control.

END OF SECTION

SECTION 02831

GALVANIZED CHAIN LINK FENCES AND GATES

PART 1 - GENERAL

1.1 GENERAL REQUIREMENTS

This section covers the requirements for furnishing and installing galvanized chain link fences and gates.

PART 2 - PRODUCTS

2.1 MATERIALS

All materials and fittings shall be new, and all ferrous materials shall be hot-dipped galvanized in accordance with the requirements under ASTM A 123. All galvanized materials shall be free from barbs, icicles or other hazardous projections resulting from galvanizing.

- A. Chain Link Fence Fabric: Shall be No. 9 gage conforming to ASTM A392, Class 1, 2-inch mesh unless noted otherwise on the plan. The hot-dipped galvanized fabric shall contain not less than 1.2 ounces per square foot of uncoated wire surface as determined by stripping test ASTM A90 and under the PREECE Test (ASTM A239), shall withstand 6 or more one-minute dips before reaching the end point.
- B. Tie Wire: Shall be 12-gauge galvanized steel wire.
- C. Tension Bar: Shall be 1/4" thick by 3/4" wide mild steel bar for attachment of a fabric to a terminal post.
- D. Tension Band and Brace Band: Shall be formed from steel bands at least 12 gauge thick by 3/4" wide.
- E. Tension Rod: Shall be a 3/8" diameter mild steel rod threaded at one end and hooked 180° at the other.
- F. Fittings: (Note: Pressed steel fittings shall not be allowed)
 - 1. Post cap and eye top shall be of one-piece cast iron or malleable iron construction and shall attach securely onto their respective posts.
 - 2. Coupling for top rails shall be outside sleeve type, at least 6" long and crimped at center.

3. Rail ends shall be snug, one-piece cast iron or malleable iron fittings for top and brace rails with holes to receive 5/16" bolts for securing to rail end bands.
 4. Two-hole rail end shall be similar to rail end except for an additional 2" hole to receive the hooked end of a tension rod.
- G. Composition and Finish of Metal Parts: All metal parts and fittings, frames and bolts shall be galvanized by the hot-dip process, after fabrication, in conformance with ASTM A153. The coating on all parts shall be continuous and smooth; that is, free from barbs, icicles or other projections.
- H. Posts, Rails and Braces: Shall be the standard weight, hot-dipped galvanized, welded and seamless steel pipes conforming to ASTM A120.
- I. Selvage Wire: Shall be of 8-gauge galvanized coil spring steel wire of good commercial quality.
- J. Barbed Wire: Shall be three lines of 4-point pattern, each composed of two strands of no. 12-1/2 gauge galvanized wire.
- K. Extension Arms: Shall be hot-dipped galvanized. Line post arms of pressed steel are to be of one solid piece construction: gate and terminal posts to have ball caps. Each arm to carry 3 barbed wires at an angle of 45 degrees.
- L. Concrete for post footings shall be Class "B".

PART 3 - EXECUTION

3.1 INSTALLATION AND WORKMANSHIP

A. General

1. Chain link fencing shall be erected in strict conformance with the plans and these specifications. Posts shall be plumb and in line. Welding shall be done in accordance with latest AWS standards. However, no splicing of posts, rails or braces shall be accepted. Where changes in line occur with an angle of deflection of 30 degrees or more, the change point will be considered a corner and a corner post shall be installed thereat. End and corner posts for fences with 5-foot and wider fabric shall be braced to the nearest line post with horizontal braces and tension rods. The horizontal braces shall be spaced midway between top rail and ground and securely fastened to posts as shown on plans. Where fencing is placed along a curve with radius of 50 feet, or less, horizontal braces (and tension rods) shall be installed between all posts in like manner. Pull posts, at maximum intervals of 300 feet, shall be braced and trussed in both directions as specified above.

2. Field Touch-Ups: Field welds shall be cleaned of flux and spatter and all damaged galvanizing removed, all hazardous projections ground off, properly prepared, and then heavily coated with self-curing inorganic zinc coating. Manufactured coatings shall be applied in strict accordance with manufacturer's printed specifications. Damage to existing painted surfaces shall be touched up.
- B. Fence posts, except as otherwise indicated or specified, shall be spaced not more than 10 feet apart. In curved fence sections having a radius of 50 feet or less, the posts shall be spaced as shown on the plans. Line posts shall be set so that the eye top will receive the top rail and fence fabric at the proper height as shown on the plan.
 - C. Top rails shall pass through and bear firmly on base of eye tops, form a continuous brace from end to end of each stretch of fence, and be securely fastened to terminal posts with rail ends and brace bands. Couplings for top rails shall be installed at intervals of 21 feet maximum.
 - D. Chain link fabric shall be fastened on the side of the posts as designated and shall be mounted on the posts so that the bottom of the fabric will be no more above the finished grade than called for on the plans. High points of the ground shall be excavated as necessary. The fabric shall be stretched taut and securely fastened to the posts. Ends of wire ties shall be bent back so as not to be a hazard. Between posts the top edge of the fabric shall be fastened to the top rail and the lower edge to the tension wire with tie wire of size and at spacing as called for on the plans. Tension wire shall be stretched tight and shall be installed in a straight line between posts. Tension bars extending the full height of the fence and tension bar bands shall be used for fastening fabric to end, corner, pull and gate posts. Bolted tension bar bands shall be placed at top and bottom of tension bars and spaced at 12" intervals. Fastenings to line posts shall be made with tie wire of size and at spacing as called for on the plans.
- 3.2 FINAL CLEANUP
- A. All exposed metal surfaces shall be clean and free of cement. All surplus earth resulting from fencing work that is not used in the grading work shall be cleaned up and disposed of off site.

END OF SECTION

SECTION 03210

REINFORCING STEEL

PART 1 - GENERAL

1.1 GENERAL REQUIREMENTS

This section covers the requirements for furnishing and placing of deformed steel bars or welded wire fabric as reinforcement in concrete. The quality, type, size, and dimensions shall be as called for in these specifications and as shown on the plans.

PART 2 - PRODUCTS

2.1 MATERIALS

- A. Bar reinforcement shall be of grade 40, billet steel deformed type bars made by the open hearth process and shall conform to the requirements of ASTM Designation A615.
- B. Welded wire mesh reinforcement shall be galvanized steel, electric welded type and shall conform to the requirements of ASTM Designation A185. The gauge of the wire and dimensions of the mesh shall be given in these specifications or as shown on the plans.

2.2 EPOXY COATING

Epoxy coating for the reinforcing steel shall be applied by the electrostatic spray method conforming to ASTM A-775.

PART 3 - EXECUTION

3.1 CONSTRUCTION

Unless otherwise specified, the installation of reinforcing steel shall conform to the requirements of "ACI Standard Building Code Requirements for Reinforced Concrete" and "Concrete Reinforcing Steel Institute."

- A. Protection of Material: Steel reinforcement shall be protected at all times from damage. When placed in the work, all reinforcing steel shall be new, free from dirt, detrimental scale, paint, oil, or other foreign substances. No material cleaned by sandblasting will be allowed. In the absence of manufacturer's quality mark, the Engineer may require standard ASTM tests be made on representative samples before acceptance. All costs incurred in connection with these tests shall be borne by the Contractor.

- B. Bending Diagrams and Order Lists: Two copies of all reinforcing steel order lists and bending diagrams shall be furnished directly to the Engineer and at the site for his use in administering the contract.

Furnishing such lists and diagrams to the Engineer shall not be construed to mean that the lists and diagrams will be reviewed for accuracy. The Contractor shall be wholly and completely responsible for the accuracy of the lists and diagrams and for furnishing and placing all bar reinforcing steel in accordance with the details shown on the plans as specified.

- C. Bending: Bends for stirrups and ties shall be made around a pin having a diameter not less than two times the minimum dimensions of the bar. Bends for other bars shall be made around a pin having a diameter not less than six times the minimum dimension of the bar, except that for bars larger than one inch, the pin shall be not less than eight times the bar thickness. All bars shall be bent cold before placing in forms.

- D. Placing: Reinforcement shall be accurately placed, supported, aligned, and secured against movement. Bars shall be tied at all intersections except where the spacing is less than one foot in each direction, in which case alternate intersections shall be tied.

Distance from forms and between layers of reinforcing shall be maintained by means of approved commercial chairs, stays, blocks, ties, hangers, or other approved supports. The use of pebbles, pieces of broken stone or brick, metal pipe, or wooden blocks shall not be permitted.

No concrete shall be placed prior to the inspection and approval of the size and placement of all reinforcement by the Engineer.

- E. Splicing: End laps of bars at splices shall be a minimum of 30 bar diameters and shall be staggered unless otherwise shown. Bars shall be installed in as long lengths as practicable and splices reduced to a minimum unless otherwise shown on the plans.
- F. Wire Mesh: Wire mesh shall be rolled out flat and firmly held in place to the lines and grade as shown on the plans before placing concrete. Splices shall be made by lapping not less than one mesh and securely tied.
- G. Coverage: Unless otherwise specified on the plans, the minimum clear thickness of concrete covering reinforcement shall be 2 inches when concrete is placed against form, 3 inches when concrete is placed against ground, and 1-1/2 inches from tops of slabs or unformed surfaces.

END OF SECTION

Reinforcing Steel
03210-2

SECTION 03300

CONCRETE

PART 1 - GENERAL

1.1 GENERAL REQUIREMENTS

This specification covers the requirements for furnishing, hauling, mixing, placing, and curing of concrete.

1.2 SUBMITTALS

The Contractor shall submit concrete mix design for approval.

PART 2 - PRODUCTS

2.1 MATERIALS

A. Portland cement shall conform to the requirements of ASTM C150, Type I, for all concrete work.

B. Concrete Aggregates

1. Fine aggregates shall be calcareous or basalt sands, or a combination thereof. They shall meet the grading requirements of ASTM C33 unless the concrete producer can provide past data that show that a proposed non-conforming gradation will produce concrete with the required strength and suitable workability.

If manufactured sands are used in the concrete mix, the Contractor may select and use a water-reducing and/or an air-entraining admixture as specified hereinafter to provide satisfactory workability in the concrete. The cement content of a mix shall be as specified hereinafter, and the use of an admixture shall in no way result in the reduction of the cement factor.

2. Coarse aggregates shall be crushed close-grained, blue lava rock meeting the grading requirements of sizes 57 or 67 (ASTM D448) or both. The maximum size of aggregate shall not be larger than 1/5 of the narrowest dimensions between sides of the forms of the member for which the concrete is to be used not larger than 3/4 of the minimum clear spacing between individual reinforcing bars or bundles of bars.

C. Concrete Reinforcement

1. Reinforcing steel shall be deformed bars conforming to ASTM A615, grade as shown on plans.
2. Welded wire fabric for concrete reinforcement shall conform to ASTM A185 and shall be galvanized.
3. Metal accessories such as spaces, chairs, ties, and other devices necessary for properly placing, supporting and fastening reinforcement in place shall be provided. Chairs shall be galvanized. Annealed steel wire or not less than 16-gauge shall be used to secure reinforcement.

D. Water used in mixing concrete shall be potable.

E. Non-slip grit shall be an abrasive aggregate of silicon carbide or aluminum oxide.

F. Admixture, if used, shall conform to ASTM C494 or ASTM C260 and shall be mixed in proper amount in accordance with directions of manufacturer.

G. Curing compound shall conform to ASTM C309.

PART 3 - EXECUTION

3.1 DESIGN OF CONCRETE MIXES

- A. All concrete throughout shall be either job or plant mixture in an approved type of power operated mixer that will insure uniformity and homogeneity of the concrete produced.
- B. Mixing at jobsite shall be done in accordance with ACI 614.
- C. Ready-mixed and mixed-in-transit concrete shall be mixed to conform to the provisions of ASTM C94.
- D. Concrete shall be mixed only in such quantity as is required for immediate use. No retempering will be permitted and concrete that has started to harden shall be discarded and promptly removed from the job.
- E. Admixtures conforming to paragraph 2.1 may be used in the concrete as recommended by the supplier and approved by the Engineer.

3.3 PLACING CONCRETE

- A. No concrete shall be placed in the absence of the Engineer or his representative who shall be given one day advance notice of starting time of concrete pour.
- B. Preparation
 - 1. Concrete shall be placed upon clean, damp surfaces with no free water, or upon properly compacted fills but never upon soft mud or dry, porous earth.
 - 2. Before depositing new concrete on or against concrete which has set, all accumulation or mortar splashed upon reinforcing steel and the surfaces of forms shall be removed and the forms shall be retightened. The surfaces of previously set concrete shall be thoroughly roughened and cleaned of all foreign matter and laitance, saturated with water and slushed with a coat of cement grout. New concrete shall be placed before the grout has attained its initial set.
- C. Conveying
 - 1. Concrete shall be conveyed from mixer to forms as rapidly as practicable by methods that will prevent segregation.
 - 2. Concrete shall be deposited as nearly as practicable in its final position. Extensive spading as a means of transportation shall be avoided and in no case shall vibrators be used to transport concrete inside forms.
 - 3. Open troughs and chutes shall have a slope not to exceed 1 vertical to 2 horizontal and not less than 1 vertical to 3 horizontal. Chutes more than 20 feet long and chutes not meeting the slope requirements may be used provided they discharge into a hopper before distribution.
 - 4. The concrete shall not be allowed to drop freely more than six feet except where specifically authorized by the Engineer. When placing operations would involve the dropping of concrete from a height of more than six feet it shall be conveyed through pipes or flexible drop chutes.
 - 5. If any appreciable segregation occurs through the conveying methods employed, their use shall be ordered discontinued by the Engineer and some other satisfactory method of placing concrete shall be used.
 - 6. All chutes, troughs, pipes and other means of conveyance shall kept clean and free from coatings of hardened cement or concrete by thoroughly cleaning with water and chipping after each pour. Water used for flushing shall be discharged away from the vicinity of the concrete or forms already in place.

D. Depositing

1. Unless adequate protection is provided, concrete shall not be placed during rain. Rainwater shall not be allowed to increase the mixing water nor to damage the surface finish. Fresh concrete that has been deposited but has not attained its initial set shall be protected in the event of rain.
2. Placing of the concrete shall be started at the far end of work so that each batch will be dumped against previously placed concrete, not away from it.

E. Compaction

1. All concrete shall be consolidated by vibration so that the concrete is thoroughly worked around the reinforcement, around embedded items, and into corners of forms, eliminating all air or stone pockets which may cause honey-combing, pitting, or planes of weakness. All compaction shall be done by use of high frequency internal vibrators. Where the vibrator cannot be inserted into the concrete, compaction shall be done by spading, rodding, or forking.
2. Frequency of vibrator shall be not less than 7,000 impulses per minute. The Contractor shall provide a sufficient number of vibrators to properly consolidate all concrete immediately after placing. At least one standby vibrator shall be on hand at all times during placement of the concrete.

3.4 REINFORCEMENT

- A. Reinforcing steel bars, wire and wire fabric shall be provided in the sizes, length and configurations as indicated on plans and shall be thoroughly cleaned, before placing, of loose mill scale, loose flaky rust, oil, and all coatings that will destroy or reduce bond. If necessary, they shall be cleaned again before placing of concrete. All items shall be fabricated, positioned and secured in place as indicated in the plans and as herein specified. Annealed steel wire of not less than 16-gauge shall be used to secure reinforcement. Unless otherwise noted, cleaning, bending and placing of reinforcement shall be done in accordance with the standard practice of the Concrete Reinforcing Steel Institute.
- B. Concrete or metal support and spacers shall be used to secure the proper spacing of reinforcement over formwork. Stirrups shall be accurately and securely wired to the bars at both top and bottom. At slabs, footings and beams in contact with earth, pre-cast concrete blocks (not bricks or hollow tile) shall be used to hold reinforcement at a proper distance above earth.

- C. Bars shall be tied at all intersections, and distances from forms shall be maintained by means of pre-cast concrete blocks, ties, hangers or other approved supports.
- D. Bars shall be bent cold to the shapes shown on the plans. Bends shall be made around a pin having a diameter not less than 6 times the bar diameter except that for bars of larger than 1-inch diameter the pin diameter shall be 8 times the bar diameter. If required, bars may be bent in the field using a "hickey" bar.
- E. All reinforcing steel bars shall be furnished in the lengths indicated on the plans. Splicing of bars, except where shown, will not be permitted without the approval of the Engineer.

3.5 CONCRETE SLABS ON GRADE

- A. Concrete slabs on earth shall be placed over a structural fill as specified in another section.
- B. All slabs shall be reinforced with 6 x 6 - W1.4 by W1.4 welded wire fabric unless otherwise shown or called for on the plans.
- C. Care shall be taken in handling and placing the reinforcement as follows:
 - 1. Reinforcing fabric shall not be rolled over by trucks, buggles or wheelbarrows, nor trampled to the extent that it is bent out of the plans of the fabric. Material which has been so bent that it cannot be laid out flat shall be rejected.
 - 2. Reinforcing fabric shall be positively set, either prior to or during the placement of concrete, to the levels required within the slabs as indicated on the plans or as otherwise called for herein.
- D. A bond-break filler shall be provided where edge of slab abuts any vertical surface and where indicated on plans. Width of filler strips shall equal depth of floor slab.

3.6 FINISHING OF SLABS

- A. Broom Finish for Slabs: The concrete slabs shall be given a coarse transverse scored texture by drawing a broom across the surface. The operation shall follow immediately after steel trowelling.

3.7 REPAIR OF DEFECTS

- A. After forms have been removed, any concrete which is not constructed as shown on the plans or is out of alignment or level beyond required tolerances or which shows a defective surface which in the opinion of the Engineer cannot be properly repaired or patched shall be removed.

- B. Where concrete which is exposed to view requires repairing or patching, the texture of the surface of such repair or patch shall closely match that of the surrounding surface.

3.8 CURING AND PROTECTION

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

Curing shall immediately follow the finishing operation.

- B. Water Curing: If cured with water, concrete shall be kept wet by mechanical sprinklers, by ponding, or by any other method which will keep the surfaces continuously wet.
- C. Saturated Sand Curing: Surfaces cured with sand shall be covered with a minimum of one inch thickness of sand which shall be kept uniformly distributed and continuously saturated during the entire curing period.
- D. Curing Compounds: Curing compounds shall not be used on concrete surfaces that are to receive paint finish, acid stain or resilient flooring, except those that are recommended by the manufacturer to be compatible with the applied finish. The Contractor shall submit to the Engineer a letter certifying that the curing compound is compatible with the applied finish. Application shall be in accordance with the manufacturer's recommendations. If curing, sealing or other compounds are used which are incompatible with applied finish, such compound shall be thoroughly removed by grinding with a terrazo grinder.
- E. Waterproof Paper: Waterproof paper or opaque polyethylene film conforming to ASTM C171 may be used. The paper or film shall be anchored securely and all edges sealed or applied in such a manner as to prevent moisture escaping from the concrete.

3.9 SAMPLING AND TESTING

- A. Sampling - ASTM C 172: Collect samples of fresh concrete to perform tests specified. ASTM C 31 for making test specimens.
- B. Slump Tests - ASTM C 143: Take concrete samples during concrete placement. The maximum slump may be increased as specified with the addition of an approved admixture provided that the water-cement ratio is not exceeded. Perform tests at commencement of concrete placement, when test cylinders are made, and for each batch (minimum) or every 10 cubic yards (maximum) of concrete.

- C. Compressive Strength Tests - ASTM C 39: Make four test cylinders for each set of tests in accordance with ASTM C 31. Test one cylinder at 7 days, two cylinders at 28 days, and hold one cylinder in reserve. Provide concrete cylinders for compression tests not less than once a day, nor less than once for each 100 cubic yards of concrete, nor less than once for each 5,000 square feet of surface for slabs or walls. If the average strength of the 28-day test cylinders is less than f'_c and a maximum of one single cylinder is less than f'_c minus 300 psi, take three ASTM C 42 core samples and test. If the average strength of the 28-day test cylinders is less than f'_c and two or more cylinders are less than f'_c minus 300 psi, take six core samples and test. Concrete represented by core tests shall be considered structurally adequate if the average of the three cores is equal to at least 85 percent of f'_c and if no single core is less than 80 percent of f'_c . Locations represented by erratic core strengths shall be retested. Remove concrete not meeting strength criteria and provide new, acceptable concrete at no additional cost to the State. Repair core holes with nonshrink grout. Match color and finish of adjacent concrete.
- D. Testing: All sampling and testing shall be performed by an independent testing agency and all test results submitted to the Engineer for approval. All cost of sampling and testing shall be borne by the contractor.

END OF SECTION

SECTION 03308

CONCRETE SIDEWALK

PART 1 - GENERAL

1.1 GENERAL REQUIREMENTS

This section covers the requirements for furnishing and installing of concrete sidewalk in accordance with the lines and grades indicated on the plans.

PART 2 - PRODUCTS

2.1 MATERIALS

- A. Materials for roads and parking areas shall be constructed in accordance with the below-listed sections of the Counties' STANDARD SPECIFICATIONS FOR PUBLIC WORKS CONSTRUCTION dated September 1986 and STANDARD DETAILS FOR PUBLIC WORKS dated September 1984 as revised, except as amended in the plans and/or specifications herewith. (Paragraphs concerning Measurements and Payments in the sections are not applicable to this project.)

- 1. Concrete Sidewalk Section 42

PART 3 - EXECUTION

3.1 INSTALLATION

- A. The Contractor shall stake out the areas to be paved, using wooden stakes on which the final finish elevations, are clearly marked. All such stakes and elevations shall be approved by the Engineer before any work is done.
- B. Installation of concrete sidewalk shall be in accordance with sections noted hereinbefore. Provide expansion joint where new sidewalk joins existing sidewalk.

3.2 REPAIR OF EXISTING CONCRETE SIDEWALKS

Any existing concrete sidewalks damaged by construction activities shall be repaired to the original condition and to the satisfaction of the Engineer. Damage done by heavy equipment, especially on walks not stable for such equipment, shall be repaired to the original condition and to the satisfaction of the Engineer.

END OF SECTION

SECTION 04221

CONCRETE MASONRY UNIT (CMU)

PART 1 - GENERAL

1.1 GENERAL REQUIREMENTS

This section covers the requirements for furnishing and installing concrete masonry units; for furnishing, hauling, mixing, placing and curing concrete; and the furnishing and placing of all reinforcing required as shown on the plans or directed by the Engineer.

1.2 SUBMITTALS

- A. Certificates: A signed certification that the masonry units comply with ASTM C90 and the curing requirements specified herein shall be submitted by the masonry manufacturer to the Engineer upon request.

1.3 STORAGE AND HANDLING

- A. Masonry Units: Shall be carefully stacked prior to use and shall be protected from physical damage. All units shall be handled with reasonable care to prevent marring or damaging of faces, edges, corners of units. In no case shall dumping of units from hand trucks or wheelbarrows be permitted.

Where used in exposed wall construction, any unit with exposed face or faces having chips, cracks, or other imperfections more than 1-inch in dimension shall be rejected.

- B. Mortar and Grout Materials: Portland cement, masonry cement, lime and admixtures shall be stored in such a manner as to prevent deterioration or contamination with foreign matter. Cement which has become caked, partially set or otherwise deteriorated, or any material which becomes damaged or contaminated, shall be rejected.

PART 2 - PRODUCTS

2.1 MATERIALS

- A. Hollow Concrete Masonry Units: Shall be load-bearing units and shall conform to the requirements of ASTM C90, "Hollow Load-Bearing Concrete Masonry Units," Grade N-II. Units shall be 2-core type, 8-inch nominal height, 16-inch nominal length and thickness as indicated. Units for jamb, corner, sill, lintel and other special shapes shall be provided as required.

All units shall be sound, free of cracks, straight and true. They shall be either steam cured or cured under atmospheric conditions for a minimum of 30 days. Color shall be standard with manufacturer.

- B. Portland Cement: Shall conform to ASTM C150, Type I or Type II.
- C. Hydrated Lime: Shall conform to ASTM C207, Type S.
- D. Aggregate for Use in Mortar: Shall conform to ASTM C144.
- E. Aggregate for Use in Grout: Shall conform to ASTM C404, with grading in accordance with ASTM D448, No. 10.
- F. Water used in mixing mortar or grout shall be potable.
- G. Admixture, if used, shall conform to ASTM C494 and shall be mixed in proper amount in accordance with directions of manufacturer.
- H. Horizontal Reinforcement: Shall be trussed or ladder design with #9 gauge, deformed side rods and welded #12 gauge or larger cross rods (Dur-O-Wal," Wal-Lok," "Blok-Mesh," or approved equal), or as otherwise indicated on the plans.
- I. Masonry Cement: Shall be such quality that a one-part masonry cement to 2-1/2 parts masonry aggregate mix tested in accordance with ASTM C270 shall have a minimum 28-day compressive strength of 2,000 psi. ("Supermortar" by Cyprus Hawaiian Cement Corp., "Kaiser Mortar" by Kaiser Cement & Gypsum Corp., or approved equal).

PART 3 - EXECUTION

3.1 PLACING REINFORCEMENT

- A. Reinforcement shall be free from scale, loose flaky rust or other coatings that will destroy bond. It shall be straight except for bends around corners or where bends or hooks are detailed. Size and spacing shall be as indicated on the drawings.
- B. Vertical reinforcement, where positioned by dimension on a drawing section, shall be accurately placed and tied at top and bottom and at intervals not to exceed 192 diameters of the reinforcement (8-feet for #4 bars; 10-feet for #5 bars). Dowels and splices shall be lapped as indicated but not less than 40 diameters or 24-inch whichever is longer. At corners and ends of walls, including those abutting concrete, one #5 bar shall be installed in the end cell and that cell shall be filled with grout. Bars adjacent to corners and ends of walls shall extend the full height of walls.
- C. At intersections, corners and splices, horizontal reinforcing shall be placed, bent and lapped. End laps shall be at least 40 diameters.

3.2 PLACING ANCHORS

Work with other trades shall be coordinated as necessary to set into tile walls all anchors, bolts, nailing blocks, etc. Anchors shall be grouted around with sufficient mortar to make

them secure.

3.3 MORTAR AND GROUT MIX

- A. The proportioning of materials for mortar and grout shall be by volume and done in such manner that the specified proportions can be controlled and accurately maintained. Fine aggregate shall be measured in a damp loose condition. Mixing shall be by a mechanical batch mixer for at least 3 minutes for mortar and 5 minutes for grout. Hand mixing shall be permitted only for small batches of 3 cu. ft. or less.
- B. Mortar shall be freshly prepared and uniformly mixed in one of the following proportions:
1. 1 part Portland cement
1/4 part hydrated lime
2-1/4 to 3 parts sand or aggregate
 2. 1 part masonry cement
1 part Portland cement
4-1/2 to 6 parts sand or aggregate
 3. 1 part masonry cement
2-1/2 parts sand or aggregate

Admixture may be added in accordance with manufacturer's specifications. Sufficient water shall be used to provide a workable consistency. Mortar shall be used and placed in final position within 2-1/2 hours after mixing.

- C. Grout shall be freshly prepared and uniformly mixed in the following proportion:

1 part Portland cement
2 parts sand and 1 part gravel OR
1-1/4 parts to 3 parts aggregate

(not more than 1/10 part lime to 1 part Portland cement may be added)

Sufficient water shall be used to produce a consistency just fluid enough for pouring without segregation. Grout shall be used and placed in final position within 90 minutes after mixing, but shall in no case be used after initial set has occurred.

In any event, the grout shall attain not less than 2,000 psi 28-day compressive strength.

3.4 LAYING

- A. General: All masonry units shall be handled so that edges and faces will not be chipped, spalled, or cracked. All beds on which masonry is to be laid shall be cleaned. All work shall be built plumb, level, and true, within the tolerances specified below, and shall be laid up with whole units except at closures. Masonry units in walls shall be laid so that one face

of the wall is a true flat plane. Unless otherwise indicated on the drawings, this shall be on the inside face. All cutting and fitting as may be required for and necessary to accommodate other trades shall be done neatly using a power driven carborundum saw. It shall be the responsibility of the Contractor to control any dust pollution caused by the cutting operations.

All drilling and cutting of small holes shall be neatly done. Bolts, anchors, ties, conduits, and similar items for the installation of work under other Sections of these specifications shall, as far as practicable, be placed as the work progresses.

B. Tolerances: Shall be as follows:

1. Plumb: Maximum allowed variation from plumb shall be as follows:

	<u>Tolerance</u>
Partitions, columns, end walls, and baffle walls	1/4-inch in 5 feet
	3/8-inch in 10 feet
	1/2-inch in 20 feet
	3/4-inch in 40 feet

"Plumb tolerances" shall apply to open ends as well as to faces of walls.

2. Level: Maximum allowed variations from level shall be 3/8-inch in 20 feet.

3. Tools: The following tools and methods shall be the minimum or acceptable type:

- a. Plumb and level shall be determined by level and/or pull string method.
- b. Leveling for runs shall be minimum 4 feet length, though a shorter level may be used for cross-leveling of units.

- C. Masonry units shall not be wet before being used, and wet units shall be dried to a moisture content less than 30% by weight before being laid. Where no bond pattern is shown, the wall shall be laid up in straight uniform course with regular running bond.

- D. Masonry units in first course shall be laid with shell mortar beds not exceeding 3/4-inch in thickness. Webs adjoining cells containing reinforcement shall also be bedded in mortar to prevent escape of grout. Vertical head joints shall be buttered well for a thickness equal to the face shell of the block and these joints shall be shoved tightly so that the mortar bonds well to both blocks. Joints shall be solidly filled from the face of the block to the depth of the face shell.

- E. If it is necessary to move a block so as to open a joint, the block shall be removed from the wall, cleaned and set in fresh mortar.

- F. Mortar joints shall be straight, clean and in thickness of 3/8-inch. All exposed horizontal

and vertical joints shall be tooled with a 1/2-inch to 5/8-inch round bar at least 14-inches long to produce a dense, slightly concave surface well bonded to the block at the edges. Tooling shall compact the mortar, pressing the excess mortar out of the joint rather than gouging it out. Use a 3/8" diameter half-round molding to simulate a concave horizontal joint between a concrete bond beam and the hollow tile wall below. Where walls are to receive plaster or where unexposed such as below finish grade (and where special glazed finish is indicated) the joints shall be struck flush.

- G. All hollow masonry units shall be built to preserve the unobstructed vertical continuity of the cells to be filled. Walls and cross webs forming such cells to be filled shall be full-bonded in mortar to prevent leakage of grout.
- H. All cells containing reinforcement shall be filled solidly with grout in lifts not exceeding 8-inch unless otherwise shown on the plans. Other cells, where indicated to be solid for anchors or such items, shall also be filled. When grouting is stopped for one hour or longer, horizontal construction joints shall be formed by stopping the pour of grout 1-1/2-inches below the top of the uppermost unit.
- I. Care shall be taken to prevent mortar splashes. All forms shall be made tight and concrete or grout spilled on the wall shall be washed off immediately before it can set up. Walls shall be protected against stains and excess mortar shall be wiped off the surface as the work progresses. After the wall is constructed it shall not be saturated with water for curing, cleaning, etc.
- J. All exposed surfaces of the masonry units shall be coated with a moisture proof sealant, such as Benjamin Moore's UGL/Drylock Waterproofing or approved equal, to prevent the movement of moisture through the masonry units.

3.5 CLEANING

At the completion of the work, all holes defective mortar joints in exposed masonry shall be pointed and where necessary defective joints shall be cut out and repointed. All exposed masonry shall be thoroughly cleaned of mortar drippings, sand and splashes during the course of the work. No smoothing of a wall surface which produces a "Bright spot" when painted will be accepted. All adjoining work subject to damage shall be carefully protected.

Upon completion of work, all surplus, waste materials, rubbish and debris shall be removed from premises, leaving same in clean and satisfactory condition.

END OF SECTION

SECTION 06100
ROUGH CARPENTRY

PART 1 - GENERAL

1.1 GENERAL REQUIREMENTS

This section covers the requirements for furnishing and installing rough carpentry.

1.2 COORDINATION WITH OTHER SECTIONS

Coordinate installation of carpentry work with Section 06310, PRESERVATIVE TREATED LUMBER. All lumber shall be treated with termite preservative treatment, unless otherwise noted in the plans or contract specifications.

1.3 SUBMITTALS

Certificates of Grade: Attesting that products meet the grade requirements specified in lieu of grade markings where appearance is important and grade marks will deface material.

1.4 DELIVERY AND STORAGE

Deliver materials to the site in an undamaged condition. Carefully store materials off the ground to provide proper ventilation, drainage, and protection against dampness. Remove defective and damaged materials and provide new materials.

1.5 GRADING AND MARKING

Lumber: Mark each piece of framing and board lumber or each bundle of small pieces of lumber with the grade mark of a recognized association or independent inspection agency. Such association or agency shall be certified by the Board of Review, American Lumber Standards Committee, to grade the species used. All Douglas fir, western hemlock, western red cedar, white fir and sitka spruce shall be graded and dressed in accordance with the latest applicable West Coast Lumber Inspection Bureau or Western Wood Products Association "Standard Grading Rules" and its revisions.

1.6 SIZES AND SURFACING

PS 20 for dressed sizes of yard and structural lumber. Lumber shall be surfaced four sides. Size references, unless otherwise specified, are nominal sizes, and actual sizes shall be within manufacturing tolerances allowed by the standard under which the product was produced.

1.7 MOISTURE CONTENT

Air-dry or kiln-dry lumber. Kiln-dry treated lumber after treatment. Maximum moisture content of wood products shall be as follows at the time of delivery to the job site:

1. Framing lumber and boards - 19 percent maximum
2. Timbers five inches and thicker - 25 percent maximum
3. Materials other than lumber - Moisture content shall be in accordance with standard under which the product was produced.

PART 2 - PRODUCTS

2.1 MATERIALS

A. Lumber, New

1. Douglas Fir
 - a. Concealed lumber shall be "construction" grade, S4S.
 - b. Exposed lumber shall be "select structural" grade, S4S.

B. Plywood for Siding and Doors

1. Exterior: Shall be APA #303-6 wood patch, T1-11 5/8" thick exterior grade, Douglas Fir with rough sawn face, 3/8" X 1/4" deep grooves spaced at 4" o.c. conforming to U.S. Product Standard P.S. 1-74 of the American Plywood Association Specifications.
2. Interior: Shall be 1/2" thick A/C Panel, interior/exterior glue treated as specified in Section 06310.

C. Nails, Screws, Bolts and Rough Hardware

Commercial standard of sizes indicated or required. For finish work, brass screws (chrome plated, nickel plated or plain brass as required). Otherwise, nails, screws and bolts shall be hot-dip galvanized. Light gauge metal pre-fabricated joist and beam hangers, angle clips, etc., shall be as manufactured by "Silver," "Simpson," "Teco," or equal. All hangers shall be hot-dipped galvanized after fabrication.

D. Damp-proofing

Apply a continuous strip of 40 pound asphalt saturated felt under wood members bearing on concrete or masonry and 15 pounds in other non-bearing concrete areas.

E. Metal Framing Anchors

Construct anchors to the configuration shown using hot dip zinc-coated steel conforming to ASTM A 525, coating designation G90. Steel shall be not lighter than 18 gauge. Special nails supplied by the manufacturer shall be used for all nailing.

PART 3 - EXECUTION

3.1 WORKMANSHIP

All work shall be done by experienced and skilled workers that are familiar with the type of work required to the best practices of this trade.

3.2 INSTALLATION

- A. Fit framing lumber and other rough carpentry, set accurately to the required lines and levels, and secure in place in a rigid manner. Do not splice framing members between bearing points. Spiking and nailing not indicated or specified otherwise shall be in accordance with the Nailing Schedule contained in UBC; perform bolting in an approved manner. Spikes, nails, and bolts shall be drawn up tight.
- B. Wherever it is necessary to end cut or penetrate into (such as by drilling or notching) treated wood on the job, all such cuts and penetrations shall be treated in accordance with AWWA Standard M4-84 using two heavy brush coats of a treating solution as specified therein or of the same solution used in the initial treatment of the wood.
- C. Holes for bolts generally are to be for "drive" fit.
- D. Screws driven with a hammer or overly tightened so as to lose tension shall be removed and replaced with next larger size and/or longer.
- E. All finish work shall be free from hammer marks, undesirable scratches and/or dents and crushed edges.
- F. A continuous strip of 40 lbs. asphalt felt shall be installed under wood members bearing on concrete or masonry, and in other non-bearing contact areas use 15 lbs. asphalt felt.
- G. Opening Frames: Wood frames for doors, etc., shall be constructed as per drawings. Head shall be dadoed and housed into jamb with waterproof glue and nailed together securely. Wipe off all excess glue. Frames shall be set plumb and true, solidly blocked and rigidly secured to structural backing at not more than 18" o.c. Coordinate with other trade for anchoring.
- H. For Interior and Exterior Running Trims, Including Door Stops: Use long lengths of finish lumber, keeping splice to minimum. All trims shall be installed straight and level and with mitered splices nailed together. Splices will not be permitted in vertical trims.

- I. Finish Hardware, shall be carefully fitted and installed in accordance with the manufacturer's directions and shall be adjusted for perfect working order to the satisfaction of the Engineer with further adjustment if necessary within one (1) year after acceptance of the project.

3.3 CLEAN-UP AND PROTECTION

- A. Protect all installed finish work, millwork, etc., from being defaced or marred by workmen of other trades. Replace or repair any damaged work as instructed by the Engineer at no cost to the State.
- B. At the completion of this work, remove from the premises all rubbish, debris, etc., accumulated during the progress of this work.

END OF SECTION

SECTION 06200

FINISH CARPENTRY

PART 1 - GENERAL

1.1 GENERAL REQUIREMENTS

This section covers the requirements for furnishing and installing finish carpentry.

1.2 APPLICATION PUBLICATIONS

The publications listed below form a part of this specification to the extent referenced. The publications are referred to in the text by the basic designation only.

- A. Federal Specifications (Fed. Spec.)
- B. U. S. Department of Commerce, Product Standards (PS)
- C. American National Standards Institute (ANSI) Publications
- D. American Society for Testing and Materials (ASTM) Publications
- E. American Wood Preservers Bureau (AWPB) Publications
- F. National Electrical Manufacturers Association (NEMA) Publications
- G. National Woodwork Manufacturers Association, Inc. (NWMA) Industry Standard
- H. Western Wood Products Association (WWPA) Publication

1.3 SUBMITTALS

- A. Shop Drawings: Show all prefabricated millwork. Include details and erection data associated with the work of other trades; materials and species; arrangements; profiles of moldings; thicknesses; sizes of parts; construction; fastenings; and clearances.
- B. Certificates of Compliance: Submit certificates on all materials, except for those materials bearing certification markings or statements.
- C. Certificates of Grade: Submit certificates from the grading agency on graded but unmarked lumber or plywood attesting that materials meet the grade requirements specified herein.

D. Samples:

1. Interior trim and moldings: One linear foot of each kind.
2. Laminated Plastic: Two samples of each color, pattern, and texture for approval by the Engineer.

1.4 DELIVERY AND STORAGE

Deliver lumber, plywood, trim, and millwork to the job site in an undamaged condition. Stack materials to ensure ventilation and drainage and protect against dampness before and after delivery. Store materials under cover in a well-ventilated enclosure and protect against extreme changes in temperature and humidity. Do not store products in the building until wet trade materials are dry.

1.5 GRADE AND QUALITY MARKINGS

- A. Lumber: Each piece or each bundle of lumber, millwork, and trim shall be identified by the grade mark of a recognized association or independent inspection agency that is certified by the Board of Review, American Lumber Standards Committee, to grade the species.
- B. Plywood: Each sheet of plywood shall bear the mark of a recognized association or independent inspection agency that maintains continuing control over the quality of the plywood. The mark shall identify the plywood by species group or span rating, and shall show exposure durability classification, grade, and compliance with PS 1.

1.6 SIZES AND PATTERNS OF WOOD PRODUCTS

Yard and board lumber sizes shall conform to PS 20. Provide shaped lumber and millwork in the patterns indicated and standard patterns of the association covering the species. Size references, unless otherwise specified, are nominal sizes, and actual sizes shall be within manufacturing tolerances allowed by the applicable standard.

1.7 MOISTURE CONTENT OF WOOD PRODUCTS

Air-dry or kiln dry lumber. Kiln-dry treated lumber after treatment. The maximum moisture content of wood products at time of delivery to the job site shall be as follows:

- A. Interior paneling: 12 percent.
- B. Interior finish lumber, trim, and millwork 1-1/4-inch or less in nominal thickness: 12 percent on 85 percent of the pieces and 15 percent on remainder.
- C. Exterior treated or untreated finish lumber and trim 4-inch or less in nominal thickness: 15 percent.

- D. Moisture content of other materials shall be in accordance with the applicable standards.

1.8 PRESERVATIVE TREATMENT OF WOOD PRODUCTS

- A. Nonpressure Treatment: Treat woodwork and millwork, such as exterior trim, door trim, and window trim, in accordance with NWMA I.S.4. Provide a liberal brushcoat of preservative treatment to field cuts and holes.
- B. Pressure Treatment: Treat lumber and plywood used on the exterior of buildings and wood members in contact with masonry or concrete in accordance with AWPB LP-2 or AWPB LP-4.

PART 2 - PRODUCTS

2.1 WOOD

- A. Trim, Finish, and Frames: Provide species and grades as shown on the drawings for materials to be paint finished. Materials that are to be stain, natural, or transparent finished shall be one grade higher than that listed. Provide species indicated on drawings for materials to be transparent finished. Run trim, except window stools and aprons, with hollow backs.
- B. Shelving: Suitable species of grade equal to or exceeding Boards, 3 Common Hem-Fir under WWPA Standard Grading Rules for Western Lumber.
- C. Plywood for Shelving: Interior Type, A-B Grade, any species group.
- D. Plywood for Countertops: Exterior Type, A-C grade.

2.2 LAMINATED PLASTIC

NEMA LD 3.

- A. Countertops: Grade GP 50 or PF 42, Satin Finish. Color and pattern shall be as indicated, by the Engineer.

2.3 HARDWARE

Provide sizes, types, and spacings of manufactured building materials recommended by the product manufacturer except as otherwise indicated or specified. Provide hot-dipped galvanized steel or aluminum nails and fastenings where used on the exterior or exposed to the weather.

- A. Toggle Bolts: Fed. Spec. FF-B-588.
- B. Wood Screws: ANSI B18.6.1.

- C. Wire Nails and Staples: Fed. Spec. FF-N-105.
- D. Bolts, Nuts, lag Screws, and Studs: ANSI B18.2.1, ANSI B18.5, ANSI B18.2.2, and ASTM A 687.

2.4 FABRICATION

- A. Countertops: Fabricate with lumber and a core of exterior plywood or particleboard, glued and screwed to form an integral unit. Bond laminated plastic under pressure to exposed surfaces, using type of glue recommended by the plastic manufacturer. The countertop unit shall be either the self-edged type covered with NEMA LD 3, Grade GP 50 plastic, or the post-formed type covered with NEMA LD 3, grade PF 42 plastic, at the option of the Engineer.
- B. Cabinets: Fabricate with solid ends and frame fronts, or with frames all around. Frames shall be solid hardwood and, where exposed, of the same species as the plywood veneer. Ends, bottom, back partitions, and doors shall be hardwood plywood. Mortise and tenon, glue and screw joints to produce a rigid unit, and cover exposed edges of plywood with hardwood strips. Doors, frames, and solid exposed ends shall be 3/4-inch thick; bottom, partitions, and framed ends 1/2-inch minimum; back 1/4-inch minimum.
- C. Cabinet Hardware: ANSI A156.9. Provide hardware for each door, including two semiconcealed hinges, magnetic catch, and door pull. Provide two side-mounted metal drawer slides and a pull for each drawer. Hardware exposed to view shall be bright chromium plated.
- D. Finish: Provide a natural factory finish on all wood surfaces after fabrication. The finish shall be the fabricator's standard natural finish, except that it shall be equivalent to one coat of sealer and one coat of spar varnish on all surfaces and a second coat of spar varnish on all surfaces exposed to view. Sand lightly and wipe clean between coats.

PART 3 - EXECUTION

3.1 GENERAL FINISH WORK

Provide sizes, materials, and designs as indicated and as specified. Apply primer to finish work before installing. Where practicable, shop assemble and finish items of built-up millwork. Joints shall be tight and constructed in a manner that will conceal shrinkage. Miter trim and moldings at exterior angles and cope at interior angles and at returns. Material shall show no warp after installation. Install millwork and trim in the maximum practical lengths. Fasten finish work with finish nails. Provide blind nailing where practicable. Set face nails for putty stopping.

- A. Exterior Finish Work: Construct joints to exclude water. Fascias and other flat members, unless otherwise indicated, shall be 3/4-inch thick.
- B. Interior Finish Work: After installation, sand exposed surfaces smooth.

3.2 SHELVING

Nominally one-inch thick wood shelf material or 3/4-inch or 23/32-inch thick plywood shelf material supported substantially with end and intermediate supports and arranged to prevent buckling and sagging.

- A. Storage Closet: Provide storage closet with shelves 11-1/2-inches wide and spaced 18-inches apart from the floor to the ceiling.

3.3 MISCELLANEOUS

- A. Counters: Construct as indicated. Conceal fastenings where practicable, fit the counter neatly, install in a rigid and substantial manner, and scribe to adjoining surfaces. Provide counter sections in the longest lengths practicable; keep joints in tops to a minimum; and where joints are necessary, provide tight hairline joints drawn up with concealed-type heavy pull-up bolts. Glue joints with water-resistant glue and, in addition, make rigid and substantial with screws, bolts, or other approved fastenings.
- B. Cabinets: Install level, plumb, and tight against adjacent walls. Secure cabinets to walls with concealed toggle bolts, and secure top to cabinet with concealed screws.

END OF SECTION

SECTION 06310

PRESERVATIVE TREATED LUMBER

PART I - GENERAL

1.1 GENERAL REQUIREMENTS

This section covers the requirements for furnishing and installing of preservative treatment.

1.2 SUBMITTALS

A Certificate of Treatment shall be issued to the Engineer showing compliance with these specifications, both as to kiln drying and type of treatment performed, including dip treatment.

1.3 GUARANTEE

The Contractor shall submit to the Engineer a written guarantee that he will replace all treated wood which is attacked by subterranean termites during the first two (2) years or is attacked by dry rot during the first two (2) years after project acceptance.

PART 2 - PRODUCTS

2.1 GENERAL

- A. All wood treated with oil-borne preservatives shall be kiln-dried before treatment to an average of 12% to 15% moisture content.
- B. All wood shall be treated as below except all-heart redwood.
- C. Lumber shall be milled to finish size and shape prior to treating, and it shall be treated before assembly. Plywood may be treated in regular panel sizes.

2.2 MATERIALS

- A. **Asbestos Prohibition:** No asbestos containing materials shall be used under this section. The Contractor shall insure that all materials incorporated in the project are asbestos-free unless specifically approved in writing by the Engineer.
- B. Water-Borne Preservatives shall be Woman, CCA, Osmose CCA or Chemonite ACZA in accordance with American Wood Preservers Association (AWPA) Standard P5.

- C. Oil-Borne Preservatives shall be water repellent penta-chlorophenol (Penta) or tri-N-butyltin oxide (TBTO) in accordance with AWPA Standard P8, or chlorpyrifos and 3-iodo-2-propynyl butylcabamate (IPBC) manufactured to the manufacturer's quality control. The solvent used in formulating the preservative solution shall meet the requirements of AWPA hydrocarbon solvent Type C, Standard P9, Paragraph 3.1.

PART 3 - EXECUTION

3.1 WOOD PRESERVATION WITH WATER-BORNE PRESERVATIVES

All lumber and plywood, except as stipulated in Paragraphs 3.02 and 3.03 below, shall be treated by a pressure method with Wolman CCA, Osmose CCA or Chemonite ACZA in accordance with American Wood Preservers Bureau Standards AWPB Approved (Hawaii use only) and AWPB LP-2, respectively. All 1" and 2" lumber and all plywood shall be dried to a moisture content of 19% or less after treatment.

3.2 WOOD PRESERVATION BY PRESSURE TREATMENT WITH OIL-BORNE PRESERVATIVES

Exposed lumber 2" nominal thickness and over that will be unpainted or will receive a clear finish shall be unincised and pressure treated with either a 1.2% TBTO solution to a net retention of 0.06 pounds of TBTO per cubic foot of wood or a 0.5% chlorpyrifos/0.75% IPBC solution to a net retention of 500 ppm chlorpyrifos and 1000 ppm IPBC per cubic foot of wood.

3.3 WOOD PRESERVATION OF DIP TREATMENT

All finish lumber under 2" nominal thickness; finish plywood; and millwork items that will be exposed to view in the finished work shall be immersion treated for a minimum period of 15 minutes in any preservatives listed in Section 2.02B, above in accordance with the requirements of the National Wood, Window and Door Association (NWWDA) Industry Standard I.S. 4-81.

3.4 INSTALLATION

Wherever it is necessary to end cut or penetrate into (such as by drilling or notching) treated wood on the job, all such cuts and penetrations shall be treated in accordance with AWPA Standard M-4-84 using two heavy brush coats of treating solution as specified therein or of the same solution used in the initial treatment of the wood.

END OF SECTION

SECTION 07410

PREFORMED METAL ROOFING

PART 1 - GENERAL

1.1 GENERAL REQUIREMENTS

- A. Furnish all labor, materials, tools and equipment necessary to provide a complete pre-finished corrugated metal roofing, including all associated accessories as indicated on the contract drawings and as specified herein.
- B. Pre-finished corrugated metal roofing shall be fabricated and factory finished as specified herein and shall conform to the American Iron and Steel Institute "Light-Gage Cold-Formed Steel Design Manual" and the requirements of the Steel Deck Institute.
- C. The Contractor shall be responsible to verify all existing and proposed dimensions and conditions, and shall notify the Engineer of any discrepancies between actual conditions and the contract document before ordering and fabrication.

1.2 SUBMITTALS

- A. Manufacturer's Data: Catalog cuts, technical data sheets and descriptive literature. Include test references to industry standards (ASTM), material composition, and finish.
- B. Shop Drawings: The Contractor shall prepare shop drawings showing complete arrangements and details for the laying and anchoring of the pre-finished corrugated metal roofing, including the fastener layout, closure strips and fabricated ridge cap, ventilators, edge and counter flashing in accordance with the contract drawings; and six (6) copies of such drawing shall be submitted to the Engineer for approval.

1.3 DELIVERY AND STORAGE

Deliver, store, and handle panels and other manufactured products to prevent damage. Stack materials stored on the site on platforms or pallets and cover with tarpaulins or other suitable weather tight covering. Store all panels so that water which might have accumulated during transit or storage will drain off; do not store the panels in contact with materials that might cause staining. Inspect the panels upon arrival to the job site; if wet, remove the moisture and restack and protect the panels until used.

1.4 GUARANTY

The Contractor shall furnish to the Contracting Officer a written guaranty on the pre-finished metal roofing, including associated flashing and sealing for a two year period after the date of the project acceptance against defects resulting from the use of defective or interior materials, equipment or workmanship.

1.5 COORDINATION

Before commencing with any work of this Section the Contractor shall inspect the existing areas, surfaces and/or conditions of which work under the Section will be performed. The Contractor shall report any defective conditions and send a copy to the Contracting Officer for interpretation and corrective measures. The Contractor shall not proceed until the unsatisfactory conditions have been corrected. Proceeding with the work shall imply acceptance of the existing conditions.

PART 2 - PRODUCTS

2.1 MANUFACTURERS

- A. Pre-finished corrugated metal roofing of the following manufacturers are acceptable, provided they meet or exceed the material requirements specified:
 - 1. Ferro Union Hawaii, Inc.
 - 2. Custom Metal Roofing, HPM Building Supply.
- B. The pre-finished corrugated metal roofing of other manufacturers are acceptable, provided they meet or exceed the material requirements specified.

2.2 MATERIALS

- A. General:
 - 1. All materials specified and/or required for a complete pre-finished corrugated metal roofing shall be as recommended and approved by one manufacturer. All other materials required, but not furnished by the pre-finished corrugated metal roofing manufacturer, shall be certified and approved for its intended use by the pre-finished corrugated metal roofing manufacturer.
 - 2. The Contractor shall verify that all materials to be installed are compatible with the pre-finished corrugated metal roofing he proposes to furnish. Should the materials indicated on the contract drawings and specified herein be incompatible with the materials the Contractor proposes to furnish, the Contractor shall notify the Engineer of any discrepancies in writing. Failure to report such discrepancies, that result in poor installation of the pre-finished corrugated metal roofing, to the Contracting Office for interpretation and/or corrective measures, shall be redone by the Contractor and at no additional cost to the State.
 - 3. All materials for pre-finished corrugated metal roofing shall have the physical and chemical characteristics equal to, or better than that specified hereinafter. All materials shall be new, free from defects that will impair the strength, durability and/or appearance of the pre-finished corrugated metal roofing. All corrugated metal roofing panels shall be formed in accordance with the approved shop drawings and

within the tolerances and requirements established by the manufacturer.

B. Pre-finished Corrugated Metal Roofing:

1. Panel sheeting: panel sheeting shall be 2-2/3" x 7/8" corrugations, Pattern #7, "Deep Corrugation" or approved equal, aluminum-zinc alloy coated steel conforming to ASTM A 792, AZ-55 coating, surface-treated for maximum coating performance. Metal roofing panels shall be of a single length indicated on the contract drawings for each plan of roof.
 - a. Metal gauge: Panel sheeting shall have a minimum thickness of 23-gauge and shall meeting all structural performance requirements, but not less than the manufacturer's recommended minimums for profile and applications indicated, and in no instance, less than 24-gauge for exterior metal roofing panels.
2. Coating and color finish: The coating system on pre-finished panel sheeting shall have a total dry film thickness of 1.0 mil. On both sides. The coating finish shall be a "Kynar 500", 70% full strength on the exterior (top) side of 1.0 mil. Off White polyester backer on the interior (under) side. Pre-finish color shall be as selected by the Engineer from the Manufacturer's standard colors.
3. Coating and color finish: The coating on pre-finished panel sheeting shall be high-build system with a total dry film thickness of factory-applied polyvinylidene fluoride (PVDF) on 0.80 mil minimum finish coat over a 0.80 mil minimum epoxy primer to provide a total system of 1.6 mils minimum dry film thickness. The coating finish shall be a "Kynar 500", 70% full strength on the exterior (top) side of 1.6 mils minimum, and off White polyester backer on the interior (under) side of 1.0 mil minimum. **Pre-finish color shall match "Sinclair's Dectone Parkway Green (398)".**

C. Miscellaneous Material:

1. Fastener: Fasteners shall be stainless steel, Type 304 or 305 conforming to ASTM A 167, self-tapping screws with conical shaped metal washers with neoprene gasket washer, and factory pre-finished to match the roofing panel. Fasteners shall be of the following sizes for the required installation, uplift resistance and as recommended by the manufacturer of the pre-finished corrugated metal roofing.
 - a. Wood installation (except plywood): #9 x 2-1/2" (wood roof framing member thickness vary, fastener shall have the maximum embedment into the framing member to conform to uplift requirements without penetrating through).

All fasteners shall be spaced in accordance with the manufacturer's standards and requirements for uplift resistance, unless noted and/or specified otherwise.
All fasteners improperly installed shall be replaced immediately.
2. Accessory component: Accessory components shall be provided as required for a complete pre-finished corrugated metal roofing, including ridge and hip cap flashing, edge flashing, counter flashing, vent pipe flashing and other items as necessary.

Flashing accessory components shall be fabricated from the same material type, gauge and finish as the metal roofing panels.

3. Flashing tape: Flashing tape shall be self-adhering, polyester reinforced heavy duty aluminum flashing tape and approved by the pre-finished corrugated metal roofing manufacturer.
4. Closure strip: Closure strips shall be of 1-inch width minimum polyethylene and approved by the pre-finished corrugated metal roofing manufacturer, resistant to moisture and ultraviolet. Closure strips shall be pre-cut to fit the profile of the metal roofing panels. All closure strips shall have adhesive/sealant applied on all surfaces contacting metal roofing surfaces.
5. Sealant: Sealants shall be as recommended for use by the manufacturer of the pre-finished corrugated metal roofing.
6. Bituminous protective coating: Protective coating shall be of cold-application asphalt mastic, SSPC 12 paints, compounded for 15 mil. Dry film thickness per coat.

PART 3 - EXECUTION

3.1 INSTALLATION

Install in accordance with the manufacturer's approved erection instructions and diagrams, except as specified otherwise herein. Panels shall be in full and firm contact with supports and with each other at side and end laps. Where sheets are cut in the field, or where any of the factory-applied coverings or coatings are abraded or damaged in handling or installation, they shall, after the necessary repairs have been made with material of the same type and color as the weather coating, be approved before installation. All cut ends and edges, including those at openings through the sheets, shall be sealed completely.

Correct defects or errors in the materials in an approved manner. Remove materials which cannot be corrected in an approved manner and provide nondefective materials. Provide molded closure strips where indicated and whenever sheets terminate with open ends after installation. Use only mechanical or manual shears for cutting of metal roofing. Circular or reciprocating sawblades are prohibited.

- A. Roof Panels: Apply roofing panels with the configurations parallel to the slope of the roof. Provide roofing panels in the longest lengths obtainable, with end laps occurring only at structural members. Lay all side laps away from the prevailing wind and seal side and end laps with joint sealing material. Flash and seal the roof at the ridge, at eaves and rakes, at projections through the roof, and elsewhere as necessary. Accomplish the placement of closure strips, flashing, and sealing material in an approved manner that will assure complete weathertightness. Minimum side lap shall be one corrugation or interlocking rib. End laps shall be not less than 12 inches and shall occur only over purlins.

- B. Flashings: All flashing and related closures and accessories in connection with the preformed metal panels shall be provided as indicated and as necessary to provide a watertight installation. Details of installation which are not indicated shall be in accordance with the panel manufacturer's printed instructions and details or the approved shop drawings. Installation shall allow for expansion and contraction of flashing.
- C. Fasteners: Fastener spacings shall be in accordance with the manufacturer's recommendations. Install fasteners in valleys or crowns as recommended by the manufacturer of the sheet being used. Install fasteners in straight lines within a tolerance of 1/2 inch in the length of a bay. Drive exposed penetrating type fasteners normal to the surface and to a uniform depth to seat gasketed washers properly and drive so as not to damage factory-applied coating. Exercise extreme care in drilling pilot holes for fastenings to keep drills perpendicular and centered in valleys or crowns, as applicable. After drilling, remove metal filings and burrs from holes prior to installing fasteners and washers. Torque used in applying fasteners shall not exceed that recommended by the manufacturer. Remove panels deformed or otherwise damaged by over-torqued fastenings, and provide new panels. Remove metal shavings and filings from roofs at the end of each working day to prevent rusting and discoloration of the panels.
- D. Ridge Cap: Prior to installation of the ridge cap flashing, each valley corrugation of roofing shall be bent up and the ridge transition sealed with an aluminum-faced flashing tape. Connections shall be sealed as required for a watertight pre-finished corrugated metal roofing.

3.2 CLEANUP

1. During the progress of the work, the project site shall be kept free of all debris and waste materials resulting from the work under this Section. All such debris and rubbish shall be removed from the project site.
2. Clean residue from drilling immediately after holes are made in the roofing. **Remove all metal shavings and other injurious material from the roof surface.**
3. Upon completion of pre-finished corrugated metal roofing installation, the finish surfaces of metal roofing panels shall be cleaned as recommended by the pre-finished corrugated metal roofing manufacturer. All excess pre-finished corrugated metal roofing materials shall be removed from the project site.

END OF SECTION

SECTION 07600

FLASHING AND SHEET METAL

PART I - GENERAL

1.1 GENERAL REQUIREMENTS

This section covers the requirements for furnishing and installing flashing and sheet metal.

1.2 COORDINATION WITH OTHER SECTIONS

Coordinate installation of sheet metal work with Section 07900, SEALANTS AND CAULKINGS.

1.3 SUBMITTALS

Submit shop drawings of gutters, downspouts, flashings and other sheet metal work for approval.

PART 2 - PRODUCTS

2.1 MATERIALS

All materials shall be stored in such a manner as to afford adequate protection. Damaged materials shall not be used and shall be removed from the site.

- A. Galvanized Steel, Sheet and Strip: ASTM A 653 zinc-coated steel. Gutters and downspouts shall be 24 gage steel to match roofing material and color.
- B. Lead Flasing: 4 lb. sheet lead.
- C. Wire Strainers: At downspouts shall be formed ½" x ½" galvanized iron.
- D. Paste Solder: ASTM B 486, Alloy 50B.
- E. Solder: ASTM B 32, Composition Sn 50. Solder shall be 50% virgin lead and 50% pure block tin.
- F. Soldering Flux: ASTM B 32, Type OA. For soldering shall be muriatic acid "killed" with zinc or shall be an approved brand of soldering paste.
- G. Bituminous Plastic Cement: ASTM D 4586, Type I or II.

- H. 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.
- I. Fasteners: Fasteners shall be the same metal or a metal compatible with the item fastened. Type of material shall be the same as the material it contacts or of the recommended type that will not support galvanic action from installation.
- J. Stainless Steel Plates and Sheets - ASTM A 167, Type 304 alloy.
Guy wires shall be Type 304 alloy, not less than 1/8 inch diameter. Flue flashing shall be fabricated from stainless steel.

PART 3 - EXECUTION

3.1 GENERAL

Surfaces to receive sheet metal must be plumb and true, clean, even, smooth, dry and free from defects and projections which might affect the application. Installation of items not shown in detail or not covered by specifications shall meet the applicable requirements of the SMACNA Architectural Sheet Metal Manual, and the NRCA Roofing and Waterproofing Manual.

3.2 WORKMANSHIP

Install sheet metal work with lines, arrises, and angles sharp and true. Exposed surfaces shall be free from visible wave, warp, and buckle, and tool marks. Exposed edges shall be folded back neatly to form a 1/2-inch hem on the concealed side. Sheet metal exposed to the weather shall be watertight. The following defects shall be cause for rejection or replacement at the Contractor's expense: Leaking, Failure to stay in place, Undue expansion, Lifting, deformation, loosening and splitting of seams.

3.3 SEAMS

Straight and uniform in width and height with no solder showing on the face.

- A. Flat-lock Seams: Finish not less than 3/4-inch wide.
- B. Lap Seams: Finish soldered seams not less than one inch wide. Overlap seams not soldered, not less than 3 inches.
- C. Loose-lock Expansion Seams: Not less than 3 inches wide, and shall provide minimum one inch movement within the joint. Joint shall be completely filled with the specified sealant, applied at not less than 1/8-inch thick bed.
- D. Standing Seams: Not less than one inch high, double locked without solder.
- E. Flat Seams: Make seams in the direction of the flow.

3.4 SOLDERING, WELDING, AND MECHANICAL FASTENING

- A. Soldering: Pre-tin edges of sheet metals before soldering is begun. Soldering shall be done slowly with well heated soldering irons so as to thoroughly heat the seams and completely sweat the solder through the full width of the seam. Soldering shall follow immediately after application of the flux. Upon completion of soldering the acid flux residue shall be thoroughly cleaned from the sheet metal with a solution of washing soda in water and rinsed with clean water.

3.5 PROTECTION FROM CONTACT OF DISSIMILAR MATERIALS

- A. All metal: Surfaces in contact with mortar, concrete, or other masonry materials shall be painted with alkali-resistant coatings such as heavy-bodied bituminous paint.
- B. Wood or Other Absorptive Materials: Surfaces that may become repeatedly wet and in contact with metal shall be painted with two coats of aluminum paint or a coat of heavy bodied bituminous paint.

3.6 GUTTERS

The hung type of shape indicated and supported on underside by brackets that permit free thermal movement of the gutter. Provide gutters in sizes indicated complete with mitered corners, end caps, outlets, brackets, and other accessories necessary for installation. The outer edge of gutter shall be beaded or reinforced with a stiffening bar not less than 3/4 by 3/16-inch of material compatible with gutter. Gutters shall be fabricated in sections not less than 8 feet long. The sections shall be lapped a minimum of one inch in the direction of flow. Gutters shall be joined by riveted and soldered joints. Support and fasten gutters on approved type adjustable hangers spaced not more than 30 inches on centers. Gutters shall be adjusted to slope uniformly to outlets, with high points occurring midway between outlets. Hangers and fastenings shall be fabricated from metals compatible with the gutters.

3.7 DOWNSPOUTS

Downspouts shall be provided in approximately 10-foot lengths; end joints shall telescope not less than 1/2-inch, and longitudinal joints shall be locked. Gutter outlets shall be provided with wire ball strainers of a standard type for each outlet. Strainers shall fit tightly into outlets and shall be of the same material used for gutters. Downspouts shall be kept not less than one inch away from walls and shall be fastened to the walls at top, bottom, and at not to exceed 5 foot centers intermediately between, with approved type leader straps or concealed rack-and-pin type fasteners; straps and fasteners shall be formed from metal compatible with the downspouts.

3.8 FLASHING AT ROOF PENETRATIONS

Provide metal flashing for all pipes, flue, guy wire anchors and similar items supported by

or attached to the roof deck.

- A. Single Pipe Flashing: At Contractor's option, single pipe flashing shall be made of EPDM rubber specifically manufactured for flashing pipe which isolates movement of pipe caused by expansion, contraction and vibration. Rubber shall be resistant to ozone and ultra-violet light. Base shall be provided with stainless steel or aluminum ring which conforms to any panel configuration and roof pitch.
- B. Flue Flashing: If possible locate flue flashing between panel edge laps and between ribs formed in the panel. Solder or weld all joints. Flue flashing shall be in accordance with Plate 112, Figure A of SMACNA.

3.9CLEANING

Clean all exposed sheet metal work at completion of installation. Grease and oil films, handling marks, contamination from steel wool, fittings and drilling debris shall be removed, and the work scrubbed clean. All exposed metal surfaces shall be free of dents, creases, waves, scratch marks, and solder or weld marks.

END OF SECTION

SECTION 07900

SEALANTS AND CAULKING

PART 1 - GENERAL

1.1 GENERAL REQUIREMENTS

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

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

1.2 REFERENCES

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

C 834-76 (86) Latex Sealing Compounds.

C 920-86 Elastomeric Joint Sealants.

C 962-81 Guide for Use of Elastomeric Joint sealants.

- B. Federal Specifications (FS):

TT-S-00230 C Sealing Compound, Elastomeric Type, Single Component (for Caulking, Sealing, and Glazing in Buildings).

TT-S-01543 A Sealing Compound, Silicone or Rubber Base (for Caulking, Sealing and Glazing in Building).

- C. International Conference of Building Officials (ICBO):

1985 Uniform Building Code.

- D. Sealand and Waterproofers Institute (SWI)

1984 Sealants: The Professional's Guide.

1977 Guide to Joint Sealant for Concrete Structures.

1977 Manual of Good Practice in Sealant Application.

1.3 QUALITY ASSURANCE

A. Qualification of Installer:

1. Installation personnel shall be skilled and competent. They shall be familiar with materials and nature of work.
2. Contractor shall be authorized by the product manufacturer for work.

B. Codes and Standards:

1. Comply with codes, specifications and standards referred to in this specification, except where provisions in this specification or drawings exceed such requirements.
2. Material and workmanship shall conform to:
 - a. ASTM C 962.
 - b. SWI Recommendations.
3. Sealants and caulking shall conform with following ASTM or FS:

Types

Urethanes - Two Part:

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

One Part:

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

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

Acrylics, One Part: ASTM C 834

Acrylic Latex, One Part: ASTM C 834

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

Ethylene Copolymer: FS TT-S-01543

4. Material shall be ICBO listed.

5. Material shall be non-staining.

1.4 QUALITY CONTROL

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

1.5 SUBMITTALS

A. Product Data:

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

B. Material Samples and Samples for Color Selection:

1. Samples of manufacturer's color range for caulking compound.
2. Caulking compound. Install sample between 2 strips of material representative of typical surfaces where sealant or compound will be used, held apart to represent typical joint widths.
3. Material sample of each component used.

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

1.6 WARRANTY/GUARANTY

- A. Warranty for minimum five (5) years against defects resulting from use of defective or inferior materials, equipment or workmanship on caulking system.
- B. Roofing work shall be guarantied jointly with modified bitumen sheet roofing, flashing and sheetmetal work, and sealant and caulking work to be in a watertight condition for a period of minimum two (2) years. Contractor shall agree to repair or replace work which leaks water, deteriorates excessively or otherwise fails to perform as required due to failures of materials or workmanship. Contractor shall further agree to repair and replace damages to building resulting from such leaks, at no cost to State.

1.7 PRODUCT HANDLING

- A. Deliver caulking and sealing compounds to job in unbroken, sealed containers bearing manufacturer's directions. Store materials in sealed containers in a dry protected area above ground or floor.
- B. Protect caulking materials before, during and after installation.
- C. Do not use caulking materials that have been stored for a period of time exceeding the maximum recommended shelf life of materials.

1.8 PROTECTION

- A. Protect installed work of other trades during installation.

PART 2 - PRODUCTS

2.1 MANUFACTURERS

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

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

2.2 MATERIALS

- A. Asbestos Prohibition: No asbestos containing materials shall be used under this section. The Contractor shall insure that all materials incorporated in the project are asbestos-free unless specifically approved in writing by the Engineer.
- B. Caulking compound shall be one (1) or two (2) component, gun grade, color as approved by Engineer, and shall be urethanes, silicone, acrylics, acrylic latex, triethylene rubber or ethylene copolymer or polysulfide rubber sealant compound.
- C. Materials of other compositions may be accepted if approved by Engineer.
- D. Material shall be as recommended by Sealant and Caulking Manufacturer and the manufacturer which products are to be sealed or caulked for its intended use.
- E. Joint Primer: Suitable to substrate surfaces as recommended by sealant manufacturer.
- F. Joint Backing: Preformed compressible, resilient, non-waxing, non-extruding, non-staining strips of close cell neoprene as recommended by sealant manufacturer. Backing shall be of sizes and shapes to suit various conditions, minimum twice as wide as joint to be caulked, and shall be compatible with sealant, primers and substrates.
- G. Bond Breaker: As recommended by sealant manufacturer.
- H. Cleaning Agent: As recommended by sealant manufacturer.
- I. One component caulking compound shall be used for typical conditions, two component caulking compound shall be used for continuous water immersed conditions.
- J. Silicone compound shall not be used when compound is to be painted.

PART 3 - EXECUTION

3.1 INSPECTION

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

3.2 PRE-INSTALLATION MEETING

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

procedures and coordination with other trades.

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

3.3 PREPARATION

- A. Field Verification: Verify measurements in field as required. Check with related trade's shop drawing details and provide corrective work as may be necessary.
- B. Surface Preparation:
 - 1. Primer: Thoroughly clean joints and apply primer, as recommended by sealant manufacturer, to dry surfaces. Apply primer prior to application of joint backing, bond breaker or sealants.
 - 2. Joint Backing: In joints where depth of joint exceed required depth of sealant, install joint backing to provide backing and uniform depth of sealant. Install joint backing with approximately 30% compression. Do not stretch, twist, puncture or tear joint backing. Butt joint backing at intersections.
 - 3. Bond Breaker Tape: Install bond breaker tape smoothly at back of joint where joint backing is not required or cannot be installed. Sealant shall adhere only to sides and not to back of joint so as to eliminate three-sided adhesion.
 - 4. Surface Condition: Joint surfaces to receive a sealant shall be sound, smooth, clean, dry and free of visible contaminants. Applications of non-visible coatings or contaminants to surfaces of rabbet area prior to application of sealant shall be controlled by Contractor in consultation with sealant manufacturer's representative.

3.4 PRECAUTION

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

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3.5 INSTALLATION

- A. General: Apply sealing compound in strict accordance with manufacturer's printed directions.
- B. Sealant Application: Apply sealant in accordance with manufacturer's application manual and instructions, using hand guns or pressure equipment, with proper nozzle size, on clean, dry, properly prepared substrates. Force sealant into joint and against sides of joint to make uniform. Avoid pulling of sealant from sides. Fill sealant space completely with sealant.
- C. Tooling: Tooling is required to ensure firm full contact with interfaces of joint. Tool joints to form smooth, uniform beads with slightly concave surfaces. Finish joints shall be straight, uniform, smooth and neatly finished. Remove any excess sealant from adjacent surfaces of joint, leaving work in a neat, clean condition. Use only tooling agents if recommended by sealant manufacturer.
- D. Masking Tape: Where an irregular surface or sensitive joint border exists apply masking tape at edge of joint to insure joint neatness and protection. Remove tape after sealant is applied.

3.6 CLEANING

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

3.7 REPAIR DURING GUARANTY PERIOD

- A. Repair and replace defective work, and work damaged during term of guaranty.
- B. Following types of failures will be adjudged defective work: Leakage, hardening, cracking, crumbling, melting, chalking, shrinking, or running of caulking compound, not bonding to adjacent surfaces or staining of adjoining work.

END OF SECTION

SECTION 08100

METAL DOORS AND FRAMES

PART 1 - GENERAL

1.01 WORK INCLUDED

Furnish all labor, materials and equipment required to complete all metal door and frame work as indicated on the Drawings and specified herein.

1.02 SUBMITTALS

- A. Manufacturer's literature: Submit 5 copies of current manufacturer's literature for approval of the Architect.
- B. Shop Drawings: Submit 5 copies of Shop Drawings of all doors and frames including anchorage details for approval by the Architect.

PART 2 - PRODUCTS

2.01 MATERIALS

- A. Metal Doors:
 - 1. Doors shall be 1-3/4" steel doors with face sheets of 16 gauge, galvanized, cold rolled, leveled sheet steel.
 - 2. Both faces of the door shall have smooth, seamless, and unbroken surfaces, with top and bottom edges closed flush to the door face sheets. No inverted channels shall be allowed.
 - 3. Lock and hinge edges shall be formed by full overlap of each face sheet around the perimeter vertical channels of a unitized grid structure, meeting at the center-line of each edge.
 - 4. All structural components shall be manufactured of galvanized steel, utilizing maximum strength welding design and techniques throughout. Doors requiring kraft honeycomb or foam material as the stabilizer shall not be allowed.
 - 5. Inner structure of the door shall be formed as a unitized grid, composed of minimum No. 16 U.S. gauge steel channels with rigidized webbing, cold roll formed to assure consistent dimensions. The grid pattern shall consist of 4 vertical members and 8 horizontal members. The grid shall be unitized by double projection welding at each junction and shall have applicable

hardware reinforcements attached by multiple welds. The grid shall form the flush top and bottom sections of the door.

6. Inner surfaces of the face sheets shall be specially coated with a layer of synthetic resin-base sound deadener prior to assembly to the grid. The substance shall be noncombustible, vermin-proof, corrosion resistant, and indefinitely elastic to retain proper deadening properties.
7. Structural attachment of the face sheets to the unitized grid assembly shall be achieved by direct current principle, double projection, multiple series welds, using electronically operated equipment specifically designed to assure maximum strength and rigidity throughout.
8. All doors shall be mortised and reinforced for hinges and locks to allow field application. Hinge reinforcements shall be a minimum No. 14 U.S. gauge steel die-formed to provide screw thread depth equivalent to No. 14 U.S. gauge steel. All hinge accommodations shall be pre-formed as an integral part of the continuous vertical member forming the periphery of the unitized grid. The back-up reinforcements of hinges and lock shall be die-formed to extend no less than 5 inches into the interior, and shall join the parallel inner vertical member of the grid structure to insure a uniform distribution of torque and stresses created by operation of the door. Inserted plate-type reinforcement shall not be allowed as an acceptable method of door suspension. Provisions shall be made for additional reinforcement, for a surface door closer.
9. Finishes:
 - a. Prior to finish, all welds shall be ground smooth and touched up with "Galvaloy".
 - b. Doors shall be cleaned by a process conforming to Federal Specification TT-O-490, Grade 1.
 - c. Immediately after cleaning, doors will be finished with a zinc dust primer conforming to Federal Specification TT-P-641d, Type II.
10. Hardware Preparation: Secure templates from the finish hardware supplier. Reinforce all hardware locations as required for long life under hard service.

B. Metal Frames:

1. Dimensions: All frame dimensions shall be the manufacturer's standard for the doors being furnished.
2. Composition and Materials:

- a. Frame materials shall be 16 gauge galvanized, cold rolled steel die-formed to profiles as detailed on the Architect's Drawings.
 - b. Corners are to be mitered, welded, and ground smooth.
 - c. Frames for hollow metal doors shall be reinforced with heavy gauge reinforcement for hinges, closers and lock strikes.
3. Finishes:
- a. Prior to finishing, all welds shall be ground smooth and touched up with "Galvaloy".
 - b. Frames shall be cleaned and primed as specified for the doors.
- C. Miscellaneous:
- 1. Anchors, bolts, angles, brackets where indicated or required.

PART 3 - EXECUTION

3.01 APPLICATION

Metal doors and frames shall be fabricated and erected in strict accordance with the approval Shop Drawings.

END OF SECTION

SECTION 08710

FINISH HARDWARE

1.0 PART 1 – GENERAL

1.1 DESCRIPTION

- A. Work Included: Furnish to the project site all finish hardware required for all doors, casework, etc., complete as indicated on the Drawings and specified herein. Where items are not specifically mentioned for a completely functional operation, they shall be furnished as similar specified work. It is the intent of this section to cover the class and character of all finish hardware required.
- B. Related work, Section 06200, Finish Carpentry: Installation shall be under this section.
- C. Quality assurance, Representative: Provide services of a competent hardware specialist who shall be subject to call for the Engineer to direct application and final adjustment of finish hardware.
- D. Submittals: Contractor shall furnish 5 copies of finish hardware schedules and catalog cuts of each item to be furnished.
- E. Alternates: Suppliers proposing substitutions shall submit schedules listing the item and manufacturer of the specified item and manufacturer of the proposed substitution.

2.0 PART 2 – PRODUCTS

- A. Door/Hardware must be ADA accessible. Handles, pulls, latches, locks and other operating devices on accessible door shall have a shape that is easy to grasp with one hand and does not require tight grasping, tight pinching, or twisting of the wrist to operate. Lever-operated mechanism, push-type mechanism, and U shaped handles are acceptable designs. Hardware required to accessible door passage shall be mounted no higher than 48 inches above finished floor.
 - i. (ADAAG 4.13.9)
 - ii. Finish hardware shall be the type designed for use in this type of structure. All hardware shall be of the best quality in construction, design and finish and free from any defects. Any defective piece shall be replaced by the Contractor at his expense. Hardware shall be of the manufacture, type, weight, function and quality as shown by factory numbers or an approved equal.
- B. Quality, function, finish and design of al hardware shall be in accordance with the following

descriptive matter and schedule of Typical Requirements:

1. Locksets and Strikes: Shall be furnished in accordance with the American National Standards Institute Specifications; knobs shall be of screwless type, free from setscrew adjustments. Locksets to be Best brand, or approved equal.
 2. Door Butts: Where doors are required to swing 180 degrees, furnish butts of sufficient throw to clear trim. Non-removable for all out swing exterior doors. Painted to match door color.
 - a. 1-3/8" thick door – size 3-1/2 x 3-01/2.
 - b. 1-3/4" thick door – size 4-1/2 x 4-1/2 or 5x 5 as scheduled.
 - c. 1-1/2 pair butts each door.
 - d. 2 pair butts each door over 7' – 6" in height.
 3. Fastenings: Furnish necessary screws, bolts and other fastenings for proper application of hardware. Fastenings shall be of suitable size and type to securely install hardware as to material and finish. Furnish necessary expansion shields, "rawl" plugs, toggle bolts, machine or wood screws, or other suitable approved anchoring devices where hardware is to be installed on concrete, masonry, or other type of backing.
 4. Finish: Finish of all hardware to be 10B unless specified otherwise.
 5. Keying: During the period of construction, all locks shall be operated by the special construction master key. Regular day and master keys shall be retained by the supplier. Construction keys shall become inoperative when regular keys are turned over.
- C. Hardware Schedule: Submit hardware schedule in the manner and format specified, complying with the actual construction progress schedule requirements. Include a separate key schedule, showing clearly how the State's final instructions on keying locks have been fulfilled. Hardware schedules are intended for coordination of the work. All new locks shall be master keyed to the State master key system. Contractor to verify keying system.
- D. The following are acceptable manufacturers:
1. Lock: Best
 2. Cylinders: Best to accept State DOFAW Master Key System.
 3. Hinges: McKinney, Soss and Stanley
 4. Closer: Russwin and Sargent

6. Miscellaneous: Builders Brass Works, Quality, Pemko, Trimco, Folger Adam

3.0 PART 3 – EXECUTION

- A. Upon delivery of the finishing hardware to the job site by the hardware supplier, the General Contractor shall have a responsible person check in this materials at place for storage. The hardware shall be protected from damage at all times, both prior to and after its installation.
- B. One set of tools and maintenance or installation instruction packed with closers and locksets shall be given to the Owner when the project is complete.
- C. Method of Measurement. No measurement of finish hardware will be made.
- D. Basis of Payment. Payment for all items of work and materials specified in this Section and/or shown on the plans shall be made on a lump sum basis. Said lump sum payment shall be full compensation for furnishing materials, labor tools and equipment necessary to render work in place complete.

END OF SECTION

SECTION 09900

PAINTING

PART 1 - GENERAL

1.1 GENERAL REQUIREMENTS

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

1.2 RELATED DOCUMENTS

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

1.3 SUBMITTALS

A. Schedule of Finishes

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

B. Color Samples

1. 3 sets of each color Finish sample shall be submitted to the Engineer for approval.
2. After the color finish sample has been approved, one set of color finish samples painted onto 8-1/2" x 11" cardboard shall be submitted to the Engineer. The cardboard shall be divided into 4 horizontal strips and painted as follows:
 - a. Prime 3 strips starting from the bottom.
 - b. 1st coat bottom 2 strips.
 - c. 2nd coat bottom strip.

C. Schedule of Operations

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

D. Guarantee

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

1.2 ANALYZING AND TESTING

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

1.4 GUARANTEE

- A. The Contractor shall guarantee that the work performed under this section conforms to the contract requirements and is free of any defect of material or workmanship performed by the Contractor. Such guarantee shall continue for a period of 2 years from the date of project acceptance during which period the Contractor shall remedy at his own expense any such failure to conform or any such defect.
- B. The State shall notify the Contractor in writing within a reasonable time after discovery of any failure or defect.
- C. Should the Contractor fail to remedy any failure or defect described in Paragraph A above within 10 working days after receipt of notice thereof, the State shall have the right to repair or otherwise remedy such failure or damage at the Contractor's expense.

1.5 SPECIAL REQUIREMENTS

A. Codes

- 1. The Contractor shall comply with the State OSHL (Occupational Safety and Health Law) and all pollution control regulations of the State Department of Health.
- 2. Any violations of the above regulations or codes shall be dealt with as mentioned in the Special Provisions Section and the Environmental Protection Section of these specifications.

B. Protection

- 1. Persons
 - a. The Contractor shall take all necessary precautions to protect public pedestrians including tenants from injury.
 - b. The Contractor shall provide, erect and maintain safety barricades around scaffolds, hoists and wherever Contractor's operations create hazardous conditions in order to properly protect the public and tenants.
- 2. Completed Work: The Contractor shall provide all necessary protection for wet paint surfaces.

3. **Protective Covering:** The Contractor shall provide and install protective covering over furniture, equipment, floor and other areas that are not scheduled for treatment. Protective covering shall be clean sanitary drop cloth or plastic sheets. Paint applied to surfaces not scheduled for treatment shall be completely removed and surfaces shall be returned to original condition.
 4. **Safeguarding of Property:** The Contractor shall take whatever steps may be necessary to safeguard his work and also the property of the State and other individuals in the vicinity of his work area during the execution of this Contract. He shall be responsible for and make good on any and all damages and for losses to work or property caused by his or his employee's negligence. Also see "Protection of Property" in the Special Provision Section.
 5. **Fire Safety:** The Contractor shall direct his employees not to smoke in the vicinity and exercise precautions against fire at all times. Waste rags, plastic (polyester sheets), empty cans, etc. shall be removed from the site at the end of each day.
- C. **Storage Area for Materials:** No paint material, empty cans and paint brushes and rollers may be stored in buildings, but shall be stored in separate storage facilities away from the buildings.
- The Contractor may furnish a job site storage facility. Such facility shall comply with requirements of the local Fire Department. The storage area shall be kept clean and facility shall be locked when not in use or when no visual supervision is possible.
- D. **Right of Rejection:** The Engineer shall have the right to reject all work which is not in compliance with the plans and specifications. Rejected work will be redone at no additional cost to the State.
- E. **Sequence of Operations:** The sequence of operations shall divide the surfaces into work areas and present a schedule for:
1. Surface preparation and spot prime.
 2. Prime coat.
 3. First finish coat.
 4. Second finish coat.

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

- F. Inspection and Approvals: The Contractor shall obtain written approval from the Engineer upon completion of each phase of work (phases of work are: surface preparation and spot prime, prime, first finish coat, second finish coat) before proceeding into the next phase work. The Contractor shall give the Engineer one day (24 hours minimum) advance notice of completion of any phase of work for a area only when he deviates from the previously-submitted work schedule. The Contractor shall provide necessary access to areas to be inspected.

Failure to obtain approval of any phase of work for a work area may result in redoing the operation at no cost to the State.

PART 2 - PRODUCTS

2.1 PROHIBITION OF HAZARDOUS MATERIALS

- A. Lead Content: Do not use coatings having a lead content over 0.06 percent by weight of nonvolatile content.
- B. Chromate Content: Do not use coatings containing zinc-chromate or strontium-chromate.

2.2 PAINTS

- A. Materials shall be equal in quality to that specified under the Schedule of Finishes and any given finish shall be as labeled by one manufacturer.
- B. All materials shall be delivered to the job site in undamaged original containers bearing the manufacturer's label and shall be stored in such a manner as to prevent damage. All rejected materials shall be removed from the job site immediately.
- C. Sinclair paint is indicated for standard of quality and color, only. Comparable high quality top line paints manufactured by Devoe, Fuller O'Brien, Benjamin Moore, Sinclair, Spectra-Tone or approved equal.
- D. Thinning of paint shall be done using material recommended by the manufacturer. Mix proprietary products according to manufacturer's printed specifications. Compound thinner, mineral oil, kerosene, refined linseed oil, or gasoline shall not be used for thinning.
- E. Except for metal primers, all paint shall contain mildewcide equal in strength to 2 oz. of Super Ad-It per gallon of paint pre-mixed by supplier.
- F. The supplier shall submit a signed certification that the paint materials contains mildewcide equal in strength to 2 oz. of Super Ad It.

2.3 SCHEDULE OF FINISHES

- A. The Schedule of finishes is made for the convenience of the Contractor and indicates the types and quality of finishes to be applied to the surfaces.
- B. Any surface not specifically noted in the finish schedule shall be finished to match adjoining work.

2.4 SCHEDULE - EXTERIOR SURFACES

- A. Wood - Beams and Columns
 - 1. First Coat - Olympic solid stain
 - 2. Second Coat - Olympic solid stain
- B. Wood - Rafters and Purlins
 - 1. First Coat - Olympic solid stain
 - 2. Second Coat - Olympic solid stain
- C. Steel - Galvanized (Fuller O'Brien Specifications)
 - 1. Pretreatment - 321-60 Vinyl wash primer
 - 2. First Coat - 221-12 Zinc rich primer
 - 3. Second Coat - 312-XX Heavy duty enamel
 - 4. Third Coat - 312-XX Heavy duty enamel
- D. Color of paints shall be as approved by the Engineer.

PART 3 - EXECUTION

3.1 PREPARATION OF SURFACES

- A. Wood surfaces: Fill nail holes, cracks, open joints and other imperfections with appropriate compound and allow to set. Caulk all openings which will permit the entrance of water.
- B. Ferrous Metal and Galvanized Metal:
 - 1. Remove from surface to be painted all foreign matter such as tape, gum, and burrs.
 - 2. Remove all rust to bare metal. Remove all loose, blistered, scaled, crazed, chalky finish to a tight and firm finish.

3.2 PAINT APPLICATION

A. General

1. All work shall be done in a workmanlike manner by skilled and experienced mechanics and shall conform to the best painting practices.
2. All materials shall be applied in accordance with the manufacturer's specifications and the finished surfaces shall be free from runs, sags, drops, ridges, waves, laps, streaks, brush marks and variations in color, texture and finish (glossy or dull). The coverage shall be complete and each coat shall be so applied as to produce a film of uniform thickness. No paint, varnish or enamel shall be applied until the preceding coat is thoroughly dry and approved.
3. No exterior painting of unprotected surfaces shall be done in rainy, damp weather. Coats shall be applied only to surfaces that are thoroughly dry.

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

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

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

E. All mixing shall be done outside the building.

3.3 CLEAN-UP

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

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

END OF SECTION