State of Hawaii
DEPARTMENT OF LAND AND NATURAL RESOURCES
DIVISION OF BOATING AND OCEAN RECREATION
Honolulu, Hawaii

BOARD OF LAND AND NATURAL RESOURCES

Ryan K.P. Kanakaole
Acting Chairperson

CONTRACT SPECIFICATIONS AND PLANS

Job No. B48CM75A
Mala Boat Ramp Site Improvements
Lahaina, Maui, Hawaii

April 2026

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Job No. B48CM75A
Mala Boat Ramp Site Improvements
Lahaina, Maui, Hawaii

Approved: _____

FINN D. MCCALL
Engineering Branch Head
Division of Boating and Ocean Recreation

Approved: _____

MEGHAN L. STATTS
Administrator
Division of Boating and Ocean Recreation

April 2026

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NOTICE TO BIDDERS
(Chapter 103D, HRS)

COMPETITIVE SEALED BIDS for Job No. B48CM75A, Mala Boat Ramp Site Improvements, Lahaina, Maui, Hawaii may be submitted to the Department of Land and Natural Resources, Division of Boating and Ocean Recreation, Engineering Branch on the specified date and time through the State of Hawaii e-Procurement System (HIePRO).

The Department of Land and Natural Resources Interim General Conditions dated October 1994, as amended is available on request; and the General Conditions – AG008, latest revision shall be made a part of the specifications. Electronic copies of the General Conditions is available on the HIePRO site.

The project is located at Mala Boat Ramp, Lahaina, Maui, Hawaii.

The purpose of this Invitation for Bids (IFB) is to award to a Contractor work that shall generally consist of Asphalt Concrete (AC) pavement resurfacing and restriping of access road and parking lot areas, replacement of AC pavement near boat ramp with concrete pavement, new concrete curbing, drainage improvements for boat washdown area including trench drain, piping and subsurface infiltration disposal, comfort station improvements and renovation, new solar powered area lights and other related and appurtenant work as show in the plans, specifications, and bidding documents issued with this solicitation.

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

The estimated cost of construction is $2,000,000.

As a condition for award of the contract and final payment, the vendor shall provide proof of compliance with the requirements of 103D-310(c) HRS. Proof of compliance/documentation is obtained through Hawaii Compliance Express (HCE). Vendors shall register in Hawaii Compliance Express (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.

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

The Engineering Branch Head is responsible for administering and overseeing the Contract, including monitoring and assessing contractor performance.

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

Should there be any questions, please use the question and answer section of 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. SEALED PROPOSALS**: Not applicable. See 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 standard questionnaire. When required, 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. **No bid security is required for bids less than $50,000.**

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. This project will require a Class "A" contractor's license.

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. **Performance and payment bonds are not required for bids less than $50,000.**

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. **For contracts less than $50,000, the State reserves the right to contract the work under a purchase order.**

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 Contractor shall procure all required project permits and pay the required

fees, including hiring consultants and payment thereto for services related to obtaining required permits if required. 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 LOCAL LABOR: The Contractor shall hire local labor whenever practicable.

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 by the Contractor at the end of the project in both hard copy and 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.

CC. FIELD OFFICE AREA FOR DEPARTMENT: **Not required for this project.**

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 the contactor shall be in compliance with the following requirements:

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.

COMPLIANCE, DOCUMENTATION AND HAWAII COMPLIANCE EXPRESS

As a condition for award of the contract and as proof of compliance with the following requirements of 103D-310(c) HRS:

Vendors are required to be compliant with all appropriate state and federal statutes. Proof of compliance (compliance documentation) is required. See the HIePRO Buyer FAQ on the State Procurement website for more information.

Proof of compliance/documentation is obtained through Hawaii Compliance Express (HCE). Vendors shall register in Hawaii Compliance Express (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.

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 replacing the last paragraph with the following:

In the event the Notice to Proceed is not issued within three hundred and sixty-five (365) days after the date of bid opening, the Contractor may submit a claim for increased labor and materials costs (but not overhead costs) that will be incurred after 365 days after the date of bid opening plus the contract time allowed for performance of the work. Such claims shall be accompanied with the necessary documentation to justify the claim. No payments will be made for escalation costs that are not fully justified as determined by the State.

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

"**3.10 PROTESTS**—Pursuant to Section 103D-701, Hawaii Revised Statutes, an actual or prospective offeror who is aggrieved in connection with the solicitation or award may submit a protest. Any protest shall be submitting in writing to the Chairperson, Department of Land and Natural Resources, 1151 Punchbowl Street, Honolulu, Hawaii 96813, or designee as specified in the solicitation.

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

The notice of award, if any, resulting from this solicitation shall be posted on the HIePRO website.

Section 5 – Control of Work

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

Section 6 – Substitution of Materials and Equipment

ADD the following to Section 6.3 Sub-paragraph b:

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

Section 7 – Prosecution and Progress

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

"d. INSURANCE REQUIREMENTS

1. **Obligation of Contractor** - Contractor shall not commence any work until it obtains, at its own expense, all required herein insurance. Such insurance must have the approval of the Department as to limit, form and amount and must be maintained with a company authorized by laws of the State to issue such insurance in the State of Hawaii. Coverage by a "Non-Admitted" carrier is permissible provided the carrier has a AM Best's Rating of "A-VII" or better.

2. 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.

3. Certificate(s) of Insurance acceptable to the Department shall be filed with the Engineer prior to commencement of the work. Certificates shall identify if the insurance company is a "captive" insurance company or a "Non-Admitted" carrier to the State of Hawaii. The Best's Rating must be stated for the "Non-Admitted" carrier. Certificates shall contain a provision that coverages afforded under the policies will not be canceled or changed until at least thirty (30) days written notice has been given to the Engineer by registered mail. The insurance policies shall name the State of Hawaii, its officers and employees as an additional insured and such coverage shall be noted on the certificate. Should any policy be canceled before final acceptance of the work by the Department, and the Contractor fails to immediately

procure replacement insurance as specified, the Department, in addition to all other remedies it may have for such breach, reserves the right to procure such insurance and deduct the cost thereof from any money due to the Contractor.

4. 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.

5. 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.

6. 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.

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

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

9. In addition, the Contractor's insurance policies shall contain the following clauses:
   (a) The State of Hawaii is added as an additional insured with respect to operations performed for the State of Hawaii.
   (b) It is agreed that any insurance maintained by the State of Hawaii will apply in excess of, and not contribute with, insurance provided by this policy.

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

   (a) Worker's Compensation. The Contractor and all subcontractors shall obtain worker's compensation insurance for all persons whom they employ or may employ in carrying out the work under this contact. This insurance shall be in strict conformity with the

requirements of the most current and applicable State of Hawaii Worker's Compensation Insurance laws in effect on the date of the execution of this contract and as modified during the duration of the contract.

(b) Commercial General Liability. The Contractor shall obtain General Liability insurance with a limit of not less than $1,000,000 per occurrence and $2,000,000 aggregate. The commercial general liability insurance shall include the State as an additional insured. The required limit of insurance may be provided by a single policy or with a combination of primary and excess polices.

(c) Comprehensive Automobile Liability. The Contractor shall obtain Auto Liability insurance covering all owned, non-owned and hired autos with a combined single Limit of not less than $1,000,000 per accident for bodily injury and property damage. The State shall be named as additional insured. The required limit of insurance may be provided by a single policy or with a combination of primary and excess policies.

Furthermore, the Contractor's commercial general liability insurance and automobile liability insurance shall include coverage for bodily injury, sickness, disease or death of any person, arising directly or indirectly out of, or in connection with, the performance of work under this contract.

The Contractor's property damage liability insurance shall provide for all damages arising out of injury to or destruction of property of others including the Department's, arising directly or indirectly out of or in connection with the performance of the work under this contract including explosion or collapse.

The Contractor shall either:

i. Require each of its subcontractors to procure and to maintain during the life of its subcontract, subcontractors' comprehensive general liability, automobile liability and property damage liability insurance of the type and in the same amounts specified herein; or

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

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

(d) Builder's Risk Insurance. Unless included in the Specifications of this project, the Contractor shall not be required to provide builder's risk insurance. If required as noted in the Specifications, builder's risk insurance shall be provided during the progress of work and until final acceptance by the Department upon completion of the contract. It shall be "All Risk" (including but not limited to earthquake, windstorm and flood damage) completed value insurance coverage on all completed work and work in progress to the full replacement value thereof. Such insurance shall include the

Department as additional name insured. The 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. Construction Lines, Levels and Grades: The Contractor shall verify all lines, levels and elevations indicated on the drawings before any clearing, excavation or construction begins. Any discrepancy shall be immediately brought to the attention of the Engineer, and any change shall be made in accordance with their instruction. The Contractor shall not be entitled to extra payment if he fails to report the discrepancies before proceeding with any work whether within the area affected or not.

B. Examination of Premises: The Contractor shall contact the Engineer and obtain permission before visiting the site.

C. Notices: The Contractor shall call the Engineer and give at least three (3) working days notice before starting any work.

D. Conditions at Site: Every person bidding on this project is expected to visit the site and examine the conditions and satisfy themselves as to the character and amount of the work to be performed as indicated on the drawings and called for by the specifications. No additional allowance will be granted because of the lack of knowledge of such conditions.

E. Disruption of Utility Services: All work related to the temporary disconnection of electrical system and water service shall be pre-arranged with the Engineer so that any disruption of such services will be kept to a minimum.

In the event temporary electrical power hook-up is required, the Contractor shall provide the necessary services.

F. 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's occupied spaces for the user agency personnel and the public at all times.

G. Parking Policy for Contractor

1. The Contractor and their employees will not be allowed to park in zones assigned to facility personnel and public parking.

2. Areas to be used by the Contractor shall be as designated by the Engineer. Any lawn damaged by the Contractor shall be restored when so 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 the toilet facility clean and in a sanitary condition at all times.

During the renovations to the comfort station, when restroom facilities are unavailable for public use, the Contractor shall provide temporary portable toilet facilities at the direction of the Engineer. The number and duration shall be determined by the Engineer at no additional cost to the State.

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

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

K. Safety:

1. The Hawaii Occupational Safety and Health Law, Chapter 396, Hawaii Revised Statutes, as amended, is applicable and made a part of the Contract.

2. The Contractor shall carefully read and strictly comply with its requirements.

L. Clean Up Premises: The Contractor shall clean up and remove from the premises all debris accumulated from operations from time to time and as directed. See also Section 7.25 of the GENERAL CONDITIONS.

M. Responsibility:

1. The State of Hawaii 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 they discover any discrepancy in the plans or specifications, the Contractor shall immediately notify the Engineer before proceeding any further with the work, otherwise, they 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 their 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 they discover 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 (1) 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. 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. This is to assure that changes are recorded before they are forgotten.

        2) Within two (2) 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 together with the marked-up field office plans to the Engineer.

        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.

R. Permits

1. The following permits have been obtained and paid for by the State.
    a. State of Hawaii, Disability and Communication Access Board (DCAB)
    b. State of Hawaii, Department of Health, Notice of General Permit Coverage (NGPC) under the National Pollutant Discharge Elimination System (NPDES) General Permit Authorizing Discharges of Storm Water Associated with Construction Activities (NOI-C)

2. The project is exempt from obtaining a building and grading permit from the County of Maui.

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

PART 2 – PRODUCTS (NOT USED)

PART 3- EXECUTION (NOT USED)

END OF SECTION

SECTION 01101

ARCHAEOLOGICAL PROTECTION AND MONITORING

PART 1 - GENERAL

1.1 GENERAL REQUIREMENTS

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 In the event that any subsurface archaeological sites or remains of historic value such as artifacts or charcoal deposits are encountered, the Contractor shall stop work and immediately notify their qualified archaeologist, the Engineer and the State Department of Land and Natural Resources, Historic Preservation Division (SHPD) at 808-327-3690. The procedures outlined in the Archaeological Monitoring Plan, at the minimum, shall be followed. These situations shall be considered an unforeseen condition.

3.2 ARCHAEOLOGICAL MONITORING PLAN

A. The Archaeological Monitoring Plan shall be used to determine the level of monitoring effort required based on the specific construction method and excavation techniques involved and the distinct soil type that may be encountered throughout the project site. A copy of the Archaeological Monitoring Plan is on file and available for viewing at the Department of Land and Natural Resources, Engineering Division, Kalanimoku Building, Room 221, 1151 Punchbowl Street, Honolulu, Hawaii 96813.

B. The following archaeological procedures shall be undertaken as a minimum:

1. A qualified archaeologist shall be present for on-site monitoring, at a minimum:

   a. For all ground disturbance.
   b. During initial clearing and grubbing and exploratory work.
   c. During removal of existing subsurface utilities.
   d. During excavation for foundations and subsurface utilities.

2. If no significant artifacts are encountered, on-call monitoring is suggested for the remainder of the project.

3. A qualified archaeologist shall be available for on-call monitoring as established by the monitoring plan.

3.3 SUBMITTALS

A draft Archaeological Monitoring Report shall be submitted within 90 days of completion of monitoring fieldwork to the State Historic Preservation Division (SHPD) for review and approval. A final report shall be submitted within 30 days after any review comments are received.

3.4 QUALIFICATIONS

A. An archaeologist is required for this project and shall meet the following professional qualifications.

1. Have a graduate degree in Anthropology, with a specialization in archaeology, and

2. Have at least one (1) year of archaeological field experience (which can be made up of discontinuous periods of full-time work adding up to one (1) year) or have participated fully in 10 archaeological field projects, and

3. Have a demonstrated ability to carry research to completion, usually by completed theses, publications and manuscripts.

END OF SECTION

SECTION 01300

SUBMITTALS

PART 1 - GENERAL

1.1 SUBMITTALS

A. Product information shall be required for:
   1. Section 01530 – Public Safety - Barricades
   2. Section 02512 – Asphaltic Concrete Paving
   3. Section 02530 – Aggregate Base Course
   4. Section 02577 – Pavement Markings
   5. Section 02600 - Drainage System
   6. Section 02713 – Water System
   7. Section 02840 – Signage
   8. Section 03300 – Concrete
   9. Any others as called for in the plans and specifications or by the Engineer

B. Other required submittals shall include:
   1. Shop Drawings
   2. Certificates of Warranty
   3. Written narrative and construction schedule, including phasing and work sequence
   4. Any others as called for in the plans and 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 (1) 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 their 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 their review eight (8) 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 20 regular working days for examining the drawings.

F. The drawing shall be accurate, distinct, and complete and shall contain all required information, including satisfactory identification of items, units and assemblies in relation to the contract drawings and specifications.

G. Unless otherwise approved by the Engineer, shop drawings shall be submitted only by the Contractor, who shall indicate by a signed stamp on the drawings or other approved means that the Contractor has checked the shop drawings and that the work or equipment shown is in accordance with contract requirements and has been checked for dimensions and relationship with work of all other trades involved. All deviations from the plans and specifications shall be listed. The practice of submitting incomplete or unchecked shop drawings for the Engineer to correct or finish will not be acceptable, and shop drawings which, in the opinion of the Engineer, clearly indicate that they have not been checked by the Contractor will be considered as not complying with the intent of the contract documents and will be returned to the Contractor for resubmission in the proper form.

H. When the shop drawings have been reviewed by the Engineer, two (2) 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 (1) set will be returned to the Contractor with such changes or corrections indicated, and the Contractor shall correct and resubmit eight (8) 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 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, they shall state in their 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

This section covers the requirements for mobilization and demobilization.

1.2 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 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.

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

PUBLIC SAFETY – 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 Federal Highway Administration (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

1.1 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, MUTCD, and any amendments or revisions thereof 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 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 two (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 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 (1) of the following:

1. Reflective sheeting specified in Subsection 712.20(C)(4) of the “Standard Specifications for Road and Bridge Construction” and backed with a 26 gage galvanized steel sheet, or

2. A hardened aluminum backed reflective sheeting as specified in Subsection 712.20(C)(5) of the “Standard Specifications for Road and Bridge Construction.”

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

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

1. Orange and white stripes shall be used in the following conditions:
   a. Construction work.
   b Detours.
   c. Maintenance work.

2. Red and white stripes shall be used in the following conditions:
   a. On roadways with no outlet (i.e. dead-ends, cul-de-sacs).
   b. Ramps or lanes closed for operational purposes.
   c Permanent or semi-permanent 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 Contractor 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 01568

ENVIRONMENTAL PERMITS AND POLLUTION CONTROL

PART 1 – GENERAL

1.1 GENERAL

A. With the exception of those measures set forth elsewhere in these specifications, environmental protection shall consist of the prevention of environmental pollution as the result of construction operations under this contract. For the purpose of this specification, environmental pollution is defined as the presence of chemical, physical, or biological elements or agents which adversely affect human health or welfare, unfavorably alter ecological balances of importance to human life, affect other species of importance to man, or degrade the utilization of the environment for aesthetic and recreational purposes.

B. The work under this section shall include the following:

1. Make sure that all permits required are obtained and valid for the construction period.

2. Provide all air and water quality testing and monitoring work required by the permits during construction.

3. Provide all facilities, equipment and structural controls for minimizing adverse impacts upon the environment during the construction period.

1.2 GENERAL REQUIREMENTS

A. Applicable Regulations

To provide for abatement and control of environmental pollution arising from the construction activities of the Contractor and their subcontractors in the performance of this contract, the work performed shall comply with the intent of the applicable Federal, State, and local laws and regulations concerning environmental pollution control and abatement, including, but not limited to the following regulations:

1. State of Hawaii, Department of Health, Administrative Rules, Chapter 55, WATER POLLUTION CONTROL: Chapter 54, WATER QUALITY STANDARDS.

2. State of Hawaii, Department of Health, Administrative Rules, Chapter 59, AMBIENT AIR QUALITY: Chapter 60, AIR POLLUTION CONTROL LAW.

3. State of Hawaii, Department of Health, Administrative Rules, Chapter 44A, VEHICULAR NOISE CONTROL.

4. State of Hawaii, Occupational Safety and Health Standards, Title 12, Department of Labor and Industrial Relations, Subtitle 8, Division of Occupational Safety and Health, Subparagraph 12-202-13, ASBESTOS DUST: Environmental Protection Agency, Code of Federal Regulation Title 40, Part 61, Subpart B, NATIONAL EMISSION STANDARDS FOR ASBESTOS; and U.S. Department of Labor Occupational Safety and Health Administration (OSHA) Asbestos Regulations, Code of Federal Regulations Title 29, Part 1910.

B. Permits

1. The Contractor shall comply with the requirements and conditions of all regulatory agency permits and approvals, including the following:

   a. Disability and Communication Access Board (DCAB) approval.

   b. Archaeological Literature Research (LRFI), project posting on HICRIS, Cultural Impact Assessment (CIA) and State Historic Preservation Division (SHPD) approval conditions to construct.

   c. State Department of Health, National Pollutant Discharge Elimination (NPDES) General Permit for Discharges of Storm Water Associated with Construction Activities.

2. All permit applications and/or forms shall be submitted to the State for concurrence prior to submission to the accepting agencies.

PART 2 - PRODUCTS (NOT USED)

PART 3 – EXECUTION

3.1 ASBESTOS REPORT AND ABATEMENT

A. The Contractor shall complete an asbestos investigation and written report identifying asbestos-containing materials (ACMs) on site, and perform abatement (if required), including proper containment, removal, disposal, and all other incidentals.

3.2 AIR POLLUTION CONTROL

A. Emission.

The Contractor shall not be allowed to operate equipment and vehicles that show excessive emissions of exhaust gases until corrective repairs or adjustments are made, as determined by the Engineer.

B. Dust.

1. The Contractor, for the duration of the contract, shall maintain all embankments, haul roads, permanent access roads, plant sites, waste disposal areas, borrow areas, and all other work areas within or without the project limits free from dust which would cause a hazard to the work, or the operations of other contractors, or to persons or property. Industry accepted methods of stabilization suitable for the area involved, such as sprinkling or similar methods will be permitted. Chemical or oil treating shall not be used.

2. 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.

3. 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.

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

3.3 WATER POLLUTION CONTROLS

A. Water

The Contractor shall not deposit at the site or in the site or in the storm drainage system any solid waste or discharge liquid waste, such as fuels, lubricants, bituminous waste, untreated sewage and other pollutants, which may contaminate the existing surface or ground water.

B. Spillage

Care shall be taken to ensure that no petroleum products, bituminous materials, or other deleterious substances, including debris, are allowed to fall, flow, leach, or otherwise enter existing surfaces or ground water.

C. The work areas and haul roads, including roadways leading to the project site, shall be continuously watered to prevent the generation of dust and shall be cleaned daily to remove all mud and droppings from construction vehicles. Mud shall be removed from the tires of all vehicles before entering the construction site.

D. Storm Water

1. Comply with all requirements of the NPDES General Permit for Discharges of Storm Water Associated with Construction Activities, as administered by the Department of Health, State of Hawaii (DOH) pursuant to HAR Chapter 11-55 Appendices A and C.

2. Do not commence construction until Notice of General Permit Coverage (NGPC) is received from DOH.

3. A site-specific Storm Water Pollution Prevention Plan (SWPPP) has been developed for this project. The Contractor shall implement, maintain, and inspect all Best Management Practices (BMPs) as detailed in the SWPPP and shown on the Erosion and Sediment Control Plans.

4. The Contractor shall document modifications to BMPs and changes in site conditions in the SWPPP in accordance with permit requirements.

5. The Contractor shall ensure that no unauthorized non-stormwater or polluted storm water discharges leave the project site.

E. Hydrotesting and Dewatering Activities

Prior to commencing construction, the Contractor shall obtain and pay for all additional DOH permits required due to Contractor operations.

If work includes removing, relocating, or installing waterlines, and Contractor elects to flush waterline or discharge hydrotesting effluent into State waters or drainage systems, obtain an NPDES NGPC authorizing discharges of hydrotesting waters. Hydrotesting operations shall be in accordance with conditions of the NGPC. Submit a copy of the application and permit to the Engineer.

If excavation operations require dewatering, and Contractor elects to discharge dewatering effluent into State waters or drainage systems, obtain an NPDES NGPC authorizing discharges associated with construction activity dewatering. Dewatering operations shall be in accordance with conditions of the NGPC. Submit a copy of the application and permit to the Engineer.

3.4 NOISE CONTROL

A. 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. 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.

B. Construction equipment shall be equipped with suitable mufflers to maintain noise within levels complying with applicable regulations.

C. Construction operations shall be confined to the period between 7:00 a.m. and 4:00 p.m., Monday through Friday. Construction will not be permitted on weekends and legal State and Federal holidays. In the event the Contractor's operations require the State's inspectional and engineering personnel to work overtime, the Contractor shall reimburse the State for the cost of such service.

D. Starting up of construction equipment meeting allowable noise limits shall not be done prior to 7:00 a.m. without prior approval of the Engineer. Equipment exceeding allowable noise limits shall not be started up prior to 7:30 a.m.

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

3.5 SOLID WASTES

A. Construction waste, such as crates, boxes, building materials, pipes, and other rubbish shall be reduced to a size approved by County of Maui. Large size objects shall be reduced to a size acceptable by the County Specifications for disposal in their landfills. Other areas or methods proposed by the Contractor will be approved only if the Engineer determines that their effect on the environment is equal to or less than those described herein.

B. Removal of waste shall be a continuous on-going operation. Waste and debris shall not be allowed to accumulate in large open piles.

C. Wind-blown waste and debris and waste left by workers shall be collected by the Contractor and disposed of as described above.

D. No burning of debris and/or waste materials shall be permitted on the project site.

E. 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.

F. 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.

G. 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.

H. 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.

3.6 SUSPENSION OF WORK

A. Violations of any of the above requirements or any other pollution control requirements which may by 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.

B. 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 cost incurred by the State in taking such action from monies due to the Contractor.

C. The Engineer may also suspend any operations which they feel 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 INTERIM 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 INTERIM GENERAL CONDITIONS.

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.

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

D. CONCRETE

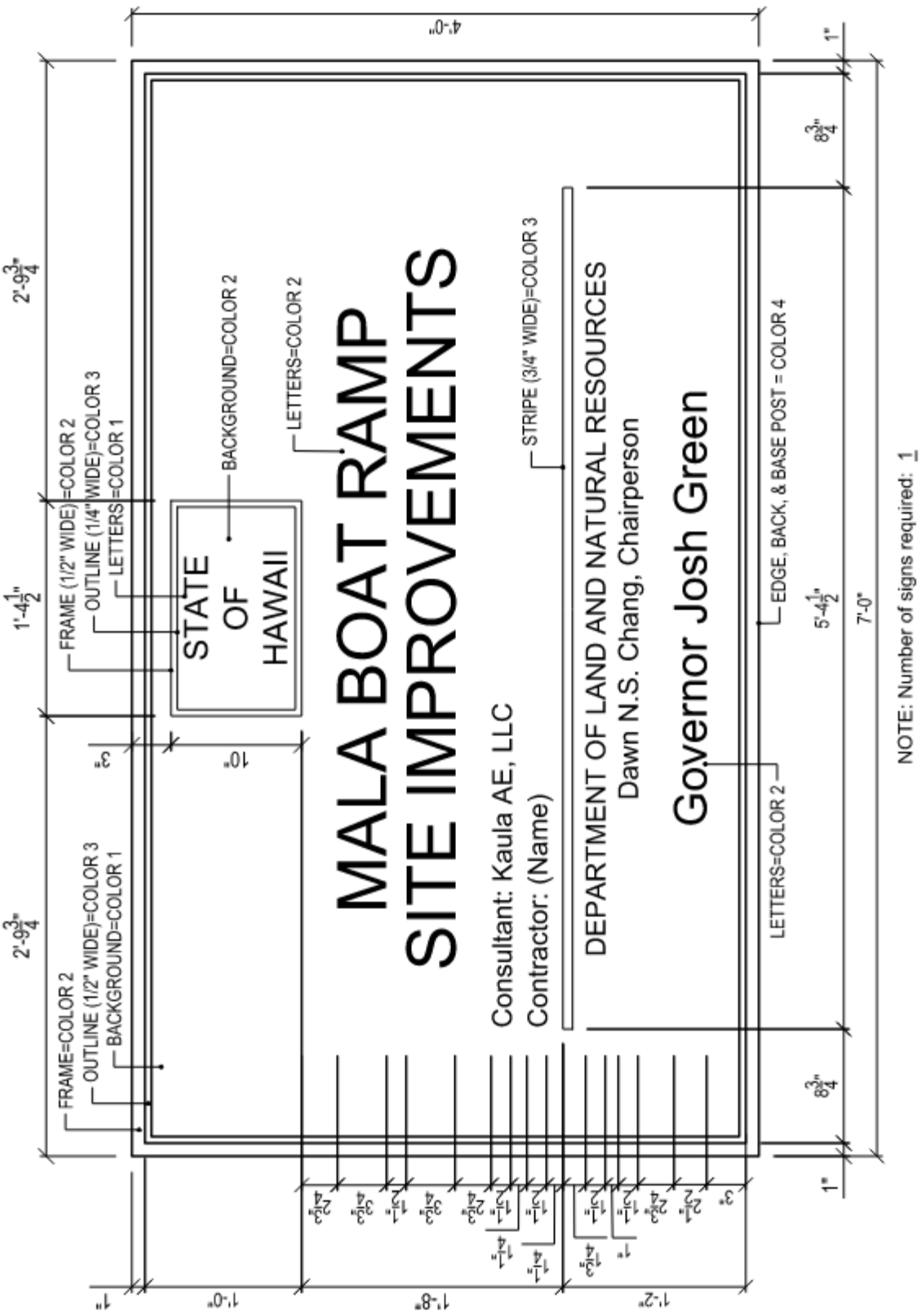
Concrete shall be class B with a 2,500 psi 28-day compressive strength.

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.



END OF SECTION

SECTION 02050

DEMOLITION

PART 1 - GENERAL

1.1 GENERAL REQUIREMENTS:

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

1.2 SUBMITTALS:

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

1.3 DUST CONTROL:

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

1.4 PROTECTION

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

B. Trees: Protect trees within the project site which might be damaged during the demolition work.

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

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

PART 2- PRODUCTS (NOT USED)

PART 3- EXECUTION

3.1 EXISTING FACILITIES

A. Demolish and remove portions of existing structures as indicated on the plans.

B. The existing slab-on-grade and below grade utilities shall be secured (capped) and remain in place. Seal and cap utility lines where necessary as required by regulations of the authority having jurisdiction.

C. The existence of active utilities lines transversing the construction area other than those indicated is not definitely known. Should any be encountered, the Contractor shall not disconnect same without authorization of the Engineer, but shall inform the latter immediately of each discovery, and shall follow his instructions.

D. Existing Items to be Removed: All work shall be executed in an orderly and careful manner with due consideration for all items to remain. All work shall be as indicated and as required to complete the removal work. Removal shall be complete including supports and hangers. Fasteners shall be removed to the extent that the surface can be patched smoothly to receive new work or match the adjacent surface.

E. Repair Work: Where exposed existing work to remain is damaged or left unfinished by the removal work, the resultant exposed unfinished surfaces shall be repaired, patched, filled or finished to match the adjoining existing surfaces. Existing work at the completion of operations shall be left in a condition as good as existed before the new work started. Where the method of repair work is not indicated or specified, the Contractor shall perform the repair work in accordance with the best recognized workmanlike procedure for the surrounding construction involved.

3.2 SAFETY

A. Work shall be done in accordance with safety provisions of the Manual of Accident Prevention in Construction, published by the Associated General Contractors of America.

3.3 DISPOSITION OF MATERIALS

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

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

3.4 CLEANUP

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

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

END OF SECTION

SECTION 02100

SITE PREPARATION

PART 1 - GENERAL

1.1 GENERAL REQUIREMENTS

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

1.2 RELATED WORK

A. SECTION 02512 - ASPHALTIC CONCRETE PAVING

B. SECTION 02530 - AGGREGATE BASE COURSE

C. Hawaii Standard Specifications for Road, Bridge, and Public Works Construction, State of Hawaii, Department of Transportation, Highways Division, 2005 and current amendments (Paragraphs on Measurement and Payment do not apply to this project).

1.3 ENVIRONMENTAL REQUIREMENTS

Construct temporary erosion control systems as shown on the plans or as directed by the Engineer to protect adjacent properties and water resources from erosion and sedimentation.

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.

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 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

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 cleared area 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

Clean up and remove all debris accumulated from construction 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 02200

BUILDING CUTTING AND PATCHING

PART 1 – GENERAL

1.1 SUMMARY

A. This section includes requirements for building cutting and patching work required to perform selective demolition of existing wall tiles and restore affected surfaces to their original or improved condition.

B. Cutting and patching includes:
   1. Removal of existing wall tiles as specified
   2. Cutting, fitting, and patching work to restore substrates and finishes
   3. Coordination with other trades for restoration

1.2 RELATED SECTIONS

A. Section 02219 – Selective Demolition -Tile Removal

B. Section 09313 – Ceramic Tiling

1.3 SUBMITTALS

A. Cutting and Patching Plan: Submit a written description detailing the scope, methods, and coordination efforts for cutting and patching.

B. Material Data: Provide product data for patching materials, including adhesives, primers, and finish materials.

C. Qualification Statements: Identify personnel or subcontractors performing the work and demonstrate relevant experience.

1.4 QUALITY ASSURANCE

A. Cutting and patching work shall be performed by workers skilled in the trades involved.

B. Work shall be performed in a manner that avoids damage to adjacent construction and maintains the integrity of structural and finish systems.

C. Comply with applicable codes, regulations, and referenced standards.

PART 2 – PRODUCTS

2.1 MATERIALS

A. Materials for Patching:

1. Provide materials that match the existing materials in composition, texture, and appearance.
2. Where matching is not feasible, provide materials that are compatible with existing construction and approved by the Architect.

B. Tile Replacement Materials:

1. Provide new tiles of equal size, thickness, color, and pattern to match existing (if reinstallation is required).
2. Use adhesives and grouts compatible with substrate and finish.

C. Primers, Sealants, and Coatings:

1. As specified in related finish Sections.
2. Compatible with adjoining materials.

PART 3 – EXECUTION

3.1 EXAMINATION

A. Verify site conditions prior to beginning cutting or patching operations.

B. Inspect and document the condition of surfaces to be demolished or disturbed. Notify the Architect of any discrepancies or unforeseen conditions.

3.2 PREPARATION

A. Provide temporary protection to prevent damage to surrounding surfaces and components.
B. Coordinate utility shutoffs or protection with appropriate subcontractors prior to commencing cutting.

3.3 CUTTING

A. Perform cutting using methods least likely to damage adjacent work or affect the structural integrity of the building.

B. Cut tile and substrate using wet saws, grinders, or hand tools suitable for the materials involved. Avoid excessive vibration and impact.

C. Protect finished surfaces and existing assemblies not scheduled for removal.

3.4 PATCHING

A. Patch to match the quality and appearance of existing adjacent surfaces.

B. Fill voids and restore substrates using compatible materials before applying new finishes.

C. Where tile is removed and not replaced, finish surfaces to match adjoining wall finishes per Section 09910 (or applicable finish section).

D. Where tile is replaced, ensure alignment, level, and consistent grout joints with surrounding areas.

E. Seal patched areas where necessary to prevent water intrusion or material deterioration.

3.5 CLEANING

A. Clean affected areas and remove debris resulting from cutting and patching operations.
B. Restore adjacent surfaces soiled or damaged during work to original condition.

3.6 PROTECTION

A. Protect completed patching work from damage due to construction operations and environmental exposure.

B. Provide temporary covers or barriers as necessary.

END OF SECTION

SECTION 02219

SELECTIVE DEMOLITION – TILE REMOVAL

PART 1 – GENERAL

1.1 SUMMARY

A. This section includes the removal of existing ceramic wall tiles installed over concrete masonry unit (CMU) walls in public restrooms to prepare the surface for new tile installation.

B. Extent of tile removal is as indicated on drawings and/or as required to accommodate new tile finishes.

1.2 RELATED SECTIONS

A. SECTION 02200 – BUILDING CUTTING AND PATCHING

B. SECTION 03300 - CONCRETE

C. SECTION 09300 – TILING

1.3 SUBMITTALS

A. Demolition Plan

B. Photographs or documentation of existing conditions prior to demolition

1.4 QUALITY ASSURANCE

A. Perform demolition work under supervision of qualified personnel experienced in tile removal and surface preparation on CMU substrates.

B. Comply with applicable codes and regulations, including the Occupational and Health Administration (OSHA) and local health and safety standards.

1.5 PROJECT CONDITIONS

A. Coordinate with owner for access and protection of occupied areas.

B. Protect adjacent finishes and surfaces from damage.

C. Provide dust control measures, temporary barriers, and negative air pressure as necessary.

PART 2 – PRODUCTS (Not Used)

PART 3 – EXECUTION

3.1 PREPARATION

A. Protect fixtures, accessories, and adjacent surfaces not scheduled for removal.

B. Shut off utilities as required to perform work safely.

3.2 REMOVAL OF WALL TILE

A. Carefully remove existing ceramic wall tile, grout, and mortar bed from CMU substrate.

B. Use mechanical means such as chipping hammers or grinders where appropriate, taking care not to damage CMU substrate.

C. Remove all loose debris, mortar residue, and adhesive remnants.

D. Dispose of all removed material in accordance with local regulations.

3.3 SURFACE PREPARATION

A. After tile removal, inspect CMU surfaces for cracks, voids, or other damage.

B. Patch and repair damaged areas with appropriate CMU-compatible patching compound.

C. Ensure wall surface is clean, sound, dry, and free of dust, oil, or other contaminants prior to new tile installation.

D. Provide a surface tolerance suitable for bonding new tile (maximum variation: 1/8 inch in 10 feet).

3.4 CLEANING AND PROTECTION

A. Remove dust and debris from restroom space daily.

B. Protect prepared surfaces until installation of new wall tile begins.

C. Maintain cleanliness and safety of adjacent public areas throughout duration of work.

END OF SECTION

SECTION 02225

EARTHWORK

PART 1 - GENERAL

1.1 DESCRIPTION

A. Existing Utilities. All areas to be excavated shall be toned prior to excavation to mark the presence of existing utilities.

B. Excavation. Excavating, hauling, and disposing of surplus excavated material and placing and compacting specified materials for utility trenches, parking lot and driveway construction and minor site grading.

C. Backfill. Prepare and compact subgrade and backfill per Drawings.

D. Staking and Grades.

1.2 REFERENCE STANDARDS

A. Hawaii Standard Specifications for Road, Bridge, and Public Works Construction. State of Hawaii. Department of Transportation. Highways Division, 2005 and current amendments (paragraphs on Measurement and Payment do not apply to this project).

1.3 SUBMITTALS

A. Submit under provisions of SECTION 01300 – SUBMITTALS.

B. Material Certificates: Submit materials certificate to on-site independent testing laboratory which is assigned by material producer and Contractor, certifying that materials comply with, or exceed, the requirements herein.

1.4 QUALITY ASSURANCE

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

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

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

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

E. Certificates of Compliance. A Certificate of Compliance shall not relieve the Contractor of responsibility for incorporating material into the Work, which is in accordance with the drawings and these Specifications. Certificates of compliance shall contain the following information:

1. Name of supplier
2. Type of material being supplied and available quantity
3. A statement that the material complies with these specifications
4. Copies of test results from a qualified testing laboratory

F. QC TESTING:

1. QC testing shall be performed by an independent, third-party laboratory certified in Hawaii.
2. QC testing shall be performed under the supervision of a Hawaii-registered Professional Civil Engineer.
3. QC reports and test results shall be signed and sealed by the Professional Civil Engineer.

1.5 PERMITS

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

PART 2 - PRODUCTS

2.1 MATERIALS

A. Borrow Excavated Material shall conform to “Hawaii Standard Specifications” Subsection 203.02 – Materials.

B. Backfill for Structures shall conform to “Hawaii Standard Specifications” Subsection 205.02 – Materials.

C. Bedding. Clean granular basaltic gravel conforming to ASTM D448, No. 67 size.

D. Geotextiles. Geotextiles in general shall conform to “Hawaii Standard Specifications” Subsection 716.01.

E. Topsoil: Imported, fertile, friable soil of loamy character having normal amounts of natural humus, free from subsoil, clay refuse roots, weeds, noxious seeds, and other

deleterious materials and free from toxic amounts of either acid or alkaline elements and capable of sustaining healthy plant life. Stones and earth lumps shall not be greater than one (1) inch in largest dimension. Red humus latosol soils or types known as "Palolo clay" or "Lualualei clay" are unacceptable.

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

PART 3 - EXECUTION

3.1 FINISH ELEVATIONS AND LINES

A. All material excavated from trenches shall be considered unclassified, whether it consists of earth, lava, soft rock, decomposed rock, solid rock, boulders, or coral. The trench shall be dug such that the pipe or structure can be properly placed to the alignment and grade specified. Excavation shall commence at the point directed by the Engineer and shall be carried on in an orderly manner.

B. No trench shall be opened more than 500 feet in advance of the installed pipe without the approval of the Engineer. No jumps or spaces will be permitted unless approved by the Engineer. Before proceeding with any excavation under asphaltic concrete and concrete pavements, the Contractor shall cut the edges of the excavation with a power saw to ensure a neat cut along the pavement.

C. Trench Widths

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

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

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

D. Trench Depths

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

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

E. Excavation Below Grades. Any part of the trench excavated below grade by the Contractor shall be corrected with select material and thoroughly compacted in place at no cost to the State.

3.2 PROCEDURES

A. Utilities

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

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

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

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

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

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

B. Protection of Persons and Property

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

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

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

4. Blasting. No blasting will be allowed for this project.

C. Public Convenience and Safety

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

2. Convenient access to harbor facilities along the line of work shall be maintained and temporary approaches shall be provided and kept in order.

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

D. Surplus Material:

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

3.3 TRENCHING

A. Excavation

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

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

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

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

5. Excavating for appurtenances:

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

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

B. Depressions

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

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

3. Where rock is encountered, excavate rock to a minimum overdepth of 4 inches below the trench depth indicated or specified. Where trenching occurs in existing lawns, remove turf in sections and keep damp. Replace turf upon completion of the backfilling.

C. Minimum Cover

1. Provide a minimum cover of 18 inches over the top of the pipe.

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

3.4 BEDDING

A. Provide bedding as indicated on the Drawings.

3.5 BACKFILLING

A. General

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

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

3. When backfill material is delivered by trucks; the material shall not be dumped

directly into the trench but the fall of the material shall be broken at the edge of the trench. The backfill material shall then be deposited by hand or by approved mechanical methods.

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

B. Backfilling Around Pipe

1. Select material shall be used to backfill the trench a minimum of 12 inches. Prior to the laying of the pipe, the select material cushion shall be deposited in the trench and shall be leveled off, compacted, and shaped to obtain a smooth compacted bed providing firm uniform bearing along the laying length of the pipe.

2. After the pipe is installed, but prior to testing the line, select material shall be deposited in the trench evenly on both sides and along the full length of the pipe in 3- inch maximum loose lifts. If necessary, additional select material can be deposited over the center of each length of pipe to prevent undue movement during testing of the line. Ensure that the initially placed material is tamped firmly under pipe haunches. The bell holes at the pipe joints shall not be backfilled at this time.

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

C. Backfilling to Grade

1. The backfill material shall be placed in layers not to exceed 12 inches in loose lifts each lift shall be compacted to a relative density not less than 90%.

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

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

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

3.6 FIELD QUALITY CONTROL

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

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

2. Check bedding for proper layer thickness and compaction.

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

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

END OF SECTION

SECTION 02512

ASPHALTIC CONCRETE PAVING

PART I - GENERAL

1.1 GENERAL REQUIREMENTS

A. 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.

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

1.2 RELATED WORK

A. SECTION 02100 – SITE PREPARATION

B. SECTION 02530 - AGGREGATE BASE COURSE

1.3 REFERENCE STANDARDS

A. Hawaii Standard Specifications for Road, Bridge, and Public Works Construction, State of Hawaii, Department of Transportation, Highways Division, 2005 and current amendments (paragraphs on Measurement and Payment do not apply to this project).

1.4 SUBMITTALS

A. Submit under provisions of SECTION 01300 – SUBMITTALS and SECTION 401 – HOT MIX ASPHALT PAVEMENT of the "Hawaii Standard Specifications".

B. Submit manufacturer’s product data and application instructions.

C. Design Mix: Before any asphaltic concrete paving is constructed, submit actual design mix to the Engineer for review and / or approval. Design mix formula shall be in accordance with procedures contained in current edition of "Asphalt Institute’s Mix Design Methods for Asphalt Concrete and Other Hot Mix Types". Manual Series No.2 (MS-2) for either Marshal Method or Hveem Method of Mix Design.

D. Material Certificates: Submit materials certificate to on-site independent testing laboratory which is assigned by material producer and Contractor, certifying that materials comply with, or exceed, the requirements herein. Submit manufacturer’s product data and application instructions.

PART 2 – PRODUCTS

2.1 Asphaltic concrete materials shall conform to SECTION 401 - HOT MIX ASPHALT PAVEMENT and SECTION 702 - BITUMINOUS MATERIALS of the "Hawaii Standard Specifications."

PART 3 - EXECUTION

3.1 PREPARATION

A. Remove loose materials from compacted base material surface immediately before applying prime coat.

B. Proof roll prepared base material surface to check for areas requiring additional compaction and areas requiring removal and recompaction.

C. Do not begin paving work until deficient base material areas have been corrected and are ready to receive paving.

3.2 INSTALLATION

Perform work in accordance with SECTION 401 - HOT MIX ASPHALT PAVEMENT of the "Hawaii Standard Specifications".

3.3 ROLLING AND COMPACTION

Roll and compact asphalt concrete paving in accordance with SECTION 401 ASPHALT CONCRETE PAVEMENT of the "Hawaii Standard Specifications".

3.5 FIELD QUALITY CONTROL

A. Independent Testing Laboratory, selected and paid by Contractor, shall be retained to perform construction testing of in-place asphaltic concrete courses for compliance with requirements for thickness, compaction and surface smoothness. Asphaltic surface and base courses shall be randomly cored at a minimum rate of one (1) core for every 20.0 square feet of paving. However, no less than three (3) cores in light duty areas and three (3) cores in heavy duty areas shall be obtained. Coring holes shall be immediately filled with full-depth asphalt or with concrete. Asphaltic Concrete pavement samples shall be tested for conformance with the mix design.

B. Grade Control: Establish and maintain required lines and elevations.

C. Thickness: In-place compacted thickness shall not be less than thickness specified on the drawings. Areas of deficient paving thickness shall receive a tack coat and a minimum 1" overlay; or shall be removed and replaced with the proper thickness, at the discretion of the Engineer; until specified thickness of the course is met or exceeded at no additional expense to the Owner.

D. Check surface areas at intervals necessary to eliminate ponding areas. Remove and replace unacceptable paving as directed by the Engineer.

E. Compaction: Field density test for in place materials shall be performed by examination of field cores in accordance with one of the following standards:

1. Bulk specific gravity of paraffin-coated specimens: ASTM D 1188

2. Bulk specific gravity using saturated surface-dry specimens: ASTM D 2726

3. Rate of testing shall be one (1) core per 20,000 square feet of pavement, with a minimum three (3) cores from heavy-duty areas and three (3) cores from standard-duty areas. Cores shall be cut from areas representative of the project.

F. Area of insufficient compaction shall be delineated, removed and replaced in compliance with the specifications at no cost to the State.

END OF SECTION

SECTION 02530

AGGREGATE BASE COURSE

PART 1 – GENERAL

1.1 GENERAL REQUIREMENTS

The work to be performed under this section shall include furnishing and placing one (1) or more courses of aggregate base on a prepared surface in accordance with the requirements of the contract.

1.2 RELATED WORK

A. SECTION 02100 - SITE PREPARATION

B. SECTION 02512 - ASPHALTIC CONCRETE PAVING

C. SECTION 03300 - CONCRETE

1.3 REFERENCE STANDARDS

A. Hawaii Standard Specifications for Road, Bridge, and Public Works Construction. State of Hawaii. Department of Transportation. Highways Division, 2005 and current amendments (paragraphs on Measurement and Payment do not apply to this project)

B. ANSI/ASTM D 1 557 - Test Methods for Moisture-Density7 Relations of Soils and Soil Aggregate Mixtures using 10 lb. (4.54 Kg) Rammer and 18 inches (457 mm) Drop

C. ASTM D2167 - Test Method for Density and Unit Weight of Soil in-place by the Rubber Balloon Method

D. ASTM DI 556 - Test Method for Density of Soil in-place by the Sand-Cone Method

E. ASTM D2922 - Test Methods for Density' of Soil and Soil-Aggregate in-place by Nuclear Methods (Shallow Depth). Method B (Direct Transmission)

F. ASTM D3017 - Test Methods for Moisture Content of Soil and Soil-Aggregate Mixtures

1.4 SUBMITTALS

A. Submit under provisions of SECTION 01300 - SUBMITTALS.

B. Submit manufacturer's product data and application instructions.

C. Submit materials certificate to on-site Independent Testing Laboratory, which is signed by material producer and Contractor, certifying that materials comply with, or exceed the requirements herein.

PART 2 – PRODUCTS

2. 1 MATERIALS

A. Aggregate base course materials shall conform to SECTION 703.06 – AGGREGATE FOR UNTREATED BASE of the "Hawaii Standard Specifications".

PART 3 – EXECUTION

3.1 PREPARATION

Contractor shall verify that the subgrade has been inspected, tested and the gradients and elevations are correct, dry and properly prepared.

3.2 INSTALLATION

Aggregate base course shall be installed in accordance with the requirements of SECTION 304 - AGGREGATE BASE COURSE of the "Hawaii Standard Specifications".

3.3 FIELD QUALITY CONTROL

A. An Independent Testing Laboratory selected and paid for by the Contractor, subject to Owner review and approval, shall perform construction testing of in-place base courses for compliance with requirements for thickness, compaction, density and tolerance. Paving base course tolerances shall be verified (by rod and level readings on not more than 50-foot centers) to be not more than 0.05 feet above design elevation which will allow for paving thickness as shown in the Drawings. Contractor shall provide instruments and a suitable benchmark.

B. The following tests shall be performed on each type of material used as base course material:
   1. Moisture and Density Relationship: ASTM D 1557
   2. Mechanical Analysis: AASHTO T88
   3. Plasticity Index: ASTM D 4318
   4. Base material thickness: Perform one (1) test for each 20.0 square feet of in-place base material area.
   5. Base material compaction: Perform one (1) test in each lift for each 20.0 square feet of in-place base material area.
   6. Test each source of base material for compliance with the requirements of these specifications.

C. Field density tests for in-place materials shall be performed according to one (1) of the following standards as part of construction testing requirements:

1. Sand-Cone Method: ASTM D I556
2. Balloon Method: ASTM D 2167
3. Nuclear Method: ASTM D 2922, Method B (Direct Transmission)

D. An Independent Testing Laboratory shall prepare test reports that indicate test location, elevation data, and test results. The Owner, Engineer, and Contractor shall be provided with two (2) copies of the reports within 96 hours of the time test.

In event that any test performed fails to meet these Specifications the Owner, Engineer, and Contractor shall be notified immediately by the Independent Testing Laboratory. The Owner or Owner's Representative reserves the right to employ Independent Testing Laboratory and to direct any testing that is deemed by them to be necessary. Contractor shall provide free access to site for testing activities.

END OF SECTION

SECTION 02577

PAVEMENT MARKINGS

PART 1 - GENERAL

1.1 DESCRIPTION

Furnish all labor, materials, equipment and incidentals necessary to install pavement markings on Asphalt Concrete (AC) and Concrete Pavement as indicated on the Drawings and as specified herein.

1.2 SUBMITTALS

A. Submit under provisions of SECTION 01300 – SUBMITTALS.

B. Submit manufacturer's product data and application instructions.

1.3 DELIVERY AND STORAGE

A. Deliver paints and paint materials in original sealed containers that plainly show the designated name, specification number, batch number, color, date of manufacture, manufacturer's directions, and name of manufacturer.

PART 2 - PRODUCTS

2.1 MATERIALS

All materials furnished by the Contractor for incorporation in the work shall be new, free of any defects which may render them unfit or installation and/or use, shall conform to the requirements of the plans and/or specifications, and shall be the standard product of a reputable manufacturer or supplier, as specified herein and/or as accepted by the Engineer.

The paint shall be traffic type for asphaltic and/or concrete surfaces, non-reflective, first quality of Ameritone, Benjamin Moore, Dupont, Dutch Boy, Fuller O'Brien, Martin Senour, Old Colony, Pervo, Pittsburgh, Sherwin Williams, Sinclair, Spectra-Tone, Tnemec, Universal, or Laykold Line Paint, Plexicolor Line Paint, Deco Color Striping Paint, Stripe-Master Line Paint, or any other Pre-qualified paint. Color shall be as shown on the plans.

PART 3 - EXECUTION

3.1 PREPARATION

A. Before application, the paint shall be mixed in accordance with the manufacturer's instructions. The paint at its original consistency, without the addition of thinner, shall be thoroughly mixed and applied to the surface of the pavement with the marking machine.

B. Sufficient paint shall be applied to produce markings with clear, true edges and even, uniform film, color and cross-section. The film shall be of sufficient thickness to completely cover the pavement and/or curb and shall provide adequate pigment for the proper reflection of light. If the paint is applied by brush, the surface shall receive two (2) coats; the first coat shall be thoroughly dry before the second coat is applied, at a rate of not less than 100 and not more than 125 square feet per gallon.

C. A time interval of two (2) weeks shall elapse from the placement of a new bituminous surface course to the period of marking the pavement. Existing pavement shall be thoroughly cleaned before the application of pavement markings. The paint shall not excessively bleed, curl or discolor when applied to new or existing bituminous surfaces.

3.2 WORKMANSHIP

A. All work performed by the Contractor in the painting of roadway and parking stripes shall be done in a workmanlike manner by personnel who are qualified by trade, skill, experience and classification. All work shall comply in all respects with the requirements of this section.

B. Wherein this section may fail to specify a given construction method, common practice and/or a method recommended by the Contractor, if accepted by the Engineer, shall be utilized.

3.3 MARKINGS

Markings shall be applied at 4" widths unless otherwise specified, at the locations and spacings indicated on the plans. Paint shall not be applied until the layouts, indicated alignment and the condition of the existing surface have been accepted by the Engineer.

END OF SECTION

SECTION 02600

DRAINAGE SYSTEM

PART 1 - GENERAL

1.1 SUMMARY

This section covers the requirements for furnishing all labor, materials, equipment and incidentals necessary to provide the boat wash drainage system including an open trench drain, drainage piping, drainage manhole, and a subsurface infiltration system.

1.2 RELATED WORK

A. SECTION 03300 - CONCRETE

1.3 REFERENCE STANDARDS

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

A. Specific sections of the STANDARD SPECIFICATIONS FOR PUBLIC WORKS CONSTRUCTION, DEPARTMENTS OF PUBLIC WORKS, DEPARTMENTS OF PUBLIC WORKS, STATE OF HAWAII (hereinafter referred to as "Standard Specifications") dated September 1986 and STANDARD DETAILS FOR PUBLIC WORKS CONSTRUCTION, DEPARTMENTS OF PUBLIC WORKS, STATE OF HAWAII, (hereinafter referred to as "Standard Details") dated September 1984 as revised, except as amended in the drawings and/or specifications herewith. Paragraphs concerning Measurements and Payments in this section are not applicable to this project.

1.4 SUBMITTALS

A. Submit under provisions of Section 01300 - SUBMITTALS.

B. Submit manufacturer’s product data and application instructions.

C. Certificates: The Contractor shall furnish to the Engineer affidavits from the manufacturers of pipe, pipe fittings, septic tanks, aerobic units, etc., furnished under this section certifying that such materials delivered to the project conform to the requirements of this specification.

D. Record Drawings: Submit record drawings as specified under Section 01019 - GENERAL SPECIFICATIONS.

E. Operation and Maintenance Manuals: Submit bound copies of instructions to operate and maintain the subsurface infiltration chamber system.

PART 2 - PRODUCTS

2.1 MATERIALS

In accordance with the below-listed sections of the Standard Specifications, except as amended in the drawings and/or specifications herewith.

1. Crushed Rock ..... Section 15
   No. 4 or No. 67, as specified on the plans.
2. Drain Pipes ..... Section 24
3. Drain Manholes ..... Section 25
4. Catch Basins and Storm Water Inlets ..... Section 26

5. Drainage piping shall be either High Density Polyethylene (HDPE) or Polyvinyl Chloride (PVC) gravity pipes and fittings, applicable for underground, drainage use. The drain pipe material and sizing between the chambers shall be as recommended and compatible with the selected subsurface infiltration chamber system.

   Pipes shall be fitted with a flexible water-tight resilient connector when connecting to the drain manhole and trench drain. Install the connector in accordance with the manufacturer's recommendations. When deemed necessary by the Engineer, a grout collar shall be installed around the pipe to ensure a watertight connection.

   For connection into a pre-formed opening, grout shall be used to fill the annular space between the pipe and the pipe opening. Pipes shall be cut flush with the inside wall face of the concrete structures. Any openings at the end of the HDPE pipe that expose the interior of the corrugations shall be filled with grout.

6. Open Trench Drain:

   a. The open trench drain shall be a cast-in-place concrete structure with a light-weight grating, as shown on the drawings.

   b. The trench drain grating shall be a light-weight molded fiberglass reinforced plastic (FRP) grating, 20" wide, 1-1/2" deep with max ¾" square top mesh or approved equal with galvanized steel angle support. Grating shall be compliant with the Americans with Disabilities Act (ADA), have UV resistance and protection, and have a slip resistant finish. Provide clips or locks to secure grating to grate support or trench drain structure and each other per manufacturer's recommendations. Fibergrate Composite Structures, Micro-mesh or approved

equal.

c. Bedding material for bottom of trench drain shall consist of clean crushed rock material, No. 4.

d. Provide a choker filter layer of clean crushed rock material, No. 67 internal to the trench drain, above the bottom of trench bedding material.

7. Subsurface Infiltration Chamber System:

   Only chambers that are approved by the Engineer will be allowed. Chambers shall be manufactured from polypropylene plastic or high-strength polyethylene, interlocking chamber system. Chambers shall meet requirements of ASTM F2418, "Standard Specifications for Polypropylene (PP) Corrugated Wall Stormwater Collection Chambers". The top of the chamber shall be arch-shaped and the bottom open. The nominal dimensions of each chamber shall be as indicated on the drawings. The chambers shall be traffic rated for H-20 loadings with 18 inches of properly compacted backfill. All components part of the chamber system shall be from the same manufacturer. Inspection ports shall be provided as shown on the Drawings. Provide pretreatment with an isolator row or approved equal per manufacturer's recommendations. Advance Drainage Systems, Inc (ADS), SC-160LP StormTech Chambers or approved equal.

   Foundation stone, perimeter stone, and embedment stone (bedding material) for the system shall consist of clean, crushed, angular rock, No. 4 AASHTO M43/ASTM D448 wrapped in manufacturer recommended non-woven geotextile. Initial and final fill material above the system shall extend a minimum of 5 feet beyond the chambers, and shall consist of clean, crushed, angular rock, No. 67 AASHTO M43/ASTM D448 wrapped in non-woven geotextile. Overlap seams per manufacturer recommendations, 2 feet min.

8. Detectable Warning Tape: Polyethylene plastic warning tape manufactured specifically for warning and identification of buried utility lines. Provide green tape on rolls, 3-inch minimum width, with warning and identification imprinted in bold black letters continuously over the entire tape length. Warning and identification to read, "CAUTION BURIED DRAIN LINE BELOW". Color and printing shall be permanent, unaffected by moisture or soil.

   Minimum thickness of the tape shall be 0.004 inches. Tape shall have a minimum strength of 1,500 pounds per square inch (psi) lengthwise and 1,250 psi crosswise. Tape shall be manufactured with integral wires, foil backing, or other means of enabling detection by a metal detector when tape is buried up to 3 feet deep. Encase metallic element of the tape in a protective jacket or provide with other means of corrosion protection.

9. Geotextile Fabric shall be non-woven and/or woven filter fabric material as shown on

the drawings and as recommended by the subsurface infiltration system chamber manufacturer. Other geotextiles in general shall conform to "Hawaii Standard Specifications" Subsection 716.01. Non-woven polymeric material, Phillips Supac 4NP (4 ounce), Mirafi 140N (4 ounce), Amoco 4545 or approved equal.

10. Geogrid: Triaxial geogrid specifically for soil stabilization or base reinforcement functions. A triaxial geogrid is a polymeric grid formed by a regular network of integrally connected, oriented in three (3) substantially equilateral directions tensile elements. Tensar InterAx NX850, or approved equal.

    Geogrid shall conform to the following:

Identification Properties [a]	General
Aperture shapes	Hexagonal, Trapezoidal, & Triangular
Structure	Coextruded & Integrally Formed
Rib shape	Rectangular
Continuous parallel rib pitch [b], in	3.2
Rib aspect ratio [c]	>1.0
Node thickness [b], inches	0.18
Color identification	White/ Black/ White

a) Unless indicated otherwise, values shown are minimum average roll values determined in accordance with ASTM D4758-02.
b) Nominal dimensions.
c) Ratio of the mid-rib depth to the mid-rib width.

PART 3 - EXECUTION

3.1 LOCATION AND ADJUSTMENT OF EXISTING UTILITY LINES

A. The Contractor shall be responsible for precisely laying out the various exterior utility lines shown on the Drawings. The locations shown on the drawings of the various existing utility lines, which the new lines are to cross over or under or connect to, were determined on the basis of the best information available; however, no assurance can be provided that the actual locations will be precisely as shown on the contract drawings. Expose all existing utility lines at connections, crossings or potential interferences prior to installation. Any discrepancies shall be reported to the Engineer for his instructions prior to proceeding with the work.

B. In performing all work, the Contractor shall exercise due care and caution necessary to avoid any damage to and impairment in the use of any existing utility line. Any damage inflicted on existing lines resulting from the Contractor's operations shall be

immediately repaired and restored as directed by the Engineer at the Contractor's expense.

3.2 EXCAVATION AND BACKFILL

A. Trench excavation and backfill for the laying and installation of sewer pipes to the required line and grade and structure excavation for the construction of the appurtenant structures, shall be governed by the following provisions of the Standard Specifications as hereinbefore amended with respect to measurement and payment and with certain additional modifications noted below:

Trench Excavation and Backfill.....Section 11
Structure Excavation and Backfill .....Section 13
Crushed Rock.....Section 15
Restoring Pavement and Other Improvements .....Section 38

B. Surplus material resulting from trench and structure excavation shall be used by the Contractor for backfilling, filling and grading to the extent required as specified elsewhere in these specifications. The Contractor, in performing any work within the limits of work shown on the contract drawings, shall exercise due care to keep to an absolute minimum any damages to existing improvements. The Contractor shall be responsible for repairing, replacing and/or restoring all damages to existing improvements to the satisfaction of the Engineer.

C. All trenching and backfilling operations shall be completed in the shortest time possible.

3.3 BOAT WASH DRAINAGE SYSTEM

A. Installation: In accordance with the following sections of the "Standard Specifications".

Drain Pipes.....Section 24
.....Install per HDPE or PVC manufacturer’s recommendations
Drain Manholes.....Section 25
Catch Basins and Storm Water Inlets .....Section 26

1. Trench grating shall be installed in accordance with manufacturer's recommendations.

2. Subsurface Infiltration Chamber system shall be installed in accordance with the manufacturer’s recommendations.

Open trenches shall be protected from surface runoff to prevent the entrance of silt and debris. When it is necessary to walk in the trench, temporary boards laid

on the bottom of the trench shall be used. The bottom of the trench shall be laid true to grade and leveled for the width of the trench. Place bedding around and over chamber system as indicated. Tamp bedding material to consolidate material in trench per manufacturer's recommendations. Take special care to prevent displacement of or damage to chamber system. Balance of trench backfill shall be compacted to 90% relative density.

Chambers shall not be installed until the manufacturer's representative has completed a pre-construction meeting with the installers. Install in accordance with the "SC/DC StormTech Chamber Installation Guide" or approved equal. The foundation stone shall be leveled and compacted prior to placing chambers. The Contractor must report any discrepancies concerning chamber foundation design and subgrade bearing capacities to the Engineer. Chambers shall be installed "toe to toe". No additional spacing between rows is required. Install pretreatment isolator row (or approved equal) and scour protection at system inlets per manufacturer's recommendations.

Compact and backfill per manufacturer's recommendations. ADS StormTech recommends 3 backfill methods: Stoneshooter located off the chamber bed; Backfill as rows are built using an excavator on the foundation stone or subgrade; Backfill from outside the excavation using a long boom hoe or excavator.

The use of construction equipment over chambers is limited. No equipment is allowed on bare chambers. No rubber-tired loaders, dump trucks, or excavators are allowed until proper fill depths are reached in accordance with the "SC/DC StormTech Chamber Installation Guide" or approved equal. Weight limits for construction equipment can be found in the guide. Full 36-inches of stabilized cover materials over the chambers is required for dump truck travel or dumping.

B. Testing:

1. The new drain lines shall be tested in the presence of the Engineer, using the exfiltration test method with the "Standard Specifications".

2. The subsurface infiltration chamber system shall be tested in accordance with the manufacturer's recommendation.

C. Backfilling: Backfilling is not permitted until drain lines and infiltration chamber system have been tested and accepted by the Engineer.

Bedding and backfill for HDPE or PVC pipes shall be as shown on the Drawings. All backfill below water level in the trench at the time of backfilling shall consist of gravel material such as aggregate base course.

D. Geogrid: Install geogrid in accordance with the manufacturer's recommendations. Unroll geogrid smoothly on prepared surface in longitudinal direction. Do not drag

geogrid. Remove wrinkles and folds by stretching and anchoring. Overlap geogrid a minimum of 12 inches at longitudinal and transverse joints.

Align geogrid and pull it taut to remove wrinkles. Anchor geogrid in place with washer and pin or large, heavy-gauge staples in accordance with the manufacturer's recommendation. Do not operate tracked or rubber-tired equipment directly on the geogrid.

Aggregate base course shall be placed, spread, and compacted in a manner to avoid development of wrinkles in the geogrid and/or movement of the geogrid. A minimum loose base course thickness of 6 inches is required on the geogrid prior to operation of any equipment over the geogrid. Turning of vehicles shall be kept to a minimum to prevent displacing the base course and damaging the geogrid. Sudden braking and sharp turn movements shall be avoided. Do not end dump base course directly onto the geogrid. Spread base course by mechanical means to allow base course to cascade onto the geogrid.

Geogrid Exposure Following Placement. Limit time exposure of geogrid to natural elements, between placement and cover, to a maximum of one day. Construction equipment and vehicular traffic shall not be allowed directly on geogrid.

Damage Repair. Geogrid shall be considered damaged if it is torn or punctured, if overlaps are disturbed, or if there is evidence of subgrade pumping, intrusion, or roadbed distortion. Repair damaged geogrid by removing material around damaged or displaced area and by replacing damaged geogrid with a patch of same type of geogrid. Overlap existing geogrid a minimum of 3 feet from edge of damaged area. Replace and compact removed untreated aggregate base course material. Repair all damage and replace any roll of geogrid damaged before, during, and after installation at no additional cost to the State.

3.4 FINAL INSPECTION

At the time of final inspection of the work performed under the contract, the utilities covered by this section shall be complete in every respect and operating as designed.

All surplus materials in every character resulting from the work of this section shall have been removed Drainage systems shall be free from sand, silt, or other obstructions. If necessary, the Contractor shall clean and flush all drain inlets, grates, and storm drain pipes at the end of the project as directed by the Engineer.

All defects discovered in the utilities subsequent to this inspection shall be corrected prior to final acceptance.

END OF SECTION

SECTION 02713

WATER SYSTEM

PART 1 - GENERAL

1.1 GENERAL REQUIREMENTS

The work included in this section shall consist of furnishing all labor, materials, equipment, tools, and incidentals necessary to install exterior water system as indicated on the Plans and specified herein.

1.2 REFERENCE STANDARDS

The reference construction standards shall supplement the requirements of these specifications. Where there is a conflict between the reference standards and the project specifications, the project specification shall govern. The following reference construction standards, including addenda and revisions, are hereby incorporated into and made a part of these specifications and shall be applicable to all work performed by the Contractor:

A. "Water System Standards" dated 2002, or latest edition, as amended, of the Board of Water Supply and Departments of Water Supply, for the counties of Kauai, Maui, Hawaii, and Honolulu.

   1. Paragraphs relating to Measurement and Payment in the Sections are not applicable to this project.

   2. Where an installation detail is not indicated on the drawings, the standard detail in the "Standard Details for Water System Construction" dated 2002 or latest edition, including all revisions and addenda shall be followed.

B. Uniform Plumbing Code (UPC), or latest edition as amended.

1.3 SUBMITTALS

A. Submit in accordance with SECTION 01300 – SUBMITTALS

B. Submit manufacturer's product data and application instructions.

C. Certificates: The Contractor shall furnish to the Engineer affidavits from the manufacturers of pipe, pipe coating, fittings, and valves (including meter valves), furnished and installed under this section certifying that such materials delivered to the project conform to the requirements of this section. Certificate of disinfection shall also be submitted to the Engineer.

D. Submit certificates stating that the solder and fluxes used are lead free.

1.4 GUARANTEE

The equipment covered by these specifications shall be guaranteed against defective parts due to faulty material or workmanship for one (1) year after date of acceptance of project. The Contractor shall guarantee to replace all defective parts within the period of time specified. All costs for the replacement of defective parts including the removal and reinstallation of the pump shall be paid for by the Contractor at no cost to the State. The guarantee shall be in writing and shall be submitted to the Engineer prior to the completion of the project.

PART 2 - PRODUCTS

2.1 MATERIALS

A. Materials for the water distribution system shall be in conformance with the appropriate Sections of the "Water System Standards" dated 2002 or latest edition, as amended, unless otherwise revised as follows or shown on the drawings.

B. Water service lines shall be copper pipe or tubing and fittings, soft temper Type "K" and shall conform to ASTM B88.

C. Hose Bibbs shall be brass, 150 psi maximum pressure rating, 3/4" Male Pipe Threads (MPT) inlet and garden hose thread outlet, per drawings.

D. Valve Boxes shall be per the Standard Details in the "Water System Standards"

PART 3 - EXECUTION

3.1 GENERAL

A. The Contractor shall be responsible for precisely laying out the various exterior utility lines shown on the Contract Drawings or as provided elsewhere in these Specifications. The location shown on the Contract Drawings of the various existing utility lines, which the new lines are to cross over or under or connect to where determined on the basis of the best information available; however, no assurance can be provided that the actual locations will be precisely as shown on the Contract Drawings. The Contractor shall field verify the location of the existing utilities prior to the start of construction and shall notify the engineer of any discrepancies or problems.

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

C. The Contractor shall notify and coordinate any connection or temporary service disruption with the Engineer, Division of Boating and Ocean Recreation (DOBOR) Harbor personnel, the Harbor Master and, if required, Department of Water Supply personnel. The Contractor shall further notify neighboring residents and the fire department of any water service disruptions at least 24 hours in advance.

3.2 INSTALLATION

A. Excavation and Backfill: Trench excavation and backfill for the laying and installation of the water service line shall be in accordance with the Drawings and the Department of Water System Standards and Standard Details.

B. Connecting, Testing, Flushing, and Disinfecting: The new lines shall be installed, but not connected until pressure testing and disinfecting is completed. Connecting shall be done at the discretion of the Engineer. Pressure testing, flushing of valves and mains, disinfection of the system shall be carried out in accordance with the "Water System Standards." The Contractor shall submit the results of such test to the Engineer for approval. All charges for services by the Department of Water Supply shall be paid for by the Contractor.

3.3 FINAL INSPECTION

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

END OF SECTION

SECTION 02840

SIGNAGE

PART 1 – GENERAL

1.1 GENERAL REQUIREMENTS

This section covers the requirements for furnishing and installing sign panels, regulatory and warning signs and sign structures and performing all incidental work.

1.2 REFERENCE STANDARDS

A. Hawaii Standard Specifications for Road, Bridge, and Public Works Construction. State of Hawaii. Department of Transportation. Highways Division, 2005 and current amendments (paragraphs on Measurement and Payment do not apply to this project)

1.3 SUBMITTALS

A. Submit under provisions of SECTION 01300 - SUBMITTALS.

B. Contractor shall be responsible for submitting three (3) sets of shop drawings of all work pertinent to the fabrication of the signs.

PART 2 – PRODUCTS

2.1 MATERIALS

A. Concrete for sign structures shall be of the class specified on the plans and in accordance with Section 03300 CONCRETE.

B. Other materials shall meet the requirements specified in the following subsections of Division 700 - "Materials" of the "Hawaii Standard Specifications", as amended.
   1. Signs - Section 750.01
   2. Sign Posts - Section 750.02
   3. Fasteners for Signs – Section 750.03

2.2 POSTS

A. Sign Posts: Unless specified otherwise in the plans, 2-inch galvanized standard pipe or 2 x 2 inch 12 gauge square tube post shall be used for Traffic Signs.

2.3 REGULATORY AND WARNING SIGN SUPPORTS

A. The Contractor shall submit shop drawings for approval prior to assembling in accordance with the requirements of Section 501 - Steel Structures, of "Hawaii Standard Specifications".

B. All welding shall be continuous and shall conform to the requirements of Section 501 of the "Hawaii Standard Specifications".

C. The weld metal at transverse joints shall extend to the sleeve, making the sleeve an integral part of the joint. Longitudinal welds shall be made by the submerged arc process. Welds except fillet welds shall be ground flush with the base material.

D. Unless otherwise specified, all exposed surfaces including the inside of the tubular posts and arms shall be hot-dip galvanized after fabrication. The upper 10 inches of anchor bolts shall be hot-dip galvanized. Galvanizing shall be in accordance with the requirements of Section 501 - Steel Structures, of "Hawaii Standard Specifications".

E. Where aluminum sign supports are used, they shall conform to the requirements of Section 715 - Aluminum, of "Hawaii Standard Specifications".

2.4 TRAFFIC SIGNS

A. Panels shall be assembled in the shop and checked for straightness, alignment and dimensions. Variations shall be corrected to the satisfaction of the Engineer.

B. Sign panels shall be carefully and securely installed as shown on the plans. Chipped or bent signs shall be replaced at the Contractor's expense.

PART 3 – EXECUTION

3.1 MOUNTING OF SIGNS

Permanent signs shall be erected on posts as shown on the plans or as directed. The posts shall be set plumb at the required locations.

END OF SECTION

SECTION 02920

LAWNS

PART 1 - GENERAL

1.1 DESCRIPTION

A. Furnish all labor, materials, equipment and tools for grass planting and restoration as specified herein. Grass shall be planted in areas indicated on the drawings and as listed below:

1. All existing grassed areas that are damaged by construction operations;

2. Areas that are dug up for utility trenches;

3. Areas from which existing structures are to be removed;

4. Areas within "Limits of Work" that are graded and covered with topsoil, except areas designated for other plants; and

5. All other areas within "Limits of Work" that are indicated on the drawings to be graded, whether with the addition of topsoil or not, such as slopes of banks, etc.

PART 2 - PRODUCTS

2.1 MATERIALS

A. All materials furnished by the Contractor for incorporation in the work shall be new, Grass shall be "Manienie", on flat areas less than 3:1 slope, or fine Bermuda grass (Cynodon Dactylon). At the option of the Contractor, grass planting may be by seeds (plain seeding or by hydro-mulching) or by sprigs.

1. Grass seeds shall be fresh, hulled, and meet the following requirements:
Pure Seed 95.0% minimum
Crop Seed 1.0% maximum
Weed 0.5% maximum
Inert Material 5.0% maximum
Germination 85.0% minimum

2. Grass seeds shall be delivered to the site in unopened, sealed containers, labeled with the brand name and percent purity. Labeling shall indicate that the seeds passed a certified germination test no more than 12 months prior to use.

3. Grass sprigs shall be healthy living runners and stolons, a minimum of 6 inches long with at least three (3) nodes. After they are dug, they shall be covered and kept moist until planted.

B. Fertilizer shall be pelleted and shall consist of the following percentages by weight of active ingredients:

For First and Second Application:
Nitrogen 16%
Phosphate 16%
Potash 16%

C. Mulch Materials

1. Mulch shall be specially-processed fiber containing no growth or germination-inhibiting factors. It shall be such that any addition and agitation in the hydraulic equipment with seed, fertilizer, water and other additives not detrimental to plant growth, the fibers will form a homogeneous slurry. When hydraulically sprayed on the soil, the fibers shall form a blotter-like ground cover, which readily absorbs water and allows infiltration to the underlying soil.

2. Stabilizing and water retaining agent for hydro-mulching option only shall be "Verdyol Super", "Ecology Control M-Binder" or approved equal. Rate of application of "Verdyol Super" shall be 50 lbs./acre and that for "Ecology Control M-Binder shall be 60 lbs./acre.

D. Organic Soil Conditioners

Organic amendments shall be brown, gray, or black in color. It shall be free of live seeds, cuttings, fungus, spores and foul odor. It shall also not contain resins, tannin or other materials in quantities that would be detrimental to plant life.

Soil conditioner shall be one (1), or a combination of the following:

1. Burnt bagasse mix shall be a mixture of sugar cane ash, aged sugar cane trash and milled forest waste products.

2. Redwood shavings shall be a nitrogen- stabilized compost of redwood material passing through a 1/2-inch screen.

3. Peat moss.

4. Shredded hapuu shall be finely shredded hapuu fern.

5. Macadamia nut husks shall be air-classified fine husk, sifted through a 1/4-inch screen and free of shells.

6. Composted green waste shall be stabilized compost of recycled green waste material passing through a 1/2-inch screen. The material shall not contain any treated or painted woods.

E. Topsoil shall consist of imported, screened (1/2-inch screen), natural, fertile, friable soil free of stones, subsoil, clay, refuse roots, weeds, noxious seed nematodes or other deleterious matter, and free from toxic amount of either acid or alkaline elements and capable of sustaining healthy plant life.

F. Water shall be potable.

G. Weed Control Fabric

Fabric must be woven, needle punched or non-woven and treated for protection against deterioration due to ultraviolet radiation. Fabric must be minimum 99 percent opaque to prevent photosynthesis and seed germination from occurring, yet allowing air, water and nutrients to pass thru to the roots. Minimum weight must be 5 ounces per square yard with a minimum thickness of 20 mils with a 20 year (minimum) guarantee.

H. Edging Material

1. Aluminum Edging – Heavy duty L-shaped profile maintenance strip edging: 3/16-inch x 3-1/2-inches high, extruded aluminum, 6063 alloy, T-6 hardness, maintenance strip edging for straight-line applications in corrugated L-shaped profile having 1.2-inch horizontal base. Section shall have loops on side of section to receive stakes spaced approximately 2 feet apart along its length.

    a. Thickness: 3/16-inch gage section at 0.076-inch minimum thick with 0.190-inch exposed top lip.
    b. Length: 8- or 16-foot sections.
    c. Connection Method: Section ends shall splice together with a horizontal aluminum sliding connector.
    d. Stake: 12-inch stake. Stakes to interlock into section loops.
    e. Finish: Black color

PART 3 - EXECUTION

3.1 INSTALLATION AND WORKMANSHIP

A. Site Preparation

1. Topsoil shall be spread evenly, compacted lightly and raked to a uniform placement, at required contours and grades. The Contractor shall accept the condition of the site prior to starting work.

2. Before soil conditioning and tilling is started, weeds and other obnoxious vegetation shall be removed by manual or chemical methods.

3. Soil Conditioning and Tilling: The Contractor shall notify the Engineer one day before this work is to be done.

   A 1-inch layer of organic soil conditioner shall be placed over all planting areas. The material shall then be roto-tilled a minimum of 2 inches into the existing soil until the latter is loose and fine textured. All rocks larger than 1-inch in diameter and all debris such as stumps, roots, wire, grade stakes and other rubbish that are turned up by tilling shall be removed. Tilling shall be omitted on slopes where watering is likely to wash the soil away.

4. Leveling: Any undulations or irregularities in the surface resulting from tilling or other operations shall be leveled out before planting operations are begun.

B. Planting. The Contractor shall notify the Engineer one (1) day before planting of grass.

1. Immediately prior to planting operations, all planting areas shall be cleared of weeds, debris, rocks over 1-inch in diameter and clumps of earth that will not break up.

2. Option by Grass Seeding: If grass seeds are used, the following procedure shall be used (NOTE: Contractor should exercise caution in seeding slopes where seeds may be washed away).

   a. The grass seeds shall be broadcast uniformly by hand or by sowing equipment at the rate of 100 lbs./acre. Half the seeds shall be sown with the sower moving in one direction and the remainder shall be sown at right angles to the first direction.

   b. The surface shall then be raked to a smooth even plane while the seeds are simultaneously worked into the soil to a depth of about a ½-inch.

   c. The surface shall then be smoothed and compacted by means of a culti-packer, roller or other similar equipment weighing 60 to 90 pounds per lineal foot of roller.

   d. The planted area shall then be watered sufficiently to provide water penetration to a depth of at least 2-inches and shall then be kept moist until roots are established.

3. Option by Grass Sprigging

   a. Furrows shall be placed perpendicular to drainage aisles and parallel to contours on slopes and shall be spaced no more than 4-inches apart.

b. Fresh sprigs shall be planted in each furrow a maximum of 6 inches apart and covered with soil to a minimum depth of 2 inches.

c. The surface shall then be smoothed and compacted by means of a culti-packer, roller or other similar equipment weighing 60 to 90 pounds per lineal foot of roller.

d. The planted areas shall be watered immediately after rolling in sufficient quantity to provide water penetration to a depth of at least 2 inches and shall then be kept moist until roots are established.

e. The area shall then be overseeded with annual rye grass seeds at the rate of 25 pounds per acre.

4. Option by Hydro-Mulching of Grass Seed: This work shall consist of furnishing and applying hulled Bermuda seed, fertilizer, mulch and stabilizing and water retaining agent by hydro-mulching.

a. The seeds shall be applied at the rate of 100-lbs./acre minimum. Mulch shall be applied at a rate of 500-lbs. / acre minimum (31 lbs. per 900 sq. ft.). In every application, complete and uniform coverage of the soil shall be attained.

b. First application of fertilizer shall be included with mulch and seed.

c. The hydro-mulch equipment shall be capable of mixing all the necessary ingredients to a uniform mixture and to apply the slurry to provide uniform coverage. Seed, fertilizer, mulch mix and stabilizing water retaining agent shall be applied in one operation by hydraulic equipment made specifically for this use. The equipment shall have a built-in agitation system with sufficient operating capacity to keep the mix in uniform distribution until pumped from the tank. Distribution and discharge lines shall be large enough to prevent stoppage and shall be equipped with hydraulic discharge spray nozzles, which provide a uniform distribution of the slurry.

d. Areas inaccessible to hydro-mulching application shall be seeded or hand sprigged and fertilized by approved hand methods.

e. Water shall be applied immediately following mulching and the planted area shall then be kept moist until roots are established.

C. Application of Fertilizer: The Contractor shall notify the Engineer one (1) day before application of fertilizer.

1. Fertilizer shall be distributed uniformly over the planted area.

2. The first application of fertilizer shall be applied at the rate of 300 pounds per acre about two (2) weeks after grassing and shall be followed by watering. (First application of fertilizer if using hydro-mulching option shall be mixed with the seeded mulch.)

3. The second application of fertilizer shall be applied at the rate of 300 pounds per acre about one (1) week before the end of the maintenance period and shall be followed by watering.

D. Maintenance

1. General: The Contractor shall be responsible for the proper care of the grassed areas. Maintenance shall include watering, weeding, mowing, repairing, regrassing and protection, and shall be required until the entire project is accepted, but in any event for a period not less than 60 days after planting of grass.

2. Watering: After planting of seeds or grass sprigs or mulching the ground shall be watered as deemed necessary by the Contractor to establish a healthy growth. Watering shall be done in a manner that will prevent erosion due to the application of excessive quantities of water, and the watering equipment shall be of a type that will prevent damage to the finished surface.

3. Weeding: Weeds shall be uprooted and removed completely and in no case shall they be allowed to grow and propagate more seeds. Large holes caused by weeding shall be filled with topsoil and raked level.

4. Mowing: Grass shall be mowed to a height of 1 inch whenever the height of grass becomes 1-1/2 inches.

5. Repairing and Regrassing: When any portion of the surface becomes gullied or otherwise damaged and grass has failed to grow, such areas shall be repaired with topsoil and replanted with grass. Any area of 1-foot square or more in which grass has failed to grow after 30 days of maintenance shall be regrassed. Regrassed area shall be subject to a new 60-day maintenance period.

6. Protection: The grassed areas shall be protected against traffic so that the grass establishes a healthy growth. Grassed areas damaged by traffic shall be replanted.

E. Weed Control Fabric Installation: Remove grass and weed vegetation, including roots, from within the area enclosed by edging. Completely cover areas enclosed by edging with specified weed control fabric prior to placing mulch layer. Overlap cut edges 6 inches.

F. Uniformly edge lawn to provide a clear-cut division line between gravel strip and adjacent landscaping. Construct gravel maintenance strip as indicated. Install aluminum edging material as indicated.

Preparation: Ensure that all underground utility lines are located and will not interfere with the proposed edging installation before beginning work. Locate border line of edging with string or other means to assure border straightness and curves as designed. Dig trench 1 inch deeper than set of edging bottom.

Set edging into trench with top at 1/2 inch above compacted finish grade on turf side with side having loops for stakes placed on opposite side of turf. Drive stakes through edging loops until locked in place. Requires five (5) stakes evenly spaced for each 16 feet section, or three (3) stakes evenly spaced for each 8 feet section with a total of eight (8) stake loops available in each 16 feet section if necessary. Provide additional stakes at approximately 24 inches apart, longer stakes, heavier gage stakes, or any combination of previously mentioned as necessary to firmly secure edging for permanent intended use.

Where edging sections turn at corners and at angled runs, cut edging partially up through its height from bottom and turn back to desired angle to form rounded exposed radius.

Backfilling and Cleanup: Backfill both sides of edging, confirm and adjust if necessary that sections are securely held together, and compact backfill material along edging to provide top of edging at 1/2 inch above landscaping finish grade. Cleanup and remove excess material from site.

3.2 EROSION CONTROL

The Contractor shall install erosion control material where required to prevent erosion before the grass is well established.

3.3 ACCEPTANCE OF GRASSING

A. At the time of acceptance, the grass shall have been well established and shall be given a final weeding and a final mowing to a height of 1 inch. If the maintenance period has expired before acceptance of the entire project, the Contractor shall continue to maintain the grass until acceptance of the entire project. If the maintenance period should extend beyond acceptance of the entire project, the Contractor shall continue to maintain the grass until the end of the specified period required for maintenance.

B. At the end of the maintenance period, should there appear areas where grass has failed to grow, such areas shall be replanted with grass, refertilized and maintained beyond the maintenance period until healthy growth is established.

END OF SECTION

SECTION 03300

CONCRETE

PART 1 - GENERAL

1.1 This section covers the requirements for furnishing all labor, materials, equipment, and incidentals necessary to provide a new concrete slab at the top of the boat ramp and vehicle wash area, concrete for a new grade adjustment wall, concrete curbs, trench drain structure, light pole foundations, and footings/support for various site structures.

1.2 REFERENCE STANDARDS

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

A. Specific sections of the STANDARD SPECIFICATIONS FOR PUBLIC WORKS CONSTRUCTION, DEPARTMENTS OF PUBLIC WORKS, DEPARTMENTS OF PUBLIC WORKS, STATE OF HAWAII (hereinafter referred to as "Standard Specifications") dated September 1986 and STANDARD DETAILS FOR PUBLIC WORKS CONSTRUCTION, DEPARTMENTS OF PUBLIC WORKS, STATE OF HAWAII, (hereinafter referred to as "Standard Details") dated September 1984 as revised, except as amended in the drawings and/or specifications herewith. Paragraphs concerning Measurements and Payments in the sections are not applicable to this project.

1.3 SUBMITTALS

A. Submit under provisions of SECTION 01300 - SUBMITTALS.

B. The Contractor shall submit concrete mix design for approval.

C. Submit manufacturer’s product data and application instructions.

D. Material Certifications.

E. Record Drawings: Submit record drawings as specified under Section 01 77 00 – CLOSEOUT PROCEDURES.

1.4 QUALITY ASSURANCE

A. Manufacturer Qualifications: A firm experienced in manufacturing ready-mixed concrete products complying with American Society for Testing and Materials (ASTM) C94 requirements for production facilities and equipment.

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

1.5. DELIVERY, STORAGE AND HANDLING

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

B. Do not deliver concrete until forms, reinforcement, embedded items, chamfer strips, and reveal strips are in place and ready for concrete placement. Protect materials from contaminants such as grease, oil and dirt. Ensure materials can be accurately identified after bundles are broken and tags removed.

PART 2 – PRODUCTS

2.1 MATERIALS

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

B. Concrete Aggregates

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

2. 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.

3. 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. Water used in mixing concrete shall be potable.

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

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

F. Fiber reinforcement shall be carbon-steel fiber, ASTM A 820, deformed, minimum 2.4 inches long and of diameter or effective diameter, Type 1, cold-drawn wire.

G. Curing compounds shall conform to ASTM C309.

H. Concrete Reinforcement

1. All reinforcing steel shall be detailed and placed in conformance with the "Specifications for Structural Concrete for Buildings" (ACI 301), the CRSI "Manual of Standard Practice", and the "ACI Detailing Manual-1994."

2. Epoxy-Coated Reinforcing Bars: ASTM A 775, Grade 60, deformed bars, epoxy coated, with less than 2 percent damaged coating in each 12-inch bar length.

3. Epoxy-Coated Wire: ASTM A 884, Class A, Type 1 coated plain-steel wire, with less than 2 percent damaged coating in each 12-inch wire length.

4. Joint Dowel Bars: ASTM A 775, Grade 60, epoxy coated. Cut bars true to length with ends square and free of burrs.

5. Metal accessories such as spacers, chairs, ties, and other devices necessary for properly placing, supporting and fastening reinforcement in place shall be provided. Annealed steel wire or not less than 16-gauge shall be used to secure reinforcement.

6. Anchor bolts, dowels and other embedded items are to be securely tied in place before concrete is poured.

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

I. Preformed Joint Filler: Preformed joint fillers shall conform to ASTM D994. Approved preformed asphalt expansion joint fillers are by W.R. Meadows, P.O. Box 543, Elgin, IL 60121.

J. Preformed joint fillers shall be used in expansion and intersection joints as shown on the plans or directed by the Engineer.

K. Joint Sealants: Polyurethane-base, non-sag elastomeric sealant shall conform to ASTM C-920, Type S, Grade NS, Class 25. Approved joint sealants are Sikaflex-la and Sikaflex-2c-NS/SL or Bostik Chem-Calk 900.

L. Bond-Breaker Tape: Bond breaker tape shall be heavy duty polyethylene or similar type tape to which elastomeric sealant will not adhere. Bond breaker tape shall be colored and a minimum thickness of 14 mils.

M. Primer: Primer shall be designated by the manufacturer for use on concrete in extreme water-immersion conditions.

2.2 PRECAST WHEEL STOPS AND JERSEY BARRIERS

A. Concrete wheel stops and jersey barriers shall be new and of the best quality of its respective kind and shall be completely assembled and free of defects which may render them unfit for use.

B. Use rigid molds, constructed to maintain precast units uniform in shape, size and finish. Maintain consistent quality during manufacture. Cure units to develop concrete quality, and to minimize appearances blemishes including non-uniformity, staining, or surface cracking.

C. Provide drainage slots at bottom (two minimum).

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 ensure uniformity and homogeneity of the concrete produced.

B. Mixing at jobsite shall be done in accordance with ACI 614.

1. Ready-mixed and mixed-in-transit concrete shall be mixed to conform to the provisions of ASTM C94, and ASTM C 1116 and furnish batch ticket information. Batch ticket information shall include design mix reference, water that can be added at the jobsite, and admixtures. For transit mixing, complete not less than 70 revolutions of the drum at the manufacturer's rated mixing speed. Discharge concrete into its final position within 90 minutes after introduction of batch water to the cement. If a retarder admixture is used, the discharge time limit of 90 minutes may be increased by the time specified for retardation by the admixture manufacturer or the concrete supplier. Mix concrete a minimum of one minute at mixing speed immediately prior to discharge.

2. 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 for the job.

3.2 LAYOUT

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

3.3 PLACING CONCRETE

A. No concrete shall be placed in the absence of the Engineer or representative. The Engineer shall be given one (1) day advance notice of starting time of concrete pour.

B. Do not place concrete when weather conditions prevent proper placement and consolidation; in uncovered areas during periods of precipitation; or in standing water.

C. Prior to placing concrete, remove dirt, construction debris and water from formwork. Concrete shall be placed on properly compacted fills and never upon soft mud or dry, porous earth.

3.4 CONCRETE SLAB REINFORCEMENT

A. Unless otherwise 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."

B. Reinforcing steel bars, wire and wire fabric shall be provided in the sizes, length and configurations as indicated on Drawings 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.

C. 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.

D. 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.

E. 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 Drawings.

F. Bars shall be bent cold. Bends shall be made around a pin having a diameter not less than six (6) times the bar diameter except that for bars of larger than 1-inch diameter the pin diameter shall be eight (8) times the bar diameter. If required, bars may be bent in the field using a "hickey" bar.

G. All reinforcing steel bars shall be furnished in the lengths indicated on the Drawings. Splicing of bars, except where shown, will not be permitted without the approval of the Engineer.

H. Care shall be taken in handling and placing the reinforcement as follows:

1. Reinforcing fabric shall not be rolled over by trucks, buggies 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.

3.5 CONCRETE PLACEMENT

A. Place concrete as soon as practicable after the forms and the reinforcement have been inspected and approved. Deposit concrete as close as practicable to the final position in the forms. Place concrete in one continuous operation from one (1) of the forms towards the other.

B. 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.

C. 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.

D. A bond-break filler shall be provided where the edge of slab abuts any vertical surface and where indicated on plans. Widths of filler strips shall equal the depth of the floor slab.

E. Concrete shall be conveyed from mixer to forms as rapidly as practicable by methods that will prevent segregation.

F. Extensive spading as a means of transportation shall be avoided and in no case shall vibrators be used to transport concrete inside forms.

G. Open troughs and chutes shall have a slope not to exceed one (1) vertical to two (2) horizontal and not less than one (1) vertical to three (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.

H. The concrete shall not be allowed to drop freely more than six (6) feet except where specifically authorized by the Engineer. When placing operations involve the dropping of concrete from a height of more than six (6) feet it shall be conveyed through pipes or flexible drop chutes.

I. 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.

J. 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.

3.6 COMPACTION

A. All concrete shall be consolidated by vibration so that the concrete is thoroughly worked around the reinforcement, around embedded items, and into comers 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.

B. 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 (1) standby vibrator shall be on hand at all times during placement of the concrete.

3.7 FINISHING OF SLABS

A. Broom Finish. 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.

3.8 JOINTS

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

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

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

2. Locate horizontal joints in walls at underside of slabs and beams, and at the top of footings.

3. Space vertical joints in walls as indicated. Locate joints beside piers integral with walls, near corners, and in concealed locations where possible.

4. Use a bonding agent or epoxy adhesive scrubbed into the surface at locations where fresh concrete is placed against hardened or partially hardened concrete surfaces. Bond agent or epoxy adhesive should be wet or tacky when new concrete is placed on it. If bonding agent or epoxy adhesive is dry, completely remove and reapply.

C. Curb Wall and Curbs: Align joints in concrete curbs and walls with joints in adjacent concrete pavement. Where curb does not abut concrete pavement, provide expansion joints at intervals not less than 30 feet or greater than 120 feet. Space contraction joints so that sections will not be less than 5 feet nor greater than 15 feet in length.

3.9 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.

3.10 CURING AND PROTECTION

A. All concrete shall be cured for a period of not less than seven (7) days by one (1) 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. The curing method selected must be compatible with the finish to be applied to the concrete. Curing shall immediately follow the finishing operation.

1. 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.

2. 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.

3. 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.

4. Waterproof Paper: Waterproof paper or opaque polyethylene film conforming to ASTM Cl71 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.

3.11 SAMPLING AND TESTING

A. Sampling - ASTM C 172: Collect samples of fresh concrete to perform tests described below. 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 (f'c) Tests - ASTM C 39: Make four test cylinders for each set of tests in accordance with ASTM C 31. Test one cylinder at seven (7) days, two (2) 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 concrete 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 (2) or more cylinders are less than f'c minus 300 psi, take six (6) 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 costs of sampling and testing shall be borne by the contractor.

E. Perform two (2) slump tests on randomly selected batches of each class of concrete for every 250 cubic yards, or fraction thereof, of concrete placed during each shift in accordance with ASTM C143. Perform additional tests when excessive variation in the workability of the concrete is noted or when excessive crumbling or slumping is noted along the edges of slip-formed concrete.

F. Inspect reinforcement prior to installation to verify it is free of loose flaky rust, loose scale, oil, mud, or other objectionable material.

G. Inspect dowel placement prior to placing concrete to verify that dowels are of the size indicated, and are spaced, aligned, and painted and oiled as specified. Horizontal and vertical alignment tolerances of dowels shall be plus or minus 1 inch.

3.12 FINAL INSPECTION

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

END OF SECTION

SECTION 06100

ROUGH CARPENTRY

PART 1 – GENERAL

1.1 SUMMARY

A. Section Includes:

1. Rough carpentry work consisting of framing, blocking, nailers, furring, grounds, and miscellaneous wood construction as indicated on drawings and as required for installation of other work.
2. Plywood and framing lumber for general construction and backing.

B. Related Sections:

1. Section 09910 – Painting.

1.2 REFERENCES

A. American Forest & Paper Association (AF&PA):
1. National Design Specification (NDS) for Wood Construction.

B. American Lumber Standard Committee (ALSC):
1. PS 20 – American Softwood Lumber Standard.

C. American Plywood Association (APA) – The Engineered Wood Association:
1. PRP-108 – Performance Standards and Policies for Structural-Use Panels.

D. American Society for Testing and Materials (ASTM) Standards:

1. ASTM D245 – Standard Practice for Establishing Structural Grades and Related Allowable Properties for Visually Graded Lumber.

2. ASTM D2555 – Standard Test Methods for Establishing Clear Wood Strength Values.

3. ASTM D3200 – Standard Specification for Plywood Panels for Structural Use.

1.3 SUBMITTALS

A. Product Data:
1. Submit data for wood treatment, fasteners, and adhesives.

B. Certificates:
   1. Certification that lumber and plywood comply with applicable standards and grades.

C. Shop Drawings (if applicable):
   1. Indicate framing layout, anchorage, and connection details.

1.4 QUALITY ASSURANCE

A. Lumber Grade Identification:
   1. Each piece of lumber shall bear an approved grade stamp identifying species, moisture content, and grading agency.

B. Moisture Content:
   1. Framing lumber: 19% maximum at time of installation.
   2. Plywood: As recommended by manufacturer, not exceeding 15%.

C. Preservative Treatment:
   1. Comply with American Wood Protection Association (AWPA) Standards.
   2. Treat lumber in contact with masonry, concrete, or exterior surfaces.

1.5 DELIVERY, STORAGE, AND HANDLING

A. Protect materials from weather and moisture.

B. Store lumber and plywood flat, off the ground, and covered.

C. Do not store in direct contact with the ground or standing water.

PART 2 – PRODUCTS

2.1 MATERIALS

A. Lumber
   1. Softwood framing lumber, kiln-dried, No. 2 or better, in accordance with PS 20.

   2. Species: Douglas Fir-Larch, Southern Pine, or Spruce-Pine-Fir.

B. Plywood:
   1. APA-rated structural panels, exterior glue, PS 1 or PS 2.

   2. Minimum thickness as indicated on drawings.

C. Blocking and Nailers:
   1. Same species and grade as adjacent framing.

D. Preservative-Treatment Lumber:

1. Conform to AWPA UC2 or UC3B for above-ground, and UC4A for ground contact.

2. Treat with copper-based preservative [e.g., Acquisition Preservation (ACQ), Conservation (CA), or Micronized Copper Azole (MCA)].

E. Fasteners and Connectors:

1. Nails, bolts, screws, and metal connectors per NDS and manufacturer's recommendations.

2. Galvanized or stainless steel for exterior or treated wood.

2.2 ACCESSORIES

A. Adhesives:

1. Construction adhesive complying with APA AFG-01 for structural use.

B. Anchors and Hangers:

1. Simpson Strong-Tie or equal, galvanized or stainless as required.

PART 3 – EXECUTION

3.1 EXAMINATION

A. Verify dimensions and conditions at site prior to beginning work.

B. Do not proceed until unsatisfactory conditions are corrected.

3.2 INSTALLATION

A. Framing:

1. Install framing, blocking, and furring true to line, level, and plumb.

2. Provide framing and grounds to support finish materials.

3. Space framing members as shown on drawings or per code.

B. Nailing and Fastening:

1. Comply with NDS requirements and approved connection schedules.

C. Blocking and Nailers:

1. Provide solid blocking for support of wall-mounted items, millwork, fixtures, and equipment.

D. Plywood Installation:

1. Lay panels with face grain perpendicular to supports.

2. Stagger joints and provide 1/8-inch spacing at edges and ends unless otherwise specified.

E. Treated Wood:

1. Cut ends of treated wood shall be field-treated with copper naphtenate or equal preservative.

3.3 TOLERANCES

A. Framing members: +/- 1/8 inch in 10 feet for plumb, level, and alignment.

3.4 FIELD QUALITY CONTROL

A. Inspect installation for proper fasteners, alignment, and moisture content.

B. Replace damaged or defective members.

3.5 CLEANING

A. Remove debris and scrap material from site.

B. Leave work clean and ready for subsequent construction.

3.6 PROTECTION

A. Protect installed rough carpentry from damage and moisture during remaining construction operations.

END OF SECTION

SECTION 06160

PLYWOOD ROOF SHEATHING

PART 1 – GENERAL

1.1 SUMMARY

A. This section Includes installation of plywood roof sheathing as substrate for asphalt shingle roofing.

B. Related Sections:
   1. Section 06100 – Rough Carpentry
   2. Section 07250 – Weather Barriers
   3. Section 07311 – Asphalt Shingle Roofing
   4. Section 07620 – Sheet Metal Flashing and Trim

1.2 REFERENCES

A. American Plywood Association (APA) – The Engineered Wood Association standards

B. American Society for Testing and Materials (ASTM) D2718 – Standard Test Methods for Structural Panels in Planar Shear (Rolling Shear)

C. International Building Code (IBC), latest edition

D. American National Standards Institute (ANSI) A108.1 – Standard Specification for Wood-Based Structural Panels

1.3 SUBMITTALS

A. Product Data: Submit manufacturer's data for plywood panels.

B. Certificates: Submit certification for compliance with APA grade and span rating requirements.

1.4 DELIVERY, STORAGE, AND HANDLING

A. Store plywood panels flat, off the ground, and protected from moisture and weather.

B. Handle panels to prevent damage to edges, corners, and surfaces.

PART 2 – PRODUCTS

2.1 PANEL MATERIALS

A. Plywood Roof Sheathing:
   1. Grade: APA Rated Sheathing, Exposure 1.
   2. Thickness: Minimum 5/8 inch (15.9 mm) or as required by structural design and local code.
   3. Span Rating: 32/16 or better.
   4. Panel Type: PS 1 or PS 2 compliant.

B. Fasteners:
   1. Nails: Minimum 8d ring-shank or screw-shank nails, hot-dip galvanized
   2. Screws (if specified): No.8 or larger, corrosion-resistant, minimum 2” length

C. Adhesives:
   APA-approved construction adhesive if adhesive-set sheathing is specified.

PART 3 – EXECUTION

3.1 INSTALLATION

A. General: Install plywood sheathing in accordance with APA recommendations, local code, and manufacturer’s instructions.

B. Panel Orientation: Install panels with the long dimension perpendicular to rafters or trusses.

C. Spacing: Provide a minimum 1/8-inch gap at panel ends and edges to allow for expansion.

D. Support: Ensure that all panel edges are supported by framing or blocking, or use H-clips between rafters where specified.

E. Fastening:
   1. Nail panels at 6” on center along supported panel edges and 12” on center at intermediate supports unless otherwise specified.
   2. Drive nails flush with panel surface without over-driving or under-driving.

F. Staggering: Stagger joints in adjacent courses to reduce joint alignment.

3.2 PROTECTION

A. Protect sheathing from exposure to prolonged moisture. If sheathing becomes wet, allow to dry before covering.

B. Install roofing underlayment as soon as practicable after sheathing installation.

END OF SECTION

SECTION 07015

REMOVAL OF ROOFING AND SHEATHING

PART 1 – GENERAL

1.1 SUMMARY

A. Work includes complete removal and disposal of existing asphalt shingle roofing system, including:
   1. Asphalt Shingles
   2. Roofing Underlayment
   3. Plywood roof sheathing

B. Coordinate with all other trades as necessary.

C. Comply with all applicable codes, ordinances, and regulations.

1.2 SUBMITTALS

A. Waste disposal plan

B. Safety plan

C. Photographic documentation of existing conditions (pre- and post-demolition)

1.3 QUALITY ASSURANCE

A. Use qualified contractors experienced in roof demolition work.

B. Comply with Occupational Safety and Health Association (OSHA) and local safety regulations.

C. Protect adjacent structures, landscaping, and interior from damage or water infiltration.

1.4 PROJECT CONDITIONS

A. Verify structural conditions before proceeding. Notify the Architect/Engineer of any deficiencies.

B. Weather protection: Do not begin demolition in inclement weather. Provide temporary covering if roofing is exposed overnight or during rain.

PART 2 – PRODUCTS

(Not Used – Refer to Section 06100 Rough Carpentry and Section 07311 Asphalt Shingle Roofing for any replacement materials.)

PART 3 – EXECUTION

3.1 PREPARATION

A. Disconnect and remove rooftop equipment as needed.

B. Protect gutters, downspouts, walls, landscaping, and other elements from damage during removal operations.

C. Install safety barriers, signage, and fall protection as required.

3.2 REMOVAL OF ROOFING MATERIALS

A. Remove asphalt shingles and underlayment down to the roof sheathing.

B. Carefully detach all flashing, drip edge, fasteners, and nails. Salvage reusable components if applicable.

C. Dispose of removed materials in accordance with approved waste disposal plan and local regulations.

3.3 REMOVAL OF SHEATHING

A. Remove damaged or specified roof sheathing panels down to the structural framing.

B. Inspect framing for signs of damage, rot, or pest infestation.

C. Notify Owner/Architect of any required structural repairs before proceeding.

D. Clean exposed framing of debris and protruding fasteners.

3.4 CLEANING AND DISPOSAL

A. Remove debris from roof and surrounding area daily.

B. Lawfully dispose of all demolition materials off-site.

C. Leave roof structure clean and ready for new installation.

3.5 PROTECTION

A. Cover open roof areas with approved temporary weather-resistant covering at the end of each workday or prior to rain.

B. Protect interior finishes from dust, water, or falling debris during removal operations.

END OF SECTION

SECTION 07250

WEATHER BARRIERS

PART 1 – GENERAL

1.1 SUMMARY

A. Section Includes:
   1. Air and water-resistive barrier (WRB) systems applied over exterior sheathing or substrate.
   2. Flashing and accessories required for a complete weather barrier assembly.

B. Related Sections:
   1. Section 06100 – Rough Carpentry
   2. Section 07620 – Sheet Metal Flashing and Trim
   3. Section 09240 – Cementitious and Gypsum Board Substrates
   4. Section 09910 – Painting

1.2 REFERENCES

A. American Society of Testing and Materials (ASTM) E2178 – Standard Test Method for Air Permeance of Building Materials.

B. ASTM E2357 – Standard Test Method for Determining Air Leakage of Air Barrier Assemblies.

C. ASTM E331 – Water Penetration of Exterior Windows, Skylights, Doors, and Curtain Walls by Uniform Static Air Pressure Difference.

D. ASTM E96 – Water Vapor Transmission of Materials.

E. ASTM D4541 – Pull-Off Strength of Coatings Using Portable Adhesion Testers.

F. International Code Council (ICC)-ES AC212 – Acceptance Criteria for Water-Resistive Coatings Used as Water-Resistive Barriers over Exterior Sheathing.

1.3 SUBMITTALS

A. Product Data: Manufacturer’s data sheets describing materials, performance criteria, installation instructions, and limitations.

B. Shop Drawings: Indicate locations, details of terminations, penetrations, and interfaces with adjacent materials.

C. Samples: Minimum 12 by 12 inches of sheet membrane or sample panel showing applied liquid barrier.

D. Certificates:
   1. Manufacturer certification that materials comply with specified requirements. Installer qualifications.
   2. Test Reports: Evidence of compliance with air and water barrier performance standards.

1.4 QUALITY ASSURANCE

A. Manufacturer Qualifications: Minimum five (5) years of experience producing air and water barrier systems.

B. Installer Qualifications: Certified or approved by manufacturer; minimum three (3) years of documented experience.

C. Mock-Up:

   1. Construct minimum 4 ft x 4 ft sample wall including joints, openings, and penetrations.

      Approved mock-up may remain as part of the finished Work.

1.5 DELIVERY, STORAGE, AND HANDLING

A. Deliver materials in original, unopened containers bearing manufacturer's name and label.

B. Store materials under cover, elevated, and protected from moisture, direct sunlight, and damage.

C. Handle materials according to manufacturer's instructions.

1.6 PROJECT CONDITIONS

A. Do not apply weather barrier in rain, high wind, or when substrate moisture content exceeds manufacturer's limits.

B. Maintain substrate temperature within manufacturer's recommended range during installation and curing.

PART 2 – PRODUCTS

2.1 MANUFACTURERS

A. Acceptable Manufacturers:
   1. DuPont – Tyvek CommercialWrap or Fluid Applied WB
   2. Henry Company – Blueskin VP100 or Air-Bloc 33
   3. Tremco – ExoAir Air and Vapor Barrier Systems
   4. Carlisle – Barritech VP
   5. Or approved equal.

2.2 MATERIALS

A. Sheet Weather Barrier:
   Type: Spunbonded polyolefin, mechanically attached, non-perforated, vapor-permeable membrane.
   Air Permeance: ≤ 0.004 cfm/ft² at 1.57 psf (ASTM E2178).
   Water Resistance: No leakage after 2-hour test (ASTM E331).

B. Fluid-Applied Weather Barrier:
   Type: Elastomeric, vapor-permeable, water-based membrane.
   Air Leakage (Assembly): ≤ 0.04 cfm/ft² at 1.57 psf (ASTM E2357).
   Water Vapor Transmission: ≥ 10 perms (ASTM E96, Method B).

C. Accessories:
   Flashing Membrane: Self-adhering, rubberized asphalt or butyl-based sheet, minimum 25 mil thick.

D. Sealants and Primers: As recommended by weather barrier manufacturer.

E. Fasteners: Corrosion-resistant nails or screws with caps, as recommended.

F. Transition Membranes and Tapes: Compatible with primary barrier.

PART 3 – EXECUTION

3.1 EXAMINATION

A. Verify substrate is clean, dry, smooth, and free of protrusions or contaminants.

B. Do not begin installation until unsatisfactory conditions have been corrected.

3.2 PREPARATION

A. Clean surfaces of dust, oil, and debris.

B. Prime porous or difficult surfaces as required by manufacturer.

C. Coordinate installation with flashing, openings, and penetrations to ensure continuous barrier.

3.3 INSTALLATION

A. Install in accordance with manufacturer's written instructions.
B. Ensure continuous, weather-tight barrier free of gaps, wrinkles, or fishmouths.

C. Overlap joints minimum 6 inches horizontally and 4 inches vertically for sheet membranes.

D. Seal all laps, seams, penetrations, and terminations with manufacturer-approved accessories.

E. Integrate weather barrier with flashings, windows, and roof underlayment to ensure continuity of the air/water barrier system.

F. Apply fluid-applied membranes to required thickness using roller, spray, or trowel as recommended.

3.4 FIELD QUALITY CONTROL

A. Inspection: Manufacturer's representative may perform periodic site inspections.

B. Testing: Perform adhesion tests and verify membrane continuity if required.

3.5 PROTECTION

A. Protect installed barrier from damage by subsequent construction operations or exposure to UV beyond manufacturer's limits.

B. Repair or replace damaged materials before covering.

END OF SECTION

ASPHALT SHINGLE ROOFING

SECTION 07311

PART 1 – GENERAL

1.1 SUMMARY

A. Section Includes:
   1. Asphalt roofing shingles
   2. Underlayment
   3. Flashing and accessories
   4. Ridge vents and ventilation components

1.2 REFERENCES

A. American Society of Testing and Materials (ASTM) D3018 – Asphalt Shingles (Self-Sealing, Mineral Surfaced)

B. ASTM D3462 – Asphalt Shingles Made from Glass Felt and Surfaced with Mineral Granules

C. ASTM D3161 – Wind-Resistance of Asphalt Shingles

D. ASTM D225 – Asphalt Saturated Organic Felt

E. ASTM D4869 – Asphalt-Saturated Organic Felt Underlayment

F. Underwriters Laboratory (UL) 790 – Standard Test Methods for Fire Tests of Roof Coverings

G. National Roofing Contractors Association (NRCA) – Roofing Manual

1.3 SUBMITTALS

A. Product data: Manufacturer’s specifications and installation instructions

B. Samples: Submit color samples of shingles for selection

C. Warranty: Submit manufacturer's warranty documentation

1.4 QUALITY ASSURANCE

A. Installer Qualifications:
   1. Minimum five (5) years roofing installation experience
   2. Certified by shingle manufacturer (if required for warranty)

B. Preinstallation Meeting: Conduct meeting with General Contractor, installer, and manufacturer representative.

1.5 DELIVERY, STORAGE, AND HANDLING

A. Deliver materials in original, unopened packages with manufacturer labels intact.

B. Store under cover and off the ground to protect from moisture.

C. Do not store more than one (1) pallet high on roof.

1.6 WARRANTY

A. Provide manufacturer's limited lifetime warranty

B. Provide five (5) year minimum installer workmanship warranty

PART 2 – PRODUCTS

2.1 MANUFACTURERS

A. Approved Manufacturers:
1. GAF
2. CertainTeed
3. Owens Corning
4. IKO
5. TAMKO

2.2 ASPHALT SHINGLES

A. Composition: Fiberglass reinforced asphalt

B. Style: Architectural / laminated dimensional shingles

C. Color: To be selected by Architect / Owner

D. Performance Requirements:
1. ASTM D3462 compliant
2. UL 790 Class A fire rating
3. ASTM D3161 Class F (110+ mph) wind resistance
4. Algae resistance as applicable

2.3 UNDERLAYMENT

A. Primary Underlayment:
    1. ASTM D4869 No. 15 asphalt-saturated felt OR synthetic underlayment meeting ASTM D226

B. Ice and Water Shield:
    1. Self-adhering membrane in valleys, eaves, rakes, penetrations, and low-slope areas
    2. Minimum 36” width; conform to ASTM D1970

2.4 ACCESSORIES

A. Startup Strip Shingles

B. Ridge Cap Shingles – match shingles

C. Metal Drip Edge: Pre-finished aluminum, minimum 0.019” thick

D. Flashing:
    1. Step flashing at roof-to-wall intersections
    2. Valley flashing – minimum 24” wide, 26-gauge galvanized or aluminum

E. Fasteners:
    1. 1-1/4” roofing nails, galvanized steel, ring shank

2.5 VENTILATION

A. Ridge Vent: Shingle-over, continuous type

B. Intake Vent: Soffit vents or equivalent per code

PART 3 – EXECUTION

3.1 EXAMINATION

A. Verify deck is dry, sound, and securely fastened.

B. Do not proceed until unsatisfactory conditions are corrected.

3.2 PREPARATION

A. Clean deck surface of dust, debris, and protrusions.

B. Install drip edge along eaves before underlayment.

C. Install ice and water shield as required.

3.3 INSTALLATION

A. Install underlayment over entire roof per manufacturer’s instructions.

B. Install asphalt shingles in accordance with manufacturer’s installation guide and NRCA recommendations.

C. Nail shingles with 4-6 nails per shingle, driven flush.

D. Flash all penetrations, valleys, and intersections.

E. Install ridge shingles after all field shingles are completed.

F. Ensure proper ventilation is installed and unobstructed.

3.4 CLEANING

A. Remove all scrap, nails, and debris from site.

B. Use magnetic sweeper around building perimeter.

3.5 PROTECTION

A. Protect installed roofing from damage during construction.

B. Repair or replace any damaged areas prior to final acceptance.

END OF SECTION

SECTION 07620

SHEET METAL FLASHING AND TRIM

PART 1 – GENERAL

1.1 SUMMARY

A. Work includes furnishing and installing all sheet metal flashing and trim required to make the building watertight and provide finished metal edges.

B. Includes, but not limited to:
1. Roof edge flashings and fascias
2. Roof-to-wall and wall-to-roof flashings
3. Counterflashings
4. Cap flashings, copings, and gravel stops
5. Window and door head, sill, and jamb flashings
6. Parapet flashings and reglets
7. Expansion joint covers and transition flashings

C. Related Sections:
1. 06100 – Rough Carpentry
2. 07920 – Joint Sealants

1.2 REFERENCES

A. American Society of Testing and Materials (ASTM) A653 – Steel Sheet, Zinc-Coated (Galvanized) or Zinc-Iron Alloy-Coated (Galvannealed).

B. ASTM B209 – Aluminum and Aluminum-Alloy Sheet and Plate.

C. ASTM B370 – Copper Sheet and Strip for Building Construction.

D. Sheet Metal and Air Conditioning Contractors' National Association (SMACNA) – Architectural Sheet Metal Manual, latest edition.

E. National Roofing Contractors Association (NRCA) – Roofing and Waterproofing Manual, latest edition.

1.3 SUBMITTALS

A. Product Data: Manufacturer's data for sheet metal materials, accessories, and coatings.

B. Shop Drawings: Indicate profiles, dimensions, jointing, fastening, and locations of all flashings and trims.

C. Samples:
   1. 12-inch long samples of each profile, showing seams and finish.
   2. Color samples for coated metals.

D. Warranty: Submit manufacturer's standard finish warranty and contractor's workmanship warranty.

1.4 QUALITY ASSURANCE

A. Fabricator Qualifications: Minimum five (5) years of experience in architectural sheet metal work of similar scope.

B. Installer Qualifications: Authorized by sheet metal manufacturer or approved by Architect.

C. Standards: Conform to SMACNA recommendations for material thickness, joints, and fastening methods.

1.5 DELIVERY, STORAGE, AND HANDLING

A. Deliver materials in manufacturer's unopened packaging, labeled with identification.

B. Store materials under cover, elevated above ground, and protected from moisture and damage.

C. Handle to prevent bending, warping, or surface damage.

1.6 WARRANTY

A. Provide 2-year warranty for workmanship and installation.

B. Provide manufacturer's 20-year finish warranty for factory-applied coatings.

PART 2 – PRODUCTS

2.1 MATERIALS

A. Galvanized Steel Sheet: ASTM A653, G90 coating, minimum 24 gauge (0.7 mm).

B. Aluminum Sheet: ASTM B209, alloy 3003-H14 or 5005-H34, minimum 0.032 inch thick.

C. Copper Sheet: ASTM B370, cold-rolled, minimum 16 oz/sq ft.

D. Stainless Steel Sheet: ASTM A240, Type 304, minimum 26 gauge.

E. Zinc Alloy Sheet: ASTM B69, minimum 0.8 mm thick.

F. Fasteners:

1. Stainless steel or coated to prevent galvanic corrosion.
2. Compatible with adjacent materials.

G. Sealants and Bituminous Coatings: Non-staining, elastomeric type compatible with metals and roofing.

2.2 FABRICATION

A. Fabricate in accordance with SMACNA Manual details and tolerances.

B. Provide hemmed edges on all exposed sheet metal edges.

C. Provide expansion joints where indicated or required.

D. Form sections true to shape, accurate in size, square, and free from distortion or defects.

E. Seal joints with solder, sealant, or watertight interlocking seams as appropriate.

F. Provide concealed stiffeners where required for rigidity.

2.3 FINISHES

A. Galvanized Steel: Factory-applied fluoropolymer (Kynar 500 or Hylar 5000) finish, 70% resin, color as selected.

B. Aluminum: Factory-applied PVDF coating, 70% resin, color as selected.

C. Copper and Stainless Steel: Natural mill finish, unless otherwise indicated.

PART 3 – EXECUTION

3.1 EXAMINATION

A. Verify substrate surfaces are clean, dry, and ready to receive sheet metal work.

B. Notify Contractor of any conditions that will affect proper installation.

3.2 INSTALLATION

A. Install in accordance with SMACNA standards and approved shop drawings.

B. Secure flashings with concealed fasteners where possible.

C. Provide positive slope to shed water away from walls and joints.

D. Lap joints minimum 2 inches and seal to make watertight.

E. Isolate dissimilar metals with bituminous coating or separator.

F. Seal all metal-to-masonry and metal-to-roof membrane joints with sealant.

3.3 FIELD QUALITY CONTROL

A. Inspect joints, seams, and fastenings for watertightness and secure attachment.

B. Repair damaged coatings and finishes in accordance with manufacturer’s recommendations.

3.4 CLEANING AND PROTECTION

A. Remove protective coverings promptly after installation.

B. Clean exposed surfaces; touch up scratches with manufacturer’s approved coating.

C. Protect installed work from damage during construction.

END OF SECTION

JOINT SEALANTS

SECTION 07920

PART 1 – GENERAL

1.1 SUMMARY

A. This section includes joint sealants for the following applications in public restrooms:
   1. Interior wall and floor joints
   2. Joints at fixtures (e.g., sinks, toilets, urinals)
   3. Perimeter joints of countertops and partitions
   4. Expansion and control joints
   5. Penetrations through moisture-resistant surfaces

B. Types of joints include:
   1. Movement joints
   2. Static joints
   3. Wet-area joints

1.2 REFERENCES

A. Comply with the following:
   1. American Society for Testing and Materials (ASTM) C834 – Latex Sealants
   2. ASTM C920 – Elastomeric Joint Sealants
   3. ASTM C1193 – Guide for Use of Joint Sealants
   4. ASTM C1248 – Staining Test
   5. ASTM C1382 – Test Method for Sealant Durability

1.3 SUBMITTALS

A. Product Data: Manufacturer’s technical data sheets for each product.

B. Color Samples: Submit manufacturer's standard color chart.

C. Compatibility and adhesion test reports, if applicable.

1.4 QUALITY ASSURANCE

A. Installer Qualifications: Minimum three (3) years’ experience with similar project types.

B. Mock-Up: Provide sample installation of at least 5 linear feet for evaluation.

C. Pre-installation Conference: Coordinate with related trades and review substrate conditions and compatibility.

1.5 DELIVERY, STORAGE, AND HANDLING

A. Deliver materials in unopened containers with manufacturer's labels intact.

B. Store in accordance with manufacturer's recommendations in dry, temperature-controlled conditions.

C. Protect from freezing, excessive heat, and moisture.

1.6 WARRANTY

A. Provide manufacturer's standard 5-year warranty against loss of adhesion, cracking, or staining under normal conditions.

PART 2 – PRODUCTS

2.1 MATERIALS

A. General:
   1. Single-component, mildew-resistant, elastomeric sealants for wet environments.
   2. Volatile Organic Compound (VOC) compliant per local environmental regulations.

2.2 ACCEPTABLE MANUFACTURERS

A. Tremco

B. Sika

C. Dow

D. Pecora

E. Bostik

2.3 JOINT SEALANT TYPES

A. Interior Wet Joints
   1. Silicone-based, mildew-resistant, ASTM C920, Type S, Grade NS, Class 24, Uses NT, G, G, and M.

B. Control/Expansion Joints in Walls and Floors:

1. Polyurethane or silyl-terminated polyether (STPE), ASTM C920, Type M/S, Grade NS, Class 25 or higher.

C. Perimeter Joints
   1. Acrylic latex (ASTM C834) where minimal movement expected, paintable.

D. Fire-Rated Joints (if applicable)
   1. Sealant must meet ASTM E814 and Underwriters Laboratory (UL) 2079.

2.4 ACCESSORIES

A. Bond breaker tape: Polyethylene or Teflon.

B. Backer Rods: Closed-cell polyethylene foam, appropriately sized.

C. Primers: As recommended by sealant manufacturer for specific substrate conditions.

PART 3 – EXECUTION

3.1 EXAMINATION

A. Verify joint dimensions and substrate conditions are suitable for sealant installation.

B. Do not proceed until defects or unsuitable conditions are corrected.

3.2 PREPARATION

A. Clean all joints: Remove dust, grease, moisture, laitance, and loose particles.

B. Prime substrates as recommended.

C. Install backer rod or bond breaker as required to control sealant depth and avoid three-sided adhesion.

3.3 APPLICATION

A. Apply sealants in accordance with manufacturer's written instructions and ASTM C1193.

B. Tool sealant to ensure complete contact with joint sides and to produce a smooth, concave surface.

C. Do not apply sealants when temperatures are below manufacturer's minimum recommended temperature.

3.4 CLEANING

A. Clean excess sealant and smears from adjacent surfaces promptly using manufacturer-approved methods.

B. Remove all masking after tooling is complete.

3.5 PROTECTION

A. Protect sealant from damage until fully cured.

B. Ensure completed sealant installations are not disturbed during restroom fixture installation and general finish work.

END OF SECTION

SECTION 09240

CEMENTITIOUS AND GYPSUM BOARD SUBSTRATES

PART 1 – GENERAL

1.1 SUMMARY

A. Section Includes:
1. Interior gypsum board assemblies.
2. Cementitious backer board for tile and wet areas.
3. Accessories, fasteners, and joint treatments associated with board substrates.

B. Related Sections:
1. Section 06100 – Rough Carpentry
2. Section 07920 – Joint Sealants
3. Section 09300 – Tiling
4. Section 09910 – Painting

1.2 REFERENCES

A. American Society for Testing and Materials (ASTM) C36 – Standard Specification for Gypsum Wallboard.

B. ASTM C1396 – Gypsum Board.

C. ASTM C840 – Application and Finishing of Gypsum Board.

D. ASTM C473 – Physical Testing of Gypsum Panel Products.

E. ASTM C1288 – Standard Specification for Fiber-Reinforced Gypsum Panels.

F. ASTM C1178 – Coated Glass Mat Water-Resistant Gypsum Backing Panel.

G. ASTM C1325 – Cementitious Backer Units.

H. Gypsum Association (GA) - 216 – Application and Finishing of Gypsum Panel Products.

I. American National Science Institute (ANSI) A108/A118 – Installation of Ceramic Tile.

1.3 SUBMITTALS

A. Product Data:
1. Manufacturer’s specifications, installation instructions, and maintenance data.

B. Samples:
1. One (1) sample of each board type and edge profile proposed for use.

C. Quality Assurance:
1. Manufacturer’s certification that materials meet specified standards.

1.4 QUALITY ASSURANCE

A. Installer Qualifications: Minimum three (3) years experience in installation of gypsum and cementitious board systems of similar scope.

B. Regulatory Requirements: Comply with local building codes and fire-resistance ratings indicated.

1.5 DELIVERY, STORAGE, AND HANDLING

A. Deliver materials in manufacturer’s original, unopened packaging.

B. Store flat, off ground, and protected from moisture, direct sunlight, and damage.

C. Handle boards carefully to prevent edge breakage or surface damage.

1.6 PROJECT CONDITIONS

A. Environmental Requirements:
1. Maintain temperature at not less than 50°F (10°C) during and after installation.
2. Ensure building is weather-tight prior to installation.

B. Ventilation: Provide adequate ventilation during joint treatment and finishing.

PART 2 – PRODUCTS

2.1 MANUFACTURERS

A. Acceptable Manufacturers:
1. USG Corporation.
2. CertainTeed Gypsum.
3. National Gypsum Company.
4. Georgia-Pacific Gypsum.
5. Custom Building Products (cement board).
Or approved equal.

2.2 MATERIALS

A. Gypsum Wallboard**:** ASTM C1396, regular or Type X as required.

1. Thickness: 1/2 inch typical; 5/8 inch at fire-rated assemblies.
2. Edges: Tapered.

B. Moisture-Resistant Gypsum Board: ASTM C1396, Type MR (green board) or glass mat type ASTM C1178, for high-humidity areas not subject to direct water exposure.

C. Cementitious Backer Units (CBU): ASTM C1325.
1. Thickness: 1/2 inch typical.
2. Use in wet areas behind tile, showers, tub surrounds, and similar.

D. Fiber-Reinforced Gypsum Panels**:** ASTM C1278, for abuse-resistant applications.

E. Fasteners:
1. ASTM C1002 – Self-drilling or self-tapping screws, corrosion-resistant.
2. Galvanized or coated for moisture-prone areas.

F. Joint Treatment Materials**:**
1. ASTM C475 – Joint compound and tape compatible with board type.
2. Glass-fiber mesh tape for cement board joints.

G. Accessories:
1. Corner beads, edge trim, control joints: Zinc, vinyl, or galvanized steel per ASTM C1047.

PART 3 – EXECUTION

3.1 EXAMINATION

A. Verify framing alignment, spacing, and blocking prior to board installation.

B. Do not begin installation until unsatisfactory conditions are corrected.

3.2 INSTALLATION

A. Install boards in accordance with ASTM C840 and GA-216.

B. Position boards with long dimension perpendicular to framing.

C. Stagger joints on opposite sides of partitions.

D. Secure with screws; do not break paper surface or board face.

E. Cement Board:
1. Install per manufacturer’s instructions and ANSI A108.11.

2. Leave 1/8-inch joints between boards; fill and tape with alkali-resistant mesh and thin-set mortar.

F. Apply control joints per manufacturer's recommendations and building movement requirements.

3.3 JOINT TREATMENT

A. Apply tape and compound to gypsum board joints, corners, and fasteners.

B. Feather out at least 12 inches each side of joint.

C. Sand smooth and ready for finish application per Section 09910 - Painting

3.4 FIELD QUALITY CONTROL

A. Inspect for surface defects, fastener pops, joint cracks, or irregularities.

B. Replace damaged or nonconforming work.

3.5 PROTECTION

A. Protect finished work from damage until completion of the project.

B. Do not install finish coatings until joint compound is completely dry.

END OF SECTION

TILING

SECTION 09300

PART 1 - GENERAL

1.1 SUMMARY

A. This section includes furnishing and installation of epoxy grout for porcelain floor and wall tiles in public restrooms.

B. Related work includes:
   1. Section 07920 – Joint Sealants
   2. Section 09313 – Ceramic Tiling
   3. Section 09240 – Cementitious and Gypsum Board Substrates

1.2 REFERENCES

A. ANSI A118.3 – American National Standard Specification for Chemical-Resistant, Water Cleanable Tile-Setting and Grouting Epoxy and Water Cleanable Tile-Setting Epoxy Adhesive

B. ANSI A108.6 – Installation of Grout in Tilework

C. ASTM C580 – Standard Test Method for Flexural Strength and Modulus of Elasticity of Chemical-Resistant Mortars, Grouts, Monolithic Surfacings, and Polymer Concretes

D. TCNA Handbook – Tile Council of North America Installation Guidelines

1.3 SUBMITTALS

A. Product Data: Submit manufacturer’s technical data for each grout product including preparation, mixing, application, and maintenance.

B. Samples: Submit manufacturer’s grout color chart for selection.

C. Warranty: Submit manufacturer’s standard warranty.

1.4 QUALITY ASSURANCE

A. Installer Qualifications: Installer shall have minimum three (3) years experience in tile grouting using epoxy grout and shall be approved by the grout manufacturer.

B. Mock-Up: Install a 4 ft x 4 ft sample area of tile with epoxy grout for approval. Approved mock-up may remain as part of finished work.

1.5 DELIVERY, STORAGE, AND HANDLING

A. Deliver materials in original unopened containers with manufacturer's labels intact.

B. Store materials in accordance with manufacturer's recommendations; protect from freezing and direct sunlight.

1.6 ENVIRONMENTAL REQUIREMENTS

A. Do not install grout when ambient temperature is below 60°F (16°C) or above 90°F (32°C).

B. Provide adequate ventilation during installation and curing periods.

PART 2 – PRODUCTS

2.1 MANUFACTURERS

A. Acceptable manufacturers (subject to compliance with specifications):
   1. Laticrete – SpectraLOCK PRO Premium Epoxy Grout
   2. Mapei – Kerapoxy
   3. Custom Building Products – CEG -Lite
   4. Or Approved Equal

2.2 MATERIALS

A. Epoxy Grout:
   1. 100% solids epoxy formulation
   2. Chemical-resistant, stain-resistant, and water cleanable
   3. Compliant with ANSI A118.3
   4. Non-sag and non-shrink properties
   5. Color as selected by Architect from manufacturer's full range

2.3 PERFORMANCE REQUIREMENTS

A. Compressive Strength (ASTM C579): >3,500 psi

B. Tensile Strength (ASTM C307): >1,000 psi

C. Flexural Strength (ASTM C580): >4,000 psi

D. Water Absorption (ASTM C413): <.050%

E. Service Temperature: -20° F to 140° F continuous exposure

PART 3 – EXECUTION

3.1 EXAMINATION

A. Verify tile has been set and cured according to tile adhesive manufacturer’s recommendations.

B. Surfaces shall be clean, dry, and free of contaminants that may impair grout adhesion.

3.2 PREPARATION

A. Protect adjacent finishes and fixtures from epoxy staining.

B. Mix grout components according to manufacturer's written instructions using clean tools.

3.3 INSTALLATION

A. Apply grout in accordance with ANSI A108.6 and grout manufacturer’s instructions.

B. Force grout into joints using a rubber float held at a 45-degree angle.

C. Remove excess grout promptly and clean tile surface with manufacturer-recommended cleaning agents.

D. Allow grout to cure fully before exposing to water, cleaning, or traffic.

3.4 CLEANING AND PROTECTION

A. Clean grout haze using appropriate cleaning methods without damaging tile or grout,

B. Protect grout from foot traffic, cleaning agents, and moisture until fully cured,

C. Provide temporary barriers or signage to restrict access to grouted areas during cure period,

3.5 MAINTENANCE

A. Provide maintenance instructions for epoxy grout to Owner. Include recommended cleaning products and procedures.

END OF SECTION

CERAMIC TILING

SECTION 09313

PART 1 – GENERAL

1.1 SUMMARY

This section includes porcelain wall tile installation for public restrooms, including setting materials, grout, and accessories.

1.2 REFERENCES

A. American National Science Institute (ANSI) A108/A118/A136 – Specifications for the Installation of Ceramic Tile

B. TCNA Handbook – Tile Council of North America

C. American Society for Testing and Materials (ASTM) C373 – Water Absorption of Ceramic Tile

D. ASTM C1027 – Visible Abrasion Resistance of Glazed Tile

1.3 SUBMITTALS

A. Product data for each tile, adhesive, grout, and accessory

B. Shop drawings showing tile layout and special details

C. Samples of each tile type, color, and finish (minimum 12”x12”)

D. Manufacturer’s installation instructions

E. Maintenance data

1.4 QUALITY ASSURANCE

A. Installer Qualifications: Minimum five (5) years of documented experience in commercial tile installation.

B. Mock-Up: Provide a minimum of 4ft x 4ft sample area for approval by Architect/Owner.

1.5 DELIVERY, STORAGE, AND HANDLING

A. Deliver materials in original, unopened containers with labels intact.

B. Store tile indoors in a dry, well-ventilated area.

C. Handle to prevent damage and contamination.

1.6 PROJECT CONDITIONS

A. Do not install tile until spaces are enclosed and ambient temperature is between 50° F and 90° F.

B. Maintain environmental conditions for 72 hours before and after installation

PART 2 – PRODUCTS

2.1 TILE MATERIALS

A. Wall Tile
   1. Type: Glazed Porcelain Tile
   2. Size: 12” x 24”
   3. Thickness: Minimum 3/8”
   4. Color and Finish: Refer to Plans
   5. Water Absorption: < 0.5% per ASTM C373
   6. Abrasion Resistance: Class III or better per ASTM C1027
   7. Volatile Organic Compound (VOC) Content: Xero-VOC or Low-VOC materials

2.2 MANUFACTURERS

A. Basis of Design Product: Subject to compliance with requirements, provide American Olean, Sunset Falls – Beige, Rectangle, Matte (SF16) or comparable to one (1) of the following:

   1. Daltile
   2. Marazzi
   3. Florida Tile
   4. Porcelanosa
   5. Shaw Floors
   6. MSI

2.3 SETTING MATERIALS

A. Thinset Mortar: ANSI A118.4 or AA118.15 compliant polymer-modified mortar

B. Grout: Sanded or unsanded cementitious grout per ANSI A118.6 or epoxy grout per ANSI A 118.3

C. Waterproof Membrane (if required): ANSI A118.10 compliant

D. Sealant (at movement joints): ASTM C920 Type S, Grade NS

2.4 ACCESSORIES

A. Trim Pieces: Metal edging strips

B. Movement joint profiles: PVC or metal joint strips per TCNA EJ171

PART 3 – EXECUTION

3.1 EXAMINATION

A. Verify substrates are clean, dry, and flat to within 1/8” in 10’.

B. Confirm that substrate is properly cured and ready to receive tile.

3.2 PREPARATION

A. Clean substrate to remove dust, oil, or contaminants.

B. Apply primer or crack isolation membrane as specified.

3.3 INSTALLATION

A. Install tile in accordance with ANSI A108 and TCNA Handbook methods W244 or W241.

B. Layout tile to minimize cuts and ensure symmetry.

C. Maintain consistent joint width, typically 1/8” unless otherwise specified.

D. Use spacers or leveling systems to control alignment and lippage.

E. Install trim and accessories with clean cuts and consistent joints.

F. Grout joints fully and tool flush; clean tile faces promptly.

3.4 EXPANSION AND CONTROL JOINTS

A. Provide per TCNA DJ171 and at all changes in plane.

B. Fill joints with specified sealant; do not grout over movement joints.

3.5 CLEANING AND PROTECTION

A. Clean tile surfaces with neutral pH cleaner; remove excess grout and haze.

B. Protect finished work from damage during construction.

C. Do not use harsh chemicals or acidic cleaners.

3.6 WARRANTY

A. Provide manufacturer's standard warranties for tile and installation materials.

B. Installation warranty: Minimum one (1) year from date of Substantial Completion.

END OF SECTION

PORCELAIN TILE ACCESSORIES

SECTION 09314

PART 1 – GENERAL

1.1 SUMMARY

A. This section includes porcelain tile accessories for public restrooms, including but not limited to:
   1. Edge trims (metal and PVC).
   2. Transition strips.
   3. Inside and outside corner profiles.
   4. Capping and terminating trims.

B. Related Sections:
   1. Section 07920 – Joints Sealants
   2. Section 09300 – Tiling
   3. Section 09910 – Painting

1.2 REFERENCES

A. American National Standards Institute (ANSI) A108/A118/A136 – Specifications for the Installation of Ceramic Tile

B. American Society for Testing and Materials (ASTM) B221 – Aluminum and Aluminum-Alloy Extruded Bars, Rods, Wire, Profiles and Tubes

C. ADA Standards – American with Disabilities Act Accessibility Guidelines

1.3 SUBMITTALS

A. Product Data: Manufacturer’s literature for each accessory type

B. Samples: 12-inch minimum length of each trim profile and color

C. Manufacturer’s Instructions: For installation of tile accessories

D. Warranty: Submit manufacturer’s standard warranty

1.4 QUALITY ASSURANCE

A. Manufacturer Qualifications: Minimum five (5) years of experience in tile

B. Installer Qualifications: Minimum three (3) years of experience with tile and tile accessory installation

1.5 DELIVERY, STORAGE, AND HANDLING

A. Store products in original, unopened packaging.

B. Protect trims from physical damage and contamination.

1.6 WARRANTY

Provide manufacturer’s standard 1-year warranty covering defects in materials and workmanship.

PART 2 – PRODUCTS

2.1 MANUFACTURERS

A. Acceptable manufacturers include, but are not limited to:
   1. Schluter Systems
   2. Progress Profiles
   3. Dural
   4. Custom Building Products

2.2 MATERIALS

A. Edge Trims (Metal)
   1. Material: Anodized aluminum, stainless steel (grade 304 or 316)
   2. Profile: Square, round, or beveled edge per design requirements
   3. Finish: Satin, brushed, or polished as scheduled
   4. Thickness: Compatible with adjacent tile thickness (e.g., 10mm = 12mm)
   5. Slip-resistant, moisture-resistant
   6. For interior use only

B. Corner and Transition Profiles:
   1. Radius or square external corners
   2. Inside corners with continuous finish
   3. Transition strips to resilient flooring or concrete
   4. Cap trims at tile terminations (e.g., wall ends or top edges)

2.3 ACCESSORIES

A. Adhesives and fasteners as recommended by trim manufacturer

B. End caps, pre-formed corners, and connectors for a clean finish

PART 3 – EXECUTION

3.1 EXAMINATION

A. Verify substrate conditions are suitable for installation

B. Confirm tile and accessory compatibility

3.2 INSTALLATION

A. Install accessories in strict accordance with manufacturer's instructions and ANSI standards.

B. Set trims flush and level with adjacent tiles.

C. Ensure tight, clean joints and no visible fasteners unless specified.

D. Maintain uniform alignment and spacing.

E. Coordinate with tile layout to minimize cuts and ensure full tile at edges where possible.

F. Clean exposed surfaces after installation.

G. Protect installed accessories from damage until acceptance.

3.3 CLEANING

A. Clean exposed surfaces with neutral pH detergent.

B. Do not use abrasive or acidic cleaners.

3.4 PROTECTION

Cover and protect edges and corners with temporary guards until completion.

END OF SECTION

SECTION 09680

EPOXY FLOOR COATING OVER EXISTING TILES

PART 1 – GENERAL

1.1 SUMMARY

A. This section covers the surface preparation, materials, and application of a seamless 100% solids epoxy floor coating system over existing ceramic or porcelain floor tiles in a public restroom.

B. Work includes:
   1. Surface cleaning and preparation
   2. Tile and grout joint repair / joint treatment
   3. Crack treatment
   4. Epoxy primer, basecoat, and topcoat application
   5. Optional slip-resistant aggregate broadcast
   6. Curing and protection

1.2 RELATED SECTIONS

A. Section 03300 – Concrete

B. Section 09910 – Painting

1.3 REFERENCES

A. American Society for Testing and Materials (ASTM) C881 – Standard Specification for Epoxy-Resin-Base Bonding Systems

B. ASTM C579 – Resin Compressive Strength

C. ASTM D2047 – Coefficient of Friction Testing

D. ASTM D4541 – Adhesion Strength

E. ASTM F1869 / F2170 – Surface Moisture Testing

F. Occupational Safety and Health Administration (OSHA) Standards for Slip Resistance

G. Manufacturer’s Application Guidelines

1.4 SUBMITTALS

A. Product Data: Manufacturer’s technical data sheets for each product used

B. Samples: Submit two (2) 6” x 6” samples showing color and finish

C. Material Safety Data Sheets (MSDS): Safety Data Sheets for all components

D. Warranty: Submit manufacturer's warranty

E. Contractor’s qualifications, references, and installation procedures

1.5 QUALITY ASSURANCE

A. Installer Qualifications: Minimum three (3) years of experience with similar flooring systems.

B. Pre-Installation Conference: Conduct meeting with Owner and Contractor to review procedures, sequencing, and schedule.

C. Mock-Up: Install sample in an inconspicuous area (6 sq ft minimum). Obtain owner/architect approval

1.6 DELIVERY, STORAGE, AND HANDLING

A. Deliver materials in original, unopened containers with manufacturer's labels.

B. Store in a dry, well-ventilated area between 60° F and 85° F.

C. Protect from direct sunlight and freezing.

1.7 PROJECT CONDITIONS

A. Maintain room temperature between 65° F and 80° F during application and cure.

B. Ensure adequate ventilation throughout the work.

C. Do not proceed with application if surface moisture is present or relative humidity exceeds 85%.

1.8 WARRANTY

A. Provide a 5-year material and labor warranty against delamination, cracking, or failure under normal traffic and maintenance.

PART 2 – PRODUCTS

2.1 MANUFACTURERS

A. Manufacturers: Subject to compliance with requirements, provide products by one (1) of the following:

1. Sika
2. Sherwin-Williams High Performance Flooring
3. BASF
4. Tennant
5. Key Resin
6. Substitutions require prior approval.

2.2 MATERIALS

A. Primer: 100% solids, moisture-tolerant epoxy primer compatible with substrate

B. Epoxy Base Coat: 100% solids, high-build epoxy designed for tile overlays

C. Aggregate (if applicable): Aluminum oxide or silica for slip resistance

D. Topcoat: UV-resistant aliphatic polyurethane or polyaspartic topcoat, satin or matte finish

E. Crack Repair / Joint Filler: Flexible epoxy or polyurethane filler for control joints and tile grout lines

2.3 PERFORMANCE REQUIREMENTS

A. Compressive Strength: > 8,000 psi (ASTM C579)

B. Adhesion: > 1,900 psi (ASTM D4541)

C. Coefficient of Friction (COF): > 0.6 dry and > 0.5 wet (ASTM D2047)

D. Chemical Resistance: Resistant to urine, cleaning agents, and disinfectants

2.4 COLOR

A. Select from manufacturer’s standard color charts. Submit color sample(s) for approval.

PART 3 – EXECUTION

3.1 EXAMINATION

A. Verify that tile substrate is sound, clean, and free of loose or cracked tiles.

B. Test for moisture content using ASTM F2170 or F1869.

C. Notify the Architect of unsatisfactory conditions before proceeding.

3.2 PREPARATION

A. Clean tile thoroughly to remove grease, soap film, and contaminants using mechanical or chemical cleaning.

B. Mechanically abrade tile surface (diamond grind or shot-blast) to create a rough profile for adhesion.

C. Remove loose grout and fill joints and cracks with approved filler.

D. Vacuum surface to remove dust and debris.

3.3 APPLICATION

A. Primer Coat:
   1. Apply primer at manufacturer’s recommended rate (typically 150-250 sq. ft./gal).
   2. Allow proper curing time.

B. Epoxy Base Coat:
   1. Apply 100% solids epoxy using a notched squeegee and back-roll.
   2. Broadcast aggregate if slip resistance is required.

C. Topcoat:
   1. Apply urethane or polyaspartic topcoat for chemical and UV resistance.
   2. Ensure uniform color and finish.

D. Field Quality Control
   1. Verify Adhesion via ASTM D4541 test.
   2. Confirm COF via ASTM D2047 (wet/dry).
   3. Conduct final inspection with architect/owner.

3.4 CURING AND PROTECTION

A. Allow coatings to cure per manufacturer's instructions.

B. Restrict foot traffic for 24 hours, light traffic for 48 hours, and full cure in 5-7 days.

C. Protect finished surface from damage until occupancy.

3.5 CLEANING AND MAINTENANCE

A. Clean with pH-neutral cleaners; avoid abrasive/solvent cleaners.

B. Repair gouges or chips per manufacturer recommendations.

C. Provide maintenance guidelines to owner.

END OF SECTION

PAINTING

SECTION 09910

PART 1 – GENERAL

1.1 SUMMARY

This section includes surface preparation and the application of wall paint systems on interior gypsum board, concrete, and masonry wall surfaces in public restrooms.

1.2 REFERENCES

Comply with the following standards:

A. American Society for Testing and Materials (ASTM) D16 – Standard Terminology for Paint, Related Coatings, Materials, and Applications

B. ASTM D2486 – Standard Test Method for Scrub Resistance of Wall Paints

C. MPI (Master Painters Institute) Standards: MPI #54 (Interior Latex, High Performance Architectural)

D. SSPC – Society for Protective Coatings Surface Preparation Standards

1.3 SUBMITTALS

A. Product Data: Manufacturer’s technical information, preparation requirements, application instructions

B. Color Samples: Submit manufacturer's standard color cards for selection

C. Warranty: Submit manufacturer's warranty for materials

1.4 QUALITY ASSURANCE

A. Applicator Qualifications: Minimum three (3) years of experience with similar work

B. Mock-Up: Apply paint system on a 4 ft x 4 ft sample surface for approval before proceeding

1.5 DELIVERY, STORAGE, AND HANDLING

A. Store materials in manufacturer's original, unopened containers with labels intact.

B. Protect from freezing, moisture, and exposure to direct sunlight.

1.6 PROJECT CONDITIONS

A. Maintain ambient and surface temperatures above 50° F (10° C) during application and for at least 24 hours after application.

B. Provide adequate ventilation during and after application until coatings are fully cured.

PART 2 – PRODUCTS

2.1 ACCEPTABLE MANUFACTURERS

A. Sherwin-Williams

B. Benjamin Moore

C. PPG Paints

D. Approved equal

2.2 MATERIALS

A. Primer
   1. Type: Water-based acrylic latex primer
   2. MPI Standard: MPI #50 or approved equal
   3. Volatile Organic Compounds (VOC): Low-VOC (<50 g/L)

B. Finish Coats
   1. Type: High Performance acrylic enamel or epoxy paint
   2. Sheen: Eggshell or Satin finish for ease of cleaning
   3. MPI Standard: MPI #54 (latex) or MPI#98 (epoxy)
   4. Color: As selected by Architect from manufacturer's standard range
   5. VOC: Low-VOC (<50 g/L preferred)

2.3 PERFORMANCE REQUIREMENTS

A. Washability: Minimum 1000 scrub cycles per ASTM D2486

B. Mildew Resistance: ASTM D5590 rated 10

C. Stain Resistance: Excellent

PART 3 – EXECUTION

3.1 EXAMINATION

A. Verify surfaces are clean, dry, and free of loose material.

B. Confirm wallboard joints and corners are properly sealed.

C. Do not begin painting until unsatisfactory conditions are corrected.

3.2 SURFACE PREPARATION

A. Clean surfaces of dirt, grease, oils, mildew, efflorescence, and other contaminants.

B. Fill holes and cracks with appropriate patching material and sand smooth.

C. For concrete / masonry: Remove laitance and dust with wire brushing or acid etching as required.

3.3 APPLICATION

A. Apply paint in accordance with manufacturer's instructions.

B. Apply primer and two (2) finish coats unless otherwise indicated.

C. Allow sufficient drying time between coats.

D. Finish shall be smooth, uniform in color and sheen, and free of runs, sags, or visible brush marks.

3.4 CLEANING

A. Clean tools and equipment with water immediately after use.

B. Remove paint splatter from adjacent surfaces.

C. Dispose of all waste materials per local environmental regulations.

3.5 PROTECTION

A. Protect painted surfaces from damage during construction.

B. Repair any damage to finished surfaces before project completion.

END OF SECTION

TOILET PARTITIONS

SECTION 10165

PART 1 – GENERAL

1.1 SUMMARY

A. Section includes:

1. Furnishing and installing toilet partitions in public restrooms, including:
   a. Floor-mounted overhead braced toilet compartments
   b. Doors, panels, pilasters, hardware, and fasteners

B. Related Sections:
1. Section 09300 – Tiling
2. Section 09910 – Painting

1.2 SUBMITTALS

A. Product Data: Manufacturer’s technical data for each product specified

B. Shop Drawings: Layout drawings showing partition dimensions, anchorage, and hardware locations

C. Samples: Color samples and finish swatches

D. Maintenance Instructions: Manufacturer’s cleaning and maintenance requirements

1.3 QUALITY ASSURANCE

A. Manufacturer: Minimum five (5) years of experience producing specified systems

B. Installer: Qualified and experienced in installing commercial toilet partitions

1.4 DELIVERY, STORAGE, AND HANDLING

A. Deliver materials in manufacturer's original packaging

B. Store materials in dry, ventilated area protected from damage

1.5 WARRANTY

Manufacturer’s standard 1-year warranty against material and workmanship defects

PART 2 – PRODUCTS

2.1 MANUFACTURERS

A. Acceptable manufacturers:
   1. Bobrick Washroom Equipment, Inc.
   2. Scranton Products
   3. Hadrian Inc.
   4. ASI Global Partitions
   5. Or approved equal

2.2 MATERIALS

A. Solid Plastic (HDPE):
   1. High-density polyethylene (HDPE) resins
   2. Minimum 1” thick panels and doors; 1-1/4” thick pilasters
   3. Color: Submit manufacturer's standard color cards for selection.
   4. Finish: Textured matte finish

B. Alternatives:
   1. Powder-Coated Steel
   2. Plastic Laminate
   3. Stainless Steel

2.3 HARDWARE

A. Stainless steel or heavy-duty chrome-plated zamac

B. Hinges: Gravity-type for self-closing doors

C. Latches: Slide or turn latch with emergency access

D. Coat Hook and Bumper: One (1) per compartment door

E. Fasteners: Vandal-resistant, tamper-proof

2.4 FABRICATION

A. Doors and panels shall be factory-fabricated with pre-drilled holes for hardware

B. Pilasters reinforced to withstand abuse and provide structural rigidity

PART 3 – EXECUTION

3.1 EXAMINATION

A. Verify field conditions and dimensions before beginning installation

B. Confirm that walls and floors are ready to receive toilet partitions

3.2 INSTALLATION

A. Install partitions in accordance with manufacturer's instructions and approved shop drawings.

B. Align partitions level and plumb.

C. Anchor to floor and walls securely using appropriate fasteners.

D. Allow for adjustment and movement as recommended by manufacturer.

3.3 CLEANING AND PROTECTION

A. Clean surfaces of fingerprints, adhesives, and debris.

B. Protect installed partitions from damage until final acceptance.

END OF SECTION

STAINLESS STEEL TOILET PARTITIONS

SECTION 10166

PART 1 – GENERAL

1.1 SUMMARY

A. Section includes:
   1. Stainless steel toilet partitions including panels, pilasters, and doors.
   2. All hardware, anchorage, and accessories for a complete installation.

B. Related Sections:
   1. Section 09300 – Tiling

1.2 REFERENCES

A. American Society for Testing and Materials (ASTM) A240 – Standard Specification for Chromium and Chromium-Nickel Steel Plate, Sheet, and Strip

B. ADAAG – Americans with Disabilities Act Accessibility Guidelines

C. American National Standards Institute (ANSI) / Builders Hardware Manufacturers Association (BHMA) A 156.16 – American National Standard for Cabinet Hardware

1.3 SUBMITTALS

A. Product Data: Manufacturer’s data sheets on each product to be used

B. Shop Drawings: Include layout, dimensions, and anchorage details

C. Samples: Provide sample panel and finish approval

D. Warranty: Submit manufacturer’s standard warranty documents

1.4 QUALITY ASSURANCE

A. Manufacturer Qualifications: Minimum five (5) years of experience in manufacturing toilet partitions.

B. Installer qualifications: Approved by manufacturer or with documented experience installing similar systems.

1.5 DELIVERY, STORAGE, AND HANDLING

A. Deliver materials in factory packaging clearly labeled with manufacturer and product identification.

B. Store in a dry area, elevated off the floor, and protect from damage and moisture.

PART 2 – PRODUCTS

2.1 MANUFACTURERS

A. Bobrick

B. Hadrian

C. ASI Accurate Partition

D. Or Approved equal

2.2 MATERIALS

A. Stainless Steel: Type 304, #4 satin finish, not less than 20-gauge thickness

B. Core Material: Honeycomb or high-density sound-deadening core, bonded to face sheets

C. Pilaster Shoes: 3-piece stainless steel, 4” high minimum

2.3 FABRICATION

A. Doors and panels shall be double-faced, reinforced, and integrally bonded to core.

B. Edges interlocked and welded or glued; corners welded and polished smooth.

C. Doors: Minimum 1” thick; panels and pilasters to match.

D. Height: Standard 58” or as specified.

E. Overhead braced, floor-mounted, ceiling-hung, or floor-to-ceiling configurations as shown on drawings.

2.4 HARDWARE AND ACCESSORIES

A. Hinges: Continuous stainless steel piano hinge or surface-mounted hinge, self-closing, gravity type.

B. Latch: Slide latch with emergency access provision.

C. Door Stop and Bumper: Rubber bumper at stop location.

D. Coat Hook: Combination hook and rubber-tipped bumper.

E. Fasteners: Theft-resistant, tamper-proof screws and bolts.

2.5 FINISHES

A. Stainless steel with satin #4 finish.

B. Anti-graffiti coating optional if specified.

2.6 ACCESSORIES

Provide grab bars, toilet tissue holders, and other accessories as specified in Section 10813 – Toilet Accessories.

PART 3 – EXECUTION

3.1 EXAMINATION

A. Verify site conditions and dimensions prior to installation.

B. Report any discrepancies to the Architect.

3.2 INSTALLATION

A. Install partitions in accordance with manufacturer's instructions and approved shop drawings.

B. Align, level, and securely anchor partition to walls and floors.

C. Maintain ½” clearance at pilaster bottoms and uniform 3/8” to ½” door gaps.

D. Install hardware for proper function; ensure ADA compliance where required.

3.3 ADJUSTING AND CLEANING

A. Adjust doors and hardware for smooth operation.

B. Clean all surfaces with manufacturer-approved stainless steel cleaner.

C. Remove protective film and construction debris.

3.4 PROTECTION

A. Protect installed partitions from damage during remaining construction activities.

B. Touch-up or replace any damaged units before final acceptance.

END OF SECTION

TOILET ACCESSORIES

SECTION 10813

PART 1 – GENERAL

1.1 SUMMARY

A. This section includes furnishing and installation of toilet accessories in public restrooms, including but not limited to:
   1. Toilet paper dispensers
   2. Grab bars
   3. Paper towel dispensers
   4. Soap Dispensers
   5. Waste receptacles
   6. Sanitary napkin disposal units
   7. Mirrors
   8. Baby changing stations (if applicable)

1.2 SUBMITTALS

A. Product Data: Submit manufacturer's product data and installation instructions for each accessory.

B. Shop Drawings: Include locations, mounting heights, and installation details.

C. Samples: Submit samples for items as requested.

D. Warranty: Manufacturer’s standard warranty documentation

1.3 QUALITY ASSURANCE

A. Manufacturer Qualifications: Company specializing in manufacturing toilet accessories with a minimum of five (5) years documented experience.

B. Installer Qualifications: Experienced installer with successful completion of at least three (3) similar projects.

1.4 COORDINATION

A. Coordinate accessory placement with other trades, especially drywall, tile, and plumbing work.

B. Confirm final mounting heights with ADA guidelines and owner’s preferences.

PART 2 – PRODUCTS

2.1 MANUFACTURERS

A. Acceptable Manufacturers (or approved equal)

1. Bobrick Washroom equipment
2. American Specialties, Inc. (ASI)
3. Bradley Corporation
4. Gamco
5. Koala Kare (for baby changing stations)

2.2 MATERIALS

A. Stainless Steel: Type 304, satin finish, corrosion-resistant

B. Fasteners: Vandal-resistant, concealed type. Provide tamper-proof screws where applicable.

2.3 TOILET PAPER DISPENSERS

A. Type: Surface-mounted, dual roll with controlled delivery

B. Material: 18-gauge stainless steel with theft-resistant spindle

C. Example: Bobrick B-274, or equal

2.4 GRAB BARS

A. Type: Straight and L-shaped as required; comply with ADA Standards

B. Size: 1-1/2” diameter, 18”,24”,36”, or 42” lengths as shown on plans.

C. Mounting: Concealed flange with snap-on cover.

D. Load Rating: Minimum 250 lb (113 kg) capacity.

E. Example: Bobrick b-5806 Series, or equal.

2.5 OTHER ACCESSORIES

A. Paper Towel Dispenser: Touch-free, automatic sensor, high-capacity.

B. Soap Dispenser: Wall-mounted, vandal-resistant, 40 oz minimum capacity.

C. Waste Receptacle: Surface-mounted, stainless steel, self-closing cover.

D. Sanitary Napkin Disposal: Surface-mounted, stainless steel, self-closing cover.

E. Mirror: ¼” plate glass, tempered, stainless steel framed, tamper-resistant.

F. Baby Changing Station (if applicable): Wall-mounted, high-density polyethylene, American National Standards Institute (ANSI) compliant.

2.6 ACCESSIBILITY COMPLIANCE

All accessories shall meet the 2010 ADA Standards for Accessible Design, International Code Council (ICC) / ANSI A117.1, and local accessibility codes.

PART 3 – EXECUTION

3.1 EXAMINATION

A. Verify wall substrates are properly prepared to receive accessories.

B. Report any defects or conditions that may affect installation.

3.2 INSTALLATION

A. Install products in accordance with manufacturer's instructions and approved shop drawings.

B. Mount accessories securely using concealed fasteners and blocking where required.

C. Ensure all items are plumb, level, and properly aligned.

D. Coordinate with other trades to avoid conflicts with plumbing, electrical, or tile work.

3.3 ADJUSTING AND CLEANING

A. Remove labels and protective coverings.

B. Clean accessories with manufacturer-approved products.

C. Replace damaged or defective units before final acceptance.

3.4 PROTECTION

A. Protect installed accessories from damage during the remainder of construction.

END OF SECTION

SECTION 15442

COMMERCIAL LAVATORIES

PART 1 – GENERAL

1.1 SUMMARY

A. Section Includes:
   1. Lavatories
   2. Faucets
   3. Supply fittings
   4. Waste fittings
   5. Supports

1.2 ACTION SUBMITTALS

A. Product Data: For each type of product
   1. Include construction details, material descriptions, dimensions of individual components and profiles, and finish for lavatories.
   2. Include rated capacities, operating characteristics, electrical characteristics, and furnished specialties and accessories.

B. Sustainable Design Submittals
   1. Product Data: For water consumption

C. Shop Drawings: Include diagrams for power, signal, and control wiring of automatic faucets.

1.3 INFORMATIONAL SUBMITTALS

A. Coordination Drawings: Counter cutout templates for mounting of counter-mounted lavatories.

1.4 CLOSEOUT SUBMITTALS

A. Operation and Maintenance Data: For lavatories and faucets to include in operation and maintenance manuals, include servicing and adjustments of automatic faucets.

1.5 MAINTENANCE MATERIAL SUBMITTALS

A. Furnish extra materials that match products installed and that are packaged with protective covering for storage and identified with labels describing contents.
   1. Faucet Washers and O-Rings: Equal to 10 percent of amount of each type and size installed.

   2. Faucet Cartridges and O-Rings: Equal to 10 percent of amount of each type and size installed.

PART 2 – PRODUCTS

2.1 STAINLESS STEEL, WALL-MOUNTED LAVATORIES

A. Lavatory: Stainless steel, wall mounted.
   1. Basis of Design Product: Subject to compliance with requirements, provide Acorn Engineering; Morris Group International; Dura-Ware model 1953-LC or comparable to one of the following:
      a. Metcraft Industries, Inc.
      b. Willoughby Industries.
   2. Fixture:
      a. Applicable Standards:
         1) American Society of Mechanical Engineers (ASME) A112.19.1 / Canadian Standards Association (CSA) B45.2
         2) International Code Council (ICC) A117.1
         3) National Sanitary Foundation (NSF) / American National Standards Institute (ANSI) 61, NSF / ANSI 372
      b. Material: 16-gauge thickness, TYPE 304 stainless steel
      c. Finish: No. 4 satin finish on exposed surfaces
      d. Receptor: Provide manufacturer's standard unit shape and configuration for each model number furnished. Provide units with integral soap depression and integral backsplash.
      e. Hot- and Cold-Water Supply Valves:
         1) Type: Pneumatic, metering type with push-button actuation and individual check stops complying with ASME A112.18.1/CSA B125.1.
         2) Temperature: Single temperature.
      f. Valve Water Outlet:
         1) Deck-mounted spout
         2) Centerset faucet with spout
      g. Drain: 1-1/2 inch (38 mm) punching
      h. Waste Connection: Tubular P-trap with 1-1/2 inch (38 mm) OD plain-end
   3. Accessories:
      a. Angle braces
      b. Brass valve body
      c. 14-gauge housing
      d. Integral shelf
      e. Lavatory overflow

f. Elbow enclosure
g. Integral Transformer: 120 V ac to 24 V ac

4. Mounting:
   a. Wall-Mounted: Installed from fixture side to reinforced wall with backing to match manufacturers' mounting locations.
   b. Carrier Support: Lavatory carrier with fixture support arms, fixture bolts and hardware matching fixture. Includes rectangular, steel uprights.

2.2 VITREOUS-CHINA, WALL-MOUNTED LAVATORIES

A. Lavatories: Vitreous china, wall mounted, with back.
   1. Manufacturers: Subject to compliance with requirements, provide products by one (1) of the following:
      a. American Standard
      b. Briggs Plumbing Products, Inc
      c. Gerber Plumbing Fixtures LLC
      d. Kohler Co
      e. Mansfield Plumbing Products LLC
      f. Peerless Pottery Sales, Inc
      g. Sloan Valve Company
      h. Zurn Industries, LLC.
   2. Fixtures:
      a. Standard: ASME A112.19.2/CSA B45.1
      b. Type: For wall hanging
      c. Nominal Size: Oval, 19 by 16 inches (483 by 406 mm)
      d. Faucet-Hole Punching: One hole
      e. Faucet-Hole Location: Top
      f. Color: White
      g. Mounting Material: Chair Carrier
   3. Faucets: Solid Brass, Manually Operated Faucets
   4. Supports: Type II, concealed-arm lavatory carrier with escutcheons. Include rectangular, steel uprights.
   5. Lavatory Mounting Height: Handicapped/elderly in accordance with ICC A117.1

B. Lavatories: Ledge back, vitreous china, wall mounted
   1. Manufacturers: Subject to compliance with requirements, provide products by one (1) of the following:
      a. American Standard
      b. Briggs Plumbing Products, Inc
      c. Gerber Plumbing Fixtures LLC
      d. Kohler Co
      e. Mansfield Plumbing Products LLC
      f. Peerless Pottery Sales, Inc
      g. Sloan Valve Company

   2. Fixtures:
      a. Standard: ASME A112.19.2/CSA B45.1

b. Type: For wall hanging
c. Nominal Size: Oval, 19 by 16 inches (483 by 406 mm)
d. Faucet-Hole Punching: One hole
e. Faucet-Hole Location: Top
f. Color: White
g. Mounting Material: Chair carrier

3. Faucets: Solid Brass, Manually Operated Faucet
4. Supports: Type II, concealed-arm lavatory carrier with escutcheons. Include rectangular, steel uprights.
5. Lavatory Mounting Height: Handicapped/elderly in accordance with ICC A117.1

C. Lavatory: Wheelchair, vitreous china, wall mounted
1. Manufacturers: Subject to compliance with requirements, provide products by one (1) of the following:
a. American Standard
b. Gerber Plumbing Fixtures LLC.
c. Kohler Co.
d. Mansfield Plumbing Products LLC.
e. Peerless Pottery Sales, Inc.
f. Sloan Valve Company
g. Zurn Industries, LLC
2. Fixtures:
a. Standard: ASME A112.19.2/CSA B45.1.
b. Type: Slab or wheel chair.
c. Nominal size: Rectangular, 27 by 20 inches (686 by 508 mm)
d. Faucet-Hole Punching: Three holes, 2inch (51 mm) centers.
e. Faucet-Hole Location: Top.
f. Color: White.
g. Mounting: For concealed-arm carrier.
3. Faucets: Solid-Brass, Manually Operated Faucets
4. Supports: Type II, concealed-arm lavatory carrier with escutcheon (shield or emblem). Include rectangular, steel uprights.
5. Lavatory Mounting Height: Handicapped/elderly in accordance with ICC A117.1

2.3 SOLID BRASS, MANUALLY OPERATED FAUCETS

A. NSF Standard: Comply with NSF 372 for faucet materials that will be in contact with potable water.

B. Lavatory Faucets: Manual-type, single-control nonmixing, commercial, solid-brass valve.
1. Manufacturers: Subject to compliance with requirements, provide products by one of the following:
a. American Standard.
b. CHG; Component Hardware Group, Inc.
c. Chicago Faucets; Geberit Company
d. Delta Faucet Company

e. Elkay Manufacturing Co.
f. Gerber Plumbing Fixtures LLC.
g. GROHE America, Inc.
h. Just Manufacturing
i. Kohler Co.
j. Moen Incorporated
k. Speakman Company
l. T&S Brass and Bronze Works, Inc
m. Zurn Industries, LLC

2. Standard: ASME A112.18.1/CSA B125.1.
3. General: Include hot-and cold-water indicators; coordinate faucet inlets with supplies and fixture hole punchings; coordinate outlet with spout and fixture receptor.
4. Body Type: Single hole
5. Body Material: Commercial, solid brass
6. Finish: Polished chrome plate
7. Maximum Flow Rate: 0.5 gpm (1.5 L/min.)
8. Maximum Flow: 0.25 gal. (0.95 L) per metering cycle.
9. Mounting Type: Deck, exposed.
10. Valve Handle: Push button
11. Spout: Rigid
12. Spout Outlet: Aerator
13. Operation: Compression, manual
14. Drain: Not part of faucet.

2.4 SOLID-BRASS, AUTOMATICALLY OPERATED LAVATORY FAUCETS

A. NSF Standard: Comply with NSF 372 for faucet materials that will be in contact with potable water

B. Lavatory Faucets: Automatic-type, battery-powered, electronic-sensor-operated, nonmixing, solid-brass valve
1. Manufacturers: Subject to compliance with requirements, provide products by one of the following:
a. Advanced Modern Technologies Corporation – AMTC
b. American Standard
c. Bradley Corporation
d. Chicago Faucets, Geberit Company
e. Gerber Plumbing Fixtures LLC
f. GROHE America, Inc
g. Hydrotek International, Inc
h. Kohler Co
i. Moen Incorporated
j. Sloan Valve Company
k. Speakman Company
l. Stern Engineering Ltd
m. T&S Brass and Bronze Works, Inc

n. TOTO USA, INC
o. Zurn Industries, LLC

2. Standards: ASME A112.18.1/CSA B125.1 and UL 1951.
3. Electrical Components, Devices, and Accessories: Listed and labeled as defined in National Fire Protection Association (NFPA) 70, by a qualified testing agency, and marked for intended location and application.
4. General: Include hot-and cold-water indicators; coordinate faucet inlets with supplies and fixture hole punchings; coordinate outlet with spout and fixture receptor.
5. Body Type: Single hole
6. Body Material: Commercial, solid brass
7. Finish: Polished chrome plate
8. Maximum Flow Rate: 0.5 gpm (1.5 L/min)
9. Mounting Type: Deck, concealed
10. Spout: Rigid
11. Spout Outlet: Aerator
12. Drain: Not part of faucet

2.5 SUPPLY FITTINGS

A. NSF Standard: Comply with NSF 372 for supply-fitting materials that will be in contact with potable water.

B. Standard: ASME A112.18.1/CSA B125.1.

C. Supply Piping: Chrome-plated-brass pipe or chrome-plated copper tube matching water-supply piping size. Include chrome-plated-brass or stainless steel wall flange.

D. Supply Stops: Chrome-plated-brass, one-quarter-turn, ball-type or compression valve with inlet connection matching supply piping.

E. Operation: Loose key

F. Risers:
1. NPS 3/8 (DN 10)
2. ASME A112.18.6, braided- or corrugated-stainless steel, flexible hose riser

2.6 WASTE FITTINGS

A. Standard: ASME A112.18.2/CSA B125.2

B. Drain: Grid type with NPS 1-1/4 (DN 32) offset and straight tailpiece

C. Trap:
1. Size: NPS 1-1/2 by NPS 1-1/4 (DN by DN 32)

2. Material: Chrome-plated, 2-piece, cast-brass trap and swivel elbow with 0.032 inch (0.83mm) thick brass tube to wall; and chrome-plated, brass or steel wall flange
3. Material: Stainless steel, 2-piece trap and swivel elbow with 0.012 inch (0.30 mm) thick stainless steel tube to wall; and stainless steel wall flange

2.7 SUPPORTS

A. Type II Lavatory Carrier:
1. Manufacturers: Subject to compliance with requirements, provide products by one (1) of the following:
a. Jay R. Smith Mfg. Co.
b. Josam Company
c. MIFAB, Inc.
d. Wade Drains
e. Watts; a Watts Water Technologies company
f. Zurn Industries, LLC

2. Standard: ASME A112.6.1M

B. Type III Lavatory Carrier:
1. Manufacturers: Subject to compliance with requirements, provide products by one (1) of the following:
a. Jay R. Smith Mfg. Co.
b. Josam Company
c. MIFAB, Inc.
d. Wade Drains
e. Watts; a Watts Water Technologies company
f. Zurn Industries, LLC.

2. Standard: ASME A112.6.1M

PART 3 – EXECUTION

3.1 EXAMINATION

A. Examine roughing-in of water supply and sanitary drainage and vent piping systems to verify actual locations of piping connections before lavatory installation.

B. Examine counters and walls for suitable conditions where lavatories will be installed.

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

3.2 INSTALLATION

A. Install lavatories level and plumb in accordance with roughing-in drawings.

B. Install supports, affixed to building substrate, for wall-mounted lavatories.

C. Install accessible wall-mounted lavatories at handicapped/elderly mounting height for people with disabilities or the elderly, in accordance with ICC/ANSI A117.1.

D. Install wall flanges or escutcheons at piping wall penetrations in exposed, finished locations. Use deep-pattern escutcheons if required to conceal protruding fittings.

E. Seal Joints between lavatories counters, and walls using sanitary-type, one-part, mildew-resistant silicone sealant. Match sealant color to fixture color. Comply with sealant requirements specified in Section 07920 - Joint Sealants.

F. Install protective shielding pipe covers and enclosures on exposed supplies and waste piping of accessible lavatories.

3.3 CONNECTIONS

A. Connect fixtures with water supplies, stops, and risers, and with traps, soil, waste, and vent piping. Use size fittings required to match fixtures.

B. Comply with requirements specified in State of Hawaii and County of Maui Plumbing Code.

3.4 ADJUSTING

A. Operate and adjust lavatories and controls. Replace damaged and malfunctioning lavatories, fittings, and controls.

B. Adjust water pressure at faucets to produce proper flow.

C. Install fresh batteries in battery-powered, electronic-sensor mechanisms.

3.5 CLEANING AND PROTECTION

A. After completing installation of lavatories, inspect and repair damaged finishes.

B. Clean lavatories, faucets, and other fittings with manufacturers' recommended cleaning methods and materials.

C. Provide protective coverings for installed lavatories and fittings.

D. Do not allow use of lavatories for temporary facilities unless approved in writing by Owner.

END OF SECTION

COMMERCIAL URINALS

SECTION 15445

PART 1 – GENERAL

1.1 SUMMARY

A. Section includes:
   1. Wall-hung urinals
   2. Urinal flushometer valves
   3. Supports

1.2 ACTION SUBMITTALS

A. Product Data for each type of product
   1. Include construction details, material descriptions, dimensions of individual components and profiles, and finishes for urinals.
   2. Include rated capacities, operating characteristics, electrical characteristics, and furnished specialties and accessories.

1.3 CLOSEOUT SUBMITTALS

A. Operation and Maintenance Data: For flushometer valves and electronic sensors to include in operation and maintenance manuals.

1.4 MAINTENANCE MATERIAL SUBMITTALS

A. Furnish extra materials that are packaged with protective covering for storage and identified with labels describing contents.
   1. Flushometer-Valve Repair Kits: Equal to 10 percent of amount of each type installed, but no fewer than six (6) of each type.

PART 2 – PRODUCTS

2.1 WALL-HUNG URINALS

A. Urinals – Wall Hung, Back Outlet, Washout:
   1. Basis of Design Product: Subject to compliance with requirements, provide Acorn Engineering; Morris Group International; Dura-Ware Model 2158 or comparable product by one (1) of following:

      a. Metcraft Industries, Inc.
      b. Willoughby Industries

2. Urinal Fixture:

    a. Standards:
        1) American Society of Mechanical Engineers (ASME) A112.19.3/ Canadian Standards Association (CSA) B45.4
        2) International Codes Council (ICC) A117.1
    b. Material: 16 gauge minimum thickness, Type 304 stainless steel.
    c. Finish: No. 4 satin finish on exposed surfaces, and matte finish on interior wetted surfaces.
    d. Bowl:
        1) Type: Washout, with back wall washdown
        2) Rim Height: 20 inches (508 mm), straddle configuration, above finished floor
        3) Rim Height for ADA-Compliant Installation: 17 inches (432 mm) above finished floor, straddle fixture configuration.
    e. Water Inlet Connection:
        1) Washout: ¾ National Pipe Thread (NPT), top spud.
        2) Washout Trough: 1-1/2 NPT, top spud
    f. Back Outlet Connection: Nominal Pipe Size (NPS) 2 (DN 50) P-trap with O-ring adapter for 2-inch connection.
    g. Water Consumption, Washout Fixtures: 0.5 gal (1.9L), high-efficiency 1.5 gal (5.7 L) per flush.
    h. Supply Pressure: 25 psig (172 kPa), minimum
    i. Drain: Beehive dome strainer, tamper-resistant fasteners.
    j. Mounting: Installed from fixture side to reinforced wall with backing that matches fixture-mounting locations.
3. Flushometer Valve:
    a. Flushometer-Valve Type: Mechanical
    b. Flushometer-Valve Accessories: Top supply flush valve cover
    c. Inlet Connection: NPS ¾ [Diameter Nominal (DN) 19], top spud
    d. Power: 120 Vac
4. Accessories:
    a. Flush valve through wall connection
    b. Waste Adapter to 2 inch NPT, female thread
    c. Waste Adapter to 2 inch NPT, male thread
    d. Waste Adapter to 2 inch NPT, female thread
    e. Waste Adapter to NPS 2, no-hub
    f. Transformer: 120 v ac to 24 V ac

B. Urinals – Wall Hung, Back Outlet, Washdown:
1. Manufacturers: Subject to compliance with requirements, provide products by one of the following:
    a. American Standard
    b. Kohler Co.

2. Fixtures:
    a. Standards: ASME A112.19.2/CSA B45.1 and ASME A112.19.5/CSA B45.15

b. Material: Vitreous China
c. Drain: Separate removable chrome-plated dome strainer with chrome-plated, NPS 1-1/2 (DN 40) tailpiece.
d. Strainer or Trapway: Manufacturer's standard strainer and NPS 1-1/2 (DN 40) tailpiece.
e. Inlet Spud Size and Location: NPS ¾ (DN 20); top
f. Outlet Size and Location: NPS 1-1/2 (DN 40); bottom
g. Color: White
h. Water Consumption: 1.0 gpf (3.8 Lpf).

3. Flushometer Valves:
   a. Flushometer-Valve Type: Mechanical
   b. Flushometer-Valve Accessories: Top supply flush valve cover
   c. Inlet Connection: NPS ¾ (DN 19), top spud
   d. Power: 120 Vac
4. Waste Fittings:
   a. Standard: ASME A112.18.2/CSA B125.2 for coupling
   b. Traps
      1) Size: NPS 2 (DN 50)
      2) Material, Chrome Plated: 2-piece, cast-brass trap and swivel elbow with 0.032-inch (0.83 mm) thick brass tube to wall; and chrome-plated brass or steel wall flange.
      3) Material, Stainless Steel; 2-piece trap and swivel elbow with 0.012-inch (0.30-mm) thick, stainless steel tube to wall; and stainless steel wall flange.
5. Supports: Type I urinal carrier with fixture support plates and coupling with seal and fixture bolts and hardware matching fixture. Includes rectangular, steel uprights.
6. Urinal Mounting Height: Handicapped/elderly in accordance with ICC A117.1

2.2 URINAL FLUSHOMETER VALVES

A. Lever-Handle, Piston Flushometer Valves:
   1. Manufacturers: Subject to compliance with requirements, provide products by one (1) of the following:
      a. American Standard
      b. Delany Products
      c. Kohler Co
      d. TOTO USA, INC.
      e. Zurn Industries, LLC
   2. Standard: ASME 1037/ASME 112.1037/CSA B125.37
   3. Minimum Pressure Rating: 125 psig (860 kPa)
   4. Features: Include integral check stop and backflow-prevention device
   5. Material: Brass body with corrosion-resistant components
   6. Exposed Flushometer-Valve Finish: Chrome plated.
   7. Panel Finish: Chrome plated or stainless steel
   8. Style: Exposed
   9. Consumption: 1.0 gal (3.8 L) per flush

10. Minimum Inlet: NPS ¾ (DN 20)
11. Minimum Outlet: NPS 1-1/4 (DN 32)

2.3 SUPPORTS

A. Type I Urinal Carrier:
   1. Manufacturers: Subject to compliance with requirements, provide products by one (1) of the following:
      a. Jay R. Smith Mfg Co.; a division of Morris Group International
      b. Josam Company
      c. MIFAB, Inc.
      d. Wade Drains
      e. WATTS
      f. Zurn Industries, LLC.
   2. Standard: ASME A112.6.1M

B. Type II Urinal Carrier:
   1. Manufacturers: Subject to compliance with requirements, provide by one (1) of the following:
      a. Jay R. Smith Mfg Co; a division of Morris Group International
      b. Josam Company
      c. MIFAB, Inc.
      d. Wade Drains
      e. WATTS
      f. Zurn Industries, LLC.
   2. Standard: ASME A112.6.1M

C. Type I Sink Carrier:
   1. Manufacturers: Subject to compliance with requirements, provide by one (1) of the following:
      a. Jay R. Smith Mfg Co; a division of Morris Group International
      b. Josam Company
      c. MIFAB, Inc.
      d. Wade Drains
      e. WATTS
      f. Zurn Industries, LLC.
   2. Standard: ASME A112.6.1M

PART 3 – EXECUTION

3.1 EXAMINATION

A. Examine roughing-in of water supply and sanitary drainage and vent piping systems to verify actual locations of piping connections before urinal installation.

B. Examine walls and floors for suitable conditions where urinals will be installed.

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

3.2 INSTALLATION

A. Urinal Installation:
   1. Install urinals level and plumb in accordance with rough-in drawings.

   2. Install wall hung, back-outlet urinals onto waste fitting seals and attached to supports.

   3. Install accessible, wall mounted urinals at mounting height for the handicapped/elderly, in accordance with ICC A117.1

B. Support Installation:
   1. Install supports, affixed to building substrate, for wall-hung urinals.

   2. Use off-floor carriers with waste fitting and seal for back-outlet urinals.

   3. Use carriers without waste fitting for urinals with tubular waste piping.

   4. Use chair-type carrier supports with rectangular steel uprights for accessible urinals.

C. Flushometer-Valve Installation:
   1. Install flushometer-valve water-supply fitting on each supply to each urinal.

   2. Attach supply piping to supports or substrate within pipe spaces behind fixtures.
      a. Install lever-handle flushometer valves for accessible urinals with handle mounted on open side of compartment.
      b. Install fresh batteries in battery-powered, electronic-sensor mechanisms.

D. Wall Flange and Escutcheon Installation:
   1. Install wall flanges or Escutcheons at piping wall penetrations in exposed, finished locations.

   2. Install deep-pattern Escutcheons if required to conceal protruding fittings.

E. Joint Sealing:
   1. Seal joints between urinals and walls and floors using sanitary-type, one-part, mildew-resistant silicone sealant.

   2. Match sealant color to urinal color.

   3. Comply with sealant requirements specified in Section 07920 - Joint Sealants.

3.3 PIPING CONNECTIONS

A. Coordinate piping installations and specialty arrangements with Drawings and with requirements specified in piping systems. If Drawings are explicit enough, these requirements may be reduced or omitted.

B. Connect urinals with water supplies and soil, waste, and vent piping. Use size fittings required to match urinals.

C. Where installing piping adjacent to urinals, allow space for service and maintenance.

3.4 ADJUSTING

A. Operate and adjust urinals and controls. Replace damaged and malfunctioning urinals, fittings, and controls.

B. Adjust water pressure at flushometer valves to produce proper flow.

C. Install fresh batteries in battery-powered, electronic-sensor mechanisms.

3.5 CLEANING AND PROTECTION

A. Clean urinals and fittings with manufacturers' recommended cleaning methods and materials.

B. Install protective covering for installed urinals and fittings.

C. Do not allow use of urinals for temporary facilities unless approved in writing by Owner.

END OF SECTION

COMMERCIAL WATER CLOSETS

SECTION 15446

PART 1 – GENERAL

1.1 SUMMARY

A. Section includes:
   1. Wall-mounted water closets
   2. Flushometer valves
   3. Toilet seats
   4. Supports

1.2 DEFINITIONS

A. Effective Flush Volume: Average of two (2) reduced flushes and one (1) full flush per fixture.

B. Remote Water Closet: Located more than 30 ft (9.1m) from other drain line connections or fixture and where less than 1.5 drainage fixture units are upstream of the drain line connection.

1.3 ACTION SUBMITTALS

A. Product Data: For each type of product.
   1. Include construction details, material descriptions, dimensions of individual components and profiles, and finishes for water closets.
   2. Include rated capacities, operating characteristics, electrical characteristics, and furnished specialties and accessories.

B. Sustainable Design Submittals:
   1. Product Data: For water consumption.

C. Shop Drawings: Include diagrams for power, signal, and control wiring.

1.4 CLOSEOUT SUBMITTALS

A. Operation and Maintenance Data: For flushometer valves and electronic sensors to include in operation and maintenance manuals.

1.5 MAINTENANCE MATERIAL SUBMITTALS

A. Furnish extra materials that are packaged with protective covering for storage and identified with labels describing contents.
   1. Flushometer-Valve Repair Kits: Equal to 10 percent of amount of each type installed, but no fewer than six of each type.

PART 2 – PRODUCTS

2.1 WALL-MOUNTED WATER CLOSETS

A. Water Closets, Wall Mounted, Top Spud, Accessible
   1. Basis-of-Design Product: Subject to compliance with requirements, provide Acorn Engineering; Morris Group International, model 2100-T-1 or comparable product by one (1) of the following:
      a. Metcraft Industries, Inc.
      b. Willoughby Industries.
   2. Water Closet:
      a. Applicable Standards:
         1) American Society of Mechanical Engineers (ASME) A112.19.3/ Canadian Standards Association (CSA) B45.4
         2) Cal Green
         3) EPA WaterSense Specifications for High Efficiency Flushometer Water Closets
         4) International Codes Council (ICC) A117.1
         5) U.S. Energy Policy Act of 1992 for Water Closets
      b. Bowl:
         1) Type: Elongated, with top inlet, integral trap, and integral contoured seat surface.
         2) Material: 16 gauge minimum-thickness, Type 304 stainless steel.
         3) Finish: No. 4 satin finish on exposed surfaces.
         4) In “Seat Surface” Subparagraph below, No. 4 satin finish is standard. No. 8 finish and plastic hinged toilet seat selections are options.
         5) Seat Surface: Plastic hinged toilet seat, open front, less cover.
         6) Coordinate “Support” Subparagraph below with “Supports” Article.
         7) Support: Water closet carrier
         8) Rim Height: 15 inches (381 mm) above finished floor.
         9) Rim Height for ADA-Compliant Installation: 18 inches (457 mm) above finished floor.
      c. Wall Outlet Waste Connection: Nominal Pipe Size (NPS) 2 inches (DN 50), extended 3 inches (76 mm) beyond back of unit
      d. Water Consumption: 1.6 gal (6 L) per flush
      e. Spud Size and Location: NPS 1-1/2 [Diametre Nominal (DN) 40] ; top
      f. Supply Pressure: 25 psig (172 kPa), minimum
   3. Flushometer Valve: Mechanical type
      a. Flushometer-Valve Accessories: ADA lever handle
   4. Accessories:
      a. 14 gauge housing
      b. Bedpan lugs
      c. Blind cap nuts
      d. Cap nuts
      e. Toilet shipping cover
      f. Transformer: 120 V ac to 24 V ac
      g. Vacuum flush system

2.2 FLUSHOMETER VALVES

A. Lever-Handle, Diaphragm Flushometer Valves.
   1. Manufacturers: Subject to compliance with requirements, provide products by one of the following:
      a. Advanced Modern Technologies Corporation – AMTC
      b. Delany Products
      c. Gerber Plumbing Fixtures LLC
      d. Sloan Valve Company
      e. Zurn Industries, LLC
   2. Standard: American Society of Sanitary Engineering (ASSE) 1037
   3. Minimum Pressure Rating: 125 psig (860 kPa)
   4. Features: Include integral check stop and backflow-prevention device
   5. Material: Brass body with corrosion resistant components
   6. Exposed Flushometer-Valve Finish: Chrome plated
   7. Panel Finish: Chrome plated or stainless steel
   8. Style: Exposed
   9. Consumption: 3.5 gal. (13.2 L) per flush
   10. Minimum Inlet: NPS 1 (DN 25)
   11. Minimum Outlet: NPS 1-1/4 (DN 32)

B. Solenoid-Actuator, Diaphragm Flushometer Valves:
   1. Manufacturers: Subject to compliance with requirements, provide products by one of the following:
      a. Delany Products
      b. Gerber Plumbing Fixtures LLC
      c. Sloan Valve Company
      d. Zurn Industries, LLC
   2. Standard: American Society of Sanitary Engineers (ASSE) 1037
   3. Minimum Pressure Rating: 125 psig (860 kPa)
   4. Features: Include integral check stop and backflow-prevention device
   5. Material: Brass body with corrosion resistant components
   6. Exposed Flushometer-Valve Finish: Chrome plated
   7. Panel Finish: Chrome plated or stainless steel
   8. Style: Exposed
   9. Actuator: Solenoid complying with Underwriters Laboratories (UL) 1951, and listed and labeled as defined in National Fire Protection Association (NFPA) 70, by a qualified testing agency, and marked for intended location application.
   10. Trip Mechanism: Battery-powered electronic sensor complying with UL 1951, and listed and labeled as defined in NFPA 70, by a qualified testing agency, and marked for intended location and application.
   11. Consumption: 3.5 gal. (13.2 L) per flush.
   12. Minimum Inlet: NPS 1 (DN 25)
   13. Minimum Outlet: NPS 1-1/4 (DN 32)

C. Lever-Handle, Piston Flushometer Valves:
   1. Manufacturers: Subject to compliance with requirements, provide products by one (1) of the following:
      a. American Standard
      b. Delany Products
      c. Kohler Co.
      d. Sloan Valve Company
      e. TOTO USA, INC.
      f. Zurn Industries, LLC.
   2. Standard: ASSE 1037
   3. Minimum Pressure Rating: 125 psig (860 kPa)
   4. Features: Include integral check stop and backflow-prevention device
   5. Material: Brass body with corrosion resistant components
   6. Exposed Flushometer-Valve Finish: Chrome plated
   7. Panel Finish: Chrome plated or stainless steel
   8. Style: Exposed
   9. Actuator: Solenoid complying with UL 1951, and listed and labeled as defined in NFPA 70, by a qualified testing agency, and marked for intended location application.
   10. Trip Mechanism: Battery-powered electronic sensor complying with UL 1951, and listed and labeled as defined in NFPA 70, by a qualified testing agency, and marked for intended location and application.
   11. Consumption: 3.5 gal. (13.2 L) per flush.
   12. Minimum Inlet: NPS 1 (DN 25)
   13. Minimum Outlet: NPS 1-1/4 (DN 32)

D. Battery-Powered, Solenoid-Actuator, Piston Flushometer Valves
   1. Manufacturers: Subject to compliance with requirements, provide products by one (1) of the following:
      a. American Standard
      b. Delany Products
      c. Gerber Plumbing Fixtures LLC
      d. Hydrotek International, Inc
      e. Kohler Co
      f. Moen Incorporated
      g. Sloan Valve Company
      h. Stern Engineering Ltd
      i. TOTO USA, INC
      j. Zurn Industries, LLC
   2. Standard: ASSE 1037
   3. Minimum Pressure Rating: 125 psig (860 kPa)
   4. Features: Include integral check stop and backflow-prevention device
   5. Material: Brass body with corrosion resistant components
   6. Exposed Flushometer-Valve Finish: Chrome plated
   7. Panel Finish: Chrome plated or stainless steel

8. Style: Exposed
9. Actuator: Solenoid complying with Underwriters Laboratory (UL) 1951, and listed and labeled as defined in NFPA 70, by a qualified testing agency, and marked for intended location application.
10. Trip Mechanism: Battery-powered electronic sensor complying with UL 1951, and listed and labeled as defined in NFPA 70, by a qualified testing agency, and marked for intended location and application.
11. Consumption: 3.5 gal. (13.2 L) per flush.
12. Minimum Inlet: NPS 1 (DN 25)
13. Minimum Outlet: NPS 1-1/4 (DN 32)

2.3 TOILET SEATS

A. Toilet Seats:
1. Manufacturers: Subject to compliance with requirements, provide products by one (1) of the following:
   a. American Standard
   b. Bemis Manufacturing Company
   c. Centoco Manufacturing Corporation
   d. Church Seats; Bemis Manufacturing Company
   e. Jones Stephens Corp
   f. Kohler Co.
   g. Olsonite Seat Co.
   h. Sanderson Plumbing Products, Inc.
   i. Sperzel of Lexington
   j. TOTO USA, INC.
   k. Zurn Industries, LLC.
2. Standard: IAPMO/ANSI Z124.5
3. Material: Plastic
4. Type: Commercial Heavy Duty
5. Shape: Elongated rim, open front
6. Hinge: Self-sustaining
7. Hinge Material: Noncorroding metal
8. Seat Cover: Not required
9. Color: White

2.4 SUPPORTS

A. Water Closet Carrier:
1. Manufacturers: Subject to compliance with requirements, provide products by one (1) of the following:
   a. Josam Company
   b. Zurn Industries, LLC
2. Standard: ASME A112.6.1M
3. Description: Waste-fitting assembly, as required to match drainage piping material and arrangement with faceplates, coupling gaskets, and feet; bolts and hardware matching

fixture. Include additional extension coupling, faceplate, and feet for installation in wide pipe space.

PART 3 – EXECUTION

3.1 EXAMINATION

A. Examine roughing-in of water supply and sanitary drainage and vent piping systems to verify actual locations of piping connections before water-closet installation.

B. Examine walls and floors for suitable conditions where water closets will be installed.

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

3.2 INSTALLATION, GENERAL

A. Water-closet Installation:

1. Install level and plumb in accordance with roughing-in drawings
2. Install accessible, wall-mounted water closets at mounting height for handicapped/elderly, in accordance with ICC/ANSI A117.1.

B. Support Installation:

1. Install supports, affixed to building substrate, for floor-mounted, back-outlet water closets.
2. Use carrier supports with waste-fitting assembly and seal.
3. Install floor-mounted, back-outlet water closets attached to building floor substrate, onto waste-fitting seals; and attach to support.
4. Install wall-mounted, back-outlet water-closet supports with waste-fitting assembly and waste-fitting seals; and affix to building substrate.

C. Flushometer-Valve Installation:

1. Install flushometer-valve, water-supply fitting on each supply to each water closet.
2. Attach supply piping to supports or substrate within pipe spaces behind fixtures.
3. Install lever-handle flushometer valves for accessible water closets with handle mounted on open side of water closet.
4. Install actuators in locations that are easy for people with disabilities to reach.
5. Install fresh batteries in battery-operated, electronic-sensor mechanisms.

D. Install toilet seats on water closets.

E. Wall Flange and Escutcheon Installation:

1. Install wall flanges or escutcheons at piping wall penetrations in exposed, finished locations and within cabinets and millwork.
2. Install deep-pattern escutcheons if required to conceal protruding fittings.

F. Joint Sealing:

1. Seal joints between water closets and walls and floors using sanitary-type, one-part, mildew-resistant silicone sealant.
2. Match sealant color to water-closet color.
3. Comply with sealant requirements specified in Section 07920 “Joint Sealants”

3.3 CONNECTIONS

A. Connect water closets with water supplies and soil, waste, and vent piping. Use size fittings required to match water closets.

B. Where installing piping adjacent to water closets, allow space for service and maintenance.

3.4 ADJUSTING

A. Operate and adjust water closets and controls. Replace damaged and malfunctioning water closets, fittings, and controls.

B. Adjust water pressure at flushometer valves to produce proper flow.

C. Install fresh batteries in battery-powered, electronic-sensor mechanisms.

3.5 CLEANING AND PROTECTION

A. Clean water closets and fittings with manufacturers’ recommended cleaning methods and materials.

B. Install protective covering for installed water closets and fittings.

C. Do not allow use of water closets for temporary facilities unless approved by Owner.

END OF SECTION

SECTION 16519

SOLAR LIGHT POLE ASSEMBLY

PART 1 - GENERAL

1.1 SUMMARY

A. Furnish all labor, tools and equipment required for all electrical, concrete and related work for a complete and proper installation as indicated on the contract drawings.

B. The following section covers work related to this work:
Section 03300 - CONCRETE

1.2 GENERAL REQUIREMENTS

A. Provide solar light pole assemblies per contract drawings.

1.3 SUBMITTALS

A. Submit shop drawings and product specifications to Engineer for approval prior to ordering.

PART 2 - PRODUCTS

2.1 MATERIALS

A. Solar Light Pole Assembly shall be SEPCO-SEPA100-M-VPR40EXOIII-ALC11 / MAID-SP4-PZ5, or approved equal, and shall have the following:

1. 100-watt solar electric power assembly.
2. 112-amp hour battery assembly.
3. Viper fixture, 400-watt LED EXO-Optics, type III distribution.
4. Adaptive lighting control for dusk to dawn operation.
5. Motion-activated infrared detector.
6. Side of pole bracket shall be 4 feet.
7. Light pole shall be 24 feet, tapered, with an 8-inch base, complete with template and J-bolts.
8. Top cap, with stainless steel solar bolts and power wire.

B. LED Fixture Requirements

1. LED lamps and fixtures producing in excess of 1200 output lumens and/or having a Correlated Color Temperature (CCT) higher than 2700 Kelvin are prohibited except those approved by the County for outdoor lighting.

2. Light fixtures and installation must comply with fully shielded criteria at all times.
3. Fluorescent and non-filtered LED fixtures housing three (3) or more lamps are prohibited.
4. LED lighting products must be manufactured to comply with County criteria which incorporates, but is not limited to the following:

    a. Methodology to achieve County required exterior lighting criteria must be integral to the LED light engine and not removable from an operative luminaire.
    b. The LED light engine must have performance data for 6000 hours of operation to allow extrapolation of life to 10 years.
    c. The luminaire lens must be made of an impact-resistant material.
    d. The blue light content is not a function of correlated color temperature. Blue light content must not exceed 1% as tested and verified by a third party, Department of Energy approved, testing laboratory per LM79 procedures using a spectroradiometer.
    e. Lighting fixture must be Restriction of Hazardous Substances (RoHS) compliant.

PART 3 - EXECUTION

3.1 INSTALLATION

The solar light pole assembly shall be installed according to the manufacturer's recommendations and as shown on the Drawings.

END OF SECTION