STATE OF HAWAII

DEPARTMENT OF TRANSPORTATION

AIRPORTS

SPECIAL PROVISIONS, SPECIFICATIONS AND PROPOSAL

FOR

PASS & IDENTIFICATION TRAINING ROOM

KAHULUI AIRPORT

KAHULUI, MAUI, HAWAII

STATE PROJECT NO. CM1642-13

2026

NOTICE TO BIDDERS
Hawaii Revised Statutes (HRS),
Chapter 103D

The receiving of bids for **PASS & IDENTIFICATION TRAINING ROOM, KAHULUI AIRPORT, KAHULUI, MAUI, HAWAII, STATE PROJECT NO. CM1642-13** will begin as of the HIePRO Release Date. Bidders shall register and submit complete bids through HIePRO only. Refer to the following HIePRO link for important information on Vendor Registration: https://hiepro.ehawaii.gov/welcome.html.

The solicitation plans, specifications, proposal, and additional documents designated or incorporated by reference shall be available in HIePRO.

HIePRO OFFER DUE DATE AND TIME is November 25, 2026, at 2:00 p.m., Hawaii Standard Time (HST). **Bidders shall submit and upload the complete proposal to HIePRO prior to the offer due date and time. Proposals received after said due date and time shall not be considered. Any additional support documents explicitly designated as confidential and/or proprietary shall be uploaded as a separate file to HIePRO. Bidders shall not include confidential and/or proprietary documents as part of their proposal. The record of each bidder and their respective proposal shall be open to public inspection. FAILURE TO UPLOAD THE PROPOSAL TO HIePRO SHALL BE GROUNDS FOR REJECTION.**

The scope of work consists of constructing a new security checkpoint for employee screening at Kahului Airport and related work including but not limited to, the following: electrical, telecommunications, security, fire protection, and mechanical systems. Estimated construction cost is between $1,500,000.00 to $2,000,000.00.

To be eligible for award, bidders shall possess a valid State of Hawaii General Building "B" license **at the time of bidding.**

The Hawaii Department of Transportation, Air and Water Transportation Facilities Division, 2016 GENERAL PROVISIONS FOR CONSTRUCTION PROJECTS applicable to this project are available on the internet at: http://hidot.hawaii.gov/administration/con/.

A virtual pre-bid conference is scheduled for October 26, 2026, at 10:00 a.m., HST. Interested bidders shall contact Jake Shiraki, State Project Manager, directly at jake.l.shiraki@hawaii.gov, no later than five working days prior to the scheduled pre-bid conference to receive the meeting invitation. All prospective bidders and/or their respective representatives are encouraged to attend, however, attendance is not mandatory. All information presented at the pre-bid conference shall be provided for clarification and information only. Any amendments to the solicitation shall be made by formal addendum and posted in HIePRO.

A site visit for Kahului Airport will be scheduled for October 29, 2026, at 9:00 a.m., HST. Prospective bidders must contact the airport representative to indicate they will be planning to attend the site visit and coordinate the meeting place. It is the responsibility of the Contractor to understand the required scope of work. The work shall be performed and documented in accordance with these specifications.

All Request for Information (RFI) questions and Substitution Requests shall be submitted in HIePRO **no later than November 5, 2026, at 2:00 p.m., HST.** RFI questions received after the stated deadline shall not be addressed. Substitution Requests received after the stated deadline shall not be considered. Verbal RFI(s) shall not receive a response. All responses to RFI questions shall be provided for clarification and information only and issued by formal addendum. Any amendments to the solicitation shall be made by formal addendum and posted in HIePRO.

If there is a conflict between the solicitation and information stated in the pre-bid conference, the meeting minutes, and/or the responses to RFI questions, the solicitation shall govern and control, unless as amended by formal addendum.

Apprenticeship Preference. A five percent bid adjustment for bidders that are party to apprenticeship agreements pursuant to HRS § 103-55.6 is applicable to this project.

Employment of State Residents on Construction Procurement Contracts. Compliance with HRS § 103B-3 is a requirement for this project whereby a minimum of 80 percent of the bidder's work force on this project shall consist of Hawaii residents.

Campaign contributions by State and County Contractors. Contractors are hereby notified of the applicability of HRS § 11-355 which states that campaign contributions are prohibited from specified State or County government contractors during the term of the contract if the contractors are paid with funds appropriated by a legislative body. For more information, contact the Campaign Spending Commission at (808) 586-0285.

Protests. Any protest of this solicitation shall be submitted in writing to the Director of Transportation, in accordance with HRS § 103D-701 and Hawaii Administrative Rules § 3-126. Bidders are hereby notified that the Department of Transportation shall affirmatively ensure that contracts entered into pursuant to this advertisement are awarded to the lowest responsible bidder without discrimination on the basis of race, color, national origin, sex, age, disability, or any other protected status recognized under applicable State and federal law.

For additional information, contact Jake Shiraki, State Project Manager, by phone at (808) 838-8805, or by email at jake.l.shiraki@hawaii.gov.

The State reserves the right to reject any or all proposals and to waive any defects in said proposals in the best interest of the public.



CURT T. OTAGURO
Deputy Director of Transportation for Airports

HIePRO RELEASE DATE: October 15, 2026

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

STATE OF HAWAII

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AIRPORTS

SPECIAL PROVISIONS

SPECIAL PROVISIONS

The following additional amendments to the General Provisions are applicable to this project:

1.3 DEFINITIONS is amended as follows:

1. The following definition shall be deleted in its entirety and replaced with the following:

"Subcontractor – An individual, partnership, firm, corporation, or joint venture, or other legal entity, as licensed or required to be licensed under Chapter 444, Hawaii Revised Statutes, as amended, which enters into an agreement with the Contractor to perform a portion of the work."

2. Add the following to 1.3 DEFINITIONS:

"HAWAII ePROCUREMENT SYSTEM (HIePRO) - The State of Hawaii eProcurement System for issuing solicitations, receiving proposals and responses, and issuing notices of award."

3. The definition for "Bid" is amended by deleting it and replacing in with the following:

"Bid – The offer of a Bidder, on the prescribed HDOT form, to perform the work required by the proposed contract documents, for the price quoted, and within the time allotted."

2.7 REQUEST FOR SUBSTITUTION OF SPECIFIED MATERIALS AND EQUIPMENT BEFORE BID OPENING is amended as follows:

1. The last sentence in the first paragraph (line 147 to 152) shall be replaced with the following:

"Where a bidder intends to use a material or equipment of an unspecified brand, make, or model, the bidder must submit a request to the Department for review and approval at the earliest date possible. As specified in the Notice to Bidders, all requests shall be posted as a question in HIePRO under the "Question and Answer" tab. Supporting documents for specific request shall be emailed to the Project Manager specified in the Notice to Bidders. Request must be posted in HIePRO and supporting documents received by the Project Manager via email no later than than the RFI deadline in the Notice to Bidders."

2. The first sentence in the second paragraph (line 154 to 156) shall be replaced with the following:

"It shall be the responsibility of the bidder to submit sufficient evidence based upon which a determination can be made by the Department that the alternate brand is a qualified equivalent."

2.8 PREPARATION AND DELIVERY OF BID is amended as follows:

Last Paragraph (line 189 to 192) shall be replaced with the following:

"**Bidders shall submit and upload the complete proposal to HIePRO prior to the bid opening date and time. Proposals received after said due date and time shall not be considered. Any additional support documents explicitly designated as confidential and/or proprietary shall be uploaded as a separate file to HIePRO. Do not include confidential and/or proprietary documents with the proposal.** The record of each bidder

and respective bid shall be open to public inspection. Original (wet ink, hard copy) proposal documents are not required to be submitted. **Contract award shall be based on evaluation of proposals submitted and uploaded to HIePRO.**

FAILURE TO UPLOAD THE COMPLETE PROPOSAL TO HIePRO SHALL BE GROUNDS FOR REJECTION OF THE BID.

If there is a conflict between the specification document and the HIePRO solicitation, the specifications shall govern and control, unless otherwise specified."

2.11 BID SECURITY is amended by deleting (a) and replacing it with:

"(a) Unless directed otherwise in the invitation for bids, each bid shall be accompanied by bid security which is intended to protect the Department against the failure or refusal of a bidder to execute the contract for the work bid or to supply the required performance and payment bonds. Bid security shall be in an amount equal to at least five percent of the base bid and additive alternates. Bid security shall be in one of the following forms:

(1) A deposit of legal tender;

(2) A valid surety bid bond, underwritten by a company licensed to issue bonds in the State of Hawaii, in the form and composed, substantially, with the same language as provided herewith and signed by both parties; or

(3) A certificate of deposit; credit union share certificate; or cashier's, treasurer's, teller's, or official check drawn by or a certified check accepted by a bank, savings institution, or credit union insured by the Federal Deposit Insurance Corporation (FDIC) or the National Credit Union Administration (NCUA) and payable at sight or unconditionally assigned to the Department. These instruments may be utilized only to a maximum of one hundred thousand dollars ($100,000.00). If the required amount totals over one hundred thousand dollars ($100,000.00), more than one instrument not exceeding one hundred thousand dollars ($100,000.00) each and issued by different financial institutions shall be accepted.

If bidder elects options (1) or (3) above for its bid security, said bid security shall be in its original form and shall be submitted before the bid deadline to the Contract Office, Department of Transportation, Aliiaimoku Hale, 869 Punchbowl Street, Room 103, Honolulu, Hawaii 96813. Original surety bid bonds do not need to be submitted to the Contracts Office. Bidders are reminded that a copy of its surety bid bond shall be included with its bid submitted and uploaded to HIePRO."

2.12 PRE-OPENING MODIFICATION OR WITHDRAWAL OF BIDS is amended by deleting 2.12 PRE-OPENING MODIFICATION OR WITHDRAWAL OF BIDS in its entirety and replacing with the following:

"2.12 PRE-OPENING MODIFICATION OF WITHDRAWAL OF BIDS. Bids may be modified or withdrawn prior to the bid opening date and time. Withdrawal or revision of proposal shall be

completed, and submitted and uploaded to HIePRO prior to the bid opening date and time."

2.14 PUBLIC OPENING OF BIDS is amended by deleting 2.14 PUBLIC OPENING OF BIDS in its entirety.

4.12 UTILITIES AND SERVICES is amended as follows:

Add the following after the last paragraph:

"(e) Repairs and Outages.

(1) The Contractor shall have available on 24-hour call sufficient specialty contractors, such as electrical and plumbing contractors, to repair any damage to existing facilities that might occur as a result of construction operations regardless of when the damage might occur.

(2) Outage: Written requests for power outage, communication changes, and water and sewer connection outages shall be submitted to the Engineer at least seven (7) days in advance or as specified in other sections of these specifications. Outages will be restricted to non-peak operational hours between midnight and 6:00 a.m."

5.16 SUBCONTRACTING is amended as follows:

Add the following after the last paragraph:

"(e) The Specialty Items of work for this project are as follows:

Electrical contractor;
Carpentry framing contractor;
Cement concrete contractor;
Reinforcing steel contractor;
Ventilating and air conditioning contractor;
Plaster contractor;
Telecommunications contractor;
Security contractor;
Fire Protection contractor;
Mechanical contractor;

7.21 PUBLIC CONVENIENCE AND SAFETY is hereby added to Article VII - LEGAL RELATIONS AND RESPONSIBILITY TO PUBLIC of the General Provisions:

"It shall be especially noted by the Contractor that the area directly adjacent to the existing in use runways and taxiways, is an extremely hazardous area and that very strict controls will apply throughout the entire period required to complete all work within 500 feet from the edge of an in use runway and 180 feet from the edge of an in use taxiway.

The Contractor shall familiarize himself with the Airport Certification Manual available for review at the Airport Manager's Office and shall comply with its requirements.

The Contractor is responsible for the security of access points to the Airport Operational Area that are located within the limits of construction and will be fined one thousand dollars ($1,000) per incident for any breach of security at these locations. All gates leading into the AOA shall be kept locked and if required to be open, the Contractor shall provide professional security guards to attend gates. The guards must be approved by the Director and shall be

required to attend a training session conducted by the Airport Manager prior to gate assignment."

8.20 LIMITATION OF OPERATIONS is hereby added to ARTICLE VIII – PROSECUTION AND PROGRESS of the General Provisions:

"The following limitations shall be observed by the Contractor when operating within 75 feet from the edge of any taxiway.

General - The Contractor shall schedule his operations to minimize interference with the movement of aircraft or passengers as may be required by the Engineer. The Contractor shall be responsible to alert all of his personnel to the location of power and signal cables installed for the operation of the airport. The Contractor shall control his operations in a manner to preclude any possible damage to those cables. Utility companies shall be notified by the Contractor one week before commencement of work. The Contractor shall give notice to the Engineer in writing, at least 168 hours before operating within 75 feet from the edge of any taxiway and the Engineer will assure himself that the Airport Management personnel are notified in sufficient time to publish the warning (NOTAM). The Contractor shall immediately repair any damages to the existing perimeter fence to prevent inadvertent entry to the Airport Operation Area (AOA).

Work in Vicinity of Runways and Taxiways in Use - Under the terms of this contract, it is intended that work shall be completed without disturbing the paved surface of existing runways and taxiways, unless shown otherwise on the plans. Aircraft traffic shall not be interrupted. The Contractor shall schedule to work within 75 feet of the taxiway as directed by the Airport Management. No ruts, holes, or open trenches of 3 inches or more in depth and no objects or material 3 inches or more in height shall be permitted within the safety area when the airfield is in operation in conformance to Federal Aviation Regulation Part 139. The Contractor is also informed that Airport Zoning Regulations dictate that a 'clear zone' be maintained 500 feet on each side of an active runway, to be known as a hazardous area. The Contractor shall comply with all regulations governing ground operations within hazardous areas. The following FAA Advisory Circulars or later versions and FAA Regulations specify these requirements:

AC 150/5210-5C	Painting, Marking, and Lighting Vehicles Used on an Airport, dated August 2007
AC 150/5340-1J	Standards for Airport Markings
AC 150/5370-2E	Operational Safety on Airports During Construction, dated 1/17/03
FAA Regulations	Objects Affecting Navigable Airspace Part 77

The Contractor shall keep all personnel and equipment off the areas not specifically designated for work under this Contract. At all times when the Contractor's equipment is not in use, the equipment shall be moved outside the hazardous areas to an area designated by the Engineer. Under no condition shall equipment be parked or material stored within the hazardous areas.

Failure on the part of the Contractor to abide by the above will result in suspension of work.

Authority of Control Tower Personnel - With the exception of actual construction methods, the airport control tower personnel will have full authority to control the Contractor's movements within the existing taxiway. When required, the Contractor shall maintain a constant radio vigil within all work areas and in addition shall keep at least one flagman on duty with the radio man. When notified by the control tower to temporarily halt operations, it shall be the duty of the flagman, through the use of appropriate methods (lighted flares shall not be used under any circumstances), to notify all operators of equipment and other personnel to cease work and move men and equipment off of hazardous areas.

Contractor shall provide, at his own expense, the necessary radio and equipment including a radio equipped mobile vehicle to maintain contact with control tower personnel at all times during job performance. A transceiver operating at a frequency designated by the Engineer to communicate with the Control Tower.

Marking of Hazardous Areas - The Engineer will designate areas that are hazardous for aircraft. The Contractor shall provide red blinker lights spaced not more than 50 feet apart around all hazardous areas and areas of work within 75 feet of any taxiway. Such systems shall be subject to approval by the Engineer. The Contractor shall have personnel on call 24 hours per day for the emergency maintenance of hazard markings.

The Contractor shall provide red flags not less than 20 inches square in addition to the red blinker lights. When danger flags are made of fabric, a wire stiffener shall be used to hold the flags in an extended position. Flags shall be so mounted that they do not produce a hazard. The red danger flags shall be spaced not more than 50 feet apart around all areas of work within 75 feet of any taxiway.

All systems proposed by the Contractor for lighting and barricading shall be submitted to the Engineer for review prior to installation. The Contractor shall install all flags, lighting and barricades as required by the Engineer. Such systems shall be subject to approval by the Engineer.

Storage of Equipment and Materials - At the end of each working shift, all of the Contractor's equipment shall be withdrawn to an area designated by the Engineer. The Contractor shall park all equipment in an orderly fashion and place a sufficient number of red flasher lights to identify these areas. Materials stored within the airport shall be so placed and the work shall, at all times, be so conducted as to cause no greater obstruction to the air and ground traffic than is considered necessary by the Engineer. No runways, taxiways or roadways shall be closed or opened, except by permission of the Engineer.

Blasting Operations - The Contractor shall notify the Engineer at least three (3) days before performing blasting operations as to the extent and timing of such operations, so that the Control Tower and other concerned parties can be informed.

Utilities - The Contractor shall provide for the protection of all utilities from damages in areas to be traversed by his vehicles and equipment. If required, buried cables and utility lines shall be protected by mounding earth over the cables or by any other method approved by the Engineer.

The Contractor shall notify representatives of the owner, agencies, and other affected organizations at least 48 hours prior to working in any area containing the facilities of these organizations.

Failure to notify the owning organization will prevent authorization to work in a specific area.

Archaeological Features - Any archaeological features such as petroglyphs, burial sites, and artifacts discovered or unearthed during the performance of the work shall immediately be brought to the attention of the Engineer and all work that would damage or destroy these features shall be discontinued. The Engineer will decide, after proper investigation, to salvage or abandon such artifacts."

8.21 OPERATION OF CONTRACTOR'S MOTOR VEHICLE AND PERSONNEL IN RESTRICTED AIR OPERATIONS AND MOVEMENT AREAS is hereby added to ARTICLE VIII – PROSECUTION AND PROGRESS of the General Provisions:

"The Contractor shall conform with all the sections of the "State of Hawaii, Department of Transportation, Airports, Contractor's Training Guide" pertaining to access and operation in the Airport Operation Area (AOA) hereinafter described as follows:

A. Motor Vehicles in Airport Operation Area

For safety reasons, the operation of motor vehicles in the AOA must conform with all applicable State Airport rules and regulations.

B. Motor Vehicle Access Permit

Each motor vehicle operated in the AOA is required to:

1. Meet all State licensing registration and safety requirements and be specifically licensed for operation in the AOA.

2. Meet all insurance requirements.

3. Be restricted to operation by those persons qualified to drive the vehicle and in possession of a current Ramp Driver's License and applicable Motor Vehicle Operator's License.

C. The operators of motor vehicles in the AOA shall be responsible for meeting the following insurance requirements.

1. Licensed Vehicles

As a condition for authorization to enter the AOA, the Contractor shall provide evidence of vehicle liability insurance in the form of a Certificate of Insurance issued by an authorized insurance carrier. Automobile Liability and general Liability (combined single limit, Bodily Injury and Property Damage, per occurrence) shall be required in the applicable minimum limits specified below:

a. Daniel K. Inouye International Airport

(1) Standard AOA clearance.....$5,000,000

(2) Limited AOA clearance.....$1,000,000
Limited AOA clearance is defined as operations restricted to Diamond head and Ewa Concourses second level roadways and

connecting third level main terminal roadway only, with entry and exit via Security Access Point "C" (Primary) and Access Point "A" (Secondary)

b. Other Airports

Standard AOA clearance.....$1,000,000

Standard AOA clearance is defined as any portion of a public Airport from which the public is restricted by fences or appropriate signs and not leased or demised to anyone for exclusive use and shall include runways, taxiways, all ramp and apron areas, aircraft parking and storage areas, fuel storage areas, maintenance areas, and any other area of a public Airport used or intended to be used for landing, takeoff, or surface maneuvering of aircraft or used for embarkation or debarkation of passengers.

2. Unlicensed Vehicles

Airport Liability (or General Liability) shall be required in the applicable minimum limits specified below:

a. Daniel K. Inouye International Airport, Kahului Airport and Kona International Airport at Keahole

AOA clearance..... $5,000,000

b. All other Airports

AOA clearance..... $1,000,000

3. Specifically name the State of Hawaii as additionally insured.

4. Indicate that the Airport Engineer will be provided with a 30-day written prior notice of policy cancellation or material change in coverage or conditions.

D. Operator's Permit

1. No person shall operate a motor vehicle on the AOA unless he holds and carries on his person a current Airport Motor Vehicle operator's permit issued by the State of Hawaii, Department of Transportation, Airports .

2. Operator's permits will only be issued to persons who apply through the Airport District Security Office and pass a written exam covering those portions of the Airport Rules and Regulation relating to the operation of vehicles in Airport Operations Areas.

E. Authorized Vehicles

1. Only vehicles considered operationally safe and necessary for the performance of this contract may be allowed to operate in the AOA.

2. All motor vehicles must be painted in such a manner so as to be easily identifiable and must carry the Contractor's name on each side. These signs may be of a temporary nature applied to the side windows or doors.

   The lettering shall be in bold characters of a minimum of four (4) inches in height and one and one-half (1-1/2) inches in widths, the height of logos should be a minimum of six (6) inches.

3. The Contractor's operations on, over, across, and/or immediately adjacent to any runway and/or taxiway at a towered airport shall require the use of two-way radio communication. The Contractor shall obtain the necessary equipment at his own expense.

4. No person shall operate a motor vehicle on the AOA unless he holds and carries on his person a current Motor Vehicle Operator's Permit issued by the Airport Manager.

   a. The Motor Vehicle Operator's Permit will be issued only to persons who apply through the Airport Security Section and pass a written exam covering those portions of the Airport Rules and Regulations relating to the operation of vehicles in the AOA.

   b. Permits issued may be suspended or revoked for cause at any time by the Airports .

F. Airport Operation Area Construction Pass

1. Issuance of Airport Operation Area (AOA) Construction Passes shall be limited to contractors, subcontractors, companies, organizations, individuals engaged in authorized and approved construction activity which requires a continuing need for entry into the AOA or Airfield Movement Areas. Request letters for such passes must be made to the Airport District Manager's Office in accordance with the Contractors Training Guide or applicable District requirements.

2. As a condition for security area clearance, applicants must comply with Transportation Security Regulation 1542 which requires a ten-year background Criminal History Records Check for those individuals employed under this contract.

G. Access to Movement Areas

1. Movement areas shall mean all of the runways and taxiways of the Airport which are utilized for taxiing, takeoff, and landing of aircraft.
   a. Any vehicle which requires access to the movement area shall be equipped with operational radio equipment capable of positive two-way contact with Tower/Ground Control.

   b. Operators of vehicles in movement areas must possess knowledge and familiarity with restricted and airfield movement areas, operational rules, regulations, and procedures, or be under direct escort by individuals meeting all of the above requirements.

2. Vehicle Operations on Movement Areas

   a. No vehicle shall proceed across any runway unless specifically cleared by Tower/Ground Control.

   b. The operator of a vehicle in the movement area shall not leave his vehicle unless continuous radio contact is maintained with the Tower/ Ground Control while he is away from his vehicle.

   c. Any vehicle proceeding onto the movement area between the hours of sunset and sunrise shall be equipped with an overhead flashing light which is visible for one (1) mile, unless such vehicle is being escorted by another vehicle so equipped.

   d. All vehicles operated on the movement area between sunrise and sunset except those being escorted, shall operate an overhead amber or red flashing beacon visible for at least one (1) mile; or display a flag at least three (3) feet square with orange and white checkered squares of not less than one (1) foot on each side.

H. Runway and Taxiway Closure

1. Requests for runway or taxiway closures, or for any work which affect operational conditions at the airport must be made in writing through the Airport Engineering Branch.

2. Temporarily closed runways require placement of yellow "X" markings (constructed of material such as fabric or plywood or other acceptable material) on top of the runway identification numerals at both ends of the closed runway.

3. Taxiway closures require placement of barricades with alternate orange and white markings at each end of the closed taxiway segment. Barricades must be supplemented with flashing red lights. The intensity of the lights and spacing for barricades, and lights must adequately define and delineate the hazardous area.

I. Gate Guards Furnished by Contractors

1. If a contractor is permitted by the airport to maintain operational control of an AOA Access Gate, entry through such gate shall be controlled by the posting of a gate guard.

   a. Written instruction will be provided, outlining the guard's duties to enforce those requirements and provisions prescribed by the airport's security program to include all personnel and vehicle entry and access requirements.

   b. Procedures will be established to identify the actions which will be undertaken by the guard in calling for assistance.

   c. An approved emergency communications procedure will be established.

J. Compliance

1. The contractor shall comply with all regulations and rules governing the Air Operations Areas during construction, as specified in the following or later versions:

   a. Hawaii Revised Statutes, Title 19, Administrative Rules for Public Airports.

   b. Federal Aviation Administration Advisory Circular AC 150/5340 1J

   c. Marking of Paved Areas on Airport; AC 150/5370-2E, Operational Safety on Airports During Constructions.

K. Enforcement Authorization

Act 21, Section 1, Section 261-17(a), HRS; Federal Aviation Administration Regulations, Part 139, Part 107.

L. Right of Rejection or Revocation

The State of Hawaii, Airports, reserves the right to withhold, deny or revoke any airport security clearance, licenses or permits to any individual or organization who fails to meet the prescribed or required access area clearance criteria to include background investigation information, or fails to observe or comply with established rules, regulations, and directives.

It should be clearly understood that such denial or revocation is based solely on airport security or safety considerations and does not in any way constitute a determination by the State with regard to private employment by any individual or organization."

- END OF SECTION -

STATE OF HAWAII

DEPARTMENT OF TRANSPORTATION

AIRPORTS

PART I - GENERAL PROVISIONS

(NOT PHYSICALLY INCLUDED)

The Hawaii Department of Transportation AIR and WATER Transportation Facilities Division General Provisions for Construction Projects dated 2016 is not physically included in these specifications. The General Provisions are available at:

http://hidot.hawaii.gov/administration/con/

STATE OF HAWAII

DEPARTMENT OF TRANSPORTATION

AIRPORTS

PART II - TECHNICAL PROVISIONS

DIVISION 1 - GENERAL REQUIREMENTS

SECTION 01010 - DESCRIPTION OF WORK

PART I - GENERAL

1.01 RELATED DOCUMENTS

The General Provisions for Construction Projects (2016), Special Provisions and General Requirements of the Specifications, apply to the work specified in this Section.

1.02 SUMMARY

A. Section Includes:

1. Location of the work
2. Hours of work
3. Safety
4. Operation of airport facilities during construction
5. Construction stakes, lines and grades.
6. Special project requirements

1.03 VEHICLE PARKING

Parking passes may be purchased at a monthly rate of $175.00 plus a one-time fee of $25.00 for parking access card. These passes are subject to approval by the Airport Manager and availability of parking spaces. All costs associated with obtaining parking passes shall be the responsibility of the Contractor.

1.04 PROVISIONS FOR FIELD OFFICE/STORAGE SPACE

Pending the availability of space on airport property, the State will issue Revocable Permit(s) to the Contractor for the use of the space, assessed at a monthly fee of $50 for each Revocable Permit issued. The Contractor shall be responsible for paying for any associated County fees, inclusive of property taxes, and must notify the State Property Management Office at least 30 days in advance before vacating the premises. The space(s) may be used for a field office, staging of materials and equipment, vehicle parking or other uses subject to the approval of the State. All spaces shall be subject to the requirements of SECTION 01561 - CONSTRUCTION SITE RUNOFF CONTROL PROGRAM.

Since space on airport property is extremely limited, the State does not guarantee that space(s) provided to the Contractor will be in close proximity to the project site. The State will make every effort to provide the Contractor with space on airport property,

however, should the State determine that no space is available for such use(s), the responsibility shall then be on the Contractor to find space outside of airport property.

1.05 LOCATION OF THE WORK

A. The work to be performed under this contract is located at Kahului Airport, Kahului, Maui, Hawaii.

B. Conditions:

1. The Main Terminal and airport roadways shall remain operational at all times. Any damages to existing areas caused by the Contractor shall be repaired by the Contractor at no cost to the State.

2. Upon execution of the contract, the Contractor, at their cost, shall obtain all permits required for this project.

1.06 HOURS OF WORK

A. Work can be performed at the construction site at any time over a 24-hour period without considerable disruption to airport operations or other adjacent tenants. Noise, including demolition work, shall occur from 10:00 p.m. to 6:30 a.m., and water proofing shall be done from 1:30 p.m. to 10:00 p.m. Contractor shall coordinate other work activities with the Engineer for the hours between 6:30 a.m. to 1:30 p.m. Submit a proposed construction schedule to Engineer for review and approval within 14 calendar days prior to start of work. The Contractor shall coordinate their schedule with the Engineer if rescheduling of work or intermittent work is required, such work shall be performed at no extra cost to the State. If the Contractor elects to work overtime, compensation for State employees and for construction management consultant as authorized by the State shall be the Contractor's obligation to pay in accordance with Section 7.6 – “Overtime and Night Payment for State Inspection Services” of the General Provisions of Construction Projects (2016).

B. Contractor shall clean work areas at the end of each working shift. Rubbish, loose materials, etc. shall be disposed of daily. **Tools and equipment shall not be left unattended during work hours.** This includes tools left in unlocked vehicles, in the bed of pickup trucks, or in unlocked job sites. TSA citations may result in fines in excess of $13,000 per violation and the confiscation of AOA badges. Materials shall be safely secured and stored in an area designated by the Airport Manager.

C. Dependent on the type and location of work activity, the Contractor may be required to either alter the work hours and work activities, or suspend work during the Airline Operational Blackout Dates listed below.

1. Winter Break (Through the month of December to the second week of January)

2. The Dr. Martin Luther King, Jr. Day weekend (Holiday celebrated on the third Monday in January)

3. Spring Break (Varies, weeklong break, around the Easter Day weekend)

4. Golden Week (April 29 through the first week of May)

5. The Memorial Day weekend (Holiday celebrated on the last Monday in May)

6. Summer Vacation (June through August)

7. The Labor Day weekend (Holiday celebrated on the first Monday in September)

8. Silver Week (Varies; roughly around the third week of September)

9. Veterans' Day (Eleventh day in November)

10. The Thanksgiving Day weekend (Holiday celebrated on the fourth Thursday in November)

Schedule adjustments during the Airline Operational Blackout Dates shall not incur additional costs to the State of Hawaii.

D. Dependent on the type and location of nighttime work activity, the Contractor may be required to either alter the work hours and work activities, or suspend work during the Seabird Fallout Season, roughly September 15 – December 15, annually. Schedule adjustments during the Seabird Fallout Season dates shall not incur additional costs to the State of Hawaii.

1.07 SAFETY

A. The Contractor shall take the necessary precautions to protect his workers and other personnel from injuries. The rules and regulations promulgated by the Occupational Safety and Health Acts are applicable and made a part of these specifications.

B. Barricades and warning signs shall be erected by the Contractor in the work area to properly protect all personnel in the area.

C. During the progress of the work debris, empty crates, waste, material drippings, etc., shall be removed by the Contractor at the end of each workday, and the work area shall be left clean and orderly.

1.08 OPERATION OF AIRPORT FACILITIES DURING CONSTRUCTION

A. The Contractor shall coordinate the phases of work under this contract with the Engineer to permit the continuing operation of existing Airport facilities and to minimize disruption to pedestrian and vehicular traffic.

B. Utility Maintenance: During the construction of this contract, existing utility services serving occupied or used facilities shall not be disrupted except where authorized in writing by authorities having jurisdiction. Contractor shall provide temporary services during interruptions to existing utilities, as acceptable to the Engineer. Damages to

the existing utility facilities by the Contractor will be repaired at the Contractors expense.

C. Outages for water, power, communications, air conditioning or any other utility, if necessary, shall be kept to a minimum and scheduled for off-peak hours, generally from 12:00 a.m. to 6:00 a.m. The Contractor shall submit written requests to the Engineer for such outages no later than fourteen (14) calendar days in advance. The request shall include a description of work and the duration of the outage. The Contractor shall not proceed with such outages until written approval is received from the State.

1.09 CONSTRUCTION STAKES, LINES AND GRADES

A. The Contractor shall perform all construction layout and reference staking necessary for the proper control and satisfactory completion of all structures, grading, paving, drainage, sewer, water, and all other appurtenances required for the completion of the work.

B. Existing horizontal and vertical survey control points for the project are shown on the plans. The Contractor shall verify the location of all control points prior to the start of construction.

C. The Department will not be responsible for delays in setting stakes and marks.

D. All control points and stakes or marks which the Engineer may set shall be preserved by the Contractor. If such control points, stakes or marks are destroyed or disturbed by the Contractor, the cost of replacing such stakes or marks will be charged against the Contractor and deducted from payments due the Contractor.

E. The Contractor shall be responsible for the placement and preservation of adequate ties to all control points whether established by the Contractor or by the Engineer.

F. All original, additional or replacement stakes, marks, references and batter-boards which may be required for the construction operations, shall be furnished, set and properly referenced by the Contractor. The Contractor shall be solely and completely responsible for the accuracy of the line and grade of all features of the work. Any errors or apparent discrepancies found in previous surveys, the plans and specifications shall be called to the Engineer's attention by the Contractor for correction or interpretation prior to proceeding with the work.

G. Before construction is started on any structure which is referenced to an existing structure or topographical feature, the Contractor shall check the pertinent locations and grades of the existing structures or topographical features to determine whether the locations and grades shown on the plans are correct.

H. All construction staking shall be performed by qualified personnel under the direct supervision of a person with an engineering background who is experienced in the direction of such work and is acceptable to the Engineer.

I. All stakes and markers used for control staking shall be of the same quality as used by the Department for this purpose. For slope limits, pavement edges, gutter lines, et cetera, where so called "working" stakes are commonly used, stakes of different quality may be acceptable.

J. The Department may check the Contractor's control of the work at any times as the work progresses. The Contractor will be informed of the results of these checks, but the Department by doing so will in no way relieve the Contractor of his responsibility for the accuracy of the layout work. The Contractor shall at his expense correct or replace any deficient or inaccurate layout and construction work. If, as a result of these deficiencies or inaccuracies, the Department is required to make further studies, redesign, or both, all expenses incurred by the Department due to such deficiencies or inaccuracies, will be deducted from any payments due the Contractor.

K. The Contractor shall furnish all necessary personnel, engineering equipment and supplies, materials, and transportation incidental to the accurate and satisfactory completion of this work.

Unless otherwise provided, all requirements imposed by this Section and performed by the Contractor shall be considered incidental to the various contract items and not separate or additional payment will be made thereof.

1.10 SPECIAL PROJECT REQUIREMENTS

A. Upon receipt of the Contract, the Contractor shall process and return the Contract to the State' Contract Office within five (5) calendar days.

B. The State intends to issue the Notice to Proceed for the Project to the Contractor within 35 calendar days after bid opening. The Contractor shall be able to commence work on this date.

C. Downed seabirds. Downed seabirds found within the project site shall be reported to a local wildlife center according to protocols established by the Department of Land and Natural Resources, Division of Forestry and Wildlife: https://dlnr.hawaii.gov/wildlife/seabird-fallout-season/

PART 2 - PRODUCTS (Not Used)

PART 3 - EXECUTION (Not Used)

PART 4 - MEASUREMENT AND PAYMENT

4.01 BASIS OF MEASUREMENT AND PAYMENT

Work under this Section will not be measured for payment but will be paid for at the contract Lump Sum Price.

Item No.	Description	Unit Price
01010.1	Construction Work	Lump Sum

END OF SECTION

SECTION 01014 – WORK SEQUENCE

PART 1 – GENERAL

1.01 RELATED DOCUMENTS

The General Provisions for Construction Projects (2016), Special Provisions and General Requirements of the Specifications, apply to the work specified in this Section.

1.02 TENANTS ADJACENT TO CONSTRUCTION AREA

A. The User Agencies and their operations will be adjacent to the construction area throughout the construction period. The Contractor shall minimize inconvenience to them and their clientele and shall continue to provide the following for these occupants:

1. Continuity of utility services.

2. Means of ingress and egress.

3. All measures to ensure their safety and health.

4. All measures to ensure the required security in the secure areas.

B. Official communications and coordination with the User Agencies and operations shall be made through the State Engineer.

1.03 SEQUENCE OF WORK

A. Work under the entire project shall be completed within specified calendar days from the date indicated in the Notice to Proceed from the State.

B. Work shall proceed in tasks of construction to facilitate and ensure the continued operations and functions of the existing terminal facilities and automotive maintenance shop. Work to be accomplished within each task of construction is described and the areas affected are shown on drawings.

Each task of the work shall be completed within the specified number of calendar days. Specific language relating to the sequence of work is defined below.

1. Scheduled Start Day: The day designated as the beginning of a particular task; the number listed is the number of calendar days from which work for that particular task is to be completed.

2. Completion Day: The day designated as the end of a given task with completion and acceptance of work as assigned and shown in the drawings.

3. The total number of calendar days for all stages of work shall equal the number of calendar days established for the entire project.

1.04 OPERATION OF AIRPORT FACILITIES DURING CONSTRUCTION

A. The Contractor shall coordinate all tasks of work under this contract with the Engineer to permit the continuing operation of existing airport facilities.

B. The Contractor shall take precaution to protect people and property from injury and damage. Construction, including barricades as specified in SECTION 01533 - BARRICADES shall be sequenced to minimize the duration of disruption and appropriate signing be provided to aid the public and airport pedestrian and vehicular traffic around his work areas.

C. The Contractor shall limit the delivery of materials and equipment and hauling of debris material during non-peak Airport operational hours. Contractor shall obtain prior approval of planned schedule of delivery of material and hauling of debris from the State Engineer.

PART 2 - PRODUCTS (Not Used)

PART 3 - EXECUTION (Not Used)

PART 4 - MEASUREMENT AND PAYMENT

4.01 BASIS OF MEASUREMENT AND PAYMENT

Work under this Section will not be measured nor paid for separately but shall be considered incidental to and included in the bid prices for the various items of work in this project.

END OF SECTION

SECTION 01210 - ALLOWANCES

PART 1 - GENERAL

1.01 RELATED DOCUMENTS

The General Provisions for Construction Projects (2016), Special Provisions and General Requirements of the Specifications, apply to the work specified in this Section.

1.02 GENERAL REQUIREMENTS

A. This Section includes administrative and procedural requirements governing allowances. Certain materials, equipment, and services are specified in the Contract Documents by allowances. Allowances have been established in lieu of additional requirements and to defer selection of actual materials, equipment, and services to a later date when additional information is available for evaluation. If necessary, additional requirements will be issued by Change Order.

B. Types of allowances include contingency allowances.

C. Related Sections include Divisions 1 through 16 Sections for items of Work covered by allowances.

1.03 SUBMITTALS

A. Submit in accordance with SECTION 01300 - SUBMITTALS.

1. Submit proposals for purchase of products or systems included in allowances, in the form specified for Change Orders.

2. Submit invoices or delivery slips to show actual quantities of materials and equipment delivered to the site for use in fulfillment of each allowance.

3. Coordinate and process submittals for allowance items in same manner as for other portions of the Work.

1.04 COORDINATION

Coordinate allowance items with other portions of the Work. Furnish templates as required to coordinate installation.

1.05 CONTINGENCY ALLOWANCES

A. Use the contingency allowance only as directed by State Engineer for State's purposes and only by Change Orders that indicate amounts to be charged to the allowance.

B. Contractor's overhead, profit, and related costs for products, equipment, and services ordered by the State under the contingency allowance are included in the

allowance and are not part of the Contract Lump Sum. These costs include delivery, installation, taxes, insurance, equipment rental, and similar costs.

C. Change Orders authorizing use of funds from the contingency allowance will include Contractor's related costs and reasonable overhead and profit margins.

D. At Project closeout, credit unused amounts remaining in the contingency allowance to State by Change Order.

PART 2 – PRODUCTS (Not Used)

PART 3 - EXECUTION

3.01 EXAMINATION

Examine products covered by an allowance promptly on delivery for damage or defects. Return damaged or defective products to manufacturer for replacement.

3.02 PREPARATION

Coordinate materials and their installation for each allowance with related materials and installations to ensure that each allowance item is completely integrated and interfaced with related work.

3.03 SCHEDULE OF ALLOWANCES

See Proposal Schedule for list of allowances and its respective specification sections.

PART 4 - MEASUREMENT AND PAYMENT

4.01 BASIS OF MEASUREMENT AND PAYMENT

Work under this Section will not be measured nor paid for separately but shall be considered incidental to and included in the bid prices for the various items of work in this project.

END OF SECTION

SECTION 01300 - SUBMITTALS

PART 1 - GENERAL

1.01 RELATED DOCUMENTS

The General Provisions for Construction Projects (2016), Special Provisions and General Requirements of the Specifications, apply to the work specified in this Section.

1.02 PROJECT DOCUMENTATION

The contract will not be considered complete until required submittals have been received and accepted by the State.

At the discretion of the Project Manager, the number of copies to be submitted may differ from that specified in this Section.

1.03 DETAILED CONSTRUCTION SCHEDULE

A. The Contractor shall submit a detailed construction schedule to the Engineer for review, no later than 30 calendar days after execution of the contract. The detailed construction schedule shall be based on a detailed critical path analysis of construction activities and sequence of operations needed for the orderly performance and completion of any separable parts of any work and all work in accordance with the contract. The schedule shall be Critical Path Method (CPM) type in the form of an arrow diagram and activity listing or comprehensive bar graph. The network diagram shall show in detail and in orderly sequence all activities on a time scale, their descriptions, durations and dependencies, necessary and required to complete all work and any separable parts thereof. The schedule shall show in detail the following information for each activity:

1. Identification by code numbers and description;
2. Duration;
3. Craft and Equipment;
4. Earliest start and finish dates;
5. Latest start and finish dates;
6. Total and free float time; and
7. Highlighted Critical Path

B. The construction schedule shall be complete in all respects, covering in addition to activities at the site of work, off-site activities such as design, fabrication, and procurement of equipment; the scheduled delivery dates of such equipment; submittal and approval of shop drawings and samples; ordering and delivery of

materials; inspections; and testing. The schedule shall also include a manpower forecast by crafts. The detailed construction schedule shall be supplemented by a three-week schedule prepared by the Contractor and submitted to the Engineer on a weekly basis. The Contractor shall promptly inform the Engineer of any proposed change in the schedule and shall furnish the Engineer with a revised schedule and cash flow diagram within 15 calendar days after approval of such change.

The schedule shall be kept up to date, taking into account the actual progress of work and shall be updated, if necessary, every 30 calendar days. The updated schedule shall, as determined by the Engineer, be sufficient to meet the requirements for the completion of the separable parts of work and the entire projects as set forth in the contract.

Upon commencing work, the Contractor shall submit at the start of each week to the Engineer for review, a detailed three (3) week construction schedule.

C. If at any time during the progress of the Work, the Contractor's actual progress appears to the Engineer to be inadequate to meet the requirements of the contract, the Engineer will notify the Contractor of such imminent or actual noncompliance with the contract. The Contractor shall thereupon take such steps as may be necessary to improve his progress and the Engineer may require an increase in the labor force, the number of shifts, and/or overtime operations, days of work and/or the amount of construction plants all without additional cost to the State. Neither such notice by the Engineer nor the Engineer's failure to issue such notice shall relieve the Contractor from his obligation to achieve the quality of work and rate of progress required by the contract. Failure of the Contractor to comply with instructions of the Engineer under these provisions may be grounds for determination by the State that the Contractor is not prosecuting work with such diligence as will assure completion within the times specified. Upon such determination, the State may employ labor and equipment and charge the Contractor for the cost thereof, including depreciation for plant and equipment or may terminate the Contractor's right to proceed with the performance of the contract, or any separable part thereof, in accordance with the applicable provisions of the contract.

D. The Contractor shall submit to the Engineer one (1) reproducible and three (3) prints of the detailed construction schedule and of each revised schedule submitted thereafter.

1.04 SCHEDULE OF VALUES

A. The Contractor shall submit the Schedule of Values to the Engineer for review, no later than 30 calendar days after execution of the Contract.

B. Format and Content: Use Proposal Schedule and/or the Project Specifications table of contents as a guide to establish the format for the Schedule of Values. Provide at least one line item for each Specification Section. Provide a breakdown of the contract sum in sufficient detail to facilitate continued evaluation of Applications for Payment and progress reports. Break principle work or subcontract amounts down into several smaller identifiable items of work.

C. Identification: Include the following Project identification on the schedule of values:

1. Project name and location

2. Project number

3. Contractor's name and address

4. Contract No.

5. Date of submittal

D. Arrange the Schedule of Values in tabular form with separate columns to indicate the following items listed:

1. Related Specification Section or Division

2. Description of work

3. Dollar value and percent complete

E. Correlate line items in the Schedule of Values with other required administrative schedules and forms including;

1. Construction Schedule

2. Application for Payment forms including continuation sheets

3. List of Subcontractors

4. List of principle suppliers and fabricators

5. Schedule of submittals

F. Round amount to nearest whole dollar; the total shall equal the contract sum.

G. Provide a separate line item in the Schedule of Values for each part of the work where Applications for Payment may include materials or equipment, purchased, fabricated or stored, but not yet installed.

H. Schedule Updating: Update and resubmit the Schedule of Values prior to the next Applications for Payment or when Change Orders or Construction Change Directives result in a change in the Contract Sum.

1.05 OTHER SUBMITTALS REQUIRED BEFORE CONSTRUCTION

The Contractor shall submit the following items prior to or at the pre-construction meeting or unless otherwise noted:

A. Name, residence phone number, addresses and scope of authority for the following persons:

1. Superintendent

2. Contractor's authorized representative to sign documents

3. Two (2) additional persons who can be contacted during non-working hours for emergencies.

4. Field Office location and phone numbers (cellular, pager, fax, etc.)

B. Name of Safety Officer

C. Notice of Materials to be furnished

D. Three (3) copies each of Certificates of Insurance. The State of Hawaii, Department of Transportation, Airports Division shall be named as additionally insured. The project number and project title shall be referenced in the Description of Operations/Locations/Vehicles. If canceled, 30 days written notice to the State of Hawaii must be given. If certificates are not correct, work cannot proceed.

E. Three (3) copies each Insurance and Tax Rates.

F. List of apprentices who will be working on the project supported with the Statement of Apprenticeship or copy of the Apprenticeship Agreements registered with the State Board, for each apprentice.

G. List of equipment to be used on the job. Designate maximum working height and capacity of equipment involved and their respective rental rates.

H. Three (3) copies of an expenditure (cash flow) plan consisting of an anticipated work completion graph plotting contract time and gross payment anticipated.

1.06 SHOP DRAWINGS, SAMPLES, CATALOG CUTS, AND CERTIFICATES

A. Submittal Schedule: Prior to the submission of any shop drawings or submittals, the Contractor shall submit to the Engineer for review, a submittal schedule. The schedule shall identify the subject matter of each submittal, the corresponding Specification Section number and the proposed date of submission. During the progress of work, the Contractor shall revise and resubmit the submittal schedule as directed by the Engineer.

B. The Contractor shall submit for review to the Engineer, or to a representative designated by the Engineer, six (6) copies of all shop drawings, samples, catalog cuts and certificates. Three (3) copies will be returned to the Contractor with information of review action. The Contractor shall submit additional quantities for their subcontractor's or supplier's use. Each shop drawing, certificate of compliance, sample, and equipment list shall be checked and certified correct by the Contractor

and shall be identified with the applicable information specified hereinafter under "Submittal Identification."

Items are to be reviewed prior to commencing fabrication or delivery of material to the job site.

C. Each copy of the drawings, certificates, catalog cuts, and lists reviewed by the Engineer will be stamped "REVIEW ACTION" with the appropriate action noted therein. The review of the Engineer shall not be construed as a complete check but will indicate only that the general method of construction and detailing is satisfactory. Acceptance of such drawings will not relieve the Contractor the responsibility of conforming to the contract drawings and specifications or for any error or omission which may exist as the Contractor shall be responsible for the dimensions and design of adequate connections, details, and satisfactory construction of all work. Each shop drawing submitted for review shall have, in the lower right-hand corner just above title, a white space 4" x 4" in which the Engineer can place the stamp and indicate action taken. The Contractor shall also inform their subcontractors to provide this space in their preparation of shop drawings.

1.07 MAINTENANCE DATA AND OPERATING INSTRUCTIONS

Six (6) copies of maintenance data and operating instructions shall be submitted by the Contractor at the conclusion of the equipment installation. The manuals shall be assembled in one or more binders, each with a title page, typed table of contents, and heavy section dividers with numbered plastic index tabs. The binders shall be a minimum of 2 inches thick, three ring, "D slant" with hard covers. All data shall be punched for binding and composition and printing shall be arranged so that punching does not obliterate any data. The project number, project title, and Airport shall be inserted in the front and backbone binder cover.

The Contractor shall submit a draft to the Engineer for review prior to the submission of the final copies.

The manual shall include separate sections describing each equipment. Provide a general description of the equipment, instructions for operation, maintenance, recommended inspection points and periods for inspection, testing, adjustments, calibration procedures with illustrations, wiring diagrams, trouble shooting situations and solutions, and repair methods in a practical, complete, and comprehensive manner.

For each equipment, include information on detailed parts listings (part numbers and costs) with the manufacturer's name, address, contact person, e-mail address and phone/fax numbers. Provide the contact name, address, e-mail address and phone/fax numbers of the distributor in the State of Hawaii for each equipment.

Include a separate section on warranty information on all products and equipment. Provide this information in a tabular format with a listing on all products and equipments with warranty start and completion dates for each item.

Include separate sections on all approved submittals, test reports, certifications, etc.

All information shall be arranged in a logical, orderly sequence. Manuals submitted by the manufacturer will not be accepted.

1.08 TEST REPORTS

Six copies of test reports for any material used in this Contract shall be submitted when specified or required by the Engineer.

1.09 SUBMITTAL IDENTIFICATION

A. To avoid rejection and to clarify each submittal, the General Contractor shall have a rubber stamp made up in the following format:

B. _____
General Contractor's Name

PROJECT TITLE: _____
AIRPORT: _____
STATE PROJECT NO: _____
AIP PROJECT NO: _____
THIS SUBMITTAL HAS BEEN CHECKED BY THIS GENERAL CONTRACTOR AND IS CERTIFIED CORRECT AND IN COMPLIANCE WITH THE CONTRACT DRAWINGS AND SPECIFICATIONS.

ITEM NO. _____

SUBMITTAL NUMBER _____
DATE RECEIVED _____
SPECIFICATION SECTION # _____
SPECIFICATION PARAGRAPH # _____
DRAWING NUMBER _____
SUBCONTRACTOR NAME _____
SUPPLIER NAME _____
MANUFACTURER NAME _____

CERTIFIED BY _____(Contractor's Signature, Date)_____
(Contractor's Name and Title)

C. This stamp "filled in" should appear on each reproducible shop drawing, on the cover sheet of copies of test and mill reports, certificates of compliance, catalog cuts, brochures, etc. The stamp should be placed on a heavy stock paper merchandise (approximately 3" x 6") and one tag tied to each sample submitted for approval. The tag on the samples should state what the sample is, so that if the tag is accidentally separated from the sample, they can be matched up again. The back of this tag will be used by the Engineer for receipt, approval, and log stamp for any comments that relates to the sample.

D. Submission Number: Each submission is to be sequentially numbered in the space

provided in the Contractor's stamp. Correspondence and transmittal will refer to this number.

E. The Contractor shall ensure that all submittals, including shop drawings, are complete and in conformance to the requirements of the Contract specifications prior to submission to the State for review and acceptance. Incomplete submittals will not be processed by the State and returned to the Contractor for correction. Any cost impacts and delays in the Project schedule as a result of incomplete submittals shall be the responsibility of the Contractor.

1.10 AS-BUILT DRAWINGS

As-built drawings shall conform to the requirements of Section 5.8 - "Coordination Between the Contractor and the State" of the General Provisions for Construction Projects (2016), and the following requirements:

The Contractor shall maintain on the job site a set of full-size contract drawings, marking them in red to show all variations between the construction actually provided and that indicated or specified in the contract documents, including buried or concealed construction. (Section 5.8 (a) Drawings and Special Provisions of the General Provisions for Construction Projects.)

Where a choice of material or method is permitted herein or where variations in scope of character of work from that of the original contract or authorized, the drawings shall be marked to define the construction actually provided. Where equipment installation is involved, the size, manufacturer's name, model number, power input or output characteristics as applicable shall be shown on the as-built drawings.

The representation of such changes shall conform to standard drafting practice and shall include such supplementary notes, legends, and details as necessary to clearly portray the as-built construction.

The drawings shall be maintained and updated on a daily basis. The Contractor shall stamp, sign, and date each sheet with the following stamp:

AS-BUILT DRAWINGS/SPECIFICATIONS

This certifies that the dimensions and details shown on this sheet reflect the dimensions and details, and specifications as constructed in the field.

_____
CONTRACTOR'S NAME

_____
Signature Date

Monthly and final payments to the Contractor shall be subject to prior approval of the drawings. On completion of the work, both sets of marked-up drawings shall be delivered to the Engineer and shall be subject to approval before acceptance.

1.11 GUARANTEES

Guarantee periods shall start at time of acceptance in writing by the State.

All guarantees and warranties shall be made out to the "State of Hawaii." Supplier and subcontractor guarantees shall be co-signed by the Contractor.

The Contractor is solely responsible for coincidence or non-coincidence of factory warranties or equipment guarantees, and the Contractor's own warranties and guarantees as required by the contract. The Contractor is solely responsible for scheduling and coordinating the installation of equipment and materials so as to take maximum advantage of factory warranties.

PART 2 - PRODUCTS (Not Used)

PART 3 - EXECUTION (Not Used)

PART 4 - MEASUREMENT AND PAYMENT

4.01 BASIS OF MEASUREMENT AND PAYMENT

Work under this Section will not be measured nor paid for separately but shall be considered incidental to and included in the bid prices for the various items of work in this project.

END OF SECTION

SECTION 01301 – CONTRACTOR'S CONSTRUCTION SCHEDULE AND REPORTS

PART 1 - GENERAL

1.01 RELATED DOCUMENTS

The General Provisions for Construction Projects (2016), Special Provisions and General Requirements of the Specifications, apply to the work specified in this Section.

1.02 SUMMARY

A. It is expressly understood and agreed that the rate of progress and the time of completion of the Work are of the essence for this Contract. The Work shall be executed with such progress as required to prevent any delay to this contract and to other Contractors working on other contracts at the site. This includes the Contract milestone dates and constraints and the general completion of the Work of the Contract.

B. The Work specified in this Section includes the preparation and submittal of a Construction Progress Schedule and schedule updates and revisions to the Construction Progress Schedule.

C. The Contractor shall prepare and submit a Baseline Construction Progress Schedule in accordance with the requirements of this Section. By preparing and submitting the Baseline Construction Schedule and monthly Schedule Updates, the Contractor represents that it can and intends to safely execute the contracted Work and all portions thereof including all activities of Subcontractors, equipment vendors, and suppliers and including submittals and re-submittals within the specified times and constraints. The Contractor also represents that the Bid price covers all costs associated with the execution of the Work in accordance with the Construction Schedule and Contract Documents.

1.03 PURPOSE OF THE SCHEDULE

A. This Section specifies requirements and procedures for the Contractor to prepare construction schedules, cost loaded schedule, resource loaded scheduled, cash flow projections, manpower projection, and cost and schedule reports. The purpose of the schedules and reports shall be to:

1. Ensure adequate planning and timely execution of the work by the Contractor;

2. Establish a baseline Contract schedule which subsequent monthly schedule updates will be compared against to determine overall progress and performance towards satisfactory completion of the Project.

3. Facilitate coordination and interfacing of the Contractor's work with others as needed;

4. Assist the State Engineer in monitoring progress;

5. Establish the amount of the monthly progress payment to be made to the Contractor;

6. Establish the amount of daily manpower required to complete the Project within the Contract duration;

7. Evaluate proposed changes to the Contract and subsequent impacts to the construction schedule;

8. Effectively determine impacts of time extensions and change order costs of this Contract to overall Project completion.

B. The Contractor shall be required to provide and maintain at a minimum the following:

1. Monthly Requirement:

a. Construction schedule
b. Schedule of values for progress payment application
c. Cash flow projection
d. Manpower projection
e. Monthly status report (Narrative)

1.04 DEFINITIONS

A. Baseline Construction Progress Schedule: The accepted baseline schedule for the construction Contract, demonstrating the planned activities, activity costs, resources and activity durations as the Project was bid.

B. Cash Flow: For construction costs, reflects scheduled expenditures based on activity cost loading. This is the anticipated Contractor billings (gross) before the withholding of retention and is estimated by the Contractor.

C. Cost Loaded Schedule: Allocating bid estimate cost to each schedule activity which forms the basis for anticipated Contractor billings (gross) before the withholding of retention and is estimated by the Contractor.

D. Early Finish: The earliest a schedule activity is expected to finish, based on its relationship (logic) to other activities in the project.

E. Early Start: The earliest a schedule activity is expected to start, based on its relationship (logic) to other activities in the project.

F. Late Finish: The latest a schedule activity can finish, based on its relationship (logic) to other activities on the project, and still permit the project to be completed on time.

G. Late Start: The latest a schedule activity can start, based on its relationship (logic) to other activities on the project, and still permit the project to be completed on time.

H. Resource Loaded Schedule: A report that identifies by activity all direct field labor to perform the Work.

I. Original Duration: The amount of time, in calendar days, an activity is expected to take to complete at the beginning of a project.

J. Total Float: The number of days by which a part of the Work in the construction schedule may be delayed from its early start/finish dates without necessarily extending the contract completion date.

K. Work Activity: An activity which requires time and resources to complete and should be performed before the Contract is considered complete.

L. Critical Path: A continuous sequence of schedule network activities with the least amount of total float ending at a contract milestone.

M. Longest Critical Path: A continuous sequence of schedule network activities that begins with notice to proceed milestone and ends at the project completion milestone.

N. Milestone: A significant schedule event identified in the contract as a “milestone”.

O. Critical Path Method (CPM): Schedule development that starts with a proper plan sequenced from beginning to end, followed by time driven forward and backward passes to establish (1) Critical Path and (2) Float for all other paths.

1.05 SUBMITTALS

A. Work Breakdown Structure [WBS] and Activity Coding Plan

B. Baseline Construction Progress Schedule

C. Cost and Resource Loaded Schedule

D. Monthly Updated Schedule Reports, including Narrative

1.06 QUALIFICATIONS

The Contractor shall employ or retain the services of a Project Scheduler who shall have a minimum of ten (10) years verifiable experience in construction work sequencing, productivity, and scheduling as well as preparing and maintaining detailed construction schedules using the most current version of Primavera P6. Within seven (7) calendar days after Administrative Notice to Proceed, the Contractor shall submit the Project Scheduler’s resume to the State Engineer. The State Engineer reserves the right to reject the proposed scheduler based on the lack of qualifications. The Contractor’s scheduler shall attend all meetings pertaining to scheduling of the Work. This person, along with the Contractor’s management team, is expected to work closely with the State Engineer to deliver acceptable products outlined in this Section and comply with the Reports requirements of this Section.

1.07 BASELINE CONSTRUCTION PROGRESS SCHEDULE REQUIREMENTS

A. The Critical Path Method (CPM) type construction schedule will be used to monitor job progress. The Contractor shall be responsible for providing all information concerning the sequencing, logic, and duration of all activities as well as providing the initial CPM logic network (in electronic and paper form) diagram and tabular report data.

B. The Contractor shall use Primavera P6 latest version, and a hardware system commensurate with the size of the project. The system shall be capable of handling, processing, printing, and plotting all data required to satisfy the requirements of this Section. All electronic files submitted to the State Engineer shall be compatible with Primavera P6 latest version.

C. Within fourteen (14) days after Administrative Notice to Proceed, the State Engineer shall schedule and conduct a preconstruction scheduling conference to commence development of the required construction schedule. At the meeting, the requirements of this Section will be reviewed with the Contractor, the Contractor shall present their proposed methodology for the Construction Progress Schedule, sequence of operations, and resource and quantity loading methodology. The Contractor shall submit to the State Engineer a written copy of its proposed WBS and coding system or activity identification system for labeling all Work activities. The WBS and activity coding/identification scheme shall be acceptable to the State Engineer. The State Engineer shall review and accept the WBS, the coding structure, and activity identification system within fourteen (14) days after submission by the Contractor. The Contractor shall make all modifications to the proposed WBS, the coding structure, and activity identification system that are requested by the State Engineer and shall employ that coding, structure, and system in its Baseline Construction Progress Schedule submission. The WBS shall be correlated with the Contractor's Schedule of Values and the cost loaded schedule. Develop other activity codes and values needed to comply with the reporting requirements listed herewith, subject to acceptance by the State Engineer.

D. The activities contained within the schedules shall be cost loaded to equal the Contract Total Price with Sub-Totals that match the Schedule of Values. Overhead and profit shall be prorated on all activities for the entire project length. The Contractor shall not unbalance the activity cost loading. Together, the Cost Loaded Schedule and the Schedule of Values shall form the basis for the Pay Application Report and all monthly payment requests.

E. The Contractor shall collect data and information from subcontractors, suppliers, and equipment manufacturers for incorporation into the Baseline Construction Progress Schedule. The baseline schedule submittal shall include certification in the form of signatures from subcontractors, suppliers and equipment manufacturers validating data collected for schedule development.

F. Within thirty (30) days after Administrative Notice to Proceed the Contractor shall submit the Baseline Construction Progress Schedule to the State Engineer including

a written narrative to further explain the plan as set forth in its CPM logic network and schedule.

G. The Work activities comprising the Baseline Construction Progress Schedule shall be of sufficient detail to assure adequate planning and execution of the Work such that, in the judgment of the State Engineer, it provides an appropriate basis for forecasting, monitoring, and evaluating the progress of the Work. Work activities shall conform to the following requirements:

1. Describe Work activities using consistent terminology such that the Work is readily identifiable for assessment of completion.

2. Subdivide the Work into activities of duration no longer than fourteen (14) calendar days each, except as to non-construction activities (such as procurement of materials, delivery of materials, delivery of equipment, and concrete curing) and any other activities for which the State Engineer may approve a longer duration.

3. The construction time as determined by the schedule from early start to late finish for any subphase, phase, or the entire project shall not exceed the Contract times specified or shown in the Contract Documents. One day shall be the smallest time unit shown unless otherwise directed by the State Engineer.

4. Activities labeled "start," "continue," or "completion" will not be allowed. Logic relationships between activities shall be limited to finish to start type relationships. The use of durations between activities, or lags, shall not be permitted.

5. Show the following information for each Work activity:

    a. WBS and activity identification number consistent with the coding accepted by the State Engineer. The WBS and activity identification shall be cross-referenced with the Contractor’s Schedule of Values.
    b. Performance responsibility, subcontractor, trade code (GEN, MECH, ELEC, CARP, PLAST, etc.), and separate General Contractor identification.
    c. Duration (in calendar days).
    d. Work location code and description of the physical plant area involved.
    e. Cost data as described herein.

H. The Baseline Construction Progress Schedule shall contain the following standard milestones:

1. Notice to Proceed

2. Mobilization

3. Construction Start

4. Contract Milestones and constraints in SECTION 01014 – WORK SEQUENCE for each phase of work.

5. Substantial Completion

6. Final Completion

I. The Baseline Construction Progress Schedule shall begin with the date of issuance of the Notice to Proceed and not exceed the maximum contract days provided by the Contract. It shall include, but not be limited to, the following items as appropriate to this Contract:

1. Resource activity loading showing, at a minimum, the composite crew, the classification (e.g., foreman, journeyman, etc.) of the individual craftsman comprising the crew, materials, and equipment associated with each activity shown on the schedule, plus any other information required by State Engineer.

2. Quantity loading for unit price bid items showing, at a minimum, estimated quantities to be installed or removed as indicated by the contract drawings, or as determined by the Contractor in preparation of its Bid, associated with major activities shown on the schedule, plus any other information required by State Engineer.

3. Type of work to be performed, sequences, and labor trades involved, including performance responsibility and trade code.

4. All purchases, submittals, submittal reviews, fabrication, deliveries, manufacturer factory tests, field tests, readiness tests, and installation activities for all materials and equipment for which the Contractor intends to seek payment, including stored materials.

5. Delivery, installation, check-out/testing, startup, and commissioning of Owner-furnished equipment and/or materials in accordance with the schedule dates set forth in the Specifications or furnished by the Owner.

6. State Engineer review, and approval of shop drawings and material samples showing a thirty (30) calendar day minimum time specified for the State Engineer's review of submittals, unless the submittal is of the type requiring a longer period of time. Twenty one (21) calendar days duration shall be allocated for the State Engineer's review of Contractor resubmittals.

7. Approvals required by regulatory agencies or other third parties.

8. Identification of all subcontract work and assignments of responsibility for performing specific activities.

9. Access to and availability of work areas including all anticipated outages, flow diversions, or bypass pumping.

10. Connection to all existing plant systems and equipment.

11. All temporary utilities and construction.

12. Interruption and shut down requests of facilities or utilities to allow for new connections.

13. All start up, testing, training, and assistance required under the Specifications.

14. Timing of the phased or total takeover by Owner.

15. Identification of any manpower, material, or equipment restrictions, as well as any activity requiring unusual shift work, such as two (2) shifts, six (6) day weeks, overtime, or work at times other than regular days or hours, shall be clearly identified in the Construction Progress Schedule.

16. Contractor activities that will be coordinated with Owner on-going activities.

17. Contractor-obtained permits.

18. Material and Equipment Installation

    a. Installation
    b. Check out
    c. Operations and Maintenance manuals submittal/approval
    d. Training lesson plans submittal/approval
    e. Training of Owner staff

19. Preparation of coordination and layout drawings.

20. Clearly identify all non-work days in the schedule, such as, holidays, or other non-work periods.

21. Specific Work activities, including but not limited to, site work, underground piping and electrical duct banks, structural excavation, soil testing, backfill, placement of sheeting, foundations, formwork erection, rebar placement, placing of concrete, stripping forms, concrete curing, installation of process piping, electrical conduits and wiring, instrumentation and controls conduits and wiring, terminations, other materials and equipment, and cleanup.

22. Time Allowance for Inclement Weather:

    a. Normal weather conditions shall be considered and included in the planning and scheduling of all weather sensitive schedule activities. Thirteen (13) inclement weather days per calendar year shall be included in the baseline schedule.
    b. Schedule activity duration(s) shall be formulated with allowance for normal weather conditions. Any activity which could be impacted by normally anticipated inclement weather (precipitation, temperature, wind, etc.), due to

the time period which the Contractor has scheduled the work, shall include an adjustment to include the anticipated weather impact from normal weather conditions. “Inclement weather” is a lost workday, caused by inclement weather conditions, and is defined as a day in which the Contractor’s workforce cannot work fifty (50) percent or more of the day thereby resulting in a delay to the critical path.

c. The total number of inclement weather days identified in paragraph 22. a. shall be reflected in a schedule activity titled “Inclement Weather”. The duration for this activity shall be the total number of inclement weather days for the total contract time. The inclement weather activity’s successor shall be the Project completion milestone. The predecessor activities shall be the last project activities that occur before Project completion. The Contractor shall notify the State Engineer in writing when a lost workday has occurred due to inclement weather in accordance with the Baseline Construction Schedule update requirements. As inclement weather days occur, are recognized and approved by the State Engineer as an inclement weather day, the inclement weather activity duration will be reduced to account for the approval of an inclement weather day. If the number of actual inclement weather delay days exceeds the number of inclement weather delay days in paragraph 22. a., the Contractor shall notify the State Engineer in writing. Such delays shall not entitle the Contractor to any additional compensation. The sole remedy of the Contractor shall be to seek a non-compensable extension of time.

23. Punch lists.

24. Final cleanup.

25. Specific information required by the State Engineer.

26. Required inspections by the Authority Having Jurisdiction and the State Engineer.

J. The Contractor shall submit copies of detailed CPM network diagram of each of the following:

1. Predecessors/Successor Report showing the predecessor activities and successor activities for each activity in the Baseline Construction Progress Schedule, sorted by Early Start. This report shall flag any activity that has been constrained.

2. Electronic file(s) containing all data related to the Baseline Construction Progress Schedule including PDF and XER format.

3. Lists of planned submittals and procurement activities.

K. The Baseline Construction Progress Schedule shall demonstrate the final level of detail for each activity and shall contain the required relationships completely identified and the durations of each activity correctly depicted. The Baseline Construction Progress Schedule shall be developed as follows:

1. The Baseline Construction Progress Schedule shall contain no Contract changes or delays which may have been incurred during the interim schedule development period. These changes will be entered at the first update after the Baseline Construction Progress Schedule has been accepted and a change to the Contract time or duration was made via an approved Change Order.

2. The Baseline Construction Progress Schedule submitted for review and approval by the State Engineer shall be un-statused and the data date shall be the contract notice to proceed date.

3. The Baseline Construction Progress Schedule shall clearly indicate the longest critical path of activities from Notice to Proceed to the Contract completion date.

4. The Baseline Construction Progress Schedule will contain all cost information assigned each of the specific activities at the final level of detail. Each activity shall be cost loaded to permit initial generation of a cash flow curve and resource curve.

5. The Contractor shall submit certification that the approved construction schedule has been reviewed and discussed with all subcontractors, suppliers and vendors as it relates to their work prior to commencement of their work.

6. Once the Baseline Construction Progress Schedule is accepted it becomes the schedule of record and the basis for future schedule updates.

7. After the acceptance of the Baseline Construction Progress Schedule, no changes shall be made therein without approval of the State Engineer.

L. Initial Baseline Construction Progress Schedule. Contractor's first (1st) payment application will be processed if the initial Baseline Construction Progress Schedule has been submitted by the Contractor and approved by the State Engineer. If the initial Baseline Construction Schedule has been submitted and is not approved at the time of the Contractor's first payment application, only mobilization costs as allowed pursuant to the General Conditions, and to the extent otherwise supported by the Contractor as due and owing, shall be paid by State Engineer.

M. Monthly Updates to the Baseline Construction Progress Schedule. Contractor's monthly payment applications shall not be accepted and processed for payment by the State Engineer without Baseline Progress Schedule updates submitted in the time and manner required by this specification which accurately reflect the allowable costs due under the Contract Documents, and are accepted by the State Engineer.

1.08 RESOURCE LOADED SCHEDULE

A. Contractor shall provide a Resource Loaded Schedule detailing the number of work force employees needed on a work day basis to complete the work within the contract duration.

B. Any proposed changes to the Resource Loaded Schedule may only be made with the acceptance of the State Engineer.

C. Manpower resources shall be listed in the Resource Library of the Primavera Software and the Contractor shall assign manpower resource loading by trade for each work activity of the schedule.

1.09 FLOAT OWNERSHIP AND EARLY COMPLETION

A. Project float, total float, slack time, or contingency within the Construction Progress Schedule (i.e., the difference in time between the projected early completion date and the required Contract completion date), and free float or critical path float within the overall Construction Progress Schedule is not for the exclusive use of either State Engineer or the Contractor but is jointly owned by both and is an expiring resource available to and shared by both as needed to meet Contract milestones and the Contract completion date. Pursuant to the float sharing requirements of the Contract, use of float suppression techniques such as preferential sequencing, special lead/lag logic restraints, extended activity times, or imposed dates shall be cause for rejection of the Construction Progress Schedule and any revisions or updates. The use of float time shall be shared as directed by the State Engineer.

B. State Engineer-initiated changes that extend or shorten the Contract Times shall be the sole basis to adjust the Contract completion date. Delays in the critical path not associated with proper requests for time extensions in accordance with the General Conditions and General Requirements shall be deemed to be the responsibility of the Contractor.

C. Any delays to the Contractor's early completion date shall be non-compensable and is considered Project Float which is not for the exclusive use of the Contractor or State Engineer. The interface and coordination with other contractors and stakeholders preclude acceptance of a zero float early finish schedule.

D. The only allowable constraint for use in the construction schedule will be for contract milestone dates using a "Finish no later than" constraint, unless approved by the State Engineer.

1.10 PROGRESS OF THE WORK

Monthly Schedule Updates:

A. Once the Baseline Construction Progress Schedule is accepted by the State Engineer, the Contractor shall be responsible for preparing and submitting update information on logic, physical percent complete, cost percent complete, actual start and finish dates, duration changes, and related reports, diagrams, and schedules based on the Progress Payment cycle.

B. On a date determined by the State Engineer, the Contractor shall meet with the State Engineer to review the monthly progress schedule update. The Contractor and the State Engineer will review the updated construction schedule and discuss the

content of the narrative report. The State Engineer shall be allowed seven (7) calendar days after the meeting to review and accept or reject the construction schedule update. Rejected construction schedule updates shall be resubmitted to the State Engineer within seven (7) days, at which time a new seven (7) day review period by the State Engineer will begin. Submittal at the monthly construction schedule update to the State Engineer shall be a condition precedent to the making of any payments, which are due or may become due under the terms of the Contract.

C. All subsequent monthly schedule updates shall be compared to the Baseline Construction Progress Schedule. In addition, each current monthly update shall be compared to the last month's update. Each update shall be labeled by period with data date and report date identified on the hard copy and electronic file.

D. The monthly update of the Baseline Construction Progress Schedule shall include the following:

1. One (1) electronic copy (PDF and XER) of the schedule, with data date and monthly period clearly marked.

2. Four (4) copies and PDF of the CPM computer printout and arrow diagram which shall:

    a. Compare baseline schedule activities against current update activities.
    b. Clearly identify longest critical path and near critical path activities with less than thirty (30) days of total float.

3. Four (4) copies and PDF of the cash flow projections by month with early and late forecast schedule dates and actual partial payment amounts by CONTRACTOR and total project.

4. Four (4) copies and PDF of successor/predecessor, total float, and ninety (90) day look ahead reports.

5. Four (4) copies and PDF of the monthly summary cost activity report, oriented to the monthly payment requisition level of detail.

6. Four (4) copies of the narrative report.

E. Schedule Updates shall be provided monthly with the request for progress payment.

F. Default progress data provided from the scheduling system shall not be allowed. Actual start and finish dates shall not be automatically updated by default mechanisms that may be included in CPM scheduling software systems. Actual start and finish dates in the Construction Progress Schedule database shall match those dates provided from the Contractor Daily Reports. Failure of the Contractor to document the actual start and finish dates on the Contractor Daily Report for every in-progress or completed activity and to ensure that the data contained on the Contractor Daily Reports is the sole basis for schedule updating shall result in the

disapproval of the Contractor 's schedule and the inability of the State Engineer to evaluate the Contractor’s progress for payment purposes.

G. Activities that have reported progress without predecessor activities being completed, Finish Start Relationship (FS) (Out-of-Sequence Progress) will not be allowed except on a case-by-case basis with the approval from State Engineer. A written explanation of each activity shall be included in the monthly submittal. The State Engineer may direct that changes in schedule logic be made to correct any or all out-of-sequence Work.

H. The Contractor shall identify each month any changes to the schedule, such as: new activities, constraint changes, deleted activities, activity duration changes, activity description changes, and changes in logic relationships between activities. Logic changes shall be described with an explanation of the rationale for the change provided in the report.

I. The Contractor shall not constrain the schedule with artificial logic ties and/or constraint dates and/or any other scheduling techniques that may distort the activity float and total float associated with the critical path activities and the schedule in general.

J. The Contractor shall provide a schedule report defining the times at which schedule work activity submittals are required. This submittal schedule shall be tied to early start/early finish and late start/late finish work activity dates to ensure that time has been allowed for review and return.

K. The updated construction progress schedule, as approved by the State Engineer, shall determine the amount of Progress Payment to the Contractor on a monthly basis. Change order work shall be identified in the schedule as a new activity inserted into the affected schedule logic. The schedule activity shall be cost loaded once the change order is approved for payment by State Engineer.

1.11 NARRATIVE PROGRESS REPORT

A. Prepare a narrative progress report to be submitted with the monthly schedule update that summarizes cost and schedule status as outlined below.

B. Prepare and submit a summary cost activity report with each progress payment. The cost information shall be updated by activity and summarized for each month. The sum of all monthly costs shall be equal to the contract amount plus approved change orders.

C. The costs shall be summarized for each pay application and the sum of all pay applications shall be shown as costs to-date, along with the remaining contract balance.

D. The Narrative Report shall include and be in the following format:

1. The Contractor 's transmittal letter.

2. Schedule report indicating each activity on the CPM Schedule that has been:

    a. Completed during this reporting period;
    b. In progress during this reporting period;
    c. Scheduled for the next reporting period.

3. Analysis, by critical path, of each negative path describing:

    a. The nature of the critical path;
    b. Impact on other activities, milestones, and completion dates;
    c. Recommendations for recovery of the delays.

4. Current and anticipated delays

    a. Cause of the delay;
    b. Corrective action and schedule adjustments to correct the delay;
    c. Impact of the delay on other activities, milestones, and completion dates.

5. Change in construction sequence, logic changes, relationship changes, or duration changes and the rationale associated with each change.

6. Pending issues and status of other items:

    a. Permits;
    b. Contract modifications;
    c. Time extension requests;
    d. Long-lead procurement items.

7. Tabular schedule reports tabulated by:

    a. Contractor /early start;
    b. Total float/early start;
    c. Area/early start;
    d. Activity number.

8. Added/deleted activities.

9. Out of Sequence Report describing the necessity of each activity relationship shown therein.

10. Illogical Progress/Restraint Reports (if any).

11. Contract complete date status.

12. Ahead of schedule and number of days.

13. Behind schedule and number of days.

14. Summary of project status including cumulative information to date, variance, and forecast at completion.

15. Other project or scheduling concerns.

16. Review and update of CPM Schedule.

17. Safety Reports and any code violations or warnings.

18. Computer disk containing the latest CPM schedule update file.

19. Provide a report of STATE ENGINEER activities such as; e.q. owner supplied equipment, shutdowns, permits, inspections, approvals, start-up and training activities, etc.

1.12 THREE (3) WEEK LOOK AHEAD

A. The Contractor shall provide a three (3) week look ahead schedule from the current Construction Progress Schedule, in Primavera report format which shall include the week in which the schedule is presented, plus the two (2) successive weeks thereafter. The three week (3) look ahead shall be submitted to the State Engineer no later than twenty four (24) hours prior to the weekly project progress meeting.

1.13 TIME EXTENSION REQUESTS

A. Requests for time extensions shall be submitted in the time and manner specified in the General Conditions.

B. Request for time extension shall be submitted within seven (7) calendar days of the event that created the extension of time.

C. Time Impact Analysis (TIA):

1. The Contractor shall submit a *Fragnet of the* TIA to the State Engineer with each request for an adjustment in contract time or when the Contractor or the State Engineer consider an approved or anticipated change that may impact the critical path or contract progress.

2. The Contractor shall submit a TIA within seven (7) calendar days of receiving a request from the State Engineer.

3. The TIA shall illustrate the impact of each change or delay on the current scheduled completion date (or internal milestone) and utilize the baseline schedule as modified by change order(s) and a data date closest to and prior to the event being analyzed.

4. The TIA shall include an impact schedule developed from incorporating the event into the accepted schedule by adding or deleting activities, or by changing durations or logic of existing activities. If the impacted schedule shows that

incorporating the event modifies the critical path and the scheduled completion date of the accepted schedule, the difference between the scheduled completion dates of the two schedules shall be equal to the adjustment of contract time.

5. The Contractor shall allow the State Engineer seven (7) calendar days after receipt of a TIA to approve or reject the submitted TIA.

6. All approved TIA schedule changes shall be shown on the next schedule update schedule.

7. When a TIA is rejected by the State Engineer the Contractor shall meet with the State Engineer to discuss to discuss and resolve the issues. If an agreement is not reached, the Contractor shall be allowed within seven (7) calendar days after the meeting to submit a Notice of Claim. The Contractor shall not show any activities related to the TIA in any schedule updates until and if such time the TIA and or claim is approved by the State Engineer.

8. Changes that affect the controlling operation on the critical path will be considered by the State Engineer in decreasing time or granting an extension or deletion of time for completion of the contract. Time extensions will only be granted if the total float is absorbed and the scheduled completion date is delayed one or more days because of the ordered change.

9. Changes that do not affect the controlling operation on the critical path will not be considered as a basis for time adjustment.

1.14 REMEDIAL MEASURES AND RECOVERY SCHEDULE

A. If at any time during the Project, the Contractor fails to complete a critical or near critical activity by its latest completion date, thereby causing potential delay to the contract completion date, the Contractor will be required, within seven (7) days, to submit to the State Engineer a written statement as to how and when it plans to recover the schedule delay. The recovery plan and schedule changes shall be reflected during the next schedule update period.

B. Delays to Critical Path: Whenever it becomes apparent from the current monthly update that delays to the critical path have resulted and that these delays are through no fault of the State Engineer and hence, that the Contract completion date will not be met, or when so directed by the State Engineer, the Contractor shall submit to the State Engineer for review a written statement of the steps it intends to take to remove or arrest the delay to the schedule. The Contractor shall promptly provide such level of effort to bring the Work back on schedule.

C. Under no circumstances will the addition of equipment or construction forces, increasing the working hours or any other method, manner, or procedure to recover delays to the CPM Schedule be considered justification for contract modification or extra Work.

D. The State Engineer may require the Contractor, at any time during the Project, to develop a more detailed schedule/fragnet than depicted in the detailed schedule to provide a clearer understanding of the effort needed to complete a specific area or task.

1.15 FINAL SCHEDULE UPDATE

A. As a condition precedent to any release of retention, the last update to the Construction Progress Schedule submitted shall be identified by the Contractor as the As-Built Construction Schedule. The As-Built Construction Schedule shall reflect the exact manner in which the project or portion thereof was actually constructed including start and completion dates, activities, sequences, and logic ties.

B. This schedule submission shall be accompanied by a certification, signed by an officer of the company and the Contractor's Project Manager and Project Scheduler, stating "To the best of our knowledge, the enclosed final update of the Construction Progress Schedule accurately reflects the actual start and completion dates and logical relationships of all activities contained herein and represents an accurate depiction of the way in which the project was constructed."

PART 2 – PRODUCTS (NOT USED)

PART 3 – EXECUTION

3.01 REQUIRED REPORTS

Report No.	Report Description and Frequency
1.	**THE BASELINE CONSTRUCTION PROGRESS SCHEDULE CPM LOGIC DIAGRAMS** shall be plotter drawn CPM logic diagrams and submitted on sheets 30 inches by 42 inches or as otherwise directed by the STATE ENGINEER. The activity box shall include, at a minimum, the following: activity number, activity description, original durations, total float, and activity constraints. The logic diagram shall be submitted until the Baseline Construction Progress Schedules are accepted. All CPM logic diagrams shall clearly identify all contract milestones and the projects longest critical path to project completion.
2.	**ACTIVITY LISTING SCHEDULE REPORT** sorted by Total Float (TF) and Early Start Date (ES): As part of Baseline Construction Progress Schedule Submittal and Monthly Schedule Updates
3.	**CRITICAL PATH SCHEDULE REPORT** sorted by Total Float (TF) with logic ties shown: As part of Baseline Construction Progress Schedule Submittal and Monthly Schedule Updates
4.	**THREE WEEK LOOK AHEAD SCHEDULE REPORT** sorted by Total Float (TF) with one week of history and three week look ahead: As part of Baseline Construction Progress Schedule Submittal and Monthly

Schedule Updates

5. **RESOURCE LOADED SCHEDULE AND LISTING OF ALL LABOR RESOURCES**
   As part of Baseline Construction Progress Schedule Submittal

6. **ACTIVITY LISTING** of all activities with all predecessor and successor activities shown: As part of Baseline Construction Progress Schedule Submittal and Monthly Schedule Updates

7. **PURE LOGIC DIAGRAM** network plot of all activities in predecessor diagram format: As part of Baseline Construction Progress Schedule Submittal

8. **COST LOADED ACTIVITY REPORT** without progress: As part of Baseline Construction Progress Schedule Submittal

9. **UPDATED COST LOADED REPORT WITH PROGRESS** and cost values shown: As part of Baseline Construction Progress Schedule Submittal and Monthly Schedule Updates

10. **COST CURVE (CASH FLOW CURVE)** sorted by early start and early finish dates: As part of Baseline Construction Progress Schedule Submittal and Monthly Schedule Updates

11. **RESOURCE HISTOGRAM,** per period and cumulative resource curves: As part of Baseline Construction Progress Schedule Submittal

12. **CONTRACTORS DAILY REPORTS**, submitted daily identifying the start and finish dates of schedule work activities and total number of men on the project per day and project weather condition and description of work performed.

PART 4 - MEASUREMENT AND PAYMENT

4.01 BASIS OF MEASUREMENT AND PAYMENT

Work under this Section will not be measured nor paid for separately but shall be considered incidental to and included in the bid prices for the various items of work in this project.

END OF SECTION

SECTION 01400 - CONTRACTOR QUALITY CONTROL PROGRAM

PART 1 - GENERAL

1.01 RELATED DOCUMENTS

The General Provisions for Construction Projects (2016), Special Provisions and General Requirements of the Specifications, apply to the work specified in this Section.

1.02 CONTRACTOR QUALITY CONTROL PROGRAM

A. GENERAL

The Contractor shall establish, provide, and maintain an effective Quality Control Program that details the methods and procedures that will be taken to assure that all materials and completed construction required by this contract conform to contract plans, technical specifications and other requirements, whether manufactured by the Contractor, or procured from subcontractors or vendors. Although guidelines are established and certain minimum requirements are specified herein and elsewhere in the contract technical specifications, the Contractor shall assume full responsibility for accomplishing the stated purpose.

The intent of this section is to enable the Contractor to establish a necessary level of control that will:

1. Adequately provide for the production of acceptable quality materials.

2. Provide sufficient information to assure both the Contractor and the Engineer that the specification requirements can be met.

3. Allow the Contractor as much latitude as possible to develop his or her own standard of control.

The Contractor shall be prepared to discuss and present, at the pre-construction conference, his/her understanding of the quality control requirements. The Contractor shall not begin any construction or production of materials to be incorporated into the completed work until the Quality Control Program has been reviewed and approved by the Engineer and State Project Manager. No partial payment will be made for materials subject to specific quality control requirements until the Quality Control Program has been reviewed and approved.

B. DESCRIPTION OF PROGRAM

1. General Description. The Contractor shall establish a Quality Control Program to perform inspection and testing of all items of work required by the technical specifications, including those performed by subcontractors. This Quality Control Program shall ensure conformance to applicable specifications and plans with respect to materials, workmanship, construction, finish, and functional performance. The Quality Control Program shall be effective for control of all

construction work performed under this Contract and shall specifically include surveillance and tests required by the technical specifications, in addition to other requirements of this section and any other activities deemed necessary by the Contractor to establish an effective level of quality control.

2. Quality Control Program**.** The Contractor shall describe the Quality Control Program in a written document which shall be reviewed and approved by the Engineer and State Project Manager prior to the start of any production, construction, or off-site fabrication. The written Quality Control Program shall be submitted to the Engineer for review no later than thirty (30) calendar days after execution of the Contract.

3. The Quality Control Program shall be organized to address, as a minimum, the following items:

   a. Quality control organization;
   b. Submittals schedule;
   c. Inspection requirements;
   d. Quality control testing plan;
   e. Documentation of quality control activities; and
   f. Requirements for corrective action when quality control and/or acceptance criteria are not met.
   g. A listing of the definable features of work for the project.

   The Contractor is encouraged to add any additional elements to the Quality Control Program that he/she deems necessary to adequately control all production and/or construction processes required by this contract.

C. QUALITY CONTROL ORGANIZATION

The Contractor's Quality Control Program shall be implemented by the establishment of a separate quality control organization that is not a part of the production organization. An organizational chart shall be developed to show all quality control personnel and how these personnel integrate with other management/production and construction functions and personnel. The organizational chart shall identify all quality control staff by name and function and shall indicate the total staff required to implement all elements of the Quality Control Program, including inspection and testing for each item of work. At the top of the chart, an overall Contractor Quality Control System Manager, CQCSM, shall be named and his/her subordinates shall follow thereafter.

The quality control organization shall consist of the following minimum personnel:

1. Contractor Quality Control System Manager. The CQCSM shall be a full-time employee of the Contractor, or a consultant engaged by the Contractor. The CQCSM shall have a minimum of 5 years of experience in airport and/or paving and building construction and shall have had prior quality control experience on a project of comparable size and scope as the contract. The CQCSM shall be on the project full time and shall have no production duties. The CQCSM shall NOT

be the point of contact for the production organization.

The CQCSM shall have full authority to institute any and all actions necessary for the successful implementation of the Quality Control Program to ensure compliance with the contract plans and technical specifications including authority to independently stop any work not in compliance with the contract. The CQCSM shall report directly to a responsible officer of the construction firm, such officer not being the project superintendent or foreman. The CQCSM may supervise the Quality Control Program on more than one project provided that person can be at the job site within 2 hours after being notified of a problem and a Quality Control Technician is present on the job site full time.

2. Quality Control Technicians. A sufficient number of quality control technicians necessary to adequately implement the Quality Control Program shall be provided. These personnel shall be either engineers, engineering technicians, or experienced craftsman with qualifications in the appropriate fields and shall have a minimum of 2 years of experience in their area of expertise.

   The quality control technicians shall report directly to the CQCSM and shall perform the following functions:

   a. Inspection of all materials, construction, plant, and equipment for conformance to the technical specifications, and as required by Section 1.02E.
   b. Performance of all quality control tests as required by the technical specifications and Section 1.02F.

3. Staffing. The Contractor shall provide sufficient qualified quality control personnel to monitor each work activity at all times. The scheduling and coordinating of all inspection and testing must match the type and pace of work activity. The Quality Control Program shall state where different technicians will be required for different work elements.

   All personnel shown on the organizational chart shall have, in resume form, all information regarding their education, any licenses, their present position, previous work experience, etc. included in the Quality Control Program written documentation. These resumes shall be verified by the CQCSM.

D. SUBMITTALS SCHEDULE

The Contractor shall submit a detailed listing of all submittals (e.g., mix designs, material certifications, color samples) and shop drawings required by the technical specifications. The listing can be developed in a spreadsheet format and shall include:

1. Specification item number:

2. Item description;

3. Description of submittal;

4. Specification paragraph requiring submittal; and

5. Scheduled date of submittal.

E. INSPECTION REQUIREMENTS

Quality control inspection functions shall be organized to provide inspections for all definable features of work, as detailed below. All inspections shall be documented by the Contractor.

Inspections shall be performed daily to ensure continuing compliance with contract requirements until completion of the particular feature of work.

Before any definable feature of work is started, the CQCSM shall notify the Engineer and State Project Manager of such work at least 48 hours in advance. Upon notification, the Engineer or State Project Manager shall determine if a meeting shall be held to discuss the condition of the work area, material and equipment status, what is to be expected and any questions or possible problems. No definable feature work shall commence without the consent of the Engineer and State Project Manager.

F. QUALITY CONTROL TESTING PLAN

As a part of the overall Quality Control Program, the Contractor shall implement a quality control testing plan, as required by the technical specifications. The testing plan shall include the minimum tests and test frequencies required by each technical specification item, as well as any additional quality control tests that the Contractor deems necessary to adequately control production and/or construction processes.

The testing plan can be developed in a spreadsheet fashion and shall, a minimum, include the following:

1. Specification item number;

2. Item description (e.g., concrete cylinder test);

3. Test type (e.g., concrete compressive strength);

4. Test standard (e.g., ASTM or AASHTO test number, as applicable);

5. Test frequency (e.g., as required by technical specifications or minimum frequency when requirements are not stated);

6. Responsibility (e.g., plant technician, independent lab); and

7. Control requirements (e.g., target, permissible deviations).

The testing plan shall contain a statistically based procedure of random sampling for acquiring test samples in accordance with ASTM D 3665. The Engineer and State Project Manager shall be provided the opportunity to witness quality control sampling and testing. The CQCSM shall make every effort to inform the Engineer and State Project Manager at least 24 hours, or more if stated in the specifications, before such testing occurs.

All quality control test results shall be documented by the Contractor as required by Section 1.02G.

G. DOCUMENTATION

The Contractor shall maintain current quality control records of all inspections and tests performed. These records shall include factual evidence that the required inspections or tests have been performed, including type and number of inspections or tests involved; results of inspections or tests; nature of defects, deviations, causes for rejection, etc.; proposed remedial action; and corrective actions taken.

These records must cover both conforming and defective or deficient features, and must include a statement that all supplies and materials incorporated in the work are in full compliance with the terms of the contract. Legible copies of these records shall be furnished to the Engineer and State Project Manager daily. The records shall cover all work placed subsequent to the previously furnished records and shall be verified and signed by the CQCSM.

Specific Contractor quality control records required for the contract shall include, but are not necessarily limited to, the following records:

1. Daily Inspection Reports. Each Contractor quality control technician shall maintain a daily log of all inspections performed for both Contractor and Subcontractor operations on a form acceptable to the Engineer and State Project Manager. These technician's daily reports shall provide factual evidence that continuous quality control inspections have been performed and shall, as a minimum, include the following:

    a. Technical specification item number and description and location of work performed;
    b. A comprehensive breakdown of the work force including the number of workers and total hours for each trade.
    c. Compliance with approved submittals;
    d. Proper storage of materials and equipment;
    e. Proper operation of all equipment;
    f. Adherence to plans and technical specifications;
    g. Review of quality control tests; and
    h. Safety inspection.

    The daily inspection reports shall identify inspections conducted, results of inspections, location and nature of defects found, causes for rejection, and remedial or corrective actions taken or proposed.

The daily inspection reports shall be signed by the responsible quality control technician and the CQCSM. The Engineer and State Project Manager shall be provided at least one copy of each daily inspection report on the workday following the day of record.

2. Daily Test Reports. The Contractor shall be responsible for establishing a system which will record all quality control test results. Daily test reports shall document the following information:

   a. Technical specification item number and description;
   b. Test designation;
   c. Location;
   d. Date of test;
   e. Control requirements;
   f. Test results;
   g. Causes for rejection;
   h. Recommended remedial actions; and
   i. Retests.

   Test results from each day's work period shall be submitted to the Engineer and State Project Manager prior to the start of the next day's work period. When required by the technical specifications, the Contractor shall maintain statistical quality control charts. The daily test reports shall be signed by the responsible quality control technician and the CQCSM.

H. CORRECTIVE ACTION REQUIREMENTS

The Quality Control Program shall indicate the appropriate action to be taken when a process is deemed, or believed, to be out of control (out of tolerance) and detail what action will be taken to bring the process into control. The requirements for corrective action shall include both general requirements for operation of the Quality Control Program as a whole, and for individual items of work contained in the technical specifications.

The Quality Control Program shall detail how the results of quality control inspections and tests will be used for determining the need for corrective action and shall contain clear sets of rules to gauge when a process is out of control and the type of correction to be taken to regain process control.

When applicable or required by the technical specifications, the Contractor shall establish and utilize statistical quality control charts for individual quality control tests. The requirements for corrective action shall be linked to the control charts.

I. SURVEILLANCE BY THE ENGINEER AND STATE PROJECT MANAGER

All items of material and equipment shall be subject to surveillance by the Engineer or State Project Manager at the point of production, manufacture or shipment to determine if the Contractor, producer, manufacturer or shipper maintains an adequate quality control system in conformance with the requirements detailed

herein and the applicable technical specifications and plans. In addition, all items of materials, equipment and work in place shall be subject to surveillance by the Engineer or State Project Manager at the site for the same purpose.

Surveillance by the Engineer or State Project Manager does not relieve the Contractor of performing quality control inspections of either on-site or off-site Contractor's or subcontractor's work.

J. NONCOMPLIANCE

1. The Engineer or State Project Manager will notify the Contractor of any noncompliance with any of the foregoing requirements. The Contractor shall, after receipt of such notice, immediately take corrective action. Any notice, when delivered by the Engineer or State Project Manager or his/her authorized representative to the Contractor or his/her authorized representative at the site of the work, shall be considered sufficient notice.

2. In cases where quality control activities do not comply with either the Contractor's Quality Control Program or the Contract provisions, or where the Contractor fails to properly operate and maintain an effective Quality Control Program, as determined by the Engineer or State Project Manager, the Engineer or State Project Manager may:

   a. Order the Contractor to replace ineffective or unqualified quality control personnel or subcontractors in accordance with Section 8.4 – "Character and Proficiency of Workers" of the General Provisions for Construction Projects (2016).
   b. Order the Contractor to stop operations in accordance with Section 8.10 – "Suspension of Work" of the General Provisions for Construction Projects (2016).
   c. Determine work performed by the Contractor during periods of noncompliance to be unacceptable and subject to inspection, removal or non-payment in accordance with Section 5.12 – "Removal of Non-Conforming and Unauthorized Work: Performance of Corrective or Remedial Work" of the General Provisions for Construction Projects (2016).

PART 2 - PRODUCTS (Not Used)

PART 3 - EXECUTION (Not Used)

PART 4 – MEASUREMENT AND PAYMENT

4.01 BASIS OF MEASUREMENT AND PAYMENT

Work under this section will not be measured nor paid for separately but shall be considered incidental to and included in the prices bid for the various items of work in this project.

END OF SECTION

SECTION 01524 – CONSTRUCTION WASTE MANAGEMENT

PART 1 - GENERAL

1.01 RELATED DOCUMENTS

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

1.02 DESCRIPTION OF WORK

A. Section includes administrative and procedural requirements for the following:

1. Salvaging nonhazardous demolition and construction waste.

2. Recycling nonhazardous demolition and construction waste.

3. Disposing of nonhazardous demolition and construction waste.

1.03 DEFINITIONS

A. Construction Waste: Building and site improvement materials and other solid waste resulting from construction, remodeling, renovation, or repair operations. Construction waste includes packaging.

B. Demolition Waste: Building and site improvement materials resulting from demolition or selective demolition operations.

C. Disposal: Removal off-site of demolition and construction waste and subsequent sale, recycling, reuse, or deposit in landfill or incinerator acceptable to authorities having jurisdiction.

D. Recycle: Recovery of demolition or construction waste for subsequent processing in preparation for reuse.

E. Salvage: Recovery of demolition or construction waste and subsequent sale or reuse in another facility.

F. Salvage and Reuse: Recovery of demolition or construction waste and subsequent incorporation into the Work.

1.04 PERFORMANCE REQUIREMENTS

A. General: Achieve End-of-Project rates for salvage/recycling of **75** percent by weight of total non-hazardous solid waste generated by the Work. Practice efficient waste management in the use of materials in the course of the Work. Use all reasonable means to divert construction and demolition waste from landfills and incinerators.

Facilitate recycling and salvage of materials, including the following but not limited to:

1. Demolition Waste:

    a. Asphaltic concrete paving
    b. Concrete
    c. Concrete reinforcing steel
    d. Brick
    e. Concrete masonry units
    f. Wood studs
    g. Wood joists
    h. Plywood and oriented strand board
    i. Wood paneling
    j. Wood trim
    k. Structural and miscellaneous steel
    l. Rough hardware
    m. Roofing
    n. Insulation
    o. Doors and frames
    p. Door hardware
    q. Windows
    r. Glazing
    s. Metal studs
    t. Gypsum board
    u. Acoustical tile and panels
    v. Carpet
    w. Carpet pad
    x. Demountable partitions
    y. Equipment
    z. Cabinets
    aa. Plumbing fixtures
    bb. Piping
    cc. Supports and hangers
    dd. Valves
    ee. Sprinklers
    ff. Mechanical equipment
    gg. Refrigerants
    hh. Electrical conduit
    ii. Copper wiring
    jj. Lighting fixtures
    kk. Lamps
    ll. Ballasts
    mm. Electrical devices
    nn. Switchgear and panelboards
    oo. Transformers

2. Construction Waste:

    a. Site-clearing waste
    b. Masonry and CMU
    c. Lumber
    d. Wood sheet materials
    e. Wood trim
    f. Metals
    g. Roofing
    h. Insulation
    i. Carpet and pad
    j. Gypsum board
    k. Piping
    l. Electrical conduit
    m. Packaging, including uncontaminated materials as follows:
        1) Paper
        2) Cardboard
        3) Boxes
        4) Plastic sheet and film
        5) Polystyrene packaging
        6) Wood crates
        7) Plastic pails

1.05 SUBMITTALS

A. Submit in accordance with Section 01300 - Submittals.

B. Waste Management Plan: Submit plan within 30 days of date established for the Notice of Award.

1.06 INFORMATIONAL SUBMITTALS

A. Waste Reduction Progress Reports: Concurrent with each Application for Payment, submit report. Use **Form CWM-7** for construction waste and Form CWM-8 for demolition waste. Include the following information:

1. Material category

2. Generation point of waste.

3. Diversion/Recycler Hauler or Location

4. Total quantity of waste in tons.

5. Quantity of waste salvaged, both estimated and actual in tons.

6. Quantity of waste recycled, both estimated and actual in tons.

7. Total quantity of waste recovered (salvaged plus recycled) in tons.

8. Total quantity of waste recovered (salvaged plus recycled) as a percentage of total waste.

B. Waste Reduction Calculations: Before request for Substantial Completion, submit calculated end-of-Project rates for salvage, recycling, and disposal as a percentage of total waste generated by the Work.

C. Records of Donations: Indicate receipt and acceptance of salvageable waste donated to individuals and organizations. Indicate whether organization is tax exempt.

D. Records of Sales: Indicate receipt and acceptance of salvageable waste sold to individuals and organizations. Indicate whether organization is tax exempt.

E. Recycling and Processing Facility Records: Indicate receipt and acceptance of recyclable waste by recycling and processing facilities licensed to accept them. Include manifests, weight tickets, receipts, and invoices.

F. Landfill and Incinerator Disposal Records: Indicate receipt and acceptance of waste by landfills and incinerator facilities licensed to accept them. Include manifests, weight tickets, receipts, and invoices.

G. LEED Submittal: LEED Submittal template for Credit MR 2, signed by Contractor, tabulating total waste material, quantities diverted and means by which it is diverted, and statement that requirements for the credit have been met.

H. Qualification Data for waste management coordinator.

I. Statement of Refrigerant Recovery: Signed by refrigerant recovery technician responsible for recovering refrigerant, stating that all refrigerant that was present was recovered and that recovery was performed according to EPA regulations. Include name and address of technician and date refrigerant was recovered.

1.07 QUALITY ASSURANCE

A. Waste Management Coordinator Qualifications: General Contractor shall hire a third party independent experienced firm, with a record of successful waste management coordination of Projects with similar requirements, that employs a LEED Accredited Professional, certified by USGBC, as waste management coordinator.

B. Refrigerant Recovery Technician Qualifications: Certified by EPA-approved certification program.

C. Regulatory Requirements: Comply with hauling and disposal regulations of authorities having jurisdiction.

D. Waste Management Conference: Conduct conference at Project site to comply with requirements in the General Provisions of the contract. Review methods and procedures related to waste management including, but not limited to, the following:

1. Review and discuss waste management plan including responsibilities of waste management coordinator.

2. Review requirements for documenting quantities of each type of waste and its disposition.

3. Review and finalize procedures for materials separation and verify availability of containers and bins needed to avoid delays.

4. Review procedures for periodic waste collection and transportation to recycling and disposal facilities.

5. Review waste management requirements for each trade.

1.08 WASTE MANAGEMENT PLAN

A. General: Develop a waste management plan according to ASTM E 1609 and requirements of this Section. Plan shall consist of waste identification, waste reduction work plan, and cost/revenue analysis. Indicate quantities by weight or volume, but use same units of measure throughout waste management plan.

B. Waste Identification: Indicate anticipated types and quantities of demolition, site-clearing and construction waste generated by the Work. Use **Form CWM-1** for construction waste and **Form CWM-2** for demolition waste. Include estimated quantities and assumptions for estimates.

C. Waste Reduction Work Plan: List each type of waste and whether it will be salvaged, recycled, or disposed of in landfill or incinerator. Use **Form CWM-3** for construction waste and **Form CWM-4** for demolition waste. Include points of waste generation, potential recycling hauler or locations, total quantity of each type of waste, quantity for each means of recovery, and handling and transportation procedures.

1. Salvaged Materials for Reuse: For materials that will be salvaged and reused in this Project, describe methods for preparing salvaged materials before incorporation into the Work.

2. Salvaged Materials for Sale: For materials that will be sold to individuals and organizations, include list of their names, addresses, and telephone numbers.

3. Salvaged Materials for Donation: For materials that will be donated to individuals and organizations, include list of their names, addresses, and telephone numbers.

4. Recycled Materials: Include list of local receivers and processors and type of recycled materials each will accept. Include names, addresses, and telephone numbers.

5. Disposed Materials: Indicate how and where materials will be disposed of. Include name, address, and telephone number of each landfill and incinerator facility.

6. Handling and Transportation Procedures: Include method that will be used for separating recyclable waste including sizes of containers, container labeling, and designated location on Project site where materials separation will be located.

D. Cost/Revenue Analysis: Indicate total cost of waste disposal as if there was no waste management plan and net additional cost or net savings resulting from implementing waste management plan. Use **Form CWM-5** for construction waste and **Form CWM-6** for demolition waste. Include the following:

1. Total quantity of waste.

2. Estimated cost of disposal (cost per unit). Include hauling and tipping fees and cost of collection containers for each type of waste.

3. Total cost of disposal (with no waste management).

4. Revenue from salvaged materials.

5. Revenue from recycled materials.

6. Savings in hauling and tipping fees by donating materials.

7. Savings in hauling and tipping fees that are avoided.

8. Handling and transportation costs. Include cost of collection containers for each type of waste.

9. Net additional cost or net savings from waste management plan.

PART 2 - PRODUCTS (Not Used)

PART 3 - EXECUTION

3.01 PLAN IMPLEMENTATION

A. General: Implement approved waste management plan. Provide handling, containers, storage, signage, transportation, and other items as required to implement waste management plan during the entire duration of the Contract.

1. Comply with SECTION 01010 - DESCRIPTION OF WORK for operation, termination, and removal requirements.

B. Waste Management Coordinator: Waste management coordinator shall be responsible for implementing, monitoring, and reporting status of waste management work plan.

C. Training: Train workers, subcontractors, and suppliers on proper waste management procedures, as appropriate for the Work occurring at Project site.

1. Distribute waste management plan to everyone concerned within three days of submittal return.

2. Distribute waste management plan to entities when they first begin work on-site. Review plan procedures and locations established for salvage, recycling, and disposal.

D. Site Access and Temporary Controls: Conduct waste management operations to ensure minimum interference with roads, streets, walks, walkways, and other adjacent occupied and used facilities.

1. Designate and label specific areas on Project site necessary for separating materials that are to be salvaged, recycled, reused, donated, and sold.

2. Comply with Section 01560 - Environmental Controls for controlling dust and dirt, environmental protection, and noise control.

3.02 RECYCLING DEMOLITION AND CONSTRUCTION WASTE, GENERAL

A. General: Recycle paper and beverage containers used by on-site workers.

B. Recycling Incentives: Revenues, savings, rebates, tax credits, and other incentives received for recycling waste materials shall accrue to Contractor.

C. Preparation of Waste: Prepare and maintain recyclable waste materials according to recycling or reuse facility requirements. Maintain materials free of dirt, adhesives, solvents, petroleum contamination, and other substances deleterious to the recycling process.

D. Procedures: Separate recyclable waste from other waste materials, trash, and debris. Separate recyclable waste by type at Project site to the maximum extent practical according to approved construction waste management plan.

1. Provide appropriately marked containers or bins for controlling recyclable waste until they are removed from Project site. Include list of acceptable and unacceptable materials at each container and bin.

a. Inspect containers and bins for contamination and remove contaminated materials if found.

2. Stockpile processed materials on-site without intermixing with other materials. Place, grade, and shape stockpiles to drain surface water. Cover to prevent windblown dust.

3. Stockpile materials away from construction area. Do not store within drip line of remaining trees.

4. Store components off the ground and protect from the weather.

5. Remove recyclable waste off Owner's property and transport to recycling receiver or processor.

3.03 RECYCLING DEMOLITION WASTE

A. Asphaltic Concrete Paving: Grind asphalt to maximum 1-1/2-inch size.

B. Asphaltic Concrete Paving: Break up and transport paving to asphalt-recycling facility.

C. Concrete: Remove reinforcement and other metals from concrete and sort with other metals.

1. Pulverize concrete to maximum 1-1/2-inch size.

D. Masonry: Remove metal reinforcement, anchors, and ties from masonry and sort with other metals.

1. Pulverize masonry to maximum 3/4-inch size.

2. Clean and stack undamaged, whole masonry units on wood pallets.

E. Wood Materials: Sort and stack members according to size, type, and length. Separate lumber, engineered wood products, panel products, and treated wood materials.

F. Metals: Separate metals by type.

1. Structural Steel: Stack members according to size, type of member, and length.

2. Remove and dispose of bolts, nuts, washers, and other rough hardware.

G. Asphalt Shingle Roofing: Separate organic and glass-fiber asphalt shingles and felts. Remove and dispose of nails, staples, and accessories.

H. Gypsum Board: Stack large clean pieces on wood pallets or in container and store in a dry location. Remove edge trim and sort with other metals. Remove and dispose of fasteners.

I. Acoustical Ceiling Panels and Tile: Stack large clean pieces on wood pallets and store in a dry location.

J. Metal Suspension System: Separate metal members including trim, and other metals from acoustical panels and tile and sort with other metals.

K. Piping: Reduce piping to straight lengths and store by type and size. Separate supports, hangers, valves, sprinklers, and other components by type and size.

L. Conduit: Reduce conduit to straight lengths and store by type and size.

3.04 RECYCLING CONSTRUCTION WASTE

A. Packaging:

1. Cardboard and Boxes: Break down packaging into flat sheets. Bundle and store in a dry location.

2. Polystyrene Packaging: Separate and bag materials.

3. Pallets: As much as possible, require deliveries using pallets to remove pallets from Project site. For pallets that remain on-site, break down pallets into component wood pieces and comply with requirements for recycling wood.

4. Crates: Break down crates into component wood pieces and comply with requirements for recycling wood.

B. Site-Clearing Wastes: Chip brush, branches, and trees

C. Wood Materials: Clean Cut-Offs of Lumber: Grind or chip into small pieces.

D. Gypsum Board: Stack large clean pieces on wood pallets or in container and store in a dry location.

1. Clean Gypsum Board: Grind scraps of clean gypsum board using small mobile chipper or hammer mill. Screen out paper after grinding.

3.05 DISPOSAL OF WASTE

A. General: Except for items or materials to be salvaged, recycled, or otherwise reused, remove waste materials from Project site and legally dispose of them in a landfill or incinerator acceptable to authorities having jurisdiction.

1. Except as otherwise specified, do not allow waste materials that are to be disposed of accumulate on-site.

2. Remove and transport debris in a manner that will prevent spillage on adjacent surfaces and areas.

B. Burning: Do not burn waste materials.

C. Disposal: Transport waste materials off Owner's property and legally dispose of them.

3.06 ATTACHMENTS

The following forms are appended to the end of this Section.

A. Form CWM-1 for construction waste identification.

B. Form CWM-2 for demolition waste identification.

C. Form CWM-3 for construction waste reduction work plan.

D. Form CWM-4 for demolition waste reduction work plan.

E. Form CWM-5 cost/revenue analysis of construction waste reduction work plan.

F. Form CWM-6 cost/revenue analysis of demolition waste reduction work plan.

G. Form CWM-7 for construction waste.

H. Form CWM-8 for demolition waste.

PART 4 - MEASUREMENT AND PAYMENT

4.01 BASIS OF MEASUREMENT AND PAYMENT

Work under this Section will not be measured for payment but will be paid for at the contract Lump Sum Price.

END OF SECTION

FORM **CWM-1**: CONSTRUCTION WASTE IDENTIFICATION

MATERIAL CATEGORY	GENERATION POINT	EST. QUANTITY OF MATERIALS RECEIVED* (a)	EST. WASTE - % (b)	TOTAL EST. QUANTITY OF WASTE* (c=a X b)	EST. VOLUME cy (cm)	EST. WEIGHT tons	REMARKS AND ASSUMPTIONS

*Insert units of measure

FORM **CWM-2**: DEMOLITION WASTE IDENTIFICATION

MATERIAL CATEGORY, DESCRIPTION OF GENERATION POINT	EST. QUANTITY	EST. VOLUME cy (cm)	EST. WEIGHT tons	REMARKS AND ASSUMPTIONS

FORM **CWM-3**: CONSTRUCTION WASTE WORK PLAN

MATERIAL CATEGORY, DESCRIPTION OF GENERATION POINT	DIVERSION / RECYCLER HAULER OR LOCATION	TOTAL EST. QUANTITY OF WASTE tons (a)	DISPOSAL METHOD AND QUANTITY			HANDLING AND TRANSPORTATION PROCEDURES
			EST. AMOUNT SALVAGED tons	EST. AMOUNT RECYCLED tons	EST. AMOUNT DISPOSED TO LANDFILL tons	

FORM **CWM-4**: DEMOLITION WASTE REDUCTION WORK PLAN

MATERIAL CATEGORY, DESCRIPTION OF GENERATION POINT	DIVERSION / RECYCLER HAULER OR LOCATION	TOTAL EST. QUANTITY OF WASTE tons (a)	DISPOSAL METHOD AND QUANTITY			HANDLING AND TRANSPORTATION PROCEDURES
			EST. AMOUNT SALVAGED tons	EST. AMOUNT RECYCLED tons	EST. AMOUNT DISPOSED TO LANDFILL tons	

FORM **CWM-5**: COST/REVENUE ANALYSIS OF CONSTRUCTION WASTE REDUCTION WORK PLAN

MATERIALS	TOTAL QUANTITY OF MATERIALS (VOL. OR WEIGHT) (A)	EST. COST OF DISPOSAL (B)	TOTAL EST. COST OF DISPOSAL (C = A X B)	REVENUE FROM SALVAGED MATERIALS (D)	REVENUE FROM RECYCLED MATERIALS (E)	LANDFILL TIPPING FEES AVOIDED (F)	HANDLING AND TRANSPORTATION COSTS AVOIDED (G)	NET COST SAVINGS OF WORK PLAN (H=D+E+F+G)
Packaging: Cardboard								
Packaging: Boxes								
Packaging: Plastic Sheet or Film								
Packaging: Polystyrene								
Packaging: Pallets or Skids								
Packaging: Crates								
Packaging: Paint Cans								
Packaging: Plastic Pails								
Site Clearing Waste								
Masonry or CMU								
Lumber: Cut-Offs								
Lumber: Warped Pieces								
Plywood or OSB (scraps)								
Wood Forms								
Wood Waste Chutes								
Wood Trim (cut-offs)								
Metals								
Insulation								
Roofing								
Joint Sealant Tubes								
Gypsum Board (scraps)								
Carpet and Pad (scraps)								
Piping								
Electrical Conduit								
Other:								

FORM **CWM-6**: COST/REVENUE ANALYSIS OF DEMOLITION WASTE REDUCTION WORK PLAN

MATERIALS	TOTAL QUANTITY OF MATERIALS (VOL. OR WEIGHT) (A)	EST. COST OF DISPOSAL (B)	TOTAL EST. COST OF DISPOSAL (C = A X B)	REVENUE FROM SALVAGED MATERIALS (D)	REVENUE FROM RECYCLED MATERIALS (E)	LANDFILL TIPPING FEES AVOIDED (F)	HANDLING AND TRANSPORTATION COSTS AVOIDED (G)	NET COST SAVINGS OF WORK PLAN (H=D+E+F+G)
Asphaltic Concrete Paving								
Concrete								
Brick								
CMU								
Lumber								
Plywood or OSB								
Wood Paneling								
Wood Trim								
Miscellaneous Metals								
Structural Steel								
Rough Hardware								
Insulation								
Roofing								
Doors and Frames								
Door Hardware								
Windows								
Glazing								
Acoustical Tile								
Carpet								
Carpet Pad								
Demountable Partitions								
Equipment								
Cabinets								
Plumbing Fixtures								
Piping								
Supports and Hangars								
Valves								
Sprinklers								
Mech. Equipment								
Electrical Conduit								
Copper Wiring								
Light Fixtures								
Lamps								
Lighting Ballasts								
Electrical Devices								
Switchgear and Panels								
Transformers								
Other:								

FORM **CWM-7**: CONSTRUCTION WASTE REDUCTION PROGRESS REPORT								
MATERIAL CATEGORY, DESCRIPTION OF GENERATION POINT	DIVERSION / RECYCLER HAULER OR LOCATION	TOTAL EST. QUANTITY OF WASTE tons (a)	QUANTITY OF WASTE SALVAGED		QUANTITY OF WASTE RECYCLED		TOTAL QUANTITY OF WASTE RECOVERED tons (d = b + c)	TOTAL QUANTITY OF WASTE RECOVERED % (d / a X 100)
			ESTIMATED tons	ACTUAL tons (b)	ESTIMATED tons	ACTUAL tons (c)		

FORM **CWM-8**: DEMOLITION WASTE REDUCTION PROGRESS REPORT

MATERIAL CATEGORY, DESCRIPTION OF GENERATION POINT	DIVERSION / RECYCLER HAULER OR LOCATION	TOTAL EST. QUANTITY OF WASTE tons (a)	QUANTITY OF WASTE SALVAGED		QUANTITY OF WASTE RECYCLED		TOTAL QUANTITY OF WASTE RECOVERED tons (d = b + c)	TOTAL QUANTITY OF WASTE RECOVERED % (d / a X 100)
			ESTIMATED tons	ACTUAL tons (b)	ESTIMATED tons	ACTUAL tons (c)		

SECTION 01533 - BARRICADES

PART 1 - GENERAL

1.01 RELATED DOCUMENTS

The General Provisions for Construction Projects (2016), Special Provisions and General Requirements of the Specifications, apply to the work specified in this Section.

1.02 BARRICADES

A. The Contractor shall take precaution to protect people and property from injury and damage. He shall erect barricades to delineate his work areas and provide the appropriate signing, hazard lights, and temporary paint striping per the safety plan as approved by the Engineer, to aid public and airport pedestrian and vehicular traffic around his work areas. Barricades shall be traffic cones, delineators, blinker barricades, caution tape, sawhorses, plywood barricades or other barriers as approved by the Engineer to effectively provide proper protection.

B. The Contractor shall be responsible for his own security and protection of his property, including mobilization yard barricades.

C. Barricades, in general, shall be neat and in good condition, as required for protection. In areas frequented by the general public, the barricades shall be visually presentable and plywood partitions shall be painted. Where dust is a problem, the Contractor shall erect floor to ceiling dust proof partitions

D. The Contractor shall coordinate and sequence this work with the Engineer to permit the continuing operation of the existing Airport facility. Barricades shall be removed upon the completion and acceptance of work and the premises left clean and operational.

E. The Contractor shall be responsible for securing access into and out of the barricaded areas.

PART 2 - PRODUCTS (Not Used)

PART 3 - EXECUTION (Not Used)

PART 4 - MEASUREMENT & PAYMENT

4.01 BASIS OF MEASUREMENT AND PAYMENT

Work under this section will not be measured nor paid for separately but shall be considered incidental to and included in the bid prices for the various items of work in this project.

END OF SECTION

SECTION 01560 – GENERAL ENVIRONMENTAL, HEALTH, & SAFETY CONTROLS

PART I – GENERAL

1.01 RELATED DOCUMENTS

The General Provisions for Construction Projects (2016), Special Provisions and General Requirements of the Specifications, apply to the work specified in this Section.

1.02 DESCRIPTION

This Section addresses 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 that adversely affect human health or welfare, unfavorably alter ecological balances of importance to human life, adversely affect other species of importance, or degrade the utilization of the environment for aesthetic and recreational purposes.

1.03 REFERENCES

All work shall conform to the most recent edition of the following Federal, State, and Local regulations, unless otherwise noted or specified on the drawings or in these specifications. Where conflicts among the requirements or with these specifications exists, the most stringent requirements shall apply.

A. DOTA Construction Site Runoff Control Program
http://hidot.hawaii.gov/airports/doing-business/engineering/environmental/construction-site-runoff-control-program

1. DOTA Construction Activities Best Management Practices (BMP) Field Manual.

B. Department of Health (DOH) Hazard Evaluation & Emergency Response (DOH HEER) https://health.hawaii.gov/heer/

C. State of Hawaii Administrative Rules, Title 11, Department of Health (DOH)

1. Chapter 46, Community Noise Control.

2. Chapter 59, Ambient Air Quality.

3. Chapter 60.1, Air Pollution Control.

4. Chapters 260.1, 261.1, 262.1, 263.1, 264.1, 265.1, 266.1, 268.1, 270.1, 271.1, 273.1, and 279.1, Hazardous Waste Management.

5. Chapter 451, State Contingency Plan.

6. Chapter 501, Asbestos Requirements.

D. CFR Title 40, Protection of the Environment, Chapter I, Environmental Protection Agency.

E. CFR Title 42, Public Health, Chapter I, Public Health Service, Department of Health and Human Services.

1.04 SUBMITTALS

A. The Contractor shall submit the following items as required:

1. Individual Wastewater System (IWS) Final Report: For projects involving the construction of an individual wastewater system, an IWS Final Report is required to be submitted to the DOTA Engineering Branch, Environmental Section (AIR-EE) for approval, prior to submitting to DOH Wastewater Branch and prior to project closeout.

2. Underground Injection Control (UIC) Well Final Report: For new drainage well construction and existing drainage well modification, a UIC Well Final Report is required to be submitted to AIR-EE for review and approval, prior to submitting to DOH Safe Drinking Water Branch (SDWB), and prior to project closeout. The Final Report shall also be submitted within the deadline specified on the UIC Approval to Construct. If a project involves abandoning an existing drainage well, written instructions shall be obtained from DOH SDWB and a copy provided to AIR-EE prior to backfilling the demolished well. All supporting documentation requested by DOH post demolition work shall be completed and provided to AIR-EE for review prior to submitting to DOH SDWB.

3. AST (Flammable/Combustible Liquid) Tank Installation: Provide signed record of Final Inspection issued by County Fire Department.

4. Waste Manifests: If a project will generate hazardous waste, the Contractor shall prepare waste manifests in accordance with HAR 11-262 and provide records to AIR-EE.

B. The Contractor shall comply with all applicable regulations and maintain records of permits, licenses, certificates, and other environmental regulatory requirement correspondence. Submit copies of permits, licenses, certifications, inspection reports, releases, notices, receipts for fee payments, correspondence, records, and similar documents, established for compliance with environmental regulations bearing on performance of the work.

PART 2 – PRODUCTS (Not Used)

PART 3 – EXECUTION

3.01 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: The Contractor, for the duration of the contract, shall maintain all excavations, embankments, haul roads, permanent access roads, plant sites, waste disposal areas, borrow areas, graded areas, staging and storage areas, and all other work areas within or outside the project limits free from dust that would cause a hazard or nuisance to the work or operations of other Contractors, or to persons or property. Industry-accepted methods, that meet requirements of DOTA Construction BMP Field Manual as noted in Specification 01561 and that meet stabilization suitable for the area or materials involved.

C. Burning on Airport property shall not be permitted.

3.02 SPILL CONTROL

A. The Contractor shall follow the DOTA Construction Site Runoff Program and relevant documents, such as the Construction BMP Field Manual to implement BMPs to prevent spills and leaks and report and cleanup spills and leaks immediately, as required.

3.03 DISPOSAL

A. All unusable debris and waste material shall be hauled away to an appropriate local landfill. Contractor shall control dust during loading operations.

B. Contractor shall consult with the landfill and conduct any required waste characterization to ensure that waste meets the landfill's requirements for size, type, etc.

C. No burying of debris or waste materials, except for materials that are specifically indicated elsewhere in these specifications as suitable for backfill, shall be permitted on the project site.

D. Contractor shall manage all construction materials, debris, and waste in a manner that prevents Foreign Object Debris (FOD) from reaching the airfield, where it could be an aircraft safety hazard.

3.04 HAZARDOUS MATERIALS CONTROL

Hazardous materials shall be properly stored and handled. The use of prohibited hazardous materials, e.g., asbestos, lead paint, and polychlorinated biphenyls (PCBs), in the construction of this project shall be strictly prohibited. Any corrective action to remove and replace hazardous material and contaminated work areas shall be at the sole expense of the Contractor.

3.05 OCCUPATIONAL HEALTH AND SAFETY

The Contractor shall at all times comply with all State of Hawaii and Federal rules and regulations related to occupational health and safety and develop and follow a Health

and Safety Plan describing measures the Contractor will employ to protect the health and safety of their employees. Include measures required to protect the public from dangers associated with their work.

PART 4 – MEASUREMENT AND PAYMENT

4.01 BASIS OF MEASUREMENT AND PAYMENT

All work specified in this Section shall not be measured nor paid for separately but shall be considered incidental to item 01561.1 Construction Site Pollution Controls.

END OF SECTION

SECTION 01561 – CONSTRUCTION SITE POLLUTION CONTROLS

PART 1 – GENERAL

1.01 RELATED DOCUMENTS

The General Provisions for Construction Projects (2016), Special Provisions and General Requirements of the Specifications, apply to the work specified in this Section.

1.02 DESCRIPTION

A. This Section describes procedures for the proper application of management and engineering controls at State of Hawaii, Department of Transportation, Airports (DOTA) construction sites so that pollutants do not impact any storm drainage system, State water, soil, or groundwater.

B. The Contractor shall supply all labor, materials, and equipment necessary for the management of stormwater during construction and to carry out the work in accordance with these specifications, and all applicable Federal, State, and local regulations and latest amendments.

C. This Section also applies to construction support activities including concrete or asphalt batch plants, rock crushing plants, equipment staging yards/areas, material storage areas, excavated material disposal areas, borrow areas, waste management facilities, sanitary facilities, material storage areas, and temporary equipment fueling locations, regardless of their proximity to the Airport Property and State Right-of-Way. For areas serving multiple construction projects or operating beyond the completion of the construction project in which it supports, the Contractor shall be responsible for securing the necessary permits, clearances, and documents, and following the conditions of the permits and clearances, at no cost to the State.

D. The Contractor shall be responsible for all subcontractors, suppliers, and vendors, and shall ensure that the means and methods of construction activities of subcontractors, suppliers, and vendors are in full compliance with this Section.

E. The Contractor shall examine and be familiar with documents related to stormwater management at the airports and shall comply with related requirements for construction stormwater control. Should a requirement not be clearly described within the construction plans, specifications, permits and other applicable bid documents, notify the Engineer immediately for interpretation.

1.03 REFERENCES

All work shall conform to the most recent edition of the following, unless otherwise noted or specified on the drawings or in these specifications. Where conflicts among the requirements or with these specifications exists, the most stringent requirements shall apply.

A. DOTA Construction Site Runoff Control Program

http://hidot.hawaii.gov/airports/doing-business/engineering/environmental/construction-site-runoff-control-program

1. DOTA Construction Activities Best Management Practices (BMP) Field Manual.

2. DOTA Environmental Requirements for Construction Projects Standard Operating Procedures.

3. DOTA Stormwater Management Plans (SWMPs) for the Daniel K. Inouye International Airport (HNL) and Kahului Airport (OGG), as applicable.

4. DOTA Industrial SWPPPs for the HNL, OGG, and the Lihue Airport (LIH), as applicable.

B. State of Hawaii Administrative Rules, Title 11, Department of Health (DOH) https://health.hawaii.gov/opppd/department-of-health-administrative-rules-title-11/

1. Chapter 54, Water Quality Standards

2. Chapter 55, Water Pollution Control

3. Chapter 451, State Contingency Plan

C. United States (U.S.) Code of Federal Regulations (CFR), Title 40, Chapter I: Environmental Protection Agency.

D. Hawaii Revised Statutes (HRS), Part I, Chapter 128D, “Environmental Response Law”.

PART 2 – PRODUCTS

2.01 MATERIALS

Comply with applicable materials described in the current DOTA Construction Activities BMP Field Manual. Refer to FAA Advisory Circulars and DOTA District Office, including Wildlife Hazard Management Plan, for additional guidance and conditions. In addition, materials shall comply with the following:

A. Grass: The FAA and USDA recommend the following grass species when requiring grass: “No-Mow” bermudagrass (“Green Velvet”) (Cynodon dactylon) or Seashore paspalum (Paspalum vaginatum). These species possess higher than average drought resistance, saline soil tolerances, and most importantly, do not produce seed heads attractive to the majority of hazardous avian species. Use stolons, sprigs, or plugs to avoid providing hazardous species with a readily available food source. The use of seeds is generally not allowed.

Alternative grass species shall only be applied with the approval by the Engineer after consultation with United States Department of Agriculture (USDA) airport representative. This includes, but is not limited to, sodding, cuttings, and planting.

Grass shall be a quick-growing species. Grass shall be suitable to the area and provide a temporary cover that will not compete later with permanent cover.

B. Irrigation: Any required irrigation shall be done after dark to reduce instances of water becoming a hazardous wildlife attractant.

PART 3 – EXECUTION

3.01 PRE-CONSTRUCTION REQUIREMENTS

Do not begin construction activities until all submittals detailed in this Subsection are completed, submitted to the Engineer, and accepted in writing by AIR-EE.

A. Water Pollution, Dust, Sediment, and Erosion Control Meeting: Schedule a water pollution, dust, sediment, and erosion control meeting with the Engineer after all documents required by AIR-EE are submitted to the Engineer and accepted in writing by AIR-EE. The meeting shall be scheduled a minimum of 14 calendar days prior to the Start Work Date. At a minimum, the meeting shall be attended by the Contractor, subcontractors whose work may provide an impact to stormwater or site environmental conditions, Engineer, AIR-EE, and any authorized representatives of the designated attendees. The meeting will discuss the sequence of work and plans and proposals for water pollution, dust, sediment, and erosion controls.

B. Land Disturbance Calculations: The Contractor is responsible for calculating the total land disturbance for the life of the project and complying with all environmental requirements associated with the total land disturbance calculated. Disturbance of land is defined by Hawaii Department of Health as “the penetration, turning, or moving of soil or resurfacing of pavement with exposure of the base course or the exposure of bare soil or ground surface, including the land surface exposed by construction roads, baseyards, staging areas, demolition, headquarters, and parking areas. It does not include grass or weed cutting, bush or tree trimming or felling that leaves soil or ground intact. It includes ‘grubbing’ in its normal meaning of the use of equipment to knock down and push vegetation out of the way, typically uprooting vegetation and disturbing the ground surface.”

   Land disturbing activities that shall be included in the disturbance area calculation shall follow the guidance provided in the Environmental Requirements for Construction Projects Standard Operating Procedures.

C. Site-Specific BMP (SSBMP) Plan or Stormwater Pollution Prevention Plan (SWPPP): The Contractor shall submit a SSBMP Plan (for projects disturbing less than one acre) or SWPPP (for projects disturbing one acre or more) using the latest DOTA template for acceptance by AIR-EE. If a SSBMP Plan or SWPPP was prepared by the Designer, the Contractor shall revise the plan using the latest template to include additional information required of the Contractor and any changes the Contractor proposes. The SSBMP Plan or SWPPP shall include site-specific temporary BMPs following requirements and practices outlined in DOTA’s “Construction Activities BMP Field Manual.” All AIR-EE comments shall be resolved and the SSBMP Plan or SWPPP approved prior to the start of land-disturbing activities, including those

activities that are needed for the implementation of the BMPs. Submission of the complete and acceptable SSBMP Plan or SWPPP is the sole responsibility of the Contractor, and additional contract time will not be issued for delays due to incompleteness.

D. SSBMP Plan/SWPPP Modifications: Modify, as necessary, and resubmit amended SSBMP Plan or SWPPP and construction schedules to the Engineer for acceptance by AIR-EE. Amendments to the SSBMP Plan or SWPPP shall be made under the following circumstances at a minimum:

1. Conditions that develop during construction that were unforeseen during the design and pre-construction stages that could impact stormwater, soil, or groundwater.

2. Changes to the Contractor's Means and Methods of Construction that could impact stormwater, soil, or groundwater.

3. Omitted conditions that should have been allowed for in the accepted documents.

4. A SSBMP Plan measure that replaces an accepted SSBMP Plan measure that was not satisfactorily performing.

5. Revised dates of installation and/or removal of SSBMP Plan measures.

SSBMP Plan/SWPPP modifications shall be submitted to the Engineer and accepted in writing by AIR-EE before implementing the revised site-specific BMPs in the field. Amendments to the SSBMP Plan or SWPPP shall be included with the original SSBMP Plan or SWPPP and documented in the Amendment Log.

E. Documentation: A copy of the accepted original or amended SSBMP Plan or SWPPP, with the signed certification by the authorized representative filed with DOH for SWPPPs, shall be kept on site or at an accessible location so that it can be made available at the time of an on-site inspection, or upon request by the Engineer, AIR-EE, DOTA's designated authorized representative, and/or DOH/EPA Representative.

F. NPDES Construction Permit: If the total land disturbance for the life of the project, including all construction support activity areas, is one acre or more, coverage under an NPDES Permit Authorizing Discharges of Storm Water Associated with Construction Activity (NPDES Construction Permit) authorizing stormwater discharges associated with construction activity is required from the Department of Health, Clean Water Branch (CWB).

1. Do not begin land-disturbing activities until the CWB has issued an Individual NPDES Permit or NGPC. Conduct land-disturbing activities in accordance with the conditions of the NPDES Permit and/or NGPC.

2. The Contractor shall submit a Notification of Start to CWB a minimum of seven calendar days before the start of construction and provide AIR-EE with a record

of submittal.

3. Before construction begins, the Contractor shall assign one of their personnel as the Duly Authorized Representative, in accordance with Section 15 of Appendix A, Chapter 1155. The Duly Authorized Representative is responsible for compliance with the NPDES Construction Permit (i.e., operations of the construction project) and shall certify, sign, and date various documents, including the SWPPP and SWPPP inspection documents.

G. Solid Waste Disclosure: Submit the Solid Waste Disclosure Form for Construction Sites, if applicable, to the DOH Solid Waste Branch as specified on the form within 7 calendar days before the start of construction activities and provide a copy to the Engineer. Provide a copy of all the disposal receipts from the facility permitted by the Department of Health to receive solid waste to the Engineer. This shall also include documentation from any intermediary facility where solid waste is stored, handled or processed.

H. NPDES Hydrotesting Permit: If hydrotesting activities require effluent discharge into State waters or drainage systems, coverage under an NPDES Hydrotesting Waters Permit authorizing discharges associated with hydrotesting is required from the CWB. Do not begin hydrotesting activities until the CWB has issued an Individual NPDES Permit or NGPC for hydrotesting. Conduct Hydrotesting operations in accordance with the conditions of the NPDES Permit and/or NGPC.

I. NPDES Dewatering Permit: If dewatering activities require effluent discharge into State waters or drainage systems, coverage under an NPDES Dewatering Permit authorizing discharges associated with dewatering is required from the CWB. Do not begin dewatering activities until the CWB has issued an Individual NPDES Permit or NGPC for dewatering. Conduct dewatering operations in accordance with the conditions of the permit or NGPC.

J. Construction BMP Training: All Contractor's and subcontractor's employees on the project shall complete the DOTA Construction BMP Training prior to entering the construction site and every calendar year thereafter. All Contractor and subcontractor personnel involved with construction project responsibilities shall also be trained on the site-specific BMPs that are utilized during construction and spill response. Records of completion and/or training roster sign-in sheet shall be up to date and included in the SWPPP or SSBMP Plan. Additional training required by AIR-EE shall be at no additional time or cost to the project. There are two training options:

1. All Contractor and subcontractor employees involved with construction project responsibilities watch the DOTA Construction BMP Training Video located on the DOTA Construction Site Runoff Control Program webpage and complete the DOTA Construction BMP Training Survey with a passing score, or

2. The Contractor and subcontractor supervisors/managers watch the DOTA Construction BMP Training Video located on the DOTA Construction Site Runoff Control Program webpage, complete the DOTA Construction BMP Training

Survey with a passing score, then train all employees involved with construction project responsibilities and submit a sign-in roster documenting all employees trained at the bottom of the DOTA Construction BMP Training Survey.

DOTA Construction BMP Training Survey: https://hidot.hawaii.gov/airports/doing-business/engineering/environmental/construction-bmp-training-survey/

K. Construction Connection, Discharge, and Surface Runoff Permit: The Contractor shall complete the Contractor's section of the Construction Connection, Discharge, and Surface Runoff Permit and submit to AIR-EE for review. All AIR-EE comments shall be resolved prior to the start of land-disturbing activities.

3.02 CONSTRUCTION REQUIREMENTS

A. Construction Start: Do not expose or disturb surface area of earth material or initiate any land-disturbing activities until submittals detailed in Subsection 01561.3.01 – Pre-construction Requirements are completed, submitted to the Engineer and accepted in writing by AIR-EE. Once installation of BMPs is allowed, a Pre-construction BMP Inspection is conducted, and all deficiencies that are noted during the inspection shall be corrected prior to any other ground disturbance.

B. BMP Installation and Maintenance: Provide, install, maintain, monitor, repair and replace BMPs as needed to maintain efficacy. Address all inspection comments received from the Engineer, AIR-EE, and/or DOTA's designated authorized representative.

C. Protect temporarily or permanently disturbed soil surface from rainfall impact, runoff, and wind before the end of each work day. Coordinate and schedule the work to the maximum extent possible to minimize the amount of exposed or disturbed surface area of earth material.

D. Install and maintain stabilized construction entrances/exits, including any wheel washes, to minimize tracking of dirt and mud onto roadways, sidewalks, and other paved areas. Restrict traffic to stabilized construction entrance areas only. Clean dirt, mud, or other material tracked onto the road, sidewalk, or other paved area by the end of the same day in which the track-out occurs. If tracking is excessive or sediment is being transported farther along the pavement or sidewalk by other vehicles traveling outside of the construction site, conduct cleaning and sweeping immediately. Modify stabilized construction entrances/exits, as needed, to prevent mud from being tracked onto road. Stabilize entire access roads if necessary.

E. Maintain all excavations, embankments, haul roads, permanent access roads, plant sites, waste disposal areas, borrow areas, and all other work areas within the project limits free from dust that would cause a hazard to the work, airport operations, operations of other contractors, or to persons or property. If chemicals are used as soil stabilizers for erosion and dust control, submit the manufacturer's product data sheets of the chemicals to the Project Manager for acceptance by AIR-EE. Oil treating shall not be used. Dust screens and fabrics are not allowed to be mounted on, or to inhibit the view of, the TSA and AOA Security Fences.

F. Cover exposed surfaces of materials completely with tarpaulin or a similar device when transporting aggregate, soil, excavated material, or other materials that may be a source of fugitive dust.

G. Protect ditches, channels, and other drainageways leading away from cuts and fills at all times by:

1. Hydromulching cuts and fills that may erode.

2. Installing check dams or other silt control devices.

3. Other methods acceptable to AIR-EE.

H. Clean up and remove any pollutant that is attributed to the Contractor. Care shall be taken to ensure that no petroleum/chemical products, bituminous materials, or other deleterious substances, including debris, are allowed to fall, flow, leach, or otherwise enter the sewage systems or storm drains. Deposition of solid waste or the discharge of liquid waste, such as fuels, lubricants, bituminous waste, untreated sewage and other pollutants that may contaminate stormwater, surface waters, soil, or groundwater shall not be permitted.

I. Disturbed Area Stabilization: Immediately initiate stabilization of exposed soil areas upon completion of land-disturbing activities for areas where disturbance has permanently or temporarily ceased on any portion of the site. Land-disturbing activities have permanently ceased when clearing and excavation within any area of the construction site that will not include permanent structures has been completed. Land-disturbing activities have temporarily ceased when clearing, grading, or excavation within any area of the site will not resume for a period of 14 or more calendar days, but such activities will resume in the future. The term “immediately” is used in this Section to define the deadline for initiating stabilization measures. “Immediately” means as soon as practicable, but no later than the end of the next work day, following the day when the land-disturbing activities have temporarily or permanently ceased.

1. After the initiation of stabilization, stabilization activities shall be completed according to the following timeline:

a. For projects with an NPDES Construction Permit:
   1) For construction areas discharging into waters not impaired for nutrients or sediments, complete installation of stabilization measures within 14 calendar days after the temporary or permanent cessation of land-disturbing activities.
   2) For construction areas discharging into nutrient or sediment impaired waters, complete installation of stabilization measures within 7 calendar days after the temporary or permanent cessation of land-disturbing activities.
b. For projects without an NPDES Construction Permit, complete stabilization within 14 calendar days after the temporary or permanent cessation of land-disturbing activities.

J. Notice of Cessation: For projects with an NPDES Construction Permit, the Contractor shall submit a Notice of Cessation to CWB within seven calendar days after the end of the month that the project was completed and provide AIR-EE with a record of submittal.

K. Changes to Land-disturbing Activities: The Contractor shall be responsible to prepare a new SWPPP or SSBMP Plans or amend existing SWPPP or SSBMP Plans if changes to the project or to the Contractor's activities result in land-disturbing activities additional to those previously approved:

1. Land-disturbing activity outside of the approved limits is NOT allowed until approval and proper permits are received. Revised documents, including an updated SWPPP or SSBMP Plan, shall be submitted to and approved by AIR-EE prior to conducting additional land-disturbing activities.

2. If coverage under an NPDES Construction Permit is needed, no activity in the additional area may occur until the additional permit coverage is granted:

a. If the project was already granted coverage under an NPDES Construction Permit, additional coverage shall be obtained from CWB for the additional area, either by adding the area to existing project documents, and applying for NPDES Construction Permit coverage for the entire project OR by creating new documents and obtaining separate NPDES Construction Permit coverage for the additional area.
b. If the new disturbed area will result in the total disturbed area equaling one (1.0) acre or more for a project without existing NPDES Construction Permit coverage, NPDES Construction Permit coverage shall be obtained from CWB that will cover all land-disturbing activities anticipated for the life of the project.

3.03 INSPECTIONS

Refer to the DOTA Construction Site Runoff Program for information pertaining to AIR-EE BMP inspections (pre-construction, routine, and final). Contractor self-inspections shall occur based on the frequency outlined in the SSBMP Plan and, if applicable, NPDES Permit (HAR 11-55) and SWPPP requirements.

A. Corrective Actions: The Contractor shall be responsible for the correction of all deficiencies identified during any of the above inspections.

1. If the Contractor fails to satisfactorily address inspection deficiencies, the DOTA reserves the right to employ outside assistance or use the State's own labor forces to provide necessary corrective measures. The Contractor will be fully responsible for all related cost and time. The State will charge the Contractor such incurred costs plus any associated project engineering costs and will make appropriate deductions from the Contractor's progress payment. Additionally, DOTA can issue liquidated damages for deficiencies not resolved to DOTA's satisfaction and for illicit discharges or contaminant discharges to soil, groundwater, surface water, or State waters (see Appendix A).

2. Failure to install or maintain site-specific BMP measures may result in the assessment of liquidated damages (Appendix A). Depending on the severity of the deficiencies, additional enforcement actions, such as suspension of work and/or termination of the contract (with the Contractor's Surety being fully responsible for all additional costs incurred by the State), can be conducted and assessed against the Contractor.

3. For all citations or fines received by the DOTA for non-compliance, including non-compliance with NPDES Permit conditions, the Contractor shall reimburse the State within 30 calendar days for the full amount of outstanding cost that the State has incurred. The State may deduct incurred costs from the Contractor's progress payments; however, the Contractor shall be responsible for reimbursing the State if the costs exceed remaining payments owed to the Contractor.

4. The Contractor shall be responsible for all citations, fines and penalties levied by DOH or EPA against the State due to the Contractor's failure to satisfactorily address site-specific BMP deficiencies and/or any Contractor's illicit discharges. The State may make the appropriate deductions from the Contractor's progress payment.; however, the Contractor shall be responsible for reimbursing the State if the costs of correction exceed remaining payments owed to the Contractor.

PART 4 – MEASUREMENT AND PAYMENT

4.01 BASIS OF MEASUREMENT AND PAYMENT

The work specified in this Section will be paid for at the contract lump sum price. Payment shall be full compensation for work prescribed in this Section and contract documents, including but not limited to, all labor, materials, tools, equipment, and all incidentals necessary to install, maintain, monitor, repair, replace, modify, and remove site-specific BMP measures.

Item No.	Item	Unit
01561.1	Construction Site Pollution Controls	Lump Sum

Partial payments shall be paid in the Monthly Progress Payment as follows:

A. 20% of the line item price shall be paid upon the satisfactory completion of the Pre-construction BMP Inspection and associated corrective actions accepted by AIR-EE or their designated authorized representative, as described in Section 01561.3.03(A), above.

B. 70% of the line item price shall be paid in equal monthly payments over the duration of the contract. Failure to satisfactorily apply, maintain, or modify BMP measures and devices, and/or submittals shall result in the withholding of monthly progress payments for this line item.

For projects that will disturb one acre or more of land, or will be part of a larger common plan of development that will disturb one acre or more of land,

payments shall be made only after Routine BMP Inspections described in Section 01561.3.03 above have been satisfactorily completed, and associated corrective actions accepted by AIR-EE or their designated authorized representative.

C. The remaining 10% of the line item price shall be paid after all temporary BMP measures have been satisfactorily removed.

   Payment will be made only after the satisfactory completion of the Final BMP Inspection and associated corrective actions accepted by AIR-EE or their designated authorized representative, and acceptance of the Post-construction BMPs by AIR-EE or their designated authorized representative.

Liquidated Damages, up to $25,000 per day (Appendix A), shall be assessed for each non-compliance of the BMP requirements described in this Section. The Contractor shall not be entitled to recover any Liquidated Damages assessed, even after the deficiencies have been corrected.

The Liquidated Damages cited in Appendix A are in excess of reimbursement for any citations, fines, or penalties levied by any regulatory agency against the State due to the Contractor's violations of clean water regulations or standards.

Appendix A. Liquidated Damages Schedule for Non-Compliances

Non-Compliance	Amount
Failure to obtain coverage under an NPDES Construction Permit for construction activities associated with a project that will disturb one acre or more of land, or will be part of a larger common plan of development that will disturb one acre or more of land, as defined by DOH.	$1,000 per calendar day per violation.
Failure to obtain coverage under an NPDES Hydrotesting Permit for hydrotesting activities that will require effluent discharge into State waters or drainage systems.	$1,000 per calendar day per violation.
Failure to obtain coverage under an NPDES Dewatering Permit for dewatering activities that will require effluent discharge into State waters or drainage systems.	$1,000 per calendar day per violation.
Failure to comply with the conditions specified in an NPDES Permit, or any other applicable permit.	$1,000 per calendar day per violation.
Failure to schedule a Pre-construction BMP Inspection and receive acceptance of all associated corrective actions prior to conducting land-disturbing activities.	$1,000 per calendar day per violation.
Failure to provide corrective actions accepted by AIR-EE or their designated authorized representative by the deadlines identified in the BMP inspection report.	$1,000 per calendar day per violation.
Failure to have the accepted SSBMP Plan and amendments or the accepted SWPPP and amendments available at a project construction site.	$1,000 per calendar day per violation.
Failure to properly install or maintain a BMP specified by the SSBMP Plan, SWPPP, contract drawings and documents, or permit.	$2,000 per calendar day per violation.

Non-Compliance	Amount
Failure to have an accepted amendment to the SSBMP Plan or an accepted amendment to the SWPPP prior to implementing changes to previously accepted BMPs. Note: Advance review and acceptance can be provided to satisfy this non-compliance. However, for projects with an NGPC or NPDES permit, the written amendment shall still be formally submitted for certification and signature by the authorized representative identified in the NGPC or NDPES Permit.	$2,000 per calendar day per violation.
Failure to conduct required inspections.	$1,000 for each of the first ten violations, $2,500 for each of the next ten violations, $5,000 for each subsequent violation.
Failure to maintain required records such as BMP inspection reports, rain gauge data logs, etc.	$500 per calendar day for the first ten days of each violation, $1,000 per calendar day for the next ten days of each violation, $2,500 per calendar day for each subsequent day of violation.
Any violation resulting in a polluted discharge.	Up to $25,000 per calendar day per violation.
Note: Liquidated Damages shown in the Table shall be assessed at the discretion of the DOTA.	

Assessment of Liquidated Damages for Non-Compliance:

The Contractor may be assessed liquidated damages by issuance of an Enforcement Letter. The Enforcement Letter shall indicate the amount of liquidated damages that are assessed for the non-compliances which shall be deducted from the Contractor's next progress payment. The Enforcement Letter will be sent electronically via e-mail and a hard copy to the Contractor's designated representative(s), identified in Section 01561.3.01(2)(d), responsible for the Contractor's Construction Site Runoff Control Program. An Enforcement Letter may be issued with or without previous verbal notifications, written warnings, or official enforcement letters (i.e. Warning Letter or Notice of Violation (NOV).

Liquidated Damages may be assessed for the following:

- Non-compliances listed in the Table, herein, included in Appendix A.
- Non-compliances have not been corrected in the timeframes noted.
- Corrective actions are not completed after a verbal notification, written warning (email or formal letter), or NOV is issued.
- Contractors are non-responsive to DOTA's directives.
- Repeated non-compliance.
- A polluted discharge has occurred.

The number of days used for the liquidated damages calculations shall start on the day that the non-compliance was required to be corrected and shall end on the day that the non-compliance is corrected and accepted. If DOTA's personnel are not able to go out in the field to verify that the BMP deficiencies are corrected in the timeframe specified, the Contractor can send photographs showing the corrected deficiency via e-mail to the DOTA Engineer and AIR-EE along with documentation on how the deficiency was corrected. The DOTA Engineer and AIR-EE may visit the site to verify the corrective actions are acceptable. If the corrective actions are acceptable, then the clock stops on the day that the documentation was received.

The Contractor shall not be entitled for compensation for any liquidated damages or penalty, fine, or citations assessed and deducted from the Contractor's progress payments, even after corrective actions have been taken.

END OF SECTION

SECTION 01562 – MANAGEMENT OF CONTAMINATED MEDIA, SOIL DISPOSAL, AND SOIL REUSE

PART 1 – GENERAL

1.01 RELATED DOCUMENTS

The General Provisions for Construction Projects (2016), Special Provisions and General Requirements of the Specifications, apply to the work specified in this Section.

1.02 DESCRIPTION

A. This Section describes procedures for the management of known and/or unknown contaminated media (e.g., soil, sediment, groundwater, soil vapor, and building materials) and disposal and on-site reuse of either contaminated or uncontaminated soil/sediment (referred to herein as “soil”), that may be disturbed or generated during excavation or demolition activities, or other construction activities associated with this project.

B. All soil shall be treated as potentially contaminated until it is determined otherwise.

C. The Contractor shall supply all labor, materials, and equipment necessary for the removal, temporary storage, testing, handling, backfilling and management of soil and contaminated media to carry out the work in accordance with these specifications, and all applicable Federal, State, and local regulations and latest amendments.

D. The Contractor shall follow the State of Hawaii, Department of Transportation, Airports (DOTA) Programmatic Environmental Hazard Evaluation and Environmental Hazard Management Plan (DOTA EHE-EHMP), a Construction-Environmental Hazard Management Plan (C-EHMP) Addendum, or a Site-Specific C-EHMP, whichever applies to the project.

E. Qualified Environmental Professional: The Contractor shall employ a Qualified Environmental Professional (QEP) who possesses a minimum of five (5) years of experience providing environmental oversight for the management of contaminated media during construction activities, who shall assist with sampling, testing, and creating plans including the preparation of the Contractor’s C-EHMP (Site-Specific or Addendum). The QEP shall be identified in the applicable C-EHMP document.

F. The Contractor and their QEP shall review any site-specific investigation reports (e.g., Phase II Environmental Site Assessment [ESA]) or construction management plans, etc.) to understand the conditions that may affect work performance.

G. Should the Contractor deviate from the DOTA EHE-EHMP, C-EHMP Addendum, or Site-Specific EHMP, the Contractor shall be responsible to prepare or modify any existing Hawaii Department of Health (DOH) required C-EHMP (Site-specific or Addendum). Any deviation from construction EHMPs will require approval by DOH and the DOTA Engineering Branch, Environmental Section (AIR-EE) prior to

implementation. The Contractor shall detail deviations from standard practices and explain how those deviations will be protective of human health and the environment.

H. The primary contaminant-related hazards addressed by the DOTA EHE-EHMP or a C-EHMP include, but are not limited to, the following Contaminants of Potential Concern (COPCs):

1. Petroleum-related Hydrocarbons, e.g., TPH-g, TPH-d, TPH-o, BTEX, and PAHs

2. Constituents of light distillate fuels and/or Chlorinated Solvents (together considered volatile organic compounds or VOCs)

3. Polychlorinated Biphenyls (PCBs)

4. Pesticides, e.g., Chlordane, Dieldrin

5. Metals, e.g., Arsenic, Barium, Cadmium, Total Chromium, Lead, Mercury, Selenium, and Silver

6. Per- and Polyfluoroalkyl Substances (PFAS)

In addition, free petroleum product (e.g., gasoline, aviation gasoline, diesel fuel, jet fuel, motor oils, lubricating oils) may be encountered in soil or groundwater in areas of previous petroleum releases.

Soil vapor may be present from volatile COPCs present in subsurface soil or groundwater.

Should changes in site conditions or additional site information identify contaminants or risks to human health and/or the environment not addressed by the DOTA EHE-EHMP or C-EHMP (Site-Specific or Addendum), the Contractor shall be responsible to revise, update, and finalize a C-EHMP (Site-Specific or Addendum), to be reviewed and approved by AIR-EE and the DOH Hazard Evaluation and Emergency Response (HEER) Office.

The Contractor shall coordinate with AIR-EE, as well as have any C-EHMP (Site-Specific or Addendum) approved by the HEER Office, prior to the start or continuation (in the case of an Addendum) of any related ground disturbing activities.

1.03 REFERENCES

All work shall conform to the latest edition of the following, unless otherwise noted or specified on the drawings or in these specifications. Where conflicts among the requirements or with these specifications exists, the most stringent requirements shall apply.

A. DOTA Construction Site Runoff Control Program
https://hidot.hawaii.gov/airports/doing-business/engineering/environmental/construction-site-runoff-control-program/

1. DOTA EHE-EHMP

2. DOTA Construction Best Management Practices (BMP) Manual

B. Department of Health (DOH) Hazard Evaluation & Emergency Response (DOH HEER) https://health.hawaii.gov/heer/

1. Technical Guidance Manual (TGM) for Implementation of the State Contingency Plan (including updates).

2. Guidance for Soil Stockpile Characterization and Evaluation of Imported and Exported Fill Material.

3. HEER Office Screening for Environmental Hazards at Sites with Contaminated Soil and Groundwater.

4. HEER Office Construction EHMP and EHMP Addendum Template.

C. State of Hawaii Administrative Rules, Title 11, DOH https://health.hawaii.gov/opppd/department-of-health-administrative-rules-title-11/

1. Chapter 54 Water Quality Standards

2. Chapter 58.1 Solid Waste Management Control

3. Chapter 59 Ambient Air Quality Standards

4. Chapter 11-260.1-279.1 Hazardous Waste Management: General Provisions

5. Chapter 280.1 Underground Storage Tanks

6. Chapter 451 State Contingency Plan

D. The Hawaii Environmental Response Law (Hawaii Revised Statutes [HRS] Chapter 128D) and the State Contingency Plan (Hawaii Administrative Rules [HAR] Title 11, Chapters 451-1–451-24).

E. American Petroleum Institute (API) RP 2219 https://www.api.org/oil-and-natural-gas/health-and-safety/refinery-and-plant-safety/occupational-safety/rp-2219

F. United States Code of Federal Regulations (CFR), Title 29: Labor https://www.ecfr.gov/current/title-29

G. CFR, Title 40: Protection of the Environment https://www.ecfr.gov/current/title-40

1. Part 50, “National Primary and Secondary Ambient Air Quality Standards A”.

2. Part 122, “EPA Administered Permit Program: The National Pollutant Discharge Elimination System”.

3. Part 261, “Identification and Listing of Hazardous Waste”.

4. Part 263, “Standards Applicable to Transporters of Hazardous Waste”.

5. Part 302, “Designation, Reportable Quantities, and Notification”.

H. CFR, Title 49: Transportation
https://www.ecfr.gov/current/title-49

1. Part 171, “General Information, Regulations, and Definitions”.

2. Part 172, “Hazardous Materials Table, Special Provisions, Hazardous Materials Communications, Emergency Response Information, Training Requirements, and Security Plans”.

I. U.S. EPA Comprehensive Environmental Restoration, Compensation, and Liability Act (CERCLA), Section 107(1), exemption for cleanup of legally applied pesticide products. https://www.epa.gov/enforcement/superfund-enforcement-authorities

PART 2 – PRODUCTS (Not Used)

PART 3 – EXECUTION

3.01 GENERAL WORK PROCEDURES

A. Prior to beginning work, the Contractor, the Contractor’s QEP, and the Engineer or their representative shall review and discuss all available information pertaining to contamination or potential contamination at the work site.

B. It should be noted that, in some cases, the contamination (e.g., soil or groundwater contaminated with metals, PCBs, pesticides, PFAS, etc.) may not be identifiable through visual and/or olfactory observation, and contaminant-specific field screening techniques may need to be implemented.

C. Potential or suspected contaminated media from separate locations or sources shall not be mixed or placed together without the approval of the Qualified Environmental Professional and AIR-EE.

D. The removal, transfer, or handling of explosive or flammable media shall be conducted using explosion-proof pumps and equipment. If a vacuum truck is used for removal of liquids or residues, the area of operation for the vacuum truck shall be vapor free. Discharge the vacuum pump exhaust gases through a hose of adequate size and length downwind of the truck and tank area. Vacuum truck operating and safety practices shall conform to API RP 2219. Collect tank residues in drums, tanks, or tank trucks labeled according to 49 CFR 171 and 49 CFR 172 and dispose of as required by regulation.

E. Contractor shall follow decontamination regulations and procedures as necessary.

F. Soil excavation, grading, and any disturbance of contaminated soil may cause a potential exposure to Contractor's employees and the public from the release of vapors or fugitive dust. The routes of exposure to dusts are by inhalation, ingestion, and dermal contact. The Contractor shall use engineering controls such as a cover, water spraying, and/or wind barriers to control fugitive dust to mitigate the release of and exposure to soil vapors.

G. The Contractor's QEP shall test excavated soil for the presence of COPCs and oversee excavated soil management in accordance with this Section and relevant guidance and regulations.

H. Contractor shall report construction activities in areas with contaminated soil or groundwater in accordance with an applicable C-EHMP or the DOTA EHE-EHMP. Contractor shall coordinate with the DOH HEER Office, the Engineer, and AIR-EE.

I. All Contractor correspondence with DOH and other regulatory agencies shall include the Engineer and AIR-EE.

3.02 PRECONSTRUCTION REQUIREMENTS

A. Submit the following a minimum of 30 calendar days prior to beginning any ground disturbing activities, for approval by AIR-EE.

1. The Contractor's revisions to the C-EHMP Addendum or Site-Specific C-EHMP completed in the design phase, or creation of a C-EHMP addendum if deviating from the DOTA EHE-EHMP, that includes, but is not limited to:

    a. Procedures, engineering controls, and methods the Contractor will use during the excavation, soil stockpiling and segregation, temporary storage, testing, handling, treatment, backfilling, and disposal of contaminated media, work area isolation, construction barriers, dust control, decontamination, and emergency management.
    b. Names of the Contractor's and their subcontractor's qualified personnel who will be supervising or managing contaminated materials at the site. Include the personnel's phone number and qualifications.
    c. Name(s) of the Contractor's Qualified Environmental Professional, including their qualifications.
    d. Proposed schedule of work.
    e. Location map of temporary contaminated stockpiles and other contaminated media storage, including infrastructure such as pipes and appurtenances, if applicable.
    f. All documents required as part of the appendices to the DOTA EHE-EHMP (e.g., health and safety plan and completing the management plans in the appendices) or C-EHMP (Site-Specific or Addendum) applicable appendices (e.g., health and safety plan, construction material documents, etc.).

3.03 CONSTRUCTION REQUIREMENTS

A. Soil Excavation and Stockpiling:

1. Notify the DOH HEER Office at least 90 calendar days prior to disturbing contaminated soil at "HEER Sites" utilizing the HI DOH e-Permitting System - Notification of Construction Activities (HEER Office). Version 1.6 (hawaii.gov) or most recent version available. Obtain AIR-EE's review and concurrence prior to submittal to DOH.

2. The disturbance of contaminated media shall be performed in accordance with the DOTA EHE-EHMP or the Contractor's approved C-EHMP (Site-Specific or Addendum), where applicable. The HEER Office and AIR-EE shall be immediately notified if contaminated media not previously known or anticipated is encountered. The HEER Office will determine whether additional sampling is required. The Contractor shall provide a location map with Global Positioning System (GPS) coordinates and approximate depth below ground surface at which contaminated media were encountered to the Engineer and AIR-EE.

3. Soil stockpiles shall be created and managed in accordance with project plans, the approved project-specific C-EHMP (if applicable), and the DOH Guidance for Soil Stockpile Characterization and Evaluation of Imported and Exported Fill Material. If deviating from a DOH-approved C-EHMP, approval from DOTA and DOH is required. Contractor shall secure approval of new or revised stockpile characterization plans from DOTA prior to implementation. Soils placed in watertight containers shall be covered with plastic sheeting or positioned under a roof when not in active use. Soil stockpiles and containers shall be located at least 50 feet from drainage features, surface waters, and stormwater drainage paths.

4. Any liquid-phase oil or free product associated with the contaminated soil shall be drained prior to stockpiling. If feasible, the free product shall be separated from the soil, properly stored, profiled, and disposed of at an approved recycling or disposal facility.

B. Soil Testing and Disposal:

The Contractor shall test all soil generated during excavation, demolition, or other construction activities. Sampling and testing of stockpiles shall be, at a minimum, in accordance with the latest edition of the DOH's Guidance for Soil Stockpile Characterization and Evaluation of Imported and Exported Fill Material. The Contractor's QEP shall direct the soil sample collection and testing methods in accordance with the most current guidelines. All soil intended for disposal or reuse shall be tested for the presence of applicable COPCs as established by the QEP and as approved by AIR-EE.

Stockpiles shall be tested using multi-increment (MI) sampling methodology in accordance with the TGM. Alternative sampling approaches, and appropriate decision unit (DU) volumes for large volume soil stockpiles, should be discussed with

AIR-EE and may be utilized on a case-by-case basis when approved by the HEER Office.

No soil from airport property shall be reused at private-owner off-site properties, even if the soil appears acceptable for unrestricted use based on testing conducted. Exceptions to this policy may only occur with the written approval of the Engineer and AIR-EE. Disposal or reuse of soil at a residential property or where there are sensitive receptors (i.e. schools, recreational areas, etc.) will not be allowed under any circumstance.

For the purposes of this Section "off-site" is defined as any location outside of the established project construction boundary from which excavated soil was generated. There are two off-site soil disposal/reuse categories applicable to this Section: (1) Off-site within the Airport Boundary, and (2) Off-site and outside of the DOTA Airport Property. "On-site" refers to within the construction project boundary from which excavated soil was generated.

1. For off-site soil reuse <u>within the airport boundary</u>:

    a. The Contractor shall secure approval from the Engineer and AIR-EE for transport to the reuse location(s) prior to moving the soil.
    b. Soil shall not be categorized as or contain a regulated hazardous waste.
    c. Soil shall not exceed the DOH Tier 1 Environmental Action Levels (EALs) for unrestricted use.

2. For off-site soil disposal/reuse <u>outside the airport property boundary</u>:

    a. The Contractor shall confirm and comply with the disposal/receiving facility's testing requirements, as well as their standards for disposal/reuse.
    b. Soil that is a regulated hazardous waste shall be disposed at an approved United States Environmental Protection Agency (EPA) regulated facility.
    c. Soil that is above the DOH Tier 1 EALs for commercial/industrial use but not a regulated hazardous waste shall be disposed of at a DOH or EPA permitted disposal facility (i.e., landfill).
    d. Soil that is below the Hawaii Department of Health (DOH) Tier 1 Environmental Action Levels (EAL) for unrestricted use may be reused at an appropriate location as approved by the Engineer and AIR-EE.
    e. For any contaminated media removed from Airport property to an approved facility, the Contractor shall be responsible for its legal transport and disposal. Contractor shall provide to the Engineer copies of any soil disposal receipts.

3. For on-site soil reuse:

    a. The Contractor shall representatively test all soils designated for on-site reuse. Testing can occur either *in situ* prior to excavation or after excavation. Soil that does not exceed applicable DOH Tier 1 Environmental Action Levels (EAL) for unrestricted use may be reused on-site (within construction site boundaries) with AIR-EE approval.
    b. Soil with contaminants that exceed DOH Tier 1 EALs may be approved for

on-site (within construction site boundaries) reuse with written approval from AIR-EE and when the following conditions are met:

i. Contaminated soil is reused within other contaminated areas in the proximity of its original location and for which a long term EHE-EHMP has been established and (if necessary) can be readily modified to accommodate that change in site conditions.
ii. Contaminated soil is reused no less than 150 meters from the nearest surface water or surface water inlet.
iii. Contaminated soil is reused at an elevation above the tidally influenced high water table, and at least one foot below the finish surface grade, with the most contaminated soil placed at the bottom of the excavation and cleanest soil toward the ground surface. A minimum of one foot of clean soil shall comprise the final, top backfill layer and, unless waived by DOTA and DOH, an impervious layer shall cap this top layer.
iv. Contaminated soil is not reused within or beneath the footprint of a permanent building structure.
v. Contaminated soil to be reused cannot contain free oil, oil sheens, oil stains, or total petroleum hydrocarbons (TPH) concentrations exceeding 5,000 milligrams per kilogram (mg/kg).

C. Groundwater Management: Groundwater may be contaminated by petroleum hydrocarbons, dissolved metals, PFAS, VOCs, and/or pesticides, and may be encountered during soil excavation or dewatering activities.

1. If contaminated groundwater is discovered at a previously unknown source or site on the project, the Contractor shall immediately notify the Engineer, AIR-EE, and HEER Office. Provide a location map with GPS coordinates and approximate mean sea level depth of the groundwater at which the contamination was encountered.

2. The disturbance of contaminated groundwater shall be performed in accordance with the DOTA EHE-EHMP, or C-EHMP (Site-Specific or Addendum), where applicable. The HEER Office will determine whether additional sampling is required.

3. If free product is present in the extracted groundwater, it shall be separated from the groundwater, profiled, and disposed of at an DOH-approved recycling/disposal facility. Free product shall not be moved from one excavation to another. Engineering measures shall be taken to prevent the transfer of the free product during dewatering. Water contaminated with free product shall not be discharged from a dewatering pit.

4. Releases of contaminated groundwater to surface water bodies or areas beyond the work area is prohibited.

5. Groundwater shall only be re-infiltrated in the ground with the prior approval of AIR-EE and the HEER Office. Under circumstances where contaminated groundwater cannot be re-infiltrated, proper disposal at a licensed facility shall be

conducted. Notification to the appropriate agencies and other pertinent information related to the discharge shall be conducted by copying the Engineer and AIR-EE on all correspondence and copies of correspondence provided upon request.

6. The Contractor is responsible for the legal disposal or discharge of groundwater that is not re-infiltrated and shall provide AIR-EE with copies of waste manifests.

7. For groundwater containerized and removed from Airport property, the Contractor shall have representative samples taken and tested in accordance with DOH guidelines, standards, and regulations. A copy of the groundwater test results shall be submitted to AIR-EE. The groundwater shall not be disposed off-site without the approval of the Engineer and a written approval from the DOH-permitted facility receiving the groundwater indicating that they acknowledge the groundwater test results and providing their approval to dispose the groundwater at their facility. Transport off-site shall occur in DOT-approved containers or mobile tanks. Documentation for the removal of containerized groundwater is required in the Close-Out Report detailed in Section 3.04.

8. With approval from AIR-EE and oversight from the QEP, small volumes of groundwater may be disposed via evaporation from a constructed (lined) pond or basin, with solid residuals properly tested and disposed in accordance with this specification.

9. Release Reporting: Encountering previously unknown contaminated soil or groundwater during subsurface construction activities is considered a release and shall be reported to the HEER Office. Copies of the DOH Release Report, DOH-issued Release Number, and email correspondence (if applicable), shall be furnished to the Engineer and AIR-EE. The Contractor shall be responsible for release reporting and AIR-EE shall be included on all correspondence with the HEER office.

10. Report all leaks and spills immediately to AIR-EE, DOTA personnel, and regulatory agencies in accordance with the airport-specific DOTA Spill Reporting Fact Sheet available via the DOTA Construction Site Runoff Control Program Webpage at https://hidot.hawaii.gov/airports/doing-business/engineering/environmental/construction-site-runoff-control-program/.

    Releases that occur during construction activities or releases due to unforeseen events (spills) shall be reported immediately.

D. Underground Storage Tanks (USTs) and Utility Pipes:

1. For any UST or pipeline, whether unexpectedly discovered or a planned removal, the nature of the UST or pipeline and whether they are inactive shall be determined prior to removal. Immediately notify the Engineer, AIR-EE and HEER Office of any unexpected encounter with a UST or buried piping.

2. The Contractor shall record field observations of the UST and pipelines. These observations shall include, but are not limited to, the following:

    a. Location relative to fixed landmarks, including GPS coordinates. Provide a location map that shows the UST and pipelines that were encountered. The map shall include a North arrow and a scale.
    b. Depth, diameter, length, and type of piping. Describe the condition of the pipe.
    c. Volume and type of fuel or product, including analytical laboratory reports for the product recovered.
    d. Beginning and ending fluid levels, if applicable.
    e. Flow rates, if applicable.
    f. Direction of flow.
    g. Detailed photographs.
    h. Detailed description of actions taken following the discovery, such as cutting, product removal, and disposal.

3. Provide records of the field observations to the Engineer, AIR-EE, and HEER Office.

4. The removal of all USTs must comply with HAR § 11-280.1, and all correspondence related to identification, removal, and documentation shall be provided to the Engineer and AIR-EE. Only personnel knowledgeable and trained in pipeline and UST removal shall cut, drain, and remove USTs and pipelines. Hazardous conditions, particularly those created by explosive vapors and releases of product to the environment, shall be mitigated prior to removal activities. If any waste pipe or UST components are to be stored on-site prior to disposal, the area shall be lined with polyethylene plastic sheeting, 20 mil or thicker, and bermed to contain any free product. Provisions shall be in place to contain viscous products that may liquify after exposure to atmospheric heating. The waste pipe segments shall be drained of any residual product and stored on appropriate dunnage with the ends of the pipe sealed or covered to protect the interior of the pipe from contact with rainwater and wind.

5. All removed pipelines and USTs shall be properly disposed or recycled.

6. The Contractor shall prepare and submit a UST Removal Report, including the results of all sampling activities required under HAR § 11-280.1, to the Engineer, AIR-EE, and the DOH SHWB (UST Program).

3.04 POST-CONSTRUCTION REQUIREMENTS

A. Submit a Project Close-out Report within 30 calendar days after work is completed. The Close-out Report shall contain the following applicable contents:

    1. A signed letter certifying that the removal and disposal of all contaminated materials were completed in accordance with the DOTA EHE-EHMP or Contractor's approved C-EHMP (Site-Specific or Addendum), and all applicable Federal, State, and local rules and regulations.

2. All approved DOTA EHE-EHMP deviation request forms. (Reference DOTA EHE-EHMP.)

3. Any Site-Specific EHMP(s) or Long-term EHMP(s). For locations at an airport for which DOTA has already established a Site-Specific EHMP from previous projects, the DOTA's Site-Specific EHMP shall remain applicable. Contractor shall assist DOTA by providing requested project data and records necessary to draft any required amendments resulting from a change in site conditions due to construction.

4. All testing and laboratory results, including chain of custody, for any soil/sediment, groundwater, soil vapor, or other media sampling and analysis.

5. Any results from air monitoring.

6. Record of Field Observations, including location map with GPS coordinates, limits, and depths of any contaminated media (soil, groundwater, etc.) that were encountered at previously unknown source or sites on the project. Include a copy of the completed Hawaii Hazardous Substance Written Follow-up Notification form that was submitted to DOH and all other associated documents.

7. If contaminated soil was disposed off-site (off Airport Property), include the following:

    a. A copy of the signed agreement from the receiving facility acknowledging the sample test results and indicating acceptance of the soil.
    b. Documentation of the quantity of soil received by the facility.
    c. Copies of the test results of the soil sampling.
    d. All certifications, disposal forms, waste manifests, and summary logs.

8. If any soil was approved for reuse on-site (within the construction site boundaries) or off-site within Airport Property, at a minimum, include the following:

    a. Copies of the test results of the soil sampling.
    b. The quantity of soil that was re-used.
    c. Location map of the re-used soil. Include GPS coordinates of its emplaced limits.
    d. A brief description of the purpose of the reused soil (e.g., general fill, utility trench backfill material, etc.). Include the depth and thickness of its placement.
    e. Photos of the site after placement of the re-used soil has been completed.

9. Record of Field Observation of any unanticipated UST or pipeline discovered during construction activities, including a copy of the completed DOH Notice of Intent to Close Underground Storage Tanks form, UST Closure Report, and all other associated documents.

10. The Close-out Report may be distinct to each contaminated media type/source. For sites with multiple contaminated media types/sources, Close-out Reports for each contaminated media type can be submitted separately or combined into a project-wide compilation of reports.

PART 4 – MEASUREMENT AND PAYMENT

4.01 BASIS OF MEASUREMENT AND PAYMENT

Work specified in this Section will be paid at the unit price measurement noted below.

Item No.	Item	Unit
01562.1	Management of Contaminated Media, Soil Disposal, and Soil Reuse	Lump Sum
01562.2	Additional Management of Contaminated Media, Soil Disposal, and Soil Reuse	Allowance

Payment shall be full compensation for work prescribed in this Section and contract documents and stipulated below.

Lump Sum items will be paid in accordance with the bid price upon approval of completed work under that line item by the Engineer. Should any unforeseen conditions arise, payment shall be made by an allowance, as directed by the Engineer.

Should the DOTA receive reports of any illegal dumping of material, and if illegal dumping is confirmed to have occurred, the DOTA will assess a Liquated Damages amount of $5,000 per truck per day, until the illegally dumped material has been cleaned up or the incident has been remedied to the satisfaction of the Engineer with the DOH's concurrence. The Contractor shall not be entitled to recover any Liquidated Damages assessed, even after the non-compliance has been corrected.

The Contractor shall be responsible for reimbursing DOTA for all citations, fines, and penalties levied by DOH, EPA, Department of Labor and Industrial Relations, or any other regulatory agency against the State due to the Contractor's failure to properly manage contaminated medias, including non-compliance with the DOTA EHE-EHMP, DOTA Site-Specific EHMP, or and Site-specific C-EHMP or C-EHMP Addendum. The Contractor shall reimburse the State within 30 calendar days for the full amount of any outstanding cost that the State has incurred. The State may deduct all incurred costs from the Contractor's monthly progress payments; however, the Contractor shall be responsible for reimbursing the State if the costs of correction exceed remaining payments owed to the Contractor.

If the Contractor fails to satisfactorily address the non-compliance item, DOTA reserves the right to employ outside assistance or use the State's own labor forces to provide necessary corrective measures. The Contractor shall be fully responsible for all cost and time. The State shall charge the Contractor such incurred costs plus any associated

project engineering costs and shall make appropriate deductions from the Contractor's monthly progress payment.

END OF SECTION

SECTION 01565 - SECURITY MEASURES

PART 1 – GENERAL

1.01 RELATED DOCUMENTS

The General Provisions for Construction Projects (2016), Special Provisions and General Requirements of the Specifications, apply to the work specified in this Section.

1.02 DESCRIPTION

The Contractor shall incorporate the State's airport security measures as part of their work. The Contractor shall adhere to established and enhanced security procedures, as mandated by the State, Federal Aviation Administration (FAA), and Transportation Security Administration (TSA), throughout the course of this Contract.

1.03 SUBMITTALS

A. Submit a security plan that addresses the conditions set forth in this Contract. Said plan shall contain, at a minimum, a plan of the project scope with locations of construction barricades with secured entry/exits, identification of locations requiring guards, Contractor measures to ensure security of worksite and personnel and procedures to ensure the containment of the worksite from unauthorized personnel. This package shall be submitted within fourteen (14) calendar days after execution of Contract.

B. For projects that involve or utilize the sterile area (passenger/aircraft boarding areas beyond the screening checkpoints), the Contractor shall submit a Tool Management Program for approval. The Contractor shall meet with the State's Airport Security Coordinator to discuss the responsibilities of all personnel who shall attend tool management training and attest in writing that they understand the security requirements. The Tool Management Program must be approved by the State's Airport Security Coordinator and implemented prior to any work.

PART 2 – PRODUCTS (Not Used)

PART 3 – EXECUTION

3.01 SECURITY

A. Obtain airport security identification badges for all employees working on this project and Air Operations Area (AOA) decals for all vehicles entering the AOA area in accordance with the requirements stated in the Special Provisions, Paragraph 8.21. All requests for badges and AOA decals shall be submitted in writing to the Airport District Manager through the Engineer within fourteen (14) calendar days after execution of Contract. Only authorized personnel working on this project shall be allowed to obtain badges. The Contractor shall be responsible to pay for all costs associated with complying with airport security requirements, including obtaining airport security identification badges.

Currently, the fee to obtain a new airport identification badge is $60.00, but due to the changing fee structure of these services, the Contractor shall verify the fees as shown on the DOTA website at: https://hidot.hawaii.gov/airports/doing-business/badging/. Any other inquiries can be made via phone or e-mail to the appropriate District's Pass & ID Office whose contact information is also listed.

If access is required to the HNL International Arrivals Building, inquiries shall be made to the U.S. Customs and Border Protection at (808) 861-8642 for additional bonding requirements.

B. The Contractor shall comply with all existing and proposed airport security initiative requirements. Contractor may be subject to civil penalties up to $35,000.00 for each security violation.

C. The Contractor shall protect work areas from theft, vandalism, and unauthorized entry. Ensure that proper methods are undertaken to secure tools, materials, and equipment from the public.

D. All vehicles entering the AOA through any of the Airport Access Check Points will be subject to search. The Contractor shall allow extra time for these inspections and be able to provide personnel, as required, to assist Airport security personnel during the inspections.

E. All personnel entering from the public area to secured areas and sterile areas in the airport terminals are subject to random, aviation worker screening for prohibited items. Exceptions are tools and materials that have a demonstrated need and are essential to perform the work being done under this project. Personnel shall expect to be randomly screened and allow extra time to complete the screening process. Refusal to comply will result in temporary or permanent airport identification badge revocation, monetary fines and/or civil penalties.

F. If required by the State, the Contractor shall be responsible for the posting of security guards, hired from the current Airport Security Contractor, at access points where the construction traffic may compromise the integrity of the airport security. Payment for posting of security guards required by the State shall be paid for as an allowance item in the Proposal Schedule. The Contractor shall inquire and coordinate with the current Airport Security Contractor.

PART 4 - MEASUREMENT AND PAYMENT

4.01 METHOD OF MEASUREMENT

No measurement shall be made for the items in this Section.

4.02 BASIS OF PAYMENT

Work under this Section, except for posting security guards, shall be considered incidental to, and included in the bid prices for the various items of work in this project.

Posting of security guards required by the State shall be paid for under an allowance item in the Proposal Schedule. The allowance is an estimate, and the amount shall not exceed the maximum amount shown in the proposal schedule. Additional charges by the Contractor for overhead, coordination, profit, insurances and other incidental expenses shall not be allowed. These shall be included in the Contractor's lump sum bid price.

Item No.	Description	Unit
01565.1	Security Measures	Allowance

END OF SECTION

SECTION 01580 - TEMPORARY FACILITIES AND UTILITIES

PART 1 - GENERAL

1.01 RELATED DOCUMENTS

The General Provisions for Construction Projects (2016), Special Provisions and General Requirements of the Specifications, apply to the work specified in this section.

1.02 DESCRIPTION

This item shall consist of arranging and maintaining all utilities including, but not limited to, water, electricity, sewage disposal and telephone communications in the work area which the Contractor and State Engineer deems necessary to meet the requirements of the work under the contract.

PART 2 - PRODUCTS (Not Used)

PART 3 - EXECUTION

3.01 TEMPORARY UTILITIES DURING CONSTRUCTION

A. Water and Sanitation: The Contractor shall provide temporary drinking water and sanitary facilities for the field personnel. The facilities shall be in accordance with the applicable health regulations and shall be maintained clean and operable until the conclusion of the construction work.

B. Telephone: The Contractor shall a have a telephone available for the State's use for communications with field personnel. Cellular telephones are acceptable. The Contractor shall install the telephone immediately upon starting work and maintain service until the project is completed. All costs associated with obtaining and maintaining telephone service shall be borne by the Contractor.

C. Electricity: Contractor shall obtain or provide temporary electric power and shall pay for all connections and energy charges incurred during construction.

D. Metering: Water and electrical services shall be metered and payment for meters and services shall be borne by the Contractor. Temporary connections for water shall include installation of a meter and backflow preventer at the point of connection according to State standards at the Contractor's cost. The Contractor shall submit requests for temporary connections in writing to the State Engineer 14 calendar days prior to the connection and shall include a description of work and a sketch of the proposed installation.

PART 4 – MEASUREMENT AND PAYMENT

4.01 BASIS OF MEASUREMENT AND PAYMENT

Work under this Section will not be measured for payment but will be paid for at the contract Lump Sum Price.

END OF SECTION

SECTION 01700 – MOBILIZATION & DEMOBILIZATION

PART 1 - GENERAL

1.01 RELATED DOCUMENTS

A. The General Provisions for Construction Projects (2016), Special Provisions, and General Requirements of the Specifications, apply to the work specified in this Section.

1.02 GENERAL REQUIREMENTS

A. "Hawaii Standard Specifications for Road, Bridge, and Public Works Construction, 2005," are hereby incorporated into and made a part of these specifications by reference unless otherwise modified hereinafter.

1.03 MOBILIZATION

A. The Contractor shall mobilize and transport his construction plant and equipment including materials and supplies for operation to the site of work, construct temporary buildings and facilities as necessary, and assemble the equipment at the site as soon as possible after receipt of Notice to Proceed, subject to the provisions of the General Provisions.

1.04 DEMOBILIZATION

A. The Contractor shall demobilize and transport his construction plant and equipment including materials, supplies and temporary buildings off the site as soon as possible after construction is completed. Demobilization shall include all cleanup required under this contract and as directed by the Engineer. Demobilization and final cleanup shall be completed prior to final acceptance.

PART 2 PRODUCTS (Not Used)

PART 3 EXECUTION (Not Used)

PART 4 MEASUREMENT AND PAYMENT

4.01 METHOD OF MEASUREMENT

Work under this section will not be measured nor paid for separately but shall be considered incidental to and included in the prices bid for the lump sum items of work in this project.

A. Mobilization shall not be measured for payment. The maximum bid allowed for "Mobilization" is an amount not to exceed six (6) percent of the sum of all items (excluding this item and all Allowances). If the proposal submitted by the bidder indicates an amount in excess of the allowable maximum, the indicated amount or amounts shall be reduced to the allowable maximum; the "Total Amount for Comparison of Bids", in the proposal schedule shall be adjusted to reflect any such reduction. For the purposes of comparing bids and determining the contract price to be inserted in the contract awarded to the bidder, if any is so awarded, the "Sum of All Items" adjusted in accordance with the foregoing shall be used and the bidder's proposal shall be deemed to have been submitted for the amounts as reduced and adjusted in accordance herewith."

B. Demobilization will not be measured for payment. A separate line item called "Demobilization" will be added to the Contractor's Schedule of Values after the contract has been awarded. The total amount for this item shall be 2.5% of the Contractor's total bid amount and will be deducted from other line items in the schedule of values as negotiated between the Contractor and the State. **THE CONTRACTOR SHALL NOT MODIFY THE PROPOSAL SCHEDULE BY ADDING A "DEMOBILIZATION" BID ITEM TO THE PROPOSAL SCHEDULE.**

4.02 BASIS OF PAYMENT

A. Mobilization will be paid for at the Contract Lump Sum Price.

Item No.	Item	Unit
01700.1	Mobilization (Not to Exceed 6% of sum of all items, Excluding this item and all allowances)	Lump Sum

B. Partial payment for "Mobilization" will be made as follows:

1. When 2 ½ percent of the original contract amount is earned, 50 percent of the bid amount will be paid.

2. When 5 percent of the original contract amount is earned, 75 percent of the bid amount will be paid.

3. When 10 percent of the original contract amount is earned, 100 percent of the bid amount will be paid.

   Nothing herein shall be construed to limit or preclude partial payments otherwise provided by the contract.

C. Partial payment will not be paid for Demobilization. Full payment will be made on the Contractor's final payment request. This will occur after the Contractor has fulfilled all of the requirements of the Contract bid documents to the satisfaction of the State and issuance of the Final Acceptance letter to the Contractor by the State.

END OF SECTION

SECTION 01800 – SPECIAL REQUIREMENTS FOR CONTRACTORS ON THE AOA

PART 1 – GENERAL

1.01 RELATED DOCUMENTS

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

1.02 DESCRIPTION OF WORK

A. Provide all materials, labor, equipment, and tools necessary to complete the Special Requirements for Contractors on the Air Operations Area (AOA).

B. The requirements of the Section are essential for ensuring public and worker safety on this project; hence, the Contractor shall comply with all requirements of this section when performing work on the AOA. Should the Contractor fail to comply with any requirement of this section; work may be delayed or temporarily suspended without contract time extensions. Liquidated damages or fines may result. All liquidated damages or fines resulting from violations due to improper activity, inattention, or failure to comply with required airport procedures; shall be borne by the Contractor.

1.03 PROJECT LIMITATIONS

A. The project normal working hours shall refer to SECTION 01010 – DESCRIPTION OF WORK. The Contractor shall work continuously during the project duration. No work shall be performed during State Holidays or when weather conditions restrict construction from occurring.

1.04 AOA SECURITY REQUIREMENTS

A. AOA Access Points: The Contractor will be assigned only one access point for each work phase, and shall ensure that all of their personnel, vehicles, and equipment enter and exit the AOA only through the assigned access point.

All vehicles entering the AOA through any of the Airport Access Check Points may be subject to search. The Contractor shall allow extra time for these inspections and be able to provide personnel, as required, to assist Airport security personnel during the inspection.

If the State deems an emergency situation has rendered the assigned access point unusable the Contractor will be assigned a temporary access point for the remaining workday. Should the original assigned access point remain unusable for a prolonged period, the Contractor will be assigned a new access point the following day and shall be responsible for all requirements at the new assigned access point.

B. The Contractor shall comply with all existing and proposed airport security initiative requirements. Contractor may be subject to civil penalties up to $35,000.00 for each security violation.

C. The Contractor shall protect work areas from theft, vandalism and unauthorized entry. Ensure that proper methods are undertaken to secure tools, materials and equipment from the public.

D. AOA Access Gates: Should the Contractor's assigned AOA access point be through an unguarded gate, the Contractor shall be responsible for the following:

1. Obtain the AOA access gate key(s) from the Airport Security Office (a $500.00 deposit is required per key).

2. Provide all gate guards required. Each gate guard shall possess the following expertise:

a. Familiarity with all of the AOA security access clearance requirements.
b. Knowledge related to AOA access badge, AOA vehicle decal, and airport vehicle operator requirements.
c. A communication device and specific instructions to call for assistance whenever problems occur.

3. Proper control of the AOA access gate in accordance with all required airport security procedures.

4. Close the AOA access gate during prolonged periods of inactivity; and close and lock whenever the AOA access gate is not in use, or is unattended.

1.05 AOA OPERATIONAL SAFETY REQUIREMENTS

A. It is the explicit intent of this contract that the safety of aircraft, and all of the personnel and equipment under the Contractor's jurisdiction, be the highest priority; hence, the Contractor shall carefully plan the operations of all personnel and equipment under their jurisdiction to provide for the free and unobstructed movement of all aircraft on the AOA, and to provide for the uninterrupted operation of visual and electronic signals used to guide aircraft while all personnel and equipment under their jurisdiction traverses the AOA.

B. With the exception of actual construction methods, the Federal Aviation Administration (FAA), Airport Traffic Control Tower (ATCT) will have full authority to control the Contractor's movements within the existing movement area. If the FAA, ATCT notifies the Contractor to temporarily halt operations, the Contractor shall effectively notify all personnel and equipment under its jurisdiction, without using lighted flares, to cease all work and move all equipment and themselves away from hazardous areas.

C. The Contractor is responsible for all of their movements on the AOA. Should the State deem that an escort, flagman, or driver fails to perform their duties, that escort,

flagman, or driver may be terminated, or suspended and required to undergo additional training.

1.06 AOA COMMUNICATION DEVICES: The Contractor shall have at least two (2) people on the AOA possessing and continuously monitoring the following fully charged communication devices:

A. A two-way radio capable of communicating on frequencies 118.90 (Tower) and 121.90 (Ground); with a spare charged battery and

B. A cellular telephone, with a listing of all required emergency contact numbers.

1.07 AOA TRAVEL ROUTE: The Contractor will be assigned only one (1) travel route per work phase, and shall ensure that all of their personnel, vehicles, and equipment traverses the AOA only along the assigned travel route.

Should the State deem that an emergency situation has caused the assigned travel route to become unusable the Contractor will be assigned a temporary travel route for the duration needed and shall be responsible for all requirements associated with the new assigned travel route.

1.08 AOA AUTHORIZED VEHICLES: Only vehicles considered safe, and required to complete the contracted work will be allowed to operate on the AOA. Each vehicle operating on the AOA shall be authorized, possessing:

A. An AOA vehicle decal obtained from the Airport Security Office and displayed on the driver's side front bumper (use of an AOA temporary vehicle permit is not allowed).

B. Insurance coverage as required by Article 7.1 of the General Provisions, and further amended by the Special Provisions.

1.09 VEHICLE AND EQUIPMENT REQUIREMENTS ON THE AOA: Each vehicle and driven piece of equipment shall possess the following when operating or staging on the AOA.

A. Operations occurring at night, or during periods of poor visibility, shall require a Flashing Amber Beacon mounted atop each vehicle /equipment's highest point.

B. Daylight operations with clear visibility, shall require a Checkered Orange and White Flag attached to a staff that is mounted to each vehicle and/or equipment in lieu of a Flashing Amber Beacon. The flag shall be at least a three-foot square with a checker pattern of international orange and white squares that are at least one-foot on each side.

C. Two placards shall be on both sides of each vehicle or equipment at all times to identify the vehicle or equipment owner. Placards shall contain the company name in letters at least four-inches (4") tall, or six-inch (6") minimum-sized company logo.

D. All additional equipment marking, lighting and positioning that may be required by the FAA.

1.10 AOA DRIVERS: All people operating a vehicle or any driven piece of equipment on the AOA shall possess the following license, permit and expertise:

A. Current and valid Hawaii State Driver's License.

B. Current and valid Airport Vehicle Operator's Permit.

C. Complete Airport Familiarization.

D. An understanding and ability to identify the following:

1. All RSA's (Runway Safety Area), TWSA's (Taxiway Safety Area).

2. All AOA Markings, Lighting, and Signing.

3. The Need for Control of DOD (Foreign Object Debris).

4. All AOA Equipment for Aircraft.

5. All AOA Critical Areas.

6. All AOA Travel Routes for the Various Work Places.

E. An understanding and ability to follow all ground vehicle operation and communication requirements while operating on the AOA.

F. Successful completion of all AOA driver training require by the Airport Operations Manager.

1.11 AIRPORT VEHICLE OPERATOR'S PERMIT: Airport vehicle operator's permit shall only be issued to people that apply through the Airport Security Office, and pass a written exam covering portions of the Airport Rules and Regulations related to vehicle operations on the AOA.

1.12 AOA ESCORTS: While operating on the AOA, the Contractor shall provide at least one escort for every five (5) vehicles and/or equipment under their jurisdiction. The Airport Operations Manager shall approve all escorts prior to any work commencing; hence, each escort shall possess:

A. All AOA Driver Requirements.

B. Both AOA Communications Devices previously specified.

C. Knowledge about the assigned access points and travel routes for the project.

D. Successful completion of all AOA driver training required by the Airport Operations

Manager. Each escort shall pass an exam given by the Airport Operations Manager, which demonstrates they possess an understanding and ability to follow all ground vehicle operation and communication requirements while operating on the AOA.

1.13 AOA TRAFFIC CONTROL: The Contractor shall furnish and provide the following traffic control devices to block off entrances of working area:

A. Runway Lighted X's: Wherever working within an RSA.

B. Low-Profile Barricades: Low-profile barricades shall be any one of the following: however, if option a or b is selected, the Contractor shall be responsible for water filling and emptying these types of barricades as part of their contracted work.

1. Neubert Aero Corporation's reusable Airport Low-Profile Barricade Model No. NAC-PC 2410 with at least one battery-powered red barricade light, or

2. Multi-Barrier Safety Barricade Model No. AR-10x96 with at least one Multi-Barrier 360 degree solar-powered light, or

3. Constructed barricades as indicated on plans.

4. All Low-profile barricades shall be spaced fifteen (15) feet on center, and used as follows:

a. Restrict aircraft from taxiing into work areas: Barricades shall extend across the full TWY/RWY width, with one (1) barricade places on the TWY/RWY centerline.
b. Channel aircraft around work areas: Barricades shall be placed ten (10) feet away from active RSAs/TWSAs.

C. Reflective Cones: Reflective cones shall be used to demarcate AOA travel routes and locations where vehicles shall yield to aircraft.

1.14 AOA FOD CONTROL: The Contractor shall keep all work areas, AOA Travel Routes, and all adjacent areas clean at all times. Unless otherwise stated in this contract, or otherwise directed by the Airport Manager, the Contractor shall properly haul and dispose all removed pavement materials and collected debris to a site off the Airport. The State will require remedial cleaning from the Contractor whenever their FOD Control Operations are unsatisfactory. Upon receipt of notification, the Contractor shall be ready to start remedial cleaning at the jobsite within one-hour. Notification by telephone will be deemed as official.

1.15 AOA FLAG PERSONS: Should the plans require flag persons along the AOA Travel Route, each flag-person shall possess:

A. AOA Driver as state in Sections 1.05.E.3, 1.05.E.4, and 1.05.E.6.

B. Both AOA Communication Devices previously specified in Section 105.A.

C. A traffic directing LED (Light-Emitting Diode) Light Baton.

D. A broom and dustpan to assist in AOA FOD Control.

1.16 AIRPORT STAGING AREAS: The Contractor shall only stage its vehicles and equipment at State approved areas. No vehicle or equipment shall park within four (4) feet of a security fence. Demarcation of the staging area shall be as follows:

A. Weighted Lighted Barricades shall be placed around the staging area perimeter at a maximum of twenty feet (20') on center.

B. Yellow Barrier Tape with the words "CAUTION DO NOT ENTER" continuously printed on the tape shall be used with barricades to demarcate the staging area perimeter.

1.17 COORDINATION OF CONSTRUCTION ON THE AOA

A. Work on the AOA requires RWY and TWY closures that demand proper notification to numerous agencies responsible for public safety; thus, the Engineer shall receive the following sufficiently accurate information from the Contractor.

B. Maximum height equipment: Equipment height shall be submitted to the State at least thirty-five (35) consecutive calendar days prior to construction. Construction shall not commence until the State receives confirmation from the FAA. All reported heights shall be the maximum heights among all vehicles or equipment used to compete the contracted work, and includes proper notification to the State whenever the reported maximum heights are to be exceeded.

C. Detailed work schedule: See SECTION 01300 – SUBMITTALS.

D. Cancellations: The Contractor shall only cancel work through the Engineer, Airport Operations Manager, or Airport Duty Manager. Whenever a cancellation is not made and the Contractor is not at the assigned AOA Access Point within thirty (30) minutes of the start time; all Contractor closures for the remaining workweek will be cancelled. The Contractor shall reimburse the State six hundred dollars ($600.00) for every work cancellation the State deems unjustified. This reimbursement is to compensate the State for all unnecessary costs related to cancelling existing and coordinating new closures.

1.18 CONSTRUCTION LIGHTING REQUIREMENTS

A. Should any part of the work area lack sufficient sunlight; the Contractor shall provide sufficient artificial lighting to permit the work and inspection to be carried out efficiently, thoroughly, safely, and satisfactorily. Work and inspections shall not be performed with only flashlight and/or vehicle/equipment headlights. All lights shall be positioned so they do not blind aircraft pilots, or FAA-ATCT controllers. All wiring for electrical lights and power shall be properly installed, maintained, securely fastened and kept as far as possible from telephone and signal wires. The Contractor shall submit a lighting plan to the Engineer for all work phases that

shall be subject to approval.

1.19 ENVIRONMETAL AND HEALTH REQUIREMENTS

A. The Contractor shall perform the following in accordance with all applicable federal, state, local, and airport rules and regulations related to environmental pollution control, abatement, and fire code.

B. Airport water: Airport water shall not be drawn from a top lacking a reverse pressure principal backflow prevention device. Water valves shall be opened and closed so that water hammers are not produced.

C. Waste Disposal: Waste disposal shall be performed properly. Materials shall not be burned, and construction wastes shall not be disposed into Airport storm water or sewer systems.

D. Restoration: Completely restore, to an acceptable condition; staging area, work area, AOA travel routes, and areas adjacent to the aforementioned.

E. When the Contractor damages and existing Airport perimeter fence, the Contractor shall perform immediate repairs on the fence to prevent inadvertent entry and maintain Airport Security.

F. Vehicle/equipment leaks and material spills: Shall be handled by the following five-step process, and pertains to all fluids other than potable water:

1. All leaked or spilled fluids shall immediately be kept from entering the Airport storm water and sewer systems.

2. All fluid leaks or spills shall be respectively fixed or stopped, immediately after ensuring that the fluids are kept out of the Airport storm water and sewer systems.

3. All areas containing the leaks or spills shall be properly cleaned and restored.

4. Dispose all wastes per Section 1.08.B.

5. Submit proper documentation to the State showing that all leaks or spills were properly cleaned and disposed.

G. Erosion control: The Contractor shall provide any essential temporary drainage, dikes, and similar facilities to prevent erosion damage to the site. Run-off shall be controlled to prevent damage to the surrounding areas.

H. Dust control: The Contractor shall positive measures to ensure that dust is properly controlled without chemicals and/or oil treatments.

I. Noise control: Noise control shall be within the levels that comply with all applicable regulations.

1.20 OTHER REQUIREMENTS

A. The Contractor shall also comply with the following requirements should they arise:

B. Any new TSA (Transportation Security Administration) security requirements.

C. Any additional operational safety requirement generated by the FAA.

D. Provide additional lights along AOA travel routes should the Engineer deem additional safety enhancements are needed.

E. Any new environmental and health requirements generated by the EPA (Environmental Protection Agency) or DOH (Department of Health).

PART 2 - PRODUCTS (Not Used)

PART 3 - EXECUTION (Not Used)

PART 4 - MEASUREMENT & PAYMENT

4.01 BASIS OF MEASUREMENT AND PAYMENT

Work under this section will not be measured nor paid for separately, but shall be considered incidental to and included in the bid prices for the various items of work in this project.

END OF SECTION

DIVISION 2 – SITE CONSTRUCTION

SECTION 02410 – SELECTIVE DEMOLITION

PART 1 - GENERAL

1.01 RELATED DOCUMENTS

The General Provisions for Construction Projects (2016), Special Provisions and General Requirements of the Specifications, apply to the work specified in this Section.

1.02 DESCRIPTION OF WORK

A. Extent of selective demolition work is indicated on the drawings. Selective demolition work includes, but is not limited to, selective demolition, removal, and subsequent disposal of all materials indicated or required to be removed.

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

C. Execute all work in an orderly and careful manner with due consideration for all items of work to remain.

D. Obvious conditions which exist on the site shall be accepted as part of the work, even though they may not be clearly indicated on the Drawings and/or described herein, or may vary therefrom.

E. All debris of any kind accumulated from the work of this Section shall be disposed off the site.

F. Protect all building interior at all times from damage during construction work. Coordinate with roofing work to provide temporary cover, weather protection, waterproofing, etc. as required over unfinished work area at the end of each day and during rain to prevent damage.

G. Schedule construction work in sections or phases to be able to protect exposed area from rain damage.

H. Protect all existing conditions surrounding the work area, including, but not limited to, walkways, parking, landscaping, etc. at all times from damage.

I. Any damage as a result of demolition work and any neglect to provide protection shall be fixed new at Contractor's own expense.

J. Demolish and remove materials as indicated on the drawings and as required to perform work under this project.

K. Carefully remove and salvage, relocate, or return to the State as indicated on the drawings.

L. Remove/relocate existing furniture, equipment, pictures, signage, blinds, etc. as required to perform demolition work. Return all items to its original location, unless otherwise indicated or directed by the State Engineer, after completion of work.

M. Temporarily disconnect and remove all existing overhead utilities on the roof if required during roofing work. Obtain State Engineer's written approval of all utility outages prior to performing work. Re-install and reconnect utility service when roofing work is completed.

N. Existing Conditions: The Contractor is cautioned that the existing roofing system contains hazardous substance. Abatement of this is part of the scope of work of this project and shall be performed as specified in DIVISION 13 – SPECIAL CONSTRUCTION. Work under this Section shall be carefully coordinated with the Contractor and Abatement Contractor to assure installation of roofing as soon as possible following abatement work.

O. Permits, Notice, Etc.:

1. The Contractor shall procure and pay for all necessary permits or certificates that may be required in connection with this work.

2. The Contractor shall serve proper notice and consult with the State Engineer regarding any temporary disconnections of electrical or other utility lines in the area which may interfere with the removal work, and all such lines where necessary shall be properly disconnected or relocated before commencing with the work.

1.03 SUBMITTALS

A. Submit in accordance with SECTION 01300 - SUBMITTALS.

B. Schedule: Submit schedule indicating proposed methods and sequence of operations for selective demolition work for review prior to commencement of work. Include coordination for temporary shut-off and continuation of utility services as required, together with details for dust and noise control protection.

1.04 JOB CONDITIONS

A. Condition of Structure: The State assumes no responsibility for actual condition of items or portions of structure to be demolished.

B. Existing Conditions: Conditions existing at time of commencement of contract will be maintained by the State insofar as practicable.

C. Occupied Spaces: Do not interfere with use of adjacent occupied spaces. Maintain free and safe passage to and from occupied spaces.

D. Partial Demolition and Removal: Items indicated to be removed but of salvageable value to Contractor, may be removed from structure as work progresses. Transport

salvaged items from site as they are removed. Storage or sale of removed items on site will not be permitted.

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

F. Utility Services: The existence of above and below ground and exposed and concealed utility lines other than those shown on the drawings is not definitely known. Should any other utility lines be encountered, the Contractor shall immediately notify the State Engineer and follow his direction as to procedure. Maintain existing utilities indicated to remain, keep in service, and protect against damage during demolition operations. Do not interrupt existing utilities serving occupied building or facilities, except when authorized in writing by the State Engineer. Outages and interruptions must be accepted in advance by the State Engineer. Submit written notice of outages and interruptions not less than fourteen days in advance of intended outage. Report damage, however slight, immediately. Do not repair or reconstruct any pipe, conduit, or installation without authorization, except perform emergency repairs immediately.

G. Dust Control:

1. Keep dust within acceptable levels at all times, including non-working hours, weekends and holidays, in conformance with Hawaii Administrative Rules, Title 11, Department of Health, Chapter 60.1, Air Pollution Control, latest edition as amended.

2. Mechanical dry sweeping not permitted. Vacuuming, wet mopping, approved limited dry hand, wet or damp sweeping is acceptable.

3. During loading operations, water down debris and waste materials to allay dust.

4. The method of dust control and all costs incurred thereof shall be the responsibility of the Contractor.

H. Noise Control:

1. Noise shall be kept within acceptable levels at all times in conformance with Hawaii Administrative Rules, Title 11, Department of Health, Chapter 46 - Community Noise Control, latest edition as amended. The Contractor shall obtain and pay for community noise permit from the State Department of Health when the construction equipment or other devices emit noise at level exceeding the allowable limits.

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

3. Conform to noise control related to events at the project site or adjoining facilities as directed by the State Engineer.

I. Other Controls:

1. Wherever trucks and/or vehicles leave the site and enter surrounding paved streets, the Contractor shall prevent any material from being carried onto the pavement. Waste water shall not be discharged into existing streams, waterways, or drainage systems such as gutter and catch basins unless treated to comply with Department of Health pollution regulations.

2. Trucks hauling materials shall be covered as required by PUC regulation. Trucks hauling fine materials shall be covered.

J. Existing Conditions: The Contractor shall be responsible for protection of existing conditions for the entire duration of the project. Damage to the existing conditions as a result of the work of this Section shall be corrected at Contractor's own expense.

PART 2- PRODUCTS (Not Used)

PART 3 - EXECUTION

3.01 INSPECTION

A. Prior to commencement of selective demolition work, inspect areas in which work will be performed. Inventory existing conditions of structure surfaces, equipment or surrounding properties which could be misconstrued as damage resulting from selective demolition work; photograph, video or otherwise document and file with the State Engineer prior to starting work.

3.02 SELECTIVE DEMOLITION

A. Perform selective demolition work, including all improvements indicated on the drawings, in a systematic manner. Use such methods as required to complete work indicated on drawings in accordance with demolition schedule and governing regulations.

1. Demolish concrete in small sections. Cut concrete at junctures with construction to remain using power-driven masonry saw or hand tools; do not use power-driven impact tools.

2. Provide services for effective air and water pollution controls as required by local authorities having jurisdiction. All dust shall be suppressed by a fog spray or other approved method.

B. If unanticipated mechanical, electrical or structural elements which conflict with intended function or design are encountered, investigate and measure both nature and extent of the conflict. Submit report to the State Engineer in written, accurate detail. Pending receipt of directive from the State Engineer rearrange selective demolition schedule as necessary to continue overall job progress without delay.

3.03 PROTECTIONS

A. Provide temporary barricades and other forms of protection as required to protect the general public from injury due to selective demolition work.

1. Erect temporary barricades as required, to prevent people from entering into project area to the extent as approved by the State Engineer. The extent of barricade may be adjusted as necessary with the approval of the State Engineer. This work shall be accomplished at Contractor's own expense.

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

3. Provide interior and exterior shoring, bracing, or support to prevent movement, settlement, or collapse of structure or elements to be removed, and adjacent facilities or work to remain.

4. Protect from damage existing finish work that is to remain in place and becomes exposed during demolition operations.

5. Life safety procedures and provisions shall be in conformance with all applicable Federal, State, and City and County regulations, including OSHA.

6. Remove protections at completion of work.

3.04 DAMAGES

Provide temporary barricades and other forms of protection as required to protect the general public from injury due to selective demolition work.

3.05 TRAFFIC

A. Conduct selective demolition operations and debris removal in a manner to ensure minimum interference with roads, streets, walks, and other adjacent occupied or used facilities. Do not close, block or otherwise obstruct streets, walks or other occupied or used facilities without written permission from the State Engineer. Provide alternate routes around closed or obstructed traffic ways if required by governing regulations, as directed by the State Engineer.

B. Buildings and facilities which are essential for public use for the construction period shall be provided with safe pedestrian passageways around the construction site as per ADAAG 201.3, 206, and ADAAG Chapter 4.

3.06 DISPOSAL OF DEMOLISHED MATERIALS

Remove debris, rubbish, and other materials resulting from demolition operations from building site daily. Transport and legally dispose of materials off site. Burning of removed materials is not permitted on project site.

3.07 HAZARDOUS MATERIALS

If hazardous materials are encountered during demolition operations, comply with applicable regulations, laws, and ordinances concerning removal, handling, and protection against exposure or environmental pollution.

3.08 MATERIAL STORAGE

Removed items to be re-installed by the Contractor shall be stored in a secured room. The Contractor shall be responsible for all items and shall replace any missing items at his own expense.

3.09 CLEAN-UP AND REPAIR

A. Upon completion of demolition work, remove tools, equipment, and demolished materials from site. Remove protections and leave interior areas broom clean.

B. Repair demolition performed in excess of that required. Return structures and surfaces to remain to condition existing prior to commencement of selective demolition work. Repair adjacent construction or surfaces soiled or damaged by selective demolition work.

C. Where exposed existing surfaces and/or materials are 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. 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.

D. All existing grass areas disturbed or damaged due to construction or ingress or egress to the site shall be repaired to its original conditions. Grass areas shall be recultivated, topsoiled, and then grassed with the same kind and type of material as existing.

E. Trenches, holes, depressions, and pits left by the removal of miscellaneous improvements shall be backfilled with suitable material and compact to 95% maximum dry density as determined by ASTM D 1557.

PART 4 - MEASUREMENT AND PAYMENT

4.01 BASIS OF MEASUREMENT AND PAYMENT

Work under this Section will not be measured nor paid for separately, but shall be considered incidental to and included in the bid prices for the various items of work in this project.

Work for Unforeseen Conditions required by the State shall be paid for under allowance items in the Proposal Schedule. Payment shall be the actual cost as invoiced by the Contractor and approved by the State Engineer. The Contractor shall be allowed to include overhead, profit, insurances and/or any other mark-ups, as stipulated in Section

9.5 of the General Provisions.

Item No.	Item	Unit
02410.1	Unforeseen Conditions	Allowance

The allowance is an estimate and the amount shall not exceed the maximum amount shown in the proposal schedule.

END OF SECTION

DIVISION 3 - CONCRETE

SECTION 03300 – CAST-IN-PLACE CONCRETE

PART 1 – GENERAL

1.01 RELATED DOCUMENTS

The General Provisions for Construction Projects (2016), Special Provisions and General Requirements of the Specifications, apply to the work specified in this Section.

1.02 DESCRIPTION OF WORK

A. This section includes, but is not limited to, all of the design, shop drawings, materials, labor, construction, placement and finishing of all regular reinforced concrete necessary to complete the project.

1.03 SUBMITTALS

A. Submit in accordance with SECTION 01300 - SUBMITTALS.

1. Product data:
   Materials for curing concrete
   Joint sealant
   Joint filler
   Self-leveling concrete topping

2. Design Data:
   Concrete mix design

3. Certificates:
   Cement mill certificates for all cement to be supplied
   Material Safety Data Sheets

4. Shop Drawings: Reinforcing steel shop drawings with details of fabrication, bending, and placement, prepared according to ACI 315, “Details and Detailing of Concrete Reinforcement.” Include material, grade, bar schedules, stirrup spacing, bent bar diagrams, arrangement, and supports of concrete reinforcement prepared in sufficient detail to permit installation without reference to the Contract Drawings.

1.04 REFERENCES

All work shall conform to the latest edition of the following, unless otherwise noted or specified on the structural drawings or in these specifications.

A. ACI 301, “Specifications for Structural Concrete Buildings”

B. ACI 318, “Building Code Requirements for Reinforced Concrete”

C. ACI 247, “Recommended Practice for Concrete Formwork”

D. CRSI MSP-2, “Manual of Standard Practice” IBC, “International Building Code.”

E. ASTM E 1745 Standard Specification for Plastic Water Vapor Retarders Used in Contact with Soil or Granular Fill Under Concrete Slabs.

F. ASTM E 154/E154M Standard Test Methods for Water Vapor Retarders Used in Contact with Earth Under Concrete Slabs, on Walls, or as Ground Cover.

G. ASTM E 96 Standard Test Methods for Water Vapor Transmission of Materials

H. ASTM E 1643 Standard Practice for Selection, Design, Installation and Inspection of Water Vapor Retarders Used in Contact with Earth or Granular Fill Under Concrete Slabs

I. American Concrete Institute (ACI)

1.05 STORAGE OF MATERIALS

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

1.06 TESTS

A. Slump: Standard slump tests as described in ASTM C143 (Modification: Sampling of concrete for slump test shall be taken after at least 1/4 cubic yard of concrete has been discharged) will be made periodically during the placement of concrete by the testing laboratory to ensure that the slump for which the concrete has been designed is met. Slump test shall be performed prior to the addition of superplasticizer or other site workability additive. Any concrete batch tested and showing slumps exceeding the specified tolerance shall be rejected. Any concrete placed prior to slump testing shall be the sole responsibility of the Contractor and shall be rejected should the subsequent slump test of the batch in question indicate that the slump tolerance is being exceeded. All rejected concrete shall be promptly removed and properly replaced. All costs resulting there from shall be borne by the Contractor.

B. Compressive Strength: During the progress of the work compressive strength tests of concrete shall be made in accordance with ASTM C39 by a testing laboratory hired by the State. 6-inch x 12-inch cylinders shall be taken from each major pour at the rate of 4 cylinders for regular reinforced concrete, for each 100 cubic yards. Notwithstanding this established rate, take concrete cylinders in whatever quantity is deems fit and/or necessary from any concrete pour. For pours of less than 15 cubic yards not used for structural purposed, cylinders may be omitted.

C. The testing laboratory will make and identify all test cylinders. The Contractor shall provide assistance to the laboratory technician to make the cylinders. The testing laboratory shall provide the labor and equipment to deliver the cylinders to the testing laboratory.

D. The standard age for testing the cylinders shall be 28 days.

E. All cylinders shall be made and cured in accordance with ASTM C31.

F. In all cases where the strength of any group of cylinders falls below the minimum compressive strength specified, the State Engineer shall have the right to require that test specimens be cut from the structure. Specimens shall be selected by the State Engineer from the location in the structure represented by the test specimen or specimens, which failed. Specimens shall be secured, prepared, and tested in accordance with ASTM C42 within a period of 60 days after placing the concrete.

The testing shall be done by a laboratory approved by the State Engineer. Concrete in the area represented by the core tests will be considered structurally adequate if the average strength of 3 cores is no less than 85% and the strength of a single core is no less than 75% of the 28-days strength specified. Should laboratory analysis indicate, however, that the proper concrete mix has not been used by the Contractor, all such concrete placed using the improper mix shall be subject to rejection. The cost of cutting specimens from the structure, patching the resulting holes, and making the analysis, including laboratory and consultation costs, shall be borne by the Contractor.

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

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

PART 2 - PRODUCTS

2.01 MATERIALS

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

B. Concrete Aggregates:

1. Fine Aggregates shall be calcareous or basalt sands, or a combination thereof. They shall meet the grading requirements of ASTM C33 unless the concrete producer can provide past data that shows that a proposed non- conforming

gradation will produce concrete with the required strength and suitable workability.

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 nor larger than 3/4 of the minimum clear spacing between individual reinforcing bars or bundles of bars.

4. Use locally manufactured, extracted, harvested, or recovered aggregate material if feasible to support the local economy and reduce transportation cost and environmental impact from using overseas material.

C. Water used in mixing concrete shall be clean and free from injurious amounts of oils, acids, alkalis, salts, organic materials or other substances that may be deleterious to concrete or reinforcement. Non-potable water shall not be used.

D. Concrete Admixtures:

1. General:

   a. Compatibility: Where more than one type of admixture is utilized in any mix, the admixtures shall be compatible with each other as certified in writing by each Admixture Manufacturer.
   b. Prohibited Admixtures: Admixtures are not allowed where containing any calcium chloride thyocyanates or containing more than 0.1% chloride ions.

2. Air Entraining Admixture: ASTM C 260.

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

4. High-Range Water-Reducing Admixture (Super Plasticizer): ASTM C 494, Type F or Type G.

5. Water-Reducing, Non-Chloride Accelerator Admixture: ASTM C 494, Type E.

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

7. Shrinkage Reducing Admixture: ASTM C-494, Type S. Tetraguard AS20 by BASF Construction Chemicals, LLC, Eclipse Plus by Grace Construction Products or approved equal. Dosage: 128 ounces per cubic yard and as recommended by manufacturer.

E. Expansion Joint Filler: A pre-molded material of 1/2" thickness, unless otherwise noted, composed of fiberboard impregnated with asphalt conforming to ASTM D 1751.

F. Joint Sealing Compound shall be a polysulfide or urethane compound conforming to ASTM C 920 or other approved equal, compatible with the floor finish to be applied. Color to be selected by the State Engineer.

G. Bond-Break Filler: Mineral-surfaced roofing cap sheet or coated asphalt felt.

H. Curing Compound shall be compatible with the floor finish to be applied.

I. Pervious Sheeting shall be burlap or other acceptable absorbent material, free from substances that will harm the concrete or cause discoloration.

J. Vapor Barrier: Low permeance vapor barrier with the following performance:

1. Maximum WVTR as tested by ASTM E 96 of 0.008.

2. Water Vapor Barrier as tested by ASTM E-1745: Meets or exceeds Class A.

3. Vapor Barriers:

a. Stego Wrap (15 mil) Vapor Barrier by STEGO INDUSTRIES LLC, San Juan Capistrano, CA (877) 464-7834, www.stegoindustries.com. Distributed in Hawaii by OK Hardware, 671-2886.
b. W.R. Meadows® Premoulded Membrane with Plasmatic Core
c. Zero-Perm® by Alumiseal®

4. Accessories: Provide sealing and joining accessories necessary to produce a vapor tight installation.

K. "Keyed Kold Joint" shall be galvanized.

L. Cementitious Coatings shall be cement based polymer modified cement finishing materials ("Pro-Finish" by Bonded Materials Company, "Polycoat" by Tremcrete Systems Incorporated, "Durus" by Durus High Tech Cement, or approved equal).

M. Slab Protection Sheets: Water repellant, vapor permeable sheets.

N. Reinforcing steel shall be deformed bars conforming to ASTM A615, grade as shown on plans. Material shall contain recycled content when feasible.

O. 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 of not less than 16 gauge shall be used to secure reinforcement.

P. Plywood shall be commercial-standard Douglas Fir, moisture resistant concrete form plywood not less than 5 ply and at least 5/8 inch thick.

Q. Metal clamps and ties shall be used. Form ties for exposed concrete shall be removable either completely or to a minimum depth of one-inch from the face of the concrete.

R. Self-leveling concrete topping: compressive strength 4300 psi at 28 days, ASTM C109; flexural strength 1000 psi at 27 days, ASTM C348.

PART 3 - EXECUTION

3.01 DESIGN OF CONCRETE MIXES

A. Ingredients for concrete shall be Portland cement, fine and coarse aggregates and water.

B. Normal weight concrete shall meet the requirements outlined in Subsection below.

C. Concrete shall be designed so that the concrete materials will not segregate nor cause excessive bleeding. Slump shall be 4 inches. A tolerance of 1" above the indicated slump will be allowed for individual batches.

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

E. For each class of concrete, the test results for 28-day compressive strength shall meet the following requirements:

F. 28-Day-Compressive-Strength-Test-Results (psi)

	Min. Average for 3 Cylinders	Min. Average for 2 Cylinders
5,000	5,000	4,750
4,500	4,500	4,250
4,000	4,000	3,750
3,000	3,000	2,750

G. Slabs-on-grade shall have a maximum water-cement-ratio of 0.45 or as indicated and shall contain 4% to 1-1/2% entrained air.

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

I. The Contractor shall use only approved mixes.

J. Concrete strength for various elements shall be as indicated.

K. For slabs-on-grade, the contractor may use a mix design other than that indicated provided the vapor emission rate is equal or less than 5 lbs. per 1000 s.f. at the time of the finished flooring installation. If the vapor emission rate exceeds this limit, the Contractor shall be responsible to take the measures necessary to reduce the emission to an acceptable level without delaying the project.

3.02 JOINTS

A. Construction joints shall be provided as detailed at locations indicated on the plans. Construction joints not shown on the plans shall be so made as to least impair the strength of the structure and shall be approved by the State Engineer. In general, they shall be located near the middle of the spans of slabs, beams and girders unless a beam intersects a girder at this point, in which case the construction joints in the girders shall be offset a distance equal to twice the width of the beam. Joints in columns and walls shall be at the underside of floors, slabs, beams or girders and at the top of footings or floor slabs. Beams, girders, brackets, column capitals, haunches and drop panels shall be placed at the same time as slabs. Joints shall be perpendicular to the main reinforcement.

B. All reinforcing steel shall be continuous across construction joints. Keys and/or inclined dowels shall be provided as required. Longitudinal keys at least 1-1/2" deep shall be provided in all joints in walls and between walls and slabs or footings. Unless otherwise indicated, joints shall be sealed with joint sealing compound.

C. Expansion joints shall be provided as detailed at locations indicated on the plans. Reinforcement or other embedded metal items bonded to the concrete (except dowels in floors or walls bonded on only one side of joint) shall not be permitted to extend continuously through any expansion joint. Joints shall be sealed with expansion joint filler and sealing compound at least 3/8" deep.

D. Contraction/control joints shall be provided where shown or called for on the plans and shall be 1/4 the depth of the slab or a minimum of 1" deep. Unless otherwise indicated on the plans, joints may either be tooled, formed-in-place or sawcut. When saw-cut joints are provided, cutting shall be timed properly with the set of the concrete so that it is firm enough not to be torn or damaged by the cutting blade and before random shrinkage cracking can form in the slab. In any case, cutting shall be completed not later than 12 hours after the concrete is placed and finished. Unless otherwise indicated on the plans, joints shall be sealed with joint sealing compound.

3.03 MIXING CONCRETE

A. All concrete throughout shall be either job or plant mixture in an approved type of power operated mixer that will ensure uniformity and homogeneity of the concrete produced. The Contractor shall provide a sufficient number of mixers to continuously carry on the work.

B. Mixing at jobsite shall be done in accordance with ACI 304 and as follows:

1. Concrete shall be thoroughly mixed in a batch mixer of an approved type and size which will insure a uniform distribution of materials throughout the mass. The machine shall have a control device to prevent materials from being discharged until they have been mixed for the specified minimum time.

2. The entire contents of the drum shall be discharged before materials of the succeeding batch are placed therein. No mixer shall be used which has a rated capacity of less than a 1-sack batch and no mixer shall be charged in excess of its rated capacity.

3. The first batch of materials placed in the mixer after the machine has been cleaned shall contain a sufficient excess of cement, sand and water to coat the inside of the drum without reducing the required mortar content of the mix. Upon cessation of mixing, the mixer shall be thoroughly cleaned.

C. Ready Mixed and Mixed-In-Transit Concrete shall be mixed to conform to the provisions of ASTM C94 and as follows:

1. The plant shall have sufficient capacity and transportation equipment to deliver concrete at the rate desired. The interval between batches for a pour shall not exceed 30 minutes.

2. The time elapsed between the introduction of the mixing water to the cement and aggregates or the cement to the aggregates, and the placing of concrete in its final position shall not exceed 90 minutes.

3. In hot weather (more than 90 degrees Fahrenheit ambient temperature) or under conditions contributing to quick stiffening of the concrete, the elapsed time in 2 shall not exceed 60 minutes, if no retarding admixture is used. If an ASTM C494 Type B or D admixture is added to the concrete, the elapsed time in 2 shall remain at 90 minutes.

4. Concrete shall be mixed only in such quantity as is required for immediate use. No retempering will be permitted and concrete that has started to harden shall be discarded and promptly removed from the job.

5. Admixtures conforming to item entitled “MATERIALS” paragraph E. hereinabove may be used in the concrete as recommended by the supplier and approved by the State Engineer.

D. Hand mixing of concrete will not be permitted except to make up shortages for fence post footings, sidewalks, thresholds, flag pole foundations, curbs and gutters, and thrust blocks.

3.04 PLACING CONCRETE

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

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

C. Preparation:

1. All sawdust, chips and other construction debris and extraneous matter shall be removed from interior of forms. Struts, stays, bracing, or blocking serving temporarily to hold forms in correct shape or alignment shall be removed when the concrete placing has reached an elevation rendering their services unnecessary.

2. Concrete shall be placed upon clean, damp surfaces with no free water, or upon properly compacted fills but never upon soft mud or dry, porous earth. Before pouring footings or foundations, bottoms of excavations shall be properly leveled off and tamped.

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

D. Conveying:

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

2. Concrete shall be deposited as nearly as practicable in its final position. Extensive spading as a means of transportation shall be avoided and in no case shall vibrators be used to transport concrete inside the forms.

3. Open troughs and chutes shall have a slope not to exceed 1 vertical to 2 horizontal and not less than 1 vertical to 3 horizontal. Chutes more than 20 ft. long and chutes not meeting the slope requirements may be used provided they discharge into a hopper before distribution.

4. The concrete shall not be allowed to drop freely more than 6 feet except where specifically authorized by the State Engineer. When placing operations would involve the dropping of concrete from a height of more than 6 feet, it shall be

conveyed through pipes or flexible drop chutes.

5. If any appreciable segregation occurs through the conveying methods employed, their use shall be ordered discontinued by the State Engineer and some other satisfactory method of placing concrete shall be used.

6. All chutes, troughs, pipes and other means of conveyances shall be kept clean and free from coatings of hardened cement or concrete by thoroughly cleaning with water and chipping after each pour. Water used for flushing shall be discharged away from the vicinity of the concrete or forms already in place.

E. Depositing:

1. Unless adequate protection is provided, concrete shall not be placed during rain. Rainwater shall not be allowed to increase the mixing water nor to damage the surface finish. Fresh concrete that has been deposited but has not attained its initial set shall be protected in the event of rain.

2. Concrete shall be placed so as to avoid segregation of the materials and the displacement of the reinforcing. As nearly as practicable, the concrete shall be dropped vertically without hitting reinforcement, sleeves or forms into its final position in order to avoid separation of coarse aggregates from concrete. After the initial set of concrete, the forms shall not be jarred and no strain shall be placed on the projecting reinforcing.

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

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

F. Construction joints shall be made only where located on the plans unless approved otherwise by the State Engineer. Pours shall be planned to provide for the continuous placing of concrete from one construction joint to another. The face edges of all joints that are exposed to view shall be carefully finished true to line and elevation.

G. In slab construction, placing of the concrete shall be started at the far end of the work so that each batch will be dumped against previously placed concrete, not away from it. The concrete shall not be dumped in separate piles and the piles then leveled and worked together. For floor slabs on earth, additional requirements in item entitled “MIXING CONCRETE” hereinabove shall apply.

H. Beams and girders shall not be placed at the same time as the supporting columns or walls. At least 2 hours must elapse after columns or walls are placed before placing beams and girders supported thereon.

I. Columns shall be placed in approximately 4-foot sections, with each section being vibrated and compacted as placed.

J. In placing a deck of slabs and beams, the beams shall be placed first up to the height of the bottom of the floor slab. This placement shall extend in bay modules and end at the midspan, midpoint between columns. The length of this placement shall be determined by the time it takes to return to the slab and the top layer of the beams before the top of the first pour has started to harden and form a cold joint.

K. If depositing of concrete must be stopped short of a full placement, it shall be leveled to a horizontal plane or stopped against a vertical bulkhead. Such bulkhead or horizontal plane shall be located only as approved by the State Engineer.

L. Compaction:

1. All concrete shall be consolidated by vibration so that the concrete is thoroughly worked around the reinforcement, around embedded items, and into corners of forms, eliminating all air or stone pockets which may cause honeycombing, pitting, or planes of weakness. All compaction shall be done by use of high frequency internal vibrators. Where the vibrator cannot be inserted into the concrete, compaction shall be done by spading, rodding or forking.

2. Frequency of vibrator shall be not less than 7,000 impulses per minute. The Contractor shall provide a sufficient number of vibrators to properly consolidate all concrete immediately after placing. At least one standby vibrator shall be on hand at all times during placement of the concrete.

3. Vibration shall not be applied through contact with reinforcement of forms. Vibration shall penetrate previously deposited concrete sufficiently to prevent pockets or voids or construction joints from occurring between pours, but must not be applied to concrete which has set up sufficiently to cease to be plastic under vibration.

3.05 FLOOR SLABS ON EARTH

A. Concrete floor slabs on grade, with the exception of sidewalks, shall be placed directly over a vapor barrier, and a minimum of 4 inches of gravel cushion fill (ASTM C33, No. 67). The edges of the vapor barrier shall be lapped and sealed as required by vapor barrier manufacturer to assure barrier performance. For slabs which will receive vehicular traffic, the slab shall be placed over a 6-inch layer of gravel cushion fill. The gravel cushion fill shall consist of crushed basaltic aggregate compacted to a minimum of 95% relative compaction.

Repair holes in the vapor barrier created by screeds, formwork or other temporary construction prior to coverage with concrete.

B. All earth-supported slabs**,** with the exception of sidewalks**,** shall be reinforced with a minimum of Grade 60 #3 steel reinforcing bars at 15 inches o.c. each way unless otherwise shown or called for on the plans. Plain bar dowels shall be provided as detailed for construction and expansion joints. Such dowels shall be wrapped or greased on one side of the joints to prevent bonding.

C. Care shall be taken in handling and placing the reinforcement. Reinforcement shall be positively set to the level required within the slab(s) as indicated on the plans.

D. Floor slabs shall be placed in alternate panels, long strip pattern, following construction or expansion joints. Narrow contraction/control joints shall be provided transverse to the length of the cast strips. There shall be an interval of at least 2 days between the placing of the initial panels and that of the adjacent ones. "Keyed Kold Joint" may be used in lieu of placement in alternate panels in areas where floor covering is specified provided all shrinkage cracks are sealed prior to installation of floor covering. As an option, slabs may be placed in alternate panel checkerboard pattern. Where slabs are placed in a checkerboard pattern, no panel shall be placed in excess of 500 square feet in area nor exceed 32 feet in its longest dimension.

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

F. Prior to concrete placement, small mounds of concrete shall be placed at random rebar intersections during the pour to provide support in addition to the chairs or blocks. Reinforcing bars shall be lifted as necessary to ensure proper placement within the slab.

3.06 CONCRETE SIDEWALKS ON GROUND

A. Concrete walks shall be of one lift construction, 4 inches in thickness with thickened edge, and reinforced with synthetic fiber reinforcement. Keys and /or plain bar dowels shall be provided as detailed for construction and expansion joints. Such dowels shall be wrapped or greased on one side of the joint to prevent bonding.

B. Expansion joints shall be provided as detailed, not more than 32 feet apart; at junctions with curbs; where walks abut buildings, platforms and other fixed structures; and elsewhere as shown in the plans. Reinforcement or other embedded metal items bonded to the concrete (except dowels in floors or walls bonded on only one side of joint) shall not be permitted to extend continuously through any expansion joint. Joints shall be sealed with expansion joint filler and sealing compound at least 3/8" deep.

C. Contraction/control joints shall be provided where shown on the plans and shall be 1/4 the depth of the slab or a minimum of 1" deep. Unless otherwise indicated on the plans, joints may either be tooled, formed-in-place or sawcut. When saw-cut joints are provided, cutting shall be timed properly with the set of the concrete so that it is firm enough not to be torn or damaged by the cutting blade and before random shrinkage cracking can form in the slab. In any case, cutting shall be completed not later than 12 hours after the concrete is placed and finished. Unless otherwise

indicated on the plans, joints shall be sealed with joint sealing compound.

D. Concrete shall be tamped and screeded true to grade and section, sufficient mortar brought to the surface for finishing, and the required finish given as specified hereinafter before the concrete sets. Steps in connection with walks shall have same finish as walks. All edges except for those at saw-cut control joints shall be rounded to 1/8" radius. Cross slope for sloped or crowned walks shall be 5/32" per foot. No pedestrian traffic shall be permitted on concrete walks for a period of 3 days after placing.

E. Walks shall be finished as indicated hereinafter and scored where shown or called for on the plans.

3.07 FINISHING OF SLABS

A. Finish A - Scratched Finish. After the concrete has been placed, struck off, consolidated and leveled, the surfaces shall be roughened with stiff brushes or rakes (cross-scratched) before final set.

B. Finish B - Light Trowelled Finish. After the concrete has been placed, struck off, consolidated and leveled, the concrete shall not be worked further until ready for floating. Floating shall begin when the water sheen has disappeared and/or when the mix has stiffened sufficiently to permit the proper operation of a power-driven float. The surface shall then be consolidated with power-drive floats of the impact type except in thin sections. Hand floating with wood or cork-faced floats shall be used in locations inaccessible to the power-driven machine. The slab shall then be steel trowelled to a uniform, smooth texture.

C. Finish C - Trowelled Finish. The surface shall be finished first with impact power floats, as specified above for Finish B, then with power trowels and finally with steel hand trowels. The first trowelling after power floating shall be done by a power trowel and shall produce a smooth surface which is relatively free of defects but which may still contain some trowel marks.

D. Additional trowelling shall be done by hand after the surface has hardened sufficiently. The final trowelling shall be done to a point when a ringing sound is produced as the trowel is moved over the surface. The finished surface shall be free of any trowel marks and shall be uniform in texture and appearance. On surfaces intended to support floor coverings, any defects of sufficient magnitude to show through the floor covering shall be removed by grinding.

E. Finish D - Broom Finish. The concrete slab shall be given a coarse transverse scored texture by drawing a broom across the surface. The operation shall follow immediately after steel-trowelling performed under Finish B above.

F. Finish F - Non-Slip Finish. The surface shall be given a dust-on application of non-slip grit abrasive aggregates. Finish with steel trowel but avoid over-trowelling. The rate of application of abrasive aggregates shall be not less than 25 pounds per 100 square feet or application shall be in strict accordance with the manufacturer's

recommendations.

G. Finish G - Swirled Finish. After the concrete surface has been struck off, darbied, power floated and steel troweled, the surface shall be given a swirl float finish. The float should be worked flat on the surface in semi-circular or fan-like motion.

3.08 FINISHING TOLERANCES FOR SLABS

A. Finish shall be true planes within plus or minus 0.5 inch in 10 feet, as determined by a 10-foot straightedge placed anywhere on the slab in any direction.

B. Unless otherwise shown on the plans, all slabs shall meet this tolerance. The tolerances will be checked prior to removing of forms or shores.

3.09 SELECTION OF FLOOR FINISHES

Unless otherwise indicated on the plans, the following floor finishes shall be used:

A. Finish A - Scratched Finish. For surfaces intended to receive bonded applied cementitious applications (such as setting beds for ceramic tile or quarry tile on the first floor, where no membrane is called for).

B. Finish B - Light Trowelled Finish. For surfaces intended to receive roofing, waterproofing and membrane (such as setting beds on membranes, second floor and above).

C. Finish C - Trowelled Finish. For interior floors and floors intended to receive floor coverings.

D. Finish D - Broom Finish. For walks.

E. Finish F - Non-Slip Finish. For platforms, interior and exterior steps, landings and ramps.

F. Finish G - Swirled Finish. Not used.

3.10 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 State Engineer cannot be properly repaired or patched shall be removed.

B. Where cast-in-place concrete which is exposed to view or designated as sandblasted requires repairing or patching, the texture of the surface of such repair or patch shall closely match that of the surrounding surface. If the concrete is to remain unpainted, the surface color shall also be closely matched to that of the surrounding surface.

C. All tie holes and all repairable defective areas shall be patched immediately after

form removal as follows:

1. All honeycombed concrete shall be chipped out to sound concrete but in no case to a depth of less than 1 inch. If possible, edges of the chipped-out areas shall be undercut.

2. Rock pockets, form tie holes, deep holes not too large in area, other holes with relatively high ratio of depth to area, and similarly confined areas shall be dry packed.

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

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

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

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

D. Except for concrete required to be removed under Paragraph 3.10, any concrete which is not constructed as shown on the plans or is out of alignment and/or level beyond allowable tolerances may be patched using an epoxy-and-sand mixture.

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

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

   1. The surface of the affected area shall be chipped, etched, or otherwise cleaned and roughened to provide a sound surface for bonding;

   2. Concrete nails or other fasteners which can provide positive mechanical bonding of the patch shall be set into the surface at about 18 inches o.c. in all directions with a minimum of 2 rows;

3. Wire mesh reinforcement as approved by the State Engineer shall be installed in those portions of the patch which exceed 2-inch thickness;

4. A bonding agent suitable for use in the repair location (epoxy required for exterior use) shall be applied over the entire surface to be patched;

5. Formwork to the true lines called for shall be installed over the area requiring the patch; and

6. Concrete or grout with aggregate sized appropriately for the cavity and which will provide strength equivalent to that of the base surface shall be placed in the form, properly compacted and suitably cured.

3.11 SURFACE FINISHES

A. Rough Concrete Finish. Rough concrete finish surfaces shall be reasonably true to line and plane with no specific requirements for selected facing materials. Tie holes, honeycombing and defects shall be patched in accordance with item entitled “REPAIR OF DEFECTS” hereinabove except that the patches for concealed surfaces need not be matched in color and texture with adjacent surfaces. Fins exceeding 1/4 inch in height shall be removed. Otherwise, surfaces shall be left with the texture imparted by the forms

B. Sandblasted Finish:

1. All sandblasting shall be done at a consistent point in cure age for sake of uniformity. Upon completion of sandblasting and prior to application of finish treatment, thoroughly remove all residue sand from blasted surfaces by water.

2. Form ties shall be broken back from the surface and washers removed prior to blasting the surface.

3. During sandblasting operation, protect surfaces not to be sandblasted by masking with wood, metal, rubber, or tape. Concrete shall receive a medium sandblast (by wet method). Provide samples for approval and selection, using beach sand, crush basalt, silica sand, or a combination of them for the samples.

4. Prepare one 4 feet x 4 feet sample with the specified mix for final approval. Approved sample shall remain on jobsite during period of sandblasting and shall be labeled with the following information.

   a. Age of concrete when sandblasted.
   b. Type of nozzle used.
   c. Type of sand used.

C. Plywood Finish. Finish of all exposed surfaces cast against forms constructed of plywood or lined with "Plyform" shall be true to line and plane within the tolerances in item entitled “FORMWORK TOLERANCES” herein below.

D. Joint marks and fins shall be removed and surfaces left smooth, dense and free from prominent grain markings.

E. The surface shall be scrubbed to remove any laitance or loose particles and to expose any defects.

F. Tie holes, honeycombing and defects shall be repaired in accordance with item entitled “REPAIR OF DEFECTS” hereinabove.

G. The surface shall be thoroughly wetted. Then, as the concrete approaches surface dryness, a mortar consisting of 1 part Portland cement, 2 parts well-graded sand passing a No. 30 sieve, and enough water to provide the consistency of thick paint shall be vigorously and thoroughly rubbed over the area with clean burlap pads so as to fill all voids.

H. While the mortar is still plastic but partially set so that it cannot be easily pulled from the voids, the surface shall be rubbed again with a dry (no water) mortar mix of the same proportions as above. Burlap pads, stretched tightly around a board to prevent dishing the mortar in the voids, shall be used for this operation. There shall be no discernible thickness of mortar on the surface, except in the voids, when this operation is concluded.

I. Immediately following the rubbing treatment, the surface shall be continuously moist-cured for 72 hours.

3.12 LOCATION OF SURFACE FINISHES

A. Unless otherwise indicated on the plans, the location of formed surface finishes shall be as follows:

B. Rough Concrete Finish - All concealed concrete surfaces such as behind ceramic tile, furring, acoustical tile, etc.

C. Plywood Finish with Cement Wash - All exposed concrete surfaces.

3.13 CURING AND PROTECTION

A. All concrete shall be cured for a period of not less than 7 days. 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. Acceptable curing methods:

1. Slabs-on-grade: Water cure or pervious sheeting or curing compound membrane.

2. Other slabs: Cure by one of the methods listed below. Curing method selected must be compatible with the finish to be applied to the concrete.

B. Curing shall immediately follow the finishing operation.

C. To promote drying of slabs on grade to receive floor finish and avoid moisture related flooring problems, once drying of the slab has started, if not sheltered by roofs or other floors it shall be protected by slab protection sheets from getting wet for a minimum of 90 days immediately prior to the placement of the floor finish. If the slab cannot be adequately protected, mechanical drying or other means shall be employed to reduce the vapor emission level to 3 lbs. per 1000 s.f. or less prior to placement of the floor finish.

D. 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.

E. Pervious Sheeting - Overlap sheeting edges approximately 6 inches and keep sheets continuously wet throughout the curing period.

F. Curing Compounds - Curing compounds used on concrete surfaces that are to receive floor covering**,** paint or colored finish shall be as recommended by the manufacturer to be compatible with the applied finish.

1. The Contractor shall submit to the State Engineer a letter certifying that the curing compound is compatible with the applied finish. Application shall be in accordance with the manufacturer's recommendations. If curing, sealing or other compounds are used which are incompatible with applied finish, such compound shall be thoroughly removed by grinding with a terrazzo grinder or other means approved by the State Engineer.

3.14 FORMWORK TOLERANCES

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

1. Variations from plumb:

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

In any 10 ft. of ht.: 1/4-inch
Max. for the entire ht. of structure: 1/2-inch

b. For exposed corner columns, control-joint grooves, and other conspicuous lines:

In any 20 ft. of length 1/4-inch
Max. for the entire length 1/2-inch

2. Variation from the level or from the grades specified in the contract documents:

a. In slab soffits, ceilings, beam soffits and in arises, measured before removal of supporting shores:

In any 10 ft. of length	3/16-inch
In any bay or in any 20 ft. length	3/8-inch
Max. for the entire length	1/2-inch

b. In exposed lintels, sills, parapets, horizontal grooves, and other conspicuous lines:

In any bay or in 20 ft. length	1/4-inch
Max. for the entire length	1/2-inch

3. Variation of the linear building lines from established position in plan and related position of columns, walls and partitions:

In any bay	1/2-inch
In any 20 ft. of length	1/2-inch
Max. for the entire length	one-inch

4. Variation in the sizes and location of sleeves, floor openings, and wall openings:

Plus or Minus 1/4-inch

5. Variation in cross-sectional dimensions of columns and beams and in thickness of slabs and walls:

Minus	1/4-inch
Plus	1/2-inch

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

a. Variations in dimensions in plan:

Minus	1/2-inch
Plus	2 inches

b. Misplacement or eccentricity:

2 percent of the footing width in the direction of misplacement but not more than 2 inches

c. Thickness:

Decrease in specified thickness	5 percent
Increase in specified thickness	No Limit

7. Variation in steps: The largest tread run within any flight of stairs shall not

exceed the smallest by more than 1/4-inch. The greatest riser height shall not exceed the smallest by more than 1/4-inch.

3.15 INSERTS, FASTENING DEVICES AND CONDUITS

A. Install inserts, reglet strips, hangers, metal ties, anchors, bolts, nailing strips, blocking, grounds and other fastening devices as required for attachment of other work. Properly locate all embedded items in cooperation with other trades and secure in position before concrete is placed.

B. All electrical and mechanical conduits and fittings shall be located such that they do not impair the strength of the concrete member and shall be subject to acceptance by the Owner.

3.16 CONSTRUCTION OF FORMS

A. All concrete forms shall be placed with metal clamps and ties. Locate ties level and plumb in horizontal rows and vertical tiers.

B. Temporary access openings to forms for cleaning prior to depositing of concrete shall be provided.

C. Forms for concrete surfaces or on exposed surfaces which are to receive a finishing material shall be either wetted thoroughly immediately before placing concrete or coated with a bond-breaking material compatible with the finishing material and/or its adhesive prior to the placement of reinforcing steel. Forms for unexposed surfaces may be coated with form oil. However, any surplus oil on the form surfaces and any oil on the reinforcing steel shall be removed by wiping with dry rags.

D. Forms shall not be removed before the expiration of the minimum lapsed time from concrete pour shown below unless information and/or data justifying a request for a shorter period is submitted to and approved by the Owner. Even with such approval, however, the Contractor shall be fully responsible to repair any damages which may result from the early removal.

- Walls, columns and side forms of beams 3 days
- Footing side forms 24 hours
- Bottom forms of cast-in-place slabs 14 days
- Bottom forms of post-tensioned slabs 7 days

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

F. Edge forms and intermediate screed strips shall be set accurately to produce the designated elevations and contours of the finished surface, and shall be sufficiently strong to support vibrating screeds or roller pipe screeds if the nature of the finish specified requires the use of such equipment. The concrete surface shall be aligned to the contours of screed strips by the use of strike-off templates or approved compacting type screeds. Screeds shall be set adjacent to all walls and in parallel rows not to exceed 8 feet on centers. Penetrations of the moisture barrier shall be held to a minimum.

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

3.17 REINFORCEMENT TOLERANCES

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

Sheared length: One-inch
Depth of truss bars: +0, -1/2 inch
Overall dimensions of stirrups, ties: 1/2 inch
All other bends: One-inch

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

Clear distance to formed soffits (exposed underside of beams and slabs): -1/4 inch
Minimum distance between bars: -1/4 inch
Tolerance on d: 3/8 inch
Tolerance on the minimum concrete cover: -3/8 inch.
Note: The tolerance for cover shall not exceed minus one third the minimum concrete cover.

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

Longitudinal location of bends and ends of reinforcement: 2 inches except at discontinuous ends of members where tolerance shall be 1/2 inch.

Bars may be moved as necessary to avoid interference with other reinforcing steel, conduits, or embedded items. If bars are moved more than one bar diameter, or enough to exceed the above tolerances, the resulting arrangement of bars shall be subject to approval by the Owner.

3.18 REINFORCEMENT

A. Reinforcing steel bars, wire and wire fabric shall be provided in the sizes, lengths and configurations as indicated on plans and shall be thoroughly cleaned, before placing, of loose mill scale, loose flaky rust, oil, and all coatings that will destroy or reduce bond. If necessary, they shall be cleaned again before placing of concrete. All items shall be fabricated, positioned and secured in place as indicated in the plans and as herein specified. Annealed steel wire shall be used to secure reinforcement. Reinforcement shall be placed in specified positions not exceeding the tolerances listed in Sub-section 3.01. Unless otherwise noted, cleaning, bending and placing of reinforcement shall be done in accordance with the standard practice of the Concrete Reinforcing Steel Institute.

B. Concrete or plastic coated support and spacers shall be used to secure the proper spacing of reinforcement over formwork. Stirrups shall be accurately and securely wired to the bars at both top and bottom. At slabs, footings and beams in contact with earth, pre-cast concrete blocks (not bricks or hollow tile) or chairs shall be used to hold reinforcement at a proper distance above earth.

C. Bars shall be tied at all intersections, and distances from forms shall be maintained by means of pre-cast concrete blocks, ties, hangers, chairs or other approved supports.

D. Bars shall be bent cold to the shapes shown on the plans. Bends shall be made around a pin having a diameter not less than 6 times the bar diameter except that for bars of larger than one inch diameter the pin diameter shall be 8 times the bar diameter. If required, bars may be bent in the field using a "hickey" bar.

E. All reinforcing steel bars shall be furnished in the lengths indicated on the plans. Splicing of bars, except where shown, will not be permitted without the approval of the Owner. Splices where permitted shall be staggered as far as possible, wired together in such a manner as to maintain the clear depth of the member and the minimum clear distance to the surface of concrete. Unless otherwise shown on the plans, splices shall be lapped 48 bar diameters or 24 inches, whichever is larger.

F. Unless permitted by the Owner, reinforcement shall not be bent after being partially embedded in hardened concrete. Improperly and/or excessively bent bars shall be replaced.

G. Unless shown in plan, the minimum concrete protective covering for reinforcement, except for extremely corrosive atmosphere, other severe exposures, or fire protective covering shall be as follows:

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

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

3. Interior surfaces: 1-1/2 inch for beams, girders, and columns; ¾ inch for slabs, walls and joists with #11 bars or smaller, and 1-1/2 inch with #14 and #18 bars.

H. Dowels (minimum #3 @ 24 inches o.c. unless otherwise shown in the plans) shall be installed in all concrete to which masonry walls abut.

I. Inserts, reglet strips, hangers, metal ties, anchors, bolts, nailing strips, blocking, grounds and other fastening devices as required for attachment of other work. Properly locate all embedded items in cooperation with other trades and secure in position before concrete is placed.

J. All electrical and mechanical conduits and fittings shall be located such that they do not impair the strength of the concrete member and shall be subject to acceptance by the Owner.

3.19 CONCRETE FOR ELECTRICAL WORK

A. Unless otherwise noted on plans, concrete for handholes and manholes shall be 3,000 psi strength at 28 days. Concrete for encased ducts shall be 2,500 psi strength at 28 days. Maximum size of aggregates for concrete encased duct shall be 3/4".

B. All ducts shall have a minimum cover of 3 inches of concrete. Spacers shall be used for placing ducts and for rigidly holding the ducts during the concrete pour. Provide minimum earth cover of 18 inches over top of concrete encasement unless otherwise shown on plans.

C. The encased section of ducts to which a future connection is to be made shall end with a coupling. An unencased 1-foot section of duct and end cap shall constitute the terminus of such ducts.

3.20 CONCRETE FOR DRAINAGE, SEWER AND PLUMBING SYSTEMS

A. Unless otherwise noted on plans, all concrete required for construction of manholes, catch basins, valve boxes, etc., which are required for plumbing and drainage installations shall be 3,000 psi strength at 28 days.

B. Normal weight concrete containing calcareous coarse aggregates shall not be used in sewerage structures and/or components.

C. Sewer manholes shall be constructed in accordance with Civil drawings and specifications.

3.21 FIELD QUALITY CONTROL

A. Testing Agency: Contractor shall engage a qualified independent testing and inspecting agency to perform concrete testing and special inspections.

B. All reinforcement shall be inspected by the Special Inspector prior to the closing of forms. This approval, however, shall not be construed to relieve the Contractor of his responsibility to place all reinforcement in accordance with the plans.

C. Flatness and Levelness of Floors: Floors shall be measured for levelness and flatness as indicated below. Measurements shall be made within 24 hrs following placement of the slab and shall be reported to the State Engineer as soon as possible and not later than 72 hours following installation. All tests are to be performed prior to removing shoring. Proposed sectional boundaries for taking measurements shall be submitted to the State Engineer for review and approval prior to pouring the slabs. In general, use one-half bay spacings, control and cold joint locations for sectional boundaries.

1. Concrete Slab Over Metal Deck: Use a minimum F_f value of 20.

2. Poured in Place and Shored Slabs: Use a minimum F_f/F_l value of 20/17.

F_f and F_l values shall be defined per ACI 302.1R-26. Where these tolerances are not met it shall be immediately be brought to the State Engineer's attention. Remedial measures can be performed with approval of the State Engineer but should remedial measures not be possible, the contractor shall remove and replace the portions of the slab that are not in conformance at the contractor's expense.

3.22 SELF-LEVELING CONCRETE TOPPING INSTALLATION

A. Prepare existing concrete substrate per manufacturer's instructions. Concrete surface must be sound, solid, clean and free of all oil, grease, dirt and any substance that might act as a bond breaker. Mechanically clean to a minimum of ICRI surface profile CSP 3.

B. All existing construction joints, control joints, expansion joints, or sawcut joints must be properly repaired by installing a flexible sealing compound for control/expansion joints, or epoxy adhesive for cracks.

C. Apply and cure topping per manufacturer's instructions.

3.23 CLEAN UP

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

PART 4 - MEASUREMENT AND PAYMENT

4.01 BASIS OF MEASUREMENT AND PAYMENT

Work under this Section will not be measured nor paid for separately but shall be considered incidental to and included in the bid prices for the various items of work in this project.

SECTION 03360 - CONCRETE FLOOR SEALER

PART 1 – GENERAL

1.01 RELATED DOCUMENTS

The General Provisions for Construction Projects (2016), Special Provisions and General Requirements of the Specifications, apply to the work specified in this Section.

1.02 SUMMARY

A. Extent of concrete floor sealer is shown on the drawings as a protective finish for concrete floors.

B. Related Work Described Elsewhere: Coordinate compatibility of compounds used in concrete work with SECTION 03300 - CAST-IN-PLACE CONCRETE.

1.03 SUBMITTALS

A. Submit in accordance with SECTION 01300 - SUBMITTALS.

B. Manufacturer's Data: Submit manufacturer's technical product data and installation instructions for all materials.

C. Safety Data Sheets (SDS): Submit SDS for each material as applicable.

1.04 QUALITY ASSURANCE

A. Manufacturer: Company specializing in manufacturing the products specified in this Section with minimum 3 years documented experience.

B. Applicator: Company specializing in performing the work of this Section with minimum 3 years documented experience.

C. Job Site Sample: Test a small area of surface where directed by the State Engineer before starting general application to assure desired results. Samples shall be accepted prior to application in the remaining areas.

1.05 PRODUCT HANDLING

A. Deliver materials in the original manufacturer's sealed containers.

B. Store materials in such a way as to prevent damage to containers or products.

C. Sealer shall be thoroughly stirred before and occasionally during use.

1.06 PROJECT CONDITIONS

A. Surface, air, and material temperatures shall conform to manufacturer's requirements.

B. Areas not subject to natural ventilation shall have positive ventilation provided throughout the application.

C. Surfaces to be treated shall be dry.

D. Surfaces unintentionally coated during application shall be cleaned as recommended by the manufacturer.

E. Upon completion of the work, trash, and debris created by work completed under this Section shall be removed from the site.

G. Restrict traffic from area where materials are being installed until material has been cured.

PART 2 - PRODUCTS

2.01 MATERIALS

A. Water Based Concrete Floor Sealer: Water based acrylic formula to protect exposed concrete slabs. Provide Sika Scofield SelectSeal Plus or equal acceptable to the State Engineer.

B. Anti-Slip Additive: Glaze N Seals Grip N Seal micronized polymer powder or equal acceptable to the State Engineer.

PART 3 - EXECUTION

3.01 EXAMINATION

A. Verify that substrate work done under other sections meets requirements for application of concrete floor sealer. Notify State Engineer in writing of any conditions requiring additional treatment prior to application.

B. Verify surfaces to be coated are dry, clean, and free of efflorescence, oil, or other matter detrimental to application of coating.

C. Verify joint sealants where installed are cured.

3.02 PREPARATION

A. All concrete and patches shall be sufficiently cured prior to application of sealer.

B. Surfaces shall be cleaned to have all laitance, dirt, dust, efflorescence, mold, salt, grease, oil, and curing compounds removed prior to application. Acceptable surface cleaning methods include shotblasting, sandblasting, water blasting, and chemical cleaners.

C. Surfaces shall be free of alkali, efflorescence, chemical films, and other contaminants.

D. Surface shall be dry prior to application.

E. Mask joints and drains to prevent migration of materials as required.

3.03 APPLICATION

A. Apply sealer and anti-slip additive as recommended by the manufacturer and back roll with a 3/8-inch knap roller.

B. Coverage Rates: Apply at maximum rate as recommended by the manufacturer for material and porosity of the substrates. Avoid excessive buildup and discoloration.

3.04 PROTECTION OF FINISHED AND ADJACENT WORK

A. Protect adjacent surfaces, including finished floors not scheduled to receive coating.

B. If applied to unscheduled surfaces, remove immediately by a method instructed by concrete floor sealer manufacturer.

END OF SECTION

DIVISION 4 - MASONRY

SECTION 04200 – UNIT MASONRY

PART 1 – GENERAL

1.01 RELATED DOCUMENTS

The General Provisions for Construction Projects (2016), Special Provisions and General Requirements of the Specifications, apply to the work specified in this Section.

1.02 DESCRIPTION OF WORK

A. Section Includes: Reinforced Concrete Masonry Units (CMU).

B. Related Sections:

1. Section 03300 - CAST-IN-PLACE CONCRETE

2. DIVISION 8 – DOORS AND WINDOWS

1.03 SUBMITTALS

A. Submit in accordance with SECTION 01300 – SUBMITTALS

B. Product Data: Submit manufacturer's product data for each type of masonry unit accessory, and other manufactured products, including certifications that each type complies with specified requirements.

C. Reinforcing Steel Mill Certificates: Submit steel producer's certificates of mill analysis, and tensile and bend tests for reinforcement steel required for project.

D. Grout Mix Design: Strength as indicated.

E. Submit reinforcing steel shop drawings with details of fabrication, bending, and placement, prepared according to ACI 315, "Details and Detailing of Concrete Reinforcement." Include material, grade, bar schedules, spacing, bent bar diagrams, arrangement, and supports of concrete reinforcement prepared in sufficient detail to permit installation without reference to the Contract Drawings.

1.04 QUALITY ASSURANCE

A. Standards:

1. ACI 530: Building Code Requirements for Masonry Structures and Commentary

2. ACI 530.1: Specifications for Masonry Structures and Commentary

3. Masonry Institute of America Publications

4. National Concrete Masonry Association Publications

B. Manufacturer: Obtain masonry from a single source.

1.05 PROJECT/SITE CONDITIONS

Protection of New Work:

1. Covers: Cover tops of construction with heavy waterproof sheeting. Cover tops of partially completed structures when work is not in progress. Extend covers a minimum of 24" down each side and secure in place.

2. Staining: prevent grout, mortar, soil, and other staining materials from the faces of units to be left exposed or painted. Remove all stains immediately from such surfaces.

PART 2 - PRODUCTS

2.01 CONCRETE MASONRY UNITS

A. Hollow Load Bearing Units: ASTM C 90, as follows.

1. Size: Nominal 8" x 8" x 16" (7-5/8" x 7-5/8" x 15-5/8" Actual), unless otherwise indicated. Where masonry is installed with an exterior exposure, use solid grouted, double open end bond beam units with epoxy coated reinforcing steel and tie wire.

2. Grade: N, minimum 1,900 psi on net area.

3. Type: II.

4. Weight Classification: Normal Weight.

5. Assemblage: ASTM 2270, f'm (prism strength at 28 days) = 1,500 psi minimum

6. Exposed Face: Split face one side, gray.

7. Moisture Control: Cure units by atmospheric drying for not less than 30 days before installation to comply with ASTM C 90, Type II.

B. Special Shapes: Comply with requirements for primary CMU units, except provide special shapes as indicated or required by installation for lintels, corners, jambs, sash, control joints, headers, bond beams, and other special conditions.

2.02 MORTAR/GROUT MATERIALS

A. Portland Cement: ASTM C 150, Type 1 or Type II.

B. Hydrated Lime: ASTM C 207, Type S.

C. Aggregate for Mortar: ASTM C 144, except for joints less than 1/4" use aggregate graded with 100% passing the No. 16 sieve.

D. Aggregate for Grout: ASTM C 404.

E. Water: Clean and potable with no deleterious substances to mix.

F. Use of masonry cement is not allowed. Call out mortar proportions.

2.03 REINFORCING

A. Reinforcing Bars: ASTM A 615, deformed, minimum yield strength of 60,000 psi.

B. Epoxy-Coated Reinforcing Bars: ASTM A 775 where masonry has an exterior exposure.

2.04 MORTAR AND GROUT MIXES

A. Mortar: Portland Cement Lime, with proportions complying with ASTM C 270, Table 1. Types as follows:

Type S: For units in contact with grade and where indicated.

B. Grout: ASTM C 476, fine or coarse as required herein.

PART 3 – EXECUTION

3.01 CONSTRUCTION TOLERANCES:

A. Variation from Plumb: For vertical lines and surfaces of columns, walls and arrises do not exceed 1/4 inch in 10 feet, or 3/8 inch in a story height not to exceed 20 feet, nor 1/2 inch in 40 feet or more. For external corners, expansion joints, control joints and other conspicuous lines, do not exceed 1/4 inch in any story or 20 feet maximum, nor 1/2 inch in 40 feet or more. For vertical alignment of hear joints do not exceed plus or minus 1/4 inch in 10 feet, 1/2 inch maximum.

B. Variation from Level: For bed joints and lines of exposed lintels, sills, parapets, horizontal grooves and other conspicuous lines, do not exceed 1/4 inch in any bay or 20 feet maximum, nor 1/2 inch in 40 feet or more. For top surface of bearing walls do not exceed 1/8 inch between adjacent floor elements in 10 feet' or 1/16 inch within width of a single unit.

C. Variation of Linear Building Line: For position shown in plan and related portion of columns, walls and partitions, do not exceed 1/2 inch in any bay or 20 feet maximum, nor 3/4 inch in 40 feet or more.

D. Variation in Cross Sectional Dimensions: For columns and thickness of walls, from dimensions shown, do not exceed minus 1/2 inch nor plus 1/2 inch.

E. Variation in Mortar Joint Thickness: Do not exceed bed joint thickness indicated by more than plus or minus 1/8 inch, with a maximum thickness limited to 1/2 inch. Do not exceed head joint thickness indicated by more than plus or minus 1/8 inch.

3.02 INSTALLATION, GENERAL

A. Construction: Comply with specified construction tolerances, with courses accurately spaced and coordinated with either work. Maintain core (cell) continuity to ensure proper clearances for reinforcement.

B. Pattern Bond: Lay in "running bond". Pattern, unless otherwise indicated. Bond and interlock each course of each wythe at corners.

C. Joints: Provide vertical control and expansion joints in walls, spaced and detailed in accordance with industry standards to minimize cracking.

3.03 PLACING REINFORCEMENT

A. General:

1. Cleaning: Clean reinforcement of loose rust, mill scale, earth, and other materials which will reduce bond to mortar or grout.

2. Positioning: Position reinforcement accurately at the spacing indicated. Support and secure against displacement from required positions.

3. Defects: Do not use reinforcement with defects, including any kniks or beds on reinforcement bars not shown on drawings or final shop drawings, or reinforcement with reduced cross-section due to excessive rusting or other causes. Repair damaged epoxy coating per manufacturer’s recommendations.

B. Reinforcement Bars:

1. Proximity Between Vertical Bars: Where vertical bars are in close proximity, provide a clear distance between bars of not less than nominal bar diameter or 1" (whichever is greater); except for columns, piers and pilasters, provide a clear distance between vertical bars indicated, but not less than 1-1/2 times the nominal bar diameter or 1-1/2", whichever is greater. Provide lateral ties as indicated.

2. Splicing: Splice reinforcement bars where shown; do not splice at other points unless acceptable to the State Engineer. Provide lapped splices of laps not less than indicated or required by governing code. In splicing vertical bars or attaching to dowels, lap ends, place in contact and wire tie.

3.04 FIELD QUALITY CONTROL

A. Special Inspection- All masonry work requires special inspection. Special Inspector will be hired by the State.

B. Testing: State Engineer may require testing of masonry work. Where required, provide appropriate notifications of State Engineer and Testing Service. Allow proper access to work by testing service personnel.

C. Testing Service: The State will employ separate testing laboratory to perform field quality control testing, if required.

D. Types of Testing: When required, types of tests may include following and such other tests as the testing agency may require.

1. Unit Tests:

   a. Concrete Masonry: ASTM C 140.
   b. Mortar Tests: ASTM C 780.

2. Prism Test Method: ASTM E 447, Method B.

E. Reports: Test reports will be made available to State Engineer.

F. Test Evaluation/Action: masonry work, in absence of other indications of noncompliance with requirements, will be considered satisfactory if results from construction quality control tests comply with requirements indicated. Where work does not comply, Contractor to remove defective work, replace with new work at no cost to the State, and pay for additional testing to ensure compliance with requirements.

3.05 REPAIR, POINTING, AND CLEANING

Defective Work: Remove and replace masonry units which are loose, chipped, broken, stained or otherwise damaged, or if units do not match adjoining units as intended. Provide new units to match adjoining units and install in fresh mortar or grout, pointed to eliminate evidence of replacement.

3.06 PROTECTION

Final Protection: Institute appropriate protection measures as required and maintain conditions in a manner acceptable to Installer, which ensures unit masonry work being without damage and deterioration at time of substantial completion.

PART 4 – MEASUREMENT AND PAYMENT

4.01 BASIS OF MEASUREMENT AND PAYMENT

Work under this Section will not be measured nor paid for separately but shall be considered incidental to and included in the bid prices for the various items of work in this project.

DIVISION 5 - METALS

SECTION 05400 - COLD-FORMED METAL FRAMING

PART 1 – GENERAL

1.01 RELATED DOCUMENTS

The General Provisions for Construction Projects (2016), Special Provisions and General Requirements of the Specifications, apply to the work specified in this Section.

1.02 SUMMARY

A. Section Includes: Non-load-bearing steel stud exterior wall framing.

1.03 REFERENCES

A. American Iron and Steel Institute (AISI) www.steel.org – Specification for the Design of Cold-Formed Steel Structural Members.

B. American Society of Civil Engineers (ASCE) www.asce.org7 – Minimum Design Loads for Buildings and Other Structures.

C. American Welding Society (AWS) www.aws.orgD1.3/D1.3M – Structural Welding Code – Sheet Steel.

D. ASTM International (ASTM) www.astm.org:

1. A653/A653M – Standard Specification for Steel Sheet, Zinc-Coated (Galvanized) or Zinc-Iron Alloy Coated (Galvannealed) by the Hot-Dip Process.

2. A780 – Standard Practice for Repair of Damaged and Uncoated Areas of Hot-Dip Galvanized Coatings.

3. A1003/A1003M – Standard Specification for Steel Sheet, Carbon, Metallic- and Nonmetallic-Coated for Cold-Formed Framing Members.

4. C955 – Standard Specification for Load-Bearing (Transverse and Axial) Steel Studs, Runners (Tracks), and Bracing or Bridging for Screw Application of Gypsum Board and Metal Plaster Bases.

5. C1007 – Standard Specification for Installation of Load Bearing (Transverse and Axial) Steel Studs and Related Accessories.

6. C1513 – Standard Specification for Steel Tapping Screws for Cold-Formed Steel Framing Connections.

E. Steel Stud Manufacturer's Association (SSMA) www.ssma.com – Member Directory.

F. Society for Protective Coatings (SSPC) www.sspc.org – Painting Manual.

1.04 SUBMITTALS

A. Submit in accordance with SECTION 01300 - SUBMITTALS.

B. Submittals for Review:

1. Shop Drawings: Indicate framing layout, components, connections, fastenings, and pertinent details.

2. Product Data: Indicate framing components, sizes, materials, finishes, and accessories.

C. Quality Control Submittals:

1. Certificates of Compliance: Certificate from Professional Structural Engineer responsible for system design that system was designed in accordance with Contract Document requirements, applicable Building Code, and generally accepted engineering practices.

2. Welder Certifications: As required by AWS D1.3/D1.3M.

1.05 QUALITY ASSURANCE

A. Manufacturer: Current member of SSMA.

B. Installer Qualifications: Minimum 5 years documented experience in work of this Section.

C. Calculate structural properties of framing members in accordance with AISI Specifications.

D. Design framing under the direct supervision of a Professional Structural Engineer with minimum 2 years documented experience in the work of this Section and licensed in the State in which the Project is located.

E. Design exterior wall stud system to withstand:

1. Live and dead loads in accordance with Building Code.

2. Wind pressure loads in accordance with ASCE 7.

3. Movement caused by an ambient temperature range of 120 degrees F and a surface temperature range of 160 degrees F.

4. Maximum deflection under loading: L/360 without sheathing materials.

5. Minimum 1/2 inch vertical deflection of structure.

F. Design system to accommodate construction tolerances, deflection of building structural members, and clearances at openings.

G. Welder Qualifications: AWS D1.3/D1.3M.

1.06 DELIVERY, STORAGE, AND HANDLING

In accordance with ASTM C1007.

PART 2 - PRODUCTS

2.01 FRAMING MATERIALS

A. ASTM A653/A653M or A1003/A1003M, galvanized sheet steel G90 for exterior wall system coating class.

B. Fabricate components to ASTM C955.

C. Studs: SSMA stud profile, C-shaped, punched for utility access.

D. Tracks:

1. SSMA stud track profile, C-shaped, same gage and depth as studs, unpunched.

2. Top track: Deflection type, deep leg track with slotted screw holes; permit plus or minus 1/2 inch movement of overhead structure without damage to framing.

3. Top and bottom track: 1-1/4 inch high legs.

2.02 ACCESSORIES

A. Bracing, Furring, Bridging and Web Stiffeners: Formed sheet steel, thickness determined by performance requirements specified.

B. Plates, Gussets, Clips: Formed sheet steel, thickness determined by performance requirements specified.

C. Fasteners: ASTM C1513; self-drilling, self-tapping screws.

D. Touch Up Paint: SSPC Paint 20, Type I or II.

E. Welding Electrodes: AWS D1.3/D1.3M; type required for materials being welded.

2.03 FABRICATION

A. Framing components may be prefabricated using templates.

B. Cut members square and with tight fit to adjacent framing.

C. Assemble components using screw connection, welding, or clinching methods. Welding to conform to AWS D1.3/D1.3M.

D. Fabricate straight, level, and true, without warp or rack.

E. Fabrication Tolerances: In accordance with ASTM C955.

PART 3 - EXECUTION

3.01 INSTALLATION - GENERAL

A. Install framing components in accordance with ASTM C1007, manufacturer's instructions, and approved Shop Drawings.

B. Welding: In accordance with AWS D1.3/D1.3M.

C. Make provisions for erection stresses. Provide temporary alignment and bracing.

3.02 INSTALLATION - NON-AXIALLY LOADED STUD FRAMING

A. Place top and bottom tracks in straight lines with ends butted. Fasten tracks at maximum 12 inches on center or as indicated.

B. Place studs at spacing indicated and not more than 2 inches from abutting walls and at each side of openings.

C. Install deflection compensating top track at framing extending to underside of structure.

D. Connect studs to top and bottom tracks.

E. Construct corners using minimum of three studs.

F. Do not splice studs.

G. Erect, brace, and reinforce stud framing to develop strength to achieve design requirements.

H. Install headers above openings and intermediate studs above and below openings to align with wall stud spacing.

I. Install framing between studs for attachment of mechanical and electrical items, and to prevent stud rotation.

J. Laterally brace walls at locations indicated.

3.03 INSTALLATION TOLERANCES

In accordance with ASTM C1007.

3.04 FIELD QUALITY CONTROL

Testing and Inspection Services: Inspect and test shop and field welds in accordance with AWS D1.3/D1.3M.

3.05 ADJUSTING

Clean and touch up galvanized coatings at welded and abraded surfaces in accordance with ASTM A780.

PART 4 – MEASUREMENT AND PAYMENT

4.01 BASIS OF MEASUREMENT AND PAYMENT

Work under this Section will not be measured nor paid for separately but shall be considered incidental to and included in the bid prices for the various items of work in this project.

DIVISION 6 – WOOD AND PLASTICS

SECTION 06105 - MISCELLANEOUS ROUGH CARPENTRY

PART 1 - GENERAL

1.01 RELATED DOCUMENTS

The General Provisions for Construction Projects (2016), Special Provisions and General Requirements of the Specifications, apply to the work specified in this Section.

1.02 SUMMARY

A. Section Includes:

1. Wood blocking and nailers.

2. Plywood backing panels.

B. Related Requirements:

1. SECTION 06160 - SHEATHING.

1.03 DEFINITIONS

A. Boards or Strips: Lumber of less than 2 inches nominal size in least dimension.

B. Dimension Lumber: Lumber of 2 inches nominal or greater size but less than 5 inches nominal size in least dimension.

1.04 SUBMITTALS

A. Submit in accordance with SECTION 01300 - SUBMITTALS.

B. Product Data: For each type of process and factory-fabricated product. Indicate component materials and dimensions and include construction and application details.

1. Include data for wood-preservative treatment from chemical treatment manufacturer and certification by treating plant that treated materials comply with requirements. Indicate type of preservative used and net amount of preservative retained.

2. Include data for fire-retardant treatment from chemical treatment manufacturer and certification by treating plant that treated materials comply with requirements. Include physical properties of treated materials based on testing by a qualified independent testing agency.

3. For fire-retardant treatments, include physical properties of treated lumber both before and after exposure to elevated temperatures, based on testing by a qualified independent testing agency according to ASTM D 5664.

4. For products receiving a waterborne treatment, include statement that moisture content of treated materials was reduced to levels specified before shipment to Project site.

C. Evaluation Reports: For the following, from ICC-ES:

1. Preservative-treated wood.

2. Fire-retardant-treated wood.

3. Power-driven fasteners.

4. Post-installed anchors.

5. Metal framing anchors.

1.05 QUALITY ASSURANCE

A. Testing Agency Qualifications: For testing agency providing classification marking for fire-retardant-treated material, an inspection agency acceptable to authorities having jurisdiction that periodically performs inspections to verify that the material bearing the classification marking is representative of the material tested.

B. Stack lumber flat with spacers beneath and between each bundle to provide air circulation. Protect lumber from weather by covering with waterproof sheeting, securely anchored. Provide for air circulation around stacks and under coverings.

PART 2 - PRODUCTS

2.01 WOOD PRODUCTS, GENERAL

A. Lumber: DOC PS 20 and applicable rules of grading agencies indicated. If no grading agency is indicated, provide lumber that complies with the applicable rules of any rules-writing agency certified by the ALSC Board of Review. Provide lumber graded by an agency certified by the ALSC Board of Review to inspect and grade lumber under the rules indicated.

1. Factory mark each piece of lumber with grade stamp of grading agency.

2. Dress lumber, S4S, unless otherwise indicated.

B. Maximum Moisture Content of Lumber: 15 percent for 2-inch nominal thickness or less, 19 percent for more than 2-inch nominal thickness unless otherwise indicated.

2.02 WOOD-PRESERVATIVE-TREATED MATERIALS

A. Preservative Treatment by Pressure Process: AWPA U1; Use Category UC2 for interior construction not in contact with ground, Use Category UC3b for exterior construction not in contact with ground, and Use Category UC4a for items in contact with ground. Preservative Chemicals: Acceptable to authorities having jurisdiction and containing no arsenic or chromium. Do not use inorganic boron (SBX) for sill plates.

B. Kiln-dry lumber after treatment to a maximum moisture content of 19 percent. Do not use material that is warped or does not comply with requirements for untreated material.

C. Mark lumber with treatment quality mark of an inspection agency approved by the ALSC Board of Review.

D. Application: Treat items indicated on Drawings, and the following:

1. Wood cants, nailers, curbs, equipment support bases, blocking, stripping, and similar members in connection with roofing, flashing, vapor barriers, and waterproofing.

2. Wood blocking, stripping, and similar concealed members in contact with masonry or concrete.

2.03 FIRE-RETARDANT-TREATED MATERIALS

A. General: Where fire-retardant-treated materials are indicated, materials shall comply with requirements in this article, that are acceptable to authorities having jurisdiction, and with fire-test-response characteristics specified as determined by testing identical products per test method indicated by a qualified testing agency.

B. Fire-Retardant-Treated Lumber and Plywood by Pressure Process: Products with a flame-spread index of 25 or less when tested according to ASTM E 84, and with no evidence of significant progressive combustion when the test is extended an additional 20 minutes, and with the flame front not extending more than 10.5 feet beyond the centerline of the burners at any time during the test.

1. Treatment shall not promote corrosion of metal fasteners.

2. Exterior Type: Treated materials shall comply with requirements specified above for fire-retardant-treated lumber and plywood by pressure process after being subjected to accelerated weathering according to ASTM D 2898. Use for exterior locations and where indicated.

3. Interior Type A: Treated materials shall have a moisture content of 28 percent or less when tested according to ASTM D 3201 at 92 percent relative humidity. Use where exterior type is not indicated.

C. Kiln-dry lumber after treatment to a maximum moisture content of 19 percent. Kiln-dry plywood after treatment to a maximum moisture content of 15 percent.

D. Identify fire-retardant-treated wood with appropriate classification marking of qualified testing agency.

E. Application: Treat items indicated on Drawings, and the following:

1. Concealed blocking.

2. Wood cants, nailers, curbs, equipment support bases, blocking, and similar members in connection with roofing.

3. Plywood backing panels.

2.04 MISCELLANEOUS LUMBER

A. General: Provide miscellaneous lumber indicated and lumber for support or attachment of other construction, including the following:

1. Blocking.

2. Nailers.

3. Raised podium at STSO podium

B. Dimension Lumber Items: Standard, Stud, or No. 3 grade lumber of any species.

C. For blocking not used for attachment of other construction, Utility, Stud, or No. 3 grade lumber of any species may be used provided that it is cut and selected to eliminate defects that will interfere with its attachment and purpose.

D. For blocking and nailers used for attachment of other construction, select and cut lumber to eliminate knots and other defects that will interfere with attachment of other work.

2.05 PLYWOOD BACKING PANELS

A. Equipment Backing Panels: Plywood, DOC PS 1, Exterior, C-C Plugged, fire-retardant treated, in thickness indicated or, if not indicated, not less than 3/4-inch nominal thickness.

2.06 FASTENERS

A. General: Provide fasteners of size and type indicated that comply with requirements specified in this article for material and manufacture.

B. Nails, Brads, and Staples: ASTM F 1667.

C. Screws for Fastening to Metal Framing: ASTM C 1002, length as recommended by screw manufacturer for material being fastened.

D. Power-Driven Fasteners: Fastener systems with an evaluation report acceptable to authorities having jurisdiction, based on ICC-ES AC70.

E. Post-Installed Anchors: Fastener systems with an evaluation report acceptable to authorities having jurisdiction, based on ICC-ES AC01 or ICC-ES AC58 as appropriate for the substrate.

1. Material: Carbon-steel components, zinc plated to comply with ASTM B 633, Class Fe/Zn 5.

2. Material: Stainless steel with bolts and nuts complying with ASTM F 593 and ASTM F 594, Alloy Group 1 or 2.

PART 3 - EXECUTION

3.01 INSTALLATION, GENERAL

A. Framing Standard: Comply with AF&PA's WCD 1, "Details for Conventional Wood Frame Construction," unless otherwise indicated.

B. Set carpentry to required levels and lines, with members plumb, true to line, cut, and fitted. Fit carpentry accurately to other construction. Locate furring, nailers, blocking, grounds, and similar supports to comply with requirements for attaching other construction.

C. Install plywood backing panels by fastening to studs; coordinate locations with utilities requiring backing panels. Install fire-retardant-treated plywood backing panels with classification marking of testing agency exposed to view.

D. Install metal framing anchors to comply with manufacturer's written instructions. Install fasteners through each fastener hole.

E. Provide blocking and framing as indicated and as required to support facing materials, fixtures, specialty items, and trim.

F. Comply with AWPA M4 for applying field treatment to cut surfaces of preservative-treated lumber.

1. Use inorganic boron for items that are continuously protected from liquid water.

2. Use copper naphthenate for items not continuously protected from liquid water.

G. Where wood-preservative-treated lumber is installed adjacent to metal decking, install continuous flexible flashing separator between wood and metal decking.

H. Securely attach carpentry work to substrate by anchoring and fastening as indicated, complying with the following:

1. Table 2304.9.1, "Fastening Schedule," in ICC's International Building Code.

2. ICC-ES evaluation report for fastener.

3.02 WOOD BLOCKING AND NAILER INSTALLATION

A. Install where indicated and where required for attaching other work. Form to shapes indicated and cut as required for true line and level of attached work. Coordinate locations with other work involved.

B. Attach items to substrates to support applied loading. Recess bolts and nuts flush with surfaces unless otherwise indicated.

3.03 WOOD FURRING INSTALLATION

A. Install level and plumb with closure strips at edges and openings. Shim with wood as required for tolerance of finish work.

3.04 PROTECTION

A. Protect wood that has been treated with inorganic boron (SBX) from weather. If, despite protection, inorganic boron-treated wood becomes wet, apply EPA-registered borate treatment. Apply borate solution by spraying to comply with EPA-registered label.

B. Protect miscellaneous rough carpentry from weather. If, despite protection, miscellaneous rough carpentry becomes wet, apply EPA-registered borate treatment. Apply borate solution by spraying to comply with EPA-registered label.

PART 4 - MEASUREMENT AND PAYMENT

4.01 BASIS OF MEASUREMENT AND PAYMENT

Work under this Section will not be measured nor paid for separately but shall be considered incidental to and included in the bid prices for the various items of work in this project.

END OF SECTION

SECTION 06160 – SHEATHING

PART 1 - GENERAL

1.01 RELATED DOCUMENTS

The General Provisions for Construction Projects (2016), Special Provisions and General Requirements of the Specifications, apply to the work specified in this Section.

1.02 SUMMARY

A. Section Includes:

1. Wall sheathing.

B. Related Requirements:

1. Section 06105 - MISCELLANEOUS ROUGH CARPENTRY: For plywood backing panels.

1.03 SUBMITTALS

A. Submit in accordance with SECTION 01300 – SUBMITTALS.

B. Evaluation Reports: For the following, from ICC-ES International Code Council Evaluation Service: Product Data: For each product required.

C. Glass-mat gypsum sheathing.

1.04 QUALITY ASSURANCE

Installer Qualifications: An entity that employs installers and supervisors who are trained and approved by manufacturer of air-barrier and water-resistant glass-mat gypsum sheathing.

1.05 DELIVERY, STORAGE, AND HANDLING

Stack panels flat with spacers beneath and between each bundle to provide air circulation. Protect sheathing from weather by covering with waterproof sheeting, securely anchored. Provide for air circulation around stacks and under coverings.

PART 2 - PRODUCTS

2.01 PERFORMANCE REQUIREMENTS

Fire-Resistance Ratings: As tested according to ASTM E 119; testing by a qualified testing agency. Identify products with appropriate markings of applicable testing agency.

Fire-Resistance Ratings: Indicated by design designations from UL's "Fire Resistance Directory" or from the listings of another qualified testing agency.

2.02 WALL SHEATHING

A. Glass-Mat Gypsum Sheathing: ASTM C 1177/1177M.

1. Manufacturers: Subject to compliance with requirements, provide products by one of the following:

a. “DensGlass Gold”, Georgia-Pacific Corp (Basis of Design).
b. “Securock” glass-mat sheathing panels, USG.
c. “GlasRoc”, CertainTeed.
d. Or approved equal.

2. Type and Thickness: Type X, 5/8 inch thick.

2.03 FASTENERS

A. General: Provide fasteners of size and type indicated that comply with requirements specified in this article for material and manufacture. For parapet and wall sheathing, provide fasteners with hot-dip zinc coating complying with ASTM A 153/A 153M.

B. Power-Driven Fasteners: Fastener systems with an evaluation report acceptable to authorities having jurisdiction, based on ICC-ES AC70.

C. Screws for Fastening Gypsum Sheathing to Cold-Formed Metal Framing: Steel drill screws, in length recommended by sheathing manufacturer for thickness of sheathing to be attached.

1. For steel framing less than 0.0329 inch thick, use screws that comply with ASTM C 1002.

2. For steel framing from 0.033 to 0.112 inch thick, use screws that comply with ASTM C 954.

PART 3 - EXECUTION

3.01 EXAMINATION

A. Examine walls, floors, and support bases, with Installer present, for compliance with requirements for installation tolerances and other conditions affecting performance of the Work.

B. Prepare written report, endorsed by Installer, listing conditions detrimental to performance of the Work.

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

3.02 INSTALLATION, GENERAL

A. Do not use materials with defects that impair quality of sheathing or pieces that are too small to use with minimum number of joints or optimum joint arrangement. Arrange joints so that pieces do not span between fewer than three support members.

B. Cut panels at penetrations, edges, and other obstructions of work; fit tightly against abutting construction unless otherwise indicated.

C. Securely attach to substrate by fastening as indicated, complying with the following:

1. Table 2304.9.1, "Fastening Schedule," in the ICC's International Building Code.

2. ICC-ES evaluation report for fastener.

D. Coordinate wall and parapet sheathing installation with flashing and joint-sealant installation so these materials are installed in sequence and manner that prevent exterior moisture from passing through completed assembly.

E. Do not bridge building expansion joints; cut and space edges of panels to match spacing of structural support elements.

F. Coordinate sheathing installation with installation of materials installed over sheathing so sheathing is not exposed to precipitation or left exposed at end of the workday when rain is forecast.

3.03 GYPSUM SHEATHING INSTALLATION

A. Comply with GA-253 and with manufacturer's written instructions.

1. Fasten gypsum sheathing to cold-formed metal framing with screws.

2. Install panels with a 3/8-inch gap where non-load-bearing construction abuts structural elements.

3. Install panels with a 1/4-inch gap where they abut masonry or similar materials that might retain moisture, to prevent wicking.

B. Apply fasteners so heads bear tightly against face of sheathing, but do not cut into facing.

C. Horizontal Installation: Install sheathing with V-grooved edge down and tongue edge up. Interlock tongue with groove to bring long edges in contact with edges of adjacent panels without forcing. Abut ends over centers of studs, and stagger end

joints of adjacent panels not less than one stud spacing. Attach at perimeter and within field of panel to each stud.

1. Space fasteners approximately 8 inches o.c. and set back a minimum of 3/8 inch from edges and ends of panels.

2. For sheathing under stucco cladding, panels may be initially tacked in place with screws if overlying self-furring metal lath is screw-attached through sheathing to studs immediately after sheathing is installed.

D. Vertical Installation: Install vertical edges centered over studs. Abut ends and edges with those of adjacent panels. Attach at perimeter and within field of panel to each stud.

1. Space fasteners approximately 8 inches o.c. and set back a minimum of 3/8 inch from edges and ends of panels.

2. For sheathing under stucco cladding, panels may be initially tacked in place with screws if overlying self-furring metal lath is screw-attached through sheathing to studs immediately after sheathing is installed.

PART 4 - MEASUREMENT AND PAYMENT

4.01 BASIS OF MEASUREMENT AND PAYMENT

Work under this Section will not be measured nor paid for separately but shall be considered incidental to and included in the bid prices for the various items of work in this project.

END OF SECTION

DIVISION 7 – THERMAL AND MOISTURE PROTECTION

SECTION 07111 - BITUMINOUS DAMPPROOFING

PART 1 - GENERAL

1.01 RELATED DOCUMENTS

The General Provisions for Construction Projects (2016), Special Provisions and General Requirements of the Specifications, apply to the work specified in this Section.

1.02 SUMMARY

Section Includes: Cold-applied, emulsified-asphalt dampproofing.

1.03 SUBMITTALS

A. Submit in accordance with SECTION 01300 – SUBMITTALS.

B. Product Data: For each type of product.

1.04 FIELD CONDITIONS

A. Weather Limitations: Proceed with application only when existing and forecasted weather conditions permit dampproofing to be performed according to manufacturers' written instructions.

B. Ventilation: Provide adequate ventilation during application of dampproofing in enclosed spaces. Maintain ventilation until dampproofing has cured.

PART 2 - PRODUCTS

2.01 MANUFACTURERS

A. Source Limitations: Obtain primary dampproofing materials and primers from single source from single manufacturer. Provide protection course and auxiliary materials recommended in writing by manufacturer of primary materials.

2.02 PERFORMANCE REQUIREMENTS

A. VOC Content: Products shall comply with VOC content limits of authorities having jurisdiction unless otherwise indicated.

2.03 COLD-APPLIED, EMULSIFIED-ASPHALT DAMPPROOFING

A. Product: Subject to compliance with requirements, provide one of the following dampproofing types:

1. Trowel Coats: ASTM D 1227, Type II, Class 1.

2. Fibered Brush and Spray Coats: ASTM D 1227, Type II, Class 1.

3. Brush and Spray Coats: ASTM D 1227, Type III, Class 1.

2.04 AUXILIARY MATERIALS

A. Furnish auxiliary materials recommended in writing by dampproofing manufacturer for intended use and compatible with bituminous dampproofing.

B. Emulsified-Asphalt Primer: ASTM D 1227, Type III, Class 1, except diluted with water as recommended in writing by manufacturer.

C. Asphalt-Coated Glass Fabric: ASTM D 1668/D 1668M, Type I.

D. Patching Compound: Epoxy or latex-modified repair mortar of type recommended in writing by dampproofing manufacturer.

E. Protection Course: ASTM D 6506, semirigid sheets of fiberglass or mineral-reinforced-asphaltic core, pressure laminated between two asphalt-saturated fibrous liners.

1. Thickness: Nominal 1/8 inch.

2. Adhesive: Rubber-based solvent type recommended in writing by waterproofing manufacturer for protection course type.

PART 3 - EXECUTION

3.01 EXAMINATION

A. Examine substrates, areas, and conditions, with Applicator present, for compliance with requirements for surface smoothness, maximum surface moisture content, and other conditions affecting performance of the Work.

B. Proceed with application only after substrate construction and penetrating work have been completed and unsatisfactory conditions have been corrected.

3.02 PREPARATION

A. Clean, prepare, and treat substrates according to manufacturer’s written instructions. Provide clean, dust-free, and dry substrates for dampproofing application.

B. Mask or otherwise protect adjoining exposed surfaces from being stained, spotted, or coated with dampproofing. Prevent dampproofing materials from entering and clogging weep holes and drains.

C. Clean substrates of projections and substances detrimental to dampproofing work; fill voids, seal joints, and remove bond breakers if any.

D. Apply patching compound to patch and fill tie holes, honeycombs, reveals, and other imperfections.

3.03 APPLICATION, GENERAL

A. Comply with manufacturer's written instructions for dampproofing application, cure time between coats, and drying time before backfilling unless otherwise indicated.

1. Apply dampproofing to provide continuous plane of protection.

2. Apply additional coats if recommended in writing by manufacturer or to achieve a smooth surface and uninterrupted coverage.

B. Where dampproofing footings and foundation walls, apply from finished-grade line to top of footing; extend over top of footing and down a minimum of 6 inches over outside face of footing.

1. Extend dampproofing 12 inches onto intersecting walls and footings, but do not extend onto surfaces exposed to view when Project is completed.

2. Install flashings and corner protection stripping at internal and external corners, changes in plane, construction joints, cracks, and where indicated as "reinforced," by embedding an 8-inch-wide strip of asphalt-coated glass fabric in a heavy coat of dampproofing. Dampproofing coat for embedding fabric is in addition to other coats required.

3.04 COLD-APPLIED, EMULSIFIED-ASPHALT DAMPPROOFING

A. Concrete Foundations: Apply one fibered brush or spray coat at not less than 3 gal./100 sq. ft. or one trowel coat at not less than 4 gal./100 sq. ft.

B. Unexposed Face of Concrete Retaining Walls: Apply one brush or spray coat at not less than 1.25 gal./100 sq. ft.

C. Interior Face of Exterior Concrete Walls: Where above grade and indicated to be furred and finished, apply one brush or spray coat at not less than 1 gal./100 sq. ft

D. Interior Face of Exterior Masonry Walls: Where above grade and indicated to be furred and finished, apply primer and one brush or spray coat at not less than 1 gal./100 sq. ft.

3.05 PROTECTION COURSE INSTALLATION

A. Install protection course over completed-and-cured dampproofing. Comply with dampproofing-material and protection-course manufacturers' written instructions for attaching protection course.

1. Support protection course over cured coating with spot application of adhesive type recommended in writing by protection-board manufacturer.

2. Install protection course on same day of dampproofing installation (while coating is tacky) to ensure adhesion.

3.06 PROTECTION

A. Protect installed insulation drainage panels from damage due to UV light, harmful weather exposures, physical abuse, and other causes. Provide temporary coverings where panels are subject to abuse and cannot be concealed and protected by permanent construction immediately after installation.

B. Correct dampproofing that does not comply with requirements; repair substrates and reapply dampproofing.

PART 4 - MEASUREMENT AND PAYMENT

4.01 BASIS OF MEASUREMENT AND PAYMENT

Work under this Section will not be measured nor paid for separately but shall be considered incidental to and included in the bid prices for the various items of work in this project.

END OF SECTION

SECTION 07190 - WATER REPELLENT SEALER

PART 1 - GENERAL

1.01 RELATED DOCUMENTS

The General Provisions for Construction Projects (2016), Special Provisions and General Requirements of the Specifications, apply to the work specified in this Section.

1.02 SUMMARY

A. Extent of water repellent sealer with graffiti control is shown on the drawings and includes masonry surfaces.

B. Related Work Described Elsewhere: Concrete masonry is provided under SECTION 04200 - UNIT MASONRY.

1.03 SUBMITTALS

A. Submit in accordance with SECTION 01300 – SUBMITTALS.

B. Manufacturer's Data: Submit manufacturer's technical product data and installation instructions for all materials.

C. Samples: Submit 4 samples of water repellent on accepted masonry finish samples, with repellent treatment to be applied to half of each sample.

D. Safety Data Sheets (SDS): Submit SDS for each material as applicable.

E. Warranty: Submit warranty as stipulated in item entitled "WARRANTY" hereinbelow.

1.04 QUALITY ASSURANCE

A. Manufacturer: Company specializing in manufacturing the products specified in this Section with minimum 3 years documented experience.

B. Applicator: Company specializing in performing the work of this Section with minimum 3 years documented experience.

C. Job Site Sample: Test a small area of surface where directed by the Engineer before starting general application to assure desired results. Sample shall be accepted prior to application at remaining areas.

1.05 PRODUCT HANDLING

A. Deliver materials in the original manufacturer's sealed containers.

B. Store materials in such a way as to prevent damage to containers or products.

C. Sealer shall be thoroughly stirred before and occasionally during use.

1.06 PROJECT CONDITIONS

A. Surface, air, and material temperatures shall conform to manufacturer's requirements.

B. Weather shall be clear and there shall be no precipitation during application or within a subsequent period as recommended by the manufacturer.

C. Surfaces to be treated shall be dry.

D. Personnel shall be warned against contact of materials with skin or eyes.

E. Surfaces unintentionally coated during application shall be cleaned as recommended by the manufacturer.

F. Upon completion of the work, trash, and debris created by work completed under this Section shall be removed from the site.

G. Restrict traffic from area where materials are being installed until material has cured.

1.07 WARRANTY

A. Contractor's Warranty: Submit 2-year warranty signed by Contractor and applicator. Include coverage for replacement of collateral work from failure of installation to resist penetration of moisture and graffiti.

B. Manufacturer’s Warranty: Submit manufacturer’s 10-year graffiti and 20-year water repellency warranty.

PART 2 - PRODUCTS

2.01 MATERIALS

Clear Penetrating Water Repellent and Graffiti Control: Exterior Performance Coatings, Inc. Micro-Seal with Graffiti Control or equal as acceptable to the Engineer.

PART 3 - EXECUTION

3.01 EXAMINATION

A. Verify that substrate work done under other sections meets requirements for application of water repellent sealer. Notify Engineer in writing of any conditions requiring additional treatment prior to application.

B. Verify surfaces to be coated are dry, clean, and free of efflorescence, oil, or other matter detrimental to application of coating.

C. Verify joint sealants where installed are cured.

3.02 PREPARATION

A. All mortar and patches shall be sufficiently cured prior to application of sealer.

B. Surfaces shall be cleaned to have all laitance, dirt, dust, efflorescence, mold, salt, grease, and oil removed prior to application. Acceptable surface cleaning methods include water blasting, and chemical cleaners.

C. Surfaces shall be free of alkali, efflorescence, chemical films, and other contaminants.

D. Surface shall be dry prior to application.

3.03 APPLICATION

A. Apply to saturation as recommended by the manufacturer.P

B. Coverage Rates: Apply at maximum rate as recommended by the manufacturer for material and porosity of the substrates.

C. Coats: Apply in 2 continuous, uniform applications.

3.04 PROTECTION OF FINISHED AND ADJACENT WORK

A. Protect adjacent surfaces, including pavement not scheduled to receive coating.

B. Protect landscaping, vehicles, and construction not to receive coatings.

C. If applied to unscheduled surfaces, remove immediately by a method instructed by water repellent manufacturer.

PART 4 – MEASUREMENT AND PAYMENT

4.01 BASIS OF MEASUREMENT AND PAYMENT

Work under this Section will not be measured nor paid for separately but shall be considered incidental to and included in the bid prices for the various items of work in this project.

END OF SECTION

SECTION 07210 - THERMAL INSULATION

PART 1 - GENERAL

1.01 RELATED DOCUMENTS

The General Provisions for Construction Projects (2016), Special Provisions and General Requirements of the Specifications, apply to the work specified in this Section.

1.02 SUMMARY

A. Section Includes:

1. Glass-fiber blanket.

2. Extruded polystyrene rigid board (wall continuous insulation / sheathing).

B. Related Requirements:

1. Section 09290 - GYPSUM BOARD: For sound attenuation blanket used as acoustic insulation.

1.03 SUBMITTALS

A. Submit in accordance with Section 01300 – SUBMITTALS.

B. Product Data: For each type of product.

C. Product Test Reports: For each product, for tests performed by a qualified testing agency.

1.04 QUALITY ASSURANCE

Installer Qualifications: An entity that employs installers and supervisors who are trained and approved by manufacturer of glass fiber blanket and extruded polystyrene rigid board.

1.05 DELIVERY, STORAGE, AND HANDLING

A. Protect insulation materials from physical damage and from deterioration due to moisture, soiling, and other sources. Store inside and in a dry location. Comply with manufacturer's written instructions for handling, storing, and protecting during installation.

PART 2 - PRODUCTS

2.01 GENERAL

Insulation materials shall achieve an R- value as indicated on Drawings, or if not indicated, an R-value of not less than 13 for insulation batts in walls and R value of not less than 5 for continuous insulation board (sheathing) at walls.

2.02 GLASS-FIBER BLANKET

Glass-Fiber Blanket, Unfaced: ASTM C 665, Type I; with maximum flame-spread and smoke-developed indexes of 25 and 50, respectively, per ASTM E 84; passing ASTM E 136 for combustion characteristics.

2.03 INSULATION FASTENERS

A. Adhesively Attached, Spindle-Type Anchors: Plate welded to projecting spindle; capable of holding insulation of specified thickness securely in position with self-locking washer in place.

   1. Plate: Perforated, galvanized carbon-steel sheet, 0.030 inch thick by 2 inches square.

   2. Spindle: Copper-coated, low-carbon steel; fully annealed; 0.105 inch in diameter; length to suit depth of insulation. OR

B. Adhesively Attached, Angle-Shaped, Spindle-Type Anchors: Angle welded to projecting spindle; capable of holding insulation of specified thickness securely in position with self-locking washer in place.

   1. Angle: Formed from 0.030-inch-thick, perforated, galvanized carbon-steel sheet with each leg 2 inches square.

   2. Spindle: Copper-coated, low-carbon steel; fully annealed; 0.105 inch in diameter; length to suit depth of insulation. OR

C. Insulation-Retaining Washers: Self-locking washers formed from 0.016-inch-thick galvanized-steel sheet, with beveled edge for increased stiffness, sized as required to hold insulation securely in place, but not less than 1-1/2 inches square or in diameter.

D. Anchor Adhesive: Product with demonstrated capability to bond insulation anchors securely to substrates without damaging insulation, fasteners, or substrates.

2.04 ACCESSORIES

Insulation for Miscellaneous Voids: Glass-Fiber Insulation: ASTM C 764, Type II, loose fill; with maximum flame-spread and smoke-developed indexes of 5, per ASTM E 84.

PART 3 - EXECUTION

3.01 PREPARATION

Clean substrates of substances that are harmful to insulation, including removing projections capable of puncturing insulation or vapor retarders, or that interfere with insulation attachment.

3.02 INSTALLATION, GENERAL

A. Comply with insulation manufacturer's written instructions applicable to products and applications.

B. Install insulation that is undamaged, dry, and unsoiled and that has not been left exposed to ice, rain, or snow at any time.

C. Extend insulation to envelop entire area to be insulated. Fit tightly around obstructions and fill voids with insulation. Remove projections that interfere with placement.

D. Provide sizes to fit applications and selected from manufacturer's standard thicknesses, widths, and lengths. Apply single layer of insulation units unless multiple layers are otherwise shown or required to make up total thickness or to achieve R-value.

3.03 INSTALLATION OF INSULATION IN FRAMED CONSTRUCTION

A. Blanket Insulation: Install in cavities formed by framing members according to the following requirements:

1. Use insulation widths and lengths that fill the cavities formed by framing members. If more than one length is required to fill the cavities, provide lengths that will produce a snug fit between ends.

2. Place insulation in cavities formed by framing members to produce a friction fit between edges of insulation and adjoining framing members.

3. Maintain 3-inch clearance of insulation around recessed lighting fixtures not rated for or protected from contact with insulation.

4. For metal-framed wall cavities where cavity heights exceed 96 inches, support unfaced blankets mechanically and support faced blankets by taping flanges of insulation to flanges of metal studs.

B. Miscellaneous Voids: Install insulation in miscellaneous voids and cavity spaces where required to prevent gaps in insulation using the following materials: Glass-Fiber Insulation: Compact to approximately 40 percent of normal maximum volume equaling a density of approximately 2.5 lb/cu. ft.

3.04 PROTECTION

Protect installed insulation from damage due to harmful weather exposures, physical abuse, and other causes. Provide temporary coverings or enclosures where insulation is subject to abuse and cannot be concealed and protected by permanent construction immediately after installation.

PART 4 - MEASUREMENT AND PAYMENT

4.01 BASIS OF MEASUREMENT AND PAYMENT

Work under this Section will not be measured nor paid for separately but shall be considered incidental to and included in the bid prices for the various items of work in this project.

END OF SECTION

SECTION 07920 - JOINT SEALANTS

PART 1 - GENERAL

1.01 RELATED DOCUMENTS

The General Provisions for Construction Projects (2016), Special Provisions and General Requirements of the Specifications, apply to the work specified in this Section.

1.02 SUMMARY

Section includes joint sealants for elastomeric, latex, and butyl-rubber based join sealants for non-acoustical applications.

1.03 SUBMITTALS

A. Submit in accordance with SECTION 01300 - SUBMITTALS.

B. Product Data: For each joint sealant.

C. Samples for Verification: For each kind and color of joint sealant required, provide Samples with joint sealants in 1/2-inch-wide joints formed between two 6-inch-long strips of material matching the appearance of exposed surfaces adjacent to joint sealants.

D. Product Test Reports: For each kind of joint sealant, for tests performed by a qualified testing agency.

E. Sample Warranties: For special warranties.

PART 2 - PRODUCTS

2.01 JOINT SEALANTS, GENERAL

Compatibility: Provide joint sealants, backings, and other related materials that are compatible with one another and with joint substrates under conditions of service and application, as demonstrated by joint-sealant manufacturers, based on testing and field experience.

PART 3 – EXECUTION

3.01 EXAMINATION

Examine joints indicated to receive joint sealants, with Installer present, for compliance with requirements for joint configuration, installation tolerances, and other conditions affecting performance of the work.

PART 4 – MEASUREMENT AND PAYMENT

4.01 BASIS OF MEASUREMENT AND PAYMENT

Work under this Section will not be measured nor paid for separately but shall be considered incidental to and included in the bid prices for the various items of work in this project.

END OF SECTION

SECTION 07921 - ACOUSTICAL JOINT SEALANTS

PART 1 - GENERAL

1.01 RELATED DOCUMENTS

The General Provisions for Construction Projects (2016), Special Provisions and General Requirements of the Specifications, apply to the work specified in this Section.

1.02 SUMMARY

Section includes acoustical joint sealants.

1.03 SUBMITTALS

A. Submit in accordance with SECTION 01300 - SUBMITTALS.

B. Product Data: For each acoustical joint sealant.

C. Samples for Verification: For each kind and color of acoustical joint sealant required, provide Samples with joint sealants in 1/2-inch-wide joints formed between two 6-inch-long strips of material matching the appearance of exposed surfaces adjacent to joint sealants.

D. Acoustical-Joint-Sealant Schedule: Include the following information:

1. Joint-sealant application, joint location, and designation.

2. Joint-sealant manufacturer and product name.

3. Joint-sealant formulation.

4. Joint-sealant color.

E. Product Test Reports: For each kind of acoustical joint sealant, for tests performed by a qualified testing agency.

F. Sample Warranties: For special warranties.

1.04 WARRANTY

A. Special Installer's Warranty: Installer agrees to repair or replace acoustical joint sealants that do not comply with performance and other requirements specified in this Section within specified warranty period. Warranty Period: Two years from date of Substantial Completion.

B. Special Manufacturer's Warranty: Manufacturer agrees to furnish acoustical joint sealants to repair or replace those joint sealants that do not comply with performance

and other requirements specified in this Section within specified warranty period. Warranty Period: 5 years from date of Substantial Completion.

PART 2 - PRODUCTS

2.01 PERFORMANCE REQUIREMENTS

Provide acoustical joint-sealant products that effectively reduce airborne sound transmission through perimeter joints and openings in building construction, as demonstrated by testing representative assemblies according to ASTM E 90.

2.02 ACOUSTICAL JOINT SEALANTS

A. Acoustical Sealant for Exposed and Concealed Joints: Manufacturer's standard nonsag, paintable, nonstaining latex acoustical sealant complying with ASTM C 834. Colors of Exposed Acoustical Joint Sealants: As selected by the State Engineer from manufacturer's full range of colors.

B. Acoustical Sealant for Concealed Joints: Manufacturer's standard nonsag, nondrying, nonhardening, nonskinning, nonstaining, gunnable, synthetic-rubber acoustical sealant.

2.03 MISCELLANEOUS MATERIALS

A. Primer: Material recommended by acoustical-joint-sealant manufacturers where required for adhesion of sealant to joint substrates.

B. Cleaners for Nonporous Surfaces: Chemical cleaners acceptable to manufacturers of sealants and sealant backing materials, free of oily residues or other substances capable of staining or harming joint substrates and adjacent nonporous surfaces in any way, and formulated to promote optimum adhesion of sealants to joint substrates.

C. Masking Tape: Nonstaining, non-absorbent material compatible with joint sealants and surfaces adjacent to joints.

PART 3 - EXECUTION

3.01 EXAMINATION

A. Examine joints indicated to receive acoustical joint sealants, with Installer present, for compliance with requirements for joint configuration, installation tolerances, and other conditions affecting performance of the Work.

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

3.02 PREPARATION

A. Surface Cleaning of Joints: Clean out joints immediately before installing acoustical joint sealants to comply with joint-sealant manufacturer's written instructions.

B. Joint Priming: Prime joint substrates where recommended by acoustical-joint-sealant manufacturer. Apply primer to comply with joint-sealant manufacturer's written instructions. Confine primers to areas of joint-sealant bond; do not allow spillage or migration onto adjoining surfaces.

C. Masking Tape: Use masking tape where required to prevent contact of sealant or primer with adjoining surfaces that otherwise would be permanently stained or damaged by such contact or by cleaning methods required to remove sealant smears. Remove tape immediately after tooling without disturbing joint seal.

3.03 INSTALLATION OF ACOUSTICAL JOINT SEALANTS

A. Comply with acoustical joint-sealant manufacturer's written installation instructions unless more stringent requirements apply.

B. STC-Rated Assemblies: Seal construction at perimeters, behind control joints, and at openings and penetrations with a continuous bead of acoustical joint sealant. Install acoustical joint sealants at both faces of partitions, at perimeters, and through penetrations. Comply with ASTM C 919, ASTM C 1193, and manufacturer's written recommendations for closing off sound-flanking paths around or through assemblies, including sealing partitions to underside of floor slabs above acoustical ceilings.

C. Acoustical Ceiling Areas: Apply acoustical joint sealant at perimeter edge moldings of acoustical ceiling areas in a continuous ribbon concealed on back of vertical legs of moldings before they are installed.

3.04 CLEANING

Clean off excess sealant or sealant smears adjacent to joints as the Work progresses by methods and with cleaning materials approved in writing by manufacturers of acoustical joint sealants and of products in which joints occur.

3.05 PROTECTION

Protect acoustical joint sealants during and after curing period from contact with contaminating substances and from damage resulting from construction operations or other causes so sealants are without deterioration or damage at time of Substantial Completion. If, despite such protection, damage or deterioration occurs, cut out, remove, and repair damaged or deteriorated acoustical joint sealants immediately so installations with repaired areas are indistinguishable from original work.

PART 4 - MEASUREMENT AND PAYMENT

4.01 BASIS OF MEASUREMENT AND PAYMENT

Work under this Section will not be measured nor paid for separately but shall be considered incidental to and included in the bid prices for the various items of work in this project.

END OF SECTION

DIVISION 8 – DOOR AND WINDOWS

SECTION 08111 - HOLLOW METAL DOORS AND FRAMES

PART 1 - GENERAL

1.01 RELATED DOCUMENTS

The General Provisions for Construction Projects (2016), Special Provisions and General Requirements of the Specifications, apply to the work specified in this Section.

1.02 SUMMARY

A. Section includes:

1. Interior steel doors and frames.

2. Exterior steel doors and frames.

B. Related Requirements:

1. SECTION 08710 - DOOR HARDWARE: For door hardware for hollow-metal doors.

2. SECTION 08911 – FIXED LOUVERS

1.03 DEFINITIONS

A. Minimum Thickness: Minimum thickness of base metal without coatings according to NAAMM-HMMA 803 or SDI A250.8.

1.04 COORDINATION

A. Coordinate anchorage installation for hollow-metal frames. Furnish setting drawings, templates, and directions for installing anchorages, including sleeves, concrete inserts, anchor bolts, and items with integral anchors. Deliver such items to Project site in time for installation.

B. Coordinate requirements for installation of door hardware, electrified door hardware, and access control and security systems.

1.05 SUBMITTALS

A. Submit in accordance with SECTION 01300 - SUBMITTALS.

B. Product Data: For each type of product. Include construction details, material descriptions, core descriptions, fire-resistance ratings, and finishes.

C. Shop Drawings: Include the following:

1. Elevations of each door type.

2. Details of doors, including vertical- and horizontal-edge details and metal thicknesses.

3. Frame details for each frame type, including dimensioned profiles and metal thicknesses.

4. Locations of reinforcement and preparations for hardware.

5. Details of each different wall opening condition.

6. Details of electrical raceway and preparation for electrified hardware, access control systems, and security systems.

7. Details of anchorages, joints, field splices, and connections.

8. Details of accessories.

9. Details of moldings, removable stops, and glazing.

D. Samples for Verification: Fabrication: Prepare Samples approximately 12 by 12 inches to demonstrate compliance with requirements for quality of materials and construction:

1. Doors: Show vertical-edge, top, and bottom construction; core construction; and hinge and other applied hardware reinforcement. Include separate section showing glazing if applicable.

2. Frames: Show profile, corner joint, floor and wall anchors, and silencers. Include separate section showing fixed hollow-metal panels and glazing if applicable.

E. Product Schedule: For hollow metal doors and frames, prepared by or under the supervision of supplier, using same reference numbers for details and openings as those on Drawings. Coordinate with final door hardware schedule.

F. Product Test Reports: For each type of hollow-metal door and frame assembly, for tests performed by a qualified testing agency.

G. Oversize Construction Certification: For assemblies required to be fire-rated and exceeding limitations of labeled assemblies.

1.06 DELIVERY, STORAGE, AND HANDLING

A. Deliver hollow-metal doors and frames palletized, packaged, or crated to provide protection during transit and Project-site storage. Do not use non-vented plastic. Provide additional protection to prevent damage to factory-finished units.

B. Deliver welded frames with two removable spreader bars across bottom of frames, tack welded to jambs and mullions.

C. Store hollow-metal doors and frames vertically under cover at Project site with head up. Place on minimum 4-inch-high wood blocking. Provide minimum 1/4-inch space between each stacked door to permit air circulation.

PART 2 - PRODUCTS

2.01 MANUFACTURERS

A. Manufacturers: Subject to compliance with requirements, provide products by one of the following:

1. Ceco Door; ASSA ABLOY.
2. Curries Company; ASSA ABLOY.
3. JR Metal Frames Manufacturing, Inc.
4. Karpen Steel Custom Doors & Frames.
5. Security Metal Products; a brand of ASSA ABLOY.
6. Or approved equal.

2.02 PERFORMANCE REQUIREMENTS

Thermally Rated Door Assemblies: Provide door assemblies with U-factor of not more than 0.40 deg Btu/F x h x sq. ft. when tested according to ASTM C 518.

2.03 INTERIOR STEEL DOORS AND FRAMES

A. Construct hollow-metal doors and frames to comply with standards indicated for materials, fabrication, hardware locations, hardware reinforcement, tolerances, and clearances, and as specified.

B. Extra-Heavy-Duty Doors and Frames: SDI A250.8, Level 3; SDI A250.4, Level A.

1. Doors:

a. Type: As indicated in the Door and Frame Schedule.
b. Thickness: 1-3/4 inches.
c. Face: Uncoated steel sheet, minimum thickness of 0.053 inch.
d. Edge Construction: Model 2, Seamless.
e. Edge Bevel: Bevel lock edge 1/8 inch in 2 inches.
f. Core: Manufacturer's standard.
g. Fire-Rated Core: Manufacturer's standard core for fire-rated doors.

2. Frames:

    a. Materials: Uncoated steel sheet, minimum thickness of 0.053 inch.
    b. Construction: Full profile welded.

3. Exposed Finish: Prime.

2.04 EXTERIOR STEEL DOORS AND FRAMES

A. Construct hollow-metal doors and frames to comply with standards indicated for materials, fabrication, hardware locations, hardware reinforcement, tolerances, and clearances, and as specified.

B. Extra-Heavy-Duty Doors and Frames: SDI A250.8, Level 3; SDI A250.4, Level A.

1. Doors:

    a. Type: As indicated in the Door and Frame Schedule.
    b. Thickness: 1-3/4 inches.
    c. Face: Metallic-coated steel sheet, minimum thickness of 0.053 inch, with minimum A60coating.
    d. Edge Construction: Model 2, Seamless.
    e. Edge Bevel: Bevel lock edge 1/8 inch in 2 inches.
    f. Top Edge Closures: Close top edges of doors with flush closures of same material as face sheets. Seal joints against water penetration.
    g. Bottom Edges: Close bottom edges of doors with end closures or channels of same material as face sheets. Provide weep-hole openings in bottoms of exterior doors to permit moisture to escape.
    h. Core: Polyisocyanurate.
    i. Fire-Rated Core: Manufacturer's standard core for fire-rated doors.

2. Frames:

    a. Materials: Metallic-coated steel sheet, minimum thickness of 0.053 inch, with minimum A60 coating.
    b. Construction: Full profile welded.

3. Exposed Finish: Prime.

2.05 BORROWED LITES

A. Fabricate of uncoated steel sheet, minimum thickness of 0.053 inch.

B. Construction: Full profile welded.

C. Fabricate in one piece except where handling and shipping limitations require multiple sections. Where frames are fabricated in sections due to shipping or handling limitations, provide alignment plates or angles at each joint, fabricated of metal of same or greater thickness as metal as frames.

D. Provide countersunk, flat- or oval-head exposed screws and bolts for exposed fasteners unless otherwise indicated.

2.06 FRAME ANCHORS

A. Jamb Anchors:

1. Type: Anchors of minimum size and type required by applicable door and frame standard, and suitable for performance level indicated.

2. Quantity: Minimum of three anchors per jamb, with one additional anchor for frames with no floor anchor. Provide one additional anchor for each 24 inches of frame height above 7 feet.

3. Post installed Expansion Anchor: Minimum 3/8-inch-diameter bolts with expansion shields or inserts, with manufacturer's standard pipe spacer.

B. Floor Anchors: Provide floor anchors for each jamb and mullion that extends to floor.

C. Material: ASTM A 879/A 879M, Commercial Steel (CS), 04Z coating designation; mill phosphatized. For anchors built into exterior walls, steel sheet complying with ASTM A 1008/A 1008M or ASTM A 1011/A 1011M; hot-dip galvanized according to ASTM A 153/A 153M, Class B.

2.07 MATERIALS

A. Cold-Rolled Steel Sheet: ASTM A 1008/A 1008M, Commercial Steel (CS), Type B; suitable for exposed applications.

B. Metallic-Coated Steel Sheet: ASTM A 653/A 653M, Commercial Steel (CS), Type B.

C. Inserts, Bolts, and Fasteners: Hot-dip galvanized according to ASTM A 153/A 153M.

D. Power-Actuated Fasteners in Concrete: Fastener system of type suitable for application indicated, fabricated from corrosion-resistant materials, with clips or other accessory devices for attaching hollow-metal frames of type indicated.

E. Mineral-Fiber Insulation: ASTM C 665, Type I (blankets without membrane facing); consisting of fibers manufactured from slag or rock wool; with maximum flame-spread and smoke-developed indexes of 25 and 50, respectively; passing ASTM E 136 for combustion characteristics.

2.08 FABRICATION

A. Hollow-Metal Frames: Fabricate in one piece except where handling and shipping limitations require multiple sections. Where frames are fabricated in sections, provide alignment plates or angles at each joint, fabricated of metal of same or greater thickness as frames.

1. Provide countersunk, flat- or oval-head exposed screws and bolts for exposed fasteners unless otherwise indicated.

2. Door Silencers: Except on weather-stripped frames, drill stops to receive door silencers as follows. Keep holes clear during construction. Single-Door Frames: Drill stop in strike jamb to receive three door silencers.

B. Double-Door Frames: Drill stop in head jamb Hardware Preparation: Factory prepare hollow-metal doors and frames to receive templated mortised hardware, and electrical wiring; include cutouts, reinforcement, mortising, drilling, and tapping according to SDI A250.6, the Door Hardware Schedule, and templates.

1. Reinforce doors and frames to receive nontemplated, mortised, and surface-mounted door hardware.

2. Comply with BHMA A156.115 for preparing hollow-metal doors and frames for hardware.

C. Glazed Lites: Provide stops and moldings around glazed lites where indicated. Form corners of stops and moldings with butted or mitered hairline joints.

1. Provide stops and moldings flush with face of door, and with square stops unless otherwise indicated.

2. Multiple Glazed Lites: Provide fixed and removable stops and moldings so that each glazed lite is capable of being removed independently.

3. Provide fixed frame moldings on outside of exterior and on secure side of interior doors and frames. Provide loose stops and moldings on inside of hollow-metal doors and frames.

4. Coordinate rabbet width between fixed and removable stops with glazing and installation types indicated.

5. Provide stops for installation with countersunk flat- or oval-head machine screws spaced uniformly not more than 9 inches o.c. and not more than 2 inches o.c. from each corner.

2.09 STEEL FINISHES

Prime Finish: Clean, pretreat, and apply manufacturer's standard primer. Shop Primer: Manufacturer's standard, fast-curing, lead- and chromate-free primer complying with SDI A250.10; recommended by primer manufacturer for substrate; compatible with substrate and field-applied coatings despite prolonged exposure.

2.10 LOUVERS

A. Provide louvers for interior doors, where indicated, which comply with SDI 111, with blades or baffles formed of 0.020-inch-thick, cold-rolled steel sheet set into 0.032-inch-thick steel frame.

1. Sight proof Louver: Stationary louvers constructed with inverted-V or inverted-Y blades.

2. Fire-Rated Automatic Louvers: Louvers constructed with movable blades closed by actuating fusible link, and listed and labeled for use in fire-rated door assemblies of type and fire-resistance rating indicated by same qualified testing and inspecting agency that established fire-resistance rating of door assembly.

B. Form corners of moldings with hairline joints. Provide fixed frame moldings on outside of exterior and on secure side of interior doors and frames.

PART 3 - EXECUTION

3.01 PREPARATION

A. Remove welded-in shipping spreaders installed at factory. Restore exposed finish by grinding, filling, and dressing, as required to make repaired area smooth, flush, and invisible on exposed faces. Touch up factory-applied finishes where spreaders are removed.

B. Drill and tap doors and frames to receive nontemplated, mortised, and surface-mounted door hardware.

3.02 INSTALLATION

A. General: Install hollow-metal doors and frames plumb, rigid, properly aligned, and securely fastened in place. Comply with approved Shop Drawings and with manufacturer's written instructions.

B. Hollow-Metal Frames: Comply with SDI A250.11.

1. Set frames accurately in position; plumbed, aligned, and braced securely until permanent anchors are set. After wall construction is complete, remove temporary braces without damage to completed Work.

a. Where frames are fabricated in sections, field splice at approved locations by welding face joint continuously; grind, fill, dress, and make splice smooth, flush, and invisible on exposed faces. Touch-up finishes.
b. Install frames with removable stops located on secure side of opening.

2. Fire-Rated Openings: Install frames according to NFPA 80.

3. Floor Anchors: Secure with post installed expansion anchors. Floor anchors may be set with power-actuated fasteners instead of post installed expansion anchors if so indicated and approved on Shop Drawings.

4. Solidly pack mineral-fiber insulation inside frames.

5. Masonry Walls: Coordinate installation of frames to allow for solidly filling space between frames and masonry with grout or mortar.

6. In-Place Concrete or Masonry Construction: Secure frames in place with post installed expansion anchors. Countersink anchors, and fill and make smooth, flush, and invisible on exposed faces.

7. Installation Tolerances: Adjust hollow-metal frames to the following tolerances:

    a. Squareness: Plus or minus 1/16 inch, measured at door rabbet on a line 90 degrees from jamb perpendicular to frame head.
    b. Alignment: Plus or minus 1/16 inch, measured at jambs on a horizontal line parallel to plane of wall.
    c. Twist: Plus or minus 1/16 inch, measured at opposite face corners of jambs on parallel lines, and perpendicular to plane of wall.
    d. Plumbness: Plus or minus 1/16 inch, measured at jambs at floor.

C. Hollow-Metal Doors: Fit and adjust hollow-metal doors accurately in frames, within clearances specified below.

1. Non-Fire-Rated Steel Doors: Comply with SDI A250.8.

2. Fire-Rated Doors: Install doors with clearances according to NFPA 80.

3. Smoke-Control Doors: Install doors according to NFPA 105.

3.03 CLEANING AND TOUCHUP

A. Prime-Coat Touchup: Immediately after erection, sand smooth rusted or damaged areas of prime coat and apply touchup of compatible air-drying, rust-inhibitive primer.

B. Metallic-Coated Surface Touchup: Clean abraded areas and repair with galvanizing repair paint according to manufacturer's written instructions.

PART 4 - MEASUREMENT AND PAYMENT

4.01 BASIS OF MEASUREMENT AND PAYMENT

Work under this Section will not be measured for payment but will be paid for at the Contract Lump Sum Price.

END OF SECTION

SECTION 08710 - DOOR HARDWARE

PART 1 - GENERAL

1.01 RELATED DOCUMENTS

The General Provisions for Construction Projects (2016), Special Provisions and General Requirements of the Specifications, apply to the work specified in this Section.

1.02 SUMMARY

A. Section Includes:

1. Mechanical door hardware for the following:

a. Swinging doors.

2. Cylinders for door hardware specified in other Sections.

3. Electrified door hardware.

B. Related Requirements:

1. SECTION 08111 - HOLLOW METAL DOORS AND FRAMES: For astragals provided as part of labeled fire-rated assemblies and for door silencers provided as part of hollow-metal frames.

2. SECTION 10260 – WALL AND DOOR PROTECTION.

1.03 SUBMITTALS

A. Submit in accordance with SECTION 01300 - SUBMITTALS.

B. Product Data: For each type of product. Include construction details, material descriptions, dimensions of individual components and profiles, and finishes.

C. Shop Drawings: For electrified door hardware.

1. Include diagrams for power, signal, and control wiring.

2. Include details of interface of electrified door hardware and building safety and security systems.

D. Samples: For each exposed product in each finish specified, in manufacturer's standard size. Tag Samples with full product description to coordinate Samples with door hardware schedule.

E. Door Hardware Schedule: Prepared by or under the supervision of Installer's Architectural Hardware Consultant. Coordinate door hardware schedule with doors,

frames, and related work to ensure proper size, thickness, hand, function, and finish of door hardware.

1. Submittal Sequence: Submit door hardware schedule concurrent with submissions of Product Data, Samples, and Shop Drawings. Coordinate submission of door hardware schedule with scheduling requirements of other work to facilitate the fabrication of other work that is critical in Project construction schedule.

2. Format: Use same scheduling sequence and format and use same door numbers as in door hardware schedule in the Contract Documents.

3. Content: Include the following information:

    a. Identification number, location, hand, fire rating, size, and material of each door and frame.
    b. Locations of each door hardware set, cross-referenced to Drawings on floor plans and to door and frame schedule.
    c. Complete designations, including name and manufacturer, type, style, function, size, quantity, function, and finish of each door hardware product.
    d. Description of electrified door hardware sequences of operation and interfaces with other building control systems.
    e. Fastenings and other installation information.
    f. Explanation of abbreviations, symbols, and designations contained in door hardware schedule.
    g. Mounting locations for door hardware.
    h. List of related door devices specified in other Sections for each door and frame.

F. Keying Schedule: Prepared by or under the supervision of Installer's Architectural Hardware Consultant, detailing State's final keying instructions for locks. Include schematic keying diagram and index each key set to unique door designations that are coordinated with the Contract Documents.

G. Qualification Data: For Installer and Architectural Hardware Consultant.

H. Product Certificates: For each type of electrified door hardware. Certify that door hardware for use on each type and size of labeled fire-rated doors complies with listed fire-rated door assemblies.

I. Product Test Reports: For compliance with accessibility requirements, for tests performed by manufacturer and witnessed by a qualified testing agency, for door hardware on doors located in accessible routes.

J. Field quality-control reports.

K. Sample Warranty: For special warranty.

L. Maintenance Data: For each type of door hardware to include in maintenance manuals.

M. Schedules: Final door hardware and keying schedule.

1.04 QUALITY ASSURANCE

A. Installer Qualifications: Supplier of products and an employer of workers trained and approved by product manufacturers and of an Architectural Hardware Consultant who is available during the course of the Work to consult Contractor, Architect, and State about door hardware and keying.

1. Warehousing Facilities: In Project's vicinity.

2. Scheduling Responsibility: Preparation of door hardware and keying schedule.

3. Engineering Responsibility: Preparation of data for electrified door hardware, including Shop Drawings, based on testing and engineering analysis of manufacturer's standard units in assemblies similar to those indicated for this Project.

B. Architectural Hardware Consultant Qualifications: A person who is experienced in providing consulting services for door hardware installations that are comparable in material, design, and extent to that indicated for this Project and who is currently certified by DHI as an Architectural Hardware Consultant (AHC).

1.05 DELIVERY, STORAGE, AND HANDLING

A. Inventory door hardware on receipt and provide secure lock-up for door hardware delivered to Project site.

B. Tag each item or package separately with identification coordinated with the final door hardware schedule, and include installation instructions, templates, and necessary fasteners with each item or package.

C. Deliver keys to manufacturer of key control system for subsequent delivery to State.

D. Deliver keys and permanent cores to State by registered mail or overnight package service.

1.06 WARRANTY

A. Special Warranty: Manufacturer agrees to repair or replace components of door hardware that fail in materials or workmanship within specified warranty period.

1. Failures include, but are not limited to, the following:

a. Structural failures including excessive deflection, cracking, or breakage.
b. Faulty operation of doors and door hardware.

c. Deterioration of metals, metal finishes, and other materials beyond normal weathering and use.

2. Warranty Period: Three years from date of Substantial Completion.

1.07 COORDINATION

A. Floor-Recessed Door Hardware: Coordinate layout and installation with floor construction. Cast anchoring inserts into concrete.

B. Installation Templates: Distribute for doors, frames, and other work specified to be factory prepared. Check Shop Drawings of other work to confirm that adequate provisions are made for locating and installing door hardware to comply with indicated requirements.

C. Security: Coordinate installation of door hardware, keying, and access control with State's security consultant.

D. Electrical System Roughing-In: Coordinate layout and installation of electrified door hardware with connections to power supplies and building safety and security systems.

E. Existing Openings: Where hardware components are scheduled for application to existing construction or where modifications to existing door hardware are required, field verify existing conditions and coordinate installation of door hardware to suit opening conditions and to provide proper door operation.

PART 2 - PRODUCTS

2.01 MANUFACTURERS

A. Source Limitations: Obtain each type of door hardware from single manufacturer.

B. Listed Acceptable Manufacturers: Submit for review products with equivalent function and features of scheduled products.

ITEMS:	MANUFACTURER	ACCEPTABLE SUB:
Hinges	(MCK) Mckinney	Ives, Bommer
Continuous Hinges	(PEM) Pemko	Ives, Mckinney
Key System	(SAR) Sargent	
Locks	(SAR) Sargent (Russwin cores)	
Exit Devices	(SAR) Sargent	Von Duprin
Closers	(SAR) Sargent	LCN, Airport Standard
Magnetic Hold Open	(LCN) LCN	Sargent
Kickplates	(ROC) Rockwood	Ives, Trimco
Stops	(ROC) Rockwood	Ives, Trimco
Thresholds	(PEM) Pemko	Zero, National Guard
Seals & Bottoms	(PEM) Pemko	Zero, National Guard
Armor Collar	(KEE) Keedex	Schlage, Adams Rite

Elec Horn/Strobe	(SCE) Schlage/Electronic Security	
Door Position Switch	(SCE) Schlage/Electronic Security	Sargent, BEA
Electronic Cipher	(LOM) Lockmaster	
Electronic Combo Lock	(MAH) Kaba Mas	
Electric Strike	(HAN) Hanchett Entry System	Adams Rite, HES
Lock Guard	(IVE) Ives	
Power Supply	(SEC) Securitron Magnalock	Von Duprin
Door Release	(SDC) Security Door Controls	Alarm Controls Corp.

2.02 PERFORMANCE REQUIREMENTS

A. Fire-Rated Door Assemblies: Where fire-rated doors are indicated, provide door hardware complying with NFPA 80 that is listed and labeled by a qualified testing agency, for fire-protection ratings indicated, based on testing at positive pressure according to NFPA 252 or UL 10C.

B. Smoke- and Draft-Control Door Assemblies: Where smoke- and draft-control door assemblies are required, provide door hardware that complies with requirements of assemblies tested according to UL 1784 and installed in compliance with NFPA 105. Air Leakage Rate: Maximum air leakage of 0.3 cfm/sq. ft. at the tested pressure differential of 0.3-inch wg of water.

C. Electrified Door Hardware: Listed and labeled as defined in NFPA 70, by a qualified testing agency, and marked for intended location and application.

D. Means of Egress Doors: Latches do not require more than 15 lbf to release the latch. Locks do not require use of a key, tool, or special knowledge for operation.

E. Accessibility Requirements: For door hardware on doors in an accessible route, comply with the DOT's "ADA Standards for Transportation Facilities" and the ABA standards of the Federal agency having jurisdiction.

1. Provide operating devices that do not require tight grasping, pinching, or twisting of the wrist and that operate with a force of not more than 5 lbf.

2. Comply with the following maximum opening-force requirements:

   a. Interior, Non-Fire-Rated Hinged Doors: 5 lbf applied perpendicular to door.
   b. Sliding or Folding Doors: 5 lbf applied parallel to door at latch.
   c. Fire Doors: Minimum opening force allowable by authorities having jurisdiction.

3. Bevel raised thresholds with a slope of not more than 1:2. Provide thresholds not more than 1/2 inch high.

4. Adjust door closer sweep periods so that, from an open position of 90 degrees, the door will take at least 5 seconds to move to a position of 12 degrees from the latch.

5. Adjust spring hinges so that, from an open position of 70 degrees, the door will take at least 1.5 seconds to move to the closed position.

2.03 SCHEDULED DOOR HARDWARE

Provide products for each door that comply with requirements indicated in Part 2 and Door Hardware Schedule. Door hardware is scheduled on Drawings.

2.04 LOCKSETS, LATCHSETS, DEADBOLTS:

A. Mortise Locksets and Latchsets: as scheduled.

1. Russwin, ML2000 Series, Grade 1 mortise, with lever style LS Standard – Lustra (cast).

2.05 EXIT DEVICES / PANIC HARDWARE

A. General features:

1. Independent lab-tested 1,000,000 cycles.

2. Push-through push-pad design. No exposed push-pad fasteners, no exposed cavities when operated. Return stroke fluid dampeners and rubber bottoming dampeners, plus anti-rattle devices.

3. 0.75-inch throw deadlocking latchbolts.

4. End caps: impact-resistant, flush-mounted. No raised edges or lips to catch carts or other equipment.

5. No exposed screws to show through glass doors.

6. Non-handed basic device design with center case interchangeable with all functions, no extra parts required to effect change of function.

7. Releasable in normal operation with 15-lb. maximum operating force per UBC Standard 10-4, and with 32 lb. maximum pressure under 250-lb. load to the door.

8. Exterior doors scheduled with XP-series devices: Static load force resistance of at least 2000 pounds.

9. Flush end cap design as opposed to typical "bottle-cap" design end cap.

10. Comply with IBC Section 1010.1.10.

B. Specific features:

1. Non-Fire Rated Devices: cylinder dogging.

2. Lever Trim: breakaway type, forged brass or bronze escutcheon min .130" thickness, compression spring drive, match lockset lever design.

3. Rod and latch guards with sloped full-width kickplates for doors fitted with surface vertical rod devices with bottom latches.

4. Fire-Labeled Devices: UL label indicating "Fire Exit Hardware". Vertical rod devices less bottom rod (LBR) unless otherwise scheduled.

5. Electrically Operated Devices: Single manufacturer source for electric latch retraction devices, electrically controlled trim, power transfers, power supplies, monitoring switches and controls.

6. Battery alarm 99 ALK RX.

2.06 CLOSERS

A. Surface Closers:

1. Full rack-and-pinion type cylinder with removable non-ferrous cover and cast iron body. Double heat-treated pinion shaft, single piece forged piston, chrome-silicon steel spring.

2. ISO 2000 certified. Units stamped with date-of-manufacture code.

3. Independent lab-tested 10,000,000 cycles.

4. Non-sized, non-handed, and adjustable. Place closer inside building, stairs, and rooms.

5. Plates, brackets and special templating when needed for interface with particular header, door and wall conditions and neighboring hardware.

6. Adjustable to open with not more than 5.0lbs pressure to open at exterior doors and 5.0lbs at interior doors.

7. Separate adjusting valves for closing speed, latching speed and backcheck, fourth valve for delayed action where scheduled.

8. Extra-duty arms (EDA) at exterior doors scheduled with parallel arm units.

9. Exterior door closers: tested to 100 hours of ASTM B117 salt spray test, furnish data on request.

10. Exterior doors: seasonal adjustments not required for temperatures from 120 degrees F to -30 degrees F, furnish checking fluid data on request.

11. Non-flaming fluid, will not fuel door or floor covering fires.

12. Pressure Relief Valves (PRV) not permitted.

2.07 OTHER HARDWARE

A. Kick Plates: Four beveled edges, .050 inches minimum thickness, height and width as scheduled. Sheet-metal screws of bronze or stainless steel to match other hardware.

B. Door Stops: Provide stops to protect walls, casework or other hardware.

1. Unless otherwise noted in Hardware Sets, provide wall type with appropriate fasteners. Where wall type cannot be used, provide floor type. If neither can be used, provide overhead type.

2. Locate overhead stops for maximum possible opening. Consult with City for furniture locations. Minimum: 90deg stop / 95deg deadstop. Note degree of opening in submittal.

C. Seals: Finished to match adjacent frame color. Resilient seal material: polyurethane, polypropylene, nylon brush, silicone rubber or solid high-grade neoprene as scheduled. Do not furnish vinyl seal material. UL label applied to seals on rated doors. Substitute products: certify that the products equal or exceed specified material's thickness and durability.

1. Proposed substitutions: submit for approval.

2. Solid neoprene: MIL Spec. R6855-CL III, Grade 40.

3. Non-corroding fasteners at in-swinging exterior doors.

4. Sound control openings: Use components tested as a system using nationally accepted standards by independent laboratories. Ensure that the door leafs have the necessary sealed-in-place STC ratings. Fasten applied seals over bead of sealant.

5. Fire-rated Doors, Resilient Seals: UL10C / UBC Standard 7-2 compliant. Coordinate with selected door manufacturers' and selected frame manufacturers' requirements. Where rigid housed resilient seals are scheduled in this Section and the selected door manufacturer only requires an adhesive-mounted resilient seal, furnish rigid housed seal at minimum, or both the rigid housed seal plus the adhesive applied seal. Adhesive applied seals alone are deemed insufficient for this project where rigid housed seals are scheduled.

6. Fire-rated Doors, Intumescent Seals: Furnished by selected door manufacturer. Furnish fire-labeled opening assembly complete and in full compliance with UL10C / UBC Standard 7-2. Where required, intumescent seals vary in requirement by door type and door manufacture -- careful coordination required

D. Automatic door bottoms: low operating force units. Doors with automatic door bottoms plus head and jamb seals cannot require more than two pounds operating force to open when closer is disconnected.

E. Thresholds: As scheduled and per details. Substitute products: certify that the products equal or exceed specified material's thickness. Proposed substitutions: submit for approval.

1. Exteriors: Seal perimeter to exclude water and vermin. Use sealant complying with requirements in Division 7 "Thermal and Moisture Protection". Non-ferrous 1/4inch fasteners and lead expansion shield anchors, or Red-Head #SFS-1420 (or approved equivalent) Flat Head Sleeve Anchors (SS/FHSL).

2. Fire-rated openings, 90min or less duration: use thresholds to interrupt floor covering material under the door where that material has a critical radiant flux value less than 0.22 watts per square centimeter, per NFPA 253. Use threshold unit as scheduled. If none scheduled, request direction from Construction Manager.

3. Fire-rated openings, 3-hour duration: Thresholds, where scheduled, to extend full jamb depth.

4. Acoustic openings: Set units in full bed of Division-7-compliant, leave no air space between threshold and substrate.

5. Plastic plugs with wood or sheet metal screws are not an acceptable substitute for specified fastening methods.

6. Fasteners: Generally, exposed screws to be Phillips or Robertson drive. Pinned TORX drive at high security areas. Flat head sleeve anchors (FHSL) may be slotted drive. Sheet metal and wood screws: full-thread. Sleeve nuts: full length to prevent door compression.

F. Silencers: Interior hollow metal frames, 3 for single doors, 4 for pairs of doors. Omit where adhesive mounted seal occurs. Leave no unfilled/uncovered pre-punched silencer holes.

G. Floor-mounted electromagnetic door holders: LCN's SEM series or approved equivalent. Incorporate into U.L. listed fire & life-safety system, doors release to allow closure and latching when door's zone is in alarm state. Use minimum projection required to allow door to open as widely as allowed by wall conditions and projection of door hardware. Rated IP 65.

2.08 KEYING

Keying System: Factory registered, complying with guidelines in BHMA A156.28, appendix. Provide one extra key blank for each lock. Incorporate decisions made in keying conference.

2.09 KEY CONTROL SYSTEM

Key Control Cabinet: BHMA A156.28; metal cabinet with baked-enamel finish; containing key-holding hooks, labels, two sets of key tags with self-locking key holders, key-gathering envelopes, and temporary and permanent markers; with key capacity of 150 percent of the number of locks.

2.10 FABRICATION

A. Manufacturer's Nameplate: Do not provide products that have manufacturer's name or trade name displayed in a visible location except in conjunction with required fire-rating labels and as otherwise approved by Architect. Manufacturer's identification is permitted on rim of lock cylinders only.

B. Base Metals: Produce door hardware units of base metal indicated, fabricated by forming method indicated, using manufacturer's standard metal alloy, composition, temper, and hardness. Furnish metals of a quality equal to or greater than that of specified door hardware units and BHMA A156.18.

C. Fasteners: Provide door hardware manufactured to comply with published templates prepared for machine, wood, and sheet metal screws. Provide screws that comply with commercially recognized industry standards for application intended, except aluminum fasteners are not permitted. Provide Phillips flat-head screws with finished heads to match surface of door hardware unless otherwise indicated.

   1. Concealed Fasteners: For door hardware units that are exposed when door is closed, except for units already specified with concealed fasteners. Do not use through bolts for installation where bolt head or nut on opposite face is exposed unless it is the only means of securely attaching the door hardware. Where through bolts are used on hollow door and frame construction, provide sleeves for each through bolt.

   2. Spacers or Sex Bolts: For through bolting of hollow-metal doors.

   3. Gasketing Fasteners: Provide noncorrosive fasteners for exterior applications and elsewhere as indicated.

2.11 FINISHES

A. Provide finishes complying with BHMA A156.18 , 626 Satin Chromium, except for push/pull and protection plates shall be 630 satin stainless steel. Provide similar finishes where 626 is not available.

B. Protect mechanical finishes on exposed surfaces from damage by applying a strippable, temporary protective covering before shipping.

C. Appearance of Finished Work: Variations in appearance of abutting or adjacent pieces are acceptable if they are within one-half of the range of approved Samples. Noticeable variations in the same piece are not acceptable. Variations in appearance

of other components are acceptable if they are within the range of approved Samples and are assembled or installed to minimize contrast.

PART 3 - EXECUTION

3.01 EXAMINATION

A. Examine doors and frames, with Installer present, for compliance with requirements for installation tolerances, labeled fire-rated door assembly construction, wall and floor construction, and other conditions affecting performance of the Work.

B. Examine roughing-in for electrical power systems to verify actual locations of wiring connections before electrified door hardware installation.

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

3.02 PREPARATION

Steel Doors and Frames: For surface-applied door hardware, drill and tap doors and frames according to ANSI/SDI A250.6.

3.03 INSTALLATION

A. Mounting Heights: Mount door hardware units at heights to comply with the following unless otherwise indicated or required to comply with governing regulations. Steel Doors and Frames: ANSI/SDI A250.8.

B. Install each door hardware item to comply with manufacturer's written instructions. Where cutting and fitting are required to install door hardware onto or into surfaces that are later to be painted or finished in another way, coordinate removal, storage, and reinstallation of surface protective trim units with finishing work. Do not install surface-mounted items until finishes have been completed on substrates involved.

1. Set units level, plumb, and true to line and location. Adjust and reinforce attachment substrates as necessary for proper installation and operation.

2. Drill and countersink units that are not factory prepared for anchorage fasteners. Space fasteners and anchors according to industry standards.

C. Hinges: Install types and in quantities indicated in door hardware schedule, but not fewer than the number recommended by manufacturer for application indicated or one hinge for every 30 inches of door height, whichever is more stringent, unless other equivalent means of support for door, such as spring hinges or pivots, are provided.

D. Intermediate Offset Pivots: Where offset pivots are indicated, provide intermediate offset pivots in quantities indicated in door hardware schedule, but not fewer than one intermediate offset pivot per door and one additional intermediate offset pivot for every 30 inches of door height greater than 90 inches.

E. Lock Cylinders: Install construction cores to secure building and areas during construction period. Replace construction cores with permanent cores as directed by State. Preferred cores are Russwin.

F. Key Control System:

1. Key Control Cabinet: Tag keys and place them on markers and hooks in key control system cabinet, as determined by final keying schedule.

2. Key Lock Boxes: Install where indicated or approved by Architect to provide controlled access for fire and medical emergency personnel.

3. Key Control System Software: Set up multiple-index system based on final keying schedule.

G. Boxed Power Supplies: Locate power supplies as indicated or, if not indicated, above accessible ceilings. Verify location with Architect. Configuration: Provide least number of power supplies required to adequately serve doors with electrified door hardware.

H. Thresholds: Set thresholds for exterior doors and other doors indicated in full bed of sealant complying with requirements specified in SECTION 07920 - JOINT SEALANTS.

I. Stops: Provide floor stops for doors unless wall or other type stops are indicated in door hardware schedule. Do not mount floor stops where they will impede traffic.

J. Perimeter Gasketing: Apply to head and jamb, forming seal between door and frame. Do not notch perimeter gasketing to install other surface-applied hardware.

K. Meeting Stile Gasketing: Fasten to meeting stiles, forming seal when doors are closed.

L. Door Bottoms: Apply to bottom of door, forming seal with threshold when door is closed.

3.04 FIELD QUALITY CONTROL

Independent Architectural Hardware Consultant: Engage a qualified independent Architectural Hardware Consultant to perform inspections and to prepare inspection reports. Independent Architectural Hardware Consultant will inspect door hardware and state in each report whether installed work complies with or deviates from requirements, including whether door hardware is properly installed and adjusted.

3.05 ADJUSTING

A. Initial Adjustment: Adjust and check each operating item of door hardware and each door to ensure proper operation or function of every unit. Replace units that cannot be adjusted to operate as intended. Adjust door control devices to compensate for

final operation of heating and ventilating equipment and to comply with referenced accessibility requirements.

1. Door Closers: Adjust sweep period to comply with accessibility requirements and requirements of authorities having jurisdiction.

2. Spring Hinges: Adjust to achieve positive latching when door is allowed to close freely from an open position of 70 degrees and so that closing time complies with accessibility requirements of authorities having jurisdiction.

3. Electric Strikes: Adjust horizontal and vertical alignment of keeper to properly engage lock bolt.

B. Occupancy Adjustment: Approximately three months after date of Substantial Completion, Installer's Architectural Hardware Consultant shall examine and readjust each item of door hardware, including adjusting operating forces, as necessary to ensure function of doors, door hardware, and electrified door hardware.

3.06 CLEANING AND PROTECTION

A. Clean adjacent surfaces soiled by door hardware installation.

B. Clean operating items as necessary to restore proper function and finish.

C. Provide final protection and maintain conditions that ensure that door hardware is without damage or deterioration at time of Substantial Completion.

3.07 MAINTENANCE SERVICE

Maintenance Tools and Instructions: Furnish a complete set of specialized tools and maintenance instructions for State's continued adjustment, maintenance, and removal and replacement of door hardware.

3.08 DEMONSTRATION

Train State's maintenance personnel to adjust, operate, and maintain door hardware.

3.09 DOOR HARDWARE SCHEDULE

See door schedule in drawings for hardware set assignments.

PART 4 - MEASUREMENT AND PAYMENT

4.01 BASIS OF MEASUREMENT AND PAYMENT

Work under this Section will not be measured nor paid for separately but shall be considered incidental to and included in the bid prices for the various items of work in this project.

END OF SECTION

SECTION 08911 - FIXED LOUVERS

PART 1 - GENERAL

1.01 RELATED DOCUMENTS

The General Provisions for Construction Projects (2016), Special Provisions and General Requirements of the Specifications, apply to the work specified in this Section.

1.02 SUMMARY

A. Section Includes:

1. Related Requirements: Fixed formed-metal louvers.

2. Blank-off panels for existing louvers at existing security checkpoint

3. Rooftop mechanical equipment screen

B. Related Requirements:

1. SECTION 08111 - HOLLOW METAL DOORS AND FRAMES: For louvers in hollow-metal doors.

2. SECTION 09911 - EXTERIOR PAINTING: For field painting exterior louvers.

3. SECTION 09912 - INTERIOR PAINTING: For field painting interior louvers.

1.03 DEFINITIONS

A. Louver Terminology: Definitions of terms for metal louvers contained in AMCA 501 apply to this Section unless otherwise defined in this Section or in referenced standards.

B. Horizontal Louver: Louver with horizontal blades (i.e., the axis of the blades are horizontal).

C. Vertical Louver: Louver with vertical blades (i.e., the axis of the blades are vertical).

D. Drainable-Blade Louver: Louver with blades having gutters that collect water and drain it to channels in jambs and mullions, which carry it to bottom of unit and away from opening.

E. Wind-Driven-Rain-Resistant Louver: Louver that provides specified wind-driven-rain performance, as determined by testing according to AMCA 500-L.

F. Windborne-Debris-Impact-Resistant Louver: Louver that provides specified windborne-debris-impact resistance, as determined by testing according to AMCA 540.

1.04 SUBMITTALS

A. Submit in accordance with SECTION 01300 - SUBMITTALS.

B. Product Data: For each type of product. For louvers specified to bear AMCA seal, include printed catalog pages showing specified models with appropriate AMCA Certified Ratings Seals.

C. Shop Drawings: For louvers and accessories. Include plans, elevations, sections, details, and attachments to other work. Show frame profiles and blade profiles, angles, and spacing.

1. Show weep paths, gaskets, flashings, sealants, and other means of preventing water intrusion.

2. Show mullion profiles and locations.

D. Product Test Reports: Based on evaluation of comprehensive tests performed according to AMCA 500-L by a qualified testing agency or by manufacturer and witnessed by a qualified testing agency, for each type of louver and showing compliance with performance requirements specified.

E. Sample Warranties: For manufacturer's special warranties.

1.05 QUALITY ASSURANCE

A. Welding Qualifications: Qualify procedures and personnel according to the following:

1. AWS (American Welding Society) D1.2/D1.2M.

2. AWS (American Welding Society) D1.3/D1.3M.

3. AWS (American Welding Society) D1.6/D1.6M.

1.06 FIELD CONDITIONS

Field Measurements: Verify actual dimensions of openings by field measurements before fabrication.

PART 2 - PRODUCTS

2.01 MANUFACTURERS

Source Limitations: Obtain fixed louvers from single source from a single manufacturer where indicated to be of same type, design, or factory-applied color finish.

2.02 PERFORMANCE REQUIREMENTS

A. Louver Performance Ratings: Provide louvers complying with requirements specified, as demonstrated by testing manufacturer's stock units identical to those provided, except for length and width according to AMCA 500-L.

B. Thermal Movements: Allow for thermal movements from ambient and surface temperature changes. Temperature Change (Range): 120 deg F, ambient; 180 deg F, material surfaces.

C. SMACNA Standard: Comply with recommendations in SMACNA's "Architectural Sheet Metal Manual" for fabrication, construction details, and installation procedures.

2.03 FIXED FORMED-METAL LOUVERS

A. General: Where louvers are located above hollow metal door and frame assemblies, integrate louver frames as extension of door frames. Match frame material, thickness, and dimensions. Refer to SECTION 08111 - HOLLOW METAL DOORS AND FRAMES: For requirements.

B. Horizontal Nondrainable-Blade Louver:

1. Manufacturers: Subject to compliance with requirements, provide products by one of the following:

    a. Air Balance; a division of MESTEK, Inc.
    b. Airolite Company, LLC (The).
    c. Construction Specialties, Inc.
    d. Greenheck Fan Corporation.
    e. Or approved equal.

2. Louver Depth: 6 inches.

3. Blade Profile: Plain blade without center baffle.

4. Frame and Blade Material and Nominal Thickness: Galvanized-steel sheet, not less than 0.052 inch.

5. Mullion Type: Fully recessed.

6. Louver Performance Ratings:

a. Free Area: Not less than 6.5 sq. ft. for 48-inch-wide by 48-inch-high louver.
b. Point of Beginning Water Penetration: Not less than 550 fpm.
c. Air Performance: Not more than 0.10-inch wg static pressure drop at 550-fpm free-area velocity.

2.04 LOUVER SCREENS

A. General: Provide screen at each exterior louver.

1. Screen Location for Fixed Louvers: Interior face.

2. Screening Type: Bird screening.

B. Secure screen frames to louver frames with stainless-steel machine screws, spaced a maximum of 6 inches from each corner and at 12 inches o.c.

C. Louver Screen Frames: Fabricate with mitered corners to louver sizes indicated.

1. Metal: Same type and form of metal as indicated for louver to which screens are attached.

2. Finish: Mill finish unless otherwise indicated.

3. Type: Rewirable frames with a driven spline or insert.

D. Louver Screening for Galvanized-Steel Louvers: Bird Screening: Galvanized steel, 1/2-inch-square mesh, 0.041-inch wire.

2.05 MATERIALS

A. Galvanized-Steel Sheet: ASTM A 653/A 653M, G90 zinc coating, mill phosphatized.

B. Fasteners: Use types and sizes to suit unit installation conditions.

1. Use Phillips flat-head tamper-resistant screws for exposed fasteners unless otherwise indicated.

2. For fastening galvanized steel, use hot-dip-galvanized-steel or 300 series stainless-steel fasteners.

C. Postinstalled Fasteners for Concrete and Masonry: Torque-controlled expansion anchors, fabricated from stainless-steel components, with allowable load or strength design capacities calculated according to ICC-ES AC193 and ACI 318 greater than or equal to the design load, as determined by testing according to ASTM E 488/E 488M conducted by a qualified testing agency.

D. Bituminous Paint: Cold-applied asphalt emulsion complying with ASTM D 1187/D 1187M.

2.06 FABRICATION

A. Factory assemble louvers to minimize field splicing and assembly. Disassemble units as necessary for shipping and handling limitations. Clearly mark units for reassembly and coordinated installation.

B. Vertical Assemblies: Where height of louver units exceeds fabrication and handling limitations, fabricate units to permit field-bolted assembly with close-fitting joints in jambs and mullions, reinforced with splice plates.

   1. Continuous Vertical Assemblies: Fabricate units without interrupting blade-spacing pattern unless horizontal mullions are indicated.

   2. Horizontal Mullions: Provide horizontal mullions at joints unless continuous vertical assemblies are indicated.

C. Maintain equal louver blade spacing, including separation between blades and frames at head and sill, to produce uniform appearance.

D. Fabricate frames, including integral sills, to fit in openings of sizes indicated, with allowances made for fabrication and installation tolerances, adjoining material tolerances, and perimeter sealant joints. Frame Type: Channel unless otherwise indicated.

E. Include supports, anchorages, and accessories required for complete assembly.

F. Provide vertical mullions of type and at spacings indicated, but not more than is recommended by manufacturer, or 72 inches o.c., whichever is less.

   1. Fully Recessed Mullions: Where indicated, provide mullions fully recessed behind louver blades. Where length of louver exceeds fabrication and handling limitations, fabricate with close-fitting blade splices designed to permit expansion and contraction.

   2. Exterior Corners: Prefabricated corner units with mitered and welded blades and with fully recessed mullions at corners.

G. Provide subsills made of same material as louvers or extended sills for recessed louvers.

H. Join frame members to each other and to fixed louver blades with fillet welds concealed from view unless otherwise indicated or size of louver assembly makes bolted connections between frame members necessary.

2.07 GALVANIZED-STEEL SHEET FINISHES

A. Finish louvers after assembly.

B. Surface Preparation: Clean surfaces with nonpetroleum solvent, so surfaces are free of oil and other contaminants. After cleaning, apply a conversion coating compatible with the organic coating to be applied over it. Clean welds, mechanical connections, and abraded areas and repair according to ASTM A 780/A 780M.

C. Finish: Comply with the following:

1. Where frame and louver are an extension of door frames, match finish type and color of adjacent door frames.

2. Where louver assemblies are not extension of door frames, provide finish type indicated below.

D. Baked-Enamel or Powder-Coat Finish: Immediately after cleaning and pretreating, apply manufacturer's standard two-coat, baked-on finish consisting of prime coat and thermosetting topcoat, with a minimum dry film thickness of 2 mils. Color and Gloss: Custom color to match adjacent wall color at wall louver. Color to match Dark Bronze at Blank-off panels on existing louver. Custom color to match green roof color at rooftop mechanical screen.

PART 3 - EXECUTION

3.01 EXAMINATION

A. Examine substrates and openings, with Installer present, for compliance with requirements for installation tolerances and other conditions affecting performance of the Work.

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

3.02 PREPARATION

Coordinate setting drawings, diagrams, templates, instructions, and directions for installation of anchorages that are to be embedded in concrete or masonry construction. Coordinate delivery of such items to Project site.

3.03 INSTALLATION

A. Locate and place louvers level, plumb, and at indicated alignment with adjacent work.

B. Use concealed anchorages where possible. Provide brass or lead washers fitted to screws where required to protect metal surfaces and to make a weathertight connection.

C. Form closely fitted joints with exposed connections accurately located and secured.

D. Provide perimeter reveals and openings of uniform width for sealants and joint fillers, as indicated.

E. Protect unpainted galvanized- and nonferrous-metal surfaces that are in contact with concrete, masonry, or dissimilar metals from corrosion and galvanic action by applying a heavy coating of bituminous paint or by separating surfaces with waterproof gaskets or nonmetallic flashing.

F. Install concealed gaskets, flashings, joint fillers, and insulation as louver installation progresses, where weathertight louver joints are required. Comply with SECTION 07920 - JOINT SEALANTS: For sealants applied during louver installation.

3.04 ADJUSTING AND CLEANING

A. Clean exposed louver surfaces that are not protected by temporary covering, to remove fingerprints and soil during construction period. Do not let soil accumulate during construction period.

B. Before final inspection, clean exposed surfaces with water and a mild soap or detergent not harmful to finishes. Thoroughly rinse surfaces and dry.

C. Restore louvers damaged during installation and construction, so no evidence remains of corrective work. If results of restoration are unsuccessful, as determined by Architect, remove damaged units and replace with new units. Touch up minor abrasions in finishes with air-dried coating that matches color and gloss of, and is compatible with, factory-applied finish coating.

PART 4 - MEASUREMENT AND PAYMENT

4.01 BASIS OF MEASUREMENT AND PAYMENT

Work under this Section will not be measured nor paid for separately but shall be considered incidental to and included in the bid prices for the various items of work in this project.

END OF SECTION

DIVISION 9 - FINISHES

SECTION 09221 - NON-STRUCTURAL METAL FRAMING

PART 1 - GENERAL

1.01 RELATED DOCUMENTS

The General Provisions for Construction Projects (2016), Special Provisions and General Requirements of the Specifications, apply to the work specified in this Section.

1.02 SUMMARY

A. Section Includes:

1. Non-load-bearing steel framing systems for interior partitions.

2. Suspension systems for ceilings and soffits.

B. Related Requirements:

1. SECTION 09290 – GYPSUM BOARD: For interior gypsum board panels.

1.03 SUBMITTALS

A. Submit in accordance with SECTION 01300 - SUBMITTALS.

B. Product Data: For each type of product.

C. Product Certificates: For each type of code-compliance certification for studs and tracks.

D. Evaluation Reports: For post-installed anchors and power-actuated fasteners, from ICC-ES or other qualified testing agency acceptable to authorities having jurisdiction.

1.04 QUALITY ASSURANCE

A. Manufacturer: Current member of SSMA.

B. Installer Qualifications: Minimum 5 years documented experience in work of this Section.

C. Welder Qualifications: AWS D1.3/D1.3M.

D. Code compliance certification of studs and tracks: provide documentation that framing members are certified according to the product-certification program the Steel Stud Manufacturers Association.

PART 2 - PRODUCTS

2.01 PERFORMANCE REQUIREMENTS

A. Fire-Test-Response Characteristics: For fire-resistance-rated assemblies that incorporate non-load-bearing steel framing, provide materials and construction identical to those tested in assembly indicated, according to ASTM E 119 by an independent testing agency.

B. STC-Rated Assemblies: For STC-rated assemblies, provide materials and construction identical to those tested in assembly indicated on Drawings, according to ASTM E 90 and classified according to ASTM E 413 by an independent testing agency.

C. Horizontal Deflection: For wall assemblies, limited to 1/360 of the wall height based on horizontal loading of 5 lbf/sq. ft.

2.02 FRAMING SYSTEMS

A. Framing Members, General: Comply with ASTM C 754 for conditions indicated.

1. Steel Sheet Components: Comply with ASTM C 645 requirements for metal unless otherwise indicated.

2. Protective Coating: ASTM A 653/A 653M, G40, hot-dip galvanized unless otherwise indicated.

B. Studs and Tracks: ASTM C 645. Steel Studs and Tracks:

1. Minimum Base-Metal Thickness: As indicated on Drawings.

2. Depth: As indicated on Drawings.

C. Slip-Type Head Joints: Where indicated, provide one of the following:

1. Single Long-Leg Track System: ASTM C 645 top track with 2-inch-deep flanges in thickness not less than indicated for studs, installed with studs friction fit into top track and with continuous bridging located within 12 inches of the top of studs to provide lateral bracing.

2. Double-Track System: ASTM C 645 top outer tracks, inside track with 2-inch-deep flanges in thickness not less than indicated for studs and fastened to studs, and outer track sized to friction-fit over inner track.

D. Flat Strap and Backing Plate: Steel sheet for blocking and bracing in length and width indicated. Minimum Base-Metal Thickness: 0.0329 inch.

E. Cold-Rolled Channel Bridging: Steel, 0.0538-inch minimum base-metal thickness, with minimum 1/2-inch-wide flanges.

1. Depth: 1-1/2 inches.

2. Clip Angle: Not less than 1-1/2 by 1-1/2 inches, 0.068-inch-thick, galvanized steel.

F. Hat-Shaped, Rigid Furring Channels: ASTM C 645.

1. Minimum Base-Metal Thickness: 0.0179 inch.

2. Depth: As indicated on Drawings 7/8 inch.

G. Resilient Furring Channels: 1/2-inch-deep, steel sheet members designed to reduce sound transmission. Configuration: Asymmetrical.

H. Cold-Rolled Furring Channels: 0.053-inch uncoated-steel thickness, with minimum 1/2-inch-wide flanges.

1. Depth: 1-1/2 inch.

2. Furring Brackets: Adjustable, corrugated-edge-type steel sheet with minimum uncoated-steel thickness of 0.0329 inch.

3. Tie Wire: ASTM A 641/A 641M, Class 1 zinc coating, soft temper, 0.062-inch-diameter wire, or double strand of 0.048-inch-diameter wire.

I. Z-Shaped Furring: With slotted or nonslotted web, face flange of 1-1/4 inches, wall attachment flange of 7/8 inch, minimum uncoated-metal thickness of 0.0179 inch, and depth required to fit insulation thickness indicated.

2.03 SUSPENSION SYSTEMS

A. Tie Wire: ASTM A 641/A 641M, Class 1 zinc coating, soft temper, 0.062-inch-diameter wire, or double strand of 0.048-inch-diameter wire.

B. Hanger Attachments to Concrete:

1. Post-Installed Anchors: Fastener systems with an evaluation report acceptable to authorities having jurisdiction, based on ICC-ES AC01, AC193, AC58, or AC308 as appropriate for the substrate.

a. Uses: Securing hangers to structure.
b. Material for Interior Locations: Carbon-steel components zinc-plated to comply with ASTM B 633 or ASTM F 1941, Class Fe/Zn 5, unless otherwise indicated.
c. Material for Exterior or Interior Locations and Where Stainless Steel Is Indicated: Alloy Group 2 stainless-steel bolts, ASTM F 593, and nuts, ASTM F 594.

2. Power-Actuated Anchors: Fastener systems with an evaluation report acceptable to authorities having jurisdiction, based on ICC-ES AC70.

C. Wire Hangers: ASTM A 641/A 641M, Class 1 zinc coating, soft temper, 0.16 inch in diameter.

D. Flat Hangers: Steel sheet, 1 by 3/16 inch by length indicated.

E. Carrying Channels (Main Runners): Cold-rolled, commercial-steel sheet with a base-metal thickness of 0.0538 inch and minimum 1/2-inch-wide flanges. Depth: 1-1/2 inches.

F. Furring Channels (Furring Members):

1. Cold-Rolled Channels: 0.0538-inch uncoated-steel thickness, with minimum 1/2-inch-wide flanges, 3/4 inch deep.

2. Steel Studs and Tracks: ASTM C 645.

a. Minimum Base-Metal Thickness:] 0.0296 inch.
b. Depth: As indicated on Drawings.

3. Hat-Shaped, Rigid Furring Channels: ASTM C 645, 7/8 inch deep. Minimum Base-Metal Thickness: 0.0296 inch.

4. Resilient Furring Channels: 1/2-inch-deep members designed to reduce sound transmission.

G. Grid Suspension System for Gypsum Board Ceilings: ASTM C 645, direct-hung system composed of main beams and cross-furring members that interlock.

2.04 AUXILIARY MATERIALS

A. General: Provide auxiliary materials that comply with referenced installation standards.

B. Isolation Strip at Exterior Walls: Provide one of the following:

1. Asphalt-Saturated Organic Felt: ASTM D 226/D 226M, Type I (No. 15 asphalt felt), nonperforated.

2. Foam Gasket: Adhesive-backed, closed-cell vinyl foam strips that allow fastener penetration without foam displacement, 1/8 inch thick, in width to suit steel stud size.

PART 3 - EXECUTION

3.01 EXAMINATION

A. Examine areas and substrates, with Installer present, and including welded hollow-metal frames, cast-in anchors, and structural framing, for compliance with requirements and other conditions affecting performance of the Work.

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

3.02 PREPARATION

Suspended Assemblies: Coordinate installation of suspension systems with installation of overhead structure to ensure that inserts and other provisions for anchorages to building structure have been installed to receive hangers at spacing required to support the Work and that hangers will develop their full strength. Furnish concrete inserts and other devices indicated to other trades for installation in advance of time needed for coordination and construction.

3.03 INSTALLATION, GENERAL

A. Installation Standard: ASTM C 754. Gypsum Board Assemblies: Also comply with requirements in ASTM C 840 that apply to framing installation.

B. Install framing and accessories plumb, square, and true to line, with connections securely fastened.

C. Install supplementary framing, and blocking to support fixtures, equipment services, heavy trim, grab bars, toilet accessories, furnishings, or similar construction.

D. Install bracing at terminations in assemblies.

E. Do not bridge building control and expansion joints with non-load-bearing steel framing members. Frame both sides of joints independently.

3.04 INSTALLING FRAMED ASSEMBLIES

A. Install framing system components according to spacings indicated, but not greater than spacings required by referenced installation standards for assembly types.

1. Single-Layer Application: 16 inches o.c. unless otherwise indicated.

2. Multilayer Application: 16 inches o.c. unless otherwise indicated.

B. Where studs are installed directly against exterior masonry walls or dissimilar metals at exterior walls, install isolation strip between studs and exterior wall.

C. Install studs so flanges within framing system point in same direction.

D. Install tracks at floors and overhead supports. Extend framing full height to structural supports or substrates above suspended ceilings except where partitions are indicated to terminate at suspended ceilings. Continue framing around ducts that penetrate partitions above ceiling.

1. Slip-Type Head Joints: Where framing extends to overhead structural supports, install to produce joints at tops of framing systems that prevent axial loading of finished assemblies.

2. Door Openings: Screw vertical studs at jambs to jamb anchor clips on door frames; install track section (for cripple studs) at head and secure to jamb studs.

    a. Install two studs at each jamb unless otherwise indicated.
    b. Install cripple studs at head adjacent to each jamb stud, with a minimum 1/2-inch clearance from jamb stud to allow for installation of control joint in finished assembly.
    c. Extend jamb studs through suspended ceilings and attach to underside of overhead structure.

3. Other Framed Openings: Frame openings other than door openings the same as required for door openings unless otherwise indicated. Install framing below sills of openings to match framing required above door heads.

4. Fire-Resistance-Rated Partitions: Install framing to comply with fire-resistance-rated assembly indicated and support closures and to make partitions continuous from floor to underside of solid structure.

5. Sound-Rated Partitions: Install framing to comply with sound-rated assembly indicated.

E. Direct Furring: Attach to concrete or masonry with stub nails, screws designed for masonry attachment, or powder-driven fasteners spaced 24 inches o.c.

F. Z-Shaped Furring Members:

1. Erect insulation, specified in SECTION 07210 - THERMAL INSULATION, vertically and hold in place with Z-shaped furring members spaced 24 inches o.c.

2. Except at exterior corners, securely attach narrow flanges of furring members to wall with concrete stub nails, screws designed for masonry attachment, or powder-driven fasteners spaced 24 inches o.c.

3. At exterior corners, attach wide flange of furring members to wall with short flange extending beyond corner; on adjacent wall surface, screw-attach short flange of furring channel to web of attached channel. At interior corners, space second member no more than 12 inches from corner and cut insulation to fit.

G. Installation Tolerance: Install each framing member so fastening surfaces vary not more than 1/8 inch from the plane formed by faces of adjacent framing.

3.05 INSTALLING CEILING SUSPENSION SYSTEMS

A. Install suspension system components according to spacings indicated, but not greater than spacings required by referenced installation standards for assembly types.

1. Hangers: 48 inches o.c.

2. Carrying Channels (Main Runners): 48 inches o.c.

3. Furring Channels (Furring Members): 16 inches o.c. (gypsum board ceiling)

4. Furring Channels (Furring Members): 12 inches o.c. (cement plaster ceiling)

B. Isolate suspension systems from building structure where they abut or are penetrated by building structure to prevent transfer of loading imposed by structural movement.

C. Suspend hangers from building structure as follows:

1. Install hangers plumb and free from contact with insulation or other objects within ceiling plenum that are not part of supporting structural or suspension system. Splay hangers only where required to miss obstructions and offset resulting horizontal forces by bracing, countersplaying, or other equally effective means.

2. Where width of ducts and other construction within ceiling plenum produces hanger spacings that interfere with locations of hangers required to support standard suspension system members, install supplemental suspension members and hangers in the form of trapezes or equivalent devices. Size supplemental suspension members and hangers to support ceiling loads within performance limits established by referenced installation standards.

3. Wire Hangers: Secure by looping and wire tying, either directly to structures or to inserts, eye screws, or other devices and fasteners that are secure and appropriate for substrate, and in a manner that will not cause hangers to deteriorate or otherwise fail.

4. Flat Hangers: Secure to structure, including intermediate framing members, by attaching to inserts, eye screws, or other devices and fasteners that are secure and appropriate for structure and hanger, and in a manner that will not cause hangers to deteriorate or otherwise fail.

5. Do not attach hangers to steel roof deck.

6. Do not attach hangers to permanent metal forms. Furnish cast-in-place hanger inserts that extend through forms.

7. Do not attach hangers to rolled-in hanger tabs of composite steel floor deck.

8. Do not connect or suspend steel framing from ducts, pipes, or conduit.

D. Fire-Resistance-Rated Assemblies: Wire tie furring channels to supports.

E. Seismic Bracing: Sway-brace suspension systems with hangers used for support.

F. Grid Suspension Systems: Attach perimeter wall track or angle where grid suspension systems meet vertical surfaces. Mechanically join main beam and cross-furring members to each other and butt-cut to fit into wall track.

G. Installation Tolerances: Install suspension systems that are level to within 1/8 inch in 12 feet measured lengthwise on each member that will receive finishes and transversely between parallel members that will receive finishes.

PART 4 - MEASUREMENT AND PAYMENT

4.01 BASIS OF MEASUREMENT AND PAYMENT

Work under this Section will not be measured nor paid for separately but shall be considered incidental to and included in the bid prices for the various items of work in this project.

END OF SECTION

SECTION 09290 - GYPSUM BOARD

PART 1 - GENERAL

1.01 RELATED DOCUMENTS

The General Provisions for Construction Projects (2016), Special Provisions and General Requirements of the Specifications, apply to the work specified in this Section.

1.02 SUMMARY

A. Section Includes: Interior gypsum board.

B. Related Requirements:

1. SECTION 09221 - NON-STRUCTURAL METAL FRAMING: For non-structural steel framing and suspension systems that support gypsum board panels.

2. SECTION 07210 - THERMAL INSULATION: For thermal blanket used as thermal insulation.

1.03 SUBMITTALS

A. Submit in accordance with SECTION 01300 - SUBMITTALS.

B. Product Data: For each type of product.

C. Samples: For the following products: Trim Accessories: Full-size Sample in 12-inch-long length for each trim accessory indicated.

1.04 DELIVERY, STORAGE AND HANDLING

A. Store materials inside under cover and keep them dry and protected against weather, condensation, direct sunlight, construction traffic, and other potential causes of damage. Stack panels flat and supported on risers on a flat platform to prevent sagging.

1.05 FIELD CONDITIONS

A. Environmental Limitations: Comply with ASTM C 840 requirements or gypsum board manufacturer's written instructions, whichever are more stringent.

B. Do not install paper-faced gypsum panels until installation areas are enclosed and conditioned.

C. Do not install panels that are wet, moisture damaged, and mold damaged.

1. Indications that panels are wet or moisture damaged include, but are not limited to, discoloration, sagging, or irregular shape.

2. Indications that panels are mold damaged include, but are not limited to, fuzzy or splotchy surface contamination and discoloration.

PART 2 - PRODUCTS

2.01 PERFORMANCE REQUIREMENTS

A. Fire-Resistance-Rated Assemblies: For fire-resistance-rated assemblies, provide materials and construction identical to those tested in assembly indicated according to ASTM E 119 by an independent testing agency.

B. STC-Rated Assemblies: For STC-rated assemblies, provide materials and construction identical to those tested in assembly indicated according to ASTM E 90 and classified according to ASTM E 413 by an independent testing agency.

2.02 GYPSUM BOARD, GENERAL

Size: Provide maximum lengths and widths available that will minimize joints in each area and that correspond with support system indicated.

2.03 INTERIOR GYPSUM BOARD

A. Gypsum Board, Type X: ASTM C 1396/C 1396M.

1. Manufacturers: Subject to compliance with requirements, available manufacturers offering products that may be incorporated into the Work include, but are not limited to, the following:

    a. CertainTeed Corporation.
    b. Georgia-Pacific Gypsum LLC.
    c. National Gypsum Company.
    d. PABCO Gypsum.
    e. USG Corporation.
    f. Or approved equal.

2. Thickness: 5/8 inch.

3. Long Edges: Tapered and featured (rounded or beveled) for prefilling.

B. Gypsum Ceiling Board: ASTM C 1396/C 1396M.

1. Thickness: 1/2 inch.

2. Long Edges: Tapered.

C. Gypsum Shaftliner: ASTM C 1396/C 1396M.

1. Thickness: 1” inch.

2.04 TRIM ACCESSORIES

A. Interior Trim: ASTM C 1047.

1. Material: Galvanized or aluminum-coated steel sheet or rolled zinc.

2. Shapes:

a. Cornerbead.
b. LC-Bead: J-shaped; exposed long flange receives joint compound.
c. L-Bead: L-shaped; exposed long flange receives joint compound.
d. Expansion (control) joint.

3. Aluminum: Alloy and temper with not less than the strength and durability properties of ASTM B 221, Alloy 6063-T5.

2.05 JOINT TREATMENT MATERIALS

A. General: Comply with ASTM C 475/C 475M.

B. Joint Tape:

1. Interior Gypsum Board: Paper.

2. Glass-Mat Gypsum Sheathing Board: 10-by-10 glass mesh.

C. Joint Compound for Interior Gypsum Board: For each coat, use formulation that is compatible with other compounds applied on previous or for successive coats.

1. Prefilling: At open joints, rounded or beveled panel edges, and damaged surface areas, use setting-type taping compound.

2. Embedding and First Coat: For embedding tape and first coat on joints, fasteners, and trim flanges, use drying-type, all-purpose compound.

3. Fill Coat: For second coat, use drying-type, all-purpose compound.

4. Finish Coat: For third coat, use drying-type, all-purpose compound.

5. Skim Coat: For final coat of Level 5 finish, use high-build interior coating product designed for application by airless sprayer and to be used instead of skim coat to produce Level 5 finish.

2.06 AUXILIARY MATERIALS

A. General: Provide auxiliary materials that comply with referenced installation standards and manufacturer's written instructions.

B. Steel Drill Screws: ASTM C 1002 unless otherwise indicated. Use screws complying with ASTM C 954 for fastening panels to steel members from 0.033 to 0.112 inch thick.

C. Sound-Attenuation Blankets: ASTM C 665, Type I (blankets without membrane facing) produced by combining thermosetting resins with mineral fibers manufactured from glass, slag wool, or rock wool. Fire-Resistance-Rated Assemblies: Comply with mineral-fiber requirements of assembly.

D. Acoustical Sealant: Manufacturer's standard nonsag, paintable, nonstaining latex sealant complying with ASTM C 834. Product effectively reduces airborne sound transmission through perimeter joints and openings in building construction as demonstrated by testing representative assemblies according to ASTM E 90.

PART 3 - EXECUTION

3.01 EXAMINATION

A. Examine areas and substrates including welded hollow-metal frames and support framing, with Installer present, for compliance with requirements and other conditions affecting performance of the Work.

B. Examine panels before installation. Reject panels that are wet, moisture damaged, and mold damaged.

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

3.02 APPLYING AND FINISHING PANELS, GENERAL

A. Comply with ASTM C 840.

B. Install ceiling panels across framing to minimize the number of abutting end joints and to avoid abutting end joints in central area of each ceiling. Stagger abutting end joints of adjacent panels not less than one framing member.

C. Install panels with face side out. Butt panels together for a light contact at edges and ends with not more than 1/16 inch of open space between panels. Do not force into place.

D. Locate edge and end joints over supports, except in ceiling applications where intermediate supports or gypsum board back-blocking is provided behind end joints. Do not place tapered edges against cut edges or ends. Stagger vertical joints on opposite sides of partitions. Do not make joints other than control joints at corners of framed openings.

E. Form control and expansion joints with space between edges of adjoining gypsum panels.

F. Cover both faces of support framing with gypsum panels in concealed spaces (above ceilings, etc.), except in chases braced internally.

1. Unless concealed application is indicated or required for sound, fire, air, or smoke ratings, coverage may be accomplished with scraps of not less than 8 sq. ft. in area.

2. Fit gypsum panels around ducts, pipes, and conduits.

3. Where partitions intersect structural members projecting below underside of floor/roof slabs and decks, cut gypsum panels to fit profile formed by structural members; allow 1/4- to 3/8-inch-wide joints to install sealant.

G. Isolate perimeter of gypsum board applied to non-load-bearing partitions at structural abutments. Provide 1/4- to 1/2-inch-wide spaces at these locations and trim edges with edge trim where edges of panels are exposed. Seal joints between edges and abutting structural surfaces with acoustical sealant.

H. Attachment to Steel Framing: Attach panels so leading edge or end of each panel is attached to open (unsupported) edges of stud flanges first.

I. STC-Rated Assemblies: Seal construction at perimeters, behind control joints, and at openings and penetrations with a continuous bead of acoustical sealant. Install acoustical sealant at both faces of partitions at perimeters and through penetrations. Comply with ASTM C 919 and with manufacturer's written instructions for locating edge trim and closing off sound-flanking paths around or through assemblies, including sealing partitions above acoustical ceilings.

J. Install sound attenuation blankets before installing gypsum panels unless blankets are readily installed after panels have been installed on one side.

3.03 APPLYING INTERIOR GYPSUM BOARD

A. Install interior gypsum board in the following locations:

1. Type X: Typical.

2. Ceiling Type: Ceiling surfaces.

B. Single-Layer Application:

1. On ceilings, apply gypsum panels before wall/partition board application to greatest extent possible and at right angles to framing unless otherwise indicated.

2. On partitions/walls, apply gypsum panels vertically (parallel to framing) unless otherwise indicated or required by fire-resistance-rated assembly, and minimize end joints. At high walls, install panels horizontally unless otherwise indicated or required by fire-resistance-rated assembly.

3. On Z-shaped furring members, apply gypsum panels vertically (parallel to framing) with no end joints. Locate edge joints over furring members.

4. Fastening Methods: Apply gypsum panels to supports with steel drill screws.

C. Multilayer Application:

1. On ceilings, apply gypsum board indicated for base layers before applying base layers on walls/partitions; apply face layers in same sequence. Apply base layers at right angles to framing members and offset face-layer joints one framing member, 16 inches minimum, from parallel base-layer joints, unless otherwise indicated or required by fire-resistance-rated assembly.

2. On partitions/walls, apply gypsum board indicated for base layers and face layers vertically (parallel to framing) with joints of base layers located over stud or furring member and face-layer joints offset at least one stud or furring member with base-layer joints unless otherwise indicated or required by fire-resistance-rated assembly. Stagger joints on opposite sides of partitions.

3. On Z-shaped furring members, apply base layer vertically (parallel to framing) and face layer either vertically (parallel to framing) or horizontally (perpendicular to framing) with vertical joints offset at least one furring member. Locate edge joints of base layer over furring members.

4. Fastening Methods: Fasten base layers and face layers separately to supports with screws.

3.04 INSTALLING TRIM ACCESSORIES

A. General: For trim with back flanges intended for fasteners, attach to framing with same fasteners used for panels. Otherwise, attach trim according to manufacturer's written instructions.

B. Control Joints: Install control joints according to ASTM C 840 and in specific locations approved by State Engineer for visual effect.

C. Interior Trim: Install in the following locations:

1. Cornerbead: Use at outside corners unless otherwise indicated.

2. LC-Bead: Use at exposed panel edges.

3. L-Bead: Use where indicated.

3.05 FINISHING GYPSUM BOARD

A. General: Treat gypsum board joints, interior angles, edge trim, control joints,

penetrations, fastener heads, surface defects, and elsewhere as required to prepare gypsum board surfaces for decoration. Promptly remove residual joint compound from adjacent surfaces.

B. Prefill open joints, rounded or beveled edges, and damaged surface areas.

C. Apply joint tape over gypsum board joints, except for trim products specifically indicated as not intended to receive tape.

D. Gypsum Board Finish Levels: Finish panels to levels indicated below and according to ASTM C 840:

1. Level 1: Ceiling plenum areas, concealed areas, and where indicated.

2. Level 4: At panel surfaces that will be exposed to view unless otherwise indicated. Primer and its application to surfaces are specified in SECTION 09911 - EXTERIOR PAINTING.

3. Level 5: At walls and ceilings scheduled to receive paint finish. Primer and its application to surfaces are specified in SECTION 09911 - EXTERIOR PAINTING.

3.05 PROTECTION

A. Protect adjacent surfaces from drywall compound and promptly remove from floors and other non-drywall surfaces. Repair surfaces stained, marred, or otherwise damaged during drywall application.

B. Protect installed products from damage from weather, condensation, direct sunlight, construction, and other causes during remainder of the construction period.

C. Remove and replace panels that are wet, moisture-damaged, and mold-damaged.

1. Indications that panels are wet or moisture damaged include, but are not limited to, discoloration, sagging, or irregular shape.

2. Indications that panels are mold-damaged include, but are not limited to, fuzzy or splotchy surface contamination and discoloration.

PART 4 - MEASUREMENT AND PAYMENT

4.01 BASIS OF MEASUREMENT AND PAYMENT

Work under this Section will not be measured nor paid for separately but shall be considered incidental to and included in the bid prices for the various items of work in this project.

END OF SECTION

SECTION 09511 - ACOUSTICAL PANEL CEILINGS

PART 1 - GENERAL

1.01 RELATED DOCUMENTS

The General Provisions for Construction Projects (2016), Special Provisions and General Requirements of the Specifications, apply to the work specified in this Section.

1.02 SUMMARY

Section includes acoustical panels and exposed suspension systems for interior ceilings.

1.03 SUBMITTALS

A. Submit in accordance with SECTION 01300 - SUBMITTALS.

B. Product Data: For each type of product.

C. Samples: For each exposed product and for each color and texture specified, 6 inches in size.

D. Delegated-Design Submittal: For seismic restraints for ceiling systems. Include design calculations for seismic restraints including analysis data signed and sealed by the qualified professional engineer, licensed in the State of Hawaii, responsible for their preparation.

E. Coordination Drawings: Reflected ceiling plans, drawn to scale, on which the following items are shown and coordinated with each other, using input from installers of the items involved:

1. Ceiling suspension-system members.

2. Structural members to which suspension systems will be attached.

3. Method of attaching hangers to building structure.

4. Carrying channels or other supplemental support for hanger-wire attachment where conditions do not permit installation of hanger wires at required spacing.

5. Size and location of initial access modules for acoustical panels.

6. Items penetrating finished ceiling and ceiling-mounted items including the following:

    a. Lighting fixtures.
    b. Diffusers.
    c. Grilles.
    d. Speakers.

e. Sprinklers.
f. Access panels.
g. Perimeter moldings.

7. Show operation of hinged and sliding components covered by or adjacent to acoustical panels.

8. Minimum Drawing Scale: 1/4 inch = 1 foot.

F. Qualification Data: For testing agency.

G. Product Test Reports: For each acoustical panel ceiling, for tests performed by manufacturer and witnessed by a qualified testing agency or a qualified testing agency.

H. Evaluation Reports: For each acoustical panel ceiling suspension system and anchor and fastener type, from ICC-ES.

I. Field quality-control reports.

J. Maintenance Data: For finishes to include in maintenance manuals.

K. Furnish extra materials, from the same product run, that match products installed and that are packaged with protective covering for storage and identified with labels describing contents.

1. Acoustical Ceiling Units: Full-size panels equal to 2 percent of quantity installed.

2. Suspension-System Components: Quantity of each exposed component equal to 2 percent of quantity installed.

3. Hold-Down Clips: Equal to 2 percent of quantity installed.

1.04 DELIVERY, STORAGE, AND HANDLING

A. Deliver acoustical panels, suspension-system components, and accessories to Project site and store them in a fully enclosed, conditioned space where they will be protected against damage from moisture, humidity, temperature extremes, direct sunlight, surface contamination, and other causes.

B. Before installing acoustical panels, permit them to reach room temperature and a stabilized moisture content.

1.05 FIELD CONDITIONS

Environmental Limitations: Do not install acoustical panel ceilings until spaces are enclosed and weathertight, wet-work in spaces is complete and dry, work above ceilings is complete, and ambient temperature and humidity conditions are maintained at the levels indicated for Project when occupied for its intended use.

PART 2 - PRODUCTS

2.01 MANUFACTURERS

Source Limitations: Obtain each type of acoustical ceiling panel and its supporting suspension system from single source from single manufacturer.

2.02 PERFORMANCE REQUIREMENTS

A. Delegated Design: Engage a qualified professional engineer, licensed in the State of Hawaii, to design seismic restraints for ceiling systems.

B. Seismic Performance: Suspended ceilings shall withstand the effects of earthquake motions determined according to ASCE/SEI 7and 2018 IBC.

C. Surface-Burning Characteristics: Comply with ASTM E 84; testing by a qualified testing agency. Identify products with appropriate markings of applicable testing agency.

1. Flame-Spread Index: Class A according to ASTM E 1264.

2. Smoke-Developed Index: 50 or less.

D. Fire-Resistance Ratings: Comply with ASTM E 119; testing by a qualified testing agency. Identify products with appropriate markings of applicable testing agency. Indicate design designations from UL or from the listings of another qualified testing agency.

2.03 ACOUSTICAL PANELS (ACT-01)

A. Acoustical Panel Standard: Provide manufacturer's standard panels according to ASTM E 1264 and designated by type, form, pattern, acoustical rating, and light reflectance unless otherwise indicated.

B. Acoustical Panels ACT-01: Comply with the following:

1. Composition: Mineral Fiber.

2. ASTM E 1264, Type XIII, Form 2, pattern E.

3. Class: A, flame speed 25 or under.

4. Light reflectance (LR): Not less than 0.85

5. Noise Reduction Coefficient (NRC): Not less than 0.80

6. Ceiling Attenuation Class (CAC): Not less than 35

7. Articulation Class (AC): Not less than 170.

8. Size: As indicated on the Drawings.

9. Thickness: As indicated on the Drawings.

10. Edge/Joint Detail: Tegular

11. Color: White

12. Surface Texture: Fine.

13. Pattern: E (lightly textured) .

C. Available Manufacturers: Subject to compliance with requirements, provide products by one of the following:

1. Armstrong World Industries, Inc. “Ultima” (Basis of Design)

2. American Gypsum.

3. CertainTeed Corporation.

4. USG Corporation.

5. Or approved equal.

D. Antimicrobial Treatment: Manufacturer's standard broad spectrum, antimicrobial formulation that inhibits fungus, mold, mildew, and gram-positive and gram-negative bacteria and showing no mold, mildew, or bacterial growth when tested according to ASTM D 3273, ASTM D 3274, or ASTM G 21 and evaluated according to ASTM D 3274 or ASTM G 21.

2.04 METAL SUSPENSION SYSTEM

A. Metal Suspension-System Standard: Provide manufacturer's standard, direct-hung, metal suspension system and accessories according to ASTM C 635/C 635M and designated by type, structural classification, and finish indicated.

B. Wide-Face, Capped, Double-Web, Steel Suspension System: Main and cross runners roll formed from cold-rolled steel sheet; prepainted, electrolytically zinc coated, or hot-dip galvanized, G30 coating designation; with prefinished 15/16-inch-wide metal caps on flanges.

1. Structural Classification: Heavy-duty system.

2. End Condition of Cross Runners: Override (stepped) or butt-edge type.

3. Face Design: Flat, flush.

4. Cap Material: Cold-rolled steel.

5. Cap Finish: Painted white.

2.05 ACCESSORIES

A. Attachment Devices: Size for five times the design load indicated in ASTM C 635/C 635M, Table 1, "Direct Hung," unless otherwise indicated. Comply with seismic design requirements.

B. Power-Actuated Fasteners in Concrete: Fastener system of type suitable for application indicated, fabricated from corrosion-resistant materials, with clips or other accessory devices for attaching hangers of type indicated and with capability to sustain, without failure, a load equal to 10 times that imposed by ceiling construction, as determined by testing according to ASTM E 1190, conducted by a qualified testing and inspecting agency.Wire Hangers, Braces, and Ties: Provide wires as follows:

1. Zinc-Coated, Carbon-Steel Wire: ASTM A 641/A 641M, Class 1 zinc coating, soft temper.

2. Size: Wire diameter sufficient for its stress at three times hanger design load (ASTM C 635/C 635M, Table 1, "Direct Hung") will be less than yield stress of wire, but not less than 0.106-inch-diameter wire.

C. Hanger Rods: Mild steel, zinc coated or protected with rust-inhibitive paint.

D. Flat Hangers: Mild steel, zinc coated or protected with rust-inhibitive paint.

E. Angle Hangers: Angles with legs not less than 7/8 inch wide; formed with 0.04-inch-thick, galvanized-steel sheet complying with ASTM A 653/A 653M, G90 coating designation; with bolted connections and 5/16-inch-diameter bolts.

F. Hold-Down Clips: Manufacturer's standard hold-down.

G. Seismic Stabilizer Bars: Manufacturer's standard perimeter stabilizers designed to accommodate seismic forces.

H. Seismic Struts: Manufacturer's standard compression struts designed to accommodate seismic forces.

2.06 METAL EDGE MOLDINGS AND TRIM

Roll-Formed, Sheet-Metal Edge Moldings and Trim: Type and profile indicated or, if not indicated, manufacturer's standard moldings for edges and penetrations that comply with seismic design requirements; formed from sheet metal of same material, finish, and color as that used for exposed flanges of suspension-system runners. Edge moldings shall fit acoustical panel edge details and suspension systems indicated and match width and configuration of exposed runners unless otherwise indicated.

2.07 ACOUSTICAL SEALANT

Acoustical Sealant: As specified in SECTION 07921 - ACOUSTICAL JOINT SEALANTS.

PART 3 - EXECUTION

3.01 EXAMINATION

A. Examine substrates, areas, and conditions, including structural framing to which acoustical panel ceilings attach or abut, with Installer present, for compliance with requirements specified in this and other Sections that affect ceiling installation and anchorage and with requirements for installation tolerances and other conditions affecting performance of acoustical panel ceilings.

B. Examine acoustical panels before installation. Reject acoustical panels that are wet, moisture damaged, or mold damaged.

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

3.02 PREPARATION

A. Measure each ceiling area and establish layout of acoustical panels to balance border widths at opposite edges of each ceiling. Avoid using less-than-half-width panels at borders unless otherwise indicated, and comply with layout shown on reflected ceiling plans.

B. Layout openings for penetrations centered on the penetrating items.

3.03 INSTALLATION

A. Install acoustical panel ceilings according to ASTM C 636/C 636M, seismic design requirements, and manufacturer's written instructions. Fire-Rated Assembly: Install fire-rated ceiling systems according to tested fire-rated design.

B. Suspend ceiling hangers from building's structural members and as follows:

1. Install hangers plumb and free from contact with insulation or other objects within ceiling plenum that are not part of supporting structure or of ceiling suspension system.

2. Splay hangers only where required and, if permitted with fire-resistance-rated ceilings, to miss obstructions; offset resulting horizontal forces by bracing, countersplaying, or other equally effective means.

3. Where width of ducts and other construction within ceiling plenum produces hanger spacings that interfere with location of hangers at spacings required to support standard suspension-system members, install supplemental suspension members and hangers in form of trapezes or equivalent devices.

4. Secure wire hangers to ceiling-suspension members and to supports above with a minimum of three tight turns. Connect hangers directly to structure or to inserts, eye screws, or other devices that are secure and appropriate for substrate and that will not deteriorate or otherwise fail due to age, corrosion, or elevated temperatures.

5. Secure flat, angle, channel, and rod hangers to structure, including intermediate framing members, by attaching to inserts, eye screws, or other devices that are secure and appropriate for both the structure to which hangers are attached and the type of hanger involved. Install hangers in a manner that will not cause them to deteriorate or fail due to age, corrosion, or elevated temperatures.

6. When steel framing does not permit installation of hanger wires at spacing required, install carrying channels or other supplemental support for attachment of hanger wires.

7. Space hangers not more than 48 inches o.c. along each member supported directly from hangers unless otherwise indicated; provide hangers not more than 8 inches from ends of each member.

8. Size supplemental suspension members and hangers to support ceiling loads within performance limits established by referenced standards.

C. Secure bracing wires to ceiling suspension members and to supports with a minimum of four tight turns. Suspend bracing from building's structural members as required for hangers, without attaching to permanent metal forms, steel deck, or steel deck tabs. Fasten bracing wires into concrete with cast-in-place or postinstalled anchors.

D. Install edge moldings and trim of type indicated at perimeter of acoustical ceiling area and where necessary to conceal edges of acoustical panels.

1. Apply acoustical sealant in a continuous ribbon concealed on back of vertical legs of moldings before they are installed.

2. Screw attach moldings to substrate at intervals not more than 16 inches o.c. and not more than 3 inches from ends. Miter corners accurately and connect securely.

3. Do not use exposed fasteners, including pop rivets, on moldings and trim.

E. Install suspension-system runners so they are square and securely interlocked with one another. Remove and replace dented, bent, or kinked members.

F. Install acoustical panels with undamaged edges and fit accurately into suspension-system runners and edge moldings. Scribe and cut panels at borders and penetrations to provide precise fit.

1. For reveal-edged panels on suspension-system runners, install panels with bottom of reveal in firm contact with top surface of runner flanges.

2. Paint cut edges of panel remaining exposed after installation; match color of exposed panel surfaces using coating recommended in writing for this purpose by acoustical panel manufacturer.

3. Install hold-down clips in areas indicated; space according to panel manufacturer's written instructions unless otherwise indicated. Hold-Down Clips: Space 24 inches o.c. on all cross runners.

4. Protect lighting fixtures and air ducts according to requirements indicated for fire-resistance-rated assembly.

3.04 ERECTION TOLERANCES

A. Suspended Ceilings: Install main and cross runners level to a tolerance of 1/8 inch in 12 feet, non-cumulative.

B. Moldings and Trim: Install moldings and trim to substrate and level with ceiling suspension system to a tolerance of 1/8 inch in 12 feet, non-cumulative.

3.05 FIELD QUALITY CONTROL

A. Special Inspections: Engage a qualified special inspector to perform the following special inspections: Periodic inspection during the installation of suspended ceiling grids according to ASCE/SEI 7 and 2018 IBC.

B. Testing Agency: Engage a qualified testing agency to perform tests and inspections.

C. Perform the following tests and inspections of completed installations of acoustical panel ceiling hangers and anchors and fasteners in successive stages and when installation of ceiling suspension systems on each floor has reached 20 percent completion, but no panels have been installed. Do not proceed with installations of acoustical panel ceiling hangers for the next area until test results for previously completed installations of acoustical panel ceiling hangers show compliance with requirements.

1. Within each test area, testing agency select one of every 10 power-actuated fasteners and postinstalled anchors used to attach hangers to concrete and test them for 200 lbf of tension; it also select one of every two postinstalled anchors used to attach bracing wires to concrete and test them for 440 lbf of tension.

2. When testing discovers fasteners and anchors that do not comply with requirements, testing agency will test those anchors not previously tested until 20 pass consecutively and then will resume initial testing frequency.

D. Acoustical panel ceiling hangers, anchors, and fasteners will be considered defective if they do not pass tests and inspections.

E. Prepare test and inspection reports.

3.05 CLEANING

A. Clean exposed surfaces of acoustical panel ceilings, including trim, edge moldings, and suspension-system members. Comply with manufacturer's written instructions for cleaning and touchup of minor finish damage.

B. Remove and replace ceiling components that cannot be successfully cleaned and repaired to permanently eliminate evidence of damage.

PART 4 - MEASUREMENT AND PAYMENT

4.01 BASIS OF MEASUREMENT AND PAYMENT

Work under this Section will not be measured nor paid for separately but shall be considered incidental to and included in the bid prices for the various items of work in this project.

END OF SECTION

SECTION 09651 - RESILIENT BASE AND ACCESSORIES

PART 1 - GENERAL

1.01 RELATED DOCUMENTS

The General Provisions for Construction Projects (2016), Special Provisions and General Requirements of the Specifications, apply to the work specified in this Section.

1.02 SUMMARY

A. Section Includes:

1. Thermoplastic-rubber base.

2. Rubber molding accessories.

1.03 SUBMITTALS

A. Submit in accordance with SECTION 01300 - SUBMITTALS.

B. Product Data: For each type of product.

C. Samples for Verification: For each type of product indicated and for each color, texture, and pattern required in manufacturer's standard-size Samples, but not less than 12 inches long.

D. Product Schedule: For resilient base and accessory products. Use same designations indicated on Drawings.

E. Furnish extra materials, from the same product run, that match products installed and that are packaged with protective covering for storage and identified with labels describing contents. Furnish not less than 10 linear feet for every 500 linear feet or fraction thereof, of each type, color, pattern, and size of resilient product installed.

1.04 DELIVERY, STORAGE, AND HANDLING

A. Store resilient products and installation materials in dry spaces protected from the weather, with ambient temperatures maintained within range recommended by manufacturer, but not less than 50 deg F or more than 90 deg F.

1.05 FIELD CONDITIONS

A. Maintain ambient temperatures within range recommended by manufacturer, but not less than 70 deg F or more than 95 deg F, in spaces to receive resilient products during the following periods:

1. 48 hours before installation.

2. During installation.

3. 48 hours after installation.

B. After installation and until Substantial Completion, maintain ambient temperatures within range recommended by manufacturer, but not less than 55 deg F or more than 95 deg F.

C. Install resilient products after other finishing operations, including painting, have been completed.

PART 2 - PRODUCTS

2.01 THERMOPLASTIC-RUBBER BASE (RB-01)

A. Basis of Design Product: Subject to compliance with requirements, provide products indicated in “Finish Legend” on Drawings, or approved equal.

B. Product Standard: ASTM F 1861, Type TP (rubber, thermoplastic).

1. Group: I (solid, homogeneous).

2. Style and Location:

a. Style A, Cove: Provide in areas with resilient floor coverings.

C. Thickness: 0.125 inch.

D. Height: 4 inches.

E. Lengths: Coils in manufacturer's standard length.

F. Outside Corners: Job formed.

G. Inside Corners: Job formed.

H. Colors: As scheduled.

2.02 RUBBER MOLDING ACCESSORY

A. Description: Rubber joiner for transition strips.

B. Locations: Provide rubber molding accessories at locations indicated.

C. Colors and Patterns: As selected from manufacturer's full color range.

2.03 INSTALLATION MATERIALS

A. Trowelable Leveling and Patching Compounds: Latex-modified, Portland-cement-based or blended hydraulic-cement-based formulation provided or approved by resilient-product manufacturer for applications indicated.

B. Adhesives: Water-resistant type recommended by resilient-product manufacturers for resilient products and substrate conditions indicated.

C. Floor Polish: Provide protective, liquid floor-polish products recommended by resilient stair-tread manufacturer.

PART 3 - EXECUTION

3.01 EXAMINATION

A. Examine substrates, with Installer present, for compliance with requirements for maximum moisture content and other conditions affecting performance of the Work. Verify that finishes of substrates comply with tolerances and other requirements specified in other Sections and that substrates are free of cracks, ridges, depressions, scale, and foreign deposits that might interfere with adhesion of resilient products.

B. Proceed with installation only after unsatisfactory conditions have been corrected. Installation of resilient products indicates acceptance of surfaces and conditions.

3.02 PREPARATION

A. Prepare substrates according to manufacturer's written instructions to ensure adhesion of resilient products.

B. Fill cracks, holes, and depressions in substrates with trowelable leveling and patching compound; remove bumps and ridges to produce a uniform and smooth substrate.

C. Do not install resilient products until materials are the same temperature as space where they are to be installed. At least 48 hours in advance of installation, move resilient products and installation materials into spaces where they will be installed.

D. Immediately before installation, sweep and vacuum clean substrates to be covered by resilient products.

3.03 RESILIENT BASE INSTALLATION

A. Comply with manufacturer's written instructions for installing resilient base.

B. Apply resilient base to walls, columns, pilasters, casework and cabinets in toe spaces, and other permanent fixtures in rooms and areas where base is required.

C. Install resilient base in lengths as long as practical without gaps at seams and with tops of adjacent pieces aligned.

D. Tightly adhere resilient base to substrate throughout length of each piece, with base in continuous contact with horizontal and vertical substrates.

E. Do not stretch resilient base during installation.

F. On masonry surfaces or other similar irregular substrates, fill voids along top edge of resilient base with manufacturer's recommended adhesive filler material.

G. Job-Formed Corners:

1. Outside Corners: Use straight pieces of maximum lengths possible and form with returns not less than 3 inches in length. Form without producing discoloration (whitening) at bends.

2. Inside Corners: Use straight pieces of maximum lengths possible and form with returns not less than 3 inches in length. Cope corners to minimize open joints.

3.04 RESILIENT ACCESSORY INSTALLATION

A. Comply with manufacturer's written instructions for installing resilient accessories.

B. Resilient Molding Accessories: Butt to adjacent materials and tightly adhere to substrates throughout length of each piece. Install reducer strips at edges of floor covering that would otherwise be exposed.

3.05 CLEANING AND PROTECTION

A. Comply with manufacturer's written instructions for cleaning and protecting resilient products.

B. Perform the following operations immediately after completing resilient-product installation:

1. Remove adhesive and other blemishes from surfaces.

2. Sweep and vacuum horizontal surfaces thoroughly.

3. Damp-mop horizontal surfaces to remove marks and soil.

C. Protect resilient products from mars, marks, indentations, and other damage from construction operations and placement of equipment and fixtures during remainder of construction period.

D. Cover resilient products subject to wear and foot traffic until Substantial Completion.

PART 4 - MEASUREMENT AND PAYMENT

4.01 BASIS OF MEASUREMENT AND PAYMENT

Work under this Section will not be measured nor paid for separately but shall be considered incidental to and included in the bid prices for the various items of work in this project.

END OF SECTION

SECTION 09684 – MODULAR CARPET TILE

PART 1 – GENERAL

1.01 RELATED DOCUMENTS

The General Provisions for Construction Projects (2016), Special Provisions and General Requirements of the Specifications, apply to the work specified in this Section.

1.02 SUMMARY

A. This section includes procedural requirements for the installation of modular carpet tile, resilient coved rubber wall base.

1.03 SUBMITTALS

A. Submit manufacturer's product data, installation instructions, project specific shop drawings, operation and maintenance manual as indicated within SECTION 01300 – SUBMITTALS.

B. Manufacturer's Product Data: Submit manufacturer's technical data and installation recommendations for each type of modular carpet tile and accessories being used. Provide information on product's performance characteristics, criteria, physical requirements and recommended adhesive methods and product.

C. Installer's Qualifications: Submit a written statement by the manufacturer, approving the use of the installer.

D. Shop Drawings: Submit shop drawings showing layout, locations of seams, edges, columns, doorways, enclosing partitions, built-in furniture, cabinets, and cutouts. Show details of profiles and product components, including anchorage, accessories, finish colors, patterns and textures.

E. Samples: Submit three (3) sets of samples of each type, color and finish of flooring and accessory products specified, with an indication of full range of color, pattern and texture variation. Provide samples with a minimum size of 6-inch x 9-inch for flooring products and 6-inch in length for accessories.

F. Pre-Installation Testing Reports: Submit results and evidence that the manufacturer has reviewed the testing results along with the manufacturer's approval of the testing results, or recommendations from the manufacturer for corrective action needed prior to the installation of the modular carpet tile.

1.04 QUALITY ASSURANCE

A. Manufacturer/Installer's Qualifications:

1. Provide modular carpet tile products and accessories by a single manufacturer with a minimum five (5) years' experience in actual production of specified

products and with resources to provide consistent quality in appearance and physical properties, without delaying the Work.

2. Perform installations using a firm with installers having no less than three (3) years of successful experience on projects of similar size and requirements and approved by the manufacturer.

B. Fire Rating Performance Characteristics: Provide modular carpet tile products with fire performance characteristics as determined by ASTM E 648 and ASTM E 662.

C. Pre-Installation Testing: Conduct and document pre-installation testing as specified by manufacturer in accordance with the latest version of the specified test methods.

1. Substrate Porosity Testing: ASTM F 3131 – Standard Practice for Field Determination of Substrate Water Absorption (Porosity) for Substrates to Receive Resilient Flooring.

2. PH Testing: ASTM F 710 – Standard Practice for Preparing Concrete Floors to Receive Resilient Flooring.

3. In-situ Relative Humidity Testing: ASTM F 2170 – Standard Test Method for Determining Relative Humidity in Concrete Floor Slabs Using in situ Probes.

4. Calcium Chloride Testing: ASTM F 1869 – Standard Test Method for Measuring Moisture Vapor Emissions Rate of Concrete Subfloor Using Anhydrous Calcium Chloride.

5. Surface Moisture Testing: ASTM F 2659 – Standard Guide for Preliminary Evaluation of Comparative Moisture Condition of Concrete, Gypsum Cement and other Floor Slabs and Screeds Using a Non- Destructive Electronic Moisture Meter.

6. Bond Testing: Conduct testing and document results in accordance with the manufacturer’s recommendations.

D. Manufacturer's Instructions: Detailed installation instructions and maintenance data.

E. Mock-Up: Prior to beginning installation erect a mock-up section, where directed, using all required components. Coordinate location in Pre-Installation Meeting.

F. Pre-Installation Meeting: Conduct a conference, prior to start of installation, to review installation requirements, shop drawings, and all coordination needs.

G. Maintenance: Submit to the Owner, for their consideration and acceptance, the required preventative maintenance schedule and service agreement for installed products.

1.05 DELIVERY, STORAGE AND HANDLING

A. Comply with manufacturer's written instructions.

1.06 WARRANTIES

A. Standard Warranty: Provide manufacturer’s standard twenty (20) year warranty.

B. Installation Warranty: Provide manufacturer’s standard two (2) year limited warranty.

1.07 EXTRA MATERIALS

A. Extra Materials: Furnish extra materials described below that match products installed, are packaged with protective covering for storage, and are identified with labels describing contents. Only typical system components are included with attic stock.

1. Modular Carpet Tile: Full-size units equal to two percent (2%) of amount installed.

2. Coved Wall Base: Full-size units equal to two percent (1%) of amount installed.

PART 2 – PRODUCTS

2.01 MODULAR CARPET TILE

A. Manufacturer: Shaw.

B. Product Line and Model: On The Edge; see drawings for pattern name/number.

C. Construction: Multi-level pattern loop. Nylon fiber. 18 oz/sq yd.tufted weight

D. Size: Approximately 18-inches x 36-inches.

E. Thickness: 0.21-inch.

F. Backing: Thermoplastic polyolefin compound with a high performance precoat and reinforcing layer..

G. Color and Pattern: As indicated within the drawings.

H. Adhesive: As recommended by the manufacturer.

PART 3 – EXECUTION

3.01 EXAMINATION

A. Site Verification of Conditions: The Contractor and the Installer shall examine and verify conditions previously described in other sections under which flooring, and

accessories are to be installed to be in accordance with the manufacturer's installation recommendations and must notify the Contractor in writing of conditions detrimental to proper and timely completion of work. Work shall not proceed until all unsatisfactory conditions are corrected to acceptable conditions to the Owner and the Architect.

B. Material Inspection: Visually inspect all materials prior to installation in accordance with the manufacturer's installation recommendations. Material with visual defects shall not be installed and shall not be considered as a legitimate claim if they are installed.

3.02 PREPARATION

A. Comply with manufacturer's written installation recommendations for preparing substrates indicated to receive flooring products and accessories.

B. Adjacent Surfaces Protection: Protect adjacent work areas and finish surfaces from damage during product installation.

C. Surface Preparation: Prepare substrate in accordance with manufacturer's recommendations and ASTM industry standards. Work shall not proceed until all unsatisfactory conditions are corrected to acceptable conditions to the Owner and Architect.

D. Substrate: Substrates to receive flooring must be structurally sound, rigid, smooth, flat, clean, and permanently dry. The substrates must be free of all foreign materials including, but not limited to, dust, solvent, paint, wax, oils, grease, residual adhesive, adhesive removers, film-forming curing compounds, silicate penetrating curing compounds, sealing, hardening or parting compounds, alkaline salts, excessive carbonation or laitance, mold, mildew, and other foreign materials that might affect the rate of moisture dissipation from the concrete, the adhesion of flooring to the concrete or cause a discoloration of the flooring from below.

E. Concrete Substrate: Concrete substrates shall be cured per the concrete manufacturer's recommendations. They must have a minimum compressive strength of 3,000 psi and a minimum dry density of 150 pounds per cubic foot.

F. Substrate Testing: In order to ensure that the moisture condition of concrete substrates is within acceptable limits, it is essential that moisture testing be conducted and documented on all concrete substrates regardless of age or grade level, including those where resilient flooring has already been installed. Moisture testing should only be conducted once a stable, conditioned environment has been established in accordance with the latest version of the specified test methods.

1. Conduct testing per manufacturer's instructions and/or recommendations.

2. Submit results and evidence that the manufacturer has reviewed the testing results along with the manufacturer's approval of the testing results, or

recommendations from the manufacturer for corrective action needed prior to the installation of the modular carpet tile.

3.03 INSTALLATION AND PROTECTION

A. Follow manufacturer's installation instructions.

B. Protection: Do not allow heavy traffic or rolling loads for at least 72-hours following the installation. Additional time may be necessary if the installation is over a non-porous substrate. Protect installed product and finish surfaces from damage during construction. Remove and legally dispose of protective covering at time of Substantial Completion.

3.04 CLEANING

A. Initial Maintenance: In order to allow the adhesive to dry and cure properly, wait a minimum of five days following the installation before conducting wet cleaning procedures or initial maintenance. Additional time may be necessary if the installation is over a non-porous substrate.

B. Procedure:

1. Remove temporary coverings and protection of adjacent work areas. Repair or replace damaged installed products. Clean installed products in accordance with manufacturer's recommendations prior to Owner's acceptance. Remove construction debris from the Project Site and legally dispose of debris.

2. Remove visible adhesive and other surface blemishes using cleaning methods recommended by the manufacturer.

3. Remove all surface soil, debris, sand and grit by vacuuming using a dual motor upright vacuum with a rotating brush. The brush should be approximately 1/8-inch below the vacuum cleaner casing to ensure proper agitation. Make several passes with the vacuum cleaner to ensure that all loose dirt is removed. Vacuum action should be fast forward and slow backward.

4. Flotex requires regular care to keep it clean and prevent the accumulation of dirt and soil. Proper cleaning, such as daily vacuuming and routine hot water extraction, can reduce contamination to virtually non-existent levels. Identify sources of soiling and react to spills immediately, before they dry.

5. Spot clean if necessary, by using the "Scrape, Scrub and Rinse" procedures.

    a. Scrape up spills using a spatula or blunt edged scraper and wipe excess soil onto a cloth. Apply a liberal amount of clean water to the spot.
    b. Using a spatula, scrape the water and the remains of the spill into a paper towel or cloth. Keep scraping with the spatula until the spill is completely removed.

c. If the spill or stain is not completely removed, apply a general purpose spotter cleaner to a white cotton cloth and rub it into the spot. Do not be afraid to use aggressive scrubbing to remove set-in spills. A soft wire brush can be used to remove scuff marks or other set in spills. Refer to the list at the end of this section for recommended products. Be certain not to leave any detergent residue when cleaning. Any chemicals applied to the flooring must be removed. No more than 1 oz. per gallon should be used. The most common problem when caring for Flotex® is the over use of cleaning chemicals. The buildup of chemicals and cleaners will de-luster the Flotex® fibers and leave a dull appearance. Chemical buildup also attracts dirt faster and speeds soiling.
d. Using a spatula, scrape the water, any cleaner and the remains of the spill into a paper towel or cloth. Keep scraping with the spatula until the spill or stain is completely removed.
e. Rinse the area thoroughly with clean water to ensure that any cleaning solution is completely removed. A spotter machine may be used to perform rinsing throughout the spot cleaning process.
f. Allow a minimum of three hours drying time before traffic is allowed on the floor surface again. If traffic is allowed on the floor before it has completely dried, the fibers are more susceptible to attract soil, requiring additional cleaning procedures in these areas to achieve the desired result.

END OF SECTION

SECTION 09911 - EXTERIOR PAINTING

PART 1 - GENERAL

1.01 RELATED DOCUMENTS

The General Provisions for Construction Projects (2016), Special Provisions and General Requirements of the Specifications, apply to the work specified in this Section.

1.02 SUMMARY

A. Section includes surface preparation and the application of paint systems the following exterior substrates:

1. Concrete.
2. Concrete masonry units (CMU).
3. Steel.
4. Galvanized metal.
5. Aluminum (not anodized or otherwise coated).
6. Exterior portland cement plaster (stucco).

B. Related Requirements:

1. SECTION 09912 - INTERIOR PAINTING: For surface preparation and the application of paint systems on interior substrates.

1.03 DEFINITIONS

A. Gloss Level 1: Not more than 5 units at 60 degrees and 10 units at 85 degrees, according to ASTM D 523.

B. Gloss Level 3: 10 to 25 units at 60 degrees and 10 to 35 units at 85 degrees, according to ASTM D 523.

C. Gloss Level 4: 20 to 35 units at 60 degrees and not less than 35 units at 85 degrees, according to ASTM D 523.

D. Gloss Level 5: 35 to 70 units at 60 degrees, according to ASTM D 523.

E. Gloss Level 6: 70 to 85 units at 60 degrees, according to ASTM D 523.

F. Gloss Level 7: More than 85 units at 60 degrees, according to ASTM D 523.

1.04 SUBMITTALS

A. Submit in accordance with SECTION 01300 - SUBMITTALS.

B. Product Data: For each type of product. Include preparation requirements and application instructions.

C. Samples for Verification: For each type of paint system and each color and gloss of topcoat.

1. Submit Samples on rigid backing, 8 inches square.

2. Step coats on Samples to show each coat required for system.

3. Label each coat of each Sample.

4. Label each Sample for location and application area.

D. Product List: For each product indicated, include the following:

1. Cross-reference to paint system and locations of application areas. Use same designations indicated on Drawings and in schedules.

2. Printout of current "MPI Approved Products List" for each product category specified, with the proposed product highlighted.

3. VOC content.

E. Furnish extra materials, from the same product run, that match products installed and that are packaged with protective covering for storage and identified with labels describing contents. Paint: 5 percent, but not less than 1 gal. of each material and color applied.

1.05 QUALITY ASSURANCE

A. Mockups: Apply mockups of each paint system indicated and each color and finish selected to verify preliminary selections made under Sample submittals and to demonstrate aesthetic effects and set quality standards for materials and execution.

1. State Engineer will select one surface to represent surfaces and conditions for application of each paint system specified in Part 3.

a. Vertical and Horizontal Surfaces: Provide samples of at least 100 sq. ft.
b. Other Items: State Engineer will designate items or areas required.

2. Final approval of color selections will be based on mockups. If preliminary color selections are not approved, apply additional mockups of additional colors selected by State Engineer at no added cost to State.

3. Approval of mockups does not constitute approval of deviations from the Contract Documents contained in mockups unless State Engineer specifically approves such deviations in writing.

4. Subject to compliance with requirements, approved mockups may become part of the completed Work if undisturbed at time of Substantial Completion.

1.06 DELIVERY, STORAGE, AND HANDLING

A. Store materials not in use in tightly covered containers in well-ventilated areas with ambient temperatures continuously maintained at not less than 45 deg F.

1. Maintain containers in clean condition, free of foreign materials and residue.

2. Remove rags and waste from storage areas daily.

1.07 FIELD CONDITIONS

A. Apply paints only when temperature of surfaces to be painted and ambient air temperatures are between 50 and 95 deg F.

B. Do not apply paints in snow, rain, fog, or mist; when relative humidity exceeds 85 percent; at temperatures less than 5 deg F above the dew point; or to damp or wet surfaces.

1.08 WARRANTY

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

B. The Contractor shall warrant a mildew free surface for a period of one year from the project acceptance date. Should mildew formation occur on surfaces painted under this project within the one year, the Contractor shall clean such surfaces at no additional cost to the State.

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

PART 2 - PRODUCTS

2.01 MANUFACTURERS

A. Manufacturers: Subject to compliance with requirements, available manufacturers offering products that may be incorporated into the Work include, but are not limited to, the following:

1. Benjamin Moore & Co.

2. Dunn-Edwards Corporation.

3. Sherwin-Williams Company .

4. Vista Paint.

5. Or Approved Equal.

B. Products: Subject to compliance with requirements, available products that may be incorporated into the Work include, but are not limited to products listed in other Part 2 articles for the paint category indicated.

2.02 PAINT, GENERAL

A. Material Compatibility:

1. Provide materials for use within each paint system that are compatible with one another and substrates indicated, under conditions of service and application as demonstrated by manufacturer, based on testing and field experience.

2. For each coat in a paint system, provide products recommended in writing by manufacturers of topcoat for use in paint system and on substrate indicated.

B. VOC Content: Provide materials that comply with VOC limits of authorities having jurisdiction.

C. Colors: As indicated in ”Finish Legend” on Drawings.

2.03 SOURCE QUALITY CONTROL

A. Testing of Paint Materials: State reserves the right to invoke the following procedure:

1. State will engage the services of a qualified testing agency to sample paint materials. Contractor will be notified in advance and may be present when samples are taken. If paint materials have already been delivered to Project site, samples may be taken at Project site. Samples will be identified, sealed, and certified by testing agency.

2. Testing agency will perform tests for compliance with product requirements.

3. State may direct Contractor to stop applying paints if test results show materials being used do not comply with product requirements. Contractor shall remove noncomplying paint materials from Project site, pay for testing, and repaint surfaces painted with rejected materials. Contractor will be required to remove rejected materials from previously painted surfaces if, on repainting with complying materials, the two paints are incompatible.

PART 3 - EXECUTION

3.01 EXAMINATION

A. Examine substrates and conditions, with Applicator present, for compliance with requirements for maximum moisture content and other conditions affecting performance of the Work.

B. Maximum Moisture Content of Substrates: When measured with an electronic moisture meter as follows:

1. Concrete: 12 percent.

2. Masonry (Clay and CMU): 12 percent.

3. Portland Cement Plaster: 12 percent.

4. Gypsum Board: 12 percent.

C. Portland Cement Plaster Substrates: Verify that plaster is fully cured.

D. Verify suitability of substrates, including surface conditions and compatibility with existing finishes and primers.

E. Proceed with coating application only after unsatisfactory conditions have been corrected. Application of coating indicates acceptance of surfaces and conditions.

3.02 PREPARATION

A. Comply with manufacturer's written instructions and recommendations in "MPI Manual" applicable to substrates and paint systems indicated.

B. Remove hardware, covers, plates, and similar items already in place that are removable and are not to be painted. If removal is impractical or impossible because of size or weight of item, provide surface-applied protection before surface preparation and painting. After completing painting operations, use workers skilled in the trades involved to reinstall items that were removed. Remove surface-applied protection.

C. Clean substrates of substances that could impair bond of paints, including dust, dirt, oil, grease, and incompatible paints and encapsulants. Remove incompatible

primers and reprime substrate with compatible primers or apply tie coat as required to produce paint systems indicated.

D. Concrete Substrates: Remove release agents, curing compounds, efflorescence, and chalk. Do not paint surfaces if moisture content or alkalinity of surfaces to be painted exceeds that permitted in manufacturer's written instructions.

E. Masonry Substrates: Remove efflorescence and chalk. Do not paint surfaces if moisture content or alkalinity of surfaces or mortar joints exceeds that permitted in manufacturer's written instructions.

F. Steel Substrates: Remove rust, loose mill scale, and shop primer if any. Clean using methods recommended in writing by paint manufacturer. but not less than the following: SSPC-SP 7/NACE No. 4, "Brush-off Blast Cleaning."

G. Shop-Primed Steel Substrates: Clean field welds, bolted connections, and abraded areas of shop paint, and paint exposed areas with the same material as used for shop priming to comply with SSPC-PA 1 for touching up shop-primed surfaces.

H. Galvanized-Metal Substrates: Remove grease and oil residue from galvanized sheet metal by mechanical methods to produce clean, lightly etched surfaces that promote adhesion of subsequently applied paints.

I. Aluminum Substrates: Remove loose surface oxidation.

J. Plastic Trim Fabrication Substrates: Remove dust, dirt, and other foreign material that might impair bond of paints to substrates.

3.03 APPLICATION

A. Apply paints according to manufacturer's written instructions and recommendations in "MPI Manual."

1. Use applicators and techniques suited for paint and substrate indicated.

2. Paint surfaces behind movable items same as similar exposed surfaces. Before final installation, paint surfaces behind permanently fixed items with prime coat only.

3. Paint both sides and edges of exterior doors and entire exposed surface of exterior door frames.

4. Paint entire exposed surface of window frames and sashes.

5. Do not paint over labels of independent testing agencies or equipment name, identification, performance rating, or nomenclature plates.

6. Primers specified in painting schedules may be omitted on items that are factory primed or factory finished if acceptable to topcoat manufacturers.

B. Tint undercoats same color as topcoat, but tint each undercoat a lighter shade to facilitate identification of each coat if multiple coats of same material are to be applied. Provide sufficient difference in shade of undercoats to distinguish each separate coat.

C. If undercoats or other conditions show through topcoat, apply additional coats until cured film has a uniform paint finish, color, and appearance.

D. Apply paints to produce surface films without cloudiness, spotting, holidays, laps, brush marks, roller tracking, runs, sags, ropiness, or other surface imperfections. Cut in sharp lines and color breaks.

E. Painting Fire Suppression, Plumbing, HVAC, Electrical, Communication, and Electronic Safety and Security Work: Paint the following work where exposed to view:

1. Equipment, including panelboards.

2. Uninsulated metal piping.

3. Uninsulated plastic piping.

4. Pipe hangers and supports.

5. Metal conduit.

6. Plastic conduit.

7. Tanks that do not have factory-applied final finishes.

3.04 FIELD QUALITY CONTROL

A. Dry Film Thickness Testing: State may engage the services of a qualified testing and inspecting agency to inspect and test paint for dry film thickness.

1. Contractor shall touch up and restore painted surfaces damaged by testing.

2. If test results show that dry film thickness of applied paint does not comply with paint manufacturer's written recommendations, Contractor shall pay for testing and apply additional coats as needed to provide dry film thickness that complies with paint manufacturer's written recommendations.

3.05 CLEANING AND PROTECTION

A. At end of each workday, remove rubbish, empty cans, rags, and other discarded materials from Project site.

B. After completing paint application, clean spattered surfaces. Remove spattered paints by washing, scraping, or other methods. Do not scratch or damage adjacent finished surfaces.

C. Protect work of other trades against damage from paint application. Correct damage to work of other trades by cleaning, repairing, replacing, and refinishing, as approved by State Engineer, and leave in an undamaged condition.

D. At completion of construction activities of other trades, touch up and restore damaged or defaced painted surfaces.

3.06 EXTERIOR PAINTING SCHEDULE

A. Concrete and Portland Cement Plaster Substrates, Non-traffic Surfaces: 100% Acrylic Flat.

1. Prime Coat:

a. Benjamin Moore & Co: 023 Fresh Start Primer
b. Dunn Edwards: UGPR00 Utra-Grip Premium
c. Sherwin-Williams Company (The): A24W300 Loxon Primer
d. Vista Paint: 4600 Uniprime II
e. Or approved equal

2. Intermediate Coat:

a. Benjamin Moore & Co: N105 MooreLife Acrylic Flat
b. Dunn Edwards: EVSH10 Evershield Flat Exterior
c. Sherwin-Williams Company (The): K33 Duration Flat
d. Vista Paint: 2000 Duratone 100% Acrylic Flat
e. Or approved equal

3. Finish Coat:

a. Benjamin Moore & Co: N105 MooreLife Acrylic Flat
b. Dunn Edwards: EVSH10 Evershield Flat Exterior
c. Sherwin-Williams Company (The): K33 Duration Flat
d. Vista Paint: 2000 Duratone 100% Acrylic Flat
e. Or approved equal

B. Concrete and Portland Cement Plaster Substrates, Non-traffic Surfaces: 100% Acrylic Eggshell.

1. Prime Coat:

a. Benjamin Moore & Co: 023 Fresh Start Primer
b. Dunn Edwards: UGPR00 Utra-Grip Premium
c. Sherwin-Williams Company (The): A24W300 Loxon Primer
d. Vista Paint: 4600 Uniprime II

e. Or approved equal

2. Intermediate Coat:

a. Benjamin Moore & Co: 631 Aura Satin Exterior
b. Dunn Edwards: EVSH30 Evershield Eggshell Exterior
c. Sherwin-Williams Company (The): K334 Duration Satin
d. Vista Paint: 8300 Carefree Eggshell 100% Acrylic
e. Or approved equal

3. Finish Coat:

a. Benjamin Moore & Co: 631 Aura Satin Exterior
b. Dunn Edwards: EVSH30 Evershield Eggshell Exterior
c. Sherwin-Williams Company (The): K334 Duration Satin
d. Vista Paint: 8300 Carefree Eggshell 100% Acrylic
e. Or approved equal

C. Concrete and Portland Cement Plaster Substrates, Non-traffic Surfaces: 100% Acrylic Semi Gloss.

1. Prime Coat:

a. Benjamin Moore & Co: 023 Fresh Start Primer
b. Dunn Edwards: UGPR00 Utra-Grip Premium
c. Sherwin-Williams Company (The): A24W300 Loxon Primer
d. Vista Paint: 4600 Uniprime II
e. Or approved equal

2. Intermediate Coat:

a. Benjamin Moore & Co: 096 MoorGlo Semi Gloss
b. Dunn Edwards: EVSH40 Evershield Semi Gloss Exterior
c. Sherwin-Williams Company (The): K34 B42 Metalatex Semi GlossDuration Gloss
d. Vista Paint: 8400 Carefree Semi Gloss 100% Acrylic
e. Or approved equal

3. Finish Coat:

a. Benjamin Moore & Co: 096 MoorGlo Semi Gloss
b. Dunn Edwards: EVSH40 Evershield Semi Gloss Exterior
c. Sherwin-Williams Company (The): K34 Duration GlossB42 Metalatex Semi Gloss
d. Vista Paint: 8400 Carefree Semi Gloss 100% Acrylic
e. Or approved equal

D. Concrete and Portland Cement Plaster Substrates, Non-traffic Surfaces: 100% Acrylic Gloss.

1. Prime Coat:

    a. Benjamin Moore & Co: 023 Fresh Start Primer
    b. Dunn Edwards: UGPR00 Utra-Grip Premium
    c. Sherwin-Williams Company (The): A24W300 Loxon Primer
    d. Vista Paint: 4600 Uniprime II
    e. Or approved equal

2. Intermediate Coat:

    a. Benjamin Moore & Co: 543 Ben Gloss Exterior
    b. Dunn Edwards: EVSH50 Evershield Gloss Exterior
    c. Sherwin-Williams Company (The): A85 Super Paint Gloss
    d. Vista Paint: 8500 Carefree Gloss 100% Acrylic
    e. Or approved equal

3. Finish Coat:

    a. Benjamin Moore & Co: 543 Ben Gloss Exterior
    b. Dunn Edwards: EVSH50 Evershield Gloss Exterior
    c. Sherwin-Williams Company (The): A85 Super Paint Gloss
    d. Vista Paint: 8500 Carefree Gloss 100% Acrylic
    e. Or approved equal

E. CMU Substrates: 100% Acrylic Flat.

1. Prime Coat:

    a. Benjamin Moore & Co: 285 Block Filler
    b. Dunn Edwards: SBPR00 Block Filler
    c. Sherwin-Williams Company (The): B25W25 Block Filler
    d. Vista Paint: 040 Block Filler
    e. Or approved equal

2. Intermediate Coat:

    a. Benjamin Moore & Co: N105 MooreLife Acrylic Flat
    b. Dunn Edwards: EVSH10 Evershield Ext Flat
    c. Sherwin-Williams Company (The): K33 K32 Duration Flat
    d. Vista Paint: 2000 Duratone 100% Acrylic Flat
    e. Or approved equal

3. Finish Coat:

    a. Benjamin Moore & Co: N105 MooreLife Acrylic Flat
    b. Dunn Edwards: EVSH10 Evershield Ext Flat
    c. Sherwin-Williams Company (The): K33 K32 Duration Flat
    d. Vista Paint: 2000 Duratone 100% Acrylic Flat
    e. Or approved equal

F. CMU Substrates: 100% Acrylic Eggshell.

1. Prime Coat:

    a. Benjamin Moore & Co: 285 Block Filler
    b. Dunn Edwards: SBPR00 Block Filler
    c. Sherwin-Williams Company (The): B25W25 Block Filler
    d. Vista Paint: 040 Block Filler
    e. Or approved equal

2. Intermediate Coat:

    a. Benjamin Moore & Co: 631 Aura Satin Exterior
    b. Dunn Edwards: EVSH30 Evershield Eggshell Exterior
    c. Sherwin-Williams Company (The): K334 Duration Satin
    d. Vista Paint: 8300 Carefree Eggshell 100% Acrylic
    e. Or approved equal

3. Finish Coat:

    a. Benjamin Moore & Co: 631 Aura Satin Exterior
    b. Dunn Edwards: EVSH30 Evershield Eggshell Exterior
    c. Sherwin-Williams Company (The): K334 Duration Satin
    d. Vista Paint: 8300 Carefree Eggshell 100% Acrylic
    e. Or approved equal

G. CMU Substrates: 100% Acrylic Semi Gloss.

1. Prime Coat:

    a. Benjamin Moore & Co: 285 Block Filler
    b. Dunn Edwards: SBPR00 Block Filler
    c. Sherwin-Williams Company (The): B25W25 Block Filler
    d. Vista Paint: 040 Block Filler
    e. Or approved equal

2. Intermediate Coat:

    a. Benjamin Moore & Co: 096 MoorGlo Semi Gloss
    b. Dunn Edwards: EVSH40 Evershield Semi Gloss Exterior
    c. Sherwin-Williams Company (The): B42 Metalatex Semi GlossK34 Duration Gloss
    d. Vista Paint: 8400 Carefree Semi Gloss 100% Acrylic
    e. Or approved equal

3. Finish Coat:

    a. Benjamin Moore & Co: 096 MoorGlo Semi Gloss
    b. Dunn Edwards: EVSH40 Evershield Semi Gloss Exterior

c. Sherwin-Williams Company (The): B42 Metalatex Semi GlossK34 Duration Gloss
d. Vista Paint: 8400 Carefree Semi Gloss 100% Acrylic
e. Or approved equal

H. CMU Substrates: 100% Acrylic Gloss.

1. Prime Coat:

a. Benjamin Moore & Co: 285 Block Filler
b. Dunn Edwards: SBPR00 Block Filler
c. Sherwin-Williams Company (The): B25W25 Block Filler
d. Vista Paint: 040 Block Filler
e. Or approved equal

2. Intermediate Coat:

a. Benjamin Moore & Co: 543 Ben Gloss Exterior
b. Dunn Edwards: EVSH50 Evershield Gloss Exterior
c. Sherwin-Williams Company (The): A85 Super Paint Gloss
d. Vista Paint: 8500 Carefree Gloss 100% Acrylic
e. Or approved equal

3. Finish Coat:

a. Benjamin Moore & Co: 543 Ben Gloss Exterior
b. Dunn Edwards: EVSH50 Evershield Gloss Exterior
c. Sherwin-Williams Company (The): A85 Super Paint Gloss
d. Vista Paint: 8500 Carefree Gloss 100% Acrylic
e. Or approved equal

I. Ferrous Metal Substrate: 100% Acrylic Semi Gloss.

1. Prime Coat:

a. Benjamin Moore & Co: M04 Acrylic Prime
b. Dunn Edwards: UGPR00 Utra-Grip Premium
c. Sherwin-Williams Company (The): B66W1 DTM Acrylic Primer
d. Vista Paint: 9600 Protec Primer
e. Or approved equal

2. Intermediate Coat:

a. Benjamin Moore & Co: 096 MoorGlo Semi Gloss
b. Dunn Edwards: EVSH40 Evershield Semi Gloss Exterior
c. Sherwin-Williams Company (The): B42 Metalatex Semi GlossK34 Duration Gloss
d. Vista Paint: 8400 Carefree Semi Gloss 100% Acrylic
e. Or approved equal

3. Finish Coat:

    a. Benjamin Moore & Co: 096 MoorGlo Semi Gloss
    b. Dunn Edwards: EVSH40 Evershield Semi Gloss Exterior
    c. Sherwin-Williams Company (The): B42 Metalatex Semi GlossK34 Duration Gloss
    d. Vista Paint: 8400 Carefree Semi Gloss 100% Acrylic
    e. Or approved equal

J. Galvanized and Aluminum Metal Substrates: 100% Acrylic Semi Gloss.

1. Prime Coat:

    a. Benjamin Moore & Co: M04 Acrylic Prime
    b. Dunn Edwards: GAPR00 Galv-Alum Premium
    c. Sherwin-Williams Company (The): B66A50 DTM Bonding Primer
    d. Vista Paint: 4800 Metal Pro Primer
    e. Or approved equal

2. Intermediate Coat:

    a. Benjamin Moore & Co: 096 MoorGlo Semi Gloss
    b. Dunn Edwards: EVSH40 Evershield Semi Gloss Exterior
    c. Sherwin-Williams Company (The): B42 Metalatex Semi GlossK34 Duration Gloss
    d. Vista Paint: 8400 Carefree Semi Gloss 100% Acrylic
    e. Or approved equal

3. Finish Coat:

    a. Benjamin Moore & Co: 096 MoorGlo Semi Gloss
    b. Dunn Edwards: EVSH40 Evershield Semi Gloss Exterior
    c. Sherwin-Williams Company (The): B42 Metalatex Semi GlossK34 Duration Gloss
    d. Vista Paint: 8400 Carefree Semi Gloss 100% Acrylic
    e. Or approved equal

PART 4 - MEASUREMENT AND PAYMENT

4.01 BASIS OF MEASUREMENT AND PAYMENT

Work under this Section will not be measured nor paid for separately but shall be considered incidental to and included in the bid prices for the various items of work in this project.

END OF SECTION

SECTION 09912 - INTERIOR PAINTING

PART 1 - GENERAL

1.01 RELATED DOCUMENTS

The General Provisions for Construction Projects (2016), Special Provisions and General Requirements of the Specifications, apply to the work specified in this Section.

1.02 SUMMARY

A. Section includes surface preparation and the application of paint systems on the following interior substrates:

1. Concrete.
2. Concrete masonry units (CMU).
3. Steel.
4. Cast iron.
5. Galvanized metal.
6. Aluminum (not anodized or otherwise coated).
7. Gypsum board.

B. Related Requirements: SECTION 09911 - EXTERIOR PAINTING: For surface preparation and the application of paint systems on exterior substrates.

1.03 DEFINITIONS

A. Gloss Level 1: Not more than 5 units at 60 degrees and 10 units at 85 degrees, according to ASTM D 523.

B. Gloss Level 2: Not more than 10 units at 60 degrees and 10 to 35 units at 85 degrees, according to ASTM D 523.

C. Gloss Level 3: 10 to 25 units at 60 degrees and 10 to 35 units at 85 degrees, according to ASTM D 523.

D. Gloss Level 4: 20 to 35 units at 60 degrees and not less than 35 units at 85 degrees, according to ASTM D 523.

E. Gloss Level 5: 35 to 70 units at 60 degrees, according to ASTM D 523.

F. Gloss Level 6: 70 to 85 units at 60 degrees, according to ASTM D 523.

G. Gloss Level 7: More than 85 units at 60 degrees, according to ASTM D 523.

1.04 SUBMITTALS

A. Submit in accordance with SECTION 01300 - SUBMITTALS.

B. Product Data: For each type of product. Include preparation requirements and application instructions.

C. Samples for Verification: For each type of paint system and in each color and gloss of topcoat.

1. Submit Samples on rigid backing, 8 inches square.

2. Step coats on Samples to show each coat required for system.

3. Label each coat of each Sample.

4. Label each Sample for location and application area.

D. Product List: For each product indicated, include the following:

1. Cross-reference to paint system and locations of application areas. Use same designations indicated on Drawings and in schedules.

2. VOC content.

E. Furnish extra materials, from the same product run, that match products installed and that are packaged with protective covering for storage and identified with labels describing contents. Paint: 5 percent, but not less than 1 gal. of each material and color applied.

1.05 QUALITY ASSURANCE

A. Mockups: Apply mockups of each paint system indicated and each color and finish selected to verify preliminary selections made under Sample submittals and to demonstrate aesthetic effects and set quality standards for materials and execution.

1. State Engineer will select one surface to represent surfaces and conditions for application of each paint system specified in Part 3.

a. Vertical and Horizontal Surfaces: Provide samples of at least 100 sq ft.
b. Other Items: State Engineer will designate items or areas required.

2. Final approval of color selections will be based on mockups. If preliminary color selections are not approved, apply additional mockups of additional colors selected by State Engineer at no added cost to State.

3. Approval of mockups does not constitute approval of deviations from the Contract Documents contained in mockups unless State Engineer specifically approves such deviations in writing.

4. Subject to compliance with requirements, approved mockups may become part of the completed Work if undisturbed at time of Substantial Completion.

1.06 DELIVERY, STORAGE, AND HANDLING

A. Store materials not in use in tightly covered containers in well-ventilated areas with ambient temperatures continuously maintained at not less than 45 deg F.

1. Maintain containers in clean condition, free of foreign materials and residue.

2. Remove rags and waste from storage areas daily.

1.07 FIELD CONDITIONS

A. Apply paints only when temperature of surfaces to be painted and ambient air temperatures are between 50 and 95 deg F.

B. Do not apply paints when relative humidity exceeds 85 percent; at temperatures less than 5 deg F above the dew point; or to damp or wet surfaces.

1.08 WARRANTY

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

B. The Contractor shall warrant a mildew free surface for a period of one year from the project acceptance date. Should mildew formation occur on surfaces painted under this project within the one year, the Contractor shall clean such surfaces at no additional cost to the State.

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

PART 2 - PRODUCTS

2.01 MANUFACTURERS

A. Manufacturers: Subject to compliance with requirements, provide products by one of the following:

1. Benjamin Moore & Co.

2. Dunn-Edwards Paint Co.

3. Sherwin-Williams Company.

4. Vista Paint Corporation.

5. Or Approved Equal.

B. Products: Subject to compliance with requirements, available products that may be incorporated into the Work include, but are not limited to products listed in other Part 2 articles for the paint category indicated.

2.02 PAINT, GENERAL

A. Material Compatibility:

1. Provide materials for use within each paint system that are compatible with one another and substrates indicated, under conditions of service and application as demonstrated by manufacturer, based on testing and field experience.

2. For each coat in a paint system, provide products recommended in writing by manufacturers of topcoat for use in paint system and on substrate indicated.

B. VOC Content: Products shall comply with VOC limits of authorities having jurisdiction.

C. Colors: As indicated in ”Finish Legend” on Drawings.

2.03 SOURCE QUALITY CONTROL

A. Testing of Paint Materials: State reserves the right to invoke the following procedure:

1. State will engage the services of a qualified testing agency to sample paint materials. Contractor will be notified in advance and may be present when samples are taken. If paint materials have already been delivered to Project site, samples may be taken at Project site. Samples will be identified, sealed, and certified by testing agency.

2. Testing agency will perform tests for compliance with product requirements.

3. State may direct Contractor to stop applying coatings if test results show materials being used do not comply with product requirements. Contractor shall remove noncomplying paint materials from Project site, pay for testing, and repaint surfaces painted with rejected materials. Contractor will be required to remove rejected materials from previously painted surfaces if, on repainting with complying materials, the two paints are incompatible.

PART 3 - EXECUTION

3.01 EXAMINATION

A. Examine substrates and conditions, with Applicator present, for compliance with requirements for maximum moisture content and other conditions affecting performance of the Work.

B. Maximum Moisture Content of Substrates: When measured with an electronic moisture meter as follows:

1. Concrete: 12 percent.

2. Masonry (Clay and CMU): 12 percent.

3. Gypsum Board: 12 percent.

4. Plaster: 12 percent.

C. Gypsum Board Substrates: Verify that finishing compound is sanded smooth.

D. Verify suitability of substrates, including surface conditions and compatibility with existing finishes and primers.

E. Proceed with coating application only after unsatisfactory conditions have been corrected. Application of coating indicates acceptance of surfaces and conditions.

3.02 PREPARATION

A. Comply with manufacturer's written instructions and recommendations in "MPI Manual" applicable to substrates indicated.

B. Remove hardware, covers, plates, and similar items already in place that are removable and are not to be painted. If removal is impractical or impossible because of size or weight of item, provide surface-applied protection before surface preparation and painting. After completing painting operations, use workers skilled in the trades involved to reinstall items that were removed. Remove surface-applied protection if any.

C. Clean substrates of substances that could impair bond of paints, including dust, dirt, oil, grease, and incompatible paints and encapsulants. Remove incompatible primers and reprime substrate with compatible primers or apply tie coat as required to produce paint systems indicated.

D. Concrete Substrates: Remove release agents, curing compounds, efflorescence, and chalk. Do not paint surfaces if moisture content or alkalinity of surfaces to be painted exceeds that permitted in manufacturer's written instructions.

E. Masonry Substrates: Remove efflorescence and chalk. Do not paint surfaces if moisture content or alkalinity of surfaces or mortar joints exceed that permitted in manufacturer's written instructions.

F. Steel Substrates: Remove rust, loose mill scale, and shop primer, if any. Clean using methods recommended in writing by paint manufacturer. but not less than the following: SSPC-SP 7/NACE No. 4, "Brush-off Blast Cleaning."

G. Shop-Primed Steel Substrates: Clean field welds, bolted connections, and abraded areas of shop paint, and paint exposed areas with the same material as used for shop priming to comply with SSPC-PA 1 for touching up shop-primed surfaces.

H. Galvanized-Metal Substrates: Remove grease and oil residue from galvanized sheet metal fabricated from coil stock by mechanical methods to produce clean, lightly etched surfaces that promote adhesion of subsequently applied paints.

I. Aluminum Substrates: Remove loose surface oxidation.

J. Cotton or Canvas Insulation Covering Substrates: Remove dust, dirt, and other foreign material that might impair bond of paints to substrates.

3.03 APPLICATION

A. Apply paints according to manufacturer's written instructions and to recommendations in "MPI Manual."

1. Use applicators and techniques suited for paint and substrate indicated.

2. Paint surfaces behind movable equipment and furniture same as similar exposed surfaces. Before final installation, paint surfaces behind permanently fixed equipment or furniture with prime coat only.

3. Paint front and backsides of access panels, removable or hinged covers, and similar hinged items to match exposed surfaces.

4. Do not paint over labels of independent testing agencies or equipment name, identification, performance rating, or nomenclature plates.

5. Primers specified in painting schedules may be omitted on items that are factory primed or factory finished if acceptable to topcoat manufacturers.

B. Tint each undercoat a lighter shade to facilitate identification of each coat if multiple coats of same material are to be applied. Tint undercoats to match color of topcoat, but provide sufficient difference in shade of undercoats to distinguish each separate coat.

C. If undercoats or other conditions show through topcoat, apply additional coats until cured film has a uniform paint finish, color, and appearance.

D. Apply paints to produce surface films without cloudiness, spotting, holidays, laps, brush marks, roller tracking, runs, sags, ropiness, or other surface imperfections. Cut in sharp lines and color breaks.

E. Painting Fire Suppression, Plumbing, HVAC, Electrical, Communication, and Electronic Safety and Security Work:

1. Paint the following work where exposed in equipment rooms:

a. Equipment, including panelboards.
b. Uninsulated metal piping.
c. Uninsulated plastic piping.
d. Pipe hangers and supports.
e. Metal conduit.
f. Plastic conduit.
g. Tanks that do not have factory-applied final finishes.
h. Duct, equipment, and pipe insulation having cotton or canvas insulation covering or other paintable jacket material.

2. Paint the following work where exposed in occupied spaces:

a. Equipment, including panelboards.
b. Uninsulated metal piping.
c. Uninsulated plastic piping.
d. Pipe hangers and supports.
e. Metal conduit.
f. Plastic conduit.
g. Duct, equipment, and pipe insulation having cotton or canvas insulation covering or other paintable jacket material.
h. Other items as directed by State Engineer.

3. Paint portions of internal surfaces of metal ducts, without liner, behind air inlets and outlets that are visible from occupied spaces.

3.04 FIELD QUALITY CONTROL

A. Dry Film Thickness Testing: State may engage the services of a qualified testing and inspecting agency to inspect and test paint for dry film thickness.

1. Contractor shall touch up and restore painted surfaces damaged by testing.

2. If test results show that dry film thickness of applied paint does not comply with paint manufacturer's written recommendations, Contractor shall pay for testing and apply additional coats as needed to provide dry film thickness that complies with paint manufacturer's written recommendations.

3.05 CLEANING AND PROTECTION

A. At end of each workday, remove rubbish, empty cans, rags, and other discarded materials from Project site.

B. After completing paint application, clean spattered surfaces. Remove spattered paints by washing, scraping, or other methods. Do not scratch or damage adjacent finished surfaces.

C. Protect work of other trades against damage from paint application. Correct damage to work of other trades by cleaning, repairing, replacing, and refinishing, as approved by State Engineer, and leave in an undamaged condition.

D. At completion of construction activities of other trades, touch up and restore damaged or defaced painted surfaces.

3.06 INTERIOR PAINTING SCHEDULE

A. Concrete and Portland Cement Plaster Substrates, Non-traffic Surfaces: 100% Acrylic Flat

1. Prime Coat:

    a. Benjamin Moore & Co: 023 Fresh Start Primer
    b. Dunn Edwards: ESPR00 Eff-Stop Premium
    c. Sherwin-Williams Company (The): A24W8300 Loxon Primer
    d. Vista Paint: 4600 Uniprime II
    e. Or approved equal

2. Intermediate Coat:

    a. Benjamin Moore & Co: W625 Ben Int. Acrylic Flat
    b. Dunn Edwards: SPMA10 Suprema Int Flat
    c. Sherwin-Williams Company (The): A96 Duration Flat
    d. Vista Paint: 8100/6100 Carefree Acrylic Flat
    e. Or approved equal

3. Finish Coat:

    a. Benjamin Moore & Co: W625 Ben Int. Acrylic Flat
    b. Dunn Edwards: SPMA10 Suprema Int Flat
    c. Sherwin-Williams Company (The): A96 Duration Flat
    d. Vista Paint: 8100/6100 Carefree Acrylic Flat
    e. Or approved equal

B. Concrete and Portland Cement Plaster Substrates, Non-traffic Surfaces: 100% Acrylic Eggshell

1. Prime Coat:

    a. Benjamin Moore & Co: 023 Fresh Start Primer
    b. Dunn Edwards: UGPR00 Utra-Grip Premium
    c. Sherwin-Williams Company (The): A24W300 Loxon Primer
    d. Vista Paint: 4600 Uniprime II
    e. Or approved equal

2. Intermediate Coat:

    a. Benjamin Moore & Co: W626 Ben Acrylic Eggshell
    b. Dunn Edwards: SPMA30 Suprema Eggshell Interior
    c. Sherwin-Williams Company (The): A97 Duration Satin
    d. Vista Paint: 8300 Carefree Eggshell 100% Acrylic
    e. Or approved equal

3. Finish Coat:

    a. Benjamin Moore & Co: W626 Ben Acrylic Eggshell
    b. Dunn Edwards: SPMA30 Suprema Eggshell Interior
    c. Sherwin-Williams Company (The): A97 Duration Satin
    d. Vista Paint: 8300 Carefree Eggshell 100% Acrylic
    e. Or approved equal

C. Concrete and Portland Cement Plaster Substrates, Non-traffic Surfaces: 100% Acrylic Semi Gloss

1. Prime Coat:

    a. Benjamin Moore & Co: 023 Fresh Start Primer
    b. Dunn Edwards: UGPR00 Utra-Grip Premium
    c. Sherwin-Williams Company (The): A24W300 Loxon Primer
    d. Vista Paint: 4600 Uniprime II
    e. Or approved equal

2. Intermediate Coat:

    a. Benjamin Moore & Co: W627 Ben Acrylic Semi Gloss
    b. Dunn Edwards: SPMA40 Suprema Semi Gloss Interior
    c. Sherwin-Williams Company (The): A98 Duration Semi Gloss
    d. Vista Paint: 8400 Carefree Semi Gloss 100% Acrylic
    e. Or approved equal

3. Finish Coat:

    a. Benjamin Moore & Co: W627 Ben Acrylic Semi Gloss

b. Dunn Edwards: SPMA40 Suprema Semi Gloss Interior
c. Sherwin-Williams Company (The): A98 Duration Semi Gloss
d. Vista Paint: 8400 Carefree Semi Gloss 100% Acrylic
e. Or approved equal

D. Concrete and Portland Cement Plaster Substrates, Non-traffic Surfaces: 100% Acrylic Gloss

1. Prime Coat:

a. Benjamin Moore & Co: 023 Fresh Start Primer
b. Dunn Edwards: UGPR00 Utra-Grip Premium
c. Sherwin-Williams Company (The): A24W300 Loxon Primer
d. Vista Paint: 4600 Uniprime II
e. Or approved equal

2. Intermediate Coat:

a. Benjamin Moore & Co: NA
b. Dunn Edwards: SPMA50 Suprema Gloss Interior
c. Sherwin-Williams Company (The): A85 Super Paint Gloss
d. Vista Paint: 8500 Carefree Gloss 100% Acrylic
e. Or approved equal

3. Finish Coat:

a. Benjamin Moore & Co: NA
b. Dunn Edwards: SPMA50 Suprema Gloss Interior
c. Sherwin-Williams Company (The): A85 Super Paint Gloss
d. Vista Paint: 8500 Carefree Gloss 100% Acrylic
e. Or approved equal

E. CMU Substrates: 100% Acrylic Flat

1. Prime Coat:

a. Benjamin Moore & Co: 285 Block Filler
b. Dunn Edwards: SBPR00 Block Filler
c. Sherwin-Williams Company (The): B25W25 Block Filler
d. Vista Paint: 040 Block Filler
e. Or approved equal

2. Intermediate Coat:

a. Benjamin Moore & Co: W625 Ben Int. Acrylic Flat
b. Dunn Edwards: SPMA10 Suprema Int Flat
c. Sherwin-Williams Company (The): A96 Duration Flat
d. Vista Paint: 8100/6100 Carefree Acrylic Flat
e. Or approved equal

3. Finish Coat:

    a. Benjamin Moore & Co: W625 Ben Int. Acrylic Flat
    b. Dunn Edwards: SPMA10 Suprema Int Flat
    c. Sherwin-Williams Company (The): A96 Duration Flat
    d. Vista Paint: 8100/6100 Carefree Acrylic Flat
    e. Or approved equal

F. CMU Substrates: 100% Acrylic Eggshell

1. Prime Coat:

    a. Benjamin Moore & Co: 285 Block Filler
    b. Dunn Edwards: SBPR00 Block Filler
    c. Sherwin-Williams Company (The): B25W25 Block Filler
    d. Vista Paint: 040 Block Filler
    e. Or approved equal

2. Intermediate Coat:

    a. Benjamin Moore & Co: W626 Ben Acrylic Eggshell
    b. Dunn Edwards: SPMA30 Suprema Eggshell Interior
    c. Sherwin-Williams Company (The): A97 Duration Satin
    d. Vista Paint: 8300 Carefree Eggshell 100% Acrylic
    e. Or approved equal

3. Finish Coat:

    a. Benjamin Moore & Co: W626 Ben Acrylic Eggshell
    b. Dunn Edwards: SPMA30 Suprema Eggshell Interior
    c. Sherwin-Williams Company (The): A97 Duration Satin
    d. Vista Paint: 8300 Carefree Eggshell 100% Acrylic
    e. Or approved equal

G. CMU Substrates: 100% Acrylic Semi Gloss

1. Prime Coat:

    a. Benjamin Moore & Co: 285 Block Filler
    b. Dunn Edwards: SBPR00 Block Filler
    c. Sherwin-Williams Company (The): B25W25 Block Filler
    d. Vista Paint: 040 Block Filler
    e. Or approved equal

2. Intermediate Coat:

    a. Benjamin Moore & Co: W627 Ben Acrylic Semi Gloss
    b. Dunn Edwards: SPMA40 Suprema Semi Gloss Interior
    c. Sherwin-Williams Company (The): A98 Duration Semi Gloss

d. Vista Paint: 8400 Carefree Semi Gloss 100% Acrylic
e. Or approved equal

3. Finish Coat:

a. Benjamin Moore & Co: W627 Ben Acrylic Semi Gloss
b. Dunn Edwards: SPMA40 Suprema Semi Gloss Interior
c. Sherwin-Williams Company (The): A98 Duration Semi Gloss
d. Vista Paint: 8400 Carefree Semi Gloss 100% Acrylic
e. Or approved equal

H. CMU Substrates: 100% Acrylic Gloss

1. Prime Coat:

a. Benjamin Moore & Co: 285 Block Filler
b. Dunn Edwards: SBPR00 Block Filler
c. Sherwin-Williams Company (The): B25W25 Block Filler
d. Vista Paint: 040 Block Filler
e. Or approved equal

2. Intermediate Coat:

a. Benjamin Moore & Co: NA
b. Dunn Edwards: SPMA50 Suprema Gloss Interior
c. Sherwin-Williams Company (The): A85 Super Paint Gloss
d. Vista Paint: 8500 Carefree Gloss 100% Acrylic
e. Or approved equal

3. Finish Coat:

a. Benjamin Moore & Co: NA
b. Dunn Edwards: SPMA50 Suprema Gloss Interior
c. Sherwin-Williams Company (The): A85 Super Paint Gloss
d. Vista Paint: 8500 Carefree Gloss 100% Acrylic
e. Or approved equal

I. Ferrous Metal Substrate: 100% Acrylic Semi Gloss

1. Prime Coat:

a. Benjamin Moore & Co: M04 Acrylic Prime
b. Dunn Edwards: UGPR00 Utra-Grip Premium
c. Sherwin-Williams Company (The): B66W1 DTM Acrylic Primer
d. Vista Paint: 9600 Protec Primer
e. Or approved equal

2. Intermediate Coat:

    a. Benjamin Moore & Co: W627 Ben Acrylic Semi Gloss
    b. Dunn Edwards: SPMA40 Suprema Semi Gloss Interior
    c. Sherwin-Williams Company (The): A98 Duration Semi Gloss
    d. Vista Paint: 8400 Carefree Semi Gloss 100% Acrylic
    e. Or approved equal

3. Finish Coat:

    a. Benjamin Moore & Co: W627 Ben Acrylic Semi Gloss
    b. Dunn Edwards: SPMA40 Suprema Semi Gloss Interior
    c. Sherwin-Williams Company (The): A98 Duration Semi Gloss
    d. Vista Paint: 8400 Carefree Semi Gloss 100% Acrylic
    e. Or approved equal

J. Galvanized and Aluminum Metal Substrates: 100% Acrylic Semi Gloss

1. Prime Coat:

    a. Benjamin Moore & Co: M04 Acrylic Prime
    b. Dunn Edwards: GAPR00 Galv-Alum Premium
    c. Sherwin-Williams Company (The): B66A50 DTM Bonding Primer
    d. Vista Paint: 4800 Metal Pro Primer
    e. Or approved equal

2. Intermediate Coat:

    a. Benjamin Moore & Co: W627 Ben Acrylic Semi Gloss
    b. Dunn Edwards: SPMA40 Suprema Semi Gloss Interior
    c. Sherwin-Williams Company (The): A98 Duration Semi Gloss
    d. Vista Paint: 8400 Carefree Semi Gloss 100% Acrylic
    e. Or approved equal

3. Finish Coat:

    a. Benjamin Moore & Co: W627 Ben Acrylic Semi Gloss
    b. Dunn Edwards: SPMA40 Suprema Semi Gloss Interior
    c. Sherwin-Williams Company (The): A98 Duration Semi Gloss
    d. Vista Paint: 8400 Carefree Semi Gloss 100% Acrylic
    e. Or approved equal

K. Gypsum Wallboard Substrates: 100% Acrylic Flat

1. Prime Coat:

    a. Benjamin Moore & Co: 023 Fresh Start Primer
    b. Dunn Edwards: VNPR00 PVA Sealer

c. Sherwin-Williams Company (The): B28W08111 Premium Wall & Wood Primer
d. Vista Paint: 1100 Hi Build PVA Sealer
e. Or approved equal

2. Intermediate Coat:

a. Benjamin Moore & Co: W625 Ben Int. Acrylic Flat
b. Dunn Edwards: SPMA10 Suprema Int Flat
c. Sherwin-Williams Company (The): A96 Duration Flat
d. Vista Paint: 8100/6100 Carefree Acrylic Flat
e. Or approved equal

3. Finish Coat:

a. Benjamin Moore & Co: W625 Ben Int. Acrylic Flat
b. Dunn Edwards: SPMA10 Suprema Int Flat
c. Sherwin-Williams Company (The): A96 Duration Flat
d. Vista Paint: 8100/6100 Carefree Acrylic Flat
e. Or approved equal

L. Gypsum Wallboard Substrates: 100% Acrylic Eggshell

1. Prime Coat:

a. Benjamin Moore & Co: 023 Fresh Start Primer
b. Dunn Edwards: VNPR00 PVA Sealer
c. Sherwin-Williams Company (The): B28W08111 Premium Wall & Wood Primer
d. Vista Paint: 1100 Hi Build PVA Sealer
e. Or approved equal

2. Intermediate Coat:

a. Benjamin Moore & Co: W626 Ben Acrylic Eggshell
b. Dunn Edwards: SPMA30 Suprema Eggshell Interior
c. Sherwin-Williams Company (The): A97 Duration Satin
d. Vista Paint: 8300 Carefree Eggshell 100% Acrylic
e. Or approved equal

3. Finish Coat:

a. Benjamin Moore & Co: W626 Ben Acrylic Eggshell
b. Dunn Edwards: SPMA30 Suprema Eggshell Interior
c. Sherwin-Williams Company (The): A97 Duration Satin
d. Vista Paint: 8300 Carefree Eggshell 100% Acrylic
e. Or approved equal

M. Gypsum Wallboard Substrates: 100% Acrylic Semi Gloss

1. Prime Coat:

    a. Benjamin Moore & Co: 023 Fresh Start Primer
    b. Dunn Edwards: VNPR00 PVA Sealer
    c. Sherwin-Williams Company (The): B28W08111 Premium Wall & Wood Primer
    d. Vista Paint**:** 1100 Hi Build PVA Sealer
    e. Or approved equal

2. Intermediate Coat:

    a. Benjamin Moore & Co: W627 Ben Acrylic Semi Gloss
    b. Dunn Edwards: SPMA40 Suprema Semi Gloss Interior
    c. Sherwin-Williams Company (The): A98 Duration Semi Gloss
    d. Vista Paint: 8400 Carefree Semi Gloss 100% Acrylic
    e. Or approved equal

3. Finish Coat:

    a. Benjamin Moore & Co: W627 Ben Acrylic Semi Gloss
    b. Dunn Edwards: SPMA40 Suprema Semi Gloss Interior
    c. Sherwin-Williams Company (The): A98 Duration Semi Gloss
    d. Vista Paint: 8400 Carefree Semi Gloss 100% Acrylic
    e. Or approved equal

N. Gypsum Wallboard Substrates: 100% Acrylic Gloss

1. Prime Coat:

    a. Benjamin Moore & Co: 023 Fresh Start Primer
    b. Dunn Edwards: VNPR00 PVA Sealer
    c. Sherwin-Williams Company (The): B28W08111 Premium Wall & Wood Primer
    d. Vista Paint: 1100 Hi Build PVA Sealer
    e. Or approved equal

2. Intermediate Coat:

    a. Benjamin Moore & Co: NA
    b. Dunn Edwards: SPMA50 Suprema Gloss Interior
    c. Sherwin-Williams Company (The): A85 Super Paint Gloss
    d. Vista Paint: 8500 Carefree Gloss 100% Acrylic
    e. Or approved equal

3. Finish Coat:

    a. Benjamin Moore & Co: NA
    b. Dunn Edwards: SPMA50 Suprema Gloss Interior
    c. Sherwin-Williams Company (The): A85 Super Paint Gloss
    d. Vista Paint: 8500 Carefree Gloss 100% Acrylic
    e. Or approved equal

PART 4 - MEASUREMENT AND PAYMENT

4.01 BASIS OF MEASUREMENT AND PAYMENT

Work under this Section will not be measured nor paid for separately but shall be considered incidental to and included in the bid prices for the various items of work in this project.

END OF SECTION

DIVISION 10 – SPECIALTIES

SECTION 10260 - WALL AND DOOR PROTECTION

PART 1 - GENERAL

1.01 RELATED DOCUMENTS

The General Provisions for Construction Projects (2016), Special Provisions and General Requirements of the Specifications, apply to the work specified in this Section.

1.02 SUMMARY

A. Section Includes:

1. Corner guards

B. Related Requirements:

1. SECTION 08710 - DOOR HARDWARE: For metal protective trim units, according to BHMA A156.6, used for armor, kick, mop, and push plates.

1.03 SUBMITTALS

A. Submit in accordance with SECTION 01300 - SUBMITTALS.

B. Product Data: For each type of product.

1. Include construction details, material descriptions, impact strength, dimensions of individual components and profiles, and finishes.

C. Shop Drawings: For each type of wall and door protection showing locations and extent.

1. Include plans, elevations, sections, and attachment details.

D. Samples for Verification: For each type of exposed finish on the following products, prepared on Samples of size indicated below:

1. Corner Guards: 12 inches long.

1.04 DELIVERY, STORAGE, AND HANDLING

A. Store wall and door protection in original undamaged packages and containers inside well-ventilated area protected from weather, moisture, soiling, extreme temperatures, and humidity.

1. Maintain room temperature within storage area at not less than 70 deg F during the period plastic materials are stored.

2. Keep plastic materials out of direct sunlight.

3. Store plastic wall- and door-protection components for a minimum of 72 hours, or until plastic material attains a minimum room temperature of 70 deg F.

    a. Store corner-guard covers in a vertical position.
    b. Store wall-guard covers in a horizontal position.

PART 2 - PRODUCTS

2.01 MANUFACTURERS

Source Limitations: Obtain wall- and door-protection products of each type from single source from single manufacturer.

2.02 PERFORMANCE REQUIREMENTS

A. Surface Burning Characteristics: Comply with ASTM E 84 or UL 723; testing by a qualified testing agency. Identify products with appropriate markings of applicable testing agency.

    1. Flame-Spread Index: 25 or less.

    2. Smoke-Developed Index: 450 or less.

B. Regulatory Requirements: Comply with applicable provisions in the U.S. Architectural & Transportation Barriers Compliance Board's ADA-ABA Accessibility Guidelines for Buildings and Facilities and 2018 IBC.

2.03 CORNER GUARDS

A. Surface-Mounted, Metal Corner Guards: Fabricated as one piece from formed or extruded metal with formed edges; with 90- or 135-degree turn to match wall condition.

    1. Material: Stainless-steel sheet, Type 304.

        a. Finish: Directional satin, No. 4.

    2. Wing Size: Nominal 2 by 2 inches.

    3. Corner Radius: 1/8 inch.

    4. Mounting: Oval head, countersunk screws through factory-drilled mounting holes.

2.04 MATERIALS

A. Fasteners: Aluminum, nonmagnetic stainless-steel, or other noncorrosive metal screws, bolts, and other fasteners compatible with items being fastened. Use security-type fasteners where exposed to view.

B. Adhesive: As recommended by protection product manufacturer.

2.05 FABRICATION

A. Fabricate wall and door protection according to requirements indicated for design, performance, dimensions, and member sizes, including thicknesses of components.

B. Quality: Fabricate components with uniformly tight seams and joints and with exposed edges rolled. Provide surfaces free of wrinkles, chips, dents, uneven coloration, and other imperfections. Fabricate members and fittings to produce flush, smooth, and rigid hairline joints.

2.06 FINISHES

A. Protect finishes on exposed surfaces from damage by applying a strippable, temporary protective covering before shipping.

B. Appearance of Finished Work: Noticeable variations in same piece are not acceptable. Variations in appearance of adjoining components are acceptable if they are within the range of approved Samples and are assembled or installed to minimize contrast.

PART 3 - EXECUTION

3.01 EXAMINATION

A. Examine substrates and wall areas, with Installer present, for compliance with requirements for installation tolerances and other conditions affecting performance of the Work.

B. Examine walls to which wall and door protection will be attached for blocking, grounds, and other solid backing that have been installed in the locations required for secure attachment of support fasteners.

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

3.02 PREPARATION

A. Complete finishing operations, including painting, before installing wall and door protection.

B. Before installation, clean substrate to remove dust, debris, and loose particles.

3.03 INSTALLATION

A. Installation Quality: Install wall and door protection according to manufacturer's written instructions, level, plumb, and true to line without distortions. Do not use materials with chips, cracks, voids, stains, or other defects that might be visible in the finished Work.

B. Mounting Heights: Install wall and door protection in locations and at mounting heights indicated on Drawings.

C. Accessories: Provide splices, mounting hardware, anchors, trim, joint moldings, and other accessories required for a complete installation.

1. Provide anchoring devices and suitable locations to withstand imposed loads.

2. Where splices occur in horizontal runs of more than 20 feet, splice aluminum retainers and plastic covers at different locations along the run, but no closer than 12 inches apart.

3. Adjust end and top caps as required to ensure tight seams.

3.04 CLEANING

A. Immediately after completion of installation, clean plastic covers and accessories using a standard ammonia-based household cleaning agent.

B. Remove excess adhesive using methods and materials recommended in writing by manufacturer.

PART 4 - MEASUREMENT AND PAYMENT

4.01 BASIS OF MEASUREMENT AND PAYMENT

Work under this Section will not be measured nor paid for separately but shall be considered incidental to and included in the bid prices for the various items of work in this project.

END OF SECTION

SECTION 10440 – SIGNAGE

PART 1 - GENERAL

1.01 RELATED DOCUMENTS

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

1.02 DESCRIPTION OF WORK

A. This project involves construction of an acrylic plaque system with photopolymer face panels; and overhead, backlit aluminum sign boxes with translucent acrylic face. Dynamic digital signage shall also be provided and installed.

B. Each required sign type is specified by the sign detail drawings. The Contractor shall develop construction details and internal engineering in the shop drawings. Final responsibility for the development and execution of detail drawings rests with the Contractor, who will field verify existing conditions and submit shop drawings with registered Engineer's seal confirming integrity of attachments.

C. Design Requirements:

1. Signage frame shall be constructed of extruded or die cast aluminum.

2. All welds shall be internal.

3. No external fasteners are to be used except where explicitly directed.

4. All metal surfaces shall be pretreated and finished as noted in the drawings

5. All signage will be capable of wall mounting.

1.03 SUBMITTALS

A. Submit in accordance with SECTION 01300 – SUBMITTALS.

B. Product Data: Provide to State Engineer information and order numbers for all materials used in fabrication and installation of signs in standard printed published form including performance criteria. Include manufacturer's instructions for applications, construction details, profiles and finishes for each material and type of sign required. Also provide a list of all materials used in the coating system, and all Material Safety Data Sheets. Include cut sheets for dynamic signage.

C. Shop Drawings: For each type of sign required, provide electronic PDF drawings including dimensions, Sections and call-outs of all materials. Drawings to include plans and elevations at sign locations, and small-scale layouts of all copy applications with indication of colors. Show and indicate all anchorages and accessory items. Drawings are subject to State Engineer's approval prior to

fabrication.

D. Sign Message Layouts: Provide drawings with scaled images of each sign message incorporating all text, and other graphics for review. Drawings are subject to State Engineer's approval prior to fabrication. The State Engineer reserves the Fight to alter sign messages without allowing additional cost until the final message layouts are approved providing sign sizes are not increased.

E. Samples: For each type of material and finish specified, Contractor is to provide State Engineer with 4-inch square samples (4 each of all materials/finishes) clearly labeled with COIOF, material number and product order number. Samples are subject to State Engineer's approval prior to fabrication.

F. Prototype's: For each type of sign required, Contractor is to provide State Engineer with example/sample of sign in actual size of scale version, sufficient to demonstrate product quality and function. Prototypes are subject to State Engineer's approval prior to fabrication.

G. Warranty Documentation: The contractor shall provide a compiled list of manufacturers' warranties for all components used in this project. In addition, the contractor shall provide complete documentation for the systems covered in this project.

H. Record Documentation: Record drawings and specifications shall comply with the requirements of Division 01. The Contractor shall maintain a clean, undamaged set of black line prints of both the Contract Drawings and Shop Drawings. The contractor shall mark the set to show the actual installation where the installed work varies substantially from the work as originally shown. Mark whichever drawing is most capable of showing the actual "field" condition fully and accurately. Where Shop Drawings are used for mark-up, record a cross-reference at the corresponding location on the Contract Drawings. Give particular attention to concealed work that would be difficult to measure and record at a later date.

I. Maintenance Material Submittals: Spare Parts: The contractor shall submit to the State Engineer a complete list of Spare Parts that will be provided as part of the maintenance contract.

1.04 REFERENCES

A. Definitions:

1. Approval: All instances that reference client "Approval" shall only be transferred by means of written documentation listing the components, construction, or procedures that are acceptable.

2. Provide: "Provide" shall mean the supply, installation, demonstration, testing, documentation, and operation of the system or components thereof.

3. Reference Standards:

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

        1) ASTM B 221, Standard Specification for Aluminum and Aluminum-Alloy Extruded Bars, Rods, Wire, Profiles, and Tubes
        2) ASTM B 429, Standard Specification for Aluminum and Aluminum —Alloy Structural Pipe and Tube
        3) ASTM D 522, Standard Test Methods for Mandrel Bend Test of Attached Organic Coatings
        4) ASTM D 523, Standard Test Method For Specular Gloss
        5) ASTM D 2244, Standard Practice for Calculation of Color Tolerances and Color Differences from instrumentally Measured Color Coordinates
        6) ASTM D 2794, Standard Test Method for Resistance of Organic Coatings to the Effects of Rapid Deformation
        7) ASTM D 3359, Standard Test Methods for Measuring Adhesion by Tape Test
        8) ASTM D 3363, Standard Test Method for Film Hardness by Pencil Test
        9) American National Standards Institute (ANSI): ANSI Z66-1, Paints and Coatings Accessible to Children
        10) U.S. Government: Occupational Safety and Health Administration (OSHA)

1.05 ADMINISTRATIVE REQUIREMENTS

A. Coordination:

1. All sign locations and conditions are to be field verified and confirmed with the State Engineer prior to the shop drawing submittal.

2. Coordinate installation of signs with General Contractor as required.

3. Scheduling: Coordinate scheduling of installation of all signs with General Contractor.

1.06 QUALITY ASSURANCE

A. For each separate type of sign required, obtain signs from one source, from a single manufacturer.

B. All products are to be handled in accordance with Manufacturer's instructions. All signs are to be warranted by the Sign Contractor for a minimum one (1) year period, covering manufacturing defects and defects in workmanship. Provide warranty documents to the State at shop drawing submittal, for approval prior to manufacturing.

C. All sign locations and conditions are to be field verified and confirmed with the State Engineer prior to shop drawing submittal.

D. Paint Coordination: Provide finish coats which are compatible with the prime paints used. Review other Sections of these specifications in which prime paints are to be provided to ensure compatibility of the total coatings system for the various substrates.

1.07 DELIVERY, STORAGE, AND HANDLING

A. Delivery, Storage, and Handling

1. Provisions for direct delivery of system components shall be made for acceptance by the Contractor at the project site. The Contractor shall take such measures as are necessary to ensure that all products are adequately protected from environmental and physical damage during shipment, storage, and installation.

2. Inspect materials or equipment immediately upon delivery and again prior to installation. Reject any damaged, defective or non-conforming items.

3. Schedule delivery to minimize long-term storage at the site and to prevent overcrowding of construction specs.

B. Storage and Handling Requirements

1. Store delivered materials and finished components in a clean, dry space. Protect materials from dirt, fumes, water, construction debris, and traffic.

2. Handle finished equipment carefully to prevent damage, breakage, denting, and scoring finishes. Do not install damaged components; replace with new equipment and return damaged units to manufacturer.

3. Store products at the site in a manner that will facilitate inspection and measurement of quantity or counting of units.

4. Store products subject to damage by the elements, under cover in a weather tight enclosure, with ventilation adequate to prevent condensation. Maintain temperature and humidity within range required by the manufacturer's instructions.

1.08 WARRANTY

A. Manufacturer Warranty:

1. Manufacturer shall unconditionally warrant materials and workmanship for a period of 5 years from the date of final acceptance of the project by the State.

2. The warranty shall cover, but not be limited to:

a. Color fastness against fading or chalking
b. Non-yellowing of translucent components

c. Assembly, construction and operation

3. Any part found to be defective due to faulty materials and/or workmanship and shall be replaced within 30 days of failure. Manufacturer shall assume all costs involved with the execution of same. Manufacturer shall assume full responsibility for the removal and replacement of all other finishes required to affect such repair and/or replacement.

4. Manufacturer's disclaimers and limitations on product warranties do not relieve the Contractor of the warranty on the Work that incorporates the products, nor does it relieve suppliers, manufacturers, and subcontractors required to countersign special warranties with the Contractor.

PART 2 - PRODUCTS

2.01 MATERIALS

A. Provide materials which have been selected for their surface flatness, smoothness and freedom from surface blemishes wherever exposed to view in the finished unit. Exposed-to-view surfaces which exhibit pitting, seam marks, roller marks, "oil canning", stains, discolorations, or other imperfections on the finished unit will not be acceptable.

B. Aluminum-Alloy Extruded Bars, Rods, Shapes and Tubes: ASTM-B221, Alloy 6061-T6 or 6351-T5, with minimum thicknesses as shown.

C. Aluminum Sign Face Blanks: ASTM-B209, Alloy 5052-H36, 5052-H38, 5154- H38, or 6061-T6, minimum thickness 0.08-inch or as shown on drawings.

D. Anchors and Insets: Use non-ferrous metal anchors and inserts as required for corrosion resistance. Use toothed steel or lead expansion bolt devices for drilled-in place anchors. Furnish inserts, as required, to be set into concrete or masonry work.

E. Polycarbonate Sheet: Provide "Tuffak XL" (Altuglas International), or approved equal, as noted in drawings, matte finish. Sheets shall be resistant to ultraviolet exposure. Sheets should be cut from a single roll or sheet, multiple panels with visible joints are not to be used.

F. Paint and Coatings: Acrylic Polyurethane coatings. "Matthews Acrylic Polyurethane" or equal.

G. Typography: Arial Narrow is the standard typeface for all sign messages, unless shown otherwise in the contract drawings.

H. Dynamic Digital Signage: "Adtronics" or equal, full color single face digital LED display. With mounting backet and all hardware for a complete installation.

Physical Pitch:	**5mm**
Physical Matrix Size:	192 x 512 pixels
Sign's Visual Size	3’-2” x 8’-4 3/4”
LED Type:	RGB-SMD
Grey level	16,384 steps
Color Pallet	281 trillion colors
Viewing Angle:	160 deg
LED Life:	100,000 hours
Brightness:	7,500 nits
Min char height:	3” (for ADA)
Construction:	Aluminum Cabinet
Cabinet	IP65
Operating System	Windows 10
Communications:	Wired/Wireless Ethernet
Warranty	5 year parts
Certifications:	UL48,CSA C22-2 No 207
Operator Training	Free lifetime training

2.02 ASSEMBLY AND FABRICATION

A. Factory Assembly:

1. All work shall be fabricated to the details and specifications shown in the Contract Drawings and shall be first class workmanship in accordance with the best trade practices.

2. All fabrication and assembly will be done in the factory and shipped to the job site as one complete unit.

3. All joints, corners, mitres, splices, etc. shall be accurately machined, filled, fitted, filed, and rigidly framed together at joints and contact points and mechanically smoothed to give a monolithic appearance and imperceptible joints.

4. Mechanical fasteners, where allowable, are to be countersunk flush with the top surface being joined.

5. Allow for thermal movement resulting from a maximum ambient temperature change (range) of 100 deg F (70 deg C). Design and fabricate sign assembly to prevent buckling, opening up of joints, or overstressing of welds and fasteners. Base design on actual surface temperatures of metals due to both external and internal heat gain.

PART 3 - EXECUTION

3.01 SUMMARY

A. Discard units of material which are unsound, warped, bowed, twisted, improperly treated, not adequately seasoned or too small to fabricate work with minimum of joints or optimum jointing arrangements, or which are or defective manufacture with respect to surfaces, sizes or patterns.

B. Contractor is responsible for the location and mounting of all signs that are shown in the sign location plans and the sign message layouts. Confirm all exact locations with State Engineer prior to installation.

3.02 ASSEMBLY AND FABRICATION

A. Prepare all surfaces in strict accordance with the Manufacturers' specifications.

B. Cleaning: Remove all deleterious materials.

C. Ensure all permanents signs installed are mounted so that a person may approach within 3 inches of signage without encountering protruding objects or standing within the swing of a door. Install signs as shown. Signs should be mounted truly plumb and level. In the event that the installed sign does not "look right" due to ceiling, wall, floor, etc., not being plumb or level, the Contractor shall adjust the sign in such a manner that the sign is oriented optically and subject to approval by the State Engineer. All signs shall be installed with sufficient amounts of fasteners and /or adhesives to ensure against theft.

D. Finishes

1. Color: All panel background and housing surfaces shall be "Sugarcane Graphic" digital artwork provided by State Engineer / Architect, unless noted otherwise. Messages on sign panels to be satin or matte-finish white, unless other color indications are given.

2. Compatibility: All materials comprising a sign shall be finished with a coating system compatible with that material; appropriate preparatory work/priming shall be done in accordance with finisher's specification. All exposed surfaces, edges and connections shall receive this same finish system. Colors and degree of gloss for all surface paint/finish applications shall be consistent throughout, regardless of substrate: satin sheen, matte finish.

E. Acrylic/Polycarbonate

1. Panels shall receive a finish of two (2) coats satin finish clear acrylic polyurethane utilizing ultraviolet inhibitors.

2. Acrylic signs with subsurface graphics are constructed to be vandal-proof. Graphics and/or lettering are applied as shown in layouts, by silkscreen or in vinyl in reverse on back surface of clear 1/16-inch thick matte finish acrylic. Silkscreen inks are epoxy base for maximum coverage and color retention. Submit samples of all colors and materials to State Engineer for approval and to ensure consistent matching of masonry paints and inks where color coding must be uniform.

3. Silkscreen graphics are then back-sprayed in black and/or white to conceal lamination to back plate substrate. Face panels are permanently adhered to substrate of exact same dimensions, with counter sunk fasteners concealed

through back for mounting to walls, doors and/or concrete columns.

4. Unit to mount flush to surfaces, provide with epoxy grout filling holes to prevent unauthorized removal. Edges to fit smooth with corners eased slightly – no sharp surfaces.

3.03 CLEANING

A. All areas of work shall be left completely clean and any damage to the surrounding finish or other areas of work shall be corrected to the satisfaction of the State Engineer.

B. At the completion of installation clean soiled surfaces of sign units using the recommended procedures for each finished surface of the sign.

3.04 PROTECTION

The Contractor is responsible for the protection and of the condition of installed signs until the signs are approved.

PART 4 – MEASUREMENT AND PAYMENT

4.01 BASIS OF MEASUREMENT AND PAYMENT

Work under this Section will not be measured nor paid for separately but shall be considered incidental to and included in the bid prices for the various items of work in this project.

END OF SECTION

SECTION 10441 - FIRE PROTECTION CABINETS

PART 1 - GENERAL

1.01 RELATED DOCUMENTS

The General Provisions for Construction Projects (2016), Special Provisions and General Requirements of the Specifications, apply to the work specified in this Section.

1.02 SUMMARY

A. Section Includes: Fire-protection cabinets for the following: Portable fire extinguishers.

B. Related Requirements: Section 10442 - FIRE EXTINGUISHERS.

1.03 SUBMITTALS

A. Submit in accordance with SECTION 01300 - SUBMITTALS.

B. Product Data: For each type of product. Show door hardware, cabinet type, trim style, and panel style. Include roughing-in dimensions and details showing recessed-, semi recessed-, or surface-mounting method and relationships of box and trim to surrounding construction. Show location of knockouts for hose valves.

C. Shop Drawings: For fire-protection cabinets. Include plans, elevations, sections, details, and attachments to other work.

D. Samples: For each type of exposed finish required.

E. Product Schedule: For fire-protection cabinets. Indicate whether recessed, semi recessed, or surface mounted. Coordinate final fire-protection cabinet schedule with fire-extinguisher schedule to ensure proper fit and function. Use same designations indicated on Drawings.

F. Maintenance Data: For fire-protection cabinets to include in maintenance manuals.

1.04 COORDINATION

A. Coordinate size of fire-protection cabinets to ensure that type and capacity of fire extinguishers indicated are accommodated.

B. Coordinate sizes and locations of fire-protection cabinets with wall depths.

PART 2 - PRODUCTS

2.01 PERFORMANCE REQUIREMENTS

Fire-Rated Fire-Protection Cabinets: Listed and labeled to comply with requirements in ASTM E 814 for fire-resistance rating of walls where they are installed.

2.02 FIRE-PROTECTION CABINET

Cabinet Type: Products: Provide Potter Roemer, 1700 Series, #1724-B, full break glass with lock, with stainless steel #4 door and frame, or approved equal Suitable for fire extinguisher.

A. Manufacturers: Subject to compliance with requirements, available manufacturers offering products that may be incorporated into the Work include, but are not limited to, the following:

   1. Guardian Fire Equipment, Inc.

   2. JL Industries, Inc.; a division of the Activar Construction Products Group.

   3. Larsens Manufacturing Company.

   4. Modern Metal Products, Division of Technico Inc.

   5. Nystrom, Inc.

   6. Potter Roemer LLC.

   7. Or approved equal.

B. Cabinet Construction: Nonrated and rated. Fire-Rated Cabinets: Construct fire-rated cabinets with double walls fabricated from 0.043-inch-thick cold-rolled steel sheet lined with minimum 5/8-inch-thick fire-barrier material. Provide factory-drilled mounting holes.

C. Cabinet Material: Cold-rolled steel sheet.

D. Semi recessed Cabinet: One-piece combination trim and perimeter door frame overlapping surrounding wall surface with exposed trim face and wall return at outer edge (backbend). Square-Edge Trim: 1-1/4- to 1-1/2-inch backbend depth.

E. Cabinet Trim Material: Stainless Steel sheet.

F. Door Material: Stainless Steel sheet.

G. Door Style: Vertical duo panel with frame.

H. Door Glazing: Float glass (clear).

I. Door Hardware: Manufacturer's standard door-operating hardware of proper type for cabinet type, trim style, and door material and style indicated. Provide continuous hinge, of same material and finish as trim, permitting door to open 180 degrees.

J. Accessories:

1. Mounting Bracket: Manufacturer's standard steel, designed to secure fire extinguisher to fire-protection cabinet, of sizes required for types and capacities of fire extinguishers indicated, with plated or baked-enamel finish.

2. Door Lock: Cam lock.

3. Break-Glass Strike: Provide manufacturer's standard metal strike, complete with chain and mounting clip, secured to cabinet

4. Identification: Lettering complying with authorities having jurisdiction for letter style, size, spacing, and location. Locate as directed by Architect. Identify fire extinguisher in fire-protection cabinet with the words "FIRE EXTINGUISHER."

   a. Location: Applied to cabinet door.
   b. Application Process: Decals or Pressure-sensitive vinyl letters.
   c. Lettering Color: Red.
   d. Orientation: Vertical.

K. Materials:

1. Cold-Rolled Steel: ASTM A 1008/A 1008M, Commercial Steel (CS), Type B.

   a. Finish: Baked enamel or powder coat.
   b. Color: White
   c. Location: Interior of cabinet

2. Clear float glass, ASTM C 1036, Type I, Class 1, Quality q3, 1.5 mm, single strength.

3. Stainless steel: Type 304, #4 finish.

2.03 FABRICATION

A. Fire-Protection Cabinets: Provide manufacturer's standard box (tub) with trim, frame, door, and hardware to suit cabinet type, trim style, and door style indicated.

1. Weld joints and grind smooth.

2. Provide factory-drilled mounting holes.

3. Prepare doors and frames to receive locks.

B. Cabinet Doors: Fabricate doors according to manufacturer's standards, from materials indicated and coordinated with cabinet types and trim styles.

1. Fabricate door frames with tubular stiles and rails and hollow-metal design, minimum 1/2 inch thick.

2. Miter and weld perimeter door frames.

C. Cabinet Trim: Fabricate cabinet trim in one piece with corners mitered, welded, and ground smooth.

2.04 GENERAL FINISH REQUIREMENTS

A. Comply with NAAMM's AMP 500, "Metal Finishes Manual for Architectural and Metal Products," for recommendations for applying and designating finishes.

B. Protect mechanical finishes on exposed surfaces of fire-protection cabinets from damage by applying a strippable, temporary protective covering before shipping.

C. Finish fire-protection cabinets after assembly.

D. Appearance of Finished Work: Noticeable variations in same piece are not acceptable. Variations in appearance of adjoining components are acceptable if they are within the range of approved Samples and are assembled or installed to minimize contrast.

PART 3 - EXECUTION

3.01 EXAMINATION

A. Examine walls and partitions for suitable framing depth and blocking where recessed and semi recessed cabinets will be installed.

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

3.02 PREPARATION

Prepare recesses for semi-recessed fire-protection cabinets as required by type and size of cabinet and trim style.

3.03 INSTALLATION

A. General: Install fire-protection cabinets in locations and at mounting heights indicated or, if not indicated, at heights acceptable to authorities having jurisdiction.

B. Fire-Protection Cabinets: Fasten cabinets to structure, square and plumb.

1. Unless otherwise indicated, provide recessed fire-protection cabinets. If wall thickness is inadequate for recessed cabinets, provide semi recessed fire-protection cabinets.

2. Provide inside latch and lock for break-glass panels.

3. Fasten mounting brackets to inside surface of fire-protection cabinets, square and plumb.

C. Identification: Apply decals or vinyl lettering at locations indicated.

3.04 ADJUSTING AND CLEANING

A. Remove temporary protective coverings and strippable films, if any, as fire-protection cabinets are installed unless otherwise indicated in manufacturer's written installation instructions.

B. Adjust fire-protection cabinet doors to operate easily without binding. Verify that integral locking devices operate properly.

C. On completion of fire-protection cabinet installation, clean interior and exterior surfaces as recommended by manufacturer.

D. Touch up marred finishes, or replace fire-protection cabinets that cannot be restored to factory-finished appearance. Use only materials and procedures recommended or furnished by fire-protection cabinet and mounting bracket manufacturers.

E. Replace fire-protection cabinets that have been damaged or have deteriorated beyond successful repair by finish touchup or similar minor repair procedures.

PART 4 - MEASUREMENT AND PAYMENT

4.01 BASIS OF MEASUREMENT AND PAYMENT

Work under this Section will not be measured nor paid for separately but shall be considered incidental to and included in the bid prices for the various items of work in this project.

END OF SECTION

SECTION 10442 - FIRE EXTINGUISHERS

PART 1 - GENERAL

1.01 RELATED DOCUMENTS

A. The General Provisions for Construction Projects (2016), Special Provisions and General Requirements of the Specifications, apply to the work specified in this Section.

1.02 SUMMARY

A. Section includes portable, hand-carried fire extinguishers and mounting brackets for fire extinguishers.

B. Related Requirements: SECTION 10441 - FIRE PROTECTION CABINETS.

1.03 SUBMITTALS

A. Submit in accordance with SECTION 01300 – SUBMITTALS.

B. Product Data: For each type of product. Include rating and classification, material descriptions, dimensions of individual components and profiles, and finishes for fire extinguisher and mounting brackets.

C. Product Schedule: For fire extinguishers. Coordinate final fire-extinguisher schedule with fire-protection cabinet schedule to ensure proper fit and function. Use same designations indicated on Drawings.

D. Warranty: Sample of special warranty.

E. Operation and Maintenance Data: For fire extinguishers to include in maintenance manuals.

1.04 COORDINATION

A. Coordinate type and capacity of fire extinguishers with fire-protection cabinets to ensure fit and function.

1.05 WARRANTY

A. Special Warranty: Manufacturer's standard form in which manufacturer agrees to repair or replace fire extinguishers that fail in materials or workmanship within specified warranty period.

1. Failures include, but are not limited to, the following:

a. Failure of hydrostatic test according to NFPA 10.
b. Faulty operation of valves or release levers.

2. Warranty Period: Six years from date of Substantial Completion.

PART 2 - PRODUCTS

2.01 PERFORMANCE REQUIREMENTS

A. NFPA Compliance: Fabricate and label fire extinguishers to comply with NFPA 10, "Portable Fire Extinguishers."

B. Fire Extinguishers: Listed and labeled for type, rating, and classification by an independent testing agency acceptable to authorities having jurisdiction. Provide fire extinguishers approved, listed, and labeled by FM Global.

2.02 PORTABLE, HAND-CARRIED FIRE EXTINGUISHERS

A. Fire Extinguishers: Type, size, and capacity for each fire-protection cabinet and mounting bracket indicated.

1. Manufacturers: Subject to compliance with requirements, available manufacturers offering products that may be incorporated into the Work include, but are not limited to, the following:

a. Amerex Corporation.
b. Ansul Incorporated; Tyco International.
c. Badger Fire Protection.
d. Buckeye Fire Equipment Company.
e. Guardian Fire Equipment, Inc.
f. JL Industries, Inc.; a division of the Activar Construction Products Group.
g. Kidde Residential and Commercial Division.
h. Larsens Manufacturing Company.
i. MOON American.
j. Nystrom, Inc.
k. Potter Roemer LLC.
l. Or approved equal.

2. Valves: Manufacturer's standard.

3. Handles and Levers: Manufacturer's standard.

4. Instruction Labels: Include pictorial marking system complying with NFPA 10, Appendix B, and bar coding for documenting fire-extinguisher location, inspections, maintenance, and recharging.

B. Multipurpose Dry-Chemical Type in Steel Container: UL-rated 4-A:80-B:C, 10-lb nominal capacity, with monoammonium phosphate-based dry chemical in enameled-steel container.

2.03 MOUNTING BRACKETS

A. Mounting Brackets: Manufacturer's standard galvanized steel, designed to secure fire extinguisher to wall or structure, of sizes required for types and capacities of fire extinguishers indicated, with plated or red baked-enamel finish.

1. Manufacturers: Subject to compliance with requirements, available manufacturers offering products that may be incorporated into the Work include, but are not limited to, the following:

a. Amerex Corporation.
b. Ansul Incorporated; Tyco International.
c. Badger Fire Protection.
d. Buckeye Fire Equipment Company.
e. Fire End & Croker Corporation.
f. Guardian Fire Equipment, Inc.
g. JL Industries, Inc.; a division of the Activar Construction Products Group.
h. Larsens Manufacturing Company.
i. Nystrom, Inc.
j. Potter Roemer LLC.
k. Or approved equal.

B. Identification: Lettering complying with authorities having jurisdiction for letter style, size, spacing, and location. Locate as indicated by Architect. Identify bracket-mounted fire extinguishers with the words "FIRE EXTINGUISHER" in red letter decals applied to mounting surface. Orientation: Vertical.

PART 3 - EXECUTION

3.01 EXAMINATION

A. Examine fire extinguishers for proper charging and tagging. Remove and replace damaged, defective, or undercharged fire extinguishers.

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

3.02 INSTALLATION

A. General: Install fire extinguishers in locations indicated and in compliance with requirements of authorities having jurisdiction.

B. Mounting Brackets: Fasten mounting brackets to surfaces, square and plumb, at locations indicated.

PART 4 - MEASUREMENT AND PAYMENT

4.01 BASIS OF MEASUREMENT AND PAYMENT

Work under this Section will not be measured nor paid for separately but shall be considered incidental to and included in the bid prices for the various items of work in this project.

END OF SECTION

DIVISION 15 – MECHANICAL

SECTION 15000 – MECHANICAL GENERAL REQUIREMENTS

PART 1 - GENERAL

1.01 RELATED DOCUMENTS

The General Provision for Construction Projects (2016), Special Provisions and General Requirements of the Specifications, apply to the work specified in this Section.

1.02 WORK DESCRIPTION

A. These general mechanical requirements govern work specified under all sections of Division 15 – MECHANICAL.

B. The Contractor shall furnish all labor, materials, tools, and equipment and perform all work and services necessary for a complete and properly operating mechanical work, equipment and systems, as shown of drawings and as specified, in accordance with provisions of the contract documents and completely coordinated with work of all other trades.

C. The Contractor shall completely examine the contract documents and shall report to the Engineer any error, inconsistency or omission he discovers.

D. Furnish and install all supplementary or miscellaneous items, details, appurtenances, and devices incidental to or necessary for a sound, secure, and complete mechanical system where work required is not specifically indicated.

E. Drawings and specifications shall be taken together. Provide work specified and not indicated or work indicated and not specified as though mentioned in both.

F. The Contractor shall warrant that all materials and equipment furnished under this contract will be new and that all work will be good quality, free from faults and defects and in conformance with contract documents for a guaranteed period of one year.

G. The Contractor shall maintain at the site one copy of all drawings, specifications, addenda, Engineer accepted shop drawings, change orders and other modifications, in good order and marked to record all changes made during construction. These shall be made available to the Engineer.

H. The Contractor at all times shall keep the premises free from accumulation of waste materials or rubbish caused by his operations. At the completion of the work, he shall remove all his waste materials and rubbish from and about the project as well as all his tools, construction equipment, machinery, and surplus materials and shall clean all new equipment and accessories.

I. The Contractor shall give the Engineer timely notice of its readiness for testing of any work including the date arranged so the Engineer may observe such testing. The Contractor shall bear all cost of such tests.

1.03 SUBMITTALS

A. Submit 6 complete sets of shop drawings, manufacturer's data, and certificates for equipment, materials, and finish and pertinent details for each system and have them approved before procurement, fabrication or delivery of the items to the job site. Partial submittals will not be acceptable and will be returned without review. Submittals shall include shop drawings, the manufacturer's name, trade name, catalog model or number, nameplate data, size, layout dimensions, capacity, project specification and paragraph reference, applicable industry and technical society publication references, and other information necessary to establish contract compliance of each item the Contractor proposes to furnish. Provide all required items for a complete operational and integral system.

B. Shop Drawings: Drawings shall be maximum 24" x 36" and minimum 22" x 34" in size, except as specified otherwise. Drawings shall be a minimum of 1/4" scale but not less than indicated on the drawings. Drawings shall include floor plans, sectional views, wiring and piping diagrams and installation details of equipment; and equipment spaces identifying and indicating proposed location, layout and arrangement of items of equipment, control panels, accessories, piping, ductwork, locations, and sizes of all openings penetrating through walls, floors, roofs and structural members, access panels to valves and all items requiring maintenance or inspection, and other items that must be shown to assure a coordinated installation. Wiring diagrams shall identify circuit terminals and indicate the internal wiring for each item of equipment and interconnection between each item of equipment. Drawings shall indicate adequate clearance for operation, maintenance, and replacement of operating equipment devices. If equipment is not acceptable, drawings shall be revised to show acceptable equipment and be resubmitted.

1. The Contractor shall review, stamp with his approval, and submit all shop drawings required by the contract documents or subsequently by the Engineer as covered by modifications. At the time of submission, the Contractor shall inform the Engineer in writing of any deviation in the shop drawings from the requirements of the contract documents. By approving and submitting shop drawings, the Contractor certifies that he has determined and verified all field measurements, field construction criteria, materials, catalog numbers, and similar data and that he has checked and coordinated each shop drawing with the requirements of the work and of the contract documents and that all equipment and related items fits in the allotted space and complete coordination between all contractors involved.

2. Submitting reproductions of bid documents shall not be construed to be shop drawings.

3. The Contractor shall certify that his shop drawings, equipment, and material shown is in compliance with the contract drawings and specifications and can be

installed in the allocated spaces without interferences to other related work and access spaces.

4. All additional related work caused by the product installation and operational requirements shall be the Contractor's responsibility at no additional cost to the State.

C. Manufacturer's Data: Submittals for each manufactured item shall be manufacturer's descriptive literature of cataloged products, equipment drawings, diagrams, performance and characteristic curves, and catalog cuts. Manufacturer's data shall be submitted together with the shop drawings. Partial submittals shall be returned without review.

D. Standards Compliance: When materials or equipment must conform to the standards of organizations such as the American National Standards Institute (ANSI), ASTM International (ASTM), National Electrical Manufacturers Association (NEMA) and Underwriters Laboratories (UL), proof of such conformance shall be submitted to the Engineer for approval. If an organization uses a label or listing to indicate compliance with a particular standard, the label or listing will be acceptable evidence, unless otherwise specified in the individual sections. In lieu of the label or listing, the Contractor shall submit a certificate from an independent testing organization, which is competent to perform acceptable test and is approved by the Engineer. The certificate shall state that the item has been tested in accordance with the specified organization's test methods and that the item conforms to the specified organization's standard. For materials and equipment whose compliance with organizational standards or specifications is not regulated by an organization using its own listing or label as proof of compliance, a certificate of compliance from the manufacturer shall be submitted for approval. The certificate shall identify the manufacturer, the product, and the referenced standard and shall simply state that the manufacturer certifies that the product conforms to all requirements of the project specification and of the referenced standards listed.

E. Certified Test Reports: Before delivery of materials and equipment, certified copies of all test reports specified in the individual sections shall be submitted for approval by the Engineer.

F. Certificates of Conformance or Compliance: Submit 3 certificates of compliance from the manufacturer attesting that materials and equipment to be furnished for this project comply with the requirements of this specification and of the reference publications. Pre-printed certifications will not be acceptable; certifications shall be in the original. The certification shall not contain statements that could be interpreted to imply that the product does not meet all requirements specified, such as "as good as", "achieve the same end use and result as materials formulated in accordance with the referenced publication", "equal or exceed the service and performance of the specified material". The certification shall simply state that the product conforms to the requirements specified.

G. As-Built Drawings: Record changes from the contract drawings for all material and equipment. A set of prints showing layout as installed shall be kept up to date at the

job site. Submit as-built drawings for review prior to final inspection. Upon completion of work, a complete set of reproducible as-built drawings shall be submitted to the Engineer before the project will be accepted as complete.

H. Operation and Maintenance Manual: Submit as noted in paragraph entitled "OPERATION AND MAINTENANCE MANUAL" herein below.

I. Posted Operating Instructions: Submit as noted in paragraph entitled "POSTED OPERATING INSTRUCTIONS" herein below.

J. Instructions to Hawaii Department of Transportation Personnel: Submit as noted in paragraph entitled "INSTRUCTIONS TO HAWAII DEPARTMENT OF TRANSPORTATION PERSONNEL" herein below.

K. Guarantee: Submit as noted in paragraph entitled "GUARANTEE" herein below.

L. Maintenance Service Contract: Submit as noted in paragraph entitled "MAINTENANCE SERVICE CONTRACT" herein below.

1.04 LAWS, REGULATIONS, AND CODES

A. All work shall be in accordance with government laws, ordinances, rules and regulations, and orders.

B. The following shall govern where applicable: The Plumbing Code of the County of Maui, the Building Code of the County of Maui, State of Hawaii Department of Health Regulations, U.S. Department of Health, Education and Welfare, Applicable National Fire Protection Association Standards, Occupational Safety and Health Administration (OSHA) Rules and Regulations and all other codes and standards referenced in these specifications. Where requirements differ in these codes and standards, the more stringent shall apply.

1.05 TRADE NAME

Mentioning of a trade name indicates that the manufacturer is acceptable to the Engineer. However, certain specified construction and details may not be regularly included in the manufacturer's catalogued product. The Contractor shall provide the material or equipment complete as specified.

1.06 PERMITS AND INSPECTIONS

A. Applications for permits will be done by the Engineer; the Contractor shall pay for all necessary permits and fees.

B. The Contractor shall apply and pay for all necessary inspections required by any public authority having jurisdiction.

1.07 DISCREPANCIES

A. The drawings and specifications are intended to cooperate. Any materials, equipment or system related to this section and exhibited on the civil, landscape, architectural, structural, electrical or mechanical drawings but not mentioned in the specifications are to be executed to the intent and meaning thereof, as if it were both mentioned in the specifications and set forth on the drawings.

B. In case of differences between the drawings and specifications, the specifications shall govern first, and then the drawings. Large-scale details shall take precedence over small-scale drawings as to the shape and details of construction. Specifications shall govern as to materials.

C. Drawings and specifications are intended to be fully cooperative and to agree, but should any discrepancy or apparent difference occur between drawings and specifications or should error occur in the work of others affecting the work, the Contractor shall notify the Engineer at once. If the Contractor proceeds with the work affected without instructions from the Engineer, he shall make good any resultant damage or defect at the Contractor's cost. All interpretations of drawings and specifications shall be clarified by the Engineer.

1.08 WORKMANSHIP AND MATERIALS

A. Workmanship shall be of the best quality and none but competent mechanics skilled in their trades shall be employed. The Contractor shall furnish the services of an experienced superintendent, who will be constantly in charge of the erection of the work, until completed and accepted.

B. Unless otherwise specified hereinafter, each article of its kind shall be the standard product of a single manufacturer.

C. Whenever the words “or approved substitute” or other words of similar intent or meaning are used, implying that judgment is to be exercised, it is understood that it is the judgment of the Engineer that is referred to.

D. The Engineer shall have the right to accept or reject material, equipment, and/or workmanship and determine when the Contractor has complied with the requirements herein specified.

E. All manufactured materials shall be delivered and stored in their original containers. Equipment shall be clearly marked or stamped with the manufacturer's name and rating. Equipment and materials shall be carefully handled, properly stored, and adequately protected to prevent damage before and during installation, in accordance with the manufacturer’s recommendations, and as approved by the Engineer. Damaged or defective items, in the opinion of the Engineer, shall be replaced.

F. References to standards are intended to be the latest revision of the standard specified.

1.09 MANUFACTURER'S RECOMMENDATIONS

Equipment installed under this division of the specifications shall be installed according to manufacturers' recommendations, unless otherwise shown on the drawings or herein specified. Where installation procedures or any part thereof are required to be in accordance with the recommendations of the manufacturer of the material being installed, printed copies of these recommendations shall be furnished to the Engineer, prior to installation. Installation of the item will not be allowed to proceed until the recommendations are received and accepted by the Engineer. Failure to furnish these recommendations can be cause for rejection of the material.

1.10 INSPECTION OF SITE

This Contractor shall visit the site and examine the conditions affecting his work before submitting his proposal. The submission of the proposal shall be considered evidence that the Contractor has visited the site and no extra payments will be allowed to the Contractor on account of extra work made necessary by his failure to visit the site.

1.11 CONTINUITY OF SERVICES, PHASING

A. The existing facility will be in use during construction of this project. It is intended that interruption of utilities be kept to a minimum. Notice of service interruptions shall be submitted to the Engineer for approval at least 2 weeks before intended date of service interruptions. Exact date and time of interruption allowed shall be determined by the Engineer. Provide temporary valves, cross connections, piping, etc., as necessary to assure this continuity of service; they shall be furnished under this section without additional charge to the State and shall be removed when no longer necessary.

B. All interruptions of existing utilities serving occupied or used facilities shall not be disrupted except where authorized in writing by authorities having jurisdiction.

C. The Contractor shall submit to the Engineer a copy of his work schedule indicating the date and area to be affected by his work.

D. Execute work using such methods, techniques, connections and tie-ins that will cause least interference with, and interruptions of, existing utilities and services. Keep roads clear of materials, debris, etc., to maximum extent possible. Schedule all arrangements for work that will cause interferences or interruptions, in advance with the Engineer, all other affected trades, and authorities having jurisdiction.

E. Examine site and become familiar with existing local conditions affecting work.

F. Examine all drawings and specifications, including electrical, and become familiar with the types and systems of construction to be used. Determine how such types and systems will affect the installation of mechanical work.

G. Investigate, determine, and verify locations of any overhead or buried utilities on or near site. Determine such locations in conjunction with all public and private utility

companies and with all authorities having jurisdiction.

1.12 OPENINGS, CUTTING AND REPAIRING

A. The Contractor shall cooperate with the work to be done under other sections in providing information as to openings required in roof, walls, slabs, and footings for all piping and ductwork including sleeves where required.

B. Any drilling or cutting required for the performance of work under this section shall be the responsibility of this Contractor and the cost there shall be borne by him.

C. Holes in Concrete: The Contractor shall pay all costs for cutting of holes. All holes through existing concrete shall be either core drilled or saw cut. All holes required shall have the approval of the Engineer prior to cutting and drilling.

D. It shall be the responsibility of this Contractor to ascertain that all openings are properly located.

E. All conduits, pipe, and duct penetrations shall be properly fire stopped and sealed so as not to compromise the fire rating of the walls, floors, and roof assemblies of the building.

1.13 ELECTRICAL WORK

A. All power wiring, including final hook-up to all mechanical equipment will be provided under Division 16 – ELECTRICAL of these specifications. Control devices which are required on the power wiring shall be provided by the Mechanical Subcontractor, to be wired by the Electrical Subcontractor.

B. Electrical work under Division 16 – ELECTRICAL is based on the electrical rating of equipment indicated on the mechanical drawings. Additional electrical work caused by any deviation under Division 15 – MECHANICAL shall be paid for by the Contractor.

C. All control wiring are included under mechanical work and shall be in accordance with Division 16 – ELECTRICAL, except where specified otherwise in Division 15 – MECHANICAL.

D. The Mechanical Subcontractor shall furnish all starters for installation by the Electrical Subcontractor.

PART 2 – PRODUCTS

2.01 MATERIALS

A. As specified in all sections of Division 15 – MECHANICAL.

B. Materials and equipment shall be cataloged products of manufacturers regularly engaged in production of such materials or equipment and shall be manufacturer's

latest design that complies with the specifications requirements. Materials and equipment shall duplicate items that have been in satisfactory commercial or industrial use at least 2 years prior to bid opening. Where 2 or more items of the same class of equipment are required, these items shall be products of a single manufacturer; however, the component parts of the items need not be the products of the same manufacturer. Each item of equipment shall have the manufacturer's name, address, model number, and serial number on the nameplate. Nameplate of the distributing agent will not be acceptable.

PART 3 – EXECUTION

3.01 PIPING IDENTIFICATION

A. Identification of all new pipe lines shall be by means of colored, waterproof, all temperature, self-adhering labels and directional arrows.

B. At Contractor's option, each and every system may be identified by painting with contrasting colors, using 3/4" high minimum stencil letters. Painting shall be done by the Painting Subcontractor.

C. All exposed pipes, whether insulated or not, shall be identified. Labels may be omitted from piping where the use is obvious, due to its connection to equipment and where the appearance would be objectionable in finished rooms, as approved by direction.

D. Identification labels shall be placed as follows:

1. Near each valve and branch connection.

2. Wherever piping merges or disappears from view from the floor of the room in which it is installed.

3. Labels shall not be more than 50 feet apart.

3.02 VALVE INDEX

The Contractor shall provide brass or plastic tags on all valves with letters stamped or engraved thereon designating service and numbering of each valve. Valve numbering and identification shall coincide with shop drawings and as-built drawings.

3.03 FIELD TEST

The Contractor shall perform all tests of the installed work and shall provide all services, labor, equipment, materials, and instruments needed for the tests. During pressure tests, all items in the system to be tested, not designed for test pressures shall be removed or isolated from the system and shall be reconnected or unblocked after tests are completed. Should operating tests require the presence of manufacturers' representatives, the Contractor shall cooperate with them and shall place at their disposal all assistance, materials, and services required to perform such test. The

Contractor shall certify in writing that all work have passed all required tests.

3.04 OPERATION AND MAINTENANCE MANUAL

Furnish an operation and maintenance manual for each item of equipment. Furnish 6 copies of the manual bound in hardback binders or an approved equivalent. Furnish one complete manual prior to the time that equipment tests are performed and furnish the remaining manuals before the contract is completed. Inscribe the following identification on the cover: OPERATION AND MAINTENANCE MANUAL, the name and location of the equipment or the building, the name of the Contractor and the contract number. The manual shall include the names, addresses, and telephone numbers of each Subcontractor installing equipment and of the local representatives for each item of equipment. The manual shall have a table of contents and be assembled to conform to the table of contents with the tab sheets placed before instructions covering the subject. The instructions shall be legible and easily read, with large sheets of drawings folded in. The manual shall include: Wiring and control diagrams with data to explain detailed operation and control of each item of equipment; a control sequence describing start-up, operation, and shut-down; description of the function of each principal item of equipment; the procedure for starting; the procedure for operating; shut-down instructions; installation instructions; maintenance and repair instructions; lubrication schedule including type, grade, temperature range and frequency; safety precautions, diagrams and illustrations; test procedures; performance data; and parts list. The parts lists for equipment shall indicate the sources of supply, recommended spare parts and the service organization which is reasonably convenient to the project site. The manual shall be complete in all respects for equipment, controls, accessories, and associated appurtenances provided.

3.05 POSTED OPERATING INSTRUCTIONS

Furnish manufacturer approved operating instructions for each principal item of equipment for the use of the operation and maintenance personnel. The operating instructions shall include wiring diagrams, piping diagrams, valve operating positions, control diagrams, and control sequence for each principal item of equipment. Operating instructions shall be printed or engraved and shall be framed under glass or in approved laminated plastic and posted where directed by the Engineer. Operating instructions shall be attached to or posted adjacent to each principal item of equipment including start up, procedure in the event of equipment failure and other items of instruction as recommended by the manufacturer of each item of equipment. Operating instructions exposed to the weather shall be made of weather-resisting materials or shall be suitably enclosed to be weather protected. Operating instructions shall not fade when exposed to sunlight and shall be secured to prevent easy removal or peeling.

3.06 INSTRUCTIONS TO HAWAII DEPARTMENT OF TRANSPORTATION PERSONNEL

The Contractor shall furnish the services of competent instructors who will give full instruction to the designated personnel in the adjustment, operation, and maintenance, including pertinent safety requirements of the equipment or system specified. Each instructor shall be thoroughly familiar with all parts of the installation and shall be trained in operating theory as well as practical operation and maintenance work. Instruction

shall be given during the first regular work week after the equipment or system has been accepted and turned over to the State for regular operation. Instructions shall be provided for all shifts. The number of man-days (8 hours) of instruction furnished shall be as specified in other sections. When more than 4 man-days of instruction are specified, approximately half of the time shall be used for classroom instruction. All other time shall be used for instruction with the equipment or system. When significant changes or modifications in the equipment or system are made under the term of the contract, additional instruction shall be provided to acquaint the operating personnel with the changes or modifications.

3.07 SAFETY REQUIREMENTS

Belts, pulleys, chains, gears, couplings, projecting setscrews, keys, and other rotating parts located so that any person can come in close proximity thereto shall be fully enclosed or properly guarded. High temperature equipment and piping so located as to endanger personnel or create a fire hazard shall be properly guarded or covered with insulation of a type as specified herein. Items such as catwalks, ladders, and guardrails shall be provided where required for safe operation and maintenance of equipment.

3.08 FINAL INSPECTION

Final inspection shall be requested by the Contractor only after submittal of all required certificates. No final inspection will be made until all moving parts of equipment are properly guarded, all controls and safety devices tested and operative, all painting required done and the site cleaned up.

3.09 GUARANTEE

The Contractor shall guarantee the installation for a period of one year from the date of acceptance of the project by the Engineer against any defects due to faulty materials, equipment, workmanship, or installation. Upon notice of defect, the Contractor shall correct, replace, or repair defective item at no additional cost to the State.

3.10 MAINTENANCE SERVICE CONTRACT

A. In addition to the Guarantee on materials and workmanship, the Contractor shall provide a Maintenance Service Contract of one year, countersigned by the Contractor that will validate said Guarantee. Maintenance shall include inspection, balancing, correction of undue noise, and lubrication. The maintenance services shall include all labor, materials, equipment, and parts to service the equipment listed on the maintenance schedule, on a periodic basis, so as to assure proper operation and function and shall extend for a period of one year commencing at the day of final acceptance by the Engineer.

B. Maintenance Log: Keep a separate log recording all maintenance calls to the project, including at least the following information:

   1. Name of person making service call.

2. Date of call, time in and out from project.

3. Nature of call, if emergency, who contacted service company.

4. Equipment gauge and temperature readings, ambient temperature.

5. Maintenance checklist.

6. In addition, submit written reports of maintenance performed within 7 days to the Engineer. Submit reports on the attached form or facsimile.

C. Maintenance Schedule: Periodic maintenance shall conform to the following schedule, with at least the following services:

1. Air cooled condensing unit:

a. Monthly service:

1) General operation and condition.
2) Check and refill compressor oil.
3) Check for refrigerant and oil leaks. Check for proper refrigerant charge and moisture contamination.
4) Check condenser coil face and clean as required.
5) Check and adjust all gauge readings.
6) Check operation of all safety and capacity controls, valves and accessories.
7) Lubricate all moving parts as required.
8) Check for noise and vibration.
9) Check all electrical components for proper operation and worn parts.

b. Quarterly service:

1) Review past log readings.
2) Check for unusual vibration.
3) Check response of unit at various load conditions for proper operation and calibration of capacity control system; record temperature and setting when compressor cuts in.
4) Check safety controls and record settings.
5) Check and clean all filters and strainers.
6) Clean condenser coils with spray coil cleaner; wash unit to remove dirt, oil and debris from fan assembly and chassis.
7) Lubricate compressor and fan motor bearings.
8) Certify performance of quarterly maintenance service is correct and report all discrepancies.

c. Annual service:

1) Change compressor oil and filter.

2) Change refrigerant and filter-drier element.
3) Include work indicated for monthly and quarterly maintenance.

2. Fan coil unit:

a. Monthly service:

1) Inspect general condition and operation of fan coil unit.
2) Clean washable filters.
3) Check for noise, vibration and insulation damage.
4) Check temperature controls.
5) Check all ductwork and associated piping damage.

b. Quarterly service:

1) Lubricate fan and motor bearings.
2) Check refrigerant and air temperature, flow rate and pressure drops.
3) Check circuits and operation of all temperature controls including dampers and valves.
4) Clean condensate pan and flush drain line.
5) Cean washable filters.

c. Annual service:

1) Clean inside and outside surface of cooling coils.
2) Inspect all valves and vents, replace with new parts if required.
3) Clean fan wheel, shaft, pulleys, dampers and motors.
4) Clean drain pan.
5) Check and clean condensate drain.
6) Check damper linkage, set screws and blade adjustment for proper operation.
7) Inspect all controls.

3. Refrigerant and condensate piping:

a. Monthly service:

1) Check all condensate drain, refrigerant piping and condensate piping, valves and fittings for leaks. Clean and flush condensate system.
2) Check all insulated piping, valves and fittings for damage.
3) Drain dirt leg.

4. Air distribution system:

a. Monthly:

1) Check ductwork exposed to traffic for leakage, damage, and corrosion.
2) Check ductwork for noise and vibrations.
3) Check ductwork and insulation for loose connections and damage.

b. Annual:

1) Check volume dampers for proper operation.
2) Re-balance complete system.
3) Clean all air devices.

5. Controls:

a. Monthly:

1) Check circuits and operation of all temperature controls and sequencing system for fan coil unit.
2) Check all control valves for proper operation.

6. Fans:

a. Quarterly:

1) Check for overheating.
2) Check for arcing of contacts.
3) Check operation of timing relays.
4) Check motor temperature and voltage amperage.
5) Replace MERV 13 disposable filters

b. Every 6 months:

1) Check and adjust or replace as required the alignment of bearings and sheaves.
2) Check, lubricate, adjust, or replace fan and bearings.
3) Replace MERV 13 disposable filters

c. Once, within one month of expiration of service contract:

1) Clean fan wheels.
2) Check motor starter contacts.
3) Clean fan.
4) Replace MERV 13 disposable filters

4.01 BASIS OF MEASUREMENT AND PAYMENT

Work under this Section will not be measured nor paid for separately but shall be considered incidental to and included in the bid prices for the various items of work in this project.

SERVICE MAINTENANCE REPORT

Date: _____ Sheet No.: _____

Name of Facility and Location: _____

_____

Date of Service Call: _____

Time In, Time Out at Site: _____

Person(s) Contacted: _____

Nature of Service Call – (Routine Maintenance or Emergency – Explain):

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Equipment Readings and Maintenance Performed (List all items services and identify equipment.)

Remarks:

END OF SECTION

SECTION 15330 - FIRE EXTINGUISHING SPRINKLER SYSTEMS

PART 1 - GENERAL

1.01 RELATED DOCUMENTS

The General Provisions for Construction Projects (2016), Special Provisions and General Requirements of the Specifications, apply to the work specified in this Section.

1.02 SUMMARY

The work includes providing a new automatic wet pipe fire extinguishing sprinkler systems for light and ordinary hazard occupancies for uniform distribution of water by pipe schedule or hydraulic design to afford complete fire protection coverage throughout. The equipment, materials, installation, workmanship, examination, inspection, and testing shall be in strict accordance with the required and advisory provisions of NFPA 13, except as modified. Each system shall be designed for earthquakes and shall include all materials, accessories, and equipment inside and outside the building to provide each system complete and ready for use. Provide each system to give full consideration to blind spaces, piping, electrical equipment, ductwork, and other construction and equipment in accordance with detailed Drawings to be submitted for approval. Locate sprinkler heads in a consistent pattern with ceiling grid, lights, and supply air diffusers. Devices and equipment for fire protection service shall be UL listed and FM approved for use in wet pipe sprinkler systems. System shall conform to the State Fire Code with County of Maui Amendments and the latest edition of NFPA 13, which ever is more stringent.

1.03 GENERAL REQUIREMENTS

SECTION 15000 - MECHANICAL GENERAL REQUIREMENTS, applies to this section.

1.04 RELATED WORK SPECIFIED IN OTHER SECTIONS

A. Requirements of DIVISION 1 - GENERAL REQUIREMENTS apply to this Section.

B. Painting: SECTION 09911 – EXTERIOR PAINTING.

C. Electrical Work: Electrical equipment furnished under this Section to be connected under DIVISION 16 - ELECTRICAL.

1.05 SUBMITTALS

A. Submit in accordance with SECTION 01300 – SUBMITTALS and SECTION 15000 - MECHANICAL GENERAL REQUIREMENTS.

B. Material List: Submit required products and items for a complete operational and integral system proposed to be provided under this Section and on Drawings.

1. Pipe, fittings, and mechanical couplings.

2. Sprinkler heads.

3. Pipe hangers and supports.

C. Shop Drawings: Shop drawing submitted for review shall be approved by the County of Maui Fire and Building Departments before being submitted to the Director. Refer to SECTION 15000 - MECHANICAL GENERAL REQUIREMENTS.

1. Sprinkler heads and piping system layout.

2. System calculations.

D. Certificates of Compliance: Refer to SECTION 15000 - MECHANICAL GENERAL REQUIREMENTS.

1. Contractor's material and test certificate.

2. Pipe and fittings.

E. Operation and Maintenance Manuals: Alarm valves, nitrogen system, pre-action system, fire sprinkler heads, switches.

F. Provide name, license number and qualifications of fire sprinkler special inspector.

G. Field Testing and Flushing: See paragraph 3.07.

H. Care and Maintenance: See paragraph 3.08

1.06 QUALIFICATIONS OF INSTALLER

A. Prior to installation, submit data for approval showing that the Contractor has successfully installed automatic fire extinguishing sprinkler systems of the same type and design as specified. The data shall include the names and locations of at least two installations where the Contractor has installed such systems. Indicate the type and design of each system and certify that each system has performed satisfactorily in the manner intended for a period of not less than 18 months.

B. Contractor shall hire the service of an independent, third party fire sprinkler special inspector to provide inspection services as required by the State.

1.07 FIELD POSTED AS-BUILT DRAWINGS

Refer to SECTION 15000 - MECHANICAL GENERAL REQUIREMENTS.

1.08 CERTIFICATES

Refer to SECTION 15000 - MECHANICAL GENERAL REQUIREMENTS.

1.09 PRODUCT DELIVERY, STORAGE AND HANDLING

Furnish new equipment, materials and accessories bearing the manufacturer's identification. Coordinate deliveries to avoid interferences or construction delays. Protect products during delivery, storage, installation, and the remainder of the construction period after installation.

1.10 QUALITY ASSURANCE

A. Products of the following manufacturer's are acceptable in lieu of those specified hereinafter, subject to submittal and shop drawing requirements. Specified in SECTION 15000 - MECHANICAL GENERAL REQUIREMENTS.

   1. Fire Sprinkler Heads: Tyco, Reliable Automatic Sprinkler Co., Viking or Central.

   2. Pipe Supports: Elcen, Fee and Mason, Grinnell or Unistrut.

B. Comply with the latest recommendations and requirements of the codes and standards listed hereinafter in addition to detailed requirements of this specification. In the event of conflicting requirements, these specifications shall prevail. All codes and standards shall be the latest published edition.

   1. American Society for Testing and Materials Publications (ASTM): A53/A53M Pipe, Steel, Black and Hot-Dipped, Zinc Coated, Welded and Seamless

   2. National Fire Protection Association (NFPA): 13 Standard for Installation of Sprinkler System.

   3. Underwriters Laboratories, Inc. (UL): 262 Gate Valves for Fire Protection Services. FPEL-2001 Fire Protection Equipment List.

1.11 CORROSION PREVENTION OF FERROUS METALS

Expose for 125 hours in a salt-spray fog test, except equipment located outdoors shall withstand 500 hours. The salt-spray fog test shall be in accordance with ASTM B117 using a 5-part by weight (plus or minus 1) of sodium chloride in 95 parts of distilled water or water containing not more than 200 parts per million of total solid coating shall show no signs of blistering, wrinkling or cracking, no loss of adhesion and the specimen shall show no signs of rust creepage beyond 1/8-inch on either side of the scratch mark. The film thickness of the factory coating or paint system applied on the equipment shall be not less than the film thickness used as the test specimen.

PART 2 - PRODUCTS

2.01 DESIGN OF SPRINKLER SYSTEMS

A. NFPA 13 and requirements specified. The design shall be by the Pipe Schedule Method as defined by NFPA 13. Design of automatic wet pipe sprinkler system shall

be for light and ordinary hazard occupancy. Provide all required items for a complete operational and integral system. All components shall be of the same manufacturer.

B. Location of Sprinkler Heads: Heads in relation to the ceiling and the spacing of sprinkler heads shall not exceed that permitted by NFPA 13 for ordinary hazard occupancy per hazard classification of area. Uniformly space sprinklers on the branch piping.

2.02 SPRINKLER HEADS

A. Release element of each head shall be of the ordinary temperature rating (155 degrees F) or higher as suitable for the specific application.

B. Concealed Pendant Head: Adjustable or non-adjustable as required, brass or bronze body, quick response, white cover plate, glass bulb, 0.50-inch orifice. Reliable, Viking, Tyco or approved equal.

C. Upright/Pendant Head: Brass or bronze body ordinary temperature rating, glass bulb, quick response 0.50-inch orifice. Reliable, Viking, Tyco or approved equal.

2.03 CABINET

Provide metal cabinet with extra sprinkler heads and sprinkler head wrench AND STOPPERS adjacent to each alarm valve. The number and types of extra sprinkler heads shall be as specified in State Fire Code with County of Maui Amendments. Reliable Model A1, Viking, Tyco or approved equal.

2.04 ABOVE GROUND PIPING SYSTEMS

A. Inspect, test, and approve piping before covering or concealing. Provide fittings for changes in direction of piping and for all connections. Make changes in piping sizes through tapered reducing pipe fittings; bushings will not be permitted. Perform welding in the shop; field welding will not be permitted. Conceal piping in areas with suspended ceiling.

B. Sprinkler Pipe and Fittings: NFPA 13, except as modified herein. Steel piping shall be Schedule 40 conforming to ASTM A53 or Type K hard drawn copper pipe and brazed fittings at no additional cost to the State. Fittings into which sprinkler heads, sprinkler head riser nipples, or drop nipples are threaded shall be welded or threaded type. Fittings shall be UL listed and or FM approved for use in wet pipe and dry pipe sprinkler systems 175 psi. Fittings and all related items shall be supplied by the same manufacturer. All piping and fittings shall be primed and painted.

C. Flexible Drops: FM approved, UL listed, braided stainless steel with adjustable ceiling bracket. Refer to Structural drawings for design category. 18c compliant without oversized ceiling ring. Flexhead or approved equal.

D. Pipe Hangers and Supports: Provide in accordance with NFPA 13. Galvanized, primed, and painted.

E. Identification Signs: NFPA 13. Attach properly lettered and approved metal signs to each valve and alarm device. Permanently affix hydraulic design data nameplates to the riser of each system.

2.05 PIPE SLEEVES AND SEALS

A. Contract shall provide sleeves where piping passes through walls, floors, roofs, beam and partitions. Grout sleeves in position and location during construction. Provide sleeves of sufficient length to pass through entire thickness of walls, floors, roofs, beams and partitions. Provide clearance between exterior of piping and interior of sleeve in accordance with NFPA 13. Sleeves through fire rated walls, floors and enclosure shall have seals with fire ratings greater than or equal to the fire rating of the walls, floors and enclosure. Firmly pack space with noncombustible material. Solid rubber links interconnected with bolts. Thunderline “Link Seal Pyropac” or approved equal.

B. Sleeves in Masonry and Concrete Walls, Floors, Beams and Roofs: Provide ASTM A 53, hot-dip galvanized steel pipe sleeves. Extend sleeves 3-inches above the finished floor.

C. Sleeves in Partitions and Other Than Masonry and Concrete Walls, Floors, and Roofs: Provide hot-dip galvanized steel sheet having a nominal weight of not less than 0.90 psf.

2.06 ESCUTCHEON PLATES

Provide one piece or split hinge type polish chrome plates for piping passing through floors, walls, and ceilings in exposed spaces. Provide polished chrome plates in finished spaces. Provide paint finish on plates in unfinished spaces. Secure plates in proper position.

PART 3 - EXECUTION

3.01 INSTALLATION

Equipment, materials, installation, workmanship, examination, inspection, and testing shall be in accordance with NFPA 13, except as modified herein. Install piping straight and true to bear evenly on hangers and supports. Keep the interior and ends of new piping affected by Contractor’s operations thoroughly cleaned of water and foreign matter. Keep piping systems clean during installation by means of plugs or other approved methods. When work is not in progress, securely close open ends of piping to prevent entry water and foreign matter. Inspect piping before placing into position. Report any deficiencies to the Director. Support sprinkler system piping from building structure by means of hangers, inserts, other supports, as per requirements in NFPA Pamphlet 13.

3.02 DRAIN AND TEST CONNECTIONS

Install horizontal piping sloped to low points and in manner to make it possible to test and empty entire system; provide valves and piping of sizes and in locations in accordance with requirements of NFPA 13. Extend drain valves discharge pipes to suitable points; terminate pipes so that discharge will be visible; use sight-drain fittings, if necessary. Provide flushing connections at end of cross mains, consisting of capped nipple same diameter as pipe but not larger than 2 inches.

3.03 VALVE SEALS, TAGS, CHARTS

A. Seals: Provide approved seal for each manually operated shut-off valve required to be sealed in open position.

B. Signs: Provide identification signs of standard design, fasten securely at designated locations as per NFPA Pamphlet 13.

C. Tags: Provide brass tags 3-inches diameter; stamp with designator numbers, secure with 12-gage copper wire to spindle or control valves.

D. Charts: Provide two copies of approved sprinkler system diagram and valve chart, giving designating number, functions, location of each valve; mount in painted, glazed frames, hang where directed by the Engineer.

3.04 PIPE SLEEVES, ESCUTCHEONS

Furnish and set sleeves to accommodate pipes passing though foundations, walls, floors, beams, partitions; provide escutcheons at exposed finished surfaces pierced by pipes. Extend sleeves above finished floor and pack space between pipe and sleeve as recommended by NFPA Pamphlet 13.

3.05 DISINFECTION

Fill piping systems with solution containing minimum of 50-parts per million of available chlorine and allow solution to stand for minimum of 24 hours. Flush solution from the systems with clean water until maximum residual chlorine content is not greater than 0.2-parts per million. Exercise caution when mixing chlorine disinfection solutions.

3.06 FIELD PAINTING

A. See SECTION 09911 – EXTERIOR PAINTING.

B. Field Painting: All Exposed sprinkler systems including valves, piping, conduit, hangers, supports, miscellaneous metal work and accessories shall be painted. Paint shall be applied only to clean dry surfaces using clean brushes. Immediately after cleaning, metal surfaces shall receive one coat of pretreatment primer applied to minimum dry film thickness of 0.3 mil, and one coat of primer applied to minimum dry film thickness of one mil. Due care shall be exercised to avoid painting or sprinkler heads or protective devices. Materials which are used to protect sprinkler heads, while painting is in process, shall be removed upon completion of painting. Remove all sprinkler heads which are painted and shall provide new clean sprinkler

heads of proper type at his own expense at no additional cost to the State. Primed surfaces shall receive the following:

1. Sprinkler System in All Exposed Ceiling Areas: Primed surfaces shall receive 2 coats of paint to match adjacent surfaces.

2. Sprinkler System in Exposed Ceiling Areas (i.e. Mechanical and Electrical Rooms, Loft area): Primed surfaces shall receive 2 coats of “Fire Engine” red enamel.

3.07 FIELD TESTING AND FLUSHING

A. Preliminary Tests: Hydrostatically test each system at 200 psi for a 2-hour period with no leakage or reduction in gauge pressure. Flush piping with portable water in accordance with NFPA 13. Piping above suspended ceilings shall be inspected, tested, and approved before installation of ceilings. Test the alarms and other devices. Test the water flow alarms by flowing water through the inspector’s test connection. When tests are completed and corrections made, submit a signed and dated certificate, similar to that specified in NFPA 13, with a request for formal inspection and tests.

B. Formal Inspection and Tests: Testing shall be conducted in accordance with the State Fire Code with County of Maui Amendments and NPFA 13. The State, Building Department, Fire Department and Director will witness formal tests and approve all systems before acceptance. Submit the request for formal inspection at least 15 days prior to inspection date. Complete all County of Maui forms prior to requesting a formal inspection. An experienced technician regularly employed by the system installer shall be present during the inspection. During the inspection, repeat any or all of the required tests as directed. Correct defects in work provided by the Contractor, and make additional tests at no additional cost to the State, until systems comply with all contract requirements. Furnish appliances, equipment, electricity, instruments, connecting devices, and personnel for the tests. The Contractor will furnish water for the tests.

3.08 CARE AND MAINTENANCE

A. Provide Director with the following:

1. Instruction charts describing operation and maintenance of sprinkler system.

2. Publication Entitled: NFPA 25 - Inspection, Testing, and Maintenance of Water Based Fire Protection Systems.

3. Fire sprinkler special inspection final report.

B. Conduct maintenance for the fire system as indicated in NFPA 25 - Inspection, Testing, and Maintenance of Water Based Fire Protection Systems.

END OF SECTION

SECTION 15804 – AIR CONDITIONING AND VENTILATION

PART 1 - GENERAL

1.01 RELATED DOCUMENTS

The General Provision for Construction Projects (2016), Special Provisions and General Requirements of the Specifications, apply to the work specified in this Section.

1.02 WORK DESCRIPTION

Provide all labor, materials, and equipment necessary for a complete installation of the air conditioning and ventilation system as shown on the drawings and/or specified herein.

1.03 RELATED WORK SPECIFIED IN OTHER SECTIONS

A. Section 15000 – MECHANICAL GENERAL REQUIREMENTS.

B. Division 16 – ELECTRICAL: Electrical power to air conditioning equipment.

1.04 COMPLIANCE WITH STANDARD AND INDUSTRY SPECIFICATIONS

Comply with safety regulations of the Occupational Safety and Health Administration (OSHA) and the Division of Occupational Safety and Health (DOSH), State of Hawaii.

1.05 SUBMITTALS

A. Refer to Section 15000 – MECHANICAL GENERAL REQUIREMENTS.

B. Shop Drawings: Contractor shall provide 24" x 36" maximum size detailed shop drawings consisting of a complete list of equipment and materials including manufacturer's descriptive and technical literature, performance charts and curves, catalog cuts, and installation instructions. Shop drawings shall also contain complete wiring, routing, and schematic diagrams and any other details required to demonstrate that the system has been coordinated and will function properly as an integral system. Shop drawings will include, but not be limited to, the following work:

1. Installation of equipment, piping ductwork.

2. Installation of controls.

C. Materials List: Submit all required products and items for a complete operational and integral system.

D. As-Built Drawings: Upon completion of the work, a complete set of reproducible record drawings, indicating locations of all equipment and material installed under this section shall be submitted to the Engineer before the installation will be accepted as complete.

E. Certificates: Submit as noted under item entitled “CERTIFICATES” herein below.

F. Maintenance Service Contract: See Section 15000 – MECHANICAL GENERAL REQUIREMENTS.

1.06 CERTIFICATES

The Engineer shall have the right to require a written certificate dated and signed by a responsible employee of this Contractor, evidencing the performance of any portion of the work or any testing; as a condition precedent to the acceptance of any work or the result of any test. Whenever a regulatory agency performs inspections or tests of any portion of work, a certificate shall be furnished by the Contractor that the inspection or test was satisfactorily passed.

1.07 PRODUCT DELIVERY, STORAGE AND HANDLING

Furnish new equipment, materials and accessories bearing the manufacturer's identification. Coordinate deliveries to avoid interferences or construction delays. Protect products during delivery, storage, installation and the remainder of the construction period after installation.

1.08 COORDINATION

Contractor shall coordinate work with all trades to insure the proper fit of equipment and materials within the spaces indicated. Due to the limited space available for equipment and material installation, particular care must be given to coordinate equipment installation with ductwork, piping, controls, plumbing, and electrical work. Contractor will be required to correct all defective work resulting from lack of coordination of his work with other trades to the satisfaction of the Engineer at no additional cost to the State.

1.09 CORROSION PROTECTION

A. Unless specified otherwise, equipment fabricated from ferrous metals that do not have a zinc coating conforming to ASTM International (ASTM) A386 or a duplex coating of zinc and paint shall be treated for prevention of rust with a factory coating or paint system that will withstand 125 hours in a salt-spray fog test except that equipment located outdoors shall be tested for 500 hours. The salt-spray fog test shall be in accordance with ASTM B117 using a 5 parts by weight (plus or minus) of sodium chloride in 95 parts of distilled water or water containing not more than 200 parts per million of total solids sodium chloride solution. Immediately after completion of the test, the coating shall show no signs of blistering, wrinkling or cracking, no loss of adhesion and the specimen shall show no signs of rust creepage beyond 1/8" on either side of the scratch mark. The film thickness of the factory coating or paint system applied on the equipment shall be not less than film thickness used on test specimen.

B. Locally Applied Corrosion Protection: Provide locally applied corrosion protection for all air handling equipment. Corrosion protection shall be by Certified Personnel. Contractor shall submit certification for review.

1. Non-ferrous heat exchanger finned surfaces: Heat exchanger finned surfaces shall be cleaned and conversion liquid or bonding agent shall be applied by either spraying or dipping. The minimum thickness of the dried conversion liquid shall be one micron. The heat exchanger finned surface shall be finished coated utilizing a one component, polyurethane coating to a dry film thickness of 20-25 microns. Coating shall not reduce the heat transfer rate to the coils and shall be ultraviolet (UV) resistant. Color shall be silver. Provide 3-year written guarantee. Blygold Polual, HVAC Guard, or approved substitute.

2. Ferrous, galvanized and aluminum surfaces: Exterior finish coat shall be applied over existing factory coated surfaces. Coating shall be a high solid, self-priming polysiloxane epoxy. Coating shall be applied in one coat to a minimum 5 mils dry film thickness. Volume of solids shall be 90% + 3% (per ASTM D2687), adhesion characteristics of 2,000 psi (per ASTM D4541), and abrasion resistance of 53 mg weight loss (per ASTM D4060). Ameron PSX700, HVAC Guard, or approved substitute.

PART 2 – PRODUCTS

2.01 SPLIT AIR CONDITIONING UNIT

A. Variable Capacity A/C System: The variable capacity, heat pump heat recovery air conditioning system shall be Variable Refrigerant Flow Zoning System or approved equal. The system shall consist of an outdoor unit, multiple indoor units, and an electronic/electric control system. Provide all indoor units and control wiring to new ACCUs. Each indoor unit or group of indoor units shall be independently controlled.

1. General: The units shall be listed by Electrical Laboratories (ETL) and bear the ETL label. All wiring shall be in accordance with the National Electrical Code (NEC). The units shall be manufactured in a facility registered to ISO 9001 and ISO14001 which is a set of standards applying to environmental protection set by the International Standard Organization (ISO). Provide a full charge of R-454B for the system.

2. Warranty: The units shall be covered by the manufacturer's limited parts warranty for a period of one year from date of project acceptance. In addition, the compressor shall have a manufacturer's limited warranty for a period of 6 years from date of project acceptance. The surety shall not be held liable beyond 2 years from the project acceptance date.

3. Air-Cooled Condensing Unit:

   a. General: The system shall consist of the outdoor unit, indoor units, and electronic/electric control system. The outdoor units shall be equipped with multiple circuit boards that interface to the electronic/electric control system. The outdoor unit shall have a powder coated finish. The outdoor unit shall be completely factory assembled, piped and wired. Each unit shall be run tested at the factory. Mitsubishi S-series or approved substitute.

1) The sum of connected capacity of all indoor air handlers shall range from 50% to 130% of outdoor rated capacity.
2) Outdoor unit shall have a sound rating no higher than 52 dB(A).
3) Both refrigerant lines from the outdoor unit to indoor units shall be insulated.
4) The outdoor unit shall have an accumulator with refrigerant level sensors and controls.
5) The outdoor unit shall have a high-pressure safety switch, over-current protection and DC bus protection.
6) The outdoor unit shall have the ability to operate with a maximum height difference of 98 feet and have a total refrigerant tubing length of 393 feet. The greatest length is not to exceed 262 feet between the outdoor unit and the indoor units without the need for line size changes or traps.
7) The outdoor unit shall be capable of heat operation at 10°F ambient temperature without additional low ambient controls.
8) The outdoor unit shall have a high efficiency oil separator plus additional logic controls to ensure adequate oil volume in the compressor is maintained.
9) Provide waffle isolation pads, bolt unit through waffle pad to concrete slab.

b. Unit cabinet: The casing shall be fabricated of galvanized steel, bonderized and finished with a powder coated baked enamel. Provide local applied corrosion protection. At manufacturer's option, provide manufacturer's optional corrosion coating features applied at the factory consisting of the following:

1) Polypropylene resin plastic fan and fan guard.
2) Cellulose and urethane series and amino alkyd resin coating on heat exchange.
3) Alloyed galvanized steel frame, panels and partition plate.

c. Fan:

1) The unit shall be furnished with 2 direct drive, variable speed propeller type fans.
2) The fan motor shall have inherent protection, have permanently lubricated bearings, and be completely variable speed.
3) The fan motor shall be mounted for quiet operation.
4) The fan shall be provided with a raised guard to prevent contact with moving parts.
5) The outdoor unit shall have horizontal discharge airflow.

d. Refrigerant: R-454B refrigerant shall be required. Provide full charge for system.

e. Coil:

1) The outdoor coil shall be of nonferrous construction with lanced or corrugated plate fins on copper tubing.
2) The coil shall be protected with an integral metal guard.
3) Refrigerant flow from the outdoor unit shall be controlled by means of an inverter driven compressor.
4) Provide and install intertwining kit.

f. Compressor:

1) The compressor shall be a high performance, inverter driven, modulating capacity scroll compressor.
2) The outdoor unit compressor shall have an inverter to modulate capacity. The capacity shall be completely variable down to 16% of rated capacity.
3) The compressor shall be equipped with an internal thermal overload.
4) The compressor shall be mounted to avoid the transmission of vibration.

g. Electrical:

1) The outdoor unit electrical power shall be 208/230 volts, 1-phase, 60 hertz.
2) The unit shall be capable of satisfactory operation within voltage limitations of 187-228 volts (208V/60Hz) or 207-253 volts (230V/60Hz).
3) The outdoor unit shall be controlled by integral microprocessors.
4) The control circuit between the indoor units and the outdoor unit shall be 24VDC completed using a 2-conductor, twisted pair shielded cable to provide total integration of the system.

4. Ceiling Recessed Cassette Type Indoor Unit:

a. General: The indoor unit shall be a four-way cassette style indoor unit that recesses into the ceiling with a ceiling grille.

b. Indoor Unit: The indoor unit shall be factory assembled, wired and run tested. Contained within the unit shall be all factory wiring, piping, electronic modulating linear expansion device, control circuit board and fan motor. The unit shall have a self-diagnostic function, 3-minute time delay mechanism, and an auto restart function. Indoor unit and refrigerant pipes shall be charged with dehydrated air before shipment from the factory.

c. Unit Cabinet: The cabinet shall be ceiling-concealed with a four-way grill fixed to the bottom of the cabinet. The cabinet panel shall have provisions for a field installed filtered outside air intake.

d. Fan:

1) The indoor unit fan shall be an assembly with a turbo fan direct driven by a single motor.

2) The indoor fan shall be statically and dynamically balanced to run on a motor with permanently lubricated bearings.
3) The indoor fan shall consist of three (3) speeds; High, medium and Low.
4) The indoor unit shall have an adjustable air outlet system offering 4-way airflow, 3-way airflow, or 2-way airflow.
5) The indoor unit vanes shall have 5 fixed positions and a swing feature that shall be capable of automatically swinging the vanes up and down for uniform air distribution.

e. Filter: Return air shall be filtered by means of a long-life washable filter.

f. Coil:

1) The indoor coil shall be of nonferrous construction with smooth plate fins on copper tubing.
2) The tubing shall have inner grooves for high efficiency heat exchange.
3) All tube joints shall be brazed with phos-copper or silver alloy.
4) The coils shall be pressure tested at the factory.
5) A condensate pan and drain shall be provided under the coil.
6) The unit shall be provided with an integral condensate lift mechanism that will be able to raise drain water a minimum of 19-3/4” inches above the condensate pan.
7) Both refrigerant lines from ACCU to FCU shall be insulated.

g. Electrical: Refer to Drawings for the unit electrical power.

h. Controls:

1) The unit shall use controls provided by the unit manufacturer to perform functions necessary to operate the system.
2) Control board shall include contacts for control of supply fan.
3) Fan coil unit shall include no less than 4 digital inputs capable of being used for customizable control strategies.
4) Fan coil shall include no less than 3 digital outputs capable of being used for customizable control strategies.
5) The drain pan sensor shall provide protection against drain pan overflow by sensing a high condensate level in the drain pan. Should this occur the control shuts down the indoor unit before an overflow can occur. A thermistor error code will be produced should the sensor activate indicating a fault which must be resolved before the unit re-starts.

B. Controls: The controls shall be capable of supporting remote controllers, schedule timers and system controllers.

1. Electrical characteristics: The controls shall operate at 24VDC. Controller power and communications shall be via a common non-polar communications bus.

a. Wiring: Control wiring shall be installed in a system daisy chain configuration from indoor unit to ME remote controller to indoor unit, to the BC controller

(main and subs, if applicable) and to the outdoor unit. Control wiring to remote controllers shall be run from the indoor unit terminal block to the controller associated with that unit.

Control wiring for schedule timers, system controllers, and centralized controllers shall be installed in a daisy chain configuration from outdoor unit to outdoor unit, to system controllers, to the power supply.

Control wiring for the remote controllers shall be from the remote controller to the first associated indoor unit then to the remaining associated indoor units in a daisy chain configuration.

The system controller shall be capable of being networked with other system controllers for web-based control.

b. Wiring type: Wiring shall be 2-conductor (16 AWG or 18 AWG), twisted shielded pair, stranded wire, as defined by the Design Tool AutoCAD output. Network wiring shall be CAT-5e with RJ-45 connection.

2. Remote controllers: See drawings for control descriptions.

2.02 DIFFUSERS, REGISTERS AND GRILLES

A. Contractor shall coordinate all air device requirements with ceiling work.

B. Material and Finishes: Construct diffusers, registers, and grilles of aluminum. Exterior and exposed edges shall be rolled, or otherwise stiffened and rounded. Certified data shall be tested in accordance with Air Diffusion Council (ADC) standards.

C. Ceiling Diffusers:

1. Equip with baffles or other devices required, to provide proper air distribution pattern. Provide factory-fabricated, single-key, aluminum volume dampers. Internal parts shall be removable through the diffuser-neck for access to the duct and without the use of special tools. Air devices with separate ceiling fire dampers shall be constructed of steel and integral volume dampers omitted.

2. Square and rectangular diffusers: Construct each diffuser of 4 or more concentric elements designed to deliver air in a generally horizontal direction without excess smudging of the ceiling. The interior elements of square and rectangular ceiling diffusers may be square, or rectangular as manufacturer's standard. Provide lay-in type. Color shall be white. Titus TDC-AA, Metalaire or approved equal.

2.03 DUCTWORK AND ACCESSORIES

A. Galvanized Sheet Steel: As per SMACNA “HVAC Duct Construction Standards”, latest edition. ASTM A527; weight of galvanized coating shall be not less than 1 1/4 ounces total for both sides of one square foot of a sheet.

B. Low Pressure Ducts

1. Duct construction, metal gages, and reinforcements shall conform to the SMACNA latest edition and NFPA 90A.

2. Fittings: Square elbows, fittings, branch take-offs, transitions, splitters, duct volume dampers, and flexible connections shall conform to the SMACNA latest edition. Test holes shall be factory-fabricated, airtight, and non-corrosive with screw cap and gasket.

3. Joints: Make airtight. No dust marks from air leaks shall show at duct joints or connections to grilles, registers, and diffusers.

4. Laps: Make laps at joints in the direction of air flow. Space button-punch or bolt-connection in standing seams at fixed centers not greater than 6-inches. Longitudinal locks or seams, known as “Button Punch Snap-Lock” may be used in lieu of Pittsburgh Lock only for 2-inch W.G. and below systems.

5. Duct Pressure Class:

   Constant Air Volume Systems: 2-inch W.G. construction.

6. Flexible Duct: Rated for 6-inch pressure, polymeric core with galvanized wire helix with heavy fiberglass insulation with vapor barrier, UL labeled, R=8.0 minimum, one-hour minimum. Thermaflex-G-KM R-8 or approved equal.

7. Duct sizes are net inside dimensions.

C. Fans

1. Sound rating per AMCA 300; statically and dynamically balanced, with air capacities, brake horsepower, fan types, fan arrangement, sound power level or loudness level, and static pressure, as indicated. Fan bearing life shall have a minimum average 200,000 hours at design operating conditions. Construct housings and fan wheels of aluminum, except as specified otherwise. Motor shall be energy efficient type. Refer to drawings for make and model. Provide vibration isolators, 90 percent efficiency.

2. Supply Fan: UL listed, AMCA seal, galvanized steel cabinet, access panel, all aluminum centrifugal fan wheel, motor shall be permanently lubricated and resilient mounted, backdraft damper, vibration isolators, direct-drive with speed controller, mounted on fan housing. MERV 13 filters. S & P, Panasonic or pre-approved equal

D. Flexible Connections: UL approved neoprene-coated glass fabric cloth connections. Weight 32 ounce per square yard. Elgen neoprene-commercial type, Durodyne neoprene, or approved equal.

2.04 PIPING MATERIALS

A. Condensate Drain and Refrigerant Piping: Hard drawn type “L” copper tubing for refrigerant use only. Plugged tees at changes of direction shall be used to permit cleaning of piping. Provide Type “L” copper pipe and 95/5 solder for condensate drain line.

B. Fittings: For copper tubing shall be Mueller “Streamline” wrought copper solder sweat type.

C. Valves in Copper Tubing: Bronze or brass, suitable for R-454B refrigerant service, sealed cap type. Henry Valve Company, Mueller Brass Company or approved equal.

D. Contractor shall verify with air conditioning equipment manufacturer all refrigerant piping accessories required.

2.05 PIPE INSULATION

A. All material shall be applied in accordance with manufacturer’s recommendations by skilled mechanics. Vapor-proof cover where required, shall have flame spread rating and smoke emission in conformance with latest edition of NFPA Pamphlet 90A as revised. Materials shall have a flame spread rating less than 25 and smoke developed rating less than 50 in accordance with NFPA 255, ASTM E84, or UL 723.

B. All air conditioning condensate drain lines shall be insulated with closed cell insulation with additional sealant applied on longitudinal and end joints. AP Armaflex, Imcolock or approved. Exterior piping shall have stainless steel jackets. The following piping shall be insulated with thickness as indicated.

1. Condensate drain: Shall be one-inch thick.

2. Refrigerant Piping: Shall be one-inch thick.

PART 3 - EXECUTION

3.01 PREPARATION

Review the contract documents and make proper provisions to avoid interferences or construction delays. Determine the exact route of all ductwork and piping. Make offsets and changes in shape and direction required to maintain proper headroom and pitch or to accommodate the structure and the work of other trades. When changing the shape of the ductwork, provide ducts having the same friction loss as the size of the duct shown on the contract documents. Furnish other trades with information to properly locate and size openings in the structure required for the work under this section.

Furnish anchor bolts, sleeves, inserts, and supports required for the work under this section.

3.02 INSTALLATION

Perform all work using personnel skilled in the trade involved. Provide competent supervision. Furnish new equipment, materials, and accessories bearing the manufacturer's identification and conforming to the recognized commercial standards. Provide guards around exposed moving machinery parts and around high-temperature equipment and materials. When exposed to weather, provide a protective enclosure around electrical equipment, controls, and other items that are not satisfactorily protected. No piping, electrical conduit, ceiling supports, or similar items shall be supported from air conditioning and ventilation equipment, ductwork, or ceiling. All equipment and materials shall be supported from the building structure.

3.03 EQUIPMENT

Install equipment in the space allotted with sufficient clearance for proper operation and maintenance. Where required for equipment lubrication, extend grease lines to an easily accessible location. Where equipment differs in arrangement or connections from those shown, provide all required changes in piping, supports, and appurtenances. Provide equipment accessories necessary for proper operation and support. Contractor shall include for his work, all costs for services of manufacturer's representative for supervision of equipment installation. Contractor shall be a manufacturer's authorized Installer.

3.04 LOW PRESSURE DUCTS

A. Construction: Construct ducts of galvanized steel sheets unless otherwise indicated. Duct construction, metal gauges, and reinforcements shall conform with SMACNA HVAC Duct Construction Standards and NFPA 90A. Ducts shall not pulsate or vibrate when in operation. Air leakage shall be less than 1% of the system capacity.

B. Joints: Construct joints to meet the requirements of the leakage test specified by SMACNA.

C. Fittings: Square elbows, fittings, transitions, and duct volume dampers shall conform to the SMACNA HVAC Duct Construction Standards.

D. Rectangular Ducts: Joints between sections of duct and between ducts fittings shall be made with joints recommended in SMACNA HVAC Duct Construction Standards.

E. Dampers and Deflectors: Provide dampers for air volume control where indicated, specified, directed, and as required. Dampers shall be of galvanized steel with indicating quadrant in accessible location and locking device for adjusting locking damper in position.

F. Provide sizes, runs, and connections of ducts that adhere to drawings as closely as possible. Install to indicated heights as permitted by structure. Consult with other

trades and coordinate to establish necessary space requirements for each trade. Fabricate ductwork in workmanlike manner with airtight joints, presenting smooth surface on the inside, neatly finished on the outside.

G. Details of construction and materials not specified herein shall be in accordance with SMACNA HVAC Duct Construction Standards and NFPA 90A.

H. Keep ductwork openings closed with sheet metal during construction to prevent injury. Take all possible precautions to keep interior of ducts, plenums, and fan housings free of dirt or dust.

I. Seal all penetrations with fire stopping material that is UL listed and is equal or greater than the fire rating of the wall, floor, or roof.

3.05 PIPING INSTALLATION

Arrange and install piping as indicated; straight, plumb and as direct as possible; from right angles on parallel lines with building walls. Keep pipes close to walls, partitions, and ceilings; offset only where necessary to follow walls, as directed. Locate groups of pipes parallel to each other; space them at distances to permit applying full insulation and to permit access for servicing valves. Check each length of pipe before it is installed in place to make certain there is no foreign material in the system. Gauges or gauge ports are to be provided where shown and as required to obtain final system balance.

A. Pipe joints: For copper tube, Type “L” brazed joints: Clean and polish outer surface of tube ends and inner surface of fittings, apply flux as recommended by manufacturer of silver braze fittings.

B. Piping supports, hangers and inserts: Support pipes with supports suitable for type of building construction. Provide pipe covering protection saddles at supports for insulated pipes.

C. Open pipe end protection: Keep piping free from scale and dirt; protect open pipe ends wherever work is suspended during construction to prevent foreign bodies entering, use temporary plugs, burlap or other approved material for protection open ends.

D. Sleeves: In gypsum board partitions provide 26-gauge galvanized iron or steel. After installing pipe, pack sleeve with fiberglass insulation. Provide sheet metal closure collar on both sides of sleeve. Pipes which penetrate the building structure shall be provided with pipe sleeves. Sleeves shall be securely retained in position and location before and during construction. Space between pipe and sleeves or between insulation of pipe and sleeves, shall be not less than 1/4" between outside of pipe or insulation, and inside wall of sleeves. Pack the annular space with hemp or fiberglass, and seal with elastic cement. Sleeves for uninsulated pipes shall have ends flush with finished wall surfaces and pipe or tubing with outside perimeter of pipe caulked to sleeve. Sleeves for insulated pipes shall extend 1/2" from concrete or masonry ceiling or wall faces and outside perimeter of the insulation shall be caulked to the sleeve on both sides of the faces. Terminal ends of pipe insulation

shall be sealed with mastic. Sleeves for lines passing through floors shall extend 3 inches above finished floor slab and shall be caulked to the slab. Provide escutcheon plates on both side of pipe penetration through the building structure.

E. Provide condensate drain from fan coil unit pans, terminating where indicated.

3.06 PIPE INSULATION

Provide insulation for piping and specialties as indicated and as specified herein. Installation shall be in accordance with manufacturer's written specifications.

3.07 CONTROLS

Provide a complete system of electric temperature and pressure control. The control system shall be complete with all necessary thermostats, relays, sensors, valves, dampers, and appurtenances for a completely operable system. The control system to be provided is generally described in this section of the specifications; however, other information affecting the work is specified in other paragraphs of the specifications. The Contractor shall familiarize himself with the reinforcements of the entire system so that a complete integrated system is installed.

3.08 ELECTRICAL WORK

A. All control circuits must be through respective equipment disconnects to ensure control circuit being off when equipment disconnect is off. Wiring materials and methods shall conform to electrical sections, to applicable codes and to the National Electrical Code, and National Electrical Manufacturers Association (NEMA) Standards and specifications.

B. Provide electrical controls and electric wiring from power supply points coordinated with the Electrical Subcontractor. Install thermostats located as indicated on drawings, with adjustment subject to space finishing work. Submit shop drawings, wiring diagrams, and other pertinent data for control systems.

3.09 PAINTING AND IDENTIFICATION

A. The following work shall be the responsibility of the Contractor providing such equipment, including supports and hangers. At his option, the work may be done by the Painting Subcontractor.

1. All factory-assembled equipment shall have a factory-applied prime coat with all damaged spots touched up after installation. Finish color for registers and grilles shall match the adjacent wall color.

2. Prime coat all ducts, piping, hangers, supports, and mechanical equipment exposed to view. Provide one finish coat in color to match adjoining wall and/or ceiling color, except as otherwise specified below. Ducts and equipment enclosed in drop ceilings and enclosed in chases are not considered as being exposed to view.

3. All items to be painted shall be cleaned of all dirt, oil, grease, scale, and shall be perfectly dry before painting.

B. Equipment Identification: Label equipment and starters to indicate system number and designation with black plastic laminate labels one-inch high with 1/2" white letters. Submit sample for approval by the Engineer.

3.10 FINAL INSPECTION AND CLEAN UP

A. Final Inspection: Notify the Engineer when final inspection of the installation is to be performed. Thoroughly clean all materials and equipment, remove all labels, adjust each for quiet operation, and deliver in condition satisfactory to the Engineer.

B. In the event defects or deficiencies are found during the final inspection, final acceptance of the work will be after such defects or deficiencies have been corrected to the satisfaction of the Engineer.

C. Maintenance Service Contract shall be provided. See Section 15000 – MECHANICAL GENERAL REQUIREMENTS

PART 4 - MEASUREMENT AND PAYMENT

4.01 BASIS OF MEASUREMENT AND PAYMENT

Work under this Section will not be measured nor paid for separately but shall be considered incidental to and included in the bid prices for the various items of work in this project.

SECTION 15990 – TESTING AND BALANCING OF AIR SYSTEMS

PART 1 - GENERAL

1.01 RELATED DOCUMENTS

The General Provisions for Construction Projects (2016), Special Provisions and General Requirements of the Specifications, apply to the work specified in this Section.

1.02 WORK DESCRIPTION

This section includes testing and balancing of air systems for air conditioning and ventilation systems.

1.03 RELATED SECTIONS

A. Requirements of DIVISION 1- GENERAL REQUIREMENTS apply to this Section.

B. Requirements of SECTION 15000 – MECHANICAL GENERAL REQUIREMENTS apply to this Section

1.04 APPLICABLE PUBLICATIONS

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

B. American Society of Heating, Refrigerating and Air Conditioning Engineers (ASHRAE): ASHRAE Handbook of Fundamentals, Latest Edition

C. Associated Air Balance Council (AABC): National Standards for Field Measurements and Instrumentation, Total System Balance, Air Distribution - Hydronic Systems - Air Pollution - Sound Vibration, Latest Edition

D. National Environment Balancing Bureau (NEBB): Procedural Standards for Testing - Balancing - Adjusting of Environmental Systems, Latest Edition.

1.05 SUBMITTALS

A. Submit in accordance with SECTION 01300 – SUBMITTALS and as indicated in SECTION 15000 - MECHANICAL GENERAL REQUIREMENTS.

B. Standard Compliance Certificates: Testing Agency, Testing Agency Personnel, Professional Engineers, and Instrument Calibration

C. Schedules: Testing Agenda

D. Reports:

1. Air system performance.

2. Air motion and sound pressure levels.

3. Instrument records.

4. Identification of conspicuous items not conforming to contract requirements or obvious mal-operation and design deficiencies.

1.06 GENERAL REQUIREMENTS

A. The provisions of SECTION 15000 - MECHANICAL GENERAL REQUIREMENTS, apply to this section.

B. Definitions:

1. Adjust: To regulate the specified fluid flow rate and air patterns at the terminal equipment (e.g., reduce fan speed, throttling, etc.).

2. Balance: To proportion flows within the distribution system (submains, branches and terminals) in accordance with specified design quantities.

3. Procedure: Standardize approach and execution of sequence of work operations to yield reproducible results.

4. Report Forms: Test data sheets arranged for collection of test data in logical order to submission and review. This data should also form the permanent record which shall be used as the basis for any future testing, adjusting and balancing required.

5. Test: To determine quantitative performance of equipment.

1.07 TESTING AND BALANCING AGENCY

A. Air Systems Testing and Balancing: Upon completion of the installation and field testing, performance test and adjust the supply, return and outside air systems to provide the air volume quantities indicated and sound levels required. Accomplish work in accordance with the agenda and procedures specified in AABC 71679 and standards of the NEBB. The Contractor shall correct air system performance deficiencies disclosed by the test before balancing the systems.

B. Agency Qualifications: Obtain the services of a qualified testing organization to perform the testing and balancing work as herein specified.

1.08 AGENDA

A. Submittal: An agenda shall be submitted and approved by the Engineer prior to start of testing and balancing work. Include the following:

1. General description of each air system with its associated equipment and operation cycles for ventilating and cooling systems. Where different cycles are used for day and night, they shall be described independently.

2. A complete listing of air and air terminal measurements to be performed.

3. Proposed selection points for sound measurements. List shall include typical spaces and sound sensitive areas.

4. Specific test procedures and parameters for determining specified quantities, e.g., flow drafts, sound levels, etc., from the actual field measurements to establish compliance with contract requirements.

5. Samples of forms showing applications of procedures and calculations to typical systems.

B. Procedure Reporting: Provide specific test procedures for measuring air quantities at terminals. Specify type of instrument to be used, method of instrument application (by sketch) and factors for:

1. Air terminal configuration

2. Flow direction (supply or exhaust)

3. Velocity corrections

4. Effective area applicable to each size and type of air terminal

5. Density corrections (unless applicable data are covered elsewhere)

C. Area and Application Factors: Will not be required where pitot tubes are employed to determine terminal capacity.

1.09 PROCEDURES, GENERAL

A. Requirements: Adjust systems and components thereof that perform as required by drawings and specifications.

1. The Contractor shall provide a final balance of systems to satisfy specific occupant and Engineer's recommendations after acceptance of balance report.

B. Test Duration: Operating tests of pumps cooling coils, fans and other equipment shall be of not less than 4 hours duration, after stabilized operating conditions have been established. Capacities shall be based on temperatures and air quantities measured during such tests.

C. Instrumentation: Method of application of instrumentation shall be in accordance with the approved agenda. Furnish personnel, instruments and equipment for tests specified herein.

1. Accuracy of Instruments: Instruments used for measurements shall be accurate. Provide calibration histories for each instrument for examination. Calibrate each test instrument by an approved laboratory or by the manufacturer. The Engineer has the right to request instrument recalibration or the use of other instruments and test methodology, where accuracy of readings is questionable.

2. Application of Instruments: Comply with manufacturer's certified instructions.

3. Permanently-Installed Instruments: Do not install permanently-installed equipment used for the tests, e.g., gauges, thermometers, etc., until just prior to the tests to avoid damage and changes in calibration.

4. Accuracy of Thermometers: Plus or minus one graduation at the temperatures to be measured. Graduations shall conform with the following schedule:

Medium	Design Temperature Differential (^oF)	Maximum Graduation (^oF)
Air	10 or less	½
Air	over 10	1
Air	Pressure	0-10"WG Adjustable Range

PART 2 - PRODUCTS

2.01 SYSTEM PROCEDURES

A. Adjustments: Adjust air systems to provide the required design air quantity to, or through, each component. Conduct adjusting and balancing of systems during periods of the year approximating maximum seasonal operation.

B. Equalizers: Adjust equalizing devices to provide uniform velocity across the inlets (duct side for supply of terminals, prior to measuring flow rates).

C. Balance: Use flow adjusting (volume control) devices to balance air quantities only; i.e., proportion flow between various terminals comprising system and only to the extent that their adjustments do not create objectionable air motion or sound, i.e., in excess of specified limits.

1. Balancing Between Runs (submains, branch mains and branches): Use flow regulating devices at, or in, the divided - flow fitting. Minimize restriction imposed by flow regulating devices in or at terminals.

2. Final Measurements of Air Quantity: Make final measurements of air quantity, after the air terminal has been adjusted to provide the optimum air patterns of diffusion.

D. Fan Adjustment: Total air system quantities, generally, shall be varied by adjustment of fan speeds or axial-flow fan wheel blade pitch. For systems with direct-connected

fans (without adjustable pitch blades), damper restrictions of a system's total flow may be used, only if system pressure is less than 1/2-inch w.g. and sound level criteria is met.

E. Air Measurement:

1. Pitot Tube: Except as specifically indicated herein, make pitot tube traverses of each duct to measure air flow therein. Pitot tubes, associated instruments, traversed and techniques shall conform with the ASHRAE Handbook Fundamentals.

2. Pitot Tube Traverse: Except for ducts serving modular office areas with movable partitions, which are subject to change, Pitot-tube traverse may be omitted if the duct serves only a single room or space and its design volume is less than 2000 cfm. In lieu of Pitot-tube traverse, determine air flow in the duct by totaling volume of individual terminals served, measured as described herein.

3. Measurements of Air Quantity: Where duct's design velocity and air quantity are both less than 1000 (fpm/cfm), air quantity may be determined by measurements at terminals served.

4. Test Holes: Test holes, shall be in a straight duct, as far as possible downstream from elbows, bends, take-offs and other turbulence generating devices, to optimize reliability of flow measurements.

5. Air Terminal Balancing: Measurement of flow rates by means of velocity meters applied to individual terminals, with or without cones or other adapters, shall be used only for balancing. Measurement of air quantities at each type of air terminal (inlet and outlet) shall be determined by the method approved for balancing agenda. Conduct laboratory tests to prove accuracy of methodology when so directed by the Engineer. Perform such tests in conformance with applicable ASHRAE or ASME codes.

6. As indicated. In addition to air motion measurements, Air Motion and Distribution shall make smoke tests shall be made wherever requested by the Engineer, to demonstrate the air distribution from air terminals.

2.02 TEST REPORTS

A. Submittal: Submit six copies of the reports described herein, covering air system performance, air motion (fpm) and sound pressure levels, to the Engineer prior to final tests and inspection.

B. Instrument Records: Include types, serial numbers and dates calibration of instruments.

C. Reports: Reports shall identify conspicuous items not conforming to contract requirements or obvious mal-operation and design deficiencies.

2.03 AIR SYSTEM DATA

A. Report: The report shall include for each system the data listed below:

1. Equipment

a. Installation Data:

1) Manufacturer and Model
2) Size
3) Arrangement, Discharge and Class
4) Motor H.P., Voltage, Phase, Cycles and Full Load Amps.
5) Location and Local Identification Data

b. Design Data: Data listed in schedules on drawings and specifications.

c. Fan Recorded (Test) Data:

1) C.F.M
2) Static Pressure
3) R.P.M.
4) Motor Operating Amps
5) Motor Operating B.H.P.
6) Entering and leaving air temperatures (D.B. & W.B.)
7) Ambient Air Conditions; D.B and W.B.
8) System Total Static Pressure

2. Duct Systems:

a. Duct and Air Device Air Quantities (Maximum and Minimum): Main, Submains, Branches, Outdoor (Outside) Air, Total-Air and Exhaust

1) Duct size(s)
2) Number of Pitot-tube (Pressure) Measurements
3) Sum of Velocity Measurement, excluding pressure measurements
4) Average Velocity
5) Recorded (Test) C.F.M
6) Design C.F.M.
7) Recorded System Static Pressure

2.04 FINAL TEST, INSPECTION AND ACCEPTANCE

A. Capacity and Performance Tests: Make tests to demonstrate that capacities and general performance of air systems comply with contract requirements.

1. Final Inspection: At the time of final inspection, the Contractor shall recheck, in the presence of the Engineer, random selections of data, air quantities, air motion and distribution recorded in the test report.

2. Points and Areas for Recheck: As selected by the Engineer.

3. Measurement and Test Procedures: As approved for work forming basis of certified report.

4. Selections for Recheck (specific plus random): In general, selections for recheck will not exceed 25 percent of the total number tabulated in the report, except that special air systems may require a complete recheck for safety reasons.

B. Retests: If random tests elicit a measured flow deviation of ten percent or more from greater than that recorded in the test report listings, at ten percent or more of the rechecked selections, the report shall be automatically rejected. In the event the report is rejected, all systems shall be readjusted and tested, new data recorded, new test reports submitted and new inspection tests made at no additional cost to the State.

C. Marking of Settings: Following final acceptance of certified reports by the Engineer, the settings of valves, splitters, dampers and other adjustment devices shall be permanently marked by the Contractor, so that adjustment can be restored if disturbed at any time. Do not mark devices until after final acceptance.

PART 3 – EXECUTION (Not Used)

PART 4 - MEASUREMENT & PAYMENT

4.01 BASIS OF MEASUREMENT AND PAYMENT

Work under this Section will not be measured for payment but will be paid for at the contract Lump Sum Price.

END OF SECTION

DIVISION 16 - ELECTRICAL

SECTION 16010 - ELECTRICAL WORK

PART 1 - GENERAL

1.01 RELATED DOCUMENTS

The General Provisions for Construction Projects (2016), Special Provisions and General Requirements of the Specifications, apply to the work specified in this Section.

1.02 SUMMARY

A. Furnish all labor and materials required to complete all electrical work as indicated on the drawings and/or specified herein. In general, the following work is included:

1. Power and lighting systems; including dry transformers, branch circuits, outlets, wiring devices, panels, and wiring.

2. Empty raceways with pull string for telephone and data.

3. Installation of equipment furnished by the State or by others, including the furnishing of disconnects.

4. Power connections for mechanical equipment including the furnishing of disconnects if not furnished by others.

5. Submittal of shop drawings.

6. Preparation of "as-built" drawings.

B. The term "wiring" shall include raceways, outlets, conductors, fixtures, devices, and panelboards.

C. Wiring and connecting all electrical equipment supplied for installation and use in this contract and not specifically listed as work by others.

1.03 RULES, STANDARDS AND PERMITS

A. The entire work shall comply with applicable laws of the local electric bureau, the Standards of NEMA and ANSI and National Electrical Safety Code, and the regulations of the local utility companies.

B. The Contractor shall obtain and pay for the electrical permits required, and shall give notice for inspections as the work progresses. Upon completion, he shall deliver certificates of completion and inspection to the Contracting Officer.

1.04 DRAWINGS

A. These specifications are accompanied by floor plans of the building, and diagrammatic electrical layouts showing the approximate location of the outlets, switches, devices and other equipment.

B. The wiring layouts and schedules show the approximate locations of all outlets, switch control, service runs and other electrical apparatus. These locations are approximate and before installing Contractor shall study adjacent architectural details and make installation in most logical manner. Any device may be relocated within 10-feet-0 inch before installation at the direction of the Contracting Officer, whose decision shall be final.

C. Contractor shall maintain in his field office one set of electrical drawings for the sole purpose of recording changes and field deviations as they occur. Each change with explanatory notes shall be entered before the close of the work day, and shall be initialed by the representative of the Contracting Officer.

D. Above reference to deviations shall not be construed to allow deviations without prior approval. Upon completion of the electrical work, the Contractor shall transfer all changes posted on the field set to a set of transparencies to be furnished by the Contracting Officer. The final set shall be certified to show "as-built" conditions and both sets delivered to the Contracting Officer. This is mandatory.

1.04 SUBMITTALS

A. Submit in accordance with SECTION 01300 - SUBMITTALS.

B. Submit for approval 6 copies of shop drawings or catalog cuts of following equipment and resubmit until approval is received before placing order:

1. Panelboards, circuit breakers, and safety switches.

2. Dry transformers.

3. Lighting fixtures and lamp schedule.

4. Relays, contactors, and time switch.

5. Any other special or built-to-order equipment.

C. Warranty: Submit warranty as noted under item entitled “WARRANTY” hereinbelow.

1.05 WARRANTY

A. Manufacturer's Warranty:

1. Submit 1 5-year manufacturer's warranty for LED luminaires. The warranty period shall commence from the project acceptance date. LED luminaires shall be replaced by such materials, apparatus or parts including installation labor to make such defective portion of complete system conform to true intent and meaning of drawings and specifications, at no additional cost to the State.

2. Warranty Provisions: The warranty provisions and number of years for the warranties required in this Section shall take precedence over the standard provisions in the Interim General Conditions (IGC).

B. Contractor's Warranty: Installation shall be complete in every detail and ready for use. Any item supplied by the Contractor developing defects within one year from the project acceptance date by the State shall be replaced by such materials, apparatus, or parts including installation labor to make such defective portion of the complete system conform to the true intent and meaning of drawings and specifications, at no additional cost to the State.

PART 2 - PRODUCTS

2.01 MATERIALS

A. Materials and equipment shall be new and those listed by Underwriters' Laboratories shall bear "UL" label of approval. Brand names, manufacturer's names and catalog numbers indicate standards of design and quality required.

B. Relays and contactors shall be rated as indicated, silver contacts enclosed in code gage box. Lighting contactors shall be designed for lighting loads. Square D, Cutler Hammer, Allen Bradley, General Electric, Zenith, Ward Leonard, ITE or accepted equivalent.

C. Ground rods shall be copper clad 5/8-inch x 8-feet long minimum.

D. Panelboards shall be 3-phase, 4WSN application, voltage and mounting as indicated, with doors and trims, copper bussed with bolted molded case thermal magnetic breakers, complement as shown on the drawings, circuit directory, lock and 2 keys. Breakers shall be interchangeable trip type when such is available. All panels shall be keyed alike.

E. Raceways:

1. Rigid Steel, zinc-coated, 3/4-inch minimum diameter, except as noted. Other sizes to conform to NEC Chapter 9, Table 3A, based on RHW wires.

2. Electric metallic tubing (EMT) galvanized round bore with compression connectors, 3/4-inch minimum diameter, other sizes to conform to NEC Chapter 9, Table 3A, based on RHW wires.

3. Flexible conduit - galvanized steel, neoprene jacketed for wet locations.

F. Conductors shall be delivered to site in original factory packages or reels. Conductors shall be copper, #12 AWG minimum.

1. Interior locations - Branch circuits, Type RHW, TW, THW or THWN.

2. Exterior locations - Type RHW - USE, or cross-linked polyethylene Style USE.

3. In gutters and feeders - #6 AWG and larger. Type THW or XHHW.

G. Boxes:

1. Outlet and small junction boxes shall be zinc-coated pressed steel of ample size. Light outlets shall be fitted with no-bolt type fixture studs as necessary for fixture support. Utility boxes ("Handy", Type OA, etc.) shall not be used. Minimum size of outlet boxes, 4-inch square of octagon.

2. Large junction boxes and covers shall be zinc-coated. Screws for cover shall be brass.

3. Telephone and communications outlets, to be 4-11/16 inches square boxes minimum.

4. Exposed boxes and weather exposed boxes – NEMA 3R 316 Stainless Steel.

H. Terminal Cabinets: Terminal cabinet construction, lock and finish shall match panelboard cabinets. Provide 3/4-inch wolmanized plywood backboard. Locks shall match panelboard cabinet. NEMA 4X 316 Stainless Steel.

I. Wiring Devices: Specification grade unless otherwise noted.

1. Receptacles, bakelite body, flush, nylon face, ivory: Duplex, grounding type, 20A, 125V, 3-wire, specification grade spring bronze contacts, bronze mounting strap and ground contacts, Hubbell 5362, Bryant, Leviton or accepted equivalent.

2. Switches, tumbler, bakelite body, flush, ivory, 20-ampere, 277-volts, quiet operating, poles as indicated, Bryant #490X Series, Hubbell 122X Series, Arrow #1991X-SL Series or accepted equivalent. Provide pilot light for switches as indicated. Switches shall be key operated type where indicated. Key shall be fork type. Furnish 3 keys for each key switch.

3. Special receptacles shall be of the type and size indicated on the drawings. Provide matching cap for each special receptacle. Arrow, Hubbell, Bryant or accepted equivalent. Provide one matching plug for each receptacle.

4. Equivalent grade and type of wiring devices manufactured by General Electric Company, Sierra or Leviton are approved or accepted equivalent.

5. Plates shall be 0.040-inch thick, 18-8 stainless steel, except where other metals are noted or specified.

J. Lighting Fixtures:

1. Provide all lighting fixtures and lamps as indicated including lamps, drivers, stems and accessories.

2. Fixture shall be manufactured from sheet metal protected by "Bonderite" or "Cryscoat" process and baked white finished, 80 percent minimum reflectance, to resist 300 hours salt spray test. Anodize all aluminum, galvanize or chrome all steel. All ferrous metal surfaces, including edges shall be plated or primed and painted.

K. Circuit breakers and safety switches shall be of the rating and type indicated. Circuit breakers shall be of the interchangeable trip type when available. Safety switches shall be heavy duty for indoor locations, enclosures shall be NEMA 1 enclosure and for exterior locations enclosures shall be NEMA 3R 316 stainless steel.

L. Time Switch shall be rated 35 amperes minimum, circuits as indicated, with 10 hour minimum spring carry-over motor, for 21 degrees North Latitude. Sangamo type WY, Tork, Paragon or accepted equivalent.

M. Hardware, Supports, Backing, Etc.: Provide all hardware, supports, backing and other accessories necessary to install electrical equipment. Wood materials to be termite resistant. Ferrous material shall be galvanized for corrosion protection. Non-ferrous materials shall be brass or bronze.

N. Dry Transformers shall be general-purpose dry-type transformers, UL listed, size as indicated. Audible-sound levels tests shall be made in accordance with NEMA standard ST 1. All transformers shall have standard NEMA taps except when taps are not required by NEMA, four 2-1/2 per cent taps (two above and two below rated voltage) shall be provided. All transformers shall be furnished with sound isolation mountings. Transformers shall be General Electric, Square D, Eaton-Cutter Hammer.

PART 3 - EXECUTION

3.01 CONSTRUCTION METHODS

A. Workmanship shall be subject to the approval of the Contracting Officer, who shall be afforded every facility to determine the skill and competency of labor.

B. Outlet locations are shown approximately only. The Contractor shall check architectural drawings and details and center or space the outlets to obtain neat symmetrical appearance. Provided change is ordered before outlets are installed, there shall be no additional cost to the State for reasonable change of outlet locations.

C. Building wiring shall be in concealed raceways, except as shown. Interior conduit for future extension shall be terminated in couplings set flush with finish surface and closed by means of recessed pipe plugs. Provide expansion fittings in conduit runs at all building expansion joints. Electrical metallic tubing may be used only in dry ceilings and walls. Electrical metallic tubing may not be used in exposed locations or embedded in concrete slabs.

D. Provide all necessary foundations, supports and backing for enclosures, conduit, and equipment. Fixture support shall be capable of 300-pound loading, and shall be made to building structure.

E. Perform all cutting, drilling and patching necessary for installation of conduit and equipment. Repair any surface damaged or marred during the installation. Cutting, repairs and finish shall be subject to the approval of the Contracting Officer.

F. Minimum wire size for branch circuit shall be #12 AWG. Larger sizes may be used as necessary.

G. Homeruns shall mean that portion of a branch circuit from outlet nearest panel, to the panel.

H. Crimp or pressure-connect all splices #10 AWG or smaller. Leave no sharp points that can pierce taping. Use no-solder pressure connectors for #8 AWG and larger. Use highest grade insulating and friction tape, applied in accordance with best practice of trade. Connections of light fixture wires to building wires may be made with approved wire-nuts.

I. Form wires neatly in all enclosures. Cable together and lace with waxed strings branch circuit conductors at panelboards.

J. Lubricants used for wire-pulling in all areas except as noted, shall be such that lubricant will not damage conductor insulation or sheathing. For neoprene jacketed and plastic-sheathed conductors, use powdered soapstone.

K. Where ducts pass through structural wall, provide openings with minimum of one-inch mastic fill between duct envelope and structure to eliminate transfer of stresses from one to another. Through each duct, pull a test mandrel 10-inches long and 1/4-inch less than nominal size of duct. Clean duct with compressed air on "mouse". Provide duct "combs", or supports for all multiple duct runs.

L. All exposed risers shall be rigid steel conduit. Plug risers during construction with approved wood plugs or sealing bushings. Swab all conduits dry before pulling wires.

M. Conduit runs under floor slabs to be heavily coated with 2 coats of asphaltum paint.

N. Attach conduit to concrete and masonry with expansion anchors. Attach to wood by means of wood or lag screws.

O. Set all enclosures plumb and exactly flush with finish surface.

P. All cable splices shall be made in accordance with manufacturer's instructions.

Q. Install all lamps. Provide lamp extensions where necessary to position filament.

R. Balance feeder loading on all three phases as closely as practicable. Furnish necessary test equipment and make all tests necessary to check for unspecified grounding, shorts and wrong connections. Correct faulty conditions, if any. Attach to the inside surface of panel door a card indicating recorded load of each phase.

S. Except as indicated in this section, the subcontractor shall be responsible for the proper wiring of the electrical equipment pertaining to this project whether furnished by him or by others and shall install and connect whatever control equipment which may be furnished to him by the equipment contractor or the State. He shall also furnish whatever raceways, disconnect switches, motor starters, boxes, fittings, wires and devices that he may need for proper and adequate installation of such electrical equipment.

T. Label all panels and service equipment. Signs by competent craftsmen. Letters to be one-inch high minimum, black paint. Panels should have label designation, as directed. Tag all empty conduits in terminal cabinets and boxes giving destination. Use fiber disc tags in bushing.

U. Provide typewritten circuit directory for each panel.

V. Fixtures to be safely, positively and securely supported to structure by means of fixture studs in outlet boxes or other approved methods. Fixtures shall not be hung from outlet box "ears" or ceilings. Plumb and align fixtures shall be provided with swivel ball aligners. All suspended fixtures shall be positively supported from structural frame of building and shall not be supported from ceiling system.

W. Grounding:

1. Provide grounding for entire electric installation as indicated and specified herein. Following are included as requiring grounding:

    a. Electric service, its equipment and enclosures. Conduits, other conductor enclosures and panelboards.

    b. Neutral or identified conductor of interior wiring system.

    c. Non-current carrying metal parts of fixed equipment, such as, motors, starter and controller cabinets, lighting fixtures, etc.

2. Grounding Electrodes:

    a. Where underground water piping is available, and ground connection can be

made to it at a point which will be accessible for future inspection, it shall serve as grounding electrode. Make connection to such water piping inside buildings, on street side of main shut-off valve.

b. Where such water piping is not available, use copper clad ground rods. Resistance to ground shall be 10 ohms maximum. Ground rods shall be 5/8-inch x 8-feet minimum. Bond ground rods with #1/0 bare copper wires.

3. Manner of Grounding: Sizes and types of ground conductors, ground clamps, bonding jumpers, conduit, fittings, also methods of securing same to obtain electric continuity and effective grounding, when not indicated, as per NEC Article 250.

4. Install ground wire in all non-metallic conduits. Size in accordance with NEC.

X. Finishing:

1. Patch, repair and restore all structural and architectural elements cut or drilled for installation of electrical system. Drilling, cutting, patching, repairing and restoring shall be subject to approval of the Contracting Officer.

2. Attach electrical equipment to wood by wood screws, and attach to concrete by embedded or expansion inserts and bolts. Use powdered-driven charge with approval only. Close unused knock-outs on boxes or enclosures with metal cap. Powder actuated fasteners shall not be used on precast concrete. Do not use powder activated fasteners to attach enclosures and boxes to the building.

3. Wipe clean all exposed raceways and enclosures with rag and solvent. Prime painting and finishing of unfinished raceways and enclosures shall conform to SECTION 09911– EXTERIOR PAINTING and SECTION 09912 – INTERIOR PAINTING. Factory finished enclosures shall not be painted.

3.02 TESTING AND COMPLETION

A. Final inspection of electrical work will be made by the Contracting Officer.

B. Test all wiring and systems for proper operation. Measure insulation resistance of all wires #4 and larger, using Biddle Co. 500 volt megger. Record readings and submit 4 copies to the Contracting Officer. Measure ground resistance at service and furnish 4 copies of readings to the Contracting Officer. All test shall be made in the presence of the Contracting Officer. All test shall be made in the presence of the Contracting Officer.

3.03 OUTAGES

A. Outages will not be permitted unless absolutely necessary. Outages will be scheduled to suit the schedule of the Airport. Contractor shall request for outages in writing at least three weeks prior to desired outages and shall state desired length of

outage. Outage requests shall be submitted to the Engineer. The Contractor shall not proceed with any outages until written approval is received from the State. All desired outages shall be kept to a minimum and the outage time shall be kept as short in duration as possible. At the beginning of the project, contractor shall submit a tentative schedule of outages to the Engineer. Tentative schedule shall indicate approximate date of outage, duration of outage and purpose of the outage. Contractor shall provide temporary power and connections if necessary at no additional expense to the State of Hawaii.

PART 4 – MEASUREMENT AND PAYMENT

4.01 BASIS OF MEASUREMENT AND PAYMENT

A. Work under this Section will not be measured nor paid for separately but shall be considered incidental to and included in the bid prices for the various items of work in this project.

END OF SECTION

SECTION 16740 - BUILDING TELECOMMUNICATION SYSTEMS

PART 1 - GENERAL

1.01 RELATED DOCUMENTS

The General Provisions for Construction Projects (2016), Special Provisions and General Requirements of the Specifications, apply to the work specified in this Section.

1.02 DESCRIPTION OF WORK

This work specification is intended to provide qualified Contractors with a detailed description of the passive cabling infrastructure for the telecommunication systems, as well as pathways and spaces, which shall be provided for this project. The structured cabling systems shall consist of an intra-building cabling system as indicated and an inter-building backbone wiring system to provide communications from the electrical/communications room to the Command Center. All new telecommunications infrastructure shall conform to the ANSI/TINEIA documents referenced within this section.

1.03 APPLICABLE PUBLICATIONS

The publications cited within this specification form a part of this specification to the extent referenced. Unless otherwise indicated, most recent edition of the publication with current revisions and amendments will be enforced.

1.04 SUBMITTALS

Submit shop drawings and of the following equipment for approval in accordance with SECTION 01300 - SUBMITTALS. Each submittal shall be prepared with a summary sheet attached to each copy identifying all items included in the submittal. Incomplete submittals and those without summary sheets will be returned without review.

A. Shop Drawings:

1. Telecommunication System Design Drawings - RCDD Approved.

2. Telecommunication Space Drawings - RCDD Approved.

B. Manufacturer's Data:

1. Telecommunications Cabling and Connectors.

2. Fiber Optic Cabling and Connectors.

3. Termination Equipment, including patch panels and termination blocks.

4. Telecommunication Outlets, including outlet box, faceplates, and jacks.

5. Equipment Cabinets/Racks.

C. Qualifications:

1. Telecommunications System Designer of Record.

2. Telecommunications Contractor.

D. Test Reports: Telecommunication system cabling test reports.

E. Record Documentation.

F. Labeling: Telecommunication cabling system labeling scheme.

1.05 MANUFACTURER'S STANDARD OF QUALITY

A. It is the intent of these specifications and applicable drawings to identify the essential requirements related to the data wiring system and the quality of materials, construction, design, and overall workmanship. All manufacturers shall meet these minimum requirements.

B. All of the products referenced in this section may be substituted with a product of the same or better operating specifications if substitution request is submitted and approved in accordance to the Special Provisions. Contractor shall list all apparatus or material substitutions, and provide sufficient product information or specifications, to illustrate product is equivalent to those specified herein.

C. Products From Other Manufacturers: The products of other manufacturers that meet or exceed the material, construction, and standard of quality specified hereinafter shall be submitted for approval in accordance with the substitution request requirements set forth the GENERAL CONDITIONS, the SPECIAL PROVISIONS, and the requirements below:

1. Manufacturers requesting substitution approval shall submit evidence of at least two (2) years experience for type of products covered in this specification. Catalogs and technical data identifying conformance to the specifications shall be submitted for substitution approval.

2. The acceptance of any other manufacturer's product shall not relieve the Contractor of his responsibility for providing a complete and functioning voice and data wiring system.

1.06 QUALITY ASSURANCE

A. It shall be the responsibility of the Contractor to furnish and install all cabling, conduits/raceways, cable terminations, controls, systems, active communications switching equipment, power supplies, materials, devices, components, electrical power, equipment racks/cabinets, low-voltage and line voltage cable and connectors, patch panels, jacks, colored patch cords, wire management -front

and rear between each switch and patch panel, enclosures, support hardware, hook and loop wraps, labeling of all ports, patch cords and panels and software as well as all appurtenances, programming, commissioning and testing needed to deliver a complete and fully operational system as indicated by the contract documents and as required by the vendor to provide a fully warrantable structured cabling infrastructure.

B. The System Integrator shall be an accredited and authorized distributor of the appropriate equipment manufacturer and have a team of trained personnel assigned to the project that are fully certified in the installation, testing and programming of all equipment being provided. Copies of all valid and applicable certifications attained by the technical personnel assigned to the project shall be presented; their role shall also be identified. Technical personnel without certifications but having achieved a definable high level of competence on the specific systems deployed throughout this project shall be submitted with an accompanying document outlining previous projects identifying their role and achievements, and their role on this project shall also be identified.

C. Brand names, manufacturer's names and catalog numbers indicate standard of design and quality required. Acceptable manufacturers for electrical apparatus include Belden, Berktek, Commscope, Corning, Ortronics, Superior Essex, Systimax, Siemon, Suttle and Tyco Electronics. All apparatus supplied shall bear the name of the approved manufacturer on its nameplates. Substitute materials may be used if pre-qualified prior to bidding by the Engineer.

D. Preparation of design drawings and submittals shall be done under the supervision of a BICSI Registered Communications Distribution Designer (RCDD). RCDD shall be currently employed by the Contractor. Sub-contracting personnel with RCDD accreditation is not acceptable.

E. All Contractor personnel shall be fully trained and qualified to perform the tasks associated with the installation, termination and testing of UTP and fiber optic cable including but not limited to fusion splicing, fiber optic connector termination, bonding and grounding of equipment rooms, cable tray and equipment racks and the proper operation of cabling test devices (i.e. Optical Time Domain Reflectometer and Pentascanner). Contractor shall submit a list of personnel qualified to perform such activities for bid evaluation.

F. To ensure the appropriate expertise and past experience with the products being provided, the installation contractor shall be trained and certified by the manufacturer for installation and testing of their products.

1.07 SHOP DRAWINGS

A. Provide Shop Drawings no less than 25 working days after notice to proceed.

B. Primarily Shop Drawings are to show all deviations of project drawings and deliver Contractor developed details of the installation. Where no changes exist between project drawings and contract drawings Contractor developed drawings may be

substituted. Coordinate with the Supporting Engineer as necessary for enhanced clarity if needed.

C. All shop drawings shall be prepared using latest version of AutoCAD, or Visio, drawn accurately, and in accordance with the Owners CAD Standards. Visio submissions shall include the .vsd and the converted .dwg file, corrected as needed.

D. All shop drawings and enhanced detail drawings shall include sufficient information, clearly presented, to determine full compliance with all project drawings and specifications. Detailed software, product, device and equipment information may be presented as an itemized and coordinated reference schedule within the shop drawing set. Include the following information as applicable for review, failure to provide all information listed below shall result in all shop drawing submittals being returned for resubmission:

1. All Building Floor and Site Plans

2. All equipment, devices and components with manufacturer's name(s), model numbers, device and component electrical ratings and power requirements

3. All equipment, device and component performance ratings.

4. All equipment /device battery calculations.

5. All equipment /device voltage drop calculations.

6. All equipment rack/cabinet layouts and rack/cabinet sizes.

7. All device-mounting elevations.

8. All device wiring details.

9. All grounding and bonding connections.

10. All conduit runs of ¾ inch or greater.

11. All junction box locations with conduit identifications.

12. Complete point-to-point-wiring diagrams for all systems.

13. Include all equipment and wiring termination schedules and/or matrixes.

E. Provide a complete set of “Contractor amended or developed” installation drawings. Drawings at the minimum shall consist of floor plans indicating all; passive and active electronic component locations, field devices, device identifications, distribution racks, patch panels, patches, control panels, auxiliary control panels, power supplies, as well as conduit and cable requirements. Drawings shall include at the minimum the following:

1. Detailed equipment layouts for all communication rooms. Coordinate all room layouts with affected trades for this submittal.

2. Floor plan drawings showing locations of all equipment, devices, equipment cabinets and/or rack locations. Identify type and sizes of all equipment cabinets and/or racks.

3. All cable tray layouts, and conduit routing of all conduits ¾ inch in diameter or greater.

4. System riser diagrams and single line drawings

5. Detailed equipment layouts for all equipment consoles. Indicate all equipment locations and installation details.

6. Elevations of all equipment cabinets/racks showing the relative position of all major components, all-wiring and grounding terminations. Include all panel, cabinet and/or rack dimensions.

7. All grounding and bonding termination points.

1.08 RECORD DOCUMENTATION

A. Final Record Documentation will be developed by the Supporting Engineer.

B. The Contractor shall deliver their final set of Shop Drawings, mark up as-built drawings and supporting documentation for preliminary approval.

C. Any changes needed to update the Contractor provided documents or drawings, as identified by the Supporting Engineer, in order to reflect actual installation conditions shall be the responsibility of the Contractor.

D. The final approved Shop Drawings, as-built drawings and supporting documents shall be submitted in both paper and editable electronic media formats.

E. In addition to the standard close out documentation, Contractor shall provide drawings including documentation on installed cables and termination hardware in accordance with ANSI/TIA/EIA-606-B. The drawings shall include patch panel layouts and cover plate assignments, cross-connect information and connecting terminal layout as a minimum. Provide hard copy documentation for the following:

1. Cables: A record of installed cable shall be provided in accordance with ANSI/TIA/EIA-606-B. The cable records shall include only the required data fields in accordance with ANSI/TINEIA-606-B. Include manufacture date of cable with submittal.

2. Termination Hardware: A record of installed patch panels, cross-connect points, distribution frames, terminating block arrangements and type, and

outlets shall be provided in accordance with ANSI/TIA/EIA-606-B. Documentation shall include the required data fields as a minimum in accordance with ANSI/TINEIA- 606-B.

1.09 DEFINITION OF TERMS

A. Apparatus: Generally used herein to include the inter-building cable system, station wiring, cable racks, wiring and equipment frames, cross connect equipment and wiring adapters, information outlets and faceplates, designation strips, materials, supplies or whatsoever that may be purchased, together with the usual appropriate fittings, attachments, appurtenances, and appliances required for the intended operation. Work Specification: The technical specification describing the Scope of Work, including the engineering, furnishing, delivery, installation and testing of the telecommunication wiring system.

B. Intra-building Wiring System: A wiring system, which includes necessary apparatus, providing communications within a building.

C. Inter-building Wiring System: A wiring system, which includes necessary apparatus, providing communications between more than one building.

1.10 WARRANTY

A. The Contractor shall provide a vendor/ manufacturer multi-year Structured Cable Infrastructure Installation Warranty with Certification documentation. Merely as an example, to be similar to the Multi-Year Certification Plus System and other such comparable vendor offerings. The system warranty shall apply to all UTP/STP, copper and fiber links and/or channels.

1. The structured cabling infrastructure certification warranty shall meet, at a minimum the following criteria:

a. A minimum 15-year guarantee that the installed cabling system will pass the Commercial Building Telecommunications Standards cited in this document or as defined by the vendor offering the warranty – whichever is more stringent.
b. This warranty is to cover all registered links and/or channels. All data transport links are to be fully tested and registered.
c. The Contractor shall indicate in warranty documentation each tested and registered connection and identify if the connection warranty is link or channel.
d. Vendor installation requirements in order to attain the multiyear warranty shall be followed.
e. The vendor certified Contractor will correct any problems and malfunctions that are warranty–related issues without charge for the entire warranty period.
f. If the Certification warranty needs to be utilized by HDOT-A within the warranted period and the original installer is no longer in business, the vendor

shall find a substitute certified contractor and assume costs to fulfill the obligations of the warranty.

g. Upon acceptance of the warranty paperwork and test results from the Contractor, the vendor is to formally notify the installation contractor and provide the infrastructure warranty notification letter with warranty certificate made out to the Hawaii Department of Transportation, Aviation Division.
h. The warranty period shall commence following the final acceptance of the project by the Hawaii Department of Transportation, Aviation Division and confirmation of project completion by the Contractor.

2. Installation Warranty: Contractor shall warrant to the State that the installation, workmanship, equipment, and/or material to be furnished herein shall be new and free from defects in material and workmanship for a period of no less than two years from the date of system acceptance; and will be of the kind and quality designated or described herein and shall perform in the manner set forth in the Contract. At time of acceptance, Contractor shall guarantee that the State shall be in sole ownership and title to all materials and equipment, which shall be free of any encumbrance or claims imposed by a third party.

B. If it appears within two years from the date of acceptance, and/or title passage that the installation, workmanship, equipment and/or material furnished hereunder does not meet the warranties specified above and the State notifies the Contractor promptly, the Contractor shall thereupon correct any defect, including non-conformance with the Contract, without delay and expense to the State.

C. If Contractor is obliged to correct defects as specified above, the warranty period for the repaired or replacement part shall be warranted for the remaining warranty term, as determined by the original date of acceptance.

D. The State shall also be entitled to all Manufacturer's warranties and guarantees associated with the apparatus or materials provided by the Contractor. Faults or problems caused by equipment damage occurring after the initial installation as a result of accidental physical abuse, or misuse on the part of the State will be: 1) handled as an exception to this warranty agreement; 2) repaired by the Contractor; and 3) billed in accordance to their standard maintenance and repair rates, provided these rates are reasonable and acceptable to the State.

E. In either instance, the suspected cause of the problem will not serve to delay prompt resolution of the fault.

F. If abuse or misuse is the suspected cause, and costs to correct the problem are estimated to be less than $100, evidence of such abuse or misuse shall be documented by the Contractor and the problem shall be resolved immediately by the Contractor. Contractor will be reimbursed by the State for this work.

G. In the event the cost is estimated to be more than $100, the Contractor shall

document any evidence of abuse or misuse and provide the State a written estimate of charges to correct the problem. The State will then decide whether to accept the charges and provide notice to proceed.

PART 2 – PRODUCTS

2.01 COMPONENTS

UL or third party certified. Provide a complete system of telecommunications cabling and pathway components using star topology and support structures, pathways, and spaces complete with conduits, pull wires, terminal boxes, outlets, cables, junction boxes, and backboards. Fixed cables and pathway systems for telecommunications systems shall be UL listed, or third party independent testing laboratory certified, and shall comply with NFPA 70.

2.02 PATHWAYS (BACKBONE AND HORIZONTAL)

A. ANSI/TIA-569-C and Addenda. Provide grounding and bonding as required by the National Electrical Code (NFPA 70) and ANSI/TIA-607-B.

B. Work Area Pathways: Provide minimum one (1) 3/4"C between the image processing server located in the server cabinet to the QPSWalk2000. Provide minimum one (1) 3/4"C between the image processing server located in the server cabinet to the new network rack located in the Main Comm/Elec Room 188. Provide minimum one (1) ¾" C between each information outlet location and cable tray or comm room. Comply with the National Electrical Code (NFPA 70) and ANSI/TIA-569-C and Addenda.

2.03 TELECOMMUNICATIONS CABLING

Cabling shall be UL listed for the application and shall comply with ANSI/TIA/EIA-568-C.1, ANSI/TIA/EIA-568-C.2, ANSlfTIAfEIA-568-C.3 and NFPA 70. Provide a labeling system for cabling as indicated on the drawings and as required by ANSlfTIAfEIA-606-B and UL 969. All Automated Worker Screening cabling infrastructure shall be installed and labeled in accordance with DOT-A Cabling System Guidelines. Cabling manufactured more than 12 months prior to date of installation shall not be used.

A. Utility Service Entrance Cables:

Utility service entrance cable to be provided by utility service providers. Contractor to coordinate installation requirements with utility service providers.

B. Exterior Backbone Cabling:

1. Exterior Backbone Optical Fiber Cabling: ANSI/TINEIA-492AAAB, ANSI/TINEIA-492CAAA, ANSI/TIA/EIA-568-C.3, UL 1666, NFPA 70.

Exterior backbone cabling shall be suitable for underground duct

applications within wet locations. Cable jacket shall be imprinted with the manufacturer, fiber count, fiber type, and aggregate length at regular intervals not to exceed 40-inches. The cable cordage jacket, fiber, unit, and group color shall be in accordance with ANSI/TIA/EIA-598-C.

a. Single mode optical fiber, minimum 12-strands, 8/125-micron indoor/outdoor rated loose tube all-dielectric fiber optic cable with a nonconductive optical fiber plenum (OFNP) or a nonconductive optical fiber riser (OFNR) rating in accordance with NFPA 70. Type OFNP cable may be substituted for type OFNR cables.
b. Multi-mode optical fiber, minimum 12-strands, 50/125-micron, laser optimized (OM3) indoor/outdoor rated loose tube all-dielectric fiber optic cable with a nonconductive optical fiber plenum (OFNP) or a nonconductive optical fiber riser (OFNR) rating in accordance with NFPA 70. Type OFNP cable may be substituted for type OFNR cables. Multi-mode optical fiber, as a minimum, shall have a 500/500 MHz-km modal bandwidth, capable of supporting Gigabit Ethernet (1000Base-SX or LX) up to a minimum distance of 550-meters, and conforms to ANSI/TIA/EIA-492AAAA or AAAB standard.

C. Interior Backbone/Riser Cabling:

1. Interior Backbone Optical Fiber Cabling: ANSI/TIA/EIA-492AAAB, ANSI/TIA/EIA-492CAAA, ANSI/TIA/EIA-568-C.3, UL 1666, NFPA 70.

   Cable jacket shall be imprinted with the fiber count, fiber type, and aggregate length at regular intervals not to exceed 40-inches. The cable cordage jacket, fiber, unit, and group color shall be in accordance with ANSI/TIA/EIA-598-C.

   a. Single mode optical fiber, minimum 12-strands, 8/125-micron indoor rated tight buffer fiber optic cable with a nonconductive optical fiber plenum (OFNP) or a nonconductive optical fiber riser (OFNR) rating in accordance with NFPA 70. Type OFNP cable may be substituted for type OFNR cables.
   b. Multi-mode optical fiber, minimum 12-strands, 50/125-micron, laser optimized (OM3) indoor rated tight buffer fiber optic cable with a nonconductive optical fiber plenum (OFNP) or a nonconductive optical fiber riser (OFNR) rating in accordance with NFPA 70. Type OFNP cable may be substituted for type OFNR cables. Multi-mode optical fiber, as a minimum, shall have a 500/500 MHz-km modal bandwidth, capable of supporting Gigabit Ethernet (1000Base-SX or LX) up to a minimum distance of 550-meters, and conforms to ANSI/TIA/EIA- 492AAAA or AAAB standard.

D. Horizontal Cabling:

1. Horizontal Data Cabling: Comply with NFPA 70, NEMA WC 63.1, ICEA S-90-661

and performance characteristics in ANSI/TIA/EIA-568-C.1.

a. Horizontal UTP Copper: ANSI/TIA/EIA-568-C.2, NFPA 70, UTP (unshielded twisted pair), 100-ohm. Provide four each individually twisted pair, minimum 24 AWG conductors, Category-6, plenum (CMP) rated with a PVC jacket. Cables and connectors shall be color coded and labeled as indicated.
b. Horizontal Single Mode Fiber: ANSI/TIA/EIA-568-B, 8 to 10.5-micrometer, nonconductive, optical fiber. OS1 Single mode cabling for Indoor and tight Buffered applications meeting the requirement of: IEC/CEI 60793-2-50: "Product specifications-Sectional specifications for category B1.1 single mode fibers" and OS2 Single mode cabling for Outdoor and Loose Tube applications meeting the requirement of: IEC/CEI 60793-2-50 "Product specifications-Sectional specifications for category B1.3 single mode fibers".

2.04 TELECOMMUNICATIONS OUTLET BOXES

Mount flush in new finished walls at height specified for outlet receptacles. Depth of boxes shall be large enough to allow manufacturers' recommended conductor bend radii.

2.05 TELECOMMUNICATIONS OUTLET/CONNECTOR ASSEMBLIES

A. Outlet/Connector UTP Copper: Outlet/connectors shall comply with FCC Part 68.5, ANSI/TIA/EIA-568-C.1, and ANSI/TIA/EIA-568-C.2.

1. Data outlet/connectors shall be UL1863 listed, non-keyed, 8-pin modular, constructed of high impact rated thermoplastic housing and shall be third party verified and shall comply with ANSI/TIA/EIA-568-C.2 Category-6 requirements. Outlet/connectors provided for UTP cabling shall meet or exceed the requirements for the cable provided. Outlet/connectors shall be terminated using a Type 110O IDC PC board connector, color-coded for both T568A and T568B wiring. Each typical outlet/connector shall be wired T568A, with the exception of the TSA IT horizontal distribution. TSA IT outlet/connectors shall be wired T568B. UTP outlet/connectors shall comply with ANSI/TIA/EIA-568-C.2 for 200 mating cycles.

B. Cover Plates: Telecommunications cover plates shall comply with UL 514C, ANSI/TIA/EIA-568-C.1, ANSI/TIA/EIA-568-C.2, and ANSI/TIA/EIA-568-C.3; flush design constructed of 302 stainless or brass material. Stenciled lettering for voice and data circuits shall be provided using thermal ink transfer process.

C. Optical Fiber Connectors: EIA/TIA-604 FOCIS-10 . Optical fiber connectors shall be duplex LC, epoxyless crimp style compatible with fiber optic cable to which it will be terminated. LC connectors shall be compatible with 9/125µm OS1. The fibers shall terminate in 1.25mm ceramic ferrules with non-optical disconnect functionality and an average insertion loss of 0.5 dB (single mode) per mated pair.

D. 110 Connector Blocks: Provide insulation displacement connector (IDC) Type 11

for Category 5e and higher systems. Provide blocks for the number of horizontal and backbone cables terminated on the block plus 25 percent spare.

E. UTP Copper Patch Panels: Provide in accordance with ANSI/TIA/EIA-568-C.1 and ANSI/TIA/EIA-568-C.2. Panels shall be third party verified and shall comply with EIA/TIA Category 6 requirements. Panels shall be constructed of 0.09-inch minimum aluminum and shall be rack mounted and compatible an EIA compliant 19-inch equipment rack. Panel shall provide 48 non-keyed, 8-pin modular ports wired to T568A for all outlets. Patch panels shall terminate the building cabling on Type 110 IDCs and shall utilize a printed circuit board interface. The rear of each panel shall have incoming cable strain-relief and routing guides. Panels shall have each port factory numbered and be equipped with laminated plastic nameplates above each port.

F. Optical Fiber Patch Panels: Provide panel for maintenance and cross-connect of optical fiber cables. Panel shall be constructed of 18-gauge steel or 11-gauge aluminum minimum and shall be rack mounted and compatible with an EIA compliant 19-inch equipment rack. Each panel shall support a minimum of 24-strands configured as 12 multi-mode adapters as duplex "SC" in accordance with ANSITIA/EIA-604-3A with zirconia ceramic alignment sleeves. Provide dust cover for unused adapters. The rear of each panel shall have a cable management tray a minimum of 8-inches deep with removable cover, incoming cable strain-relief and routing guides. Panels shall have each adapter factory numbered and be equipped with laminated plastic nameplates above each adapter.

2.06 GROUNDING AND BONDING PRODUCTS

A. Conductors

1. Manufacturers: Subject to compliance with requirements, available manufacturers offering products that may be incorporated into the Work include, but are not limited to, the following:

    a. Harger Lightning and Grounding
    b. Panduit Corp
    c. Tyco Electronics Corp

2. General Requirements

    a. All grounding conductors shall be insulated conductors utilizing stranded copper wire. Conductors shall be green or green with yellow stripe insulation, insulated for 600 V, and comply with UL 83.
    b. Grounding wires provided for equipment ground jumpers which are to have custom-lengths shall be No. 6 AWG, 19-strand, UL-listed, Type THHN wire.

3. Cable Tray Requirements:

    a. Cable Tray Equipment Grounding Wire shall be No. 6 AWG, 19-strand, UL-listed, Type THHN wire.
    b. Cable Tray Grounding Jumpers shall be no smaller than No. 6 AWG and no longer than 12 inches. If jumper is a wire, it shall have a crimped grounding lug with two holes and long barrel for two crimps. If jumper is a flexible braid, it shall have a one-hole ferrule. Attach with grounding screw or connector provided by cable tray manufacturer.

4. Bare Copper Conductor Requirements:

    a. Solid Conductors: ASTM B 3.
    b. Stranded Conductors: ASTM B 8.
    c. Tinned Conductors: ASTM B 33.
    d. Bonding Cable: 14 strands of No. 17 AWG conductor, 1/4 inch in diameter.
    e. Bonding Conductor: No. 6 AWG, stranded conductor.
    f. Bonding Jumper: Tinned-copper tape, braided conductors terminated with two-hole copper ferrules; 1-5/8 inches wide and 1/16 inch thick.

B. Connectors

1. Manufacturers: Subject to compliance with requirements, available manufacturers offering products that may be incorporated into the Work include, but are not limited to, the following:

    a. Burndy; Part of Hubbell Electrical Systems
    b. Chatsworth Products, Inc.
    c. Harger Lightning and Grounding
    d. Panduit Corp.
    e. Tyco Electronics Corp.

2. General Requirements:

    a. Irreversible connectors listed for the purpose. Listed by an NRTL as complying with NFPA 70 for specific types, sizes, and combinations of conductors and other items connected. Comply with UL 486A-486B.

3. Specific Requirements:

    a. Compression Wire Connectors: Crimp-and-compress connectors that bond to the conductor when the connector is compressed around the conductor. Comply with UL 467.
    b. Electroplated tinned copper, C and H shaped.
    c. Signal Reference Grid Connectors: Combination of compression wire

connectors, access floor grounding clamps, bronze U-bolt grounding clamps, and copper split-bolt connectors, designed for the purpose.

d. Busbar Connectors: Cast silicon bronze, solderless exothermic-type, mechanical connector; with a long barrel and two holes spaced on 5/8- or 1-inch centers for a two-bolt connection to the busbar.
e. Welded Connectors: Exothermic-welding kits of types recommended by kit manufacturer for materials being joined and installation conditions.

C. Grounding Busbars

1. Manufacturers : Subject to compliance with requirements, available manufacturers offering products that may be incorporated into the Work include, but are not limited to, the following:

   a. Chatsworth Products, Inc.
   b. Harger Lightning and Grounding
   c. Panduit Corp.

2. General Requirements:

   a. Length of busbars shall be as indicated on Drawings if shown. Otherwise, length shall be shown on shop drawings for Supporting Engineer review and approval. Remaining dimensions shall be as follows unless otherwise noted on Contract Reference Drawings.

3. Specific Requirements:

   a. TMGB: Predrilled, wall-mounted, rectangular bars of hard-drawn solid copper, 1/4 inch thick by 4 inch high. The busbar shall be NRTL listed for use as TMGB and shall comply with J-STD-607-A. Predrilling shall be with holes for use with lugs specified in this Section. Provide with stand-off brackets that provide a 4-inches clearance to access the rear of the busbar. Brackets and bolts shall be stainless steel. Stand-off insulators for mounting shall be Lexan or PVC. Comply with UL 891 for use in 600-V switchboards, impulse tested at 5000 V.
   b. TGB: Predrilled rectangular bars of hard-drawn solid copper, 1/4 inch thick by 2 inches high. The busbar shall be for wall mounting, shall be NRTL listed as complying with UL 467, and shall comply with J-STD-607-A. Predrilling shall be with holes for use with lugs specified in this Section. Provide with stand-off brackets that provide at least a 2-inches of clearance to access the rear of the busbar. Stand-off insulators for mounting shall be Lexan or PVC. Comply with UL 891 for use in 600-V switchboards, impulse tested at 5000 V.
   c. Rack and Cabinet Grounding Busbars: Rectangular bars of hard-drawn solid copper, accepting conductors ranging from No. 14 to No. 2/0 AWG, NRTL listed as complying with UL 467, and complying with J-STD-607-A. Predrilling shall be with holes for use with lugs specified in this Section.

d. Cabinet-Mounted Busbar: Terminal block, with stainless-steel or copper-plated hardware for attachment to the cabinet.
e. Rack-Mounted Horizontal Busbar: Designed for mounting in 19- or 23-inch equipment racks. Include a copper splice bar for transitioning to an adjoining rack, and stainless-steel or copper-plated hardware for attachment to the rack.
f. Rack-Mounted Vertical Busbar: 72 or 36 inches stainless-steel or copper-plated hardware for attachment to the rack.

D. Ground Rods

1. Manufacturers: Subject to compliance with requirements, available manufacturers offering products that may be incorporated into the Work include, but are not limited to, the following:

a. Harger Lightning and Grounding.
b. Tyco Electronics Corp.

2. General Requirements:

a. The installation of grounding electrode system for the alternating-current (ac) power system, which includes ground rods, ground rings, metal underground water pipes, metal building frames, concrete-encased electrodes, and pipe and plate electrodes, is specified in Section “Grounding and Bonding for Electrical Systems." The grounding and bonding system of this Section is connected to the grounding and bonding of the ac power system with the BCT from the TMBG specified in "Grounding Electrode System" Article.

3. Specific Requirements:

a. Ground Rods: Copper-clad, 3/4 inch diameter by 10 feet in length.

PART 3 - EXECUTION

3.01 GENERAL

A. Rules and Permit: The entire installation shall be made in strict accordance with the latest rules and regulations of the National Board of Fire Underwriters, the currently adopted edition of the National Electrical Code (NEC) and the local Electrical Bureau. The Contractor shall obtain and pay for the electrical permit as required by local laws and rules. All work shall be inspected by the proper local authorities as it progresses. The Contractor shall pay all inspection fees and shall deliver certificates of completion and inspection to the Engineer before final payment will be made. Costs of permits and inspection fees shall be included in the Contractor's bid price.

B. Qualification of Installers:

1. For actual fabrication, installation and testing of the work of this section use only thoroughly trained and experienced workmen completely familiar with items required and with manufacturers' recommended methods of installation. In acceptance or rejection of installed work, no allowance will be made for lack of skill on part of workmen.

2. Workmanship shall meet the approval of the Engineer who shall be afforded every opportunity to determine skill and competency. Concealed work shall be reopened at random during formal inspection by the Engineer at their request.

C. Construction Methods: Construction shall conform to construction practices as recommended by the American Electricians Handbook by Croft (latest edition), Edison Electric Institute, National Electrical Code, National Electrical Safety Code and applicable instructions of manufacturers of equipment and material supplied for this project.

D. Record Drawings: As specified in SECTION 01300 - SUBMITTALS.

E. Plans and Specification: This specification is intended to cover all labor, materials and standards of workmanship to be employed in the work indicated on the plans and called for in the specification or reasonably implied therein. The plans and specification supplement one another. Any part of the work mentioned in one and not represented in the other, shall be done the same as if it has been mentioned in both. The Contractor shall not make alterations to the drawings and specification.

F. Discrepancies and Interpretations:

1. Should the Contractor find any discrepancies in or omissions from any of the documents or be in doubt as to their meaning, he shall advise the Engineer who will issue any necessary clarification within a time period which does not disrupt the progress of the work.

2. All interpretation and supplemental instructions will be in the form of a written addendum to the Contract Documents. Should any discrepancy arise from the failure of the Contractor to notify the Engineer, the higher quality or larger quantity of item shall prevail. The Engineer shall make the final interpretation and judgment.

3. In the event of a discrepancy between small scale drawings and large scale details, or between drawings and specification, of which is in violation of any regulations, ordinances, laws or codes, the discrepancy, if known by the Contractor, shall be immediately brought to the attention of the Engineer for a decision before proceeding with the particular work involved. Work carried out disregarding these instructions will be subject to removal and replacement at the Contractor's expense.

G. Symbols: All device symbols are defined by the appropriate symbol schedules as indicated by the symbol and abbreviation drawing sheets for each discipline. The Contractor shall coordinate exact locations with all architectural, mechanical, electrical, reflected ceiling, furniture drawings and door hardware specifications as

well as all affected trades prior to submittal of bids.

1. All symbols are shown on the contract reference drawings as close as possible to their intended location. The Contractor shall coordinate the installation of all equipment, devices, controls, components, cabling conduits/raceways and integration of other systems with all affected trades and specified system integrators necessary to efficiently implement the Contractors submitted design. The contractor shall document all coordination requirements at the time of shop drawing submission.

2. Drawings for this work are diagrammatic and intended to convey the extent, general arrangement and locations of the work. Include all items where required by code and related specification sections for proper installation of all work.

3. Where ambiguity exists between the project specifications and the Contractors design and the contract reference drawings, the superior in system performance at the sole discretion of the engineer and regardless of cost shall prevail and shall be delivered by the Contractor at no additional expense to the project.

4. Project specifications and drawings may not deal individually with every part, control, device, component, or appurtenance which may be required to produce the equipment performance for the specified system and/or as required for compliance with all specified systems integration.

    a. Include such items and components, as required, for complete operational systems as defined by the project documents, whether or not specifically indicated. The contractor shall be responsible for providing conduits/raceways, cable terminations, controls, systems, equipment, materials, devices, components, electrical power, equipment racks/cabinets, software, programming, commissioning, testing and all appurtenances as well as the integration of any ancillary systems or Owner provided equipment/components/systems.

H. Coordination: This specification is accompanied by floor plans of the buildings, sections and elevations, and site plans indicating locations of all devices, controls, service runs, and other electrical apparatus. These locations are approximate and, before installing, the Contractor shall study the adjacent architectural details and actually make the installation in the most logical manner. Coordinate with other applicable trades in submittal of shop drawings and the installation of all systems. All shop drawings shall detail space conditions in order to accommodate other concerned trades, all equipment locations are subject to final review by the Owner and Supporting Engineer.

I. Electrical Service Outages: The Contractor shall coordinate all power outages with the State. Power outages will be scheduled per the requirements specified in SECTION 01010 - DESCRIPTION OF WORK. A written request to interrupt electrical service shall be submitted to the Engineer a minimum of three (3) weeks in advance for approval.

3.02 INSTALLATION

A. Telecommunications cabling and pathway systems, including the horizontal and backbone cable, pathway systems, telecommunications outlet/connector assemblies, and associated hardware shall be installed in accordance with

ANSI/TIA/EIA-568-C.1, ANSI/TIA/EIA-568-C.2, ANSI/TIA/EIA-568-C.3, ANSI/TIA-569-C, NFPA 70, and UL standards as applicable. Cabling shall be connected in a star topology network. Daisy chaining cables between outlets is not acceptable. Metal raceway bases, covers, and dividers shall be bonded and grounded in accordance with ANSI/TIA-607-B.

1. Cabling: Install UTP and optical fiber telecommunications cabling and pathway system as detailed in ANSI/TIA/EIA-568-C.1, ANSI/TIA/EIA-568-C.2, and ANSI/TIA/EIA-568-C.3. Screw terminals shall not be used except where specifically indicated on plans. Use an approved insulation displacement connection (IDC) tool kit for copper cable terminations. Do not untwist UTP cables more than half inch from the point of termination to maintain cable geometry. Provide service loop on each end of the cable, minimum 10-feet unless otherwise noted, at each backboard location and in the electrical/telecommunications closet. Do not exceed manufacturers' cable pull tensions for copper and optical fiber cables. Provide a device to monitor cable pull tensions. Do not exceed 25 pounds pull tension for four pair copper cables. Do not chafe or damage outer jacket materials. Use only lubricants approved by cable manufacturer. Do not over cinch cables, or crush cables with staples. For UTP cable bend radii shall not be less than six times the cable diameter. Ensure that all communications systems cabling supports (conduits, support grips, cable tray and J-hooks) are fully installed before proceeding with cable installation.

    a. Optical Fiber Backbone Cable. Install backbone optical fiber in indicated pathways. Do not exceed manufacturer's recommended bending radii and pull tension. Prepare cable for pulling by cutting outer jacket 10 inches leaving strength members exposed for approximately 1O inches. Twist strength members together and attach to pulling eye. Vertical cable support intervals shall be in accordance with manufacturer's recommendations.
    b. Horizontal Cabling: Install horizontal cabling and pathway as indicated on drawings between electrical/telecommunications closet and telecommunications outlet assemblies. Horizontal cabling shall be homerun between outlet connector and patch panel within designated telecommunications room. Splicing of horizontal distribution cabling is not allowed.
    c. Cable runs must be installed in conduit.

2. Cables entering all communications equipment rooms shall be supported from entrance to rack/cabinet location as indicated on the contract reference drawings, required by the Contractors design and/or as herein specified.

3. Interior and exterior raceways shall be a minimum ¾” on runs connecting no more than two end devices and no less than 1” for all other runs unless otherwise noted. Size all raceways and install conductors in accordance with NEC requirements. Fill ratio shall not exceed 40 percent for indoor raceways or

exterior raceways.

B. Pathway Installations: Comply with latest ANSI/TIA-569 and associated addenda. Conceal conduit within finished walls and ceilings, where possible. Keep conduit minimum 6 inches away from parallel runs of electrical power equipment, flues, steam, and hot water pipes. Install conduit parallel with or at right angles to ceilings, walls, and structural members were located above accessible ceilings and where conduit is visible after completion of project.

C. Work Area Outlets:

1. Terminations: Terminate UTP cable in accordance with ANSI/TIA/EIA-568- C.1, ANSI/TIA/EIA-568-C.2, and wiring configuration as specified. Terminate fiber optic cables in accordance with ANSI/TIA/EIA-568-C.3.

2. Faceplates: As a minimum, each jack shall be labeled as to its function and a unique number to identify cable link.

3. Cables: Unshielded twisted pair shall have a minimum of 6 inches of slack cable loosely coiled into the telecommunications outlet boxes. Minimum manufacturer's bend radius for each type of cable shall not be exceeded.

4. Pull Cords: Pull cords shall be installed in all conduits which do not initially have cable installed.

D. Telecommunications Closet Termination: Install termination hardware required for copper and optical fiber system. An insulation displacement tool shall be used for terminating copper cable to insulation displacement connectors.

E. Grounding and Bonding: In accordance with ANSI/TIA-607-B, and NFPA 70.

3.03 LABELING

A. Labels: All labels shall be in accordance with labeling scheme indicated on drawings and also in accordance with ANSI/TIA/EIA-606-B and the latest version of the DOT-A Airports Building Design Standards. Handwritten labeling unacceptable. Permanently label all cabling at both ends, to include patch cords, with all weather permanent adhesive vinyl labels, providing a white printable area and black text with a label size of 0.5” x 1”. Handwritten labels are not acceptable. All labels shall be machine printed. Provide the following:

1. All data patch panels shall exhibit data drop numbers, in sequential order, for all workstations or devices served by the associated security equipment.

2. Each fiber optic cable segment and patch cord shall be labeled at each end with its respective communications network identifier.

3. Warning Tags: At each location where the fiber cable is exposed to human

intrusion, it shall be marked with warning tags. These tags shall be yellow or orange in color and shall contain the warning: "CAUTION FIBER OPTIC CABLE." The text shall be permanent, black, block characters, and at least 3/16" high. A warning tag shall be permanently affixed to each exposed cable or bundle of cables, at intervals of not more than five (5) feet. Any section of exposed cable which is less than five (5) feet in length shall have at least one warning tag affixed to it.

B. Termination Hardware: All communication outlets and patch panel connections shall be labeled using color coded labels with identifiers as indicated on the drawings.

C. Passive telecommunications infrastructure components and cabling shall be labeled and identified in accordance with labeling scheme indicated on drawings and also in accordance with ANSI/TIA/EIA-606-B and as required by the latest version of the DOT-A Airports Building Design Standards.

D. All telecommunications pathways (conduits, cable trays, etc.) shall be labeled at not more than 8-feet on center and at each side of every junction. Color coded labeling scheme shall be utilized in accordance with DOT-A Airports Building Design Standards.

3.04 TESTING

A. Telecommunications Cabling Testing: Perform telecommunications cabling inspection, verification, and performance tests in accordance with ANSI/TIA/EIA-568-C.1, ANSI/TIA/EIA-568-C.2, and ANSI/TIA/EIA-568-C.3.

1. Inspection: Visually inspect cabling jacket materials for UL or third party certification markings. Visually inspect UTP and optical fiber jacket materials for UL or third party certification markings. Inspect cabling terminations at backboards and at outlets to confirm color code for tip and ring pin assignments, and inspect cabling connections to confirm compliance with ANSI/TIA/EIA-568-C.1, ANSI/TIA/EIA-568-C.2, and ANSI/TIA/EIA-568-C.3. Visually confirm marking of outlets, wall plates, outlet/connectors, and patch panels.

   Verification Tests: Cabling shall be tested for DC loop resistance, shorts, opens, intermittent faults, and polarity between conductors, and between conductors and shield, if cable has overall shield. Test operation of shorting bars in connection blocks. Test cables after termination but not cross connected.

B. Perform optical fiber end to end attenuation tests using an optical time domain reflectometer (OTDR) and manufacturer's recommended test procedures. Perform tests in accordance with ANSI/TIA/EIA-526-7, Method B for single mode optical fiber and ANSI/TIA/EIA-526-14A, Method B for multi-mode optical fiber. Perform verification acceptance tests and factory reel tests. Maximum acceptable end-to-end limit for optical loss (fiber optic cabling) of 7.5dB for multi- mode fiber and 10.5d8 for single-mode fiber.

1. Performance Tests: Optical fiber Links. Perform optical fiber end to end attenuation tests and reel tests at jobsite.

2. Final Verification Tests: Perform verification tests for UTP and optical fiber systems after the complete telecommunications cabling and workstation outlet/connectors are installed.

PART 4 - MEASUREMENT AND PAYMENT

4.01 BASIS OF MEASUREMENT AND PAYMENT

Work under this Section, except for the following items, shall be considered incidental to and included in the LUMP SUM PRICE:

Item No.	Item	Unit
16740.1	Data Connections	Allowance

Work indicated above required by the State shall be paid for under allowance items in the Proposal Schedule. Payment shall be the actual cost as invoiced by the Contractor and approved by the Engineer. The Contractor shall not be allowed to include overhead, profit, insurances and/or any other mark-ups which shall be considered incidental to and included in the LUMP SUM PRICE.

The allowance is an estimate, and the amount shall not exceed the maximum amount shown in the proposal schedule. Additional charges by the Contractor for overhead, coordination, profit, insurances and other incidental expenses shall not be allowed. These shall be included in the Contractor's LUMP SUM PRICE.

SECTION 16750 - ELECTRONIC SECURITY SYSTEMS

PART 1 - GENERAL

1.01 RELATED DOCUMENTS

The General Provisions for Construction Projects (2016), Special Provisions and General Requirements of the Specifications, apply to the work specified in this Section.

1.02 SUMMARY

A. It shall be the responsibility of the Contractor to provide their system based on the guidelines and requirements contained in these Contract Documents and translate them into a complete installation proposal containing all elements necessary for a complete, operational and functionally integrated System. The contractor shall hold complete installation and functional responsibility for the systems under this scope, including any and all supporting or temporary requirements which may be required. This responsibility shall only be relieved upon successful completion and approval of the full acceptance test program as listed in each system specification.

B. The Work shall include installation and commissioning of the following:

1. Closed Circuit Television (CCTV) System.

2. Interfaces to other Work.

    a. Security System/ Security LAN
    b. UPS and other power supplies / Security system

3. Wire and cable as required, for installing all equipment as specified herein.

4. Miscellaneous conduit and back boxes not shown on the Security Drawings, but required for a complete installation.

1.03 REFERENCES

A. State:

1. The State's General Conditions shall be considered as forming an integral part of the Specification and shall be carefully examined before proposals for any Work are submitted. Unless this Section contains statements, which are more definitive or more restrictive than those contained in the State's General Conditions, this Specification shall not be interpreted as waiving or overruling any requirements expressed in the General Conditions.

2. The Work is critical to the security of the State's facility. All plans, Specifications and other documentary material and information about the Work are considered Security Sensitive Information (SSI) under CFR49 Part 1520 and must remain secure and confidential at all times. Confidential information must not be deliberately or inadvertently disclosed to anyone

other than the Contractor's personnel and subcontractors who require disclosure to perform their portion of the Work. The Contractor shall keep track of all confidential information at all times and shall ensure that all copies are accounted for at all times. The Contractor shall not permit any persons to have access to the confidential information of the Work unless and until the Contractor has assured itself of the trustworthiness of such persons.

B. Supplemental Conditions:

1. The Contractor represents that he/she is familiar with, and has expertise in the Work of this nature and scope and has the appropriate licenses to perform the work.

2. The Contractor further agrees to provide the work described in the specifications but not shown on the drawings, and work shown on the drawings but not described in the specifications, as though expressly required by both.

3. The Contractor shall comply with all of the legal regulations, including OSHA safety regulations and regulations of municipal, city, local, and other government agencies having jurisdiction concerning the Work of the Contractor. The Contractor shall give all notices and comply with all laws, ordinances, codes, rules, and regulations bearing on the conduct of the Work. If the Contractor performs any Work, which is contrary to such laws, ordinances, codes, rules and regulations, they shall make all changes to comply therewith and bear all costs arising there from.

4. Because Drawings are, in general, diagrammatic, the Contractor shall coordinate all installations with the State or their authorized agent, based on the field conditions. The contractor represents that by submitting their proposal they are familiar with the field conditions at the facility and have based their firm price proposal on that knowledge.

5. All permits required for any part of the Contractor's Work shall be procured and paid for by the Contractor. The Contractor shall determine all permit required and transmit the required information to the Authority Having Jurisdiction. All persons working at the facility are required to be issued a security credential by the State. This credential requires finger printing and a background investigation be completed for each badge holder. All costs associated with obtaining and maintaining the issued security credentials are the responsibility of the contractor.

6. The Contractor must state if they intends to utilize a subcontractor, and provide said subcontractor's name and address. The subcontractor shall comply with all the same rules, regulations, laws, codes, licenses, etc.. as required by the Contractor and as specified herein. The State reserves the right to approve or disapprove any subcontractor proposed by Contractor.

C. Publications:

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

2. Specific reference in Specifications to codes, rules, regulations, standards, manufacturer's instructions or requirements of regulatory agencies shall mean the latest printed edition of each in effect at date of Contract unless the Document is shown dated.

3. Comply with all local codes, and the requirements of the Authorities Having Jurisdiction.

4. Conflicts:

   a. Between referenced requirements: Comply with the one (1) establishing the more stringent requirements.
   b. Between referenced requirements and Contract documents. Comply with the one (1) establishing the more stringent requirements.

5. The Security System shall be installed in accordance with the most current version of and with all applicable revisions pertaining to all applicable national, state and local codes and standards including, but not limited to the following:

   a. BICSI Building Industry Consulting Service International Inc.,
   b. NFPA 3- Recommended Practice for Commissioning of Fire Protection and Life Safety (2024 Edition)
   c. NFPA 4 – Standard for Integrated Fire Protection and Life Safety System Testing (2024 Edition)
   d. NFPA 70- National Electric Code (2023 Edition)
   e. NFPA 72- National Fire Alarm Code (2022 Edition)
   f. NFPA 90A – Standard for the installation of Air-conditioning and ventilation systems (2024 Edition)
   g. NFPA 101 – Life Safety Code (2021 Edition)
   h. NFPA 170- Standard for Fire Safety and emergency Symbols
   i. International Building Code (2018 Edition)
   j. International Fire Code (2018 Edition)
   k. Americans with Disabilities Act (ADA)
   l. Requirements of the Authority Having Jurisdiction
   m. Manufacturers Installation Instructions
   n. Project Specifications
   o. Meet FM Global Recommendations

6. Local, county, state and federal regulations and codes in effect as of date of contract shall be complied with.

1.04 DEFINITIONS

A. The following shall serve as general definitions in addition to the definitions outlined in the State's General Conditions; the following definitions shall apply to this Section of the Work.

1. State: The State is the Hawaii Department of Transportation Airports Division (HDOT-A), and/or their designated representative.

2. Contractor: The Contractor is the firm submitting a proposal to furnish and install the Work as defined herein.

3. Work: The term "Work" means all related labor, materials, equipment and services provided or to be provided by the Contractor to fulfill the proposals obligations.

4. Security System: The Security System shall consist of multiple Systems as defined within this Specification and the functional integration of all Systems through subsystem interfaces as specified herein.

5. Provide: Where the term "provide" is used throughout this Section of the Work, it shall mean the Contractor is to "furnish and install."

6. Contract Documents :The Contract Documents shall consist of the following:

   a. These Specifications in their entirety.
   b. Drawings and plans herein referred to as Security Drawings.
   c. Addenda, Bulletins, Drawings, and associated correspondence as may be authorized in writing and issued by the State, to interpret, clarify, or modify the Contract Documents.

B. Security System Acronyms:

1. Closed Circuit Television (CCTV) System.

2. Underwriters Laboratories (UL).

3. Uninterruptible Power Supply System (UPS).

4. Volts - Alternating Current (VAC).

5. Volts - Direct Current (VDC).

1.05 SUBMITTALS

A. Submittals provided by the contractor under this section are subject to the requirements of Specification SECTION 01300 - SSUBMITTALS for this project. Where there is a conflict between that section and the requirements of this section, the more stringent will apply.

1. Phasing Plan: The Contractor shall submit to the State as part of their proposal a Phasing Plan for evaluation. The plan shall highlight the Contractor's methods for maintaining security at the site during construction of the new facility. The plan should discuss their experience in transitioning systems while maintaining operations. The plan shall also include discussions addressing the requirement for compatibility with the existing system and using as much of the existing infrastructure as possible in accordance with the State's desire to control costs.

The plan must provide the lowest risk for disruption of normal operation to the State by maintaining continuity of security while controlling costs.

B. Pre-Fabrication:

1. Submit the Pre-Fabrication Data according to the Conditions of the Contract but in no case later than forty-five (45) days after the notice to proceed.

2. Pre-fabrication Submittals shall consist of Product Data, Shop Drawings, and a Detailed Schedules. Partial submittals will not be accepted without prior written approval from the Consulting Engineer or designated alternate.

3. No portion of the Work shall commence, nor shall any equipment be procured until the Consulting Engineer or designated alternate has approved the Pre-fabrication Submittals in writing. All Work shall be in accordance with the manufacturer's installation instructions.

4. A letter of transmittal identifying the name of the Project, Contractor's name, date submitted for review, shall accompany pre-fabrication Submittals and a list of items transmitted.

C. Product Data required as part of the Pre-fabrication Submittal shall include the following:

1. Submit manufacturer's data on System components including, but not limited to, electrical Specifications, mechanical Specifications, rough-in diagrams, and instructions for installation, operation and maintenance.

2. The Contractor shall submit catalogue cut-sheets that include Warranty information, manufacturer, trade name, and complete model number for each product specified. Literature sheets containing more than one (1) device or component model number shall be clearly marked to delineate items included in the Work. Model number shall be encircled and/or indicated with an arrow to indicate exact selection. Identify applicable Specification Section reference for each product. Product data sheets shall be bound in a three (3) ring binder and shall include a product index listing the model number and description of product.

3. Equipment schedules listing all system components, the manufacturer, model number and the quantity of each along with a general functional descriptions for each system component.

4. A complete list of cable and wiring types and sizes, as well as the manufacturer and model number for each.

5. A complete list of finishes and graphics.

6. List of the maintained parts inventory to provide service and maintenance of the systems following installation and commissioning.

D. Shop Drawings shall include the following:

1. Floor plan drawings indicating device locations with device legends indicating

manufacturers and model numbers for each device.

2. System riser diagram with all devices, wire runs and wire designations.

3. Schematic block diagrams for each system showing typical equipment interconnect data flow, etc.

4. Wiring diagrams for each subsystem defining the interconnection of all inputs and outputs for all equipment.

5. Fabrication Shop Drawings for all custom equipment mounting (if applicable).

6. Plans and elevations of the security console(s) and equipment racks quantifying all equipment to be mounted therein and including notes detailing the fabrication of such. All materials, methods for construction and finishes shall be fully detailed.

7. Elevations of security closet layouts showing panel locations, power supply locations, conduit, wire ways, wire molds, and all other equipment to be mounted at that location.

8. Point- to-Point schedule indicating the interconnection of inputs and outputs for all equipment including, interconnect panels, device tamper switches, , IP and RS data connections and other system to system connections.

9. Schedule of device power requirements, power source and load calculations.

10. Parts Lists: Provide complete parts lists and breakdowns that identify each component (to the lowest repairable unit) as well as ordering information. The characteristics of each component shall also be shown, where applicable, to aid in obtaining substitute parts.

E. Detailed Project Schedule shall include the following:

1. The Contractor will develop and submit a sufficiently detailed CPM (Critical Path Method) schedule prepared in MS Project that identifies the activities and deliverables that are included within the scope of their proposal. This schedule shall include and make visible as many of the following elements that apply to their proposal including but not limited to:

    a. Key Milestones
    b. Deliverable(s)
    c. Activities
    d. Procurement
    e. Durations
    f. Activities
    g. Milestones
    h. Lead Times
    i. Dates
    j. Forecast Start (Start)
    k. Forecast Finish (Finish)
    l. Dependencies

m. Predecessors
n. Successors

2. The proposal schedule submittal shall have the following fields exposed and be printed on paper of sufficient size so that the contents of these fields and the Gantt Chart are clearly legible:

a. Activity ID (ID)
b. Activity Name (Task Name)
c. Duration (in Days)
d. Start Date (Start)
e. Finish Date (Finish)
f. Predecessor
g. Successor
h. Gantt Chart

F. Procedure for Resubmitting:

1. Make corrections or changes in Product Data, Shop Drawings, and/or Samples as required by the Consulting Engineer or designated alternate and resubmit when stamped as requiring re-submittal.

2. Clearly identify changes made other than those specifically requested by the Consulting Engineer or designated alternate when resubmitting Shop Drawings. Changes shall be clouded or similarly highlighted as coordinated with the State. Only changes that have been specifically requested by the Consulting Engineer or designated alternate or have been clouded by the Contractor will be reviewed on re-submittals.

3. Any drawing sheets added to the re-submittal shall be clearly identified and clouded, and shall not change the sheet numbering scheme for previously issued Shop Drawings.

4. The Contractor shall be responsible for any delays caused by the re- submittal process.

5. If the State or their designated representative rejects the Contractor's Prefabrication Submittal (Rejected, Revise and Resubmit), the State will be compensated for their time spent on all subsequent reviews beyond the second review, whether partial or comprehensive. The amount of such compensation will be incorporated by Change Order and withheld from the Contractor's Application for Payment.

G. Field Mark-Up Document:

1. Field-Record Documentation shall include all information required in the Pre-fabrication Submittals but revised to reflect "as installed" conditions. The documents shall be updated daily to reflect the most recent installation activity. The documents shall be kept on-site and be made available for inspection by the Consulting Engineer or designated alternate.

2. Thirty (30) days prior to the Final Acceptance testing, submit one (1) copy . of the Field Drawings to the Consulting Engineer or designated alternate. This copy shall be used during the Final Acceptance testing by the Consulting Engineer or designated alternate.

3. Update all documentation to reflect changes or modifications made during final acceptance testing as required and submit three (3) blue./ black line sets as part of the Record Documents.

H. Record Drawings:

1. Record Documentation shall consist of "As-Built" Drawings and Operation and Maintenance Manuals. The Record Documentations shall be submitted to the Consulting Engineer or designated alternate within forty- five (45) days after final acceptance

2. Produce all Record Drawings using the latest version of AutoCAD. Record Drawings shall, at a minimum, include the following:

   a. Floor plan drawings indicating device locations, with device legends indicating manufacturers and model numbers for each device.
   b. Floor plan drawings indicating wire routing. Wire routing shall be delineated in straight line runs and be tagged with cable identification and terminal strip numbers to coincide with the installation.
   c. Mounting details for all equipment and hardware.
   d. Functional block diagrams for each subsystem.
   e. Wiring details showing rack elevations, equipment wiring and terminations, and inter-rack wiring.
   f. Wiring diagrams for all custom circuitry including interfaces to various control output controlled devices, i.e. overhead doors, automatic sliding doors, fire alarm system interface, etc.
   g. Typical point-to-point wiring diagrams for each piece of equipment and groups of equipment within the system.
   h. Layout details for each riser location, including security panels, power supplies, junction boxes, conduit, and any other security related equipment.

I. Operation and Maintenance Manuals:

1. Intent: The intent of this Section is to require complete documentation of each System for the purpose of system operation and maintenance during and after the Warranty period. It is intended that the operation and maintenance manuals be exhaustive in the coverage of the system to the extent that they may be used as the sole guide to the troubleshooting, identification, and repair of defective parts.

2. Scope: The Contractor shall comply with the terms of the contract but in no case provide the State with less than two (2) complete drawing books and maintenance and operation manuals on the completed system hardcopy and six (6) copies of the drawing books and maintenance and operations manuals in PDF format on CD-ROM format. These manuals shall include basic wiring diagrams, schematics, and functional details such that any component, wire, or piece of equipment in the system may be easily identified by going to the actual equipment and making reference to this

manual. It is required that everything in the system be neatly labeled and easily identifiable. Every terminal, wire, component, or piece of equipment, relay, and other such items shall have a number or letter designation. All of these identification characteristics shall be included in the maintenance and operation manuals.

3. The maintenance manual requirement of this Section is in addition to Shop Drawing requirements. Maintenance manuals and drawing sets shall be compiled after system fabrication and testing, and shall incorporate any changes made after Shop Drawing submittal. The maintenance manuals and drawing books shall be permanently bound in hard plastic covers.

4. Maintenance Manuals, Manufacturer's Literature: Provide manufacturer's standard literature, covering all equipment included in the system. The maintenance manuals shall contain Specifications, adjustment procedures, circuit schematics, component location diagrams, and replacement parts identification. All references to equipment not supplied on this Project shall be crossed out.

5. Provide Pulling/Terminating operation Record and CMS (Cable Management System): As-Built required cable data to be provided to the State as part of the O&M Manuals. An electronic record shall be in an Excel spreadsheet format and supported by AutoCAD drawings in .DWG format only. Contractor shall be responsible for any delays due to improper documentation or failing to submit within the prescribed time frame.

6. Drawing Books: All Drawings developed specifically for this Project shall be reduced to 11" X 17", folded and bound with hard plastic covers. The 11" X 17" Drawings provided shall be easily readable after printing, even if this requires breaking large drawings into several parts. Text shall be no smaller than 1/16-inch. The Drawing book documents shall be produced with AutoCAD and the electronic files shall be provided to the State at the completion of the project on CD-ROM in DWG format. Provide component identification and cross reference on the Drawings to allow the maintenance department to understand the function of each item (the block diagram), find the room where the device is mounted (Contract document plans), find its location in a rack (arrangement drawings), find how it is wired (wiring diagrams), and its detailed Specifications (vendor data sheets), and how to repair it (spare part lists). Include the following drawings as a minimum:

    a. Functional Block Diagram: Provide an overall block diagrams showing the major interconnections between subsystems.
    b. Arrangement Drawings: Provide drawings showing the physical arrangement of all major system components. This shall include:
    c. Elevation drawings of all equipment racks showing the location of each component in the racks. Components in the racks shall be identified as in the functional block diagrams.
    d. Wiring Diagrams: Provide wiring diagrams showing all field installed interconnecting wiring. Wire identification on the diagrams shall agree with the wire markers installed on the equipment.

7. Spare Parts Lists: Submit cost lists for manufacturer recommended field replaceable modules to maintain the complete system with a minimum of downtime. This list shall include part names, part numbers, and source for additional purchase. The part list shall be cross-referenced to the functional block diagrams and the product data.

8. Special Tools List: Submit a list of special tools required to maintain the systems. Include on the list the name, part number, and source for all special tools. Special tools are defined as a tool that cannot be purchased at a normal retail hardware department.

9. Special Test Equipment: Submit a list of special test equipment required to prove that all system components are functioning per the Specifications. Special test equipment is defined as a device that cannot be purchased at a normal retail outlet.

10. Operation and Maintenance Manuals shall apply to all security related devices, equipment and software modules.

11. Operation and Maintenance Manuals shall also include, at a minimum, the following:

    a. Explanations of subsystem interrelationships. Explanations shall include operations of each subsystem and operations unique to the interfaces between each of the subsystems and possible conflicts that may occur with the interfaces. Each explanation shall be identified, tagged, bound and indexed into a single binder.
    b. Power-up and power-down procedures for each subsystem.
    c. Description of all diagnostic procedures.
    d. A list of manufacturers, their local representatives and subcontractors that have performed Work on the Project. The list shall include contact names, phone numbers and addresses for each.
    e. Installation and service manuals for each piece of equipment.
    f. Maintenance schedules for all installed components. Schedules shall include inspections and preventative maintenance schedules, and documentation of all repaired or replaced equipment.
    g. Operation and Maintenance Manuals shall be formatted as follows: Bind each manual in a hard-back loose-leaf binder.
    h. Identify each manual's contents on the cover.
    i. Provide a table of contents and tabulated sheets for each manual. Place tab sheets at the beginning of each chapter or section and at the beginning of each appendix if applicable.
    j. Any hardware manual demonstrating more than one model number of device on any one page shall be clearly marked as to delineate which model has been implemented in the Work.

12. Operation and Maintenance Manuals shall include a separate section for each software program incorporated into the Project. The software section shall include, at a minimum, the following information:

a. Definitions of all software related terms and functions.
b. Description of required sequences.
c. Directory of all disk files.
d. Description of all communications protocols, including data formats, command characters, and a sample of each type of data transfer.
e. Instructions for manufacturer supplied report generation with illustrations showing what reports should look like and screen by screen illustrations for each entry made.
f. Instructions for custom report generation.
g. Database format and data entry requirements.

J. Procedure for Resubmitting

1. Make corrections or changes in O & M and/or Record Drawings as required by the State and resubmit when the State's stamp requires re- submittal.

2. Clearly identify changes made other than those specifically requested by the State when resubmitting Record Drawings. Changes shall be clouded or similarly highlighted as coordinated with the State. Only changes that have been specifically requested by the State or have been clouded by the Contractor will be reviewed on re-submittals.

3. Any drawing sheets added to the re-submittal shall be clearly identified and clouded, and shall not change the sheet numbering scheme for previously issued Record Drawings.

4. The Contractor shall be responsible for any delays caused by the re- submittal process. If the State rejects the Contractor's Record Submittal (Rejected, Revise and Resubmit), the State will be compensated for their time on all subsequent reviews beyond the second time, whether partial or comprehensive. The amount of such compensation will be incorporated by Change Order and withheld from the Contractor's Application for Payment.

1.06 QUALITY ASSURANCE

A. Contractor Qualifications

1. Contractor shall be recognized by the manufacturer of the equipment being provided under this contract as a "top tier" dealer having maintained this manufacturer certification for not less than one (1) year and having installed a minimum of one (1) other system of the type being provided under this contract. Furthermore, the contractor shall have on their team for the duration of the project a certified network engineer to provide planning and configuration of all operating systems, database programs, network equipment and other data processing equipment.

2. Work specified herein shall be the responsibility of a single electronic security systems integration contractor. Contractor shall document a minimum of five (5) years experience in the fabrication, assembly and installation of systems of similar complexity as specified herein. This requirement shall apply equally to suppliers and manufacturers of the security subsystems and major

components to be used on this Project. The documentation shall include the names, locations, and points of contact for at least three (3) installations completed within the past three (3) years. The references should represent the type and complexity specified of the work specified herein, one (1) of which is preferred to be a commercial aviation facility. Contractor shall indicate the type and brand of each referenced system and certify that each system has performed satisfactorily in the manner intended for a period of not less than twelve (12) months.

3. The Contractor shall have local in-house Engineering and Project Management capabilities consistent with the requirements of the Work. The Contractor shall provide a full-time Project Manager who is to be present on site at all times that Work is actively in progress. This person shall be the same individual throughout the course of the Project and shall be the person responsible for direct supervision coordination and scheduling of all subcontract labor (as applicable). Should it be necessary to assign a new project manager during the course of the project, the State reserves the right to approve the replacement Project Manager.

4. By submitting a Bid, the Contractor thereby certifies that it is qualified in all areas pertaining to, either directly or indirectly, the Work. In the event the Contractor becomes unable to complete the Work in accordance with the Contract Documents, or the satisfaction of the State or its representatives, due to a lack of understanding of equipment, systems or services required by the Contract Documents, it shall be the responsibility of the Contractor to retain the services of the applicable manufacturers' representatives to expeditiously complete the Work in accordance with the State's construction schedule with no additional cost to the State.

5. The Contractor shall maintain, or establish and maintain, a fully staffed office including a service center capable of providing comprehensive maintenance and service to the Security System for the Project. The Contractor shall staff the service center with factory trained technicians and adequately equip the office to provide emergency service within two (2) hours after being called, twenty-four (24) hours per day, whether or not the State elects to purchase a maintenance contract from the Contractor.

6. The Contractor shall provide factory-certified technicians to install, commission, and maintain the Work. All installing personnel shall be licensed as required by local and/or state jurisdictions.

7. The Contractor shall ensure compliance with, and have a thorough understanding of, all local codes and contract conditions pertaining to this Project.

1.07 PRODUCT STANDARDS

A. Provide at the time of installation the latest Commercial-Off-The-Shelf (COTS) version of all equipment and software. Discontinued or prototype equipment shall not be acceptable.

B. Provide equipment suitable for the purpose for which it was manufactured. Field modifications made to adapt equipment for purposes other than what it was manufactured shall not be permitted.

1.08 CERTIFICATIONS

The Contractor warrants that he/she and his/her subcontractors are licensed by the State and as required by local ordinances prior to engaging in any construction or installation work.

1.09 DELIVERY, STORAGE AND HANDLING

A. All risk of loss or damage to materials shall rest with the Contractor until delivery of equipment to an on-site designated delivery and storage location. Materials will be subject to inventory by the State upon delivery and anytime thereafter without warning or notification.

B. The Contractor shall be responsible to provide and maintain his/her own storage facility. If this storage facility is required to be on-site it shall be the Contractor's responsibility to coordinate the size and spatial requirements with the State and/or their representatives. The Contractor shall assume full responsibility for their storage facility and all contents therein, unless otherwise indicated by the State.

The Contractor shall examine the site and the Contract Documents and review with the State the designated areas of access, delivery, and storage for the Contractor's use. The Contractor agrees that such areas are satisfactory and sufficient for his/her needs in the prosecution of his Work in conformance with the terms of this Contract.

1.10 PROJECT SITE CONDITIONS

Existing Conditions: The State shall be engaged in the construction of Pass & Identification Training Room at Kahului (OGG) International Airport which shall be coordinated / constructed by one or more General Contractors and / or Special Contract Groups. The Security Project Contractor shall be required to coordinate their scope of work with one or more Contractors for such things as locking hardware, power and conduit requirements. The State currently operates network based security systems using physically discrete hardware and shared backbone communications infrastructure. The contractor shall be responsible for integrating the work under this contract with the existing security system, including any upgrades to the existing systems to accommodate the work described in this project. This shall in no way impact the requirement for installation of a complete and operational Security System since all work shall be considered as forming an integral part of those systems defined herein.

1.11 SEQUENCING & SCHEDULING

A. The installation of the new ACS shall be done in a manner to avoid extended

Security System outages. The contractor must schedule any required short duration outages with the State a minimum of five (5) days in advance to allow for alternative security arrangements to be made. Each scheduled system outage must include an estimate of the approximate down time for the system and a written plan for providing back-up security in the event the outage extends beyond the estimated service interruption.

1.12 WARRANTY

A. Provide a one (1) year warranty on the Work. If, within one (1) year after the date of Final Acceptance of the Work or by the terms of any applicable special warranty required by the Contract Documents or provided by a manufacturer, any of the Work or equipment is found to be defective or not in accordance with the Contract Documents, the Contractor shall correct it promptly including all parts and labor after receipt of notice from the State to do so unless the State has previously given the Contractor a written acceptance of such condition. The State will give such notice promptly after discovery of the condition. Such notice shall be provided by State representatives, to be identified either verbally or in writing.

B. Nothing contained in the Contract Documents shall be construed to establish a shorter period of limitation with respect to any other obligation, which the Contractor might have under the Contract Documents or any manufacturer's warranty. The establishment of the time period of one year after the date of final acceptance of the Work or such longer period of time as may be prescribed by law or by the terms of any manufacturer's warranty or these contract documents relates only to the specific obligation of the Contractor to correct the Work or equipment, and has no relationship to the time within which its obligation to comply with the Contract Documents may be sought to be enforced, nor to the time within which proceedings may be commenced to establish the Contractor's liability with respect to its obligations other than specifically to correct the Work or equipment.

C. The one (1) year Warranty period shall begin upon final acceptance of the installed systems. For purposes of Warranty consideration, final acceptance shall be defined as the date on which the State formally acknowledges acceptance of the completed Work.

D. Warranty Service: In the event that defects in the materials and/or workmanship are identified during the Warranty period, the Contractor shall provide all labor, travel expenses and materials as may be required for prompt correction of the defect at no additional charge to the State.

E. During the Warranty period, the Contractor shall, upon receipt of a request for service from the State, deploy service personnel to the State's premises and complete corrective action within twenty-four (24) hours of arriving on site.

F. Repair or replacement service during the warranty period shall be performed in accordance with the following schedule:

1. Seven (7) days, twenty-four (24) hour, three (3) hour on-site response time shall apply for major system failure. A major system failure is defined as a failure that causes multiple portions of a system to be unable to perform the task for which it was intended or creates a potential for an immediate security breach.

2. Next business day response time shall apply for minor component and device failures.

3. The State shall be the sole authority to define a failure as a major or minor system failure.

G. If the Contractor is unable to restore system operation during the warranty period within two (2) business days of a system failure, the State reserves the right to require the Contractor to provide on-site manufacturer's service technicians at no additional cost.

H. All Warranty service and repair work shall be performed by personnel, who have been trained, certified and experienced in the operation and maintenance of the installed system(s).

I. Warranty service shall include the prompt replacement of all parts and/or components at no additional cost to the State and as required for restoring normal system operation. In the event that system parts or components must be removed for repair, it shall be the responsibility of the Contractor to furnish and install temporary parts and/or components as required to restore normal system operation until the repaired parts or components can be repaired and re-installed.

J. It shall be the responsibility of the Contractor to maintain an inventory of spare parts or to arrange for manufacturer parts support as required to ensure correction of all critical component failures or malfunctions within twenty-four (24) hours of the State's request for service.

K. The Contractor's Warranty obligation shall include correction of any software/firmware defects, which may be identified during the Warranty period. Any failure of the software/firmware to perform as specified by the software/firmware manufacturer beyond the time of final acceptance shall be defined as a software/firmware error.

L. Immediately following the completion of a Warranty repair or service call, the Contractor's service personnel shall submit a written report to the State which details the service work performed, the cause of the trouble, and any outstanding work which is required to restore complete and normal operation.

M. The contractor shall provide for manufacturer direct technical support to the end user via telephone as well as any training required by the manufacturer to do so. This effort to self-support on the part of the Airport shall not relieve the contractor of any of their obligations under the terms of the warranty to provide service.

N. As part of the warranty, the Contractor shall perform preventative maintenance during the warranty one (1) year period. The Contractor shall submit a list of manufacturer required items to be included in the preventative maintenance program. The list shall include maintenance to each item, the frequency of such maintenance, and the amount of time to be spent on each item for maintenance. As a minimum, preventative maintenance shall include, but not be limited to, the following.

1. Within five (5) days of the one year anniversary of Final Acceptance the contractor shall perform Annual Preventative Maintenance as follows:

    a. Test all system sensors and devices provided under this contract for proper operation using procedures identical to those used for Final Acceptance Testing. Repair or adjust devices to restore system capabilities to those accepted at Final Acceptance Testing unless otherwise directed by the State. Prepare Annual Inspection Report detailing repairs and adjustments made during the Annual Preventative Maintenance visit.

2. Within five (5) days of the six-month anniversary of Final Acceptance the contractor shall perform Semi-Annual Preventive Maintenance on components provided under this contract and as recommended by the manufacturer but in no case less than the following:

    a. Inspect, test, clean, and adjust power supplies and battery back-up. Replace batteries as necessary.
    b. Inspect, clean and vacuum all equipment mounted in consoles and equipment racks including air filters.
    c. Test and adjust all CCTV System pan, tilt, zoom, and preset functions. Inspect video quality and adjust CCTV System processing and recording equipment.

3. Within five (5) days after the initial 90 days from Final Acceptance and every 90 days thereafter the contractor shall perform on all components provided under this contract, Quarterly Preventive Maintenance as directed by the manufacturer, but in no case less than:

    a. Clean all camera housing view panels and domes.
    b. Visually observe all cameras and monitor displays and adjust as needed for optimal performance.
    c. Inspect recorded video to ensure storage requirements for devices provided under this contract are met. In addition, review the image quality of overnight recordings and make camera adjustments to optimize the overall quality.

O. Prior to undertaking any maintenance, the contractor shall notify the Airport of the intended date of such maintenance or upgrade in advance. This schedule and intended outcome of the maintenance visit including a list of items to be maintained shall be presented to the Airport within 24 hours prior to the scheduled visit.

P. Provide written notice to the State documenting any work performed during the

preventative maintenance visit within 24 hours of the completion of the maintenance visit.

Q. Include a manufacturer's software maintenance agreement as part of the Warranty. This agreement shall include all software updates, revisions, service assistance and training for any changes in operation of the security system application required by the update. This software maintenance agreement shall also include all operating system and database programs provided under this contract.

R. The Contractor shall maintain an inventory of spare parts and other items critical to system operation and as necessary to meet the emergency service requirements of this Project within the local service center. Spare parts shall include, but not be limited to, the following:

1. CCTV System:

a. Fixed Cameras, illuminators and Lenses.
b. Pan/Tilt/Zoom 180 and/or 360 degrees Cameras.
c. Fiber Optic Media Adapters and IP Encoders.
d. Power Supplies.

S. Provide loaner equipment for any equipment not field repairable. Such loaner equipment shall be in working order and the functional and technical equivalent of the item replaced.

T. Provide loaner equipment that is fully compatible and fully functions with all associated equipment.

U. Loaner equipment for system components that must be shipped from the manufacturer or distributor shall be on site and operational within twenty-four (24) hours of the component failure. Furnish lists of equipment that will require shipment from the manufacturer or distributor and lead times associated with that equipment.

V. The State reserves the right to expand or add to the system during the warranty period using firm(s) other than the Contractor for such expansion without affecting the Contractor's responsibilities on the components originally provided by them, provided that the expansion is done by a firm which is an authorized dealer or agent for the equipment or system being expanded.

1.13 COMMISSIONING

A. All of the Contractor's Work shall be tested and inspected by all Authorities Having Jurisdiction including the State and Consulting Engineer or designated alternate and in accordance with all Specifications. The Contractor shall coordinate and cooperate fully and shall provide at no additional cost to the State, manpower, blueprints, facilities, scaffolds, etc. to reasonably assist the inspectors.

B. Commissioning shall occur in two phases. The .first phase will be a functional and

physical inspection of the installation. All faults found in this first phase will be corrected prior to the advancement to the second phase.

C. The second phase of commissioning shall be a reliability test. The installed systems shall operate for a period of not less than fifteen (15) days without a malfunction. If a malfunction is identified during this period it shall be promptly corrected, and the reliability test period start over again and run for another fifteen (15) days unless restarted by another failure. The Final Acceptance Certificate will only be issued after successful completion of the second phase of commissioning where there have been no failures noted for a continuous fifteen (15) day period.

PART 2 - PRODUCTS

2.01 IP NETWORK BASED DIGITAL VIDEO SURVEILLANCE SYSTEM

A. The contractor shall provide CCTV equipment where shown on the drawings that is compatible with the existing airport CCTV system. This Section includes all labor and materials including, but not limited to: IP/Ethernet, cameras, housings, mounting hardware and power supplies required to form a fully functional network based video surveillance system. Provide all software licenses required for the specified cameras. The contractor shall provide cameras as shown on the drawings including, cables, conduit, lightning protection and mounting bracket fabrication.

B. The CCTV system is intended to be a network base system.

1. New cameras in this scope of work will be integrated into existing Video Management and Access Control System (VMACS). The video management system runs on Genetec v5.10 Security Center. Coordinate with maintenance contractor of the original system configuration to add the new project cameras onto the system.

2. IP based cameras shall be fully supported by the existing video recording system including all PTZ functions and provide a minimum of 1080p resolution at 15 frames-per-second.

3. The system shall provide recording/display capabilities for all of the cameras shown on the drawings. The contractor is required to expand the storage capacity of the existing system to accommodate the added cameras and not reduce the amount of existing storage time. As a minimum the added cameras shall be available for review at full resolution and frame rates no less than thirty (30) days in the past.

4. The system shall provide continuous recording of all cameras. Recording on motion only if required shall still continuously record at no less than one frame-per-second and increase recording frame rates to no less than fifteen frames per second when sensing motion within the camera field of view.

5. All cameras designated to view alarm information received by the access control

system shall be displayed at no less than full motion from ten (10) seconds prior to the initiation of the alarm event until two (2) minutes after the initiation of the alarm event on a designated alarm screen or window.

6. The contractor shall calculate an additional storage requirement based on recording of ten (10) alarm events per day in addition to the other continuous recording requirements stated above. These alarm events shall be retained for Thirty (30) days before being automatically overwritten.

C. The CCTV system shall be highly integrated with the access control system (ACS). Alarm events on the ACS from doors or other sources shall result in available live video images of the event being displayed designated existing workstations with instant replay capabilities. Stored video images associated with the ACS alarm event shall be linked with the event on the. Alarm images shall consist of ten (10) seconds of pre-alarm video and two (2) minutes of post alarm video.

D. Transportation of digital (IP) signals for viewing and management shall be via the existing Security Network which is to be expanded to the project area by the security system contractor as part of this contract. Coordinate IP addressing, Ethernet switch port assignments, fiber optic cable use and bandwidth utilization with other devices on the security network. The integration of the CCTV system with the Access Control System specified earlier in this document is part of this contract. All costs associated with the integration of this system with the CCTV system shall be included in the contract. The CCTV system shall immediately respond to alarm events associated with the ACS by calling designated camera views near the site of the alarm to designated alarm displays in the communications center control room. If the designated view is from a PTZ style camera, the CCTV system shall be capable of selecting a programmed preset position at the direction of the ACS to allow the PTZ to rotate and zoom in on the area of the alarm event. If the area is capable of being viewed from several cameras, the closest view will be called up to the designated alarm display with additional images being called up on alternate alarm displays. This integration shall be accomplished through a serial or network data exchange; contact closure interfaces to the ACS shall be prohibited.

E. All System configurations, changes, setups and operation shall be available to the System administrator for access and use. System configurations, changes, setups and operation shall be password protected.

F. The system shall support the use of IP mega-pixel cameras and cameras with 180 and 360 degree fields of view displayed without distortion on a single monitor. The field of view may be virtually panned and zoomed to provide the desired field of view. The system shall display up to four (4) independent views from the same camera and can manipulate PTZ of each view individually.

G. Cameras

1. Configure cameras such that all ACS alarm points, and card reader controlled doors located within the available field of view of the nearest camera are programmed for automatic viewing and real time recording.

2. Provide Multisensor 180 degrees CCTV cameras as indicated on drawings.

    a. Axis P3818-PVE or approved equal.
    b. Submit full model number for approval prior to procurement.

3. Provide Multidirectional 360 degree CCTV cameras as indicated on drawings.

    a. Axis P3735-PLE or approved equal.
    b. Submit full model number for approval prior to procurement

4. Provide Fixed CCTV cameras as indicated on drawings.

    a. Axis P3287-LVE or approved equal.
    b. Submit full model number for approval prior to procurement

5. All cameras, called out or otherwise identified, shall be submitted for approval.

6. Camera product numbers and camera series change frequently, if any product is found to be out of production, in end of life or has a manufacture identified replacement; the Contractor shall submit the updated replacement camera for approval.

7. Directly prior to procurement the Contractor is to verify manufacturer part numbers and identify if updated models have been introduced. If the camera manufacturer recommends upgrading submit the recommended camera for approval.

H. Power Over Ethernet

1. All cameras shall operate using POE/POE+.

2. All physical layer of Ethernet connected cameras shall be installed and confirm to TIA/EIA structured cabling standards and meet the requirements needed to obtain the manufacturers certified cable plant warranty. The Permanent Link shall not extend beyond 295 feet. The Channel shall not extend beyond 328 feet. Any cable runs beyond these identified limits shall be identified during the installation of the conduit and prior to the installation of the cable. Submit any exceptions to the Supporting Engineer for review. Any cables installed beyond TIA/EIA cabling standards will require correction, at the full direction of the Supporting Engineer, and at no additional cost to the project.

I. Outdoor Switch Enclosure

1. Provide Etherwan EASYPOE34X-MNC outdoor ethernet switch enclosure or approved equal for providing ethernet connectivity for cameras within the scope of work.

    a. NEMA 4X rated stainless steel

b. Minimum 8 port 10/100/1000 BASE T POE Ports
c. Minimum 2 100/1000 BASE SFP port
d. Operating temperature -40 to 75 ° C
e. Input 100-240 V AC

2. Contractor to provide fiber connection from the outdoor switch enclosure to the network switch identified in the drawings to connect the cameras to the existing VMACS system.

J. CCTV Camera Housings and Mounts

1. Provide CCTV camera housings and mounts as indicated on the Drawings.

2. Coordinate appropriate housing and mounts for cameras from same manufacturers as camera being selected. Submit housing and mounting to DOT-A Engineer for approval.

3. Wiring to all cameras shall pass from the back box through the mount and into the housing. Exposed wiring of any kind shall not be acceptable.

4. Provide sun shields for camera housings in outdoor locations exposed directly to sunlight.

5. Provide weather and dust proof camera housings with thermostatically controlled blowers in outdoor locations.

6. Provide transient voltage surge protection for power, control, and video cables for all exterior cameras.

2.02 LOCAL AREA NETWORK

A. The contractor shall provide network connectivity that will supplement the existing security LAN. In general the system must meet the requirements of the technologies provided by the contractor. The minimum equipment provided must comply with the requirements contained in this section.

B. Contractor shall provide CAT6 connection for new cameras part of scope to existing Layer 2/Layer 3 switch as per contract drawing. Coordinate with Engineer and DOT-A for available ports on network switch.

C. Fiber Connections:

1. Submit for approval and provide, as necessary, all new fiber optic patch cables of the proper length. Appropriately sized fiber patch cords (i.e. ran and dressed neatly with a minimal amount of slack) shall be provided by the Contractor for each installed uplink port in the network.

2. Shall match SFP/SFP+ interface of each side of the connection.

3. Patch cables are to be LC-LC, LC-SC, SC-SC, or as needed to connect to legacy interface.

D. UTP Connections:

1. Provide, as necessary, all new CAT 6/6A UTP patch cables of the proper length.

2. All patch cables are to include port to port identification labels as outlined by the ANSI/TIA 606-B Cable Labeling Standard, or as directed by the HDOT-A Project Manager and /or the Supporting Engineer.

E. The Contractor is to provide all needed physical layer communication infrastructure. Including all UTP/STP/FTP/Fiber Optic patch cords, rack mounted patch panels, DIN Rail patch panels, keystone panels, keystone fittings and inserts, and wire management hardware. The installed communications infrastructure shall be certified and supported by a manufacturer's performance warranty. All components shall provide Internet Protocol (IP) switching across all types of LAN technologies and topologies.

F. If the number of ports initially occupied by attached security project equipment exceeds 80% of the available ports, a switch with a greater port count will be provided in all cases. Provide switches with a minimum of sixteen (16) 10/100/1000 ports on each unit.

2.03 FIBER OPTIC TRANSMISSION

A. Provide fiber optic transceiver equipment if required. Provide stand alone units at field locations and rack mounted equipment in the security equipment room.

B. Rack mounted equipment shall be equipped with supervised and redundant power supplies.

2.04 WIRE AND CABLE

A. General

1. Provide wire, cable and single mode fiber as required to install the System as indicated on the drawings and specified herein.

2. All wire and cable shall be Underwriter's Laboratories (UL) listed, and shall meet all national, state and local code requirements for its application.

3. All wire and cable shall meet individual system or subsystem manufacturer specifications.

4. All wire and cable shall be plenum type cable, except that which shall be installed in conduit.

5. All insulated wire and cable shall conform to the minimum requirements of Insulated Cable Engineer Association (ICEA) Standards. Wire and cable shall comply with the applicable requirements of the National Electrical Code (NEC), latest edition, in regards to cable construction and usage.

6. The conductors of wires shall be copper, and have conductivity in accordance

with the standardization rules of the Institute of Electrical and Electronics Engineers, Inc. (IEEE). The conductor and each strand shall be round and free of kinks and defects.

7. All cable carrying data or voice transmissions shall be shielded. All other cable shall be shielded where necessary for interference-free signals.

8. Insulation shall be rated for a minimum of 300 V.

9. Color coding shall be accomplished by using solidly colored insulation. Grounding conductors, where insulated, shall be colored solid green or identified with green color as required by the National Electric Code (NEC).

B. Wire Types and Sizes

1. 120-volt Power Wiring: Minimum 12 AWG copper with THHN/THWN insulation.

2. Low Voltage Power Cable: Wire size shall be a minimum of 18 AWG, twisted, stranded, insulated and jacketed.

3. Control Point Cable (Non-Power): Wire size shall be a minimum of 20 AWG, twisted, stranded, insulated and jacketed.

4. Alarm Point Cable (Non-Power): Wire size shall be a minimum of 20 AWG, twisted, stranded, insulated and jacketed.

5. Control Point Cable (Low Voltage Power): Wire size shall be a minimum of 18 AWG, stranded, insulated, and jacketed.

6. Ethernet cable: Shall be a Category 6a cable. Wire size shall be a minimum of 24 AWG bare copper, twisted, unshielded and jacketed and shall be used for cable runs not to exceed 250 feet.

7. All fiber optic cable shall be suitable for the location in which it is to be installed. Cable installed in an exterior environment shall be filled with a water excluding gel. Cable type shall be compatible with existing fiber optic infrastructure.

2.05 CONDUIT BOXES & RACEWAYS

A. This Section is intended to provide guidance but not supersede any requirement contained in the electrical sections specifying raceways, fittings, boxes, enclosures, and cabinets for electrical wiring:

1. Rigid Metal Conduit ¾” minimum diameter

2. Electrical Metallic Tubing (EMT).

3. Liquid tight Flexible Conduit. ¾” minimum diameter

4. Boxes, enclosures, and cabinets include the following:

5. Device Boxes.

6. Outlet Boxes.

7. Pull and Junction Boxes.

8. Cabinets and Hinged Cover Enclosures.

9. Conduit Bodies.

10. Rigid Non-Metallic Conduit.

B. Install all conduits necessary for a complete installation, but not provided for in the Electrical Drawings. Conduit and boxes in finished areas shall be concealed in chases, furring, concrete slabs and/or above suspended ceilings. No exposed conduit shall be installed within public areas.

C. Conduit shall be carefully installed, properly and adequately supported as required to comply with the requirements outlined herein and as required by the NEC to provide a neat, workmanlike installation. Horizontal conduit runs shall be supported by clamps, pipe straps, special brackets or heavy iron tie, tied to the black iron structural members supporting the ceiling. Fastening of conduit to masonry walls, floor or partitions require malleable pipe clips with screws and suitable expansion sleeves.

D. All conduit shall be cut accurately to measurements established at the building and shall be installed without springing or forcing.

E. All required inserts shall be drilled-in and all openings required through concrete or masonry shall be saw cut or core drilled with tools specifically designed for this purpose.

F. Swab out and remove all burrs from conduit before any wires are pulled.

G. Layout and install conduit runs as to avoid proximity to hot pipes. In no case shall a conduit be run parallel within one (1) foot of such pipes. Where crossings are unavoidable and then the conduit shall be kept at least six (6) inches from the covering of the pipe and cross it at no less than a ninety (90) degree angle.

H. Provide fire stops where conduits penetrate fire rated walls and/or floors.

I. All conduit installation, whether run exposed or concealed, shall be approved by the Consulting Engineer or designated alternate prior to installation.

J. Seismically brace all conduits required to be seismically braced per National and Local Building Codes.

K. Small Junction Boxes mounted in ceiling shall be 4 11/16" square x 2 1/8" depth or as noted.

L. For Exposed Boxes and Weather Exposed Boxes: Boxes shall be cast iron, prime painted and enamel finished, with threaded hubs for conduit connection.

M. Large Junction Boxes: For dry interior locations, the box shall be fabricated from NEC gauge galvanized steel with matching screw-on type cover, field punched knockouts. For exterior and wet locations, the box shall be NEMA 4X stainless steel. All screws shall be stainless steel.

PART 3 – EXECUTION

3.01 INSTALLATION MANAGEMENT

A. Project Manager's Duties and Responsibilities

1. The Contractor shall provide to the State, as a part of the prefabrication submittal, the name of the Project Manager that will provide all duties and responsibilities as specified herein, during the term of the project.

    a. The State reserves the right to approve or disapprove the individual that shall be designated as the Project Manager.
    b. If at any point during the term of the project, and for any reason, the Project Manager is replaced, it shall be the responsibility of the Contractor to submit such information onto the State expeditiously for approval prior to any position replacement.

2. The Project Manager shall maintain the ability of making all managerial decisions on behalf of the Contractor on a day-to-day basis, and shall retain the authority of accepting notices of deduction, inspection reports, payment schedules and any other project related correspondence on behalf of the State.

3. The Project Manager shall schedule and attend weekly project management meetings, during which time all system related issues are discussed, scheduled, confirmed and/or resolved.

    a. The project management meetings shall continue weekly until such time that the Contractor and State schedule otherwise. The scheduling of the project management meetings shall be approved by the State prior to commencement.

4. The Project Manager shall be available during normal business hours (8:00 a.m. to 5:00 p.m.) within two (2) hours by phone during the term of the project.

    a. After normal business hours, they shall be available within four (4) hours by phone during the term of the project.
    b. In the *event* that the Project Manager is not available within the allotted time frame, the Contractor may designate another employee to temporarily act as the Project Manager in all correspondence with the State.
    c. The Contractor shall ensure that any individual temporarily assuming the duties of the Project Manager is at equal or higher level in the Contractor's managerial chain of command.
    d. Upon notification by the State, of any project related installation issue, or issue that may contradict the system specifications as stated herein, the Project Manager shall respond to such issue, verbally and/or in writing within an eight (8) hour period. Responses to such issues as stated above shall include a clear. understanding of the issue, along with a tentative plan of action,

reflecting milestones and/or deadlines to resolve the issue.

e. Where appropriate, based on the overall importance of the project issue, the Project Manager shall follow-up their initial response with a written response to the issue within twenty-four (24) hours of identification of the issue.

3.02 CONNECTION TO EXISTING SYSTEMS

A. The systems described in this section are extensions of the existing CCTV and ACS systems installed at the Airport. They are not intended to operate as a stand-alone system. Tie-in to the existing system shall be done by the existing authorized service provider. An allowance in Proposal Schedule is accounted for this work.

B. The tie-in to the existing system shall be done in a manner that insures that there will be no system outages on the existing system. The contractor on this project shall be required to coordinate with the existing authorized service provider as part of their work on this project for such things including but not limited to device naming conventions and IP address.

C. The contractor shall provide all information including but not limited to CAD drawings for Graphical User Interface development and alarm point/camera· call-up views requested by the existing service provider in an expeditious manner so that they can program the existing system.

3.03 EXAMINATION

Site Verification of Conditions

A. Continuously verify that the site conditions are in agreement with the Contract Documents and the design package. Submit a report to the State documenting changes to the site or conditions that affect the performance of the system to be installed. For those changes or conditions, which affect system installation or performance, provide (with the report) specification sheets, or written functional requirements to support the findings, and a cost estimate to correct the deficiency. No deficiency shall be corrected without written permission from the State.

B. Specific mounting locations, exact wire and cable runs, and conduit routing have not been specified or delineated on the Security Device Drawings. Coordinate all aspects of the Work with the Consulting Engineer or designated alternate.

3.04 PREPARATION

Protection: The Contractor shall provide protection necessary to safeguard his/her own Work from damage by his/her own operations and others. Unless the Contractor proves to the State's satisfaction that their Work has been damaged by others, the Contractor shall, at his/her own cost and expense, promptly repair, adjust and clean all defective installations as shown on the punch list prepared by the State.

3.05 INSTALLATION

A. Should any questions of union jurisdiction arise, the Contractor shall immediately take steps to settle such disputes and shall use such labor as may be determined to have jurisdiction, at no additional cost to the State. Should he/she fail to take expeditious action, he/she shall be responsible for any time lost because of delays arising from such a dispute.

B. Provide code compliant fire proofing techniques for all penetrations of fire rated partitions and slabs, where the penetrations are made by or used for installation of the Security System.

C. Coordinate the routing of wire and cable requiring isolation from power, radio frequency (RF), electromagnetic interference (EMI), telephone, etc. with the Consulting Engineer or designated alternate.

D. Run all wire and cable continuous from device location to the final point of termination. No mid-run cable splices shall be allowed.

E. Furnish and install all cable such that ample slack is supplied at the device terminating end of the cable to compensate for any final field modifications in location. The approximately ten (10) feet extra cable shall be bundled and neatly wrapped to permit future use.

F. At no time shall any coaxial cable be subjected to a bend less than a 150 mm radius.

G. Wire and cable within power distribution cabinets and other security enclosures shall be neatly installed, completely terminated, pulled tight with slack removed and routed in such a way as to allow direct, unimpeded access to the equipment within the enclosure. All wire and cable shall be bundled and tied.

H. Provide grommets and strain relief material where necessary to avoid abrasion of wire and excess tension on Wire and Cable.

I. Make connections with solder-less devices, mechanically and electrically secured in accordance with the manufacturers' recommendations. Wire nuts shall not be an acceptable means of connecting wire and cable.

J. All exterior devices shall be sealed and protected against all weather conditions including heat, cold, moisture, dust, and sand.

K. Neatly bundle and wrap all horizontally run (above accessible ceilings and not within conduit) wire and cable at three-meter intervals. Provide supports as required. All system wiring within vertical riser shafts (as required) shall be bundled, wrapped and tied to the structure at three-meter intervals in order to isolate it from other wire and cable within the shaft. Additionally, all wire and cable within the shaft shall be supported at least every two floors using Slack Grips (Split Mesh Lace Closing) or approved equal. Provide all personnel and equipment necessary to install and support the cable.

3.06 COORDINATION

A. Coordinate locations of all devices with the State and Consulting Engineer or designated alternate prior to installation.

B. Coordinate and verify the location of each piece of rack-mounted equipment with the Consulting Engineer or designated alternate prior to installation.

C. Coordinate all initial database partitioning and setup with the Consulting Engineer or designated alternate prior to installation prior to initial programming and data entry.

D. Coordinate final camera locations, desired views, and camera housing and mount requirements with the State and Consulting Engineer or designated alternate prior to installation prior to installation.

E. Coordinate camera housing and mount finishes with the State and Consulting Engineer or designated alternate prior to installation prior to installation.

F. Coordinate finishes and colors of all equipment with the State and Consulting Engineer or designated alternate prior to installation. Submit all finish and graphics for all equipment in public areas to the State and Consulting Engineer or designated alternate prior to installation for approval prior to installation.

G. Contractor or equipment manufacturer logos or names shall not be visible on equipment in public areas.

H. Equipment: Provide equipment as indicated on the Drawings and specified herein. Additional specific installation requirements are as follows:

1. CCTV Cameras

a. Field verify the exact location and positioning of all cameras with the State and Consulting Engineer or designated alternate prior to installation prior to installation.
b. Confirm views with the State and Consulting Engineer or designated alternate prior to installation prior to final installation and adjust camera positions and lens sizes as required.

I. System Programming and Data Entry

1. Coordinate with the existing authorized system provider on all system programming and setup of the ACS System including, but not limited to the following:

a. Graphical Maps and Icons: Update all graphical maps and symbols to reflect the modifications made to the building as part of this project. Import all AutoCAD background information provided by the Architect and produce a complete set of graphical maps depicting all ACS and CCTV System points in the system.

b. Input and Output Points: Coordinate all input and output priorities and text, including descriptors, alarm messages, CCTV Camera call up, and map call up and identification with the State and Engineer or designated alternate.
c. Initial CCTV Camera call up and alarm information for interface with the CCTV System.
d. Alarm monitoring and automatic shut down information for the UPS interface.

J. Labeling

1. Label all controls as necessary to agree with their function.

2. Mark all Wire and Cable in common at both ends using a permanent method such as self-laminating cable marking tape. The tags shall be attached to the wire and able nylon cable ties in an accessible location so that they can easily be read. Tags shall be installed when wire and cables are installed. Labeling shall agree with Record Documentation.

3. Place wire identification numbers at each end of the conductor involved by using sleeve type, heat shrinkable markers. The markers shall be installed so as to be readable from left to right or top to bottom.

4. Mark all connectors with common designations for mating connectors. The connector designations shall be indicated on the Record Drawings.

5. Coil all spare conductors in the device back-box, panel wire way, or top of panel where wire way is not provided. These conductors shall be neatly bundled and tagged.

3.07 REPAIR/RESTORATION

A. The Contractor, upon receiving notice from State that the Contractor has furnished inferior, improper or unsound Work or materials (including equipment) (whether worked or unworked), or Work or materials at variance with that which is specified, will, within twenty-four (24) hours, proceed to remove such Work or materials and make good all other Work or materials damaged thereby, and, at the option of the State, the Contractor shall immediately replace such Work or materials with Work or materials as specified. The removal, replacement and repair shall be performed at such times and with manpower sufficient, in the judgment of the State, so as not to avoid disturbance to occupants, or other ongoing work.

B. If the Contractor does not remove such unsound Work within a reasonable time, the State may remove it and may store the material at the expense of the Contractor. If the Contractor does not pay the expenses of such removal within ten (10) days' time thereafter, the State may, upon ten (10) days' written notice, sell such materials at auction or at private sale and shall account for the net proceeds thereof, after deducting all the costs and expenses that should have been borne by the Contractor and all expenses of the sale.

C. The State shall have the authority at all times, until Final Completion and acceptance of the Work, to inspect and reject Work and materials which in its

judgment are not in conformity with the Drawings and Specifications, and its decision in regard to character and value of Work shall be final and conclusive on both contracting parties. If the State permits said Work or materials to remain, the State shall be allowed the difference in value or shall at its election have the right to have said Work or materials repaired or replaced, as well as the damage caused thereby, at the expense of the Contractor, at any time within one year after the completion of the entire project, or within such longer period as may be covered by any guaranty; and neither payments made to the Contractor, nor any other acts of the State, shall be construed as evidence of acceptance, waiver or estoppels. Any expense incurred by the State in connection with the foregoing, shall be borne by the Contractor, and the State may withhold money due to the Contractor or recover money already paid to the Contractor, to the extent of such expense.

3.08 SYSTEM ACCEPTANCE

A. Prior to any final acceptance testing, the Contractor shall submit two sets of preliminary (draft) Record Documents to the State. The preliminary Record Documents are to be used by the State to conduct the system final test.

B. Submit a paragraph-by-paragraph completion matrix indicating completion or delinquency for each item included in the Specification and all subsequent addenda and bulletins as part of the Work. Indicate completion of the requirement by the word "Completed" following each paragraph number. Indicate delinquency for the requirement by the words "To Be Completed" following the applicable paragraph number. Should work on any item be under way, but not yet fully complete, indicate the extent (or lack thereof) of completion to date, and the proposed date of completion.

C. Conduct a complete test of the entire Security System and provide the State and Consulting Engineer or designated alternate with a written report on the results of that test. During the course of this test, place the integrated Security System in service, and calibrate and test all equipment.

D. The Contractor shall submit documentation indicating completion of the testing to the State and Consulting Engineer or designated alternate before conducting System Acceptance testing. All items are required to be complete before a final inspection of the security system. If for some reason the Contractor is unable to fully comply with any of the listed conditions, a written statement describing the exception is to be submitted with the checklist for review. The checklist shall accompany the written certification to the State and Consulting Engineer or designated alternate that the installed complete Security System has been calibrated, tested, and is fully functional as specified herein.

E. Following completion of the initial testing and correction of any noted deficiencies, the State and Consulting Engineer or designated alternate shall conduct Final Acceptance testing.

F. After completion of Final Acceptance testing the State shall conduct a fifteen -day (15) burn-in test. The intent of the burn-in test shall be to prove the Security

System by placing it in real operating conditions. During this period the Security System shall be fully functional and programmed such that all points, interfaces, controls, reports, messages, prompts, etc. can be exercised and validated. Record and correct any system anomaly, deficiency, or failure noted during this period. The failure of any component during the burn-in test shall cause the testing period to begin again and run in it's entirety until successfully completed. The issuing of the Final Acceptance Certificate is based on the successful completion of the burn-in testing.

G. In order to sufficiently demonstrate the Security System's functionality, the State may have the contractor intentionally introduce faults into the system to demonstrate its resiliency. These tests shall not be allowed to adversely effect the long term operation of the system, but rather demonstrate the ability of the system to operate in a fault condition.

H. The State retains the right to suspend and/or terminate testing at any time when the system fails to perform as specified. In the event that it becomes necessary to suspend the test, all of the State's fees and expenses related to the suspended test will be deducted from the Contractor's retainage. Furthermore, in the event it becomes necessary to suspend the test, the Contractor shall work diligently to complete/repair all outstanding items to the condition called for in the Specification and as indicated on the Security Drawings. The Contractor shall supply the State with a detailed completion schedule outlining phase-by-phase completion dates and a tentative date for a subsequent punch list retest. During the final acceptance test, no adjustments, repairs or modifications to the system will be conducted without the permission of the State.

3.09 CLEANING

A. Prior to the final acceptance test, coordinate with the State and Consulting Engineer for security related construction clean-up and patch work requirements. Security equipment closets and similar areas should be free of accumulation of waste materials or rubbish caused by operations under the Contract. At completion of the Work, remove all waste materials, rubbish, the Contractor's and it's subcontractors' tools, construction equipment, machinery and all surplus materials.

B. The Contractor shall utilize good housekeeping practice with respect to his/her Work including cleanup of all dirt and debris created by the Contractor during his installation operations on a daily basis.

C. The Contractor shall at his own expense collect and dispose of packing and debris in an environmentally responsible manner at the end of each working shift. This shall include recycling packaging materials and excess copper wire.

D. The Contractor shall be on call during the Warranty to answer any questions the State might have. Maintain time sheets verifying the total hours of training provided. The State reserves the right to use any excess training hours, not used by the time of system completion, for future training as requested by the State until the total number of training hours has been completed.

PART 4 - MEASUREMENT AND PAYMENT

4.01 BASIS OF MEASUREMENT AND PAYMENT

Work under this Section, except for Connection to Existing Electronic Security Systems, shall be considered incidental to and included in the LUMP SUM PRICE.

Work for Connection to Existing Electronic Security Systems required by the State shall be paid for under allowance items in the Proposal Schedule.
Payment shall be the actual cost as invoiced by the Contractor and approved by the Engineer. The Contractor shall not be allowed to include overhead, profit, insurances and/or any other mark-ups which shall be considered incidental to and included in the LUMP SUM PRICE.

Item No.	Item	Unit
16750.1	Connection to Existing Electronic Security Systems	Allowance

The allowance is an estimate and the amount shall not exceed the maximum amount shown in the proposal schedule. Additional charges by the Contractor for overhead, coordination, profit, insurances and other incidental expenses shall not be allowed. These shall be included in the Contractor's LUMP SUM PRICE.

END OF SECTION

Requirements of Chapter 104, HRS
Wages and Hours of Employees on Public Works Law

Chapter 104, HRS, applies to every public works construction project over $2,000, regardless of the method of procurement or financing (purchase order, voucher, bid, contract, lease arrangement, warranty, SPRB).

Rate of Wages for Laborers and Mechanics

- Minimum prevailing wages (basic hourly rate plus fringe benefits), as determined by the Director of Labor and Industrial Relations and published in wage rate schedules, shall be paid to the various classes of laborers and mechanics working on the job site. [§104-2(a), (b), Hawaii Revised Statutes (HRS)]

- If the Director of Labor determines that prevailing wages have increased during the performance of a public works contract, the rate of pay of laborers and mechanics shall be raised accordingly. [§104-2(a) and (b), HRS; §12-22-3(d) Hawaii Administrative Rules (HAR)]

Overtime

- Laborers and mechanics working on a Saturday, Sunday, or a legal holiday of the State or more than eight hours a day on any other day shall be paid overtime compensation at not less than one and one-half times the basic hourly rate plus the cost of fringe benefits for all hours worked. If the Director of Labor determines that a prevailing wage is defined by a collective bargaining agreement, the overtime compensation shall be at the rates set by the applicable collective bargaining agreement [§§104-1, 104-2(c), HRS; §12-22-4.1, HAR]

Weekly Pay

- Laborers and mechanics employed on the job site shall be paid their full wages at least once a week, without deduction or rebate, except for legal deductions, within five working days after the cutoff date. [§104-2(d), HRS]

Posting of Wage Rate Schedules

- Wage rate schedules with the notes for prevailing wages and special overtime rates, shall be posted by the contractor in a prominent and easily accessible place at the job site. A copy of the entire wage rate schedule shall be given to each laborer and mechanic employed under the contract, except when the employee is covered by a collective bargaining agreement. [§104-2(d), HRS]

Withholding of Accrued Payments

- If necessary, the contracting agency may withhold accrued payments to the contractor to pay to laborers and mechanics employed by the contractor or subcontractor on the job site any difference between the wages required by the public works contract or specifications and the wages received. [§104-2(e), HRS]

Certified Weekly Payrolls and Payroll Records

- A certified copy of all payrolls shall be submitted weekly to the contracting agency. [§104-3(a), HRS; §12-22-10, HAR]

- The contractor is responsible for the submission of certified copies of the payrolls of all subcontractors. The certification shall affirm that the payrolls are correct and complete, that the wage rates listed are not less than the applicable rates contained in the applicable wage rate schedule, and that the classifications for each laborer or mechanic conform with the work the laborer or mechanic performed. [§104-3(a), HRS; §12-22-10, HAR]

- Payroll records shall be maintained by the contractor and subcontractors for three years after completion of construction. The records shall contain: [§104-3(b), HRS; §12-22-10, HAR]
  - the name and home address of each employee
  - the last four digits of social security number
  - a copy of the apprentice's registration with DLIR
  - the employee's correct classification
  - rate of pay (basic hourly rate + fringe benefits)
  - itemized list of fringe benefits paid
  - daily and weekly hours worked
  - weekly straight time and overtime earnings
  - amount and type of deductions
  - total net wages paid
  - date of payment

- Records shall be made available for examination by the contracting agency, the Department of Labor and Industrial Relations (DLIR), or any of its authorized representatives, who may also interview employees during working hours on the job. [§§104-3(c), 104-22(a), HRS; §12-22-10, HAR]

Termination of Work on Failure to Pay Wages

- If the contracting agency finds that any laborer or mechanic employed on the job site by the contractor or any subcontractor has not been paid prevailing wages or overtime, the contracting agency may, by written notice to the contractor, terminate the contractor's or subcontractor's right to proceed with the work or with the part of the work in which the required wages or overtime compensation have not been paid. The contracting agency may complete this work by contract or otherwise, and the contractor or contractor's sureties shall be liable to the contracting agency for any excess costs incurred. [§104-4, HRS]

Apprentices

- Apprentice wage rates apply to contractors who are a party to a bona fide apprenticeship program which has been registered with the DLIR. In order to be paid apprentice rates, apprentices must be parties to an agreement either registered with or recognized as a USDOL nationally approved apprenticeship program by the DLIR, Workforce Development Division, (808) 586-8877, and the apprentice must be individually registered by name with the DLIR. [§12-22-6(1) and (2), HAR]

- The number of apprentices on any public work in relation to the number of journeyworkers in the same craft classification as the apprentices employed by the same employer on the same public work may not exceed the ratio allowed under the apprenticeship standards registered with or recognized by the DLIR. A registered or recognized apprentice receiving the journeyworker rate will not be considered a journeyworker for the purpose of meeting the ratio requirement. [§12-22-6(3), HAR]

Enforcement

- To ensure compliance with the law, DLIR and the contracting agency will conduct investigations of contractors and subcontractors. If a contractor or subcontractor violates the law, the penalties are: [§104-24, HRS]

  - First Violation — Equal to 25% of back wages found due or $250 per offense up to $2,500, whichever is greater.
  - Second Violation — Equal to amount of back wages found due or $500 for each offense up to $5,000, whichever is greater.
  - Third Violation — Equal to two times the amount of back wages found due or $1,000 for each offense up to $10,000, whichever is greater; and
    Suspension from doing any new work on any public work of a governmental contracting agency for three years.

  ▪ A violation would be deemed a second violation if it occurs within two years of the **first notification of violation**, and a third violation if it occurs within three years of **the second notification of violation**. [§104-24, HRS; §12-22-25(b), HAR]

  ▪ **Suspension**: For a first or second violation, the department shall immediately suspend a contractor who fails to pay wages or penalties until all wages and penalties are paid in full. For a third violation, the department shall penalize and suspend the contractor as described above, **except that if the contractor continues to violate the law, then the department shall immediately suspend the contractor for a mandatory three years. The contractor shall remain suspended until all wages and penalties are paid in full.** [§§104-24, 104-25, HRS]

- **Suspension**: Any contractor who fails to make payroll records accessible or provide requested information within 10 days, or fails to keep or falsifies any required record, shall be assessed a penalty including suspension as provided in Section 104-22(b) and 104-25(a)(3), HRS. [§104-3(c), HRS; §12-22-26, HAR]

- If any contractor interferes with or delays any investigation, the contracting agency shall withhold further payments until the delay has ceased. Interference or delay includes failure to provide requested records or information within ten days, failure to allow employees to be interviewed during working hours on the job, and falsification of payroll records. The department shall assess a penalty of $10,000 per project, and $1,000 per day thereafter, for interference or delay. [§104-22(b), HRS; §12-22-26, HAR]

- Failure by the contracting agency to include in the provisions of the contract or specifications the requirements of Chapter 104, HRS, relating to coverage and the payment of prevailing wages and overtime, is not a defense of the contractor or subcontractor for noncompliance with the requirements of this chapter. [§104-2(f), HRS]

For additional information, visit the department's website at *http://labor.hawaii.gov/wsd*
or contact any of the following DLIR offices:

Oahu (Wage Standards Division) .....(808) 586-8777
Hawaii Island.....(808) 974-6464
Maui and Kauai .....(808) 243-5322

STATE OF HAWAII

DEPARTMENT OF TRANSPORTATION

AIRPORTS

WAGE RATE SCHEDULE

(NOT PHYSICALLY INCLUDED)

STATE OF HAWAII

DEPARTMENT OF TRANSPORTATION

AIRPORTS

PROPOSAL

PROPOSAL TO THE
STATE OF HAWAII
DEPARTMENT OF TRANSPORTATION

PROJECT:	Pass & Identification Training Room Kahului Airport Kahului, Maui, Hawaii
PROJECT NO.:	CM1642-13
COMPLETION TIME:	ONE HUNDRED EIGHTY (180) Calendar days from the date indicated in the Notice to Proceed from the Department.
LIQUIDATED DAMAGES:	ONE HUNDRED FIFTY DOLLARS ($150) for each and every calendar day which the Contractor has delayed the completion of this project.
PROJECT MANAGER:	Mr. Jake Shiraki Department of Transportation Airports 400 Rodgers Boulevard, Suite 700 Honolulu, HI 96819-1880 Phone: (808) 838-8805 Email: jake.l.shiraki@hawaii.gov
ELECTRONIC SUBMITTAL:	The bidder shall submit the proposal in HIePRO. The proposal shall be UPLOADED to HIePRO prior to the bid opening date and time. Failure to upload the Proposal into HIePRO shall be grounds for rejection of the bid. See SPECIAL PROVISIONS - 2.8 PREPARATION AND DELIVERY OF BID - for additional information.

Director of Transportation
869 Punchbowl Street
Honolulu, Hawaii 96813

Dear Sir:

The undersigned Bidder declares the following:

1. It has not, either directly or indirectly, entered into any agreement, participated in any collusion, or otherwise taken any action in restraint of free competitive bidding in connection with this proposal.

2. It has not been assisted or represented on this matter by any individual who has, in a State capacity, been involved in the subject matter of this contract within the past two years.

3. It has not and will not, either directly or indirectly offered or given a gratuity (i.e. an entertainment or gift) to any State or County employee to obtain a contract or favorable treatment under a contract.

The undersigned Bidder further agrees to the following:

1. If this proposal is accepted, it shall execute a contract with the Department to provide all necessary labor, machinery, tools, equipment, apparatus and any other means of construction, to do all the work and to furnish all the materials specified in the contract in the manner and within the time therein prescribed in the contract, and that it shall accept in full payment therefore the sum of the unit and/or lump sum prices as set forth in the attached proposal schedule for the actual quantities of work performed and materials furnished and furnish satisfactory security in accordance with Section 103D-324, Hawaii Revised Statutes, within 10 days after the award of the contract or within such time as the Director of Transportation may allow after the undersigned has received the contract documents for execution, and is fully aware that non-compliance with the aforementioned terms will result in the forfeiture of the full amount of the bid guarantee required under Section 103D-323, Hawaii Revised Statutes.

2. That the quantities given in the attached proposal schedule are approximate only and are intended principally to serve as a guide in determining and comparing the bids.

3. That the Department does not either expressly or by implication, agree that the actual amount of work will correspond therewith, but reserves the right to increase or decrease the amount of any class or portion of the work, or to omit portions of the work, as may be deemed necessary or advisable by the Director of Transportation, and that all increased or decreased quantities of work shall be performed at the unit prices set forth in the attached proposal schedule except as provided for in the specifications.

4. In case of a discrepancy between unit prices and the totals in said Proposal Schedule, the unit prices shall prevail.

5. Agrees to begin work within 10 working days after the date of notification to commence with the work, which date is in the notice to proceed, and shall finish the entire project within the time prescribed.

6. The Director of Transportation reserves the right to reject any or all bids and to waive any defects when in the Director's opinion such rejections or waiver will be for the best interest of the public.

7. The undersigned Bidder further agrees to the following: Pursuant to HRS §103D-405(d), any contractor (including consultants) paid for services to develop or prepare specifications or work statements shall be precluded from submitting an offer or receiving a contract for that particular solicitation. This includes the preparation of reports relied upon by HDOT in the development of the project scope.

The Bidder acknowledges receipt of and certifies that it has completely examined the following listed items: the Hawaii Department of Transportation, Air and Water Transportation Facilities Division General Provisions for Construction Projects dated 2016, the Notice to Bidders, the Special Provisions, if any, the Technical Provisions, the Proposal, the Contract and Bond Forms, and the Project Plans.

In accordance with Section 103D-323, Hawaii Revised Statutes, this proposal is accompanied with a bid security in the amount of 5% of the total amount bid, in the form checked below. (Check applicable bid security submitted with bid.)

_____ Surety Bid Bond (Use standard form),

_____ Cash,

_____ Cashier's Check,

_____ Certified Check, or

_____ _____.
(Fill in other acceptable security.)

The undersigned Bidder acknowledges receipt of any addendum issued by the Department by recording in the space below the date of receipt.

Addendum No. 1 _____ Addendum No. 3 _____

Addendum No. 2 _____ Addendum No. 4 _____

In accordance with Section 103D-302, Hawaii Revised Statutes, the undersigned as Bidder, has listed the name of each person or firm, who will be engaged by the Bidder on the project as a Subcontractor or Joint Contractor and the nature of work to be done by each. **The Bidder must adequately and unambiguously disclose the unique nature and scope of the work to be performed by each Subcontractor or Joint Contractor.** For each listed firm, the Bidder declares the respective firm is a Subcontractor or Joint Contractor and is subject to evaluation as a Subcontractor or Joint Contractor. It is understood that failure to comply with the aforementioned requirements may be cause for rejection of the bid submitted.

Name of Subcontractor	Nature and Scope of Work
1.	
2.	
3.	
4.	
5.	
6.	
7.	
8.	

Name of Joint Contractor	Nature and Scope of Work
1.	
2.	
3.	

NOTES:

"None" or if left blank indicates no Subcontractor or Joint Contractor.

If more space is needed, attach additional sheets.

The undersigned hereby certifies that the bid prices contained in the attached proposal schedule have been carefully checked and are submitted as correct and final.

This declaration is made with the understanding that the undersigned is subject to the penalty of perjury under the laws of the United States and is in violation of the Hawaii Penal Code, Section 710-1063, unsworn falsification to authorities, of the Hawaii Revised Statutes, for knowingly rendering a false declaration.

_____
Bidder (Company Name)

By_____
Authorized Signature

_____
Print Name and Title

_____

_____
Business Address

_____
Business Telephone

_____
Date

_____
Contact Person (If different from above)

Phone:_____ Email:_____

NOTE:

If Bidder is a CORPORATION, the legal name of the corporation shall be set forth above, the corporate seal affixed, together with the signature(s) of the officer(s) authorized to sign contracts for the corporation. Please attach to this page current (not more than six months old) evidence of the authority of the officer(s) to sign for the corporation.

If Bidder is a PARTNERSHIP, the true name of the partnership shall be set forth above, with the signature(s) of the general partner(s). Please attach to this page current (not more than six months old) evidence of the authority of the partner authorized to sign for the partnership.

If Bidder is an INDIVIDUAL, the bidder's signature shall be placed above.

If signature is by an agent, other than an officer of a corporation or a partner of a partnership, a POWER OF ATTORNEY must be on file with the Department before opening bids or submitted with the bid. Otherwise, the Department may reject the bid as irregular and unauthorized.

PREFERENCES

Bidders acknowledge that while preferences are considered in the evaluation of bids, the award of the contract will be in the amount of the bid offered exclusive of any preferences.

A. HAWAII BIDDER PREFERENCE

In accordance with HRS §103D-302, the Hawaii bidder preference is applicable to this solicitation for evaluation purposes only. Bidders desiring to qualify for the five per cent (5%) preference shall submit with their bid a completed *Hawaii Bidder/Offeror Preference Certification Form* (Form SPO-081) at or before the time set for receipt of bids. Certifications submitted for previous or other solicitations will not be accepted.

( ) Yes, the Bidder elects to receive the Hawaii Bidder Preference and has included the Form SPO-081 with the bid.

B. APPRENTICESHIP AGREEMENT PREFERENCE

In accordance with HRS §103-55.6, the estimated value of this public works contract is $250,000 or more and the apprenticeship agreement preference is applicable to this solicitation for evaluation purposes only. Bidders desiring to qualify for the five per cent (5%) preference shall submit with their bid a complete, valid CERTIFICATION OF BIDDER'S PARTICIPATION IN APPROVED APPRENTICESHIP PROGRAM UNDER ACT 17 (Certification Form 1) ***for each apprenticeable trade*** the Bidder will employ on the project.

( ) Yes, the Bidder elects to receive the Apprenticeship Agreement Preference and has attached Certification Form(s) 1 for each apprenticeable trade the Bidder will employ for this project (excluding subcontractors).

By submission of this offer, the Bidder certifies that it has indicated **all apprenticeable trades that Bidder will employ** for this project (excluding subcontractors) by listing the applicable trades below:

_____ _____

_____ _____

_____ _____

_____ _____

_____ _____

(Attach additional sheet if necessary.)

Form 1 Required. Failure to submit a valid Form 1 with the bid for every apprenticeable trade that Bidder will employ on the project will result in the preference being denied, regardless of whether the trade is listed above. If a Form 1 is submitted for a trade that is not listed above, the Form 1 will take

precedence over the listing and may be used to qualify Bidder for the preference.

Form 2 Required. If awarded the contract with the Apprenticeship Agreement Preference applied, then for the duration of the contract, the Bidder **shall** certify each month that work is being conducted on the project that the Contractor continues to be a participant in the relevant apprenticeship program for each trade it employs. Monthly certification shall be made on the Certification Form 2 and submitted to the HDOT.

Failure to comply with the requirements of the Apprenticeship Agreement Preference program will subject the Contractor to sanctions pursuant to HRS §103-55.6.

C. HAWAII PRODUCTS PREFERENCE

Hawaii Products Preference shall not apply to this solicitation.

D. RECYCLED PRODUCT PREFERENCE

Recycled Product Preference shall not apply to this solicitation.

STATE OF HAWAII
Hawaii Bidder/Offeror
Preference Certification Form
(As Defined in HRS103D-1001)

I, _____, _____ of
(Authorized Officer's Name) (Office or Position Held)

_____, certify the following:
(Name of Bidder/Offeror)

(1) That the Bidder/Offeror holds a valid commercial place of business located in the State of Hawaii at the following address:

_____

_____,

and that the above-named office was opened on the following date: _____,

and has been staffed by the Bidder/Offeror or an employee of the Bidder/Offeror for not less than two (2) consecutive years immediately preceding the time and date set for the opening of bids or receipt of proposals;

(2) That the bid or proposal in response to IFB/RFP No. _____, is submitted under the name under which the Bidder/Offeror is authorized to do business in the State;

(3) That not less than fifty-one percent (51%) of the total direct labor hours required for performance of the contract will be performed within the State; and

(4) If the Bidder/Offeror is a joint venture, the Bidder/Offeror is composed entirely of parties meeting the requirements of paragraphs (1), (2), and (3).

I certify under penalty of perjury that the above statements are true. I agree to maintain the above qualifications throughout contract performance; any changes in eligibility shall be reported to the Contract Administrator or purchasing agency's contact person identified in the RFP/IFB. I acknowledge that failure to maintain the above qualifications triggers a price adjustment equal to the value of the preference applied and may constitute cause for debarment under HRS §103D-702.

_____
Signature of Authorized Officer

_____
Print Name and Title

_____
Date

PASS & IDENTIFICATION TRAINING ROOM
KAHULUI AIRPORT
KAHULUI, MAUI, HAWAII
STATE PROJECT NO. CM1642-13

PROPOSAL SCHEDULE

Item No.	Description	Quantity	Unit	Unit Price	Total
I.	General Requirements				
01010.1	Construction Work	L.S.	L.S.	L.S.	$_____
01561.1	Construction Site Pollution Controls	L.S.	L.S.	L.S.	$_____
01561.1	Management of Contaminated Media, Soil Disposal, and Soil Reuse	L.S.	L.S.	L.S.	$_____
01700.1	Mobilization (Not to Exceed 6% of sum of all items, excluding this item and all allowances)	L.S.	L.S.	L.S.	$_____
II.	Allowances				
01562.2	Additional Management of Contaminated Media, Soil Disposal, and Soil Reuse	Allow	Allow	Allow	$50,000
01565.1	Security Measures	Allow	Allow	Allow	$50,000
02410.1	Unforeseen Conditions	Allow	Allow	Allow	$100,000
16740.1	Data Connections	Allow	Allow	Allow	$75,000
16740.1	Connection to Existing Electronic Security Systems	Allow	Allow	Allow	$75,000

TOTAL AMOUNT FOR COMPARISON OF BIDS $_____

The prices bid herein shall include all labor, materials, equipment, and incidentals necessary to construct all items in place, including installation and testing of equipment, complete and ready for operation, all in accordance with the plans and specifications.

Note 1: Bid shall include all Federal, State, County and other applicable taxes and fees.

Note 2: The TOTAL AMOUNT FOR COMPARISON OF BIDS shall be used to determine the lowest responsible bidder.

Note 3: Bidders shall complete all unit prices and amounts. Failure to do so shall be grounds for rejection of bid.

Note 4: The State reserves the right to reject any or all Bids and to waive any defects in said Bids in the best interest of the State.

Note 5: The bidders' attention is directed to Section 2.11 – BID SECURITY of the "General Provisions" as amended by the Special Provisions.

Note 6: Bidders shall complete all unit prices and amounts. Failure to do so shall be grounds for rejection of bid.

Note 7: If the lowest TOTAL AMOUNT FOR COMPARISON OF BIDS is less than, or approximately equal to the funds available for this project, an award will be made to the lowest responsible bidder.

Note 8: If the TOTAL AMOUNT FOR COMPARISON OF BIDS exceeds the funds available for the project, then the State reserves the right to negotiate with the lowest, responsive, responsible bidder as permitted under Section 103D-302, Hawaii Revised Statutes, to further reduce the scope of work and award a contract thereafter.

Note 9: **Bidders shall submit and upload the complete proposal to HIePRO prior to the bid opening date and time. Proposals received after said due date and time shall not be considered. Any additional support documents explicitly designated as confidential and/or proprietary shall be uploaded as a separate file to HIePRO. Bidders shall not include confidential and/or proprietary documents with the proposal. The record of each bidder and respective bid shall be open to public inspection.** Original (wet ink, hard copy) proposal documents are not required to be submitted. **Contract award shall be based on evaluation of proposals submitted and uploaded to HIePRO.**

FAILURE TO UPLOAD THE COMPLETE PROPOSAL TO HIePRO SHALL BE GROUNDS FOR REJECTION OF THE BID.

If there is a conflict between the specification document and the HIePRO solicitation, the specifications shall govern and control unless otherwise specified.

SURETY BID BOND

Bond No. _____

KNOW TO ALL BY THESE PRESENTS:

That we, _____
(full name or legal title of offeror)
as Offeror, hereinafter called the Principal, and

_____
(name of bonding company)
as Surety, hereinafter called Surety, a corporation authorized to transact business as a Surety in the State of Hawaii, are held and firmly bound unto

_____
(State/county entity)
as Owner, hereinafter called Owner, in the penal sum of

_____
(required amount of bid security)
Dollars($_____),lawful money of the United States of America, for the payment of which sum well and truly to be made, the said Principal and the said Surety bind ourselves, our heirs, executors, administrators, successors and assigns, jointly and severally, firmly by these presents.

WHEREAS:

The Principal has submitted an offer for

_____
(project by number and brief description)

NOW, THEREFORE:

The condition of this obligation is such that if the Owner shall reject said offer, or in the alternate, accept the offer of the Principal and the Principal shall enter into a contract with the Owner in accordance with the terms of such offer, and give such bond or bonds as may be specified in the solicitation or Contract Documents with good and sufficient surety for the faithful performance of such Contract and for the prompt payment of labor and material furnished in the prosecution thereof as specified in the solicitation then this obligation shall be null and void, otherwise to remain in full force and effect.

Signed this _____ day of _____, _____

_____
Name of Principal (Offeror) (Seal)

_____
Signature

_____
Print Name and Title

_____
Name of Surety (Seal)

_____
Signature

_____
Print Name and Title

STATE OF HAWAII

DEPARTMENT OF TRANSPORTATION

AIRPORTS

FORMS

CONTRACT

THIS AGREEMENT, made this day of _____, by and between the STATE OF HAWAII, by its Director of Transportation, hereinafter referred to as "STATE", and «CONTRACTOR», «STATE_OF_INCORPORATON», whose business/post office address is «ADDRESS», hereinafter referred to as CONTRACTOR";

WITNESSETH: That for and in consideration of the payments hereinafter mentioned, the CONTRACTOR hereby covenants and agrees with the STATE to complete in place, furnish and pay for all labor and materials necessary for "«PROJECT_NAME_AND_NO»", or such a part thereof as shall be required by the STATE, the total amount of which labor, material and construction shall be computed at the unit and/or lump sum prices set forth in the attached proposal schedule and shall be the sum of «BASIC»----DOLLARS ($«BASIC_NUMERIC») as follows:

SAMPLE

TOTAL AMOUNT FOR COMPARISON OF BIDS……$«BASIC_NUMERIC»

which sum shall be provided from State funds, all in accordance with the specifications, the special provisions, if any, the notice to bidders, the instructions to bidders, the proposal and plans for «PROJECT_NO_ONLY», and any supplements thereto, on file in the office of the Director of Transportation. These documents, together with all alterations, amendments, and additions thereto and deductions therefrom, are attached hereto or incorporated herein by reference and made a part of this contract.

The CONTRACTOR hereby covenants and agrees to complete such construction within «WORKING_DAYS» from the date indicated in the Notice to Proceed from the State subject, however, to such extensions as may be provided for in writing under the specifications.

For and in consideration of the covenants, undertakings and agreements of the CONTRACTOR herein set forth and upon the full and faithful performance thereof by the CONTRACTOR, the STATE hereby agrees to pay the CONTRACTOR the sum of «BASIC»---DOLLARS ($«BASIC_NUMERIC») in lawful money, but not more than such part of the same as is actually earned according to the STATE's determination of the actual quantities of work performed and materials furnished by the CONTRACTOR at the unit or lump sum prices set forth in the attached proposal schedule. Such payment, including any extras, shall be made, subject to such additions or deductions hereto or hereafter made in the manner and at the time prescribed in the specifications and this contract.

An additional sum of «EXTRAS»-----DOLLARS ($«EXTRA_NUMERIC») is hereby provided for extra work.

SAMPLE

All words used herein in the singular shall extend to and include the plural. All words used in the plural shall extend to and include the singular. The use of any gender shall extend to and include all genders.

IN WITNESS WHEREOF, the parties hereto have caused this instrument to be duly executed the day and year first above written.

STATE OF HAWAII

_____
Director of Transportation

«CONTRACTOR» (Seal)

_____
Signature

_____
Print name

_____
Print Title

_____
Date

SAMPLE

PERFORMANCE BOND (SURETY)
(6/21/07)

KNOW TO ALL BY THESE PRESENTS:

That _____,
(Full Legal Name and Street Address of Contractor)

as Contractor, hereinafter called Principal, and _____

_____
(Name and Street Address of Bonding Company)

as Surety, hereinafter called Surety, a corporation(s) authorized to transact business as a surety in the State of Hawaii, are held and firmly bound unto the _____,
(State/County Entity)

its successors and assigns, hereinafter called Obligee, in the amount of _____

_____
DOLLARS ($_____), to which payment Principal and Surety bind themselves, their heirs, executors, administrators, successors and assigns, jointly and severally, firmly by these presents.

WHEREAS, the above-bound Principal has signed a Contract with Obligee on _____, for the following project:_____
_____
_____
_____
_____
_____
hereinafter called Contract, which Contract is incorporated herein by reference and made a part hereof.

NOW THEREFORE, the condition of this obligation is such that:

If the Principal shall promptly and faithfully perform, and fully complete the Contract in strict accordance with the terms of the Contract as said Contract may be modified or amended from time to time; then this obligation shall be void; otherwise to remain in full force and effect.

Surety to this Bond hereby stipulates and agrees that no changes, extensions of time, alterations, or additions to the terms of the Contract, including the work to be performed thereunder, and the specifications or drawings accompanying same, shall in any way affect its obligation on this bond, and it does hereby waive notice of any such changes, extensions of time, alterations, or additions, and agrees that they shall become part of the Contract.

In the event of Default by the Principal, of the obligations under the Contract, then after written Notice of Default from the Obligee to the Surety and the Principal and subject to the limitation of the penal sum of this bond, Surety shall remedy the Default, or take over the work to be performed under the Contract and complete such work, or pay moneys to the Obligee in satisfaction of the surety's performance obligation on this bond.

Signed this _____ day of _____, _____.

(Seal) _____
Name of Principal (Contractor)

* _____
Signature

_____
Title

(Seal) _____
Name of Surety

* _____
Signature

_____
Title

*ALL SIGNATURES MUST BE ACKNOWLEDGED
BY A NOTARY PUBLIC

PERFORMANCE BOND

KNOW TO ALL BY THESE PRESENTS:

That we, _____
(full legal name and street address of Contractor)

as Contractor, hereinafter called Contractor, is held and firmly bound unto the

_____
(State/County entity)

its successors and assigns, as Obligee, hereinafter called Obligee, in the amount

_____DOLLARS $_____),
(Dollar amount of Contract)

lawful money of the United States of America, for the payment of which to the said Obligee, well and truly to be made, Contractor binds itself, its heir, executors, administrators, successors and assigns, firmly by these presents. Said amount is evidenced by:

☐ **Legal Tender;**

☐ **Share Certificate** unconditionally assigned to or made payable at sight to _____
Description:_____;

☐ **Certificate of Deposit**, No. _____, dated _____ issued by _____ drawn on _____ a bank, savings institution or credit union insured by the Federal Deposit Insurance Corporation or the National Credit Union Administration, payable at sight or unconditionally assigned to _____;

☐ **Cashier's Check** No. _____, dated _____ drawn on _____ a bank, savings institution or credit union insured by the Federal Deposit Insurance Corporation or the National Credit Union Administration, payable at sight or unconditionally assigned to _____;

☐ **Teller's Check** No. _____, dated _____ drawn on _____ a bank, savings institution or credit union insured by the Federal Deposit Insurance Corporation or the National Credit Union Administration, payable at sight or unconditionally assigned to _____;

☐ **Treasurer's Check** No. _____, dated _____ drawn on _____ a bank, savings institution or credit union insured by the Federal Deposit Insurance Corporation or the National Credit Union Administration, payable at sight or unconditionally assigned to _____;

☐ **Official Check** No. _____, dated _____ drawn on _____ a bank, savings institution or credit union insured by the Federal Deposit Insurance Corporation or the National Credit Union Administration, payable at sight or unconditionally assigned to _____;

☐ **Certified Check** No. _____, dated _____ accepted by a bank, savings institution or credit union insured by the Federal Deposit Insurance Corporation or the National Credit Union Administration, payable at sight or unconditionally assigned to _____;

WHEREAS:

The Contractor has by written agreement dated _____ entered into a contract with Obligee for the following Project:_____

_____

hereinafter called Contract, which Contract is incorporated herein by reference and made a part hereof.

NOW THEREFORE,

The Condition of this obligation is such that, if Contractor shall promptly and faithfully perform the Contract in accordance with, in all respects, the stipulations, agreements, covenants and conditions of the Contract as it now exists or may be modified according to its terms, and shall deliver the Project to the Obligee, or to its successors or assigns, fully completed as in the Contract specified and free from all liens and claims and without further cost, expense or charge to the Obligee, its officers, agents, successors or assigns, free and harmless from all suits or actions of every nature and kind which may be brought for or on account of any injury or damage, direct or indirect, arising or growing out of the doing of said work or the repair or maintenance thereof or the manner of doing the same or the neglect of the Contractor or its agents or servants or the improper performance of the Contract by the Contractor or its agents or servants or from any other cause, then this obligation shall be void; otherwise it shall be and remain in full force and effect.

AND IT IS HEREBY STIPULATED AND AGREED that suit on this bond may be brought before a court of competent jurisdiction without a jury, and that the sum or sums specified in the said Contract as liquidated damages, if any, shall be forfeited to the Obligee, its successors or assigns, in the event of a breach of any, or all, or any part of, covenants, agreements, conditions, or stipulations contained in the Contract or in this bond in accordance with the terms thereof.

The amount of this bond may be reduced by and to the extent of any payment or payments made in good faith hereunder.

Signed and sealed this _____ day of _____, _____.

(Seal)_____
Name of Contractor

_____
Signature*

_____
Title

*ALL SIGNATURES MUST BE ACKNOWLEDGED
BY A NOTARY PUBLIC

LABOR AND MATERIAL PAYMENT BOND (SURETY)
(6/21/07)

KNOW TO ALL BY THESE PRESENTS:

That _____,
(Full Legal Name and Street Address of Contractor)

as Contractor, hereinafter called Principal, and _____

_____,
(Name and Street Address of Bonding Company)
as Surety, hereinafter called Surety, a corporation(s) authorized to transact business as a surety in the State of Hawaii, are held and firmly bound unto the _____,
(State/County Entity)

its successors and assigns, hereinafter called Obligee, in the amount of _____

_____
_____ Dollars ($_____), to which payment Principal and Surety bind themselves, their heirs, executors, administrators, successors and assigns, jointly and severally, firmly by these presents.

WHEREAS, the above-bound Principal has signed Contract with the Obligee on _____ for the following project:_____
_____
_____
_____
_____
hereinafter called Contract, which Contract is incorporated herein by reference and made a part hereof.

NOW THEREFORE, the condition of this obligation is such that if the Principal shall promptly make payment to any Claimant, as hereinafter defined, for all labor and materials supplied to the Principal for use in the performance of the Contract, then this obligation shall be void; otherwise to remain in full force and effect.

1. Surety to this Bond hereby stipulates and agrees that no changes, extensions of time, alterations, or additions to the terms of the Contract, including the work to be performed thereunder, and the specifications or drawings accompanying same, shall in any way affect its obligation on this bond, and it does hereby waive notice of any such changes, extensions of time, alterations, or additions, and agrees that they shall become part of the Contract.

2. A "Claimant" shall be defined herein as any person who has furnished labor or materials to the Principal for the work provided in the Contract.

Every Claimant who has not been paid amounts due for labor and materials furnished for work provided in the Contract may institute an action against the Principal and its Surety on this bond at the time and in the manner prescribed in Section 103D-324, Hawaii Revised Statutes, and have the rights and claims adjudicated in the action, and judgment rendered thereon; subject to the Obligee's priority on this bond. If the full amount of the liability of the Surety on this bond is insufficient to pay the full amount of the claims, then after paying the full amount due the Obligee, the remainder shall be distributed pro rata among the claimants.

Signed this _____ day of _____, _____.

(Seal) _____
Name of Principal (Contractor)

* _____
Signature

_____
Title

(Seal) _____
Name of Surety

* _____
Signature

_____
Title

*ALL SIGNATURES MUST BE ACKNOWLEDGED
BY A NOTARY PUBLIC

LABOR AND MATERIAL PAYMENT BOND

KNOW TO ALL BY THESE PRESENTS:

That we, _____
(full legal name and street address of Contractor)

as Contractor, hereinafter called Contractor, is held and firmly bound unto _____
(State/County entity)

its successors and assigns, as Obligee, hereinafter called Obligee, in the amount

_____DOLLARS ($_____)
(Dollar amount of Contract)

lawful money of the United States of America, for the payment of which to the said Obligee, well and truly to be made, Contractor binds itself, its heir, executors, administrators, successors and assigns, firmly by these presents. Said amount is evidenced by:

☐ **Legal Tender;**

☐ **Share Certificate** unconditionally assigned to or made payable at sight to_____
Description:_____

☐ **Certificate of Deposit**, No. _____, dated _____ issued by _____ drawn on _____ a bank, savings institution or credit union insured by the Federal Deposit Insurance Corporation or the National Credit Union Administration, payable at sight or unconditionally assigned to _____;

☐ **Cashier's Check** No. _____, dated _____ drawn on _____ a bank, savings institution or credit union insured by the Federal Deposit Insurance Corporation or the National Credit Union Administration, payable at sight or unconditionally assigned to _____;

☐ **Teller's Check** No. _____, dated _____ drawn on _____ a bank, savings institution or credit union insured by the Federal Deposit Insurance Corporation or the National Credit Union Administration, payable at sight or unconditionally assigned to _____;

☐ **Treasurer's Check** No. _____, dated _____ drawn on _____ a bank, savings institution or credit union insured by the Federal Deposit Insurance Corporation or the National Credit Union Administration, payable at sight or unconditionally assigned to _____;

☐ **Official Check** No. _____, dated _____ drawn on _____ a bank, savings institution or credit union insured by the Federal Deposit Insurance Corporation or the National Credit Union Administration, payable at sight or unconditionally assigned to _____;

☐ **Certified Check** No. _____, dated _____ accepted by a bank, savings institution or credit union insured by the Federal Deposit Insurance Corporation or the National Credit Union Administration, payable at sight or unconditionally assigned to _____;

WHEREAS:

The Contractor has by written agreement dated _____ entered into a contract with Obligee for the following Project:_____

_____

hereinafter called Contract, which Contract is incorporated herein by reference and made a part hereof.

NOW THEREFORE,

The condition of this obligation is such that, if Contractor shall promptly and faithfully perform the Contract in accordance with, in all respects, the stipulations, agreements, covenants and conditions of the Contract as it now exists or may be modified according to its terms, free from all liens and claims and without further cost, expense or charge to the Obligee, its officers, agents, successors or assigns, free and harmless from all suits or actions of every nature and kind which may be brought for or on account of any injury or damage, direct or indirect, arising or growing out of the doing of said work or the repair or maintenance thereof or the manner of doing the same or the neglect of the Contractor or its agents or servants or the improper performance of the Contract by the Contractor or its agents or servants or from any other cause, then this obligation shall be void; otherwise it shall be and remain in full force and effect.

AND IT IS HEREBY STIPULATED AND AGREED that suit on this bond may be brought before a court of competent jurisdiction without a jury, and that the sum or sums specified in the said Contract as liquidated damages, if any, shall be forfeited to the Obligee, its successors or assigns, in the event of a breach of any, or all, or any part of, covenants, agreements, conditions, or stipulations contained in the Contract or in this bond in accordance with the terms thereof.

AND IT IS HEREBY STIPULATED AND AGREED that this bond shall inure to the benefit of any and all persons entitled to file claims for labor performed or materials furnished in said work so as to give any and all such persons a right of action as contemplated by Sections 103D-324(d) and 103D-324(e), Hawaii Revised Statutes.

The amount of this bond may be reduced by and to the extent of any payment or payments made in good faith hereunder, inclusive of the payments of mechanics' liens which may be filed of record against the Project, whether or not claim for the amount of such lien be presented under and against this bond..

Signed this _____ day of _____, _____.

(Seal)_____
Name of Contractor

_____
Signature*

_____
Title

ALL SIGNATURES MUST BE ACKNOWLEDGED BY A NOTARY PUBLIC

CHAPTER 104, HRS COMPLIANCE CERTIFICATE

The undersigned bidder does hereby certify to the following:

1. Individuals engaged in the performance of the contract on the job site shall be paid:

A. Not less than the wages that the director of labor and industrial relations shall have determined to be prevailing for corresponding classes of laborers and mechanics employed on public works projects; and

B. Overtime compensation at one and one-half times the basic hourly rate plus fringe benefits for hours worked on Saturday, Sunday, or a legal holiday of the State or in excess of eight hours on any other day.

2. All applicable laws of the federal and state governments relating to workers' compensation, unemployment compensation, payment of wages, and safety shall be fully complied with.

DATED at Honolulu, Hawaii, this _____ day of _____, 20___.

«CONTRACTOR»
Name of Corporation, Partnership, or Individual

Signature and Title of Signer

Notary Seal
NOTARY ACKNOWLEDGEMENT

Subscribed and sworn before me this
_____day of_____
Notary signature_____
Notary public, State of _____
My Commission Expires:_____

Notary Seal
NOTARY CERTIFICATION

Doc. Date: _____ #Pages: ____
Notary Name: _____ _____Circuit
Doc. Description: _____

_____
Notary signature_____
Date _____

PROVISIONS TO BE INCLUDED IN CONSTRUCTION PROCUREMENT SOLICITATIONS

1. Definitions for terms used in HRS Chapter 103B as amended by Act 192, SLH 2011:

   a. "Contract" means contracts for construction under 103D, HRS.

   b. "Contractor" has the same meaning as in Section 103D-104, HRS, provided that "contractor" includes a subcontractor where applicable.

   c. "Construction" has the same meaning as in Section 103D-104, HRS.

   d. "General Contractor" means any person having a construction contract with a governmental body.

   e. "Procurement Officer" has the same meaning as in Section 103D-104, HRS.

   f. "Resident" means a person who is physically present in the State of Hawai'i at the time the person claims to have established the person's domicile in the State of Hawai'i and shows the person's intent is to make Hawai'i the person's primary residence.

   g. "Shortage trade" means a construction trade in which there is a shortage of Hawai'i residents qualified to work in the trade as determined by the Department of Labor and Industrial Relations.

2. HRS Chapter 103B as amended by Act 192, SLH 2011–Employment of State Residents Requirements:

   a. A Contractor awarded a contract shall ensure that Hawai'i residents comprise not less than 80% of the workforce employed to perform the contract work on the project. The 80% requirement shall be determined by dividing the total number of hours worked on the contract by Hawai'i residents, by the total number of hours worked on the contract by all employees of the Contractor in the performance of the contract. The hours worked by any Subcontractor of the Contractor shall count towards the calculation for this section. The hours worked by employees within shortage trades, as determined by the Department of Labor and Industrial Relations (DLIR), shall not be included in the calculation for this section.

EXHIBIT 1

b. Prior to award of a contract, an Offeror/Bidder may withdraw an offer/bid without penalty if the Offeror/Bidder finds that it is unable to comply with HRS Chapter 103B as amended by Act 192, SLH 2011.

c. Prior to starting any construction work, the Contractor shall submit the subcontract dollar amount for each of its Subcontractors.

d. The requirements of this section shall apply to any subcontract of $50,000 or more in connection with the Contractor; that is, such Subcontractors must also ensure that Hawai'i residents comprise not less than 80% of the Subcontractor's workforce used to perform the subcontract.

e. The Contractor and any Subcontractor whose subcontract is $50,000 or more shall comply with the requirements of HRS Chapter 103B as amended by Act 192, SLH 2011.

1) Certification of compliance shall be made in writing under oath by an officer of the General Contractor and applicable Subcontractors and submitted with the final payment request.

2) The certification of compliance shall be made under oath by an officer of the company by completing a "Certification of Compliance for Employment of State Residents" form and executing the Certificate before a licensed notary public.

3) In addition to the certification of compliance as indicated above, the Contractor and Subcontractors shall maintain records such as certified payrolls for laborers and mechanics who performed work at the site and time sheets for all other employees who performed work on the project. These records shall include the names, addresses and number of hours worked on the project by all employees of the Contractor and Subcontractor who performed work on the project to validate compliance with HRS Chapter 103B as amended by Act 192, SLH 2011. The Contractor and Subcontractors shall retain these records and provide access to the State for a minimum period of four (4) years after the final payment, except that if any litigation, claim, negotiation, investigation, audit or other action involving the records has been started before the expiration of the four-year period, the Contractor and Subcontractors shall retain the records until completion of the action and resolution of all issues that arise from it, or until the end of the four-year period, whichever occurs later. Furthermore, it shall be the Contractor's responsibility to enforce compliance with this provision by any Subcontractor.

f. A General Contractor or applicable Subcontractor who fails to comply with this section shall be subject to any of the following sanctions:

1) With respect to the General Contractor, withholding of payment on the contract until the Contractor or its Subcontractor complies with HRS Chapter 103B as amended by Act 192, SLH 2011.

2) Proceedings for debarment or suspension of the Contractor or Subcontractor under Hawai'i Revised Statues §103D-702.

3. Conflict with Federal Law: This section shall not apply if the application of this section is in conflict with any federal law, or if the application of this section will disqualify the State from receiving Federal funds or aid.

CERTIFICATION OF COMPLIANCE
FOR
EMPLOYMENT OF STATE RESIDENTS
HRS CHAPTER 103B, AS AMENDED BY ACT 192, SLH 2011

Project Title: _____

Agency Project No: _____

Contract No.: _____

As required by Hawai'i Revised Statutes Chapter103B, as amended by Act 192, Session Laws of Hawaii 2011–Employment of State Residents on Construction Procurement Contracts, I hereby certify under oath, that I am an officer of _____ and
(Name of Contractor or Subcontractor Company)

for the Project Contract indicated above, _____ was in
(Name of Contractor or Subcontractor Company)

compliance with HRS Chapter 103B, as amended by Act 192, SLH 2011, by employing a workforce of which not less than eighty percent are Hawai'i residents, as calculated according to the formula in the solicitation, to perform this Contract.

☐ I am an officer of the **Contractor** for this contract.

☐ I am an officer of a **Subcontractor** for this contract.

CORPORATE SEAL

_____
(Name of Company)

_____
(Signature)

_____
(Print Name)

_____
(Print Title)

Subscribed and sworn to me before this
_____ day of _____, 2025

Doc. Date: _____ # of Pages_____ 1st Circuit
Notary Name: _____
Doc. Description: _____

_____
Notary Public, 1st Circuit, State of Hawai'i
My commission expires: _____

_____
Notary Signature Date
NOTARY CERTIFICATION

EXHIBIT 2