

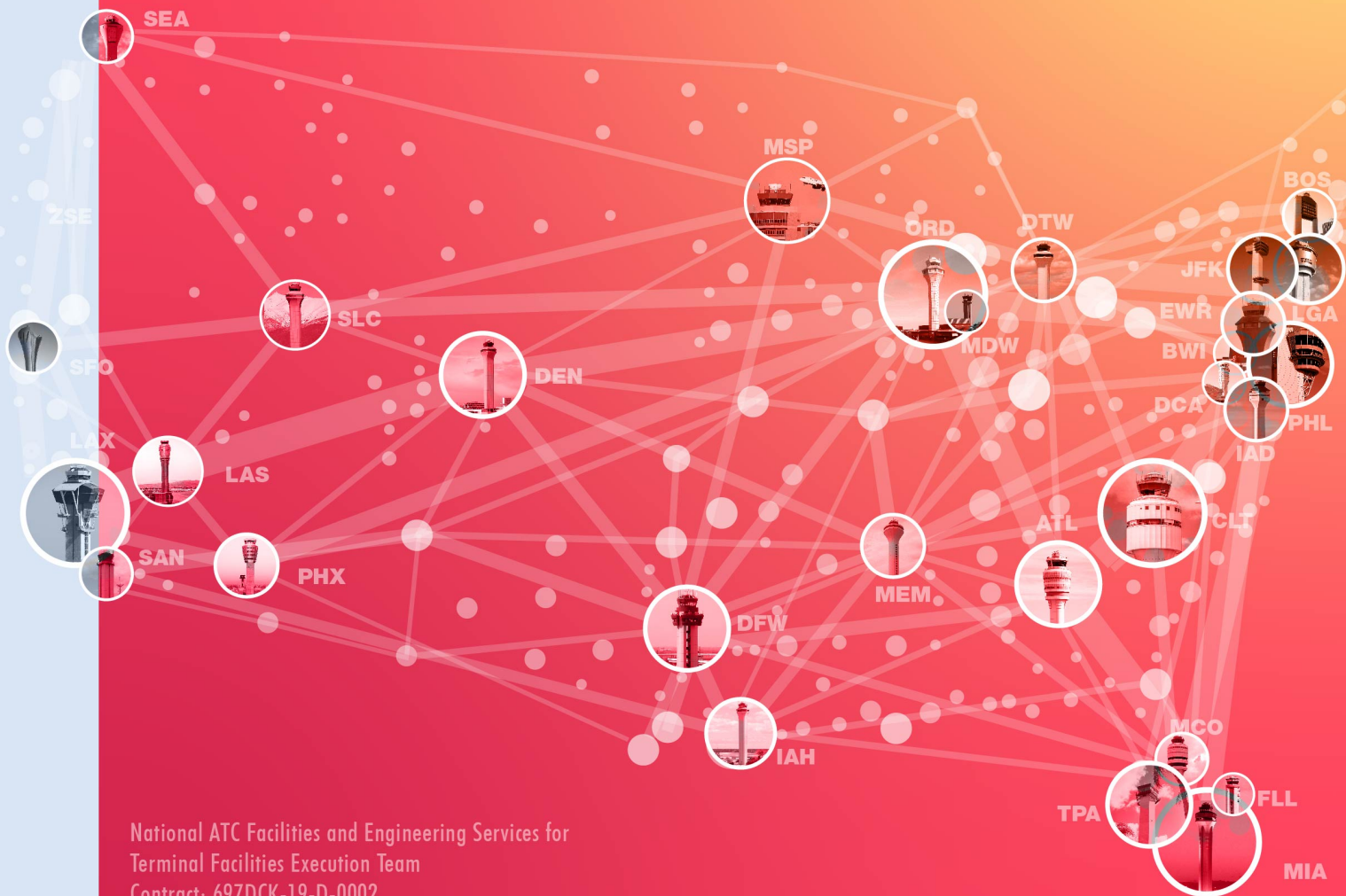


Issue for Solicitation and Construction Specifications – Volume 1 of 1

Task Order 24

HCF Roofing Honolulu Control Facility (HCF) Honolulu, HI

29 August 2022



National ATC Facilities and Engineering Services for
Terminal Facilities Execution Team
Contract: 697DCK-19-D-0002

Jacobs

Challenging today.
Reinventing tomorrow.

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Division	Section Title
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SPECIFICATIONS GROUP

General Requirements Subgroup

DIVISION 01 - GENERAL REQUIREMENTS

01 10 00	Summary
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01 32 00	Construction Progress Documentation
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07 72 00 Roof Accessories
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DIVISION 26 - ELECTRICAL

26 41 13 Lightning Protection for Structures

APPENDICES

A FAA ATCT HI - Column Assessment

END OF TABLE OF CONTENTS

SECTION 01 10 00 - SUMMARY

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

- A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and other Division 01 Specification Sections, apply to this Section.

1.2 SUMMARY

- A. Section Includes:

- 1. Project information.
 - 2. Work covered by Contract Documents.
 - 3. Phased construction.
 - 4. Contractor's use of site and premises.
 - 5. Coordination with occupants.
 - 6. Work restrictions.
 - 7. Specification and Drawing conventions.
 - 8. Miscellaneous provisions.

- B. Related Requirements:

- 1. Section 01 50 00 "Temporary Facilities and Controls" for limitations and procedures governing temporary use of FAA's facilities.
 - 2. Section 01 73 00 "Execution" for coordination of FAA-installed products.

- C. Related Projects:

- 1. Coordinate requirements of this project with those of the HCF Metalworks Contract.

1.3 DEFINITIONS

- A. Work Package: A group of specifications, drawings, and schedules prepared by the design team to describe a portion of the Project Work for pricing, permitting, and construction.
- B. Contracting Officer's Representative (COR): Individual authorized to receive and distribute information on the behalf of the Contracting Officer (CO). Also referred to as the Contracting Officer's Technical Representative (COTR) and/or Resident Engineer (RE) in some instances.
- C. Some generic terms may be used in the documents where they are used the following shall apply:

1. Owner: When referred to herein the term Owner will mean the FAA.
 2. Architect: Tasks and duties of the Architect when referred to herein will be performed by the COR
- D. Recycled Content: The recycled content value of a material assembly shall be determined by weight. The recycled fraction of the assembly is then multiplied by the cost of assembly to determine the recycled content value.
1. "Post-consumer" material is defined as waste material generated by households or by commercial, industrial, and institutional facilities in their role as end users of the product, which can no longer be used for its intended purpose.
 2. "Pre-consumer" material is defined as material diverted from the waste stream during the manufacturing process. Excluded is reutilization of materials such as rework, regrind, or scrap generated in a process and capable of being reclaimed within the same process that generated it.
- E. Discarded materials from one manufacturing process that are used as constituents in another manufacturing process are pre-consumer recycled materials.

1.4 PROJECT INFORMATION

- A. Project Identification: HCF Roofing
1. Project Location: FAA Honolulu Control Facility (HCF) 760 Worchester Avenue Honolulu, Hawaii 96818
- B. FAA: Federal Aviation Administration (FAA).
1. FAA's Lead Project Engineer: Aaron Shaw.
 2. FAA's Contracting Officer (CO): Darren Odegard

1.5 WORK COVERED BY CONTRACT DOCUMENTS

FAA

- A. The Work of Project is defined by the Contract Documents and includes, but is not limited to, the following:
1. New Cover-board and PVC Roofing over existing Base Building Roofing
 2. ATCT Cab Wall Sealant Replacement
 3. ATCT Catwalk Access Hatch and Ladder Replacement and Hatch Safety Gate
 4. ATCT Catwalk Deck Waterproofing
 5. ATCT 2nd Floor Waterproofing
 6. Cafeteria Canopy Metal Roofing and Gutters ReplacementCafeteria Canopy Column Renovation (two Columns only, Col. 4 and Col. 8 as noted on Drawings D102 and A102, and in Specifications Appendix A: Columns Condition Report).
 7. Gutters Renovation at Other Canopies
 8. Other Work indicated in the Contract Documents”

B. Type of Contract:

1. Project will be constructed under a firm fixed price contract awarded to a single contractor.

1.6 PHASED CONSTRUCTION AND COORDINATION WITH OTHER WORK

- A. The Work shall be conducted in multiple phases. The Contractor must provide a phasing work plan for approval prior to starting work. The Contractor is limited to working on one roof at a time and only on a portion which can be completed in a single work period. The Contractor will be responsible for determining the sequence of operation to maintain security of the facility and the construction site.
- B. An adjacent, separate, not in this contract, project (HCF Roof Metalwork) will occur during the same time period as this project. The Contractor must coordinate with the adjacent project in both schedule, overlap of scope construction areas, and ensure that overlap work does not cause conflict. Adjacent project will perform the following work:
1. Guardrails on outside of low-slope-roof parapets where the surface outside the parapet wall is greater than 4 feet below the roof surface at the parapet.
 2. Fall-protection tie-back points on the outside of walls above metal-roofed canopies below.
 3. New exterior stair to the roof from the ground level south of the East Main Roof.
 4. Lightning protection system bonding of the new guardrails and stair and new air terminals on the guardrail
 5. Other work in coordination with the work above.

1.7 CONTRACTOR'S USE OF SITE AND PREMISES

- A. Restricted Use of Site: Each Contractor shall have limited use of Project site for construction operations as indicated on Drawings by the Contract limits and as indicated by requirements of this Section.
- B. Limits on Use of Site: Limit use of Project site to areas within the Contract limits indicated. Do not disturb portions of Project site beyond areas in which the Work is indicated.
1. Driveways, Walkways and Entrances: Keep driveways loading areas, and entrances serving premises clear and available to FAA, FAA's employees, and emergency vehicles at all times. Do not use these areas for parking or for storage of materials.
 - a. Schedule deliveries to minimize use of driveways and entrances by construction operations.
 - b. Schedule deliveries to minimize space and time requirements for storage of materials and equipment on-site.

- C. If any interference to the existing facility operation or site access seems to be unavoidable, the contractor shall advise the COR before such interference develops. He shall then proceed as directed by the COR. If the contractor at the inception of the contract could have foreseen the obstruction or interference, all steps to prevent the interference or obstruction shall be performed at no additional cost to the FAA. This shall not relieve the Contractor of his responsibility for any other damages due to his neglect or lack of foresight. The Contractor shall examine the premises and satisfy himself as to the existing conditions under which he will be obligated to perform the work included in this contract.
- D. During work around and on the Air Traffic Control Tower (ATCT) no workers or equipment may be above the window sill level of the CAB (glass enclosed area at the top of the ATCT). No construction related activity may obstruct or impair vision thru the CAB windows.
- E. Any equipment expect ot exceed 30 feet in height must be approved for use by the FAA.
- F. The FAA reserves the right to issue an immediate cease work direction and suspend any work that is determined to be causing an impact on Air Traffic Control operations.

1.8 COORDINATION WITH OCCUPANTS

- A. FAA Limited Occupancy of Completed Areas of Construction: FAA reserves the right to occupy and to place and install equipment in completed portions of the Work, prior to Substantial Completion of the Work, provided such occupancy does not interfere with completion of the Work. Such placement of equipment and limited occupancy shall not constitute acceptance of the total Work.
 - 1. The Contracting Officer's Representative (COR) will prepare a Certificate of Substantial Completion for each specific portion of the Work to be occupied prior to FAA acceptance of the completed Work.
 - 2. Before limited FAA occupancy, fire protection, fire alarm, communications, mechanical and electrical systems shall be fully operational, and required tests and inspections shall be successfully completed. On occupancy, FAA will operate and maintain mechanical and electrical systems serving occupied portions of Work.
 - 3. On occupancy, FAA will assume responsibility for maintenance and custodial service for occupied portions of Work.

1.9 WORK RESTRICTIONS

- A. This project has phasing and work hour restrictions that include extensive off hour and weekend work. See contract drawing phasing plans for specifics on working hour limitations pertaining to work restrictions and project phasing. Contractor requests to work outside normal working hours require COR approval. However, the COR has full discretion to approve or disapprove, or withdraw approval of requests.

- B. Comply with restrictions on construction operations.
1. Comply with limitations on use of public streets, work on public streets, rights of way, and other requirements of authorities having jurisdiction.
- C. Contractor Deliveries: The Contractor must provide an individual, submitted to and approved by the COR, who will be responsible for arranging site access for periodic or unscheduled Contractor deliveries. This individual must coordinate with the COR and facility security personnel, prior to the delivery, for site access of the delivery vehicle. Facility security personnel must be provided, at a minimum, with the name of the vendor, the driver's name, and the purpose for site access. Delivery vehicles arriving at the gate without prior notice and acceptance will be denied access. Delivery vehicles shall only contain items being delivered to FAA; if vehicles contain deliveries for recipients other than FAA, the vehicle will not be allowed on site. The Contractor assumes complete liability for the actions of delivery personnel and vehicles while on site.
- D. On-Site Work Hours: Limit work to between 7:00 a.m. to 4:00 p.m., Monday through Friday (except U.S. Federal holidays), unless otherwise indicated. Work hours may be modified to meet Project requirements if approved by FAA and authorities having jurisdiction.
1. Weekend Hours: 7:00 a.m. to 4:00 p.m. Permitted with COR's approval.
 2. Early Morning Hours: Permitted with COR's approval.
 3. Hours for Utility Shutdowns: Off peak travel hours see restrictions below.
 4. Hours for Core Drilling: Nights with COR's approval.
 5. Hours for Roof work over the Operations Area of the building: 11:00 pm to 5:00 am.
- E. On-Site Work Day Restrictions: Do not perform work resulting in utility shutdowns or resulting in noisy activity on-site during work black-out days indicated in below in paragraph "Limits of Operations".
- F. Contractor requests to work outside normal working hours require COR approval. However, the COR has full discretion to approve or disapprove, or withdraw approval of requests. If the contractor desires to work outside normal hours (including Saturdays, Sundays, and holidays), he shall submit his written request to the COR at least 48 hours in advance. Some typical constraints on working outside normal working hours are:
1. The Contractor's request must be made at least two days in advance (e.g., request received by close of business Wednesday for work on following Saturday). Prior to submitting the request, the Contractor must coordinate as needed (such as utility outages) and have all required people and materials for the work that will be performed.
 2. A Contractor with quality or safety problems (as determined by the COR) will be restricted to normal working hours. Contractors may also not work time outside of normal working hours if they are not present on the job site during normal working hours.

3. A Contractor who fails to correct deficiencies within a reasonable time (as determined by the COR) will be restricted to normal working hours or may be allowed to work outside normal working hours only to correct those deficiencies.
 4. The Contractor shall schedule his work to cause the least amount of interference to normal activities.
- G. Limits on Operations: The FAA has established moratorium dates for construction activity at critical facilities. The intent is to minimize the possibility of any activity that may have an adverse impact on the ability of FAA to perform its operational activities. Moratorium dates may change without notice. The moratorium dates are generally:
1. November – Friday before Thanksgiving through Monday after Thanksgiving
 2. December/January – Friday before Christmas through Monday after New Years
- H. All construction activity during moratorium periods must be approved in advance by the FAA. Submit items of work to be performed during moratorium dates no later than forty-five (45) days prior to the moratorium dates. Activities that have, in the sole opinion of the FAA, potential to negatively impact FAA operations will not be approved. A written waiver will be provided by FAA to the Contractor outlining the allowable work items. No additional time or cost will be allowed for such denial.
- I. Existing Utility Interruptions: Do not interrupt utilities serving facilities occupied by FAA or others unless permitted under the following conditions and then only after arranging for temporary utility services according to requirements indicated:
1. Notify the FAA COR and the Utility provider not less than 10 days in advance of proposed utility interruptions.
 2. Obtain COR's and the Utility's written permission before proceeding with utility interruptions.
- J. Noise, Vibration, Dust, and Odors: Coordinate operations that may result in high levels of noise and vibration, dust, odors, or other disruption to FAA occupancy with COR.
1. Notify the FAA COR not less than 10 days in advance of proposed disruptive operations.
 2. Obtain COR's written permission before proceeding with disruptive operations.
 3. On the Ops Room Roof, limit the amount of simultaneous noise-producing work. This includes that installation of drilled and driven anchors into the concrete roof deck shall be limited to only drilling one hole at a time and only driving one anchor at a time.
- K. Smoking and Controlled Substance Restrictions: Use of tobacco products, alcoholic beverages, and other controlled substances on FAA's property is not permitted.
- L. Employee Identification: Require personnel and visitors to use FAA issued identification badges at all times.
- M. Employee Screening: Comply with FAA's requirements for drug and background screening of Contractor personnel working on Project site.
1. Maintain list of approved screened personnel with FAA's representative.

- N. Airfield Foreign Object Damage (FOD) Prevention: Secure construction materials and debris on the roof, on the ground and in vehicles to assure that nothing blows away in wind.

1.10 SPECIFICATION AND DRAWING CONVENTIONS

- A. Specification Format: The Specifications are organized into Divisions and Sections using the 50-division format and CSI/CSC's "MasterFormat" numbering system.
 - 1. Section Identification: The Specifications use Section numbers and titles to help cross-referencing in the Contract Documents. Sections in these Specifications are in numeric sequence; however, the sequence is incomplete because all available Section numbers are not used. Consult the table of contents at the beginning of the Project Manual to determine numbers and names of Sections in the Contract Documents.
 - 2. Division 01: Sections in Division 01 govern the execution of the Work of all Sections in the Specifications
- B. Specification Content: The Specifications use certain conventions for the style of language and the intended meaning of certain terms, words, and phrases when used in particular situations. These conventions are as follows:
 - 1. Abbreviated Language: Language used in the Specifications and other Contract Documents is abbreviated. Words and meanings shall be interpreted as appropriate. Words implied, but not stated, shall be inferred as the sense requires. Singular words shall be interpreted as plural and plural words shall be interpreted as singular where applicable as the context of the Contract Documents indicates.
 - 2. Imperative mood and streamlined language are generally used in the Specifications. The words "shall," "shall be," or "shall comply with," depending on the context, are implied where a colon (:) is used within a sentence or phrase.
 - 3. Text Color: Text used in the Specifications, including units of measure, manufacturer and product names, and other text may appear in multiple colors or underlined as part of a hyperlink; no emphasis is implied by text with these characteristics.
 - 4. Hypertext: Text used in the Specifications may contain hyperlinks. Hyperlinks may allow for access to linked information that is not residing in the Specifications. Unless otherwise indicated, linked information is not part of the Contract Documents.
 - 5. Specification requirements are to be performed by Contractor unless specifically stated otherwise.
- C. Division 00 Contracting Requirements: General provisions of the Contract, including General and Supplementary Conditions, apply to all Sections of the Specifications.
- D. Division 01 General Requirements: Requirements of Sections in Division 01 apply to the Work of all Sections in the Specifications.

- E. Drawing Coordination: Requirements for materials and products identified on Drawings are described in detail in the Specifications. One or more of the following are used on Drawings to identify materials and products:

1. Terminology: Materials and products are identified by the typical generic terms used in the individual Specifications Sections.
2. Abbreviations: Materials and products are identified by abbreviations scheduled on Drawings and published as part of the U.S. National CAD Standard.
3. Keynoting: Materials and products are identified by reference keynotes referencing Specification Section numbers found in this Project Manual.

1.11 PERMITS AND FEES

- A. Contractor is responsible for paying all utility service charges associated with the construction of the project. This includes temporary and permanent utilities, permits, inspection fees, connection fees and equipment to be installed by utility companies. This allocation of financial responsibility applies to all utilities as well as City and County agencies and entities. Contractor is responsible for follow up with the issuing authority after submittal.

1.12 BUILDING PERMIT APPLICATIONS

- A. Contractor will not be required to obtain a Building Permit from the local Jurisdiction.

1.13 CERTIFICATE OF OCCUPANCY

- A. Contractor will not be required to obtain a Certificate of Occupancy from the local jurisdiction.

1.14 INSURANCE

- A. Insurance Requirements
1. The Contractor shall at its sole expense, procure and maintain in effect at all times during the performance of the Work insurance coverage with insurers and under forms of policies satisfactory to the FAA, and with limits not less than those set forth in the contract.

2. The contractor shall not commence work until he/she has obtained, and the Contracting Officer has approved, all insurance required within the contract, nor shall the contractor allow any subcontractor(s) to commence work on a subcontract until all similar insurance required of the subcontractor has been obtained and approved. The successful contractor shall be required to procure and maintain bodily injury, general liability, and property damage liability insurance in his/her own name as protection against damages to persons or property, including injury or death, which may result from his/her performance of the work.
3. The insurance required shall be written for not less than the limits of liability specified in the contract documents, or required by law, whichever is greater. The proof of insurance shall be furnished within ten (10) days from the date of the Notice of Award to the Contracting Officer for approval.
4. The insurance limits shall be maintained during the entire performance or contract work. No cancellations of any insurance, whether by the insurer or by the insured, shall be effective unless written notice thereof is given to the Contracting Officer at least thirty (30) days prior to the intended effective date thereof, which date has been expressed in the notice. Prior to the effective date of any such cancellation, the contractor shall take out new insurance to cover the policies so canceled. All insurance policies referred to shall be underwritten by companies authorized to do business in the state of construction. The Certification shall be an "ACCORD" certificate with the Contract number and job location identified.
5. Workmen's Compensation Insurance
 - a. This contract shall be void and of no effect unless the contractor secures compensation for the benefit of (and keep insured during the life of this contract) such employees as are required to be insured by the Workmen's Compensation Insurance Law in the state of construction. The contractor hereby agrees to secure such compensation in the manner prescribed by law. The contractor shall require any subcontractors similarly to provide Workmen's Compensation Insurance for all the latter's employees to be engaged in the work unless such employees are covered by the protection afforded by the contractor's Workmen's Compensation Insurance.
 - b. The above-indicated insurance shall be maintained during the entire performance of contract work. No cancellation of any insurance, whether by the insurer or by the insured, shall be effective unless written notice thereof is given to the Contracting Officer at least thirty (30) days prior to the intended effective date thereof, which date has been expressed in the notice. Prior to the effective date of any such cancellation, the contractor shall take out new insurance to cover the policies so canceled. All insurance policies referred to shall be underwritten by companies authorized to do business in the state of construction.

B. FAA Furnished Insurance

1. FAA is not maintaining any insurance on behalf of Contractor covering against loss or damage to the Work or to any other property of Contractor. In the event Contractor maintains insurance against physical loss or damage to Contractor's construction equipment and tools, such insurance shall include an insurer's waiver of rights of subrogation in favor of FAA.

C. Notifications

1. In accordance with the submittal requirements outlined above, Contractor shall deliver the original and two (2) copies of the Certificate(s) of Insurance required by this clause and all subsequent notices of cancellation, termination and alteration of such policies to the CO with a copy to the COR.

D. Certificate of Insurance

1. The scope of coverage shall be shown on the certificate of insurance as "All operations of the Named Insured".

1.15 ACCESS THROUGH JOINT BASE PEARL HARBOR-HICKUM (JBPHH)

- A. Travel to the project site requires going through the Hickum Air Force Base portion of JBPHH.
- B. There are specific security and badging requirements and procedures for entering JBPHH. The Contractor must obtain JBPHH access badging for all personnel going to the project site. The FAA will provide sponsorship as required for this, in sponsored groupings no more often than once per week. The Contractor's point of contact for coordinating and obtaining the sponsorships will be the COR."

1.16 FAA SECURITY REQUIREMENTS

- A. This project is on a restricted entry site and no compromise of the security system in any nature or of any duration may be made without prior approval of the Contracting Officer. Generally, such compromises, when approved, will be less than 24 hours in duration.
- B. Contractor's personnel shall not violate any security regulations pertaining to the facility. Violators may be removed from the premises with the right to re-enter revocable.
- C. Personnel List: Contractor shall provide the COR with a list of Contractor's personnel who will require access to the site. The list shall be kept current during project work. The Contractor shall provide all personnel with readily identifiable numbered badges during the period their access to the site is required. Badges shall be worn on outer clothes at all times when on FAA property and at work in the site.
- D. Security Investigation: If contractor needs access to active facility, Contractor's site superintendent shall submit to an FAA security background check and obtain an official FAA contractor ID badge. Other Contractor personnel may be subject to security investigation by FAA. Upon request by the Contracting Officer's Representative, the Contractor shall promptly complete all security forms provided by FAA.

- E. Facility Access Badges: Contractor personnel shall be subject to a security investigation by the FAA and shall obtain FAA Identification Media Badge prior to start of on-site work. Contractor shall return all badges to the FAA prior to final acceptance.
1. After award the Contractor shall provide the Contracting Officer with a list of contractor personnel who shall request FAA Identification Media Badge. The list shall be kept current during the entire duration of the project. The Contractor shall designate a representative to be the POC for inputting employee information into the Vendor Applicant Process (VAP). The Contractor shall request from the Contracting Officer all necessary forms, including FD 258 Fingerprint Card, 1681 Application, OF 306, and I-9. The Contracting Officer shall provide instruction for submitting forms.
 2. Security Badge Process: Badging is a two-stage process. The initial phase includes VAP entry and background check conducted by FAA security. Notification shall be provided by FAA Security of "Interim Suitability". At that time, contractor employees will be notified to make an appointment at a FAA PIV Center. A FAA PIV Center is located on the grounds of the Washington ATCSCC (DCC). Alternate locations for PIV Centers can be provided upon request. The badging process takes approximately 30 days to complete. The timeframe varies based on filling out the forms timely and correctly, and scheduling appointments at the PIV Center promptly, etc.
 3. Types of FAA Identification Media Badge. FAA Identification Media consist of a Contractor PIV Badge and Contractor Yellow Badge. Contractor PIV Badge allows the contractor access to the grounds and work site and escort authorized visitors at the work site. Contractor Yellow Badge allows the individual employee access to the grounds and work site. The FAA reserves the right to limit the number of PIV Badges issued.
- F. Visitor Access: A visitor is defined as any employee who does not have a FAA Identification Media Badge. A minimum of 2 work day notification to the COR is required for admittance to the FAA facility. Contractor personnel with a "PIV badge" shall escort the visitor at all times while on site. FAA employees will not escort contractor employees except when it is coordinated and approved by the COR. Visitor access for the employee shall be renewed daily by the contractor. Visitor access is limited to single visit short duration employees.
- G. Some areas in the facility are classified as controlled areas that require FAA escort of Contractor's personnel. Contractor's personnel must not violate any security regulations pertaining to the facility. The Contracting Officer has the authority to remove anyone from the site, including anyone who is determined to be a security risk. This authority extends to the entire complex, not just the buildings.
1. Persons entering on to federal property (including visitor parking lot) are prohibited from having on their person or in their vehicle:
 - a. Guns
 - b. Knives with blades over 2.5 inches except for valid tools.
 - c. Projection devices, bow and arrows, paint ball weapons, blow guns, etc...
 - d. Clubs, batons, collapsible batons, or saps.

- e. Stun guns or tazers.
 - f. Chemical agents, mace, or pepper sprays.
 - g. Martial arts weapons of any kind.
 - h. Weapons of any kind.
 - i. Alcohol
 - j. Illegal drugs
 - k. Animals with the exception of a verified service animal
 - l. Family members, friends, children, minors, anyone not authorized on the FAA visitor list.
- H. Communication: The Contractor shall request through the COR, a meeting with the Facility personnel to discuss planned Contractor activities in the controlled facility operation area.
- I. Right to Search: Current procedures at FAA facilities located within facility boundaries include the "right to search". If in the judgment of the authorized security guard, or COR, a cause to search a vehicle or the person of personnel exists, such search will be made.
- J. Failure of the contractor to fully comply with the above instructions and/or directions from the COR will result in an immediate shutdown of the entire project until such time as the contractor demonstrates compliance.
- K. Additional security requirements, if any, will be discussed at the pre-construction conference(s).

PART 2 - PRODUCTS (Not Used)

PART 3 - EXECUTION (Not Used)

END OF SECTION **01 10 00**



U.S. Department of Transportation
Federal Aviation Administration

Failure To Provide All Requested Information May Delay Processing of Your Notice

Notice of Proposed Construction or Alteration

FOR FAA USE ONLY

Aeronautical Study Number

- - -

1. Sponsor (person, company, etc. proposing this action) :

Attn. of: _____

Name: _____

Address: _____

City: _____ State: _____ Zip: _____

Telephone: _____ Fax: _____

2. Sponsor's Representative (if other than #1) :

Attn. of: _____

Name: _____

Address: _____

City: _____ State: _____ Zip: _____

Telephone: _____ Fax: _____

3. Notice of: ☐ New Construction ☐ Alteration ☐ Existing

4. Duration: ☐ Permanent ☐ Temporary (_____ months, _____ days)

5. Work Schedule: Beginning _____ End _____

6. Type: ☐ Antenna Tower ☐ Crane ☐ Building ☐ Power Line
☐ Landfill ☐ Water Tank ☐ Other _____

7. Marking/Painting and/or Lighting Preferred:

☐ Red Lights and Paint ☐ Dual - Red and Medium Intensity White
☐ White - Medium Intensity ☐ Dual - Red and High Intensity White
☐ White - High Intensity ☐ Other _____

8. FCC Antenna Structure Registration Number (if applicable): _____

9. Latitude: _____ ° _____ ' _____ " "

10. Longitude: _____ ° _____ ' _____ " "

11. Datum: ☐ NAD 83 ☐ NAD 27 ☐ Other _____

12. Nearest: City: _____ State: _____

13. Nearest Public-use (not private-use) or Military Airport or Heliport:

14. Distance from #13. to Structure: _____

15. Direction from #13. to Structure: _____

16. Site Elevation (AMSL): _____ ft.

17. Total Structure Height (AGL): _____ ft.

18. Overall height (#16. + #17.) (AMSL): _____ ft.

19. Previous FAA Aeronautical Study Number (if applicable):

_____ - OE

20. Description of Location: (Attach a USGS 7.5 minute Quadrangle Map with the precise site marked and any certified survey.)

21. Complete Description of Proposal:

Frequency/Power (kW)

**this form to be
applied on-line at:
[https://oeaaa.faa.gov/
oeaaa/external/puntal
.jsp](https://oeaaa.faa.gov/oeaaa/external/puntal.jsp)**

Notice is required by 14 Code of Federal Regulations, part 77 pursuant to 49 U.S.C., Section 44718. Persons who knowingly and willingly violate the notice requirements of part 77 are subject to a civil penalty of \$1,000 per day until the notice is received, pursuant to 49 U.S.C., section 46301 (a).

I hereby certify that all of the above statements made by me are true, complete, and correct to the best of my knowledge. In addition, I agree to mark and/or light the structure in accordance with established marking and lighting standards as necessary.

Date

Typed or Printed name and Title of Person Filing Notice

Signature

Please Type or Print on This Form

FAA Form 7460-1 (2-99) Supersedes Previous Edition
012-0008

Form Approved OMB No. 2120-0001
NSN: 0052-00-

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Federal Aviation Administration

Request For Information No. 000

Title: _____

From:	Project:	To:
Contractor	JOB TITLE	
Contractor address	Job Location	
Phone:	Contract:	Phone:
Fax:		Fax:
Contact:		RE:
Drawing or Spec:	Date Started:	Priority: Normal
	Date Required:	Potential Cost Impact? <input type="checkbox"/> Yes <input type="checkbox"/> No
Attachments? No	Date Completed:	Potential Schedule Impact? <input type="checkbox"/> Yes <input type="checkbox"/> No
		If yes to either, explain below.

Question (Include Potential Impacts):

Response:

By: _____, FAA

Date:

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APPROVAL OR DISAPPROVAL OF CONTRACTOR'S MATERIALS OR SHOP DRAWINGS				DEPARTMENT OF TRANSPORTATION FEDERAL AVIATION ADMINISTRATION			
1. TO: Contractor Address Tel: Fax: ATTN:				2. DATE CONTRACTOR'S SUBMITTAL RECEIVED:		3. DATE SUBMITTAL RETURNED:	
				4. GOV'T TRANS. NO.		5. CONTRACTOR'S TRANS. NO.	
				6. PROJECT NAME			
				7. CONTRACT NUMBER			
8. TRANSMITTAL REFERENCE TO CONTRACT DRAWINGS and/or SHOP DRAWINGS							
9. TRANSMITTAL REFERENCE TO CONTRACT DRAWINGS AND PARAGRAPH NUMBER and/or CHANGE ORDER NUMBER							
10. FACTS:							
A. ITEM NO.	B. NO. COPIES	C. NAME OF SUPPLIER	D. TYPE OF MATERIAL OR EQUIPMENT	E. APPROVAL		F.	
				AS SUBMITTED	AS NOTED*	NOT APPROVED †	REVISE AND RESUBMIT
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G. REMARKS							
H. STIPULATIONS							
*Data marked "Approved as Noted" is satisfactory, contingent upon contractor acceptance of corrections and/or notations, and if accepted does not require re-submittal.							
†Data marked "Not Approved" does not meet job requirements, and contractor must re-submit on proper basis.							
Approval of Data does not obviate Contractor Responsibility for correct take-off or installation clearance.							
Carbon Copies Transmitted To:				Sincerely,			
<div>_____</div> <div>_____</div>				<div>_____</div> <div>Resident Engineer</div>			

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Section A. Purpose

This checklist is intended to be used as a tool by the resident engineer (RE) and other personnel overseeing construction to ensure adherence to Environmental and Occupational Safety and Health (EOSH) requirements at a project site. It must be noted that contractors are responsible for ensuring the safety of their employees. The checklist may be used by the RE as a tool to support their oversight role at the construction site. The checklist may be completed at the beginning of the project and reviewed and updated as the project proceeds.

This checklist relies on the training and professional judgment of the user. EOSH personnel should be consulted as needed.

Section B. Project Summary Information

The purpose of this section is to provide a brief description of the construction project and/or specific maintenance tasks and identify key personnel responsible for project completion. Fill in the requested site-specific information. Indicate if this work will occur in or adjacent to an occupied space. Note: Provide further explanation of activities on additional sheets if necessary.

Project Name and Description: _____		

Project Location: _____		
Facility: _____		
Planned Start Date: _____		
Expected Completion Date: _____		
Contractor Contact:	Name: _____	Phone: _____
Project/Design Representative:	Name: _____	Phone: _____
COTR/Specialist:	Name: _____	Phone: _____
EOSH Contact:	Name: _____	Phone: _____
Facility Representative:	Name: _____	Phone: _____

Section C. Construction Safety Subject Areas

The following questions cover the most common EOSH related areas that may be encountered. This list is not inclusive. Consult with your designated EOSH professionals for additional guidance and assistance.

Construction Safety Subject Area	Yes	No/NA	Comment
GENERAL			
The project has the budget, work force, and schedule to develop an Accident Prevention Plan.			The accident prevention plan must include procedures for; Preventing Accidents, Educating Employees and Conducting Accident Investigation. 29 CFR 1926 Subpart C
The construction site will be inspected before, during and after each shift for obvious hazards.			OSHA has the right to enter the work site to conduct an inspection at any time. Conducting routine inspections, correcting potential violations, and maintaining good general housekeeping can minimize possible findings. 29 CFR 1903.3, 29 CFR 1926.3(a), 29 CFR 1926.25
A bulletin board will be posted with all required OSHA Notifications, safety literature, copies of accident reports and OSHA 300 Form.			Each employer is required to establish a location for posting of information, including: copies of the OSHA standards, specific safety standards, accident reports, and State specific safety postings. 29 CFR 1903.2(a)(1) and (2)
Concrete and/or masonry construction will take place as part of the project			If yes, complete Concrete and Masonry section below. 29 CFR 1926.700(a)
Structural Steel erection will take place as part of this project.			If yes, complete Steel Erection section below. 29 CFR 1926.750(a), (b) and (c)
The project will require welding, cutting, and/or brazing.			If yes, complete Welding, Cutting, and Brazing section below. 29 CFR 1926.350, 1926.351 and 1926.352
This project will involve structural demolition.			If yes, complete Demolition section below.

Construction Safety Subject Area	Yes	No/NA	Comment
CONCRETE and MASONRY			
Formwork and shoring must be adequate to support all intended loads during concrete placement.			29 CFR 1926.703(a)(1)
All protruding reinforcing steel will be guarded to eliminate impalement hazards.			29 CFR 1926.701(b)
All forms and shoring shall remain in place until a competent person determines that the concrete can support its weight and the weight of any superimposed loads.			29 CFR 1926.701(a)
Shoring equipment must be inspected immediately prior to, during and immediately after concrete placement.			29 CFR 1926.703(b)(3)
Work conducted over 4 feet above the next lower level shall comply with fall protection requirements.			See Climbing/Walking and Work Surfaces.
Pre-cast wall units, structural framing, and tilt-up wall panels shall be supported to prevent overturning and collapse until permanent connections are made.			29 CFR 1926.704(a)
A limited access zone will be established during masonry wall construction.			29 CFR 1926.701(c)
All masonry walls over eight feet in height shall be braced or supported to prevent collapse.			29 CFR 1926.706(b)
STRUCTURAL STEEL ERECTION			
The project has the schedule, budget and manpower needed to ensure the concrete attains 75% of its compressive strength.			Prior to beginning steel erection, the prime/controlling contractor must provide written notice to the steel erection firm that the concrete has attained at least 75% of its compressive strength. 29 CFR 1926.751(a)
The project will require development of a site-specific traffic plan and site-specific erection plan. Qualified person (also defined in § 1926.32) means one who, by possession of a recognized degree, certificate, or professional standing, or who by extensive knowledge, training, and experience, has successfully demonstrated the ability to solve or resolve problems relating to the subject matter, the work, or the project.			The controlling contractor is responsible for traffic control on the site to allow ease of steel delivery and movement of derricks, cranes, etc. Further, to ensure employee safety a site specific erection plan is required to be developed by a "qualified person." 29 CFR 1926.752(c)(1) and (d)
The project requires inspections of all cranes, derricks, etc. by a qualified person before beginning each shift and of all rigging by a qualified rigger.			The contractor should supply or be able to supply their shift inspection form for equipment being used on the site. 29 CFR 1926.753(c)(1) and (2)
The crane or derrick operators training certificate is on site and copies of the certificates are maintained in the project file.			American National Standards Institute (ANSI) B30.2 through B30.22.
The crane operation is performed by a qualified or certified operator, with appropriate clearance from power lines and appropriate work area control.			OSHA Crane standard was recently revised extensively to cover crane operations, including certifications, operation, and training requirements. 29 CFR 1926.1400
The project requires all decking or roofing holes where an employee could fall 15 feet or more be guarded with railings, netting, perimeter safety wire, etc.			Any openings in decking or roofing are required to be closed unless structurally impossible. In the case where the whole cannot be decked or roofed over, fall protection must be installed, or the opening must be guarded. 29 CFR 1926.760(a)(1)
Protection from overhead falling objects will be required.			29 CFR 1926.759(b)
Fall protection training and equipment will be provided for all employees working over 6 feet above the next lower deck and Controlled Decking Zone (CDZ) training for all personnel required to work on a CDZ.			29 CFR 1926.760(a) and (c), 1926.761(b) and (c)(3)
A safety railing of at least a 1/2 inch wire rope or equivalent is installed approximately 42 inches around the periphery of all temporary planked or temporary metal decked floors of tiered buildings and other multi-floored structures during structural steel assembly.			29 CFR 1926.750(b)(1)(iii)

Construction Safety Subject Area	Yes	No/NA	Comment
DEMOLITION			
Demolition with Hazardous Materials (HazMat)			
A hazardous material assessment will be conducted to identify any asbestos, lead paint, transformers, light ballasts, etc., prior to initiation of demolition.			29 CFR 1926.850(e)
Asbestos will be abated prior to demolition of the structure.			29 CFR 1926.850(e) See ASBESTOS
All transformers and light ballasts will be removed from the structure prior to demolition.			29 CFR 1926.850(e), See POLYCHLORINATED BIPHENYLS for disposal options.
All hazardous materials and/or hazardous waste will be removed from the structure prior to demolition.			29 CFR 1926.850(e), See HAZARDOUS MATERIAL MANAGEMENT AND HAZARDOUS WASTE, as applicable.
Lead based paint will be abated and/or the ground surface will be protected from paint chips.			
Demolition without HazMat or After Abatement			
An engineering survey of the structure, assessing the potential for unplanned collapse shall be provided in writing.			Prior to beginning demolition an engineering survey assessing the potential for structural collapse must be provided in writing to the demolition contractor. 29 CFR 1926.850(a)
Continuous inspections should be made by a competent person as demolition work progresses to detect hazards from weakened or deteriorated floors or walls or loosened materials.			29 CFR 1926.859(g)
All utilities will be removed and capped prior to beginning demolition.			Gas, electrical, water and sewer lines must be disconnected and capped to prevent fire, electrocution or other hazard to the employee. 29 CFR 1926.850(c)
The area around the structure shall be protected from fragmenting glass and or falling building debris.			Employees and, where applicable, the public shall be protected from hazards posed by fragmenting and falling glass and or building materials. 29 CFR 1926.850(f)
A covered and protected walkway will be provided for any multi-story demolition.			29 CFR 1926.850(k)
Holes in flooring shall be repaired unless being used to chute materials out of the structure.			Holes in flooring must be guarded or repaired to protect workers from falling hazards, unless the hole is being used as part of a disposal chute for removing materials from the structure. All disposal chute openings must be protected by a guardrail at least 42 inches high. 29 CFR 1926.851, 852 and 853
Areas below openings where debris/materials are dropped through holes in floor, without the use of a chute, should be completely enclosed with barricades at least 42 inches high and at least six feet back from the projected edge of the opening above.			29 CFR 1926.850(h) and 1926.502(b)
Floor openings not used as debris/material drops should be equipped with a properly secured cover that will support two times the weight of employees, equipment, and materials that may be imposed on the cover at any one time.			29 CFR 1926.850(i) and 29 CFR 1926.502(i)
ELECTRICAL SAFETY			
The project will involve installation or removal of electrical systems, components or otherwise expose employees to electrical hazards.			29 CFR 1926.403; NFPA 70E Requirements
Electric equipment and lines should be considered energized until verified to be de-energized by test or other appropriate methods or means.			
Electrical equipment should be free from recognized hazards that may cause death or serious harm.			29 CFR 1926.403(b)(1)
Electrical disconnects such as circuit breakers, switches, and other disconnect means should be legibly marked to indicate purpose unless they are located so that purpose is evident.			29 CFR 1926.403(h)

Construction Safety Subject Area	Yes	No/NA	Comment
All electrical equipment should have ground fault circuit interrupters (GFCIs) to protect employees. An assured equipment grounding program should be in place if GFCIs are not in use.			29 CFR 1926.404(b)(1)(i) and (iii)
Electrical equipment used in hazardous locations must be either approved for the location or intrinsically safe.			29 CFR 1926.407(b)
When working on buried cable or a cable in manholes, metallic sheath continuity should be maintained by bonding across the opening or by an equivalent means.			29 CFR 1926.956(c)(7)
Hazardous energy controls (lockout/tagout) shall be used before servicing or maintenance activities on any machinery and equipment to prevent the unexpected energizing, startup, or release of stored energy that could cause injury.			29 CFR 1910.147(a)(2)(i)
EMERGENCY PREPAREDNESS			
A written Emergency Action Plan will be developed for the project and shall be available at the worksite.			An emergency action plan must be developed outlining that the employee is expected to take in the event of an emergency. The written plan must be available at the worksite. 29 CFR 1926.35(a) and (e)(3)
Employees will receive training in the alarm system, actions to be taken in the event of emergency, expected duties, and reporting requirements.			The emergency action plan must include: <ul style="list-style-type: none"> • Emergency escape procedures and emergency escape route assignments; • Procedures to be followed by employees who remain to operate critical plant operations before they evacuate; • Procedures to account for all employees after emergency evacuation has been completed; • Location of assembly area; • Rescue and medical duties for those employees who are to perform them; • The preferred means of reporting fires and other emergencies; and • Names or regular job titles of persons or departments who can be contacted for further information or explanation of duties under the plan. 29 CFR 1926.35(b)
Emergency medical, fire and evacuation drills will be conducted at the project site.			Fire, medical and evacuation drills should be conducted on-site to familiarize employees with alarms, rally areas, emergency exits/evacuation routes and emergency procedures. 29 CFR 1926.35(e)
Documentation of employee training and drills will be maintained in the project file.			Documentation of any training should be maintained in the project file, as Emergency Action Plan training is site specific. Further, documentation of FAA employees/contractors on-site or visiting the site being briefed should also be maintained in the project files.
EXCAVATING and TRENCHING			
The project will have the budget, schedule and personnel to arrange utility clearances with the local utility companies, if applicable.			The utility companies must be contacted and allowed at least 24 hours to respond to the request for a utility locate. If the utility company does not respond, the work can continue but precautions must be taken. A record of all utility clearances or attempts to obtain utility clearances should be maintained with the project file. 29 CFR 1926.651(b)
The project includes budget and schedule for use of proper sloping, shoring, shielding or trench boxes.			29 CFR 1926.651(i)
The project includes budget, schedule and manpower to conduct daily inspection of all excavations to prevent cave-in.			A daily inspection of the excavation by a competent person is required to look for signs of soil movement, fracturing of soils, or other issues increasing the risk of a cave in. Documentation of each daily excavation inspection should be maintained in the project file. 29 CFR 1926.651(k)

Construction Safety Subject Area	Yes	No/NA	Comment
The project includes the budget and schedule to properly shore, brace or underpin adjoining buildings, ground or walls affected by the excavation.			A registered engineer must properly design all shoring, bracing or underpinning. 29 CFR 1926.651(i)
Trenches shall be equipped with ladders so that employees in the trench do not have to travel more than 25 feet to egress any portion of the excavation.			29 CFR 1926.651(c)(2)
The site layout plan identifies safe distance requirements for stockpiling materials or excavated soils, to avoid sidewall collapse.			Materials must be kept a minimum of 2 feet from the edge of the excavation, and may require more clearance dependent upon soil type. 29 CFR 1926.651(j)
All applicable utility companies (power, gas, water, telephone, etc.) shall be contacted in order to determine the location of potential underground obstructions/hazards prior to cutting into the soil. If the utility companies are not able to specifically locate the underground obstructions/hazards, either instruments or probes shall be used to locate the underground obstructions/hazards, prior to the start of operations.			29 CFR 1926.651(b)(2) and (3)
Any trench or excavation five feet or more in depth must be provided with cave-in protection through such means as shoring, sloping, benching, or use of hydraulic shoring, trench shields, or trench boxes. Trenches or excavation less than five feet in depth, that have a potential for cave-in, must be provided with cave-in protection.			29 CFR 1926.652(a)(1)
Fences or other appropriate physical barriers are required to be erected around the excavation or trench. Flashing caution lights are required if work is being conducted at night or when the opening is left uncovered during evening periods. Both the barriers and flashing caution lights must be maintained around the opening until the work is completed or the opening is adequately covered.			
Testing and engineering controls need to be established to prevent employee exposure to hazardous atmospheres that could enter trenches/excavations.			29 CFR 1926.651(g)
A competent person is required to inspect each excavation/trench daily. These inspections shall be conducted before the start of work, at the beginning of each shift, after every rainstorm or other hazardous occurrence, and as needed throughout the shift.			29 CFR 1926.651(K)(1)
FIRE PREVENTION and PROTECTION			
A written fire prevention and protection plan shall be maintained at the site.			A site-specific fire prevention and protection plan should be established for each construction site, establishing fire alarm procedures, fire extinguisher locations and use, fire suppression system (if available), etc. 29 CFR 1926.150(a)
Instructions for reporting a fire shall be conspicuously posted at the work site.			29 CFR 1903.2(a)(1)
Adequate fire extinguishers shall be provided to allow employees to evacuate the work site.			The project manager will need to determine if the construction contractor will be required to provide fire fighting services or simply have his/her employees evacuate the site in the event of an emergency. All fire extinguishers must be within their annual certification and must be visually inspected on a monthly basis. All fire extinguishers should be conspicuously located and marked. 29 CFR 1926.150(a)(3), (5) and (c)
Flammable and combustible liquids stored at the site shall be kept in approved containers and will be stored in rooms or flammable storage cabinets meeting fire resistance requirements.			29 CFR 1926.152(a), (b) and (c)
Smoking on the work site shall be prohibited.			29 CFR 1926.151(a)(3)

Construction Safety Subject Area	Yes	No/NA	Comment
At least one portable fire extinguisher, with a rating of not less than 20-B:C, must be located within 75 feet of each pump, dispenser, underground file pipe opening, and lubrication or service area.			29 CFR 1926.152(g)(11)
HAND and POWER TOOLS			
Hand and Power Tools that can accommodate guards, shall be equipped with the appropriate guards.			If a hand tool or power tool can support guards, the guards must be installed. Further, the point of operation, the area where actual work is performed, shall be arranged and/or guarded to keep workers from placing themselves in danger. 29 CFR 1926.300(b)
Hand and power tools shall be inspected for defects, missing prongs on plugs, and frayed power cords prior to each work shift.			Employers are responsible for ensuring that employees are not using unsafe hand or power tools. All tools should be inspected prior to each work shift, the inspection documented (especially for power tools), and the documents kept in the project files. Damaged tools shall be removed from the project immediately. 29 CFR 1926.301(a)
Electric power tools must be properly grounded or double insulated.			29 CFR 1926.302(a)
Powder actuated tools shall only be used by trained personnel.			Powder actuated tools may only be used by trained employees. Copies of personnel's training records should be included in the project file and maintained on-site for the duration of the project. 29 CFR 1926.302(e)
Personnel using hand and power tools shall be issued personnel protective equipment required to protect them from the hazards associated with each particular hand or power tool.			Personnel must be issued Personal Protective Equipment (PPE) required to protect them from falling, flying, abrasive and splashing objects, dusts, fumes, mists or other hazards caused by hand or power tools. Personnel must be trained to use the PPE they are issued. Copies of training documents should be kept in the project file. 29 CFR 1926.301(c)
WELDING, CUTTING, and BRAZING			
Only trained, licensed or certified employees shall conduct welding, cutting, or brazing.			All welders must be trained in the proper use of their equipment and understand the hazard associated with the equipment use, and how to protect themselves from those hazards.
A hot work permit will be required to authorize any welding, cutting, or brazing outside of an area designed for these activities; such as welding booths.			A Hot Work Permit program allows the project manager or site supervisor to inspect the welding area prior to initiation of welding or cutting activities. This also ensures that any combustible materials have been removed or shielded, and any other fire protection requirements have been put in place. 29 CFR 1910.252(a)(1) and (2), 29 CFR 1926.352
Workers conducting any welding or cutting shall be provided personnel protective equipment including proper protective lenses.			PPE must be provided to protect workers from sparks, molten steel and damage to their eyes. Further, mechanical ventilation or respirator protection may be required to ensure workers are not over-exposed to metal fumes generated by welding or cutting activities. 29 CFR 1910.252(b), 29 CFR 1926.351(e) and 353(a)
All welding equipment, tips, cylinders, valves, etc., shall be inspected prior to each use or at the beginning of each shift.			All welding equipment should be inspected prior to use. All gas hoses must be inspected prior to each use. Copies of all inspections records should be maintained in the project file for the duration of the project. 29 CFR 1926.350(f)(3)
The project has the budget to provide a fire watch for all welding required by the project.			A fire watch is required for any welding activity where combustible materials cannot be removed, moved, or shielded and are within 35 feet of welding activities. 29 CFR 1910.252(a)(iii)
All compressed gas cylinders shall be secured in an upright position and protective caps in place during storage. Cylinders should be secured in a vertical position when transported by power vehicles.			29 CFR 1926.350(a)(4) and (9)

Construction Safety Subject Area	Yes	No/NA	Comment
Mechanical ventilation system of sufficient capacity and so arranged shall be provided to remove fumes and smoke and keep the concentration within safe limits.			29 CFR 1926.353(a)(2) and (3)
General mechanical ventilation, local exhaust ventilation, or airline respirators must be provided to employees who are required to conduct welding, cutting, or brazing operations in permit required confined spaces.			29 CFR 1926.353(b)(1)
Approved fire extinguishers shall be provided and maintained in all areas where welding will be conducted and the extinguishers must be the proper class for potential class of fire in the area.			Approved fire extinguishing media shall be immediately available at any location where welding is taking place. 29 CFR 1926.353(d) 29 CFR 1910.252(a)(1)(ii)
HOUSEKEEPING			
Separate containers shall be provided for disposal of trash, oily/combustible rags, fuel soaked rags, flammable or hazardous wastes and acidic wastes.			Waste should be collected from around the site to minimize fire hazards. Further, wastes should be segregated to avoid possible waste incompatibilities and minimize potential hazardous waste disposal costs. 29 CFR 1926.25(c), 40 CFR 262.11 See HAZARDOUS MATERIAL MANAGEMENT AND HAZARDOUS WASTE MANAGEMENT.
All wastes collected at the site shall be reviewed to ensure they are being disposed of properly.			40 CFR 262.11 See HAZARDOUS MATERIAL MANAGEMENT AND HAZARDOUS WASTE MANAGEMENT.
Work areas should be cleaned at the end of each shift, trash collected, any protruding nails removed or fixed, ladders and equipment inspected, tools and supplies organized and the floor cleared of any debris.			
LADDER and TEMPORARY STAIRWAY SAFETY			
Stairways			
All stairways shall meet industry accepted standards for angle and rise versus run.			29 CFR 1910.24(e)
Stairway treads shall be non-slip and/or slip resistant.			All treads and stair nosing must be relatively slip resistant, and the edge of the stair tread must be easily identifiable by persons using the stairwell. 29 CFR 1910.24(f)
Flights of stairs with four or more risers equipped should be equipped with standard stair railings or handrails.			Hand rails must be provided on all stairwells, closed or open. On open sided stairwells must have railings and handrails on the open side. Railings must be 42 inches high, with handrails being between 30 and 34 inches in height. Railing is able to hold at least a 200 lb load. 29 CFR 1910.23(d) and (e), and 24(h)
Stairs shall be at least 22 inches wide.			Minimum allowable stairway width is 22 inches. Stairways may be wider, but cannot be narrower. Stairways wider than 22 inches need to meet additional railing or handrail requirements. 29 CFR 1910.23(d) and (e)
Stairways shall be inspected on a regular basis.			All temporary stairways must be inspected for defects or damage. Records of these inspections should be maintained in the on-site project file for the duration of the project. Damaged or defective stairways must be taken out of service and/or repaired. 29 CFR 1926.851(b)
Ladders			
All ladders in use on the project shall be inspected on a regular basis.			All temporary stairways must be inspected for defects or damage. Records of these inspections should be maintained in the on-site project file for the duration of the project. Damaged or defective stairways must be taken out of service and/or repaired. 29 CFR 1910.26(d)(1)(x) and 1926.1053(b)(15)
All ladders shall be secured in place using bracing at the base and being tied off at the top.			While bracing can be used to help secure a ladder in place, it does not take the place of lashing the ladder at the top to prevent slippage or sliding. 29 CFR 1910.26(d)(1)(ix) and 1926.1053(b)(1)

Construction Safety Subject Area	Yes	No/NA	Comment
Side rails of ladders should extend at least 36 inches above the landing or roof edge.			29 CFR 1926.1053(b)(1)
ILLUMINATION			
The project has the budget to provide light sets to provide adequate lighting throughout the entire construction site.			The amount of lighting required is dependent upon the activities being performed in each area. For foot-candle illumination requirements see 29 CFR 1926.56(a) Table D-3.
Construction areas, ramps, runways, corridors, offices, shops, and storage areas must be lighted with either natural or artificial illumination.			29 CFR 1926.56(a)
All overhead objects (i.e. lights, signs, wiring and piping) shall be at least 7 feet above floor level.			All overhead objects are at least 7 feet above floor level to minimize the potential for head injuries. 29 CFR 1910.24(i)
All lights will be guarded to prevent breakage.			
OCCUPATIONAL HEALTH and ENVIRONMENTAL CONTROLS			
NOISE			
The project has the budget to conduct personal and/or area noise monitoring.			Engineering and administrative controls must be implemented when noise exceeds 90 dBA for 8 hours. If noise levels are louder, then the total exposure must be calculated. If calculated sound levels exceed 85 dBA, then a hearing conservation program must be implemented. Also, all monitoring records must be maintained in the project file for at least two years. 29 CFR 1910.95(a), 1910.95(m)(3)(I), and 29 CFR 1926.52(d)(1)
The project has the budget and schedule to develop a Hearing Conservation Program.			If noise levels exceed 85 dBA for an 8-hour time weighted average (TWA), then the employer must develop a Hearing Conservation Program. 29 CFR 1910.95(c)(1)
All employees exposed to noise above 85 dBA will be notified.			Any employee exposed to noise levels above 85 dBA TWA shall be notified of the noise monitoring results. 29 CFR 1910.95(e)
Employees exposed to noise levels above 85 dBA shall have hearing protection.			All employees exposed to noise levels above 85 dBA TWA shall be provided hearing protection and the employer shall ensure that employees wear the hearing protection. 29 CFR 1910.95(i)
Employees will be briefed regarding the hazards of noise over-exposure, how to recognize noise over-exposure and how to protect themselves.			During the hazard communications briefing, all employees should be briefed on the hazards associated with noise over-exposure and methods to protect themselves. The briefing should also cover proper use of any PPE supplied. Records of such training should be maintained in the project file.
SANITATION			
The project has the budget to supply drinking water, either as bottled water or as a drinking water supply with disposable cups.			Employers are required to supply an adequate potable water supply. Further, using a shared cup or allowing dipping of water from a container is prohibited. If a mutual water container is provided, disposable water cups must be supplied. 29 CFR 1926.51(a)(1) and (a)(2)
All water coolers shall be clearly marked Drinking Water-Do Not Use For Any Other Purpose.			29 CFR 1926.51(a)(3)
All water sources shall be marked as either Potable or Non-Potable.			29 CFR 1926.51(a)(6)
The project has the budget to supply heated, ventilated and well-lighted quarters.			If the project is providing temporary sleeping quarters or will be a work camp environment, sleeping quarters must be heated, ventilated and lit. 29 CFR 1926.51(e)
The project has the budget to properly manage food preparation, if necessary.			If the project is providing food to on-site workers or if the project is establishing a work camp, where employees, contractors and sub-contractors will be fed, then all local, state and federal laws and ordinances must be met. 29 CFR 1926.51(d)

Construction Safety Subject Area	Yes	No/NA	Comment
The project has the budget to provide adequate toilets and wash facilities.			If the project is providing quarters or housing on-site for the duration of the project, then lavatories and shower facilities must be established. If showers are provided, the project must also provide soap, hot and cold water and clean towels (i.e. meaning a facility for washing towels will also be required). At a minimum the number of toilet required at the job-site must meet the minimum number of toilets and urinals identified in 29 CFR 1926.51(c)(1). 29 CFR 1926.51(c)(1) and 1926.51(f)(4)
GASES, FUMES and VAPORS			
The project is utilizing hazardous materials that have established exposure limits.			If the project is using a hazardous material with an established Threshold Limit Value (TLV) or Permissible Exposure Limit (PEL), then precautions shall be taken to prevent employee exposure at levels above the TLV/PEL. 29 CFR 1926.55(a)
The project has the budget to conduct personal or area air monitoring to assess employee exposure.			
Personnel will be issued Personal Protective Equipment necessary to protect themselves from any gases, fumes or vapors.			PPE shall only be issued if engineering and administrative controls cannot reduce exposure to below the TLV/PEL. Prior to issuing respiratory protection, airborne concentrations of hazardous materials must be determined to ensure that provided respiratory protection will properly protect employees. Employees using respiratory protection must have been trained in the proper use, limitations and maintenance of the respirator. Further, employees required to use a respirator must be medically capable of using a respirator. Finally, a written respirator program must be available and should be maintained on-site for the duration of the project. 29 CFR 1910.134
HEAT and COLD EXPOSURE			
Employees will be provided Physical Hazard Data Sheets on Cold and Heat exposure during the Hazard Communication brief.			Heat and cold exposure are physical hazards that should be discussed during the Hazard Communication in-briefing at the site. Employees should be trained to recognize the signs of heat stress/heat stroke and hypothermia. Further, methods employees can use to protect themselves from these hazards should be identified.
Temperature and humidity will be monitored and rest-breaks adjusted to minimize potential for heat or cold related injuries.			
The project has the budget necessary to provide longer breaks for either warming up or cooling off, required to avoid heat and cold injuries in inclement weather.			
MATERIAL HANDLING			
For lift operations using motorized equipment, procedures for lifting and handling of materials and equipment must be developed prior commencing operations.			
Hoistways and aisles will be kept clear of any stored materials.			29 CFR 1926.250(a)(3)
Personnel required to work on stored materials (i.e. stacked, tiered storage, etc.) shall be provided with Fall Protection.			Any person required to work over 1.8 meters (6 feet) above the next lower working surface, shall be provided fall protection. 29 CFR 1926.501(b)(1)

Construction Safety Subject Area	Yes	No/NA	Comment
All slings, riggings and fastenings shall be inspected prior to each work shift by a competent person.			Each sling, rigging, fastener or other equipment used for lifting must be inspected each day before being used by a competent person. Additional inspections may be warranted depending on use, but any damaged equipment must be removed from service immediately. Records of each daily inspection and removal of equipment from service should be maintained in the project file on-site for the duration of the project. 29 CFR 1926.251(a)(6)
Areas where lifting or overhead slinging of materials occurs will have restricted access and suspended loads shall not travel over workers heads.			29 CFR 1926.550(a)(9)
Where stacked or tiered storage is being used, load limits will be identified and posted on each tier of storage.			
Materials being dropped into a disposal container shall be enclosed by a chute.			
Prescribed hand signals for all guiding all motorized equipment shall be established for the project and will be communicated to the employees.			Prescribed hand signals should be established to cover all equipment guiding being conducted during the project. All personnel responsible for guiding equipment operations should be trained in the accepted hand signals. Non-standard hand signals should be discouraged. 29 CFR 1926.550(a)(4)
All lifting/hoisting equipment on-site shall be inspected before being used each day or each shift.			Records of daily inspections of all motorized equipment should be maintained in the on-site project file for the duration of the project. 29 CFR 1926.550(a)(5)
All alarms, warning lights, etc., will be inspected for correct function before equipment is used each day or each shift.			Equipment used for material handling must be inspected before use and as necessary to ensure that it is safe. 29 CFR 1926.550(a)(5) and .601(b)(14)
Annual certificates of inspection shall be kept on-site for all equipment.			All lifting and hoisting equipment is required to have an annual inspection by a competent person or government entity. Copies of the annual certificate of inspection shall be kept in the on-site project files for the duration of the project. If equipment does not have a current inspection certificate it cannot be used on the project. 29 CFR 1926.550(a)(6)
The "swing" area around all heavy equipment and areas where employees could be pinned between heavy equipment and other objects, will be barricaded.			The swing area, especially for equipment with large counterweights must be restricted to avoid employees working in areas where the equipment operator may not be able to see them. 29 CFR 1926.550(a)(9)
All equipment shall be supplied with functional portable fire extinguishers within immediate access of the operator.			Cranes, derricks, etc., are required to have a fire extinguisher readily available to them. All equipment and vehicles at a site should be equipped with a fire extinguisher for any emergency. 29 CFR 1926.550 (14)
Aerial lift trucks working near energized lines or equipment must be grounded or barricaded and considered as energized equipment or the truck should be insulated for the work being performed.			Spotters and tag lines, or other suitable devices used to control loads being handled, are required when lifting operations are conducted adjacent to energized overhead power lines. Keep lift trucks at least 15 feet from all power lines. 29 CFR 1926.952(c)
Spotters and tag lines, or other suitable devices used to control loads being handled, are required when lifting operations are conducted adjacent to energized overhead power lines.			29 CFR 1926.952 (d)
SCAFFOLDING			
The project has the budget to have a "qualified" person design the scaffolding system.			All scaffolding must be designed by a qualified person and then must be constructed to meet that design. Further, all scaffolding must be constructed, dismantled or moved under the supervision of a "qualified" person. 29 CFR 1926.451(a)(6) and (f)(7)

Construction Safety Subject Area	Yes	No/NA	Comment
All employees constructing scaffolding shall be trained in erecting, dismantling, operating, moving, repairing, maintaining and inspecting scaffolding.			Copies of all training records for personnel erecting or otherwise working with scaffolding should be maintained in the on-site project file for the duration of the project. 29 CFR 1926.454(b)
The project has the budget to supply all personnel constructing and dismantling any required scaffolding fall protection.			Employers are required to supply fall protection for all employees erecting, or dismantling supported scaffolds, unless it can be demonstrated that the fall protection creates a greater hazard to the employee. NOTE: Requirements for fall protection should be reviewed prior to construction of any scaffolding, as requirements vary dependent upon the type of scaffolding being used on the project. 29 CFR 1926.451(g)(2)
All scaffolding more than 3.1 meter or 10 feet above ground level, shall be equipped with a guardrail capable of supporting a 200 lbs load.			NOTE: Requirements for guardrails should be reviewed prior to construction of any scaffolding, as requirements vary dependent upon the type of scaffolding being used on the project. 29 CFR 1926.451(a)(4)
Scaffolds should be capable of supporting at least four times their maximum intended load.			29 CFR 1926.451(a)(7)
Manually propelled mobile scaffolds must be erected so that their height is no more than four times the minimum base dimension.			29 CFR 1926.451(e)(1)
All scaffolding will be conspicuously marked with the maximum rated load.			Scaffolding is required to support up to six times the maximum rated load dependent upon the type of scaffolding, footings and suspension being used. Further, all working floors are required to be marked with the floors load capacity.
All employees required to work on a scaffold shall be trained in working from a scaffold.			Each employee required to work on a scaffold shall be trained by a person qualified in the subject matter to recognize hazards associated with the types of scaffolding being used and methods to control those hazards and protect themselves. Copies of all training records for personnel working on scaffolding should be maintained in the on-site project folder for the duration of the project. 29 CFR 1926.454(a)
The project has the budget to have scaffold flooring erected by a competent person.			Scaffolds must be erected such that the space between the platform, uprights and adjoining sections is no more than one (1) inch. 29 CFR 1926.451(b)(1)
The project has the budget to provide fall protection to all employees working on the scaffolding less than 18 inches wide.			Scaffolding must be at least 18 inches wide; unless the employer can demonstrate that it is not feasible. If scaffolding is less than 18 inches wide, it MUST be equipped with guardrails or each employee MUST be equipped with fall protection. 29 CFR 1926.451(b)(2)
All supported scaffolding footings shall be level, sound, rigid and capable of supporting the load.			Unstable objects shall not be used as footing or supports to establish or jury
Each scaffold shall be inspected by a person trained in erecting, repairing and inspecting scaffolding before work begins on the scaffolding, each day.			Copies of daily inspection records should be maintained in the on-site project file for the duration of the project.
MEDICAL SERVICES, FIRST AID, SANITATION			
A facility for the treatment of injured employees should be located within a reasonable distance from all FAA facilities where construction activities are being conducted site. If not, there should be a first aid trained employee(s) at the site.			29 CFR 1926.50(c)
Adequate potable (drinking) water and toilet facilities should be available at all FAA facilities where construction activities are being conducted.			29 CFR 1926.51(a) and (c)
Adequate warning signs must be posted to inform workers of potential health and safety concerns (e.g., areas where hard hats and hearing protection are required).			29 CFR 1926.200

Section D. Review Information

The appropriate FAA EOSH professionals and the Facility Representative, as applicable, will sign below to document discussion of the items on this form. **This checklist is intended to be used as a tool by the Resident Engineer (RE) to ensure adherence to EOSH requirements at the FAA contractor site. .**

Completed by:	Date
Reviewed by:	Date

Notes (e.g., provide further explanation of potential hazards, locations, etc. below and attach additional sheets if necessary)

FAA Life Safety System Inspection & Test Report

PART 1 FIRE SYSTEM LOCATION, NOTIFICATION OF TEST & VISUAL INSPECTION

PROTECTED PROPERTY:

PERSON RESPONSIBLE: _____ TITLE: _____

PHONE: _____ FAX: _____

Check each box that applies to the fire system being tested.

- | | |
|--|--|
| <input type="checkbox"/> STANDARD ATCT | <input type="checkbox"/> PROPERTY FAA OWNED |
| <input type="checkbox"/> NON-STANDARD ATCT | <input type="checkbox"/> PROPERTY FAA LEASED |
| <input type="checkbox"/> SMO | <input type="checkbox"/> ARSR SITE |
| <input type="checkbox"/> SSC | <input type="checkbox"/> SITE OCCUPIED |
| <input type="checkbox"/> AFSS | <input type="checkbox"/> SITE UNOCCUPIED |
| OTHER _____ | |

NOTIFICATION PRIOR TO FIRE SYSTEM TESTING:

Notify the following Individuals and/or Office of the fire system test.

- | | | |
|--|---|--|
| <input type="checkbox"/> FIRE DEPARTMENT | <input type="checkbox"/> CENTRAL STATION | <input type="checkbox"/> BUILDING OCCUPANTS |
| <input type="checkbox"/> A. F. MANAGER | <input type="checkbox"/> SMO SAFETY OFFICER | <input type="checkbox"/> REGION SAFETY MANAGER |
| <input type="checkbox"/> TERMINAL MANAGEMENT | <input type="checkbox"/> AIR TRAFFIC MANGER | <input type="checkbox"/> AIRPORT MANAGEMENT |
| OTHER _____ | | |

VISUAL INSPECTION OF SYSTEM PRIOR TO TESTING:

Visually inspect the following Prior to Testing.

- | | | |
|--|--|---|
| <input type="checkbox"/> CONTROL PANEL(S) | <input type="checkbox"/> PANEL LIGHTS | <input type="checkbox"/> PULL STATIONS |
| <input type="checkbox"/> PANEL SWITCHES | <input type="checkbox"/> SYSTEM BATTERIES | <input type="checkbox"/> POWER SUPPLIES |
| <input type="checkbox"/> PRESSURIZATION FAN(S) | <input type="checkbox"/> LOAD VOLTAGE | <input type="checkbox"/> SMOKE DETECTORS |
| <input type="checkbox"/> BATTERY CHARGER TEST | <input type="checkbox"/> HVAC SYSTEM(S) | <input type="checkbox"/> STROBES |
| <input type="checkbox"/> ELEVATOR EQUIPMENT | <input type="checkbox"/> AUDIO DEVICES | <input type="checkbox"/> REMOTE ANNUNCIATOR |
| <input type="checkbox"/> DACT | <input type="checkbox"/> SUPPRESSION SYSTEM(S) | <input type="checkbox"/> PRINTER |
| <input type="checkbox"/> REMOTE DETECTOR INDICATOR | <input type="checkbox"/> SYSTEM RECORDS | <input type="checkbox"/> RECORD DRAWINGS |
| <input type="checkbox"/> SYSTEM MODIFICATIONS | <input type="checkbox"/> EMERGENCY GEN. | <input type="checkbox"/> OPERATORS MANUAL |
| OTHER _____ | | |

Make notations below in the comment section for items which are deficient and noted during the visual inspection.
Additional space is available for notation of deficiencies in each section below.

WARNING:

IF THIS SYSTEM PROVIDES DETECTION AND/OR CONTROL FOR AUTOMATIC SUPPRESSION, THE AGENT RELEASE PORTION OF THE SUPPRESSION SYSTEM(S) *MUST* BE *DISABLED* PRIOR TO TESTING ANY SYSTEM INITIATING DEVICES TO PREVENT INADVERTENT AGENT RELEASE!

THIS FACILITIES HVAC SHUTDOWN, ELEVATOR RECALL AND PRESSURIZATION FAN SYSTEMS MUST BE TESTED ANNUALLY, TO INSURE PROPER OPERATION. AVOID UNNECESSARY CYCLING OF THESE SYSTEMS AND DISABLE THE CONTROLLING RELAYS OR ACTIVATE THE PREPROGRAMMED BY-PASS SWITCH AFTER INITIAL TESTING AND VERIFICATION OF EACH.

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PART 2

FIRE SYSTEM PANEL DATA & SERVICE INFORMATION

LOCATION OF THE FIRE ALARM PANEL/FIRE COMMAND CENTER:

SYSTEM MANUFACTURER _____

MODEL NO.: _____

DATE SYS. COMMISSIONED: _____

SERVICE COMPANY: _____

PHONE: _____

FAX: _____

ADDRESS: _____

CONTACT: _____

SERVICE CONTRACT: ☐ YES ☐ NO

NICET CERT. NO.: _____

NICET LEVEL: _____

STATE LICENSE NO.: _____

DATE SERVICE STARTED: _____

DATE SERVICE DEFAULTS: _____

DATE OF LAST SYSTEM SERVICE: _____

DATE OF LAST SYSTEM TEST: _____

DOES THE PANEL APPEAR TO BE OPERATING PROPERLY (NORMAL CONDITION) ☐ YES ☐ NO

IS THE FIRE PANEL A POWER LIMITED SYSTEM ☐ YES ☐ NO

ARE ALL CIRCUITS SUPERVISED ☐ YES ☐ NO

IS A SYSTEM SMOKE DETECTOR PROVIDED TO PROTECT THE PANEL ☐ YES ☐ NO

IS ADEQUATE BATTERY BACK-UP PROVIDED AS PER NFPA 72 ☐ YES ☐ NO

IS SURGE SUPPRESSION PROVIDED AT THE AC CIRCUIT BREAKER ☐ YES ☐ NO

IS THE 110 VOLT CIRCUIT PERMANENTLY LABELED "FIRE ALARM" ☐ YES ☐ NO

IS AN EMERGENCY GENERATOR PROVIDING BACK-UP POWER ☐ YES ☐ NO

IS THERE MORE THAN ONE SYSTEM PANEL INSTALLED ☐ YES ☐ NO

PANEL POWER SUPPLY, PRIMARY (MAIN), NOMINAL VOLTAGE _____, AMPS _____

OVERCURRENT PROTECTION, TYPE _____, AMPS _____, LOCATION _____

POWER DISCONNECT MEANS _____, LOCATION _____, LOCKOUT _____

SECONDARY (STANDBY) POWER _____ STORAGE BATTERY, AMP-HOUR RATING _____

CALCULATED CAPACITY TO OPERATE SYSTEM, IN HOURS: 4 _____ 24 _____ 60 _____

BATTERY TYPE:

☐ DRY CELL ☐ NICKEL CADMIUM ☐ SEALED LEAD ACID ☐ LEAD ACID ☐ OTHER _____

ENGINE GENERATOR DEDICATED TO THE FIRE ALARM SYSTEM POWER CIRCUIT ☐ YES ☐ NO

TRANSIENT SUPPRESSION:

120V CIRCUIT DEVICE TYPE: _____ QTY. _____ LOCATION: _____

INITIATION CIRCUIT TYPE: _____ QTY. _____ LOCATION: _____

AUDIO CIRCUIT TYPE: _____ QTY. _____ LOCATION: _____

VISUAL CIRCUIT TYPE: _____ QTY. _____ LOCATION: _____

SIGNALING LINE CIRCUIT TYPE: _____ QTY. _____ LOCATION: _____

OTHER: _____

A transient suppression device (listed for operation with the system) is required for each circuit that exits or enters a building. The device shall be mounted in a junction box at the point of exit and entry. Label each circuit being protected.

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IS THE SPRINKLER OR SUPPRESSION SYSTEM (IF EXISTING) MONITORED: ☐ YES ☐ NO
IS THE DACT A FOUR CHANNEL, DUAL LINE DACT (REQUIRED FOR SPRINKLER) ☐ YES ☐ NO
IS THE DACT POWER FROM THE CONTROL PANEL ☐ YES ☐ NO
IS THE POWER SUPERVISED ☐ YES ☐ NO
IS THERE A DEDICATED PRIMARY PHONE LINE ☐ YES ☐ NO
IS THERE A SECONDARY PHONE LINE ☐ YES ☐ NO
DACT MANUFACTURER: _____ MODEL NO.: _____

NAME OF CENTRAL STATION: _____ POINT OF CONTACT: _____

ADDRESS: _____

ACCOUNT # _____ PHONE: _____ FAX: _____
DATE CONTRACT STARTED: _____ DATE CONTRACT DEFAULTS: _____

LIST NAME AND PHONE NO. OF EACH PERSON(S) TO BE CONTACTED BY THE CENTRAL STATION:

NOTED DACT DEFICIENCIES AND/OR COMMENTS:

NOTE: The comment portions of this form are required to have an entry. If a deficiency does not exist then the Technician shall enter "A deficiency has not been noted."

PART 4 INITIATION DEVICES AND INITIATING, OR SIGNALING CIRCUIT TYPE

Initiating devices, are those system(s) devices which *initiate* an alarm or supervisory condition. An Initiating Device Circuit (IDC) is a *hard-wired* (non-addressable) circuit(s), which employees initiating (non-addressable) devices, to send an alarm condition to the fire panel. A Signaling Line Circuit (SLC) is a circuit(s) which employees *addressable* initiating devices (for the purpose of this section). A fire system configuration may consist of both *hard-wired* and *addressable* circuits. Additional information is available to complete this section, in the NFPA 72, Section 23.5 and 12.3 for IDC hardwired circuits and Section 23.6 and 12.3 for SLC addressable signaling line circuits. Check those boxes below that apply to the initiating devices and circuits. PART 6 of this report is for panel to panel communications and/or LCD/Printer communications. In filling out the device chart below wire class should be either "Class A", "Class B", or "Class X".

ADDRESSABLE SYSTEM, SIGNALING LINE CIRCUIT (SLC):

☐ ADDRESSABLE ☐ (CLASS A) ☐ (CLASS B) ☐ (CLASS X)

TOTAL QTY. OF ADDRESSABLE CIRCUITS _____ EACH CIRCUIT CAPACITY (MAX) _____

QTY. OF SPARE ADDRESSABLE POINTS _____ ON CIRCUIT(S) _____

PANEL CAPACITY FOR ADDITIONAL MODULES _____

ADDRESSABLE SYSTEM SOFTWARE: _____

REVISION NUMBER: _____

REVISION DATE: _____

FAA Life Safety System Inspection & Test Report

ALARM INITIATING, SUPERVISORY & CONTROL DEVICE INFORMATION:

Information of the fire alarm Circuits, Class and Style is noted below. For additional guidance regarding the characteristics of each circuit noted, refer to 12.3 and 23.6 for SLC in NFPA 72.

SYSTEM POINT OR DEVICE TYPE	QUANTITY OF DEVICE TYPE:	WIRE CLASS: (A, B, or X)	CIRCUIT NUMBER:
--------------------------------	--------------------------------	--------------------------------	--------------------

ADDRESSABLE SYSTEM:

MANUAL STATIONS	_____	_____	_____
IONIZATION DETECTORS	_____	_____	_____
PHOTOELECTRIC DETECTORS	_____	_____	_____
ION DUCT DETECTORS	_____	_____	_____
PHOTO DUCT DETECTORS	_____	_____	_____
FIXED TEMP HEAT DETECTORS	_____	_____	_____
R OF R HEAT DETECTORS	_____	_____	_____
RATE COMPENSATED DETECTORS	_____	_____	_____
MONITOR OR CONTROL MODULE FOR:	_____	_____	_____
FIXED TEMP HEAT DETECTOR	_____	_____	_____
BEAM DETECTORS	_____	_____	_____
UV/IR DETECTORS	_____	_____	_____
COMBINATION DETECTOR	_____	_____	_____
WATERFLOW ALARM SWITCH	_____	_____	_____
WATER SUPERVISORY SWITCH	_____	_____	_____
POST INDICATOR VALVE	_____	_____	_____
WATER SYSTEM AIR PRESSURE	_____	_____	_____
SUPPRESSION PANEL ALARM	_____	_____	_____
SUPPRESSION PANEL TROUBLE	_____	_____	_____
SUPPRESSION PANEL RELEASE	_____	_____	_____
SUPPRESSION PRESSURE SWITCH	_____	_____	_____
SUPPRESSION SUPERVISORY	_____	_____	_____
SECURITY CONTACT	_____	_____	_____
STAIRWELL PRESSURIZATION FAN ON	_____	_____	_____
STAIRWELL PRESSURIZATION FAN OFF	_____	_____	_____
STAIRWELL PRESSURIZATION MANUAL	_____	_____	_____
EMERGENCY GENERATOR ON	_____	_____	_____
EMERGENCY GENERATOR OFF	_____	_____	_____
ELEVATOR RECALL (PRIMARY)	_____	_____	_____
ELEVATOR RECALL (SECONDARY)	_____	_____	_____
FIRE PUMP POWER	_____	_____	_____
FIRE PUMP TROUBLE	_____	_____	_____
FIRE PUMP AUTO.	_____	_____	_____
FIRE PUMP RUNNING	_____	_____	_____
FIRE PUMP OFF	_____	_____	_____
FIE PUMP PHASE REFFERSAL	_____	_____	_____
OTHER ALARM _____	_____	_____	_____
OTHER TROUBLE _____	_____	_____	_____
OTHER SUPERVISORY _____	_____	_____	_____
OTHER _____	_____	_____	_____

HARDWIRED SYSTEM, INITIATING DEVICE AND SUPERVISORY CIRCUIT (IDC):

<input type="checkbox"/> HARDWIRED	<input type="checkbox"/> CLASS A	<input type="checkbox"/> CLASS B
TOTAL QTY. OF HARDWIRED CIRCUITS _____	QTY. OF SPARE CIRCUITS _____	

PANEL CAPACITY FOR ADDITIONAL ZONE MODULES _____

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ALARM INITIATING & SUPERVISORY DEVICE INFORMATION:

Information of the fire alarm Circuits, Class and Style is noted below. For additional guidance regarding the characteristics of each circuit noted, refer to 12.3 and 23.5 for IDC in NFPA 72.

SYSTEM POINT OR DEVICE TYPE TYPE:	QUANTITY OF DEVICE (A or B)	WIRE CLASS: (Letter)	CIRCUIT OR ZONE
HARDWIRED SYSTEM:			
MANUAL STATIONS	_____	_____	_____
IONIZATION DETECTORS	_____	_____	_____
PHOTOELECTRIC DETECTORS	_____	_____	_____
ION DUCT DETECTORS	_____	_____	_____
PHOTO DUCT DETECTORS	_____	_____	_____
FIXED TEMP HEAT DETECTORS	_____	_____	_____
R OF R HEAT DETECTORS	_____	_____	_____
RATE COMPENSATED DETECTORS	_____	_____	_____
FIXED TEMP HEAT DETECTOR	_____	_____	_____
BEAM DETECTORS	_____	_____	_____
UV/IR DETECTORS	_____	_____	_____
COMBINATION DETECTOR	_____	_____	_____
WATERFLOW ALARM SWITCH	_____	_____	_____
WATER SUPERVISORY SWITCH	_____	_____	_____
POST INDICATOR VALVE	_____	_____	_____
WATER SYSTEM AIR PRESSURE	_____	_____	_____
SUPPRESSION PANEL ALARM	_____	_____	_____
SUPPRESSION PANEL TROUBLE	_____	_____	_____
SUPPRESSION PANEL RELEASE	_____	_____	_____
SUPPRESSION PRESSURE SWITCH	_____	_____	_____
SUPPRESSION SUPERVISORY	_____	_____	_____
SECURITY CONTACT	_____	_____	_____
STAIRWELL PRESSURIZATION FAN ON	_____	_____	_____
STAIRWELL PRESSURIZATION FAN OFF	_____	_____	_____
STAIRWELL PRESSURIZATION MANUAL	_____	_____	_____
EMERGENCY GENERATOR ON	_____	_____	_____
EMERGENCY GENERATOR OFF	_____	_____	_____
ELEVATOR RECALL (PRIMARY)	_____	_____	_____
ELEVATOR RECALL (SECONDARY)	_____	_____	_____
FIRE PUMP POWER	_____	_____	_____
FIRE PUMP TROUBLE	_____	_____	_____
FIRE PUMP AUTO	_____	_____	_____
FIRE PUMP RUNNING	_____	_____	_____
FIRE PUMP OFF	_____	_____	_____
FIE PUMP PHASE REFFERSAL	_____	_____	_____
OTHERALARM_____	_____	_____	_____
OTHER TROUBLE_____	_____	_____	_____
OTHER SUPERVISORY_____	_____	_____	_____
OTHER_____	_____	_____	_____

NOTED SIGNALING DEVICE CIRCUIT (SLC), INITIATING DEVICE CIRCUIT (IDC) AND INITIATING DEVICE OR SUPERVISORY DEVICE DEFICIENCIES AND COMMENTS:

This image shows a blank sheet of white paper with horizontal ruling lines. The lines are evenly spaced and run across the width of the page. There are no margins, text, or other markings on the paper.

PART 5 NOTIFICATION APPLIANCE CIRCUIT (NAC)

1. ANSI S3.41, *American National Standard Audible Emergency Evacuation Signal*, which requires that the fire alarm signals be *distinctive* in sound from other signals and not to be used for any other purpose. See NFPA 72, 18.4.2

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2. The use of the three-pulse temporal pattern fire alarm evacuation signal has been adopted by both the American National Standard, ANSI S3.41 (as referenced above) and International Standard, ISO 8201, *Audible Emergency Evacuation Signal*. Information regarding performance, location, and mounting of Notification Appliance(s) is available in NFPA 72, Chapter 6. For control and power supplies refer to Chapter 1 and Chapter 3.

VISUAL STROBE DEVICES:

Strobes shall be UL *labeled* and the label shall indicate compliance with UL 1971, *Signaling Applications for the Hearing Impaired*. Further details are available in the NFPA 72, Chapter 18.4, regarding strobe flash rate and intensity. Spacing information, for strobe placement in room, is available in the NFPA 72 Paragraph 18.5.4, Tables 18.5.4.3.1(a), 18.5.4.3.1(b), and Figures 18.5.4.3.1. Spacing information for strobe placement in corridors is available in Chapter 18.5.4.4.

STROBE CIRCUIT NUMBER	STROBE CIRCUIT CLASS: (A or B)	IS CIRCUIT SUPERVISED AS REQUIRED PER NFPA 72:	QTY. OF STROBES PER CIRCUIT:	POWER (AMPS) REQUIRED TO DRIVE CIRCUIT:
# 1	_____	_____	_____	_____
# 2	_____	_____	_____	_____
# 3	_____	_____	_____	_____
# 4	_____	_____	_____	_____
# 5	_____	_____	_____	_____
# 6	_____	_____	_____	_____
# 7	_____	_____	_____	_____
# 8	_____	_____	_____	_____
# 9	_____	_____	_____	_____
# 10	_____	_____	_____	_____
# 11	_____	_____	_____	_____
# 12	_____	_____	_____	_____
# 13	_____	_____	_____	_____
# 14	_____	_____	_____	_____
# 15	_____	_____	_____	_____
# 16	_____	_____	_____	_____
# 17	_____	_____	_____	_____
# 18	_____	_____	_____	_____
# 19	_____	_____	_____	_____
# 20	_____	_____	_____	_____
# 21	_____	_____	_____	_____
# 22	_____	_____	_____	_____
# 23	_____	_____	_____	_____
# 24	_____	_____	_____	_____
# 25	_____	_____	_____	_____
# 26	_____	_____	_____	_____
# 27	_____	_____	_____	_____
# 28	_____	_____	_____	_____
# 29	_____	_____	_____	_____
# 30	_____	_____	_____	_____

TOTAL POWER (IN AMPS) CONSUMED BY THE VISUAL CIRCUIT(S) _____
 POWER (IN AMPS) AVAILABLE AT THE CONTROL PANEL FOR THE CIRCUIT(S) _____
 IS ADEQUATE BATTERY BACK-UP PROVIDED FOR THE CIRCUITS LISTED _____
 ARE THE CIRCUITS LISTED POWERED BY ONE FIRE CONTROL PANEL _____
 ARE ADDITIONAL PANELS EMPLOYED TO PROVIDE CIRCUIT POWER _____
 ARE THE ADDITIONAL PANELS SUPERVISED BY THE MAIN PANEL _____
 ARE THE ADDITIONAL PANELS PROTECTED WITH A SYSTEM DETECTOR _____
 ARE THE ADDITIONAL PANELS EQUIPPED WITH BATTERY BACK-UP _____
 IS ADEQUATE BATTERY BACK-UP PROVIDED FOR THE PANELS _____

☐ YES ☐ NO
☐ YES ☐ NO
☐ YES ☐ NO
☐ YES ☐ NO
☐ YES ☐ NO
☐ YES ☐ NO
☐ YES ☐ NO
☐ YES ☐ NO

[illegible]

FAA Life Safety System Inspection & Test Report

For areas of general occupancy, Audible signals shall have a sound level of not less than 75 dBA at a distance of 10 feet from the audio device. The sound level of the audio device shall be 15 dBA above the average ambient sound level or 5 dBA above the maximum sound level having a duration of at least 60 seconds (whichever is greater), measured 5 feet from above the floor in the occupiable area. The sound level of an audio device shall not exceed 110 dBA. Refer to NFPA 72, Chapter 18.4.8 for audio device location.

AUDIO CIRCUIT NUMBER	AUDIO CIRCUIT CLASS: (A or B)	IS CIRCUIT SUPERVISED AS REQUIRED PER NFPA 72:	QTY. OF DEVICES PER CIRCUIT:	POWER (AMPS) REQUIRED TO DRIVE CIRCUIT:
# 1	_____	_____	_____	_____
# 2	_____	_____	_____	_____
# 3	_____	_____	_____	_____
# 4	_____	_____	_____	_____
# 5	_____	_____	_____	_____
# 6	_____	_____	_____	_____
# 7	_____	_____	_____	_____
# 8	_____	_____	_____	_____
# 9	_____	_____	_____	_____
# 10	_____	_____	_____	_____
# 11	_____	_____	_____	_____
# 12	_____	_____	_____	_____
# 13	_____	_____	_____	_____
# 14	_____	_____	_____	_____
# 15	_____	_____	_____	_____
# 16	_____	_____	_____	_____
# 17	_____	_____	_____	_____
# 18	_____	_____	_____	_____
# 19	_____	_____	_____	_____
# 20	_____	_____	_____	_____
# 21	_____	_____	_____	_____
# 22	_____	_____	_____	_____
# 23	_____	_____	_____	_____
# 24	_____	_____	_____	_____
# 25	_____	_____	_____	_____
# 26	_____	_____	_____	_____
# 27	_____	_____	_____	_____
# 28	_____	_____	_____	_____
# 29	_____	_____	_____	_____
# 30	_____	_____	_____	_____

TOTAL POWER (IN AMPS) CONSUMED BY THE AUDIO CIRCUIT(S) _____

POWER (IN AMPS) AVAILABLE AT THE CONTROL PANEL FOR THE CIRCUIT(S) _____

IS ADEQUATE BATTERY BACK-UP PROVIDED FOR THE CIRCUITS LISTED

☐ YES ☐ NO

ARE THE CIRCUITS LISTED POWERED BY ONE FIRE CONTROL PANEL

☐ YES ☐ NO

ARE ADDITIONAL PANELS EMPLOYED TO PROVIDE CIRCUIT POWER

☐ YES ☐ NO

ARE THE ADDITIONAL PANELS SUPERVISED BY THE MAIN PANEL

☐ YES ☐ NO

ARE THE ADDITIONAL PANELS PROTECTED WITH A SYSTEM DETECTOR

☐ YES ☐ NO

ARE THE ADDITIONAL PANELS EQUIPPED WITH BATTERY BACK-UP

☐ YES ☐ NO

IS ADEQUATE BATTERY BACK-UP PROVIDED FOR THE THOSE PANELS

☐ YES ☐ NO

ADDITIONAL PANELS EQUIPPED WITH SURGE SUPPRESSION

☐ YES ☐ NO

ARE AUDIO DEVICES INSTALLED THROUGHOUT THE FACILITY *

☐ YES ☐ NO

ARE AUDIO DEVICES INSTALLED IN ONLY A PORTION OF THE FACILITY

☐ YES ☐ NO

ARE THE AUDIO DEVICES ALL OF THE SAME TYPE (HORN, BELLS, CHIMES, ETC)

☐ YES ☐ NO

ARE THE AUDIO DEVICES COMPLIANT WITH NFPA 72

☐ YES ☐ NO

ARE THERE ANY SPARE AUDIO/VISUAL CIRCUITS AVAILABLE ON THE SYSTEM

☐ YES ☐ NO

FAA Life Safety System Inspection & Test Report

* Note the exceptions allowed for Tower Cabs, TRACON Rooms, Control Rooms, etc.

For additional circuits fill out another page 10 and 11 of this form and attach.

NOTED AUDIO APPLIANCE AND/OR NOTIFICATION APPLIANCE CIRCUIT DEFICIENCIES AND COMMENTS:

[illegible]

NOTE: The comment portions of this form are required to have an entry. If a deficiency does not exist then the Technician shall enter "A deficiency has not been noted."

PART 6

REMOTE ANNUNCIATION TYPE & CIRCUIT

Check those boxes that apply.

- ☐ ADDRESSABLE ALPHA/NUMERIC
☐ GRAPHIC ANNUNCIATOR
☐ CLASS A
☐ SERIAL PRINTER(S) QTY.

- ☐ HARDWIRED ALPHA/NUMERIC
☐ HARDWIRED DIRECTORY ANNUNCIATOR
☐ CLASS B
☐ OTHER

ARE THE ANNUNCIATION DEVICES SUPERVISED

ENTRY EQUIPPED WITH AN ANNUNCIATOR

ANNUNCIATORS EQUIPPED WITH AN ALARM SILENCE

ANNUNCIATORS EQUIPPED WITH A SYSTEM RESET SWITCH

<input type="checkbox"/> YES	<input type="checkbox"/> NO
<input type="checkbox"/> YES	<input type="checkbox"/> NO
<input type="checkbox"/> YES	<input type="checkbox"/> NO
<input type="checkbox"/> YES	<input type="checkbox"/> NO

FAA Life Safety System Inspection & Test Report

ADDRESSABLE SYSTEM ANNUNCIATORS EQUIPPED WITH ACKNOWLEDGE

☐ YES ☐ NO

NOTED REMOTE ANNUNCIATOR DEFICIENCIES AND COMMENTS:

NOTE: The comment portions of this form are required to have an entry. If a deficiency does not exist then the Technician shall enter "A deficiency has not been noted."

PART 7

VOICE EVACUATION SYSTEM CONTROLS AND DEVICES

VOICE EVACUATION SYSTEM CONTROLS:

VOICE PANEL LOCATION:

PANEL MANUFACTURER: _____ MODEL NO.: _____

DOES THE PANEL APPEAR TO BE OPERATING PROPERLY (NORMAL CONDITION)

☐ YES ☐ NO

IS THE PANEL EQUIPPED WITH A MIC.

☐ YES ☐ NO

IS THE PANEL EQUIPPED WITH A FIRE PHONE SYSTEM

☐ YES ☐ NO

ARE EXTRA FIRE PHONES AVAILABLE QTY. _____

☐ YES ☐ NO

ARE ALL CIRCUITS SUPERVISED

☐ YES ☐ NO

IS A SYSTEM SMOKE DETECTOR PROTECTING THE PANEL

☐ YES ☐ NO

IS ADEQUATE BATTERY BACK-UP PROVIDED AS PER NFPA 72

☐ YES ☐ NO

IS SURGE SUPPRESSION PROVIDED AT THE 110 VOLT AC CIRCUIT

☐ YES ☐ NO

IS THE 110 VOLT CIRCUIT PERMANENTLY LABELED "FIRE ALARM"

☐ YES ☐ NO

IS THE SYSTEM EQUIPPED WITH BACK-UP AMPLIFIERS

☐ YES ☐ NO

IS THERE MORE THAN ONE VOICE SYSTEM PANEL

☐ YES ☐ NO

IS THE VOICE MESSAGE AUDIBLE

☐ YES ☐ NO

IS THE VOICE MESSAGE APPLICABLE TO THE FACILITIES NEEDS

☐ YES ☐ NO

PANEL POWER SUPPLY, PRIMARY (MAIN), NOMINAL VOLTAGE _____, AMPS _____

OVERCURRENT PROTECTION, TYPE _____, AMPS _____, LOCATION _____

POWER DISCONNECT MEANS _____, LOCATION _____, LOCKOUT _____

SECONDARY (STANDBY) POWER _____ STORAGE BATTERY, AMP-HOUR RATING _____

CALCULATED CAPACITY TO OPERATE SYSTEM, IN HOURS: 4 _____ 24 _____ 60 _____

BATTERY TYPE:

☐ DRY CELL ☐ NICKEL CADMIUM ☐ SEALED LEAD ACID ☐ LEAD ACID ☐ OTHER _____

TRANSIENT SUPPRESSION:

120V CIRCUIT DEVICE TYPE:

QTY.

LOCATION:

AUDIO CIRCUIT TYPE:

QTY.

LOCATION:

Additional information regarding Voice system requirements is available in the NFPA 72, Chapter 24.

VOICE CIRCUIT NUMBER	VOICE CIRCUIT CLASS: (A or B)	IS CIRCUIT SUPERVISED AS REQUIRED PER NFPA 72:	QTY. OF DEVICES PER CIRCUIT:	POWER (WATTS) REQUIRED TO DRIVE CIRCUIT:
# 1	_____	_____	_____	_____
# 2	_____	_____	_____	_____
# 3	_____	_____	_____	_____
# 4	_____	_____	_____	_____
# 5	_____	_____	_____	_____

FAA Life Safety System Inspection & Test Report

# 6	_____	_____	_____	_____
# 7	_____	_____	_____	_____
# 8	_____	_____	_____	_____
# 9	_____	_____	_____	_____
# 10	_____	_____	_____	_____
# 11	_____	_____	_____	_____
# 12	_____	_____	_____	_____
# 13	_____	_____	_____	_____
# 14	_____	_____	_____	_____
# 15	_____	_____	_____	_____
# 16	_____	_____	_____	_____
# 17	_____	_____	_____	_____
# 18	_____	_____	_____	_____
# 19	_____	_____	_____	_____
# 20	_____	_____	_____	_____
# 21	_____	_____	_____	_____
# 22	_____	_____	_____	_____
# 23	_____	_____	_____	_____
# 24	_____	_____	_____	_____
# 25	_____	_____	_____	_____

TOTAL POWER (IN WATTS) REQUIRED BY THE AUDIO CIRCUIT(S) _____

POWER (IN WATTS) AVAILABLE AT THE VOICE PANEL FOR THE CIRCUIT(S) _____

IS THE PANEL(S) SUPERVISED BY THE MAIN PANEL

☐ YES ☐ NO

IS ADEQUATE BATTERY BACK-UP PROVIDED FOR THE CIRCUITS LISTED

☐ YES ☐ NO

IS THE PANEL UL CROSS LISTED WITH THE FIRE CONTROL PANEL

☐ YES ☐ NO

IS THE PANEL EQUIPPED WITH MANUAL ZONE SELECTION SWITCHES

☐ YES ☐ NO

ARE ADDITIONAL PANELS EMPLOYED TO PROVIDE CIRCUIT POWER

☐ YES ☐ NO

ARE THE ADDITIONAL PANELS PROTECTED WITH A SYSTEM DETECTOR

☐ YES ☐ NO

ARE THE ADDITIONAL PANELS EQUIPPED WITH BATTERY BACK-UP

☐ YES ☐ NO

IS ADEQUATE BATTERY BACK-UP PROVIDED FOR THE THOSE PANELS

☐ YES ☐ NO

ADDITIONAL PANELS EQUIPPED WITH SURGE SUPPRESSION

☐ YES ☐ NO

ARE AUDIO DEVICES INSTALLED THROUGHOUT THE FACILITY *

☐ YES ☐ NO

ARE AUDIO DEVICES INSTALLED IN ONLY A PORTION OF THE FACILITY

☐ YES ☐ NO

ARE THE AUDIO DEVICES ALL POWER TAPPED THE SAME

☐ YES ☐ NO

ARE THERE ANY SPARE AUDIO CIRCUITS AVAILABLE ON THE SYSTEM

☐ YES ☐ NO

* Note Audio Devices are not to be installed in Tower Cabs, TRACON Rooms, Control Rooms, ETC.

For additional circuits fill out another page 13 of this form and attach.

NOTED AUDIO APPLIANCE AND/OR NOTIFICATION APPLIANCE CIRCUIT DEFICIENCIES AND COMMENTS:

[illegible]**ADDITIONAL NOTATIONS OF THE ANNUAL FIRE SYSTEM INSPECTION AND TEST:**[illegible]

The Annual Inspection and Test of the above noted system(s), at the above noted FAA facility was performed as per the following: FAA ORDER, 6930.1B, Fire Prevention and Maintenance of Fire Protection Equipment, 6470.5A, Maintenance of Air Route Traffic Control Center Environmental Systems, 6480.8A, Maintenance of Airport Traffic Control Towers, 3900.19B, the Occupational Safety and Health Administration, the National Fire Protection Association, the National Fire Alarm Code, and the recommendations of the System Manufacturer. Upon completion this form shall be filed with each individual noted below and the FAA Regional Safety Office.

Updated 12/15/10

FAA Life Safety System Inspection & Test Report

Date: _____ Time: _____ Signature: _____
NICET Cert. #: _____ Printed Name and Title: _____
Employed by: _____ Phone Number: _____
State License or other Credentials: _____

FAA Individual whom witnessed the Fire System returned to normal operation.

Date: _____ Time: _____ Signature: _____
Printed Name and Title: _____

The individuals listed below, with their signatures, affirm that the Fire Life Safety System(s) noted above have been restored to an operational condition. If upon completion of this test an acceptable level of protection is in question, due to the deficiencies noted, then immediate action shall be taken to correct all the deficiencies. A retest of the defective device(s) or system operation(s) shall be required. Appropriate action shall be taken to insure the safety of the facilities individuals and operations during any system repairs and/or service. The responsible FAA Safety Individual shall provide the facilities Manager with Fire Watch training and information if required to insure a continued safe operation during the repairs and service.

By Technician performing the annual test and inspection.

Date: _____ Time: _____ Signature: _____
NICET Cert. #: _____ Printed Name and Title: _____
Employed by: _____ Phone Number: _____
State License or other Credentials: _____

FAA Individual whom witnessed the Fire System returned to normal operation.

Date: _____ Time: _____ Signature: _____
Printed Name and Title: _____

Authority having Jurisdiction and/or approving authority:
Name and Title: _____ Phone: _____ FAX: _____

Representing: _____ Signature: _____

Local Fire Department: _____ Phone: _____ FAX: _____

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FAA Fire Alarm System Certificate of Completion

PROTECTED PROPERTY:

ADDRESS:

FAA CONTACT:

TELEPHONE: (____) _____ FAX: (____)

SYSTEM INSTALLER:

ADDRESS:

REPRESENTATIVE: _____ NICET CERT.#:

TELEPHONE: (____) _____ FAX: (____)

SYSTEM SUPPLIER:

ADDRESS:

REPRESENTATIVE:

TELEPHONE: (____) _____ FAX: (____)

SERVICE ORGANIZATION:

ADDRESS:

REPRESENTATIVE: _____ NICET CERT.#:

TELEPHONE: (____) _____ FAX: (____)

Location of AS BUILT Drawings: _____

Location of OWNER'S MANUAL: _____

Location of TEST REPORTS: _____

FAA Fire Alarm System Certificate of Completion

Parts 1 and 3 through 9 of this Certification shall be completed after the system is installed and the installation wiring has been checked. Part 2 shall be completed after the operational acceptance tests (FAA, Life Safety System Inspection & Test Report) have been completed and approved by the FAA Safety Office. A preliminary copy of this certificate shall be given to the FAA Resident Engineer and to the authority having jurisdiction who will witness operational acceptance tests. A final copy with all signatures after completion of final operational acceptance tests shall be delivered to the FAA COR

PART 1. CERTIFICATION OF SYSTEM INSTALLATION

The system was installed and inspected by:

Name & Title: _____ Company: _____ on _____ and found to comply with the installation requirements of the FAA project drawings, specifications, and the installation requirements of the NFPA Codes and Standards Referenced, to include all associated appendix sections. The Technician or Electrician, who's signature appears below shall initial each of the following designated spaces below. The initials certify that the required documents have been complied with.

NFPA 72 National Fire Alarm Code 2010 Edition

_____ Chapter 10 Fundamentals

_____ Chapter 10.18 Documentation

_____ Chapter 23 Protected Premises Fire Alarm Systems

_____ Chapter 26.4 Proprietary Supervising Station Systems

_____ Chapter 26.6 Digital Alarm Communicator Systems

_____ Chapter 17 Initiating Devices

_____ Chapter 18 Notification Appliances for Fire Alarm Systems

_____ Chapter 14 Inspection, Testing and Maintenance

_____ Article 760 of NFPA 70 2011 Edition, National Electrical Code

_____ Chapter 5 and Chapter 6 of NFPA 90A 2009 Edition, Standard for the Installation of Air Conditioning and Ventilating Systems

_____ Manufacturer's Guidelines Recommendations and Instructions

_____ FAA Project Specifications, Drawings, Written Instructions and Change Orders

=====

FAA Fire Alarm System Certificate of Completion

All operational features and functions of this system were inspected and tested by:

Name & Title: _____ Company: _____ on _____ and found to comply with the installation requirements of the FAA project drawings, specifications written instructions, change orders, and the installation requirements of the NFPA Codes and Standards Referenced, to include associated appendix. The system was found to be operating properly in accordance with the requirements of NFPA 72 National Fire Alarm Code, 2010 Edition. The Technician who's signature appears below shall initial each of the following designated spaces below. The initials certify that the required documents have been complied with:

NFPA 72 National Fire Alarm Code 2010 Edition

_____ Chapter 10 Fundamentals of Fire Alarm Systems

_____ Chapter 23 Protected Premises Fire Alarm Systems

_____ Chapter 26.4 Proprietary Supervising Station Systems

_____ Chapter 26.6 Digital Alarm Communicator Systems

_____ Chapter 17 Initiating Devices

_____ Chapter 18 Notification Appliances for Fire Alarm Systems

_____ Chapter 14 Inspection, Testing, and Maintenance

_____ Article 760 of NFPA 70 2011 Edition, National Electrical Code

_____ Chapter 5 and Chapter 6 of NFPA 90A 2009 Edition, Standard for the Installation of Air Conditioning and Ventilating Systems

_____ Manufacturer's Guidelines Recommendations and Instructions

_____ FAA Project Specifications, Drawings, Written Instructions and Change Orders

Configuration of Control Panel Jumper(s):

Is the Control Panel equipped with a Jumper that is capable of disabling detection of Ground Fault conditions YES _____ NO _____

Provide a description of the location and the position required for detecting system ground faults:

Is the Control Panel equipped with other field configured Jumpers YES _____ NO _____

Note each Jumper and it's current configuration below:

Note: Contractor may provide a panel schematic diagram with highlighted jumpers) configuration(s) noted in lieu of the above.

Enter location(s) of off premise monitoring station:

FAA Fire Alarm System Certificate of Completion

Central Station Name: _____

Address: _____

Central Station Supervisor:

Name: _____ Title: _____

Account #: _____ Phone: (____) _____ FAX: (____) _____

Part 4. **ALARM INITIATING DEVICE CIRCUITS**

See NFPA 72 Chapter 23.5 Performance of Initiating Device Circuits (IDC):

Crt. # 1	_____	_____	_____
	Device Qty	Building Location	Class/Style
Crt. #2	_____	_____	_____
	Device Qty	Building Location	Class/Style
Crt. #3	_____	_____	_____
	Device Qty	Building Location	Class/Style
Crt. #4	_____	_____	_____
	Device Qty	Building Location	Class/Style
Crt. #5	_____	_____	_____
	Device Qty	Building Location	Class/Style
Crt. #6	_____	_____	_____
	Device Qty	Building Location	Class/Style
Crt. #7	_____	_____	_____
	Device Qty	Building Location	Class/Style
Crt. #8	_____	_____	_____
	Device Qty	Building Location	Class/Style
Crt. #9	_____	_____	_____
	Device Qty	Building Location	Class/Style
Crt. #10	_____	_____	_____
	Device Qty	Building Location	Class/Style
Crt. #11	_____	_____	_____
	Device Qty	Building Location	Class/Style

Types and quantities of alarm/supervisory initiating devices installed. Check type devices installed, indicate circuit # and quantity of devices:

Qty.		Circuit #(s)
_____	Manual Stations	_____
_____	Photo Smoke Detectors	_____

FAA Fire Alarm System Certificate of Completion

___ Ion Smoke Detectors	_____
___ Fixed Temp Heat Detectors	_____
___ R of R Heat Detectors	_____
___ Rate Comp. Heat Detectors	_____
___ Photo Duct Detectors	_____
___ Ion Duct Detectors	_____
___ Sprinkler Water Flow Switches	_____
___ Sprinkler Tamper Switches	_____
___ Sprinkler PIV Switch	_____
___ Water System Air Pressure	_____
___ Suppression Panel Alarm	_____
___ Suppression Panel Trouble	_____
___ Suppression Panel Agent Release	_____
___ Supplemental Fire Panel Alarm	_____
___ Supplemental Fire Panel Trouble	_____
___ Beam Detectors (Xmtr/Rcvr Pair)	_____
___ Flame Detectors	_____
___ Kitchen Hood Extinguishing System	_____
___ Security Contact	_____
___ Fire Pump	_____
___ Engine Generator	_____
___ Other _____	_____

Part 5. ALARM NOTIFICATION APPLIANCES AND CIRCUITS

Quantity of Notification Appliance Circuits (NAC) connected to system and type of Evacuation Signal:

1 / ___/___/___/___	5 / ___/___/___/___	9 / ___/___/___/___
2 / ___/___/___/___	6 / ___/___/___/___	10 / ___/___/___/___
3 / ___/___/___/___	7 / ___/___/___/___	11 / ___/___/___/___
4 / ___/___/___/___	8 / ___/___/___/___	12 / ___/___/___/___

Number/Quantity of Devices/Class/Style/Amps or Watts (see Chapter 23.7 NFPA 72).

General Alarm ___ Temporal Code ___ Voice Evac ___ Fire Phone ___ Other ___

Audible Devices:

Note type and list quantities of alarm indicating appliances (Circuit #/Qty)

___ Bells, 6" ___ 10" ___ for notification of Sprinkler System flow on NAC # ___/___, ___/___

FAA Fire Alarm System Certificate of Completion

___ Horns, Electronic ___ Vibrating ___ on NAC# ___/___, ___/___, ___/___, ___/___, ___/___
___ Chimes, Electronic ___ Mechanical ___ on NAC # ___/___, ___/___, ___/___, ___/___
___ Mini-Horns on NAC # ___/___, ___/___, ___/___, ___/___, ___/___, ___/___, ___/___
___ Other _____ on NAC # ___/___, ___/___, ___/___, ___/___, ___/___, ___/___

Speakers:

___ .25 Watt Speakers on NAC# ___/___, ___/___, ___/___, ___/___, ___/___, ___/___, ___/___
___ .5 Wan Speakers on NAC# ___/___, ___/___, ___/___, ___/___, ___/___, ___/___, ___/___
___ .75 Watt Speakers on NAC# ___/___, ___/___, ___/___, ___/___, ___/___, ___/___, ___/___
___ 1.0 Watt Speakers on NAC# ___/___, ___/___, ___/___, ___/___, ___/___, ___/___, ___/___
___ 1.5 Watt Speaker on NAC# ___/___, ___/___, ___/___, ___/___, ___/___, ___/___, ___/___
___ 2.0 Watt Speakers on NAC# ___/___, ___/___, ___/___, ___/___, ___/___, ___/___, ___/___
___ ___ Watt Speaker on NAC# ___/___, ___/___, ___/___, ___/___, ___/___, ___/___, ___/___

_____ tone for Pre-Alert
_____ tone for Evacuation
_____ tone for All Clear
_____ tone for _____

Strobes:

___ Visual Lights on NAC# ___/___, ___/___, ___/___, ___/___, ___/___, ___/___, ___/___
___ Incandescent Red Lense on NAC# ___/___, ___/___, ___/___, ___/___, ___/___, ___/___, ___/___
___ Xenon Strobe (ADA) ___ Candela on NAC # ___ Candela on NAC # ___
___ Candela on NAC # ___, ___ Candela on NAC # ___, ___ Candela on NAC # ___

Check the appropriate circuit configuration.

___ Audible/Visual Circuits Combined ___ Audible Circuits Separate ___ Visual Circuits Separate
___ Audible Devices turn off upon Alarm Silence Only ___ Visual Devices turn off upon System RESET

Part 6. SIGNALING LINE CIRCUITS AND DEVICES

See NFPA 72 Chapter 23.6 Performance of Signaling Line Circuits (SLC), note Device Quantity, Circuit Capacity and Class (Class A, B, or X) of circuit.

SLC#1	___/___ Qty/Capacity	_____ Building Location	_____ Class
SLC#2	___/___ Qty/Capacity	_____ Building Location	_____ Class

FAA Fire Alarm System Certificate of Completion

SLC#3	____/____ Qty/Capacity	Building Location	Class
SLC#4	____/____ Qty/Capacity	Building Location	Class
SLC#5	____/____ Qty/Capacity	Building Location	Class
SLC#6	____/____ Qty/Capacity	Building Location	Class
SLC#7	____/____ Qty/Capacity	Building Location	Class
SLC#8	____/____ Qty/Capacity	Building Location	Class
SLC#9	____/____ Qty/Capacity	Building Location	Class
SLC#10	____/____ Qty/Capacity	Building Location	Class

Types and quantities of addressable initiating-supervisory devices installed . Check type devices installed, indicate circuit # and quantity of devices:

Qty.	Circuit # (s)
____ Manual Stations	_____
____ Photo Smoke Detectors	_____
____ Ion Smoke Detectors	_____
____ Fixed Temp Heat Detectors	_____
____ R of R Heat Detectors	_____
____ Rate Comp. Heat Detectors	_____
____ Photo Duct Detectors	_____
____ Ion Duct Detectors	_____
____ Sprinkler Water Flow Switches	_____
____ Sprinkler Tamper Switches	_____
____ Sprinkler PIV Switch	_____
____ Water System Air Pressure	_____
____ Suppression Panel Alarm	_____
____ Suppression Panel Trouble	_____
____ Suppression Panel Agent Release	_____
____ Supplemental Fire Panel Alarm	_____
____ Supplemental Fire Panel Trouble	_____
____ Beam Detectors (Xmtr/Rcvr Pair)	_____

FAA Fire Alarm System Certificate of Completion

<input type="checkbox"/> Flame Detectors	_____
<input type="checkbox"/> Kitchen Hood Extinguishing System	_____
<input type="checkbox"/> Security Contact	_____
<input type="checkbox"/> Fire Pump	_____
<input type="checkbox"/> Engine Generator	_____
<input type="checkbox"/> Other _____	_____

Part 7. SYSTEM POWER SUPPLIES

Primary (Main) Power Supply

Nominal Voltage _____, _____ Amps

Overcurrent Protection

Type: _____ Amps: _____

Location:

Secondary (Standby) Power Supply:

☐ Storage Battery' ☐ AH (Amp-Hr Rating) Battery Type: _____

Calculated capacity-to operate system: _____ Hour Standby _____ Minutes Alarm

☐ Fire Alarm System provided back-up power from Engine-driven generator.

Location of fuel storage: _____ Fuel Tank Capacity: _____

Emergency or Standby System used as backup to Primary Power Supply, instead of using a Secondary Power Supply:

☐ Emergency System described in NFPA 70, Article 700.

☐ Legally Required Standby System described in NFPA 70, Article 701.

☐ Optional Standby System described in NFPA 70, Article 702, which also meets the performance requirements of Article 700 or 701.

PART 8. SYSTEM DEVIATIONS FROM THE REFERENCED STANDARDS:

☐ None ☐ As Follows (describe fully)

FAA Fire Alarm System Certificate of Completion

PART 9.

CERTIFICATION SIGNATURES

The individual(s) and/or contractor(s) signatures below, with their signatures, affirm that the Fire Life Safety System(s) noted herein have been installed to an operational condition that meets or exceeds the codes and standards noted. If upon completion of this certification an acceptable level of protection is in question, due to deficiencies noted, then immediate action shall be taken to correct all the deficiencies. A re-certification of the system(s) installation and/or operation(s) shall be required at no added cost to the FAA. Appropriate action shall be taken to insure the safety of the facilities individuals and operations during any system repair(s) and/or service. The FAA Safety Individual at the CAI shall provide the AF Manager with Fire Watch information to insure a continued safe facility operation during the repairs and service. Any costs incurred as a result of providing a fire watch shall be the contractors responsibility and may be deducted from monies due under the contract. This form shall be accompanied with the required "FAA Life Safety System Inspection & Test Report" for completion of a CAI.

System Installation Contractor:

_____	_____	_____
(Signature-Title)	(NICET Certification)	(Date)
_____		_____
(Organization)		(Phone and FAX)
_____		_____
(Print Name and Title of FAA Test Witness)		(Phone and FAX)
_____		_____
(AHJ Witness)		(Phone and FAX)

System Commission Contractor:

_____	_____	_____
(Signature-Title)	(NICET Certification)	(Date)
_____		_____
(Organization)		(Phone and FAX)
_____		_____
(Print Name and Title of FAA Test Witness)		(Phone and FAX)
_____		_____
(AHJ Witness)		(Phone and FAX)

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CERTIFICATE OF SUBSTANTIAL COMPLETION (CoSC)

TO: **FEDERAL AVIATION ADMINISTRATION**

DATE OF SUBSTANTIAL COMPLETION:	PROJECT TITLE:
-	
	CONTRACT NO.
PROJECT OR SPECIFIED PART SHALL INCLUDE:	LOCATION:
	CONTRACTOR:
	NTP DATE:

The Work performed under this Contract has been inspected by authorized representatives of the FAA and Contractor and the Project (or specified part of the Project, as indicated above) is hereby declared to be substantially completed on the above date.

DEFINITION OF SUBSTANTIAL COMPLETION

The date of substantial completion of a project or specified area of a project is defined by the Contract Documents, General Conditions

A tentative list of items to be completed or corrected is appended hereto. This list may not be exhaustive, and the failure to include an item on it does not alter the responsibility of the Contractor to complete all the Work in accordance with the Contract Documents.

The Contractor accepts the above Certificate of Substantial Completion and agrees to complete and correct the items on the tentative list within the time indicated.

CONTRACTOR	(Typed)	AUTHORIZED REPRESENTATIVE	(Signature)	DATE
FAA RESIDENT ENGINEER	(Typed)	FAA RESIDENT ENGINEER	(Signature)	DATE

OWNER – FEDERAL AVIATION ADMINISTRATION

The applicable FAA AT, SSC, and SMO concurs with Substantial Completion for the purposes of maintenance and operations of the completed Work.

FAA AIR TRAFFIC REPRESENTATIVE	(Typed)	FAA AIR TRAFFIC REPRESENTATIVE	(Signature)	DATE
FAA SSC REPRESENTATIVE	(Typed)	FAA SSC REPRESENTATIVE	(Signature)	DATE
FAA SMO REPRESENTATIVE	(Typed)	FAA SMO REPRESENTATIVE	(Signature)	DATE

REMARKS:

Attached: Substantial Completion Acceptance Form (Copy)
Punchlist Dated _____
Certificate of Occupancy Dated _____ (As Required)

cc: FAA Contracting Officer
FAA Project Engineer

CERTIFICATE OF SUBSTANTIAL COMPLETION (CoSC) *(Continued)*

CONTRACT NO. _____

Concurrent with the issuance of this Certificate, the areas of responsibilities are assigned as follows:

SECURITY: _____

MAINTENANCE: _____

OPERATIONS (CLEANING/HOUSEKEEPING): _____

UTILITIES: _____

PROTECTION OF THE WORK: _____

INSURANCE: _____

HEAT: _____

COMPLETE RECORD DOCUMENTS (DATE): _____

COMPLETE O&M MANUALS (DATE): _____

DATE REQUIRED FOR COMPLETION OF CORRECTIONS TO THOSE ITEMS CONTAINED IN THE ATTACHED PUNCHLIST: _____



U.S. Department
of Transportation
**Federal Aviation
Administration**

SUBSTANTIAL COMPLETION ACCEPTANCE (SCA)

(72 Hours Notice of Inspection is Required)

PROJECT: _____
(Number & Description)

PART I - NOTICE OF INSPECTION:

The Contractor has requested a substantial completion inspection for referenced project and has submitted the attached punchlist. This inspection is scheduled for:

_____ at _____
DATE TIME

All parties will meet at _____ at the above date and time. Please ensure authorized representatives from the following are present:

Contractor: _____

FAA Resident Engineer: _____

FAA Air Traffic: _____

FAA SSC: _____

FAA SMO: _____

FAA ASO-470: _____

Others: _____

PART II – SIGNATURES OF ACCEPTANCE OF SUBSTANTIAL COMPLETION:

The following parties concur referenced project, at the above date and time of inspection, is substantially complete contingent upon concurrence of the punchlist.

Contractor: _____

FAA Resident Engineer: _____

FAA Air Traffic: _____

FAA SSC: _____

FAA ASO-470: _____

Others: _____

SUBSTANTIAL COMPLETION ACCEPTANCE (SCA) *(Continued)*

PROJECT: _____
(Number & Description)

PART III - PUNCHLIST REVIEW/ACCEPTANCE:

The following parties concur the attached punchlist dated _____ is a comprehensive punchlist to the best of their knowledge and is the substantial completion punchlist.

Contractor: _____

FAA Resident Engineer: _____

FAA Air Traffic: _____

FAA SSC: _____

FAA ASO-470: _____

Others: _____

PART IV - FINAL ACCEPTANCE:

The following parties concur all punchlist items for referenced project were completed on _____.

Contractor: _____

FAA Resident Engineer: _____

FAA Air Traffic: _____

FAA SSC: _____

FAA ASO-470: _____

Others: _____

Part IV must be completed prior to processing the Contractor's final Pay Application. **The OAR is to attach proof of FAA/TN DOT final inspections, as required.**

A copy of this form is to be attached to the Certificate of Substantial Completion at the time of issuance with Parts I through III completed.

cc: FAA Contracting Officer
FAA Project Engineer



U.S. Department
of Transportation
**Federal Aviation
Administration**

PARTIAL OCCUPANCY / USE AGREEMENT (POUA)

TO: **FEDERAL AVIATION ADMINISTRATION**

DATE OF PARTIAL OCCUPANCY/USE: _____

- _____

PROJECT OR SPECIFIED PART SHALL INCLUDE:

PROJECT TITLE : _____

CONTRACT NO: _____

LOCATION: _____

CONTRACTOR: _____

NTP DATE: _____

The Work performed under this Contract has been inspected by authorized representatives of the FAA and Contractor and the Project (or specified part of the Project, as indicated above) is hereby declared to be acceptable for Partial Occupancy/Use on the above date.

DEFINITION OF PARTIAL OCCUPANCY/USE

The date of Partial Occupancy/Use of a project or specified area of a project is defined by the Contract Documents, General Conditions

A tentative list of items to be completed or corrected is appended hereto. This list may not be exhaustive, and the failure to include an item on it does not alter the responsibility of the Contractor to complete all the Work in accordance with the Contract Documents.

The Contractor accepts the above Partial Occupancy/Use Agreement and agrees to complete and correct the items on the tentative list within the time indicated.

CONTRACTOR (Typed)

AUTHORIZED REPRESENTATIVE (Signature) DATE

FAA RESIDENT ENGINEER (Typed)

FAA RESIDENT ENGINEER (Signature) DATE

OWNER – FEDERAL AVIATION ADMINISTRATION

The applicable FAA AT, SSC, and SMO concurs with Partial Occupancy / Use for the purposes of maintenance and operations of the completed Work.

FAA AIR TRAFFIC REPRESENTATIVE (Typed)

FAA AIR TRAFFIC REPRESENTATIVE (Signature) DATE

FAA SSC REPRESENTATIVE (Typed)

FAA SSC REPRESENTATIVE (Signature) DATE

FAA SMO REPRESENTATIVE (Typed)

FAA SMO REPRESENTATIVE (Signature) DATE

REMARKS: _____

Attached: Punchlist Dated _____
Certificate of Occupancy Dated _____ (As Required)

cc: FAA Contracting Officer
FAA Project Engineer

PARTIAL OCCUPANCY/USE AGREEMENT (POUA) *(Continued)*

CONTRACT NO. _____

Concurrent with the issuance of this Agreement, the areas of responsibilities are assigned as follows:

SECURITY: _____

MAINTENANCE: _____

OPERATIONS(CLEANING/HOUSEKEEPING): _____

UTILITIES: _____

PROTECTION OF THE WORK: _____

INSURANCE: _____

HEAT: _____

COMPLETE RECORD DOCUMENTS (DATE): _____
(Status)

WARRANTY STARTS (DATE): _____

COMPLETE O&M MANUALS (DATE): _____
(Status)

DATE REQUIRED FOR COMPLETION OF CORRECTIONS TO THOSE ITEMS CONTAINED IN THE ATTACHED PUNCHLIST:



U.S. Department
of Transportation
**Federal Aviation
Administration**

JOB MEMORANDUM (JM)

JM No.: _____ Date: _____ Sheet _____ of _____

To: _____

Project: _____ (B.P. _____)

Field inspection has indicated that the following work is not being performed in accordance with the Contract Documents. The Contractor is requested to provide his proposed Contractor Corrective Action (CCA) no later than .

Reference: Sheet No.: _____ Specification No.: _____ Other: _____

Subject: _____

Description of Discrepancy: _____

Resident Engineer _____

CONTRACTOR'S CORRECTIVE ACTION (CCA)

CCA No.: _____ Date: _____

To: **FEDERAL AVIATION ADMINISTRATION – RESIDENT ENGINEER**

The following action has been

taken _____

Contractor _____

FAA's Response: _____

cc: _____
FAA Contracting Officer, FAA Project Engineer, A/E

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HOT WORK PERMIT

(for welding, cutting, or brazing activities)

THIS FORM MUST BE COMPLETED IN ITS ENTIRETY BY THE RESPONSIBLE PERSON PERFORMING THE HOT WORK, OR THE RESIDENT ENGINEER OVERSEEING THE CONTRACTOR WHO IS PERFORMING THE HOT WORK.

Facility ID and Type: _____

Date: _____

Responsible Person: _____

Start Time: _____

Finish Time: _____

Work to be performed: _____

Building: _____

Room Number, Area or Equipment: _____

Is it possible to perform this work in a welding shop or other type of workshop?

Yes

No

Complete the checklist below and if any of the tasks have not been completed, please provide, in the comments section the reasons for not completing the tasks and the precautionary measures that will be implemented.

<u>Task</u>	<u>Yes</u>	<u>No</u>	<u>Comments and/or Corrective Measures</u>
Flame or spark-producing equipment to be used has been inspected and found in good repair.			
Fire Alarm systems are operational and will not be taken out of service while welding, cutting, or brazing activities are performed. If necessary, the automatic smoke detectors in the immediate vicinity of the hot work may be temporarily disabled via functions at the fire alarm control panel or otherwise covered, and returned to operational immediately following the smoke producing activities associated with the hot work.			
Sprinklers, where provided, are operational and will not be taken out of service while this work is being done.			
There are no combustible fibers, dusts, vapors, gases or liquids in the area.			
The work will only be performed in the area specified on this permit.			
Surrounding floors have been swept clean and, if combustible, wet down.			
All floor and wall openings within 35 feet of the operations have been tightly covered.			
All combustibles have been relocated at least 35 feet from the operation.			
If no, then are barriers or guards used to contain the heat, sparks and slag. Protection should include metal guards or flame- proofed curtains, blankets, or covers (not ordinary tarpaulins (tarps)).			

<u>Task</u>	<u>Yes</u>	<u>No</u>	<u>Comments and/or Corrective Measures</u>
A "Fire Watch" will be posted in area of activity, prior to starting welding, cutting, and brazing activity, and will patrol the area, including floors above and below, during any lunch or rest period and for at least one-half hour after the work has been completed to ensure the sparks and slag have not started fires.			
If bystanders and/or fire watch may be exposed to UV or burn hazards they will be appropriately protected with PPE.			
Fire extinguisher available for instant use within 20 ft.			
Cutter/welder is trained in safe operation of equipment and the safe use of the process.			
On-site contractors were advised about flammable material or hazardous conditions of which they may not be aware.			
Welding or cutting on material containers that contain or did contain flammables: Container thoroughly cleaned and ventilated; Any pipe lines or connections to containers disconnected or blanked; and Approved by ROSHM or EOSH Coordinator.			
Personal Protective Equipment (PPE) used: Eye protection Helmets Protective clothing Other (Specify)			
Warning sign posted to warn of hot metal.			
Appropriate ventilation provided.			
When working in confined spaces a permit has been issued as per 1910.146 and local Confined Space Program.			

For specific requirements refer to General Industry Standards 1910.146; 1910.252; .253; .254 and .272 and Construction Standards 1926.803; .350; .352 and .353.

I attest that the above precautions have been taken:

Printed Name of Person Responsible
for Performing Hot Work

Signature

Approval:

Facility Manager - Printed Name

Facility Manager - Signature

NOTE: THIS PERMIT EXPIRES 24 HOURS AFTER THE DESIGNATED "START TIME". IF WORK IS TO CONTINUE ANOTHER PERMIT MUST BE ISSUED. MAINTAIN THE COMPLETED AND APPROVED PERMITS ON FILE FOR A MINIMUM OF ONE YEAR.

Pre-Construction/Installation Environmental and Occupational Safety and Health Checklist

INSTRUCTIONS FOR COMPLETING FAA FORM 3900-18

Section A. Purpose. FAA Form 3900-18, Pre-Construction/Installation Environmental and Occupational Safety and Health (EOSH) Checklist, must be used to review construction, installation and non-routine maintenance activities involving construction prior to commencement of work that potentially has EOSH impacts on NAS operations and employees. The organization that directly manages the construction project is responsible for completing the checklist. They must coordinate with the appropriate District Office prior to commencement of work. Construction must not be initiated prior to completion and review of the checklist. This form must be used at the pre-construction meeting and similar meetings. Emphasis should be placed on using this checklist as a tool to assess as well as reassess hazards as the work progresses.

Responsibilities: Responsibility for completing the checklist may vary depending on the work being performed.

- a. The District Office Manager will be responsible for District Office projects.
- b. The Project Engineer for Engineering Services projects.
- c. The Facilities Maintenance Program (FMP) Manager for FMP projects.
- d. For turnkey projects managed by Headquarters organizations, the Headquarters program office will be responsible for completing the checklist.

Section B. Work Summary Information. The individual/organization initiating the checklist will complete this portion of the checklist.

1. District Office: Name of the District Office.
2. Work Location: City, State, Airport, building, room within building.
3. Facility: Facility type, associated runway, facility LOC ID.
4. Work Description: Provide a concise statement as to the nature of the work to be accomplished. Example: Asbestos abatement of the control room attic.
5. Project Number/JCN: Provide the Project Number and or Job Control Number (JCN).
6. Planned Start Date: Provide the expected start date of the work.
7. Expected Completion Date: Provide the expected completion date of the work.
8. Contractor Contact: Provide the name and telephone number for a contractor representative who has the authority to make decisions and implement stop work/change orders. If the work is being accomplished by an FAA employee(s) or FAA contract employee(s), provide the name, organization, and telephone number of the on-site lead.
9. Project/Design Representative: Provide the name for the designer of the work (e.g., Engineering Services project engineer, District Office engineer, Headquarters program manager for turnkey projects).
10. COR/Specialist: Provide the name, organization, and telephone number of the on-site lead (e.g., Contracting Officer's Representative, Resident Engineer).
11. District Office EOSH Contact: Provide the name and telephone number of the person responsible for the occupational safety and health/environmental program for the District Office (e.g., SECM, District Office EOSH Professional).
12. Facility Representative: Provide the name and telephone number for an ATO representative at the facility who has the authority to make decisions for facility management.

Section C. Evaluation: The District Office Manager or designee may evaluate whether the remainder of the checklist needs to be completed. If necessary, the District Office Manager or designee will be provided any additional information regarding the project that will facilitate their determination on whether the remainder of the checklist should be completed. If there is an impact (yes), forward the checklist to the organization directing the construction project for completion of the remainder of the checklist. If there is no impact, provide a justification, sign and date the form, and then proceed to Section I, Distribution List, for distribution only. The designee may be the COR, SSC Manager, or other party.

Section D. Facility Procedures: The individuals/organization performing the work, and their contractors, along with the facility POC, must review all applicable facility specific procedures and plans. The intent of this section is to review applicable facility procedures and plans for the project and that it may be necessary to supplement this form.

1. Asbestos Contingency Plan: Determine the responsibilities of the personnel performing the work in the event of an incident requiring implementation of the asbestos contingency plan.
2. Hazard Communication: The personnel performing the work must be made familiar with the facility Hazard Communication program. Information such as safety data sheets (SDS) must be shared between the facility and the personnel performing the work.
3. Lockout/Tagout (LOTO): The work must be performed in accordance with the facility LOTO program. Determine if the facility LOTO procedures require equipment to be locked out/tagged out by an FAA technician, or if the personnel Performing the work will be allowed to LOTO the equipment.

Pre-Construction/Installation Environmental and Occupational Safety and Health Checklist

INSTRUCTIONS FOR COMPLETING FAA FORM 3900-18

4. Work Permits: Applicable FAA facility, District Office, or Service Area work permits must be submitted by the individuals/organization performing the work, signed and posted at the work site. General note: All work permits should be included in this document (e.g., asbestos, lead, hot work, welding, cutting, brazing).
5. Emergency Plans: Describe the responsibilities, including the points of contact, in the event of an incident that requires implementation of the facility Occupant Emergency Plan or Fire Prevention Plan
6. Impacts to Fire Protection Systems (e.g., fire alarm, fire suppression, smoke control, fire rated doors): Identify the Fire Alarm and Suppression System and instructions to avoid unintentional impact to it. If the work involves intentional impact to the Fire Alarm and Suppression System, determine what coordination has to be done to ensure no disruption of the NAS. Determine what interim life safety measures (i.e., egress pathways, occupant emergency notification & fire alarm impairments) will be required during the project.
7. Confined Space Entry: Describe the facility procedures used in and around confined spaces. In addition, describe specific procedures for permit-required confined space in and around where the work will take place.
8. Work at Heights: Describe procedures for working at elevated surfaces (e.g., catwalks, towers, roofs) that may require fall protection procedures or equipment. Review rescue procedures and ensure awareness of responsibilities.
9. Restricted Areas due to EOSH Concerns: Describe those areas of the facility that have restricted access due to safety and health hazards (e.g., asbestos regulated areas, radiation, noise).
10. First Aid/Bloodborne Pathogens: Describe the facility procedures for dealing with emergency first aid situations and other trauma situations.
11. Other: The personnel performing the work should be made familiar with other facility programs, procedures, and requirements.

Section E. Activity Hazard: The individuals/organization performing the work, and their contractors, along with the facility POC, must identify potential EOSH hazards that may be encountered during the accomplishment of the work. Determine the possibility of causing disruption of NAS operations.

1. Asbestos: Determine if known or assumed asbestos containing material will be impacted by this work.
2. Chemical, Gases, Fumes, Vapors, Mist, Dust, Radiation: Determine if any products or methods will be used that may cause odors or vapors (from chemicals volatilizing or biological agents), fumes (from welding or burning), excessive dust (e.g., sanding, grinding), or radiation (e.g., heat sources, light sources such as lasers, ionizing radiation sources such as X-ray equipment).
3. Use and Storage of Hazardous Materials: Determine if substances that exist at the facility may be impacted and what substances may be brought into the facility, which may have an impact on the facility and/or occupants.
4. Waste Management: Determine if work activities will generate wastes (e.g., construction waste, hazardous waste) and what procedures will be used for waste management (e.g., accumulation area, training).
5. Impact on HVAC System: Determine whether the environmental control elements of the facility may be impacted by the accomplishment of the work.
6. Equipment Removal/Installations: Determine if work activities will cause disturbance of excessive dust (e.g., disturbance of equipment which has been in place for a long time).
7. Fire Protection: Determine if work activities will impact fire protection systems and procedures at the facility (e.g., blocking egress, removing fire stopping, impacting fire rated barriers).
8. Impact to Integrity of Fire Alarm/Suppression System: Identify impacts to the fire alarm and suppression system. If the work involves intentional impact to the fire alarm and suppression system, determine what coordination has to be done to ensure no disruption of the NAS. Determine what interim life safety measures will be required during the project.
9. Lead Exposure: Determine if activities will expose FAA employees to lead dust, lead fumes, or other exposure to lead from known or assumed lead-containing material during the construction project.
10. Electrical Safety: Determine if work activities will expose FAA employees to electrical safety hazards (e.g., open electrical panel doors, exposed energized conductors, energized work).
11. Excessive Noise Exposure: Determine if work activities will expose FAA employees to excessive noise.
12. Walking Working Surfaces: Determine if work activities will expose FAA employees to tripping, slip and fall hazards (e.g., open panels in a raised floor, uneven floors, raised or loose carpeting, stairs, wet floors, etc.).
13. Work above Equipment/People: Determine if work activities will expose FAA employees to objects dropped from above.
14. Water Quality/Sanitation: Determine if work activities may cut off or contaminate the facility's potable water system.
15. Cranes/Rigging/Hoisting: Determine if work activities will expose FAA employees to hazards associated with rigging, hoisting and cranes.

Pre-Construction/Installation Environmental and Occupational Safety and Health Checklist

INSTRUCTIONS FOR COMPLETING FAA FORM 3900-18

16. Lighting: Determine if work activities will create insufficient lighting for FAA employees.
17. Machinery and Mechanized Equipment: Determine if work activities may expose FAA employees to hazards such as being struck by, caught in, or injured by machinery and mechanized equipment.
18. Excavation: Determine if work activities performed near facilities may cause catastrophic failure of a NAS facility.
19. Other: Other work activities that may impact NAS operations and employees.

Section F. Site Safety and Health – Controls. Ensure that measures and controls to address applicable site safety and health risks (e.g., through discussions, available site safety plans, or other applicable documents) have been identified. If a hazard has been identified in Section E, Activity Hazard, briefly describe the controls to be used.

1. Identify issues/hazards in Section E, Activity Hazard.
2. “Description of Controls” – The purpose of this column is to very briefly describe the controls in place for addressing each hazard.

Section G. Site Walk-Through: Following review of all applicable facility procedures, activity hazards and applicable control measures, the personnel performing the work must participate in a walk-through of the area of the facility where the work will be accomplished, led by a facility representative. The purpose of the walk-through is to allow the personnel performing the work to be introduced to the facility and the potential hazards as referenced in Sections E and F. It also allows the personnel performing the work to become familiar with the facility with respect to the work being done and awareness of the method of implementation of the various emergency plans. If the project is located at a staffed Air Traffic facility, inclusion of the Air Traffic Manager is warranted. The time, date, and personnel present for the walk-through must be recorded in Section G.

Section H. Review Information. This form must be reviewed by those individuals identified below, as appropriate, during design of the project, during pre-bid conferences, prior to the beginning of work (preferably at or prior to the pre-construction conference) and periodically throughout the completion of the project.

1. Originator: This is the individual/organization responsible for initiating the work (e.g., project engineer, senior engineer, technical support office) or the organization directly managing the day-to-day activities in the construction project.
2. Contractor/Installation Crew Lead/Specialist: These are the individuals performing the work who have the authority to make decisions and implement stop work/change orders. If the work is being accomplished by an FAA employee or an FAA contract employee, the employee should sign the form and provide a routing symbol and platform title.
3. District Office Manager or designee: This person must be the District Office Manager or designee. The designee may be the COR, SSC Manager, or other party.

Section I. Distribution List: This form must be forwarded to the following as applicable:

1. District Office Manager.
2. Safety and Environmental Compliance Manager (SECM) or District Office EOSH Professional.
3. Engineering Services EOSH Coordinator.
4. Engineering Services Manager.
5. Engineering Services Project Engineer.
6. Contracting Officer's Representative.
7. Facility Air Traffic Manager.

Pre-Construction/Installation Environmental and Occupational Safety and Health Checklist

Section A. Purpose

This checklist is intended to review construction, installation and non-routine maintenance activities, prior to commencement, that potentially have occupational safety and health related impacts on NAS operations and employees. This tool must be used, as appropriate, during critical phases of the work (e.g., the pre-construction meeting, prior to commencement of work, etc.). Emphasis should be placed on using this checklist as a tool to assess as well as reassess hazards as the work progresses. **This form is required to be completed as per FAA Order JO 3900.57A.**

Section B. Work Summary Information

The purpose of this section is to provide a brief description of the construction project and/or specific maintenance tasks, and identify key personnel responsible for project completion. Fill in the requested site-specific information. Indicate if this work will occur in or adjacent to an occupied space (e.g., equipment room, ATCT cab, etc.). Note: Provide further explanation of activities on additional sheets if necessary.

1. District Office:	2. Work Location:	3. Facility:
4. Work Description:		
5. Project Number/JCN:	6. Planned Start Date:	7. Expected Completion Date:
8. Contractor Contact Name:		Phone:
9. Project/Design Representative Name:		Phone:
10. COR/Specialist Name:		Phone:
11. District Office EOSH Contact Name:		Phone:
12. Facility Representative Name:		Phone:

Section C. Evaluation

The purpose of this section is to allow the District Office Manager or designee to determine whether the remainder of the checklist needs to be completed. If there is a potential EOSH hazard, then no signature is required in Section C and subsequent sections of the form are to be completed by the organization managing the construction project or maintenance task. If there is no potential hazard, the District Office Manager or designee must sign below and provide an explanation, then proceed to Section I.

Is there a potential EOSH hazard?	Yes	
	No (if no, explain)	
		(Explanation)
Name: (print)		(Title)
Signature:		(Date)

Pre-Construction/Installation Environmental and Occupational Safety and Health Checklist

Section D. Facility Procedures

Review site-specific FAA procedures and considerations with the contractor/installer/specialist. For example, discuss when or how during the work, emergency plans will be required and/or used.

Facility Procedures	Reviewed? [Yes/No/N/A]	Notes
1. Asbestos Contingency Plan		
2. Hazard Communication (e.g. SDSs)		
3. Lockout/Tagout		
4. Work Permits (e.g., asbestos, lead, hotwork)		
5. Emergency Plans (e.g., Occupant Emergency Plan)		
6. Impacts to Fire Protection Systems		
7. Confined Space Entry		
8. Work at Heights		
9. Restricted Areas due to EOSH Concerns		
10. First Aid/Bloodborne Pathogens		
11. Other		

NOTE: Think about your work and its potential hazards. Consider sensitive NAS operations and all facility personnel that may be impacted by your work. As an example, construction activities with potential for impacting asbestos materials in or near sensitive operations could result in incidents that may disrupt NAS operations.

Section E. Activity Hazard

Note: Provide further explanation of potential hazards, locations, etc. below and attach additional sheets if necessary.

Potential Hazardous Exposures and/or Activities Consider Sensitive NAS Operations	Potential for Exposure/Release / Incident [Yes/No/N/A]	Description of Hazard
1. Asbestos (e.g., tiles & insulation)		
2. Chemical, Gases, Fumes, Vapors, Mist, Dust, Radiation		
a. Painting/Solvent/Adhesive/Sealant		
b. Grinding/Sanding/Cutting/Welding/Soldering		
c. Indoor Air Quality (e.g., biological agents, mold, odors, CO ₂)		
3. Use and Storage of Hazardous Materials (e.g., flammables, compressed gas)		
4. Waste Management		
5. Impact on HVAC System		
6. Equipment Removal/Installation (e.g., dust disturbance)		
7. Fire Protection (e.g. blocked egress, fire barrier penetration)		

Pre-Construction/Installation Environmental and Occupational Safety and Health Checklist

Potential Hazardous Exposures and/or Activities Consider Sensitive NAS Operations	Potential for Exposure/Release / Incident [Yes/No/N/A]	Description of Hazard
8. Impact to Integrity of Fire Alarm/Suppression System(s)		
9. Lead Exposure (e.g., lead-based paint)		
10. Electrical Safety		
a. Work on Live Electrical Systems		
b. Temporary Wiring		
11. Excessive Noise Exposure		
12. Walking/Working Surfaces (e.g., tripping hazards, work at heights)		
13. Work above Equipment/People		
14. Water Quality/Sanitation		
15. Cranes/Rigging/Hoisting		
16. Lighting		
17. Machinery and Mechanized Equipment (e.g., operator training and certification and equipment certification)		
18. Excavation		
19. Other		

Section F. Site Safety and Health – Controls

After reviewing the potential hazards in Section E, ensure that measures and controls to address applicable site safety and health risks (e.g., through discussions, available site safety plans, or other applicable documents) have been identified. If a hazard has been identified in Section E, briefly describe the controls to be used. Note: Provide further explanation of controls below and attach additional sheets if necessary.

Potential Hazardous Exposures and/or Activities	Identified as a hazard in Section E? [Yes/No/N/A]	Description of Controls (e.g., addressed in Accident Prevention Plan or Site Safety Plan)
1. Asbestos (e.g. tiles & insulation)		
2. Chemical, Gases, Fumes, Vapors, Mist, Dust, Radiation		
a. Painting/Solvent/Adhesive/Sealant		
b. Grinding/Sanding/Cutting/Welding/Soldering		
c. Indoor Air Quality (e.g., biological agents, mold, odors, CO ₂)		
3. Use and Storage of Hazardous Materials (e.g., flammables, compressed gas)		
4. Waste Management		
5. Impact on HVAC System		

Pre-Construction/Installation Environmental and Occupational Safety and Health Checklist

Potential Hazardous Exposures and/or Activities	Identified as a hazard in Section E? [Yes/No/N/A]	Description of Controls (e.g., addressed in Accident Prevention Plan or Site Safety Plan)
6. Equipment Removal/Installation (e.g., dust disturbance)		
7. Fire Protection (e.g., blocked egress, fire barrier penetration)		
8. Impact to Integrity of Fire Alarm/Suppression System(s)		
9. Lead Exposure (e.g., lead-based paint)		
10. Electrical Safety		
a. Work on Live Electrical Systems		
b. Temporary Wiring		
11. Excessive Noise Exposure		
12. Walking/Working Surfaces (e.g., tripping hazards, work at heights)		
13. Work Above Equipment/People		
14. Water Quality/Sanitation		
15. Cranes/Rigging/Hoisting		
16. Lighting		
17. Machinery and Mechanized Equipment (e.g., operator training and certification and equipment certification)		
18. Excavation		
19. Other		

Section G. Site Walk-Through

Time/date of site walk-through with appropriate personnel (e.g., District Office representative, SSC Manager, SECM, Air Traffic Manager, Resident Engineer, COR, Contractor).

Site Walk Through:	
(Date)	(Time)
Appropriate Personnel:	
(Name)	(Organization)
(Name)	(Organization)
(Name)	(Organization)

Pre-Construction/Installation Environmental and Occupational Safety and Health Checklist

Section H. Review Information

The appropriate FAA point-of-contact and the contractor/installation crew lead/specialist print and sign below to document discussion of the items on this form.

Completed By:			
FAA Originator of Work (e.g., Project Engineer, Resident Engineer):			
(Print or Type Name)	(Signature)	(Title)	(Date)
Contractor Name:			
(Print or Type Name)	(Signature)	(Title)	(Date)
Reviewed By:			
District Office Manager or Designee:			
(Print or Type Name)	(Signature)	(Title)	(Date)

Section I. Distribution List

This form must be forwarded to the following as applicable:	Name/Routing Symbol
1. District Office Manager	
2. SECM/District Office EOSH Professional	
3. Engineering Services EOSH Coordinator	
4. Engineering Services Manager	
5. Engineering Services Project Engineer	
6. Contracting Officer (if contractor resources perform the construction work)	
7. Facility Air Traffic Manager	

SECTION 01 25 00 - SUBSTITUTION PROCEDURES

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

- A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and other Division 01 Specification Sections, apply to this Section.

1.2 SUMMARY

- A. Section includes administrative and procedural requirements for substitutions.
- B. Related Requirements:
 - 1. Section 01 60 00 "Product Requirements" for requirements for submitting comparable product submittals for products by listed manufacturers.
 - 2. Section 01 10 00 "Summary" for requirements for compliance with the Buy American Act Compliance Procedures.

1.3 DEFINITIONS

- A. Substitutions: Changes in products, materials, equipment, and methods of construction from those required by the Contract Documents.
 - 1. Any product or material that is submitted that is not the exact make and model number of the design basis shall be considered a substitution. This includes products that are from the same manufacturer, but are different models. If the design basis is discontinued or obsolete, any product replacement is also considered a substitution. All substitutions shall follow the substitution procedures listed herein.
 - 2. Substitutions for Cause: Changes proposed by Contractor that are required due to changed Project conditions, such as unavailability of product, regulatory changes, or unavailability of required warranty terms.
 - 3. Substitutions for Convenience: Changes proposed by Contractor or FAA that are not required to meet other Project requirements but may offer advantage to Contractor or FAA.
- B. Known Acceptable Source: A manufacturer of a particular product or material that has been utilized successfully on past FAA projects. This is not an indication that a particular manufacturer will meet the requirements of each FAA project, only that they have been found to meet the requirements on past projects.

- 1.4 Basis of Design: Well-defined requirements consist of a set of statements that could form the basis of inspection and test acceptance criteria. ACTION SUBMITTALS
- A. Substitution Requests: Submit documentation identifying product or fabrication or installation method to be replaced. Include Specification Section number and title and Drawing numbers and titles.
1. Substitution Request Form: Use form that is part of web-based Project management software or form acceptable to COR.
 2. Documentation: Show compliance with requirements for substitutions and the following, as applicable:
 - a. Statement indicating why specified product or fabrication or installation method cannot be provided, if applicable. Identify product by specification section and paragraph number.
 - b. Coordination of information, including a list of changes or revisions needed to other parts of the Work and to construction performed by FAA and separate contractors that will be necessary to accommodate proposed substitution.
 - c. Detailed comparison of significant qualities of proposed substitutions with those of the Work specified. Include annotated copy of applicable Specification Section. Significant qualities may include attributes, such as performance, weight, size, durability, visual effect, sustainable design characteristics, warranties, and specific features and requirements indicated. Indicate deviations, if any, from the Work specified.
 - d. Product Data, including drawings and descriptions of products and fabrication and installation procedures. Manufacturer's name and address, trade name and model number of product (if applicable), and name of fabricator or supplier (if applicable). List of maintenance services and replacement materials available.
 - e. Samples, where applicable or requested.
 - f. Certificates and qualification data, where applicable or requested.
 - g. List of similar installations for completed projects, with project names and addresses as well as names and addresses of architects and owners.
 - h. Material test reports from a qualified testing agency, indicating and interpreting test results for compliance with requirements indicated.
 - i. Research reports evidencing compliance with building code in effect for Project, from ICC-ES.
 - j. Detailed comparison of Contractor's construction schedule using proposed substitutions with products specified for the Work, including effect on the overall Contract Time. If specified product or method of construction cannot be provided within the Contract Time, include letter from manufacturer, on manufacturer's letterhead, stating date of receipt of purchase order, lack of availability, or delays in delivery.
 - k. Cost information, including a proposal of change, if any, in the Contract Sum.

- l. Contractor's certification that proposed substitution complies with requirements in the Contract Documents, except as indicated in substitution request, is compatible with related materials and is appropriate for applications indicated.
 - m. Contractor's waiver of rights to additional payment or time that may subsequently become necessary because of failure of proposed substitution to produce indicated results.
 3. COR's Action: If necessary, the COR will request additional information or documentation for evaluation within seven days of receipt of a request for substitution. The COR will notify Contractor of acceptance or rejection of proposed substitution within 15 days of receipt of request, or seven days of receipt of additional information or documentation, whichever is later.
 - a. Forms of Acceptance: Change Order, Construction Change Directive, or COR's Supplemental Instructions for minor changes in the Work.
 - b. Use product specified if COR does not issue a decision on use of a proposed substitution within time allocated.

1.5 QUALITY ASSURANCE

- A. Compatibility of Substitutions: Investigate and document compatibility of proposed substitution with related products and materials. Engage a qualified testing agency to perform compatibility tests recommended by manufacturers.

1.6 SUBMISSION PROCEDURES

- A. Submission of request for substitution shall constitute a representation by the Contractor that he:
 1. Has investigated the proposed product and determined that it is equal to or better than the specified product. Absence of an explicit comparison of any characteristic of the proposed product to the specified product shall constitute a representation that the proposed product is equal to or better than the specified product with regard to that characteristic.
 2. Will provide the same warranty for the proposed product as for the specified product.
 3. Will coordinate the installation and make other changes which may be required for the work to be complete in all respects, including:
 - a. Redesign.
 - b. Additional components and capacity required by other work affected by the change.
 - c. Update BIM.
 4. Waives all claims for additional costs and time extensions which subsequently may become apparent and which are caused by the change.

5. Will reimburse the FAA for additional costs for evaluation of the substitution request, redesign if required, and reapproval by authorities having jurisdiction if required.
- B. Substitutions will not be considered when acceptance would require substantial revision of the contract documents.
- C. Substitutions will not be considered when they are indicated or implied on shop drawing or product data submittals without separate written request.
- D. Substitution requests will not be considered when submitted directly by subcontractor or supplier.
- E. Substitution Request Procedure: Submit written request with complete data substantiating compliance of the proposed product with the requirements of the contract documents.
 1. Submit request to the Contracting Officer Representative (COR).
 2. Submit 3 copies of each request and accompanying data.
 3. Submit all requests on a standard form provided.
 4. Only one request for substitution will be considered for each product.
- F. Data Required with Substitution Request: Provide data listed in Submittals Paragraphs above.
- G. The COR will determine acceptability of the proposed substitution.
- H. When the proposed substitution is not accepted, provide the product (or one of the products, as the case may be) specified.

1.7 SUBSTITUTIONS

- A. Substitution Request Procedure: Submit written request with complete data substantiating compliance of the proposed product with the requirements of the contract documents.
- B. Substitutions for Cause: Submit requests for substitution immediately on discovery of need for change, but not later than 15 days prior to time required for preparation and review of related submittals.
 1. Conditions: COR will consider Contractor's request for substitution when the following conditions are satisfied. If the following conditions are not satisfied, COR will return requests without action, except to record noncompliance with these requirements:
 - a. Requested substitution is consistent with the Contract Documents and will produce indicated results.

- b. Requested substitution provides sustainable design characteristics that specified product provided for compliance with ASHRAE 189.1 requirements.
 - c. Substitution request is fully documented and properly submitted.
 - d. Requested substitution will not adversely affect Contractor's construction schedule.
 - e. Requested substitution has received necessary approvals of authorities having jurisdiction.
 - f. Requested substitution is compatible with other portions of the Work.
 - g. Requested substitution has been coordinated with other portions of the Work.
 - h. Requested substitution provides specified warranty.
 - i. If requested substitution involves more than one contractor, requested substitution has been coordinated with other portions of the Work, is uniform and consistent, is compatible with other products, and is acceptable to all contractors involved.
- C. Substitutions for Convenience: COR will consider requests for substitution if received within 60 days after the Notice of Award. Requests received after that time may be considered or rejected at discretion of COR.
 - 1. Conditions: COR will consider Contractor's request for substitution when the following conditions are satisfied. If the following conditions are not satisfied, COR will return requests without action, except to record noncompliance with these requirements:
 - a. Requested substitution offers FAA a substantial advantage in cost, time, energy conservation, or other considerations, after deducting additional responsibilities FAA must assume. FAA's additional responsibilities may include compensation to COR for redesign and evaluation services, increased cost of other construction by FAA, and similar considerations.
 - b. Requested substitution does not require extensive revisions to the Contract Documents.
 - c. Requested substitution is consistent with the Contract Documents and will produce indicated results.
 - d. Requested substitution provides sustainable design characteristics that specified product provided for compliance with ASHRAE 189.1 requirements.
 - e. Substitution request is fully documented and properly submitted.
 - f. Requested substitution will not adversely affect Contractor's construction schedule.
 - g. Requested substitution has received necessary approvals of authorities having jurisdiction.
 - h. Requested substitution is compatible with other portions of the Work.
 - i. Requested substitution has been coordinated with other portions of the Work.
 - j. Requested substitution provides specified warranty.
 - k. If requested substitution involves more than one contractor, requested substitution has been coordinated with other portions of the Work, is uniform and consistent, is compatible with other products, and is acceptable to all contractors involved.

1.8 PROCEDURES

- A. Coordination: Revise or adjust affected work as necessary to integrate work of the approved substitutions.

PART 2 - PRODUCTS (Not Used)

PART 3 - EXECUTION (Not Used)

END OF SECTION **01 25 00**

SECTION 01 31 00 - PROJECT MANAGEMENT AND COORDINATION

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

- A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and other Division 01 Specification Sections, apply to this Section.

1.2 SUMMARY

- A. Section includes administrative provisions for coordinating construction operations on Project, including, but not limited to, the following:
 - 1. General coordination procedures.
 - 2. Administrative and supervisory personnel.
 - 3. Coordination drawings.
 - 4. RFIs.
 - 5. Digital project management procedures.
 - 6. Project meetings.
- B. Each contractor shall participate in coordination requirements. Certain areas of responsibility are assigned to a specific contractor.
- C. Related Requirements:
 - 1. Section 01 12 00 "Multiple Contract Summary" for a description of the division of work among separate contracts and responsibility for coordination activities not in this Section.
 - 2. Section 01 32 00 "Construction Progress Documentation" for preparing and submitting Contractor's construction schedule.
 - 3. Section 01 73 00 "Execution" for procedures for coordinating general installation and field-engineering services, including establishment of benchmarks and control points.
 - 4. Section 01 77 00 "Closeout Procedures" for coordinating closeout of the Contract.
 - 5. Section 01 91 13 "General Commissioning Requirements" for coordinating the Work with FAA's Commissioning Authority.

1.3 DEFINITIONS

- A. RFI: Request for Information. Request from Contractor seeking information required by or clarifications of the Contract Documents.

1.4 INFORMATIONAL SUBMITTALS

- A. Key Personnel Names: Within 15 days of starting construction operations, submit a list of key personnel assignments, including superintendent and other personnel in attendance at Project site. Identify individuals and their duties and responsibilities; list addresses, cellular telephone numbers, and e-mail addresses. Provide names, addresses, and telephone numbers of individuals assigned as alternates in the absence of individuals assigned to Project.
 - 1. Post copies of list in Project meeting room, in temporary field office, in web-based Project software directory (if used), and in prominent location in each built facility. Keep list current at all times.

1.5 GENERAL COORDINATION PROCEDURES

- A. Coordination: Coordinate construction operations included in different Sections of the Specifications to ensure efficient and orderly installation of each part of the Work. Coordinate construction operations included in different Sections that depend on each other for proper installation, connection, and operation.
 - 1. Schedule construction operations in sequence required to obtain the best results, where installation of one part of the Work depends on installation of other components, before or after its own installation.
 - 2. Coordinate installation of different components to ensure maximum performance and accessibility for required maintenance, service, and repair.
 - 3. Make adequate provisions to accommodate items scheduled for later installation.
- B. Prepare memoranda for distribution to each party involved, outlining special procedures required for coordination. Include such items as required notices, reports, and list of attendees at meetings.
 - 1. Prepare similar memoranda for FAA and separate contractors if coordination of their Work is required.
- C. Project Coordination Schedule: The General Contractor will prepare and maintain a mutually agreed upon spatial coordination schedule with coordination drawing submittal milestones that meet the overall project construction schedule. Coordination drawing development, coordination submittal drawing submission and review by the COR, fabrication duration, and delivery lead times will be included to support the project construction schedule.
- D. Coordination Meetings: The Contractor shall host regular weekly (or more frequent) coordination meetings in accordance with this section. Attendance is mandatory by all Team members to maintain the coordination and construction schedules.

- E. Administrative Procedures: Coordinate scheduling and timing of required administrative procedures with other construction activities to avoid conflicts and to ensure orderly progress of the Work. Such administrative activities include, but are not limited to, the following:
 - 1. Preparation of Contractor's construction schedule.
 - 2. Preparation of the schedule of values.
 - 3. Installation and removal of temporary facilities and controls.
 - 4. Delivery and processing of submittals.
 - 5. Progress meetings.
 - 6. Preinstallation conferences.
 - 7. Project closeout activities.
 - 8. Startup and adjustment of systems.
- F. Conservation: Coordinate construction activities to ensure that operations are carried out with consideration given to conservation of energy, water, and materials. Coordinate use of temporary utilities to minimize waste.
 - 1. Salvage materials and equipment involved in performance of, but not actually incorporated into, the Work. Refer to other Sections for disposition of salvaged materials that are designated as FAA's property.

1.6 KEY PERSONNEL

- A. Key Personnel Names: Within 14 calendar days of Notice to Proceed, submit a list of key personnel assignments, including superintendent and other personnel in attendance at Project site. Identify individuals and their duties and responsibilities; list addresses and telephone numbers, including home, office, and cellular telephone numbers and email addresses. Provide names, addresses, and telephone numbers of individuals assigned as standbys in the absence of individuals assigned to Project.
 - 1. Post copies of list in project meeting room, in temporary field office, and by each temporary telephone. Keep list current at all times.

1.7 CONTRACTOR PERSONNEL REQUIREMENTS

- A. Project Manager with a minimum of a Bachelor of Science (BS) degree in Civil, Mechanical, or Electrical Engineering from an accredited institution of higher learning, or a technical degree, and ten (10) years of experience with coordinating subcontractors on projects with complex mechanical, electrical, and control systems in the heavy construction industry.
- B. Project Superintendent with a minimum of ten (10) years of experience in coordinating mechanical, electrical, and control subcontractors in heavy construction industry.
- C. Project Scheduler with minimum of five (5) years of experience in coordinating large complex construction projects involving multiple construction disciplines with a typical project length of 18 or more months.

- D. Quality Control (QC) Manager with a minimum of eight (8) years of experience as a superintendent, inspector, QC manager, project manager, project engineer or construction manager on similar size and type construction contracts that include the major trades that are part of this requirement. The QC Manager is required to be on site at all times and his duties can be combined with those of the Coordinating Engineer. The QC manager must be employed by the prime Contractor. The QC manager will be responsible for implementing the QC plan and interacting with the Third Party QC firm/agency.

1.8 COORDINATION DRAWINGS

- A. Coordination Drawings, General: Prepare coordination drawings according to requirements in individual Sections, and additionally where installation is not completely indicated on Shop Drawings, where limited space availability necessitates coordination, or if coordination is required to facilitate integration of products and materials fabricated or installed by more than one entity.
 - 1. Content: Project-specific information, drawn accurately to a scale large enough to indicate and resolve conflicts. Do not base coordination drawings on standard printed data. Include the following information, as applicable:
 - a. Use applicable Drawings as a basis for preparation of coordination drawings. Prepare sections, elevations, and details as needed to describe relationship of various systems and components.
 - b. Coordinate the addition of trade-specific information to coordination drawings in a sequence that best provides for coordination of the information and resolution of conflicts between installed components before submitting for review.
 - c. Indicate functional and spatial relationships of components of architectural, structural, civil, mechanical, and electrical systems.
 - d. Indicate space requirements for routine maintenance and for anticipated replacement of components during the life of the installation.
 - e. Show location and size of access doors required for access to concealed dampers, valves, and other controls.
 - f. Indicate required installation sequences.
 - g. Indicate dimensions shown on Drawings. Specifically note dimensions that appear to be in conflict with submitted equipment and minimum clearance requirements. Provide alternative sketches to COR indicating proposed resolution of such conflicts. Minor dimension changes and difficult installations will not be considered changes to the Contract.
- B. Coordination Drawing Organization: Organize coordination drawings as follows:
 - 1. Floor Plans and Reflected Ceiling Plans: Show architectural and structural elements, and mechanical, plumbing, fire-protection, fire-alarm, and electrical Work. Show locations of visible ceiling-mounted devices relative to acoustical ceiling grid. Supplement plan drawings with section drawings where required to adequately represent the Work.

2. Structural Penetrations: Indicate penetrations and openings required for all disciplines.
 3. Mechanical and Plumbing Work: Show the following:
 - a. Sizes and bottom elevations of ductwork, piping, and conduit runs, including insulation, bracing, flanges, and support systems.
 - b. Dimensions of major components, such as dampers, valves, diffusers, access doors, cleanouts and electrical distribution equipment.
 - c. Fire-rated enclosures around ductwork.
 4. Electrical Work: Show the following:
 - a. Runs of vertical and horizontal conduit 1-1/4 inches in diameter and larger.
 - b. Light fixture, exit light, emergency battery pack, smoke detector, and other fire-alarm locations.
 - c. Panel board, switchboard, switchgear, transformer, busway, generator, and motor-control center locations.
 - d. Location of pull boxes and junction boxes, dimensioned from column center lines.
 5. Review: COR will review coordination drawings to confirm that, in general, the Work is being coordinated, but not for the details of the coordination, which are Contractor's responsibility. If COR determines that coordination drawings are not being prepared in sufficient scope or detail, or are otherwise deficient, COR will so inform Contractor, who shall make suitable modifications and resubmit.
 6. Coordination Drawing Prints: Prepare coordination drawing prints according to requirements in Section 01 33 00 "Submittal Procedures."
- C. Coordination Drawing Process: Prepare coordination drawings in the following manner:
1. Schedule submittal and review of Fire Sprinkler, Plumbing, HVAC, and Electrical Shop Drawings to make required changes prior to preparation of coordination drawings.
 2. Commence routing of coordination drawing files with HVAC Installer, who will provide drawing plan files denoting approved ductwork. HVAC Installer will locate ductwork and piping on a single layer, using orange color. Forward drawings to Plumbing Installer.
 3. Plumbing Installer will locate plumbing and equipment on a single layer, using blue color.
 4. Electrical Installer will indicate service and feeder conduit runs and equipment in green color.
 5. Contractor shall perform the final coordination review. As each coordination drawing is completed, Contractor will meet with COR to review and resolve conflicts on the coordination drawings.
- D. Coordination Digital Data Files: Prepare coordination digital data files according to the following requirements:
1. File Preparation Format:

- a. Same digital data software program, version, and operating system as original Drawings.
 - b. DWG, Version 2019, operating in Microsoft Windows operating system.
 2. File Submittal Format: Submit or post coordination drawing files using PDF format.
 3. BIM File Incorporation: Develop and incorporate coordination drawing files into BIM established for Project.
 - a. Perform three-dimensional component conflict analysis as part of preparation of coordination drawings. Resolve component conflicts prior to submittal. Indicate where conflict resolution requires modification of design requirements by COR.
 4. FAA will furnish Contractor one set of digital data files of Drawings for use in preparing coordination digital data files.
 - a. FAA makes no representations as to the accuracy or completeness of digital data files as they relate to Drawings.
 - b. Digital Data Software Program: Drawings are available in AutoCAD 2021.
 - c. Contractor shall execute a data licensing agreement in the form of Agreement form acceptable to FAA.
- E. Deliverables: All drawings must be full-Size (ANSI D), suitable for half-size (11"x17") scaled reproduction uploaded to the FAA's KSN website and to the project's Cloud Computing site. On a monthly basis deliver a CD-ROM containing the updated Computer Aided Design (CAD) files, BIM model files, Coordination Drawings, Record Documents, Navisworks files, IFC files, and Facility Data COBie spreadsheets.
 1. The Construction Contract Drawings utilize Revit 2012 BIM files. The Contractor shall convert the Government Furnished Equipment (GFE) BIM files to the latest version of Revit. The Contractor shall use the BIM files to electronically reconfigure, modify, and update them with as-built information to satisfy Coordination Drawings, Record Documents, and Facility Data requirements.
 2. Middleware: Cloud services Autodesk® BIM 360™ Glue and Field, or as equal, shall be used by the Contractor to provide collaborative online access to the BIM files throughout the entire project duration. The contractor shall demonstrate middleware compatibility with desktop computers and hand-held devices provided for the FAA Construction Trailer as per DIV 01-50-10.
 - a. Updated Coordination Drawings, BIM files, Facility Data COBie files, Navisworks files, and IFC files shall be submitted to the FAA no later than 90 days after issuance of Notice-to-Proceed. Thereafter, all Coordination Drawings, BIM files, Facility Data Cobie files, Navisworks files, and IFC files shall provide each month to the FAA on DVD and be continuously maintained on the cloud computing based shared server approved by the COTR.

- b. The BIM files on the cloud computing shared server shall be maintained to the latest as built conditions daily (live) to incorporate and coordinate approved submittals and the as-built installation of products and materials. Actual product dimensions shall be shown to plan maximum utilization of space for efficient installation of different components as they are submitted for approval.
- c. Incorporate the relationship of components shown on approved Shop Drawing submittals.
- d. Indicate required installation sequences.
- e. Each update shall include a description/table of revisions made for the respective monthly update such as, references to changes made due to recently submitted and/or approved products, field as-built adjustments, etc.
- f. If the Contractor fails or refuses to provide Coordination Drawings conforming to this specification the COR may issue an order stopping all or part of the work until the Contractor complies with this specification. No part of time lost due to such stop orders must be made the subject of claim for extension of time or excess cost or damages by the Contractor.

1.9 REQUEST FOR INFORMATION (RFI)

- A. General: Immediately on discovery of the need for additional information, clarification, or interpretation of the Contract Documents, Contractor shall prepare and submit an RFI in the form specified.
 - 1. COR will return without response those RFIs submitted by other entities controlled by Contractor with no response.
 - 2. Coordinate and submit RFIs in a prompt manner to avoid delays in Contractor's work or work of subcontractors.
- B. Content of the RFI: Include a detailed, legible description of item needing information or interpretation and the following:
 - 1. Project name.
 - 2. Name of COR.
 - 3. Date.
 - 4. Name of Contractor.
 - 5. RFI number, numbered sequentially.
 - 6. RFI subject.
 - 7. Specification Section number and title and related paragraphs, as appropriate.
 - 8. Drawing number and detail references, as appropriate.
 - 9. Field dimensions and conditions, as appropriate.
 - 10. Contractor's suggested resolution. If Contractor's suggested resolution impacts the Contract Time or the Contract Sum, Contractor shall state impact in the RFI.
 - 11. Contractor's signature.
 - 12. Attachments: Include sketches, descriptions, measurements, photos, Product Data, Shop Drawings, coordination drawings, and other information necessary to fully describe items needing interpretation.

- a. Include dimensions, thicknesses, structural grid references, and details of affected materials, assemblies, and attachments on attached sketches.
- C. RFI Forms: Form bound in Project Manual or Software-generated form with substantially the same content as indicated above, acceptable to CORRefer Section 01 10 12 Construction Administration Forms.
 1. Attachments shall be electronic files in PDF format.
- D. COR's Action: COR will review each RFI, determine action required, and respond. Allow 14 calendar days for COR's response for each RFI. RFIs received by COR after 1:00 p.m. will be considered as received the following working day.
 1. The following Contractor-generated RFIs will be returned without action:
 - a. Requests for approval of submittals.
 - b. Requests for approval of substitutions.
 - c. Requests for approval of Contractor's means and methods.
 - d. Requests for coordination information already indicated in the Contract Documents.
 - e. Requests for adjustments in the Contract Time or the Contract Sum.
 - f. Requests for interpretation of COR's actions on submittals.
 - g. Incomplete RFIs or inaccurately prepared RFIs.
 2. COR's action may include a request for additional information, in which case COR's time for response will date from time of receipt by COR of additional information.
 3. COR's action on RFIs that may result in a change to the Contract Time or the Contract Sum may be eligible for Contractor to submit Change Proposal .
 - a. If Contractor believes the RFI response warrants change in the Contract Time or the Contract Sum, notify COR in writing within 4 calendar days of receipt of the RFI response.
- E. RFI Log: Prepare, maintain, and submit a tabular log of RFIs organized by the RFI number. Submit log weekly. Use software log that is part of web-based Project management software or a software log with not less than the following:
 1. Project name.
 2. Name and address of Contractor.
 3. RFI number, including RFIs that were returned without action or withdrawn.
 4. RFI description.
 5. Date the RFI was submitted.
 6. Date COR's response was received.
 7. Identification of related Minor Change in the Work, Construction Change Directive, and Proposal Request, as appropriate.
 8. Identification of related Field Order, Work Change Directive, and Proposal Request, as appropriate.

- F. On receipt of COR's action, update the RFI log and immediately distribute the RFI response to affected parties. Review response and notify COR within three calendar days if Contractor disagrees with response.

1.10 DIGITAL PROJECT MANAGEMENT PROCEDURES

- A. Use of Architect's Digital Data Files: Digital data files of Architect's and/or CAD drawings will be provided by COR for Contractor's use during construction.
 - 1. Digital data files may be used by Contractor in preparing coordination drawings, Shop Drawings, and Project Record Drawings.
 - 2. OwnerArchitect makes no representations as to the accuracy or completeness of digital data files as they relate to Contract Drawings.
 - a. Subcontractors and other parties granted access by Contractor to ArchitectOwner's digital data files shall execute a data licensing agreement in the form of AIA Document C106 Agreement acceptable to Owner and Architect.
- B. PDF Document Preparation: Where PDFs are required to be submitted to COR, prepare as follows:
 - 1. Assemble complete submittal package into a single indexed file, incorporating submittal requirements of a single Specification Section and transmittal form with links enabling navigation to each item.
 - 2. Name file with submittal number or other unique identifier, including revision identifier.
 - 3. Certifications: Where digitally submitted certificates and certifications are required, provide a digital signature with digital certificate on where indicated.

1.11 PROJECT MEETINGS

- A. General: Schedule and conduct meetings and conferences at Project site unless otherwise indicated.
 - 1. Attendees: Inform participants and others involved, and individuals whose presence is required, of date and time of each meeting. Notify COR of scheduled meeting dates and times a minimum of seven days prior to meeting.
 - 2. Agenda: Prepare the meeting agenda. Distribute the agenda to all invited attendees.
 - 3. Minutes: Entity responsible for conducting meeting will record significant discussions and agreements achieved. Distribute the meeting minutes to everyone concerned, including COR, within three days of the meeting.
- B. Preconstruction Conference: COR will schedule and conduct a preconstruction conference before starting construction, at a time convenient to FAA and COR, but no later than 15 days after execution of the Agreement.

1. Conduct the conference to review responsibilities and personnel assignments.
2. Attendees: Authorized representatives of COR; Contractor and its superintendent; major subcontractors; suppliers; and other concerned parties shall attend the conference. Participants at the conference shall be familiar with Project and authorized to conclude matters relating to the Work.
3. Agenda: Discuss items of significance that could affect progress, including the following:
 - a. Responsibilities and personnel assignments.
 - b. Tentative construction schedule.
 - c. Phasing.
 - d. Critical work sequencing and long lead items.
 - e. Designation of key personnel and their duties.
 - f. Lines of communications.
 - g. Use of web-based Project software.
 - h. Procedures for processing field decisions and Change Orders.
 - i. Procedures for RFIs.
 - j. Procedures for testing and inspecting.
 - k. Procedures for processing Applications for Payment.
 - l. Distribution of the Contract Documents.
 - m. Submittal procedures.
 - n. Sustainable design requirements.
 - o. Preparation of Record Documents.
 - p. Use of the premises and existing building.
 - q. Work restrictions.
 - r. Working hours.
 - s. FAA's occupancy requirements.
 - t. Responsibility for temporary facilities and controls.
 - u. Procedures for moisture and mold control.
 - v. Procedures for disruptions and shutdowns.
 - w. Construction waste management and recycling.
 - x. Parking availability.
 - y. Office, work, and storage areas.
 - z. Equipment deliveries and priorities.
 - aa. First aid.
 - bb. Security.
 - cc. Progress cleaning.
 - dd. Environmental requirements and procedures, including but not limited to:
 - 1) Erosion and Sediment control.
 - 2) Solid Waste Management Plan.
 - 3) IAQ Management Plan.
 - 4) Procedures for noise and acoustics management.
 - 5) Environmental Management Plan.
 - ee. Commissioning.
4. Minutes: Entity responsible for conducting meeting will record and distribute meeting minutes.

- C. Preinstallation Conferences: Conduct a preinstallation conference at Project site before each construction activity when required by other Sections and when required for coordination with other construction.
1. Attendees: Installer and representatives of manufacturers and fabricators involved in or affected by the installation and its coordination or integration with other materials and installations that have preceded or will follow, shall attend the meeting. Advise COR of scheduled meeting dates.
 2. Agenda: Review progress of other construction activities and preparations for the particular activity under consideration, including requirements for the following:
 - a. Contract Documents.
 - b. Options.
 - c. Related RFIs.
 - d. Related Change Orders.
 - e. Purchases.
 - f. Deliveries.
 - g. Submittals.
 - h. Sustainable design requirements.
 - i. Review of mockups.
 - j. Possible conflicts.
 - k. Compatibility requirements.
 - l. Time schedules.
 - m. Weather limitations.
 - n. Manufacturer's written instructions.
 - o. Warranty requirements.
 - p. Compatibility of materials.
 - q. Acceptability of substrates.
 - r. Temporary facilities and controls.
 - s. Space and access limitations.
 - t. Regulations of authorities having jurisdiction.
 - u. Testing and inspecting requirements.
 - v. Installation procedures.
 - w. Coordination with other work.
 - x. Required performance results.
 - y. Protection of adjacent work.
 - z. Protection of construction and personnel.
 3. Record significant conference discussions, agreements, and disagreements, including required corrective measures and actions.
 4. Reporting: Distribute minutes of the meeting to each party present and to other parties requiring information.
 5. Do not proceed with installation if the conference cannot be successfully concluded. Initiate whatever actions are necessary to resolve impediments to performance of the Work and reconvene the conference at earliest feasible date.
- D. Project Closeout Conference: Schedule and conduct a project closeout conference, at a time convenient to FAA and COR, but no later than 60 days prior to the scheduled date of Substantial Completion.

1. Conduct the conference to review requirements and responsibilities related to Project closeout.
 2. Attendees: Authorized representatives of COR; Contractor and its superintendent; major subcontractors; suppliers; and other concerned parties shall attend the meeting. Participants at the meeting shall be familiar with Project and authorized to conclude matters relating to the Work.
 3. Agenda: Discuss items of significance that could affect or delay Project closeout, including the following:
 - a. Preparation of Record Documents.
 - b. Procedures required prior to inspection for Substantial Completion and for final inspection for acceptance.
 - c. Procedures for completing and archiving web-based Project software site data files.
 - d. Submittal of written warranties.
 - e. Requirements for completing sustainable design documentation.
 - f. Requirements for preparing operations and maintenance data.
 - g. Requirements for delivery of material samples, attic stock, and spare parts.
 - h. Requirements for demonstration and training.
 - i. Preparation of Contractor's punch list.
 - j. Procedures for processing Applications for Payment at Substantial Completion and for final payment.
 - k. Submittal procedures.
 - l. Coordination of separate contracts.
 - m. FAA's partial occupancy requirements.
 - n. Installation of FAA's furniture, fixtures, and equipment.
 - o. Responsibility for removing temporary facilities and controls.
 4. Minutes: Entity conducting meeting will record and distribute meeting minutes.
- E. Progress Meetings: Conduct progress meetings at weekly intervals.
1. Coordinate dates of meetings with preparation of payment requests.
 2. Attendees: In addition to representatives of COR, each contractor, subcontractor, supplier, and other entity concerned with current progress or involved in planning, coordination, or performance of future activities shall be represented at these meetings. All participants at the meeting shall be familiar with Project and authorized to conclude matters relating to the Work.
 3. Agenda: Review and correct or approve minutes of previous progress meeting. Review other items of significance that could affect progress. Include topics for discussion as appropriate to status of Project.
 - a. Contractor's Construction Schedule: Review progress since the last meeting. Determine whether each activity is on time, ahead of schedule, or behind schedule, in relation to Contractor's construction schedule. Determine how construction behind schedule will be expedited; secure commitments from parties involved to do so. Discuss whether schedule revisions are required to ensure that current and subsequent activities will be completed within the Contract Time.

- 1) Review schedule for next period.
- b. Review present and future needs of each entity present, including the following:
 - 1) Interface requirements.
 - 2) Sequence of operations.
 - 3) Status of submittals.
 - 4) Status of sustainable design documentation.
 - 5) Deliveries.
 - 6) Off-site fabrication.
 - 7) Access.
 - 8) Site use.
 - 9) Temporary facilities and controls.
 - 10) Progress cleaning.
 - 11) Quality and work standards.
 - 12) Status of correction of deficient items.
 - 13) Field observations.
 - 14) Status of RFIs.
 - 15) Status of Proposal Requests.
 - 16) Pending changes.
 - 17) Status of Change Orders.
 - 18) Pending claims and disputes.
 - 19) Documentation of information for payment requests.
 - 20) Commissioning efforts.
4. Minutes: Entity responsible for conducting the meeting will record and distribute the meeting minutes to each party present and to parties requiring information.
 - a. Schedule Updating: Revise Contractor's construction schedule after each progress meeting, where revisions to the schedule have been made or recognized. Issue revised schedule concurrently with the report of each meeting.
- F. Coordination Meetings: Conduct Project coordination meetings at weekly intervals. Project coordination meetings are in addition to specific meetings held for other purposes, such as progress meetings and preinstallation conferences.
 1. Attendees: In addition to COR, each contractor, subcontractor, supplier, and other entity concerned with current progress or involved in planning, coordination, or performance of future activities shall be represented at these meetings. All participants at the meetings shall be familiar with Project and authorized to conclude matters relating to the Work.
 2. Agenda: Review and correct or approve minutes of the previous coordination meeting. Review other items of significance that could affect progress. Include topics for discussion as appropriate to status of Project.

- a. Combined Contractor's Construction Schedule: Review progress since the last coordination meeting. Determine whether each contract is on time, ahead of schedule, or behind schedule, in relation to combined Contractor's construction schedule. Determine how construction behind schedule will be expedited; secure commitments from parties involved to do so. Discuss whether schedule revisions are required to ensure that current and subsequent activities will be completed within the Contract Time.
 - b. Schedule Updating: Revise combined Contractor's construction schedule after each coordination meeting, where revisions to the schedule have been made or recognized. Issue revised schedule concurrently with report of each meeting.
 - c. Review present and future needs of each contractor present, including the following:
 - 1) Interface requirements.
 - 2) Sequence of operations.
 - 3) Status of submittals.
 - 4) Deliveries.
 - 5) Off-site fabrication.
 - 6) Access.
 - 7) Site use.
 - 8) Temporary facilities and controls.
 - 9) Work hours.
 - 10) Hazards and risks.
 - 11) Progress cleaning.
 - 12) Quality and work standards.
 - 13) Status of RFIs.
 - 14) Proposal Requests.
 - 15) Change Orders.
 - 16) Pending changes.
3. Reporting: Record meeting results and distribute copies to everyone in attendance and to others affected by decisions or actions resulting from each meeting.

PART 2 - PRODUCTS

2.1 DRAWINGS

- A. Coordination Drawings and Record Documents shall comply with the latest version of FAA-STD-002, in addition to, the United States National CAD Standard® (NCS) with the FAA-STD-002 having precedence. Contractor shall notify the FAA of any discrepancies between these standards and obtain approval of the Contractor's proposed resolution. Plans, elevations, sections, schedules, and details shall be generated solely from the contract drawings.

PART 3 - EXECUTION

3.1 GENERAL PROVISIONS

- A. The FAA furnished Drawing files included in the systems described below reflect the design intent. The model shall be updated by the Contractor for each approved submittal to include as many of the systems described in this section as are necessary and appropriate at that construction stage for Coordination Drawings, Record Documents, and Facility Data requirements.

3.2 ARCHITECTURAL

- A. The Architectural systems drawings may vary in level of detail for individual elements, but at a minimum must include all features that would be included on a quarter inch (1/4"=1'0") scaled drawing. Additional minimum Drawings requirements include:
 - 1. Roof. The Drawings must include the roof configuration, drainage system, major penetrations, specialties, and the necessary intelligence to produce accurate plans, building sections and generic wall sections where roof design elements are depicted.

3.3 MECHANICAL

- A. The mechanical systems Drawings may vary in level of detail for individual elements, but at a minimum must include all features that would be included on a quarter inch (1/4"=1'0") scaled drawing. Additional minimum Drawings requirements include:
 - 1. HVAC. All necessary heating, ventilating, air-conditioning and specialty equipment, including air distribution ducts for supply, return, and ventilation and exhaust ducts, including control system, registers, diffusers, grilles, ducts access doors, gauges, thermometers, and hydronic baseboards with necessary intelligence to produce accurate plans, elevations, building/wall sections and schedules. All piping must be modeled. Contractor must take in consideration space for insulation as required.
 - 2. Mechanical Piping. All necessary piping, valves, gauges, thermometers, and fixture layouts, and related equipment, including necessary intelligence to produce accurate plans, elevations, building/wall sections, and schedules. All piping must be modeled.
 - 3. Plumbing. All necessary plumbing piping, valves and fixture layouts, floor and area drains, and related equipment, including necessary intelligence to produce accurate plans, elevations, building/wall sections, riser diagrams, and schedules. All piping must be modeled. Contractor must take in consideration space for insulation as required.
 - 4. Equipment Clearances. All HVAC and Plumbing equipment clearances must be modeled for use in interference management and maintenance access requirements.

3.4 ELECTRICAL/TELECOMMUNICATIONS

A. The electrical systems Drawings may vary in level of detail for individual elements, but at a minimum must include all features that would be included on a quarter inch (1/4"=1'0") scaled drawing. Additional minimum Drawings requirements include:

1. Interior Electrical Power and Lighting. All necessary interior electrical components (i.e., lighting, receptacles, special and general purpose power receptacles, lighting fixtures, panelboards, transformers, disconnects, pull boxes, control systems, raceways and supports), including necessary intelligence to produce accurate plans, details and schedules. All Cable trays and conduits routing must be modeled without detail of cable contents. Lighting and power built into furniture/equipment must be modeled.
2. Grounding Systems. All necessary grounding components (i.e., lightning protection systems, static grounding systems, and communications grounding systems, bonding), including necessary intelligence to produce accurate plans, details and schedules.
3. Equipment Clearances. All lighting, power, security, and communications equipment clearances and no-fly zones must be modeled for use in interference management and maintenance access requirements.

B. INDEX OF CONSTRUCTION ADMINISTRATION FORMS

1. Notice of Proposed Construction Alteration - For Contractor Use
2. RFI Standard Form - For Contractor Use
3. Approval or Disapproval of Contractor's Materials or Shop Drawings - For Contractor Use
4. Resident Engineer Environmental and Occupational Safety and Health Checklist
5. Certificate of Substantial Completion (CoSC) - For Contractor Use
6. Substantial Completion Acceptance (SCA) - For Contractor Use
7. Partial Occupancy/Use Agreement (POUA) - For Contractor Use
8. Job Memorandum (JM) - For Contractor Use
9. Hot Work Permit - For Contractor Use
10. Pre-Construction and Maintenance Project Safety and Health Checklist (FAA 3900-18) - For Contractor Use

END OF SECTION 01 31 00



U.S. Department of Transportation
Federal Aviation Administration

Failure To Provide All Requested Information May Delay Processing of Your Notice

Notice of Proposed Construction or Alteration

FOR FAA USE ONLY

Aeronautical Study Number

- - -

1. Sponsor (person, company, etc. proposing this action) :

Attn. of: _____

Name: _____

Address: _____

City: _____ State: _____ Zip: _____

Telephone: _____ Fax: _____

2. Sponsor's Representative (if other than #1) :

Attn. of: _____

Name: _____

Address: _____

City: _____ State: _____ Zip: _____

Telephone: _____ Fax: _____

3. Notice of: ☐ New Construction ☐ Alteration ☐ Existing

4. Duration: ☐ Permanent ☐ Temporary (_____ months, _____ days)

5. Work Schedule: Beginning _____ End _____

6. Type: ☐ Antenna Tower ☐ Crane ☐ Building ☐ Power Line
☐ Landfill ☐ Water Tank ☐ Other _____

7. Marking/Painting and/or Lighting Preferred:

☐ Red Lights and Paint ☐ Dual - Red and Medium Intensity White
☐ White - Medium Intensity ☐ Dual - Red and High Intensity White
☐ White - High Intensity ☐ Other _____

8. FCC Antenna Structure Registration Number (if applicable): _____

9. Latitude: _____ ° _____ ' _____ " "

10. Longitude: _____ ° _____ ' _____ " "

11. Datum: ☐ NAD 83 ☐ NAD 27 ☐ Other _____

12. Nearest: City: _____ State: _____

13. Nearest Public-use (not private-use) or Military Airport or Heliport:

14. Distance from #13. to Structure: _____

15. Direction from #13. to Structure: _____

16. Site Elevation (AMSL): _____ ft.

17. Total Structure Height (AGL): _____ ft.

18. Overall height (#16. + #17.) (AMSL): _____ ft.

19. Previous FAA Aeronautical Study Number (if applicable):

_____ - OE

20. Description of Location: (Attach a USGS 7.5 minute Quadrangle Map with the precise site marked and any certified survey.)

21. Complete Description of Proposal:

Frequency/Power (kW)

**this form to be
applied on-line at:
[https://oeaaa.faa.gov/
oeaaa/external/puntal
.jsp](https://oeaaa.faa.gov/oeaaa/external/puntal.jsp)**

Notice is required by 14 Code of Federal Regulations, part 77 pursuant to 49 U.S.C., Section 44718. Persons who knowingly and willingly violate the notice requirements of part 77 are subject to a civil penalty of \$1,000 per day until the notice is received, pursuant to 49 U.S.C., section 46301 (a).

I hereby certify that all of the above statements made by me are true, complete, and correct to the best of my knowledge. In addition, I agree to mark and/or light the structure in accordance with established marking and lighting standards as necessary.

Date

Typed or Printed name and Title of Person Filing Notice

Signature

Please Type or Print on This Form

FAA Form 7460-1 (2-99) Supersedes Previous Edition
012-0008

Form Approved OMB No. 2120-0001

NSN: 0052-00-



Federal Aviation Administration

Request For Information No. 000

Title: _____

From:	Project:	To:
Contractor	JOB TITLE	
Contractor address	Job Location	
Phone:	Contract:	Phone:
Fax:		Fax:
Contact:		RE:
Drawing or Spec:	Date Started:	Priority: Normal
	Date Required:	Potential Cost Impact? <input type="checkbox"/> Yes <input type="checkbox"/> No
Attachments? No	Date Completed:	Potential Schedule Impact? <input type="checkbox"/> Yes <input type="checkbox"/> No
		If yes to either, explain below.

Question (Include Potential Impacts):

Response:

By: _____, FAA

Date:

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Section A. Purpose

This checklist is intended to be used as a tool by the resident engineer (RE) and other personnel overseeing construction to ensure adherence to Environmental and Occupational Safety and Health (EOSH) requirements at a project site. It must be noted that contractors are responsible for ensuring the safety of their employees. The checklist may be used by the RE as a tool to support their oversight role at the construction site. The checklist may be completed at the beginning of the project and reviewed and updated as the project proceeds.

This checklist relies on the training and professional judgment of the user. EOSH personnel should be consulted as needed.

Section B. Project Summary Information

The purpose of this section is to provide a brief description of the construction project and/or specific maintenance tasks and identify key personnel responsible for project completion. Fill in the requested site-specific information. Indicate if this work will occur in or adjacent to an occupied space. Note: Provide further explanation of activities on additional sheets if necessary.

Project Name and Description: _____		

Project Location: _____		
Facility: _____		
Planned Start Date: _____		
Expected Completion Date: _____		
Contractor Contact:	Name: _____	Phone: _____
Project/Design Representative:	Name: _____	Phone: _____
COTR/Specialist:	Name: _____	Phone: _____
EOSH Contact:	Name: _____	Phone: _____
Facility Representative:	Name: _____	Phone: _____

Section C. Construction Safety Subject Areas

The following questions cover the most common EOSH related areas that may be encountered. This list is not inclusive. Consult with your designated EOSH professionals for additional guidance and assistance.

Construction Safety Subject Area	Yes	No/NA	Comment
GENERAL			
The project has the budget, work force, and schedule to develop an Accident Prevention Plan.			The accident prevention plan must include procedures for; Preventing Accidents, Educating Employees and Conducting Accident Investigation. 29 CFR 1926 Subpart C
The construction site will be inspected before, during and after each shift for obvious hazards.			OSHA has the right to enter the work site to conduct an inspection at any time. Conducting routine inspections, correcting potential violations, and maintaining good general housekeeping can minimize possible findings. 29 CFR 1903.3, 29 CFR 1926.3(a), 29 CFR 1926.25
A bulletin board will be posted with all required OSHA Notifications, safety literature, copies of accident reports and OSHA 300 Form.			Each employer is required to establish a location for posting of information, including: copies of the OSHA standards, specific safety standards, accident reports, and State specific safety postings. 29 CFR 1903.2(a)(1) and (2)
Concrete and/or masonry construction will take place as part of the project			If yes, complete Concrete and Masonry section below. 29 CFR 1926.700(a)
Structural Steel erection will take place as part of this project.			If yes, complete Steel Erection section below. 29 CFR 1926.750(a), (b) and (c)
The project will require welding, cutting, and/or brazing.			If yes, complete Welding, Cutting, and Brazing section below. 29 CFR 1926.350, 1926.351 and 1926.352
This project will involve structural demolition.			If yes, complete Demolition section below.

Construction Safety Subject Area	Yes	No/NA	Comment
CONCRETE and MASONRY			
Formwork and shoring must be adequate to support all intended loads during concrete placement.			29 CFR 1926.703(a)(1)
All protruding reinforcing steel will be guarded to eliminate impalement hazards.			29 CFR 1926.701(b)
All forms and shoring shall remain in place until a competent person determines that the concrete can support its weight and the weight of any superimposed loads.			29 CFR 1926.701(a)
Shoring equipment must be inspected immediately prior to, during and immediately after concrete placement.			29 CFR 1926.703(b)(3)
Work conducted over 4 feet above the next lower level shall comply with fall protection requirements.			See Climbing/Walking and Work Surfaces.
Pre-cast wall units, structural framing, and tilt-up wall panels shall be supported to prevent overturning and collapse until permanent connections are made.			29 CFR 1926.704(a)
A limited access zone will be established during masonry wall construction.			29 CFR 1926.701(c)
All masonry walls over eight feet in height shall be braced or supported to prevent collapse.			29 CFR 1926.706(b)
STRUCTURAL STEEL ERECTION			
The project has the schedule, budget and manpower needed to ensure the concrete attains 75% of its compressive strength.			Prior to beginning steel erection, the prime/controlling contractor must provide written notice to the steel erection firm that the concrete has attained at least 75% of its compressive strength. 29 CFR 1926.751(a)
The project will require development of a site-specific traffic plan and site-specific erection plan. Qualified person (also defined in § 1926.32) means one who, by possession of a recognized degree, certificate, or professional standing, or who by extensive knowledge, training, and experience, has successfully demonstrated the ability to solve or resolve problems relating to the subject matter, the work, or the project.			The controlling contractor is responsible for traffic control on the site to allow ease of steel delivery and movement of derricks, cranes, etc. Further, to ensure employee safety a site specific erection plan is required to be developed by a "qualified person." 29 CFR 1926.752(c)(1) and (d)
The project requires inspections of all cranes, derricks, etc. by a qualified person before beginning each shift and of all rigging by a qualified rigger.			The contractor should supply or be able to supply their shift inspection form for equipment being used on the site. 29 CFR 1926.753(c)(1) and (2)
The crane or derrick operators training certificate is on site and copies of the certificates are maintained in the project file.			American National Standards Institute (ANSI) B30.2 through B30.22.
The crane operation is performed by a qualified or certified operator, with appropriate clearance from power lines and appropriate work area control.			OSHA Crane standard was recently revised extensively to cover crane operations, including certifications, operation, and training requirements. 29 CFR 1926.1400
The project requires all decking or roofing holes where an employee could fall 15 feet or more be guarded with railings, netting, perimeter safety wire, etc.			Any openings in decking or roofing are required to be closed unless structurally impossible. In the case were the whole cannot be decked or roofed over, fall protection must be installed, or the opening must be guarded. 29 CFR 1926.760(a)(1)
Protection from overhead falling objects will be required.			29 CFR 1926.759(b)
Fall protection training and equipment will be provided for all employees working over 6 feet above the next lower deck and Controlled Decking Zone (CDZ) training for all personnel required to work on a CDZ.			29 CFR 1926.760(a) and (c), 1926.761(b) and (c)(3)
A safety railing of at least a 1/2 inch wire rope or equivalent is installed approximately 42 inches around the periphery of all temporary planked or temporary metal decked floors of tiered buildings and other multi-floored structures during structural steel assembly.			29 CFR 1926.750(b)(1)(iii)

Construction Safety Subject Area	Yes	No/NA	Comment
DEMOLITION			
Demolition with Hazardous Materials (HazMat)			
A hazardous material assessment will be conducted to identify any asbestos, lead paint, transformers, light ballasts, etc., prior to initiation of demolition.			29 CFR 1926.850(e)
Asbestos will be abated prior to demolition of the structure.			29 CFR 1926.850(e) See ASBESTOS
All transformers and light ballasts will be removed from the structure prior to demolition.			29 CFR 1926.850(e), See POLYCHLORINATED BIPHENYLS for disposal options.
All hazardous materials and/or hazardous waste will be removed from the structure prior to demolition.			29 CFR 1926.850(e), See HAZARDOUS MATERIAL MANAGEMENT AND HAZARDOUS WASTE, as applicable.
Lead based paint will be abated and/or the ground surface will be protected from paint chips.			
Demolition without HazMat or After Abatement			
An engineering survey of the structure, assessing the potential for unplanned collapse shall be provided in writing.			Prior to beginning demolition an engineering survey assessing the potential for structural collapse must be provided in writing to the demolition contractor. 29 CFR 1926.850(a)
Continuous inspections should be made by a competent person as demolition work progresses to detect hazards from weakened or deteriorated floors or walls or loosened materials.			29 CFR 1926.859(g)
All utilities will be removed and capped prior to beginning demolition.			Gas, electrical, water and sewer lines must be disconnected and capped to prevent fire, electrocution or other hazard to the employee. 29 CFR 1926.850(c)
The area around the structure shall be protected from fragmenting glass and or falling building debris.			Employees and, where applicable, the public shall be protected from hazards posed by fragmenting and falling glass and or building materials. 29 CFR 1926.850(f)
A covered and protected walkway will be provided for any multi-story demolition.			29 CFR 1926.850(k)
Holes in flooring shall be repaired unless being used to chute materials out of the structure.			Holes in flooring must be guarded or repaired to protect workers from falling hazards, unless the hole is being used as part of a disposal chute for removing materials from the structure. All disposal chute openings must be protected by a guardrail at least 42 inches high. 29 CFR 1926.851, 852 and 853
Areas below openings where debris/materials are dropped through holes in floor, without the use of a chute, should be completely enclosed with barricades at least 42 inches high and at least six feet back from the projected edge of the opening above.			29 CFR 1926.850(h) and 1926.502(b)
Floor openings not used as debris/material drops should be equipped with a properly secured cover that will support two times the weight of employees, equipment, and materials that may be imposed on the cover at any one time.			29 CFR 1926.850(i) and 29 CFR 1926.502(i)
ELECTRICAL SAFETY			
The project will involve installation or removal of electrical systems, components or otherwise expose employees to electrical hazards.			29 CFR 1926.403; NFPA 70E Requirements
Electric equipment and lines should be considered energized until verified to be de-energized by test or other appropriate methods or means.			
Electrical equipment should be free from recognized hazards that may cause death or serious harm.			29 CFR 1926.403(b)(1)
Electrical disconnects such as circuit breakers, switches, and other disconnect means should be legibly marked to indicate purpose unless they are located so that purpose is evident.			29 CFR 1926.403(h)

Construction Safety Subject Area	Yes	No/NA	Comment
All electrical equipment should have ground fault circuit interrupters (GFCIs) to protect employees. An assured equipment grounding program should be in place if GFCIs are not in use.			29 CFR 1926.404(b)(1)(i) and (iii)
Electrical equipment used in hazardous locations must be either approved for the location or intrinsically safe.			29 CFR 1926.407(b)
When working on buried cable or a cable in manholes, metallic sheath continuity should be maintained by bonding across the opening or by an equivalent means.			29 CFR 1926.956(c)(7)
Hazardous energy controls (lockout/tagout) shall be used before servicing or maintenance activities on any machinery and equipment to prevent the unexpected energizing, startup, or release of stored energy that could cause injury.			29 CFR 1910.147(a)(2)(i)
EMERGENCY PREPAREDNESS			
A written Emergency Action Plan will be developed for the project and shall be available at the worksite.			An emergency action plan must be developed outlining that the employee is expected to take in the event of an emergency. The written plan must be available at the worksite. 29 CFR 1926.35(a) and (e)(3)
Employees will receive training in the alarm system, actions to be taken in the event of emergency, expected duties, and reporting requirements.			The emergency action plan must include: <ul style="list-style-type: none"> • Emergency escape procedures and emergency escape route assignments; • Procedures to be followed by employees who remain to operate critical plant operations before they evacuate; • Procedures to account for all employees after emergency evacuation has been completed; • Location of assembly area; • Rescue and medical duties for those employees who are to perform them; • The preferred means of reporting fires and other emergencies; and • Names or regular job titles of persons or departments who can be contacted for further information or explanation of duties under the plan. 29 CFR 1926.35(b)
Emergency medical, fire and evacuation drills will be conducted at the project site.			Fire, medical and evacuation drills should be conducted on-site to familiarize employees with alarms, rally areas, emergency exits/evacuation routes and emergency procedures. 29 CFR 1926.35(e)
Documentation of employee training and drills will be maintained in the project file.			Documentation of any training should be maintained in the project file, as Emergency Action Plan training is site specific. Further, documentation of FAA employees/contractors on-site or visiting the site being briefed should also be maintained in the project files.
EXCAVATING and TRENCHING			
The project will have the budget, schedule and personnel to arrange utility clearances with the local utility companies, if applicable.			The utility companies must be contacted and allowed at least 24 hours to respond to the request for a utility locate. If the utility company does not respond, the work can continue but precautions must be taken. A record of all utility clearances or attempts to obtain utility clearances should be maintained with the project file. 29 CFR 1926.651(b)
The project includes budget and schedule for use of proper sloping, shoring, shielding or trench boxes.			29 CFR 1926.651(i)
The project includes budget, schedule and manpower to conduct daily inspection of all excavations to prevent cave-in.			A daily inspection of the excavation by a competent person is required to look for signs of soil movement, fracturing of soils, or other issues increasing the risk of a cave in. Documentation of each daily excavation inspection should be maintained in the project file. 29 CFR 1926.651(k)

Construction Safety Subject Area	Yes	No/NA	Comment
The project includes the budget and schedule to properly shore, brace or underpin adjoining buildings, ground or walls affected by the excavation.			A registered engineer must properly design all shoring, bracing or underpinning. 29 CFR 1926.651(i)
Trenches shall be equipped with ladders so that employees in the trench do not have to travel more than 25 feet to egress any portion of the excavation.			29 CFR 1926.651(c)(2)
The site layout plan identifies safe distance requirements for stockpiling materials or excavated soils, to avoid sidewall collapse.			Materials must be kept a minimum of 2 feet from the edge of the excavation, and may require more clearance dependent upon soil type. 29 CFR 1926.651(j)
All applicable utility companies (power, gas, water, telephone, etc.) shall be contacted in order to determine the location of potential underground obstructions/hazards prior to cutting into the soil. If the utility companies are not able to specifically locate the underground obstructions/hazards, either instruments or probes shall be used to locate the underground obstructions/hazards, prior to the start of operations.			29 CFR 1926.651(b)(2) and (3)
Any trench or excavation five feet or more in depth must be provided with cave-in protection through such means as shoring, sloping, benching, or use of hydraulic shoring, trench shields, or trench boxes. Trenches or excavation less than five feet in depth, that have a potential for cave-in, must be provided with cave-in protection.			29 CFR 1926.652(a)(1)
Fences or other appropriate physical barriers are required to be erected around the excavation or trench. Flashing caution lights are required if work is being conducted at night or when the opening is left uncovered during evening periods. Both the barriers and flashing caution lights must be maintained around the opening until the work is completed or the opening is adequately covered.			
Testing and engineering controls need to be established to prevent employee exposure to hazardous atmospheres that could enter trenches/excavations.			29 CFR 1926.651(g)
A competent person is required to inspect each excavation/trench daily. These inspections shall be conducted before the start of work, at the beginning of each shift, after every rainstorm or other hazardous occurrence, and as needed throughout the shift.			29 CFR 1926.651(K)(1)
FIRE PREVENTION and PROTECTION			
A written fire prevention and protection plan shall be maintained at the site.			A site-specific fire prevention and protection plan should be established for each construction site, establishing fire alarm procedures, fire extinguisher locations and use, fire suppression system (if available), etc. 29 CFR 1926.150(a)
Instructions for reporting a fire shall be conspicuously posted at the work site.			29 CFR 1903.2(a)(1)
Adequate fire extinguishers shall be provided to allow employees to evacuate the work site.			The project manager will need to determine if the construction contractor will be required to provide fire fighting services or simply have his/her employees evacuate the site in the event of an emergency. All fire extinguishers must be within their annual certification and must be visually inspected on a monthly basis. All fire extinguishers should be conspicuously located and marked. 29 CFR 1926.150(a)(3), (5) and (c)
Flammable and combustible liquids stored at the site shall be kept in approved containers and will be stored in rooms or flammable storage cabinets meeting fire resistance requirements.			29 CFR 1926.152(a), (b) and (c)
Smoking on the work site shall be prohibited.			29 CFR 1926.151(a)(3)

Construction Safety Subject Area	Yes	No/NA	Comment
At least one portable fire extinguisher, with a rating of not less than 20-B:C, must be located within 75 feet of each pump, dispenser, underground file pipe opening, and lubrication or service area.			29 CFR 1926.152(g)(11)
HAND and POWER TOOLS			
Hand and Power Tools that can accommodate guards, shall be equipped with the appropriate guards.			If a hand tool or power tool can support guards, the guards must be installed. Further, the point of operation, the area where actual work is performed, shall be arranged and/or guarded to keep workers from placing themselves in danger. 29 CFR 1926.300(b)
Hand and power tools shall be inspected for defects, missing prongs on plugs, and frayed power cords prior to each work shift.			Employers are responsible for ensuring that employees are not using unsafe hand or power tools. All tools should be inspected prior to each work shift, the inspection documented (especially for power tools), and the documents kept in the project files. Damaged tools shall be removed from the project immediately. 29 CFR 1926.301(a)
Electric power tools must be properly grounded or double insulated.			29 CFR 1926.302(a)
Powder actuated tools shall only be used by trained personnel.			Powder actuated tools may only be used by trained employees. Copies of personnel's training records should be included in the project file and maintained on-site for the duration of the project. 29 CFR 1926.302(e)
Personnel using hand and power tools shall be issued personnel protective equipment required to protect them from the hazards associated with each particular hand or power tool.			Personnel must be issued Personal Protective Equipment (PPE) required to protect them from falling, flying, abrasive and splashing objects, dusts, fumes, mists or other hazards caused by hand or power tools. Personnel must be trained to use the PPE they are issued. Copies of training documents should be kept in the project file. 29 CFR 1926.301(c)
WELDING, CUTTING, and BRAZING			
Only trained, licensed or certified employees shall conduct welding, cutting, or brazing.			All welders must be trained in the proper use of their equipment and understand the hazard associated with the equipment use, and how to protect themselves from those hazards.
A hot work permit will be required to authorize any welding, cutting, or brazing outside of an area designed for these activities; such as welding booths.			A Hot Work Permit program allows the project manager or site supervisor to inspect the welding area prior to initiation of welding or cutting activities. This also ensures that any combustible materials have been removed or shielded, and any other fire protection requirements have been put in place. 29 CFR 1910.252(a)(1) and (2), 29 CFR 1926.352
Workers conducting any welding or cutting shall be provided personnel protective equipment including proper protective lenses.			PPE must be provided to protect workers from sparks, molten steel and damage to their eyes. Further, mechanical ventilation or respirator protection may be required to ensure workers are not over-exposed to metal fumes generated by welding or cutting activities. 29 CFR 1910.252(b), 29 CFR 1926.351(e) and 353(a)
All welding equipment, tips, cylinders, valves, etc., shall be inspected prior to each use or at the beginning of each shift.			All welding equipment should be inspected prior to use. All gas hoses must be inspected prior to each use. Copies of all inspections records should be maintained in the project file for the duration of the project. 29 CFR 1926.350(f)(3)
The project has the budget to provide a fire watch for all welding required by the project.			A fire watch is required for any welding activity where combustible materials cannot be removed, moved, or shielded and are within 35 feet of welding activities. 29 CFR 1910.252(a)(iii)
All compressed gas cylinders shall be secured in an upright position and protective caps in place during storage. Cylinders should be secured in a vertical position when transported by power vehicles.			29 CFR 1926.350(a)(4) and (9)

Construction Safety Subject Area	Yes	No/NA	Comment
Mechanical ventilation system of sufficient capacity and so arranged shall be provided to remove fumes and smoke and keep the concentration within safe limits.			29 CFR 1926.353(a)(2) and (3)
General mechanical ventilation, local exhaust ventilation, or airline respirators must be provided to employees who are required to conduct welding, cutting, or brazing operations in permit required confined spaces.			29 CFR 1926.353(b)(1)
Approved fire extinguishers shall be provided and maintained in all areas where welding will be conducted and the extinguishers must be the proper class for potential class of fire in the area.			Approved fire extinguishing media shall be immediately available at any location where welding is taking place. 29 CFR 1926.353(d) 29 CFR 1910.252(a)(1)(ii)
HOUSEKEEPING			
Separate containers shall be provided for disposal of trash, oily/combustible rags, fuel soaked rags, flammable or hazardous wastes and acidic wastes.			Waste should be collected from around the site to minimize fire hazards. Further, wastes should be segregated to avoid possible waste incompatibilities and minimize potential hazardous waste disposal costs. 29 CFR 1926.25(c), 40 CFR 262.11 See HAZARDOUS MATERIAL MANAGEMENT AND HAZARDOUS WASTE MANAGEMENT.
All wastes collected at the site shall be reviewed to ensure they are being disposed of properly.			40 CFR 262.11 See HAZARDOUS MATERIAL MANAGEMENT AND HAZARDOUS WASTE MANAGEMENT.
Work areas should be cleaned at the end of each shift, trash collected, any protruding nails removed or fixed, ladders and equipment inspected, tools and supplies organized and the floor cleared of any debris.			
LADDER and TEMPORARY STAIRWAY SAFETY			
Stairways			
All stairways shall meet industry accepted standards for angle and rise versus run.			29 CFR 1910.24(e)
Stairway treads shall be non-slip and/or slip resistant.			All treads and stair nosing must be relatively slip resistant, and the edge of the stair tread must be easily identifiable by persons using the stairwell. 29 CFR 1910.24(f)
Flights of stairs with four or more risers equipped should be equipped with standard stair railings or handrails.			Hand rails must be provided on all stairwells, closed or open. On open sided stairwells must have railings and handrails on the open side. Railings must be 42 inches high, with handrails being between 30 and 34 inches in height. Railing is able to hold at least a 200 lb load. 29 CFR 1910.23(d) and (e), and 24(h)
Stairs shall be at least 22 inches wide.			Minimum allowable stairway width is 22 inches. Stairways may be wider, but cannot be narrower. Stairways wider than 22 inches need to meet additional railing or handrail requirements. 29 CFR 1910.23(d) and (e)
Stairways shall be inspected on a regular basis.			All temporary stairways must be inspected for defects or damage. Records of these inspections should be maintained in the on-site project file for the duration of the project. Damaged or defective stairways must be taken out of service and/or repaired. 29 CFR 1926.851(b)
Ladders			
All ladders in use on the project shall be inspected on a regular basis.			All temporary stairways must be inspected for defects or damage. Records of these inspections should be maintained in the on-site project file for the duration of the project. Damaged or defective stairways must be taken out of service and/or repaired. 29 CFR 1910.26(d)(1)(x) and 1926.1053(b)(15)
All ladders shall be secured in place using bracing at the base and being tied off at the top.			While bracing can be used to help secure a ladder in place, it does not take the place of lashing the ladder at the top to prevent slippage or sliding. 29 CFR 1910.26(d)(1)(ix) and 1926.1053(b)(1)

Construction Safety Subject Area	Yes	No/NA	Comment
Side rails of ladders should extend at least 36 inches above the landing or roof edge.			29 CFR 1926.1053(b)(1)
ILLUMINATION			
The project has the budget to provide light sets to provide adequate lighting throughout the entire construction site.			The amount of lighting required is dependent upon the activities being performed in each area. For foot-candle illumination requirements see 29 CFR 1926.56(a) Table D-3.
Construction areas, ramps, runways, corridors, offices, shops, and storage areas must be lighted with either natural or artificial illumination.			29 CFR 1926.56(a)
All overhead objects (i.e. lights, signs, wiring and piping) shall be at least 7 feet above floor level.			All overhead objects are at least 7 feet above floor level to minimize the potential for head injuries. 29 CFR 1910.24(i)
All lights will be guarded to prevent breakage.			
OCCUPATIONAL HEALTH and ENVIRONMENTAL CONTROLS			
NOISE			
The project has the budget to conduct personal and/or area noise monitoring.			Engineering and administrative controls must be implemented when noise exceeds 90 dBA for 8 hours. If noise levels are louder, then the total exposure must be calculated. If calculated sound levels exceed 85 dBA, then a hearing conservation program must be implemented. Also, all monitoring records must be maintained in the project file for at least two years. 29 CFR 1910.95(a), 1910.95(m)(3)(I), and 29 CFR 1926.52(d)(1)
The project has the budget and schedule to develop a Hearing Conservation Program.			If noise levels exceed 85 dBA for an 8-hour time weighted average (TWA), then the employer must develop a Hearing Conservation Program. 29 CFR 1910.95(c)(1)
All employees exposed to noise above 85 dBA will be notified.			Any employee exposed to noise levels above 85 dBA TWA shall be notified of the noise monitoring results. 29 CFR 1910.95(e)
Employees exposed to noise levels above 85 dBA shall have hearing protection.			All employees exposed to noise levels above 85 dBA TWA shall be provided hearing protection and the employer shall ensure that employees wear the hearing protection. 29 CFR 1910.95(i)
Employees will be briefed regarding the hazards of noise over-exposure, how to recognize noise over-exposure and how to protect themselves.			During the hazard communications briefing, all employees should be briefed on the hazards associated with noise over-exposure and methods to protect themselves. The briefing should also cover proper use of any PPE supplied. Records of such training should be maintained in the project file.
SANITATION			
The project has the budget to supply drinking water, either as bottled water or as a drinking water supply with disposable cups.			Employers are required to supply an adequate potable water supply. Further, using a shared cup or allowing dipping of water from a container is prohibited. If a mutual water container is provided, disposable water cups must be supplied. 29 CFR 1926.51(a)(1) and (a)(2)
All water coolers shall be clearly marked Drinking Water-Do Not Use For Any Other Purpose.			29 CFR 1926.51(a)(3)
All water sources shall be marked as either Potable or Non-Potable.			29 CFR 1926.51(a)(6)
The project has the budget to supply heated, ventilated and well-lighted quarters.			If the project is providing temporary sleeping quarters or will be a work camp environment, sleeping quarters must be heated, ventilated and lit. 29 CFR 1926.51(e)
The project has the budget to properly manage food preparation, if necessary.			If the project is providing food to on-site workers or if the project is establishing a work camp, where employees, contractors and sub-contractors will be fed, then all local, state and federal laws and ordinances must be met. 29 CFR 1926.51(d)

Construction Safety Subject Area	Yes	No/NA	Comment
The project has the budget to provide adequate toilets and wash facilities.			If the project is providing quarters or housing on-site for the duration of the project, then lavatories and shower facilities must be established. If showers are provided, the project must also provide soap, hot and cold water and clean towels (i.e. meaning a facility for washing towels will also be required). At a minimum the number of toilet required at the job-site must meet the minimum number of toilets and urinals identified in 29 CFR 1926.51(c)(1). 29 CFR 1926.51(c)(1) and 1926.51(f)(4)
GASES, FUMES and VAPORS			
The project is utilizing hazardous materials that have established exposure limits.			If the project is using a hazardous material with an established Threshold Limit Value (TLV) or Permissible Exposure Limit (PEL), then precautions shall be taken to prevent employee exposure at levels above the TLV/PEL. 29 CFR 1926.55(a)
The project has the budget to conduct personal or area air monitoring to assess employee exposure.			
Personnel will be issued Personal Protective Equipment necessary to protect themselves from any gases, fumes or vapors.			PPE shall only be issued if engineering and administrative controls cannot reduce exposure to below the TLV/PEL. Prior to issuing respiratory protection, airborne concentrations of hazardous materials must be determined to ensure that provided respiratory protection will properly protect employees. Employees using respiratory protection must have been trained in the proper use, limitations and maintenance of the respirator. Further, employees required to use a respirator must be medically capable of using a respirator. Finally, a written respirator program must be available and should be maintained on-site for the duration of the project. 29 CFR 1910.134
HEAT and COLD EXPOSURE			
Employees will be provided Physical Hazard Data Sheets on Cold and Heat exposure during the Hazard Communication brief.			Heat and cold exposure are physical hazards that should be discussed during the Hazard Communication in-briefing at the site. Employees should be trained to recognize the signs of heat stress/heat stroke and hypothermia. Further, methods employees can use to protect themselves from these hazards should be identified.
Temperature and humidity will be monitored and rest-breaks adjusted to minimize potential for heat or cold related injuries.			
The project has the budget necessary to provide longer breaks for either warming up or cooling off, required to avoid heat and cold injuries in inclement weather.			
MATERIAL HANDLING			
For lift operations using motorized equipment, procedures for lifting and handling of materials and equipment must be developed prior commencing operations.			
Hoistways and aisles will be kept clear of any stored materials.			29 CFR 1926.250(a)(3)
Personnel required to work on stored materials (i.e. stacked, tiered storage, etc.) shall be provided with Fall Protection.			Any person required to work over 1.8 meters (6 feet) above the next lower working surface, shall be provided fall protection. 29 CFR 1926.501(b)(1)

Construction Safety Subject Area	Yes	No/NA	Comment
All slings, riggings and fastenings shall be inspected prior to each work shift by a competent person.			Each sling, rigging, fastener or other equipment used for lifting must be inspected each day before being used by a competent person. Additional inspections may be warranted depending on use, but any damaged equipment must be removed from service immediately. Records of each daily inspection and removal of equipment from service should be maintained in the project file on-site for the duration of the project. 29 CFR 1926.251(a)(6)
Areas where lifting or overhead slinging of materials occurs will have restricted access and suspended loads shall not travel over workers heads.			29 CFR 1926.550(a)(9)
Where stacked or tiered storage is being used, load limits will be identified and posted on each tier of storage.			
Materials being dropped into a disposal container shall be enclosed by a chute.			
Prescribed hand signals for all guiding all motorized equipment shall be established for the project and will be communicated to the employees.			Prescribed hand signals should be established to cover all equipment guiding being conducted during the project. All personnel responsible for guiding equipment operations should be trained in the accepted hand signals. Non-standard hand signals should be discouraged. 29 CFR 1926.550(a)(4)
All lifting/hoisting equipment on-site shall be inspected before being used each day or each shift.			Records of daily inspections of all motorized equipment should be maintained in the on-site project file for the duration of the project. 29 CFR 1926.550(a)(5)
All alarms, warning lights, etc., will be inspected for correct function before equipment is used each day or each shift.			Equipment used for material handling must be inspected before use and as necessary to ensure that it is safe. 29 CFR 1926.550(a)(5) and .601(b)(14)
Annual certificates of inspection shall be kept on-site for all equipment.			All lifting and hoisting equipment is required to have an annual inspection by a competent person or government entity. Copies of the annual certificate of inspection shall be kept in the on-site project files for the duration of the project. If equipment does not have a current inspection certificate it cannot be used on the project. 29 CFR 1926.550(a)(6)
The "swing" area around all heavy equipment and areas where employees could be pinned between heavy equipment and other objects, will be barricaded.			The swing area, especially for equipment with large counterweights must be restricted to avoid employees working in areas where the equipment operator may not be able to see them. 29 CFR 1926.550(a)(9)
All equipment shall be supplied with functional portable fire extinguishers within immediate access of the operator.			Cranes, derricks, etc., are required to have a fire extinguisher readily available to them. All equipment and vehicles at a site should be equipped with a fire extinguisher for any emergency. 29 CFR 1926.550 (14)
Aerial lift trucks working near energized lines or equipment must be grounded or barricaded and considered as energized equipment or the truck should be insulated for the work being performed.			Spotters and tag lines, or other suitable devices used to control loads being handled, are required when lifting operations are conducted adjacent to energized overhead power lines. Keep lift trucks at least 15 feet from all power lines. 29 CFR 1926.952(c)
Spotters and tag lines, or other suitable devices used to control loads being handled, are required when lifting operations are conducted adjacent to energized overhead power lines.			29 CFR 1926.952 (d)
SCAFFOLDING			
The project has the budget to have a "qualified" person design the scaffolding system.			All scaffolding must be designed by a qualified person and then must be constructed to meet that design. Further, all scaffolding must be constructed, dismantled or moved under the supervision of a "qualified" person. 29 CFR 1926.451(a)(6) and (f)(7)

Construction Safety Subject Area	Yes	No/NA	Comment
All employees constructing scaffolding shall be trained in erecting, dismantling, operating, moving, repairing, maintaining and inspecting scaffolding.			Copies of all training records for personnel erecting or otherwise working with scaffolding should be maintained in the on-site project file for the duration of the project. 29 CFR 1926.454(b)
The project has the budget to supply all personnel constructing and dismantling any required scaffolding fall protection.			Employers are required to supply fall protection for all employees erecting, or dismantling supported scaffolds, unless it can be demonstrated that the fall protection creates a greater hazard to the employee. NOTE: Requirements for fall protection should be reviewed prior to construction of any scaffolding, as requirements vary dependent upon the type of scaffolding being used on the project. 29 CFR 1926.451(g)(2)
All scaffolding more than 3.1 meter or 10 feet above ground level, shall be equipped with a guardrail capable of supporting a 200 lbs load.			NOTE: Requirements for guardrails should be reviewed prior to construction of any scaffolding, as requirements vary dependent upon the type of scaffolding being used on the project. 29 CFR 1926.451(a)(4)
Scaffolds should be capable of supporting at least four times their maximum intended load.			29 CFR 1926.451(a)(7)
Manually propelled mobile scaffolds must be erected so that their height is no more than four times the minimum base dimension.			29 CFR 1926.451(e)(1)
All scaffolding will be conspicuously marked with the maximum rated load.			Scaffolding is required to support up to six times the maximum rated load dependent upon the type of scaffolding, footings and suspension being used. Further, all working floors are required to be marked with the floors load capacity.
All employees required to work on a scaffold shall be trained in working from a scaffold.			Each employee required to work on a scaffold shall be trained by a person qualified in the subject matter to recognize hazards associated with the types of scaffolding being used and methods to control those hazards and protect themselves. Copies of all training records for personnel working on scaffolding should be maintained in the on-site project folder for the duration of the project. 29 CFR 1926.454(a)
The project has the budget to have scaffold flooring erected by a competent person.			Scaffolds must be erected such that the space between the platform, uprights and adjoining sections is no more than one (1) inch. 29 CFR 1926.451(b)(1)
The project has the budget to provide fall protection to all employees working on the scaffolding less than 18 inches wide.			Scaffolding must be at least 18 inches wide; unless the employer can demonstrate that it is not feasible. If scaffolding is less than 18 inches wide, it MUST be equipped with guardrails or each employee MUST be equipped with fall protection. 29 CFR 1926.451(b)(2)
All supported scaffolding footings shall be level, sound, rigid and capable of supporting the load.			Unstable objects shall not be used as footing or supports to establish or jury
Each scaffold shall be inspected by a person trained in erecting, repairing and inspecting scaffolding before work begins on the scaffolding, each day.			Copies of daily inspection records should be maintained in the on-site project file for the duration of the project.
MEDICAL SERVICES, FIRST AID, SANITATION			
A facility for the treatment of injured employees should be located within a reasonable distance from all FAA facilities where construction activities are being conducted site. If not, there should be a first aid trained employee(s) at the site.			29 CFR 1926.50(c)
Adequate potable (drinking) water and toilet facilities should be available at all FAA facilities where construction activities are being conducted.			29 CFR 1926.51(a) and (c)
Adequate warning signs must be posted to inform workers of potential health and safety concerns (e.g., areas where hard hats and hearing protection are required).			29 CFR 1926.200

Section D. Review Information

The appropriate FAA EOSH professionals and the Facility Representative, as applicable, will sign below to document discussion of the items on this form. **This checklist is intended to be used as a tool by the Resident Engineer (RE) to ensure adherence to EOSH requirements at the FAA contractor site.** .

Completed by:	Date
Reviewed by:	Date

Notes (e.g., provide further explanation of potential hazards, locations, etc. below and attach additional sheets if necessary)

CERTIFICATE OF SUBSTANTIAL COMPLETION (CoSC)

TO: **FEDERAL AVIATION ADMINISTRATION**

DATE OF SUBSTANTIAL COMPLETION:	PROJECT TITLE:
-	
	CONTRACT NO.
PROJECT OR SPECIFIED PART SHALL INCLUDE:	LOCATION:
	CONTRACTOR:
	NTP DATE:

The Work performed under this Contract has been inspected by authorized representatives of the FAA and Contractor and the Project (or specified part of the Project, as indicated above) is hereby declared to be substantially completed on the above date.

DEFINITION OF SUBSTANTIAL COMPLETION

The date of substantial completion of a project or specified area of a project is defined by the Contract Documents, General Conditions

A tentative list of items to be completed or corrected is appended hereto. This list may not be exhaustive, and the failure to include an item on it does not alter the responsibility of the Contractor to complete all the Work in accordance with the Contract Documents.

The Contractor accepts the above Certificate of Substantial Completion and agrees to complete and correct the items on the tentative list within the time indicated.

CONTRACTOR	(Typed)	AUTHORIZED REPRESENTATIVE	(Signature)	DATE
FAA RESIDENT ENGINEER	(Typed)	FAA RESIDENT ENGINEER	(Signature)	DATE

OWNER – FEDERAL AVIATION ADMINISTRATION

The applicable FAA AT, SSC, and SMO concurs with Substantial Completion for the purposes of maintenance and operations of the completed Work.

FAA AIR TRAFFIC REPRESENTATIVE	(Typed)	FAA AIR TRAFFIC REPRESENTATIVE	(Signature)	DATE
FAA SSC REPRESENTATIVE	(Typed)	FAA SSC REPRESENTATIVE	(Signature)	DATE
FAA SMO REPRESENTATIVE	(Typed)	FAA SMO REPRESENTATIVE	(Signature)	DATE

REMARKS:

Attached: Substantial Completion Acceptance Form (Copy)
Punchlist Dated
Certificate of Occupancy Dated (As Required)

cc: FAA Contracting Officer
FAA Project Engineer

CERTIFICATE OF SUBSTANTIAL COMPLETION (CoSC) *(Continued)*

CONTRACT NO. _____

Concurrent with the issuance of this Certificate, the areas of responsibilities are assigned as follows:

SECURITY: _____

MAINTENANCE: _____

OPERATIONS (CLEANING/HOUSEKEEPING): _____

UTILITIES: _____

PROTECTION OF THE WORK: _____

INSURANCE: _____

HEAT: _____

COMPLETE RECORD DOCUMENTS (DATE): _____

COMPLETE O&M MANUALS (DATE): _____

DATE REQUIRED FOR COMPLETION OF CORRECTIONS TO THOSE ITEMS CONTAINED IN THE ATTACHED PUNCHLIST: _____



U.S. Department
of Transportation
**Federal Aviation
Administration**

SUBSTANTIAL COMPLETION ACCEPTANCE (SCA)

(72 Hours Notice of Inspection is Required)

PROJECT: _____
(Number & Description)

PART I - NOTICE OF INSPECTION:

The Contractor has requested a substantial completion inspection for referenced project and has submitted the attached punchlist. This inspection is scheduled for:

_____ at _____
DATE TIME

All parties will meet at _____ at the above date and time. Please ensure authorized representatives from the following are present:

Contractor: _____

FAA Resident Engineer: _____

FAA Air Traffic: _____

FAA SSC: _____

FAA SMO: _____

FAA ASO-470: _____

Others: _____

PART II – SIGNATURES OF ACCEPTANCE OF SUBSTANTIAL COMPLETION:

The following parties concur referenced project, at the above date and time of inspection, is substantially complete contingent upon concurrence of the punchlist.

Contractor: _____

FAA Resident Engineer: _____

FAA Air Traffic: _____

FAA SSC: _____

FAA ASO-470: _____

Others: _____

SUBSTANTIAL COMPLETION ACCEPTANCE (SCA) *(Continued)*

PROJECT: _____
(Number & Description)

PART III - PUNCHLIST REVIEW/ACCEPTANCE:

The following parties concur the attached punchlist dated _____ is a comprehensive punchlist to the best of their knowledge and is the substantial completion punchlist.

Contractor: _____

FAA Resident Engineer: _____

FAA Air Traffic: _____

FAA SSC: _____

FAA ASO-470: _____

Others: _____

PART IV - FINAL ACCEPTANCE:

The following parties concur all punchlist items for referenced project were completed on _____.

Contractor: _____

FAA Resident Engineer: _____

FAA Air Traffic: _____

FAA SSC: _____

FAA ASO-470: _____

Others: _____

Part IV must be completed prior to processing the Contractor's final Pay Application. **The OAR is to attach proof of FAA/TN DOT final inspections, as required.**

A copy of this form is to be attached to the Certificate of Substantial Completion at the time of issuance with Parts I through III completed.

cc: FAA Contracting Officer
FAA Project Engineer



U.S. Department
of Transportation
**Federal Aviation
Administration**

PARTIAL OCCUPANCY / USE AGREEMENT (POUA)

TO: **FEDERAL AVIATION ADMINISTRATION**

DATE OF PARTIAL OCCUPANCY/USE: _____

- _____

PROJECT OR SPECIFIED PART SHALL INCLUDE:

PROJECT TITLE : _____

CONTRACT NO: _____

LOCATION: _____

CONTRACTOR: _____

NTP DATE: _____

The Work performed under this Contract has been inspected by authorized representatives of the FAA and Contractor and the Project (or specified part of the Project, as indicated above) is hereby declared to be acceptable for Partial Occupancy/Use on the above date.

DEFINITION OF PARTIAL OCCUPANCY/USE

The date of Partial Occupancy/Use of a project or specified area of a project is defined by the Contract Documents, General Conditions

A tentative list of items to be completed or corrected is appended hereto. This list may not be exhaustive, and the failure to include an item on it does not alter the responsibility of the Contractor to complete all the Work in accordance with the Contract Documents.

The Contractor accepts the above Partial Occupancy/Use Agreement and agrees to complete and correct the items on the tentative list within the time indicated.

CONTRACTOR (Typed)

AUTHORIZED REPRESENTATIVE (Signature) DATE

FAA RESIDENT ENGINEER (Typed)

FAA RESIDENT ENGINEER (Signature) DATE

OWNER – FEDERAL AVIATION ADMINISTRATION

The applicable FAA AT, SSC, and SMO concurs with Partial Occupancy / Use for the purposes of maintenance and operations of the completed Work.

FAA AIR TRAFFIC REPRESENTATIVE (Typed)

FAA AIR TRAFFIC REPRESENTATIVE (Signature) DATE

FAA SSC REPRESENTATIVE (Typed)

FAA SSC REPRESENTATIVE (Signature) DATE

FAA SMO REPRESENTATIVE (Typed)

FAA SMO REPRESENTATIVE (Signature) DATE

REMARKS: _____

Attached: Punchlist Dated _____
Certificate of Occupancy Dated _____ (As Required)

cc: _____
FAA Contracting Officer
FAA Project Engineer

PARTIAL OCCUPANCY/USE AGREEMENT (POUA) *(Continued)*

CONTRACT NO. _____

Concurrent with the issuance of this Agreement, the areas of responsibilities are assigned as follows:

SECURITY: _____

MAINTENANCE: _____

OPERATIONS(CLEANING/HOUSEKEEPING): _____

UTILITIES: _____

PROTECTION OF THE WORK: _____

INSURANCE: _____

HEAT: _____

COMPLETE RECORD DOCUMENTS (DATE): _____
(Status)

WARRANTY STARTS (DATE): _____

COMPLETE O&M MANUALS (DATE): _____
(Status)

DATE REQUIRED FOR COMPLETION OF CORRECTIONS TO THOSE ITEMS CONTAINED IN THE ATTACHED PUNCHLIST:



U.S. Department
of Transportation
**Federal Aviation
Administration**

JOB MEMORANDUM (JM)

JM No.: _____ Date: _____ Sheet _____ of _____

To: _____

Project: _____ (B.P. _____)

Field inspection has indicated that the following work is not being performed in accordance with the Contract Documents. The Contractor is requested to provide his proposed Contractor Corrective Action (CCA) no later than .

Reference: Sheet No.: _____ Specification No.: _____ Other: _____

Subject: _____

Description of Discrepancy: _____

Resident Engineer _____

CONTRACTOR'S CORRECTIVE ACTION (CCA)

CCA No.: _____ Date: _____

To: **FEDERAL AVIATION ADMINISTRATION – RESIDENT ENGINEER**

The following action has been

taken _____

Contractor _____

FAA's Response: _____

cc: _____
FAA Contracting Officer, FAA Project Engineer, A/E

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HOT WORK PERMIT

(for welding, cutting, or brazing activities)

THIS FORM MUST BE COMPLETED IN ITS ENTIRETY BY THE RESPONSIBLE PERSON PERFORMING THE HOT WORK, OR THE RESIDENT ENGINEER OVERSEEING THE CONTRACTOR WHO IS PERFORMING THE HOT WORK.

Facility ID and Type: _____

Date: _____

Responsible Person: _____

Start Time: _____

Finish Time: _____

Work to be performed: _____

Building: _____

Room Number, Area or Equipment: _____

Is it possible to perform this work in a welding shop or other type of workshop?

Yes

No

Complete the checklist below and if any of the tasks have not been completed, please provide, in the comments section the reasons for not completing the tasks and the precautionary measures that will be implemented.

<u>Task</u>	<u>Yes</u>	<u>No</u>	<u>Comments and/or Corrective Measures</u>
Flame or spark-producing equipment to be used has been inspected and found in good repair.			
Fire Alarm systems are operational and will not be taken out of service while welding, cutting, or brazing activities are performed. If necessary, the automatic smoke detectors in the immediate vicinity of the hot work may be temporarily disabled via functions at the fire alarm control panel or otherwise covered, and returned to operational immediately following the smoke producing activities associated with the hot work.			
Sprinklers, where provided, are operational and will not be taken out of service while this work is being done.			
There are no combustible fibers, dusts, vapors, gases or liquids in the area.			
The work will only be performed in the area specified on this permit.			
Surrounding floors have been swept clean and, if combustible, wet down.			
All floor and wall openings within 35 feet of the operations have been tightly covered.			
All combustibles have been relocated at least 35 feet from the operation.			
If no, then are barriers or guards used to contain the heat, sparks and slag. Protection should include metal guards or flame- proofed curtains, blankets, or covers (not ordinary tarpaulins (tarps)).			

<u>Task</u>	<u>Yes</u>	<u>No</u>	<u>Comments and/or Corrective Measures</u>
A "Fire Watch" will be posted in area of activity, prior to starting welding, cutting, and brazing activity, and will patrol the area, including floors above and below, during any lunch or rest period and for at least one-half hour after the work has been completed to ensure the sparks and slag have not started fires.			
If bystanders and/or fire watch may be exposed to UV or burn hazards they will be appropriately protected with PPE.			
Fire extinguisher available for instant use within 20 ft.			
Cutter/welder is trained in safe operation of equipment and the safe use of the process.			
On-site contractors were advised about flammable material or hazardous conditions of which they may not be aware.			
Welding or cutting on material containers that contain or did contain flammables: Container thoroughly cleaned and ventilated; Any pipe lines or connections to containers disconnected or blanked; and Approved by ROSHM or EOSH Coordinator.			
Personal Protective Equipment (PPE) used: Eye protection Helmets Protective clothing Other (Specify)			
Warning sign posted to warn of hot metal.			
Appropriate ventilation provided.			
When working in confined spaces a permit has been issued as per 1910.146 and local Confined Space Program.			

For specific requirements refer to General Industry Standards 1910.146; 1910.252; .253; .254 and .272 and Construction Standards 1926.803; .350; .352 and .353.

I attest that the above precautions have been taken:

Printed Name of Person Responsible
for Performing Hot Work

Signature

Approval:

Facility Manager - Printed Name

Facility Manager - Signature

NOTE: THIS PERMIT EXPIRES 24 HOURS AFTER THE DESIGNATED "START TIME". IF WORK IS TO CONTINUE ANOTHER PERMIT MUST BE ISSUED. MAINTAIN THE COMPLETED AND APPROVED PERMITS ON FILE FOR A MINIMUM OF ONE YEAR.

Pre-Construction/Installation Environmental and Occupational Safety and Health Checklist

INSTRUCTIONS FOR COMPLETING FAA FORM 3900-18

Section A. Purpose. FAA Form 3900-18, Pre-Construction/Installation Environmental and Occupational Safety and Health (EOSH) Checklist, must be used to review construction, installation and non-routine maintenance activities involving construction prior to commencement of work that potentially has EOSH impacts on NAS operations and employees. The organization that directly manages the construction project is responsible for completing the checklist. They must coordinate with the appropriate District Office prior to commencement of work. Construction must not be initiated prior to completion and review of the checklist. This form must be used at the pre-construction meeting and similar meetings. Emphasis should be placed on using this checklist as a tool to assess as well as reassess hazards as the work progresses.

Responsibilities: Responsibility for completing the checklist may vary depending on the work being performed.

- a. The District Office Manager will be responsible for District Office projects.
- b. The Project Engineer for Engineering Services projects.
- c. The Facilities Maintenance Program (FMP) Manager for FMP projects.
- d. For turnkey projects managed by Headquarters organizations, the Headquarters program office will be responsible for completing the checklist.

Section B. Work Summary Information. The individual/organization initiating the checklist will complete this portion of the checklist.

1. District Office: Name of the District Office.
2. Work Location: City, State, Airport, building, room within building.
3. Facility: Facility type, associated runway, facility LOC ID.
4. Work Description: Provide a concise statement as to the nature of the work to be accomplished. Example: Asbestos abatement of the control room attic.
5. Project Number/JCN: Provide the Project Number and or Job Control Number (JCN).
6. Planned Start Date: Provide the expected start date of the work.
7. Expected Completion Date: Provide the expected completion date of the work.
8. Contractor Contact: Provide the name and telephone number for a contractor representative who has the authority to make decisions and implement stop work/change orders. If the work is being accomplished by an FAA employee(s) or FAA contract employee(s), provide the name, organization, and telephone number of the on-site lead.
9. Project/Design Representative: Provide the name for the designer of the work (e.g., Engineering Services project engineer, District Office engineer, Headquarters program manager for turnkey projects).
10. COR/Specialist: Provide the name, organization, and telephone number of the on-site lead (e.g., Contracting Officer's Representative, Resident Engineer).
11. District Office EOSH Contact: Provide the name and telephone number of the person responsible for the occupational safety and health/environmental program for the District Office (e.g., SECM, District Office EOSH Professional).
12. Facility Representative: Provide the name and telephone number for an ATO representative at the facility who has the authority to make decisions for facility management.

Section C. Evaluation: The District Office Manager or designee may evaluate whether the remainder of the checklist needs to be completed. If necessary, the District Office Manager or designee will be provided any additional information regarding the project that will facilitate their determination on whether the remainder of the checklist should be completed. If there is an impact (yes), forward the checklist to the organization directing the construction project for completion of the remainder of the checklist. If there is no impact, provide a justification, sign and date the form, and then proceed to Section I, Distribution List, for distribution only. The designee may be the COR, SSC Manager, or other party.

Section D. Facility Procedures: The individuals/organization performing the work, and their contractors, along with the facility POC, must review all applicable facility specific procedures and plans. The intent of this section is to review applicable facility procedures and plans for the project and that it may be necessary to supplement this form.

1. Asbestos Contingency Plan: Determine the responsibilities of the personnel performing the work in the event of an incident requiring implementation of the asbestos contingency plan.
2. Hazard Communication: The personnel performing the work must be made familiar with the facility Hazard Communication program. Information such as safety data sheets (SDS) must be shared between the facility and the personnel performing the work.
3. Lockout/Tagout (LOTO): The work must be performed in accordance with the facility LOTO program. Determine if the facility LOTO procedures require equipment to be locked out/tagged out by an FAA technician, or if the personnel Performing the work will be allowed to LOTO the equipment.

Pre-Construction/Installation Environmental and Occupational Safety and Health Checklist

INSTRUCTIONS FOR COMPLETING FAA FORM 3900-18

4. Work Permits: Applicable FAA facility, District Office, or Service Area work permits must be submitted by the individuals/organization performing the work, signed and posted at the work site. General note: All work permits should be included in this document (e.g., asbestos, lead, hot work, welding, cutting, brazing).
5. Emergency Plans: Describe the responsibilities, including the points of contact, in the event of an incident that requires implementation of the facility Occupant Emergency Plan or Fire Prevention Plan
6. Impacts to Fire Protection Systems (e.g., fire alarm, fire suppression, smoke control, fire rated doors): Identify the Fire Alarm and Suppression System and instructions to avoid unintentional impact to it. If the work involves intentional impact to the Fire Alarm and Suppression System, determine what coordination has to be done to ensure no disruption of the NAS. Determine what interim life safety measures (i.e., egress pathways, occupant emergency notification & fire alarm impairments) will be required during the project.
7. Confined Space Entry: Describe the facility procedures used in and around confined spaces. In addition, describe specific procedures for permit-required confined space in and around where the work will take place.
8. Work at Heights: Describe procedures for working at elevated surfaces (e.g., catwalks, towers, roofs) that may require fall protection procedures or equipment. Review rescue procedures and ensure awareness of responsibilities.
9. Restricted Areas due to EOSH Concerns: Describe those areas of the facility that have restricted access due to safety and health hazards (e.g., asbestos regulated areas, radiation, noise).
10. First Aid/Bloodborne Pathogens: Describe the facility procedures for dealing with emergency first aid situations and other trauma situations.
11. Other: The personnel performing the work should be made familiar with other facility programs, procedures, and requirements.

Section E. Activity Hazard: The individuals/organization performing the work, and their contractors, along with the facility POC, must identify potential EOSH hazards that may be encountered during the accomplishment of the work. Determine the possibility of causing disruption of NAS operations.

1. Asbestos: Determine if known or assumed asbestos containing material will be impacted by this work.
2. Chemical, Gases, Fumes, Vapors, Mist, Dust, Radiation: Determine if any products or methods will be used that may cause odors or vapors (from chemicals volatilizing or biological agents), fumes (from welding or burning), excessive dust (e.g., sanding, grinding), or radiation (e.g., heat sources, light sources such as lasers, ionizing radiation sources such as X-ray equipment).
3. Use and Storage of Hazardous Materials: Determine if substances that exist at the facility may be impacted and what substances may be brought into the facility, which may have an impact on the facility and/or occupants.
4. Waste Management: Determine if work activities will generate wastes (e.g., construction waste, hazardous waste) and what procedures will be used for waste management (e.g., accumulation area, training).
5. Impact on HVAC System: Determine whether the environmental control elements of the facility may be impacted by the accomplishment of the work.
6. Equipment Removal/Installations: Determine if work activities will cause disturbance of excessive dust (e.g., disturbance of equipment which has been in place for a long time).
7. Fire Protection: Determine if work activities will impact fire protection systems and procedures at the facility (e.g., blocking egress, removing fire stopping, impacting fire rated barriers).
8. Impact to Integrity of Fire Alarm/Suppression System: Identify impacts to the fire alarm and suppression system. If the work involves intentional impact to the fire alarm and suppression system, determine what coordination has to be done to ensure no disruption of the NAS. Determine what interim life safety measures will be required during the project.
9. Lead Exposure: Determine if activities will expose FAA employees to lead dust, lead fumes, or other exposure to lead from known or assumed lead-containing material during the construction project.
10. Electrical Safety: Determine if work activities will expose FAA employees to electrical safety hazards (e.g., open electrical panel doors, exposed energized conductors, energized work).
11. Excessive Noise Exposure: Determine if work activities will expose FAA employees to excessive noise.
12. Walking Working Surfaces: Determine if work activities will expose FAA employees to tripping, slip and fall hazards (e.g., open panels in a raised floor, uneven floors, raised or loose carpeting, stairs, wet floors, etc.).
13. Work above Equipment/People: Determine if work activities will expose FAA employees to objects dropped from above.
14. Water Quality/Sanitation: Determine if work activities may cut off or contaminate the facility's potable water system.
15. Cranes/Rigging/Hoisting: Determine if work activities will expose FAA employees to hazards associated with rigging, hoisting and cranes.

Pre-Construction/Installation Environmental and Occupational Safety and Health Checklist

INSTRUCTIONS FOR COMPLETING FAA FORM 3900-18

16. Lighting: Determine if work activities will create insufficient lighting for FAA employees.
17. Machinery and Mechanized Equipment: Determine if work activities may expose FAA employees to hazards such as being struck by, caught in, or injured by machinery and mechanized equipment.
18. Excavation: Determine if work activities performed near facilities may cause catastrophic failure of a NAS facility.
19. Other: Other work activities that may impact NAS operations and employees.

Section F. Site Safety and Health – Controls. Ensure that measures and controls to address applicable site safety and health risks (e.g., through discussions, available site safety plans, or other applicable documents) have been identified. If a hazard has been identified in Section E, Activity Hazard, briefly describe the controls to be used.

1. Identify issues/hazards in Section E, Activity Hazard.
2. “Description of Controls” – The purpose of this column is to very briefly describe the controls in place for addressing each hazard.

Section G. Site Walk-Through: Following review of all applicable facility procedures, activity hazards and applicable control measures, the personnel performing the work must participate in a walk-through of the area of the facility where the work will be accomplished, led by a facility representative. The purpose of the walk-through is to allow the personnel performing the work to be introduced to the facility and the potential hazards as referenced in Sections E and F. It also allows the personnel performing the work to become familiar with the facility with respect to the work being done and awareness of the method of implementation of the various emergency plans. If the project is located at a staffed Air Traffic facility, inclusion of the Air Traffic Manager is warranted. The time, date, and personnel present for the walk-through must be recorded in Section G.

Section H. Review Information. This form must be reviewed by those individuals identified below, as appropriate, during design of the project, during pre-bid conferences, prior to the beginning of work (preferably at or prior to the pre-construction conference) and periodically throughout the completion of the project.

1. Originator: This is the individual/organization responsible for initiating the work (e.g., project engineer, senior engineer, technical support office) or the organization directly managing the day-to-day activities in the construction project.
2. Contractor/Installation Crew Lead/Specialist: These are the individuals performing the work who have the authority to make decisions and implement stop work/change orders. If the work is being accomplished by an FAA employee or an FAA contract employee, the employee should sign the form and provide a routing symbol and platform title.
3. District Office Manager or designee: This person must be the District Office Manager or designee. The designee may be the COR, SSC Manager, or other party.

Section I. Distribution List: This form must be forwarded to the following as applicable:

1. District Office Manager.
2. Safety and Environmental Compliance Manager (SECM) or District Office EOSH Professional.
3. Engineering Services EOSH Coordinator.
4. Engineering Services Manager.
5. Engineering Services Project Engineer.
6. Contracting Officer's Representative.
7. Facility Air Traffic Manager.

Pre-Construction/Installation Environmental and Occupational Safety and Health Checklist

Section A. Purpose

This checklist is intended to review construction, installation and non-routine maintenance activities, prior to commencement, that potentially have occupational safety and health related impacts on NAS operations and employees. This tool must be used, as appropriate, during critical phases of the work (e.g., the pre-construction meeting, prior to commencement of work, etc.). Emphasis should be placed on using this checklist as a tool to assess as well as reassess hazards as the work progresses. **This form is required to be completed as per FAA Order JO 3900.57A.**

Section B. Work Summary Information

The purpose of this section is to provide a brief description of the construction project and/or specific maintenance tasks, and identify key personnel responsible for project completion. Fill in the requested site-specific information. Indicate if this work will occur in or adjacent to an occupied space (e.g., equipment room, ATCT cab, etc.). Note: Provide further explanation of activities on additional sheets if necessary.

1. District Office:	2. Work Location:	3. Facility:
4. Work Description:		
5. Project Number/JCN:	6. Planned Start Date:	7. Expected Completion Date:
8. Contractor Contact Name:		Phone:
9. Project/Design Representative Name:		Phone:
10. COR/Specialist Name:		Phone:
11. District Office EOSH Contact Name:		Phone:
12. Facility Representative Name:		Phone:

Section C. Evaluation

The purpose of this section is to allow the District Office Manager or designee to determine whether the remainder of the checklist needs to be completed. If there is a potential EOSH hazard, then no signature is required in Section C and subsequent sections of the form are to be completed by the organization managing the construction project or maintenance task. If there is no potential hazard, the District Office Manager or designee must sign below and provide an explanation, then proceed to Section I.

Is there a potential EOSH hazard?	Yes	
	No (if no, explain)	
		(Explanation)
Name: (print)		(Title)
Signature:		(Date)

Pre-Construction/Installation Environmental and Occupational Safety and Health Checklist

Section D. Facility Procedures

Review site-specific FAA procedures and considerations with the contractor/installer/specialist. For example, discuss when or how during the work, emergency plans will be required and/or used.

Facility Procedures	Reviewed? [Yes/No/N/A]	Notes
1. Asbestos Contingency Plan		
2. Hazard Communication (e.g. SDSs)		
3. Lockout/Tagout		
4. Work Permits (e.g., asbestos, lead, hotwork)		
5. Emergency Plans (e.g., Occupant Emergency Plan)		
6. Impacts to Fire Protection Systems		
7. Confined Space Entry		
8. Work at Heights		
9. Restricted Areas due to EOSH Concerns		
10. First Aid/Bloodborne Pathogens		
11. Other		

NOTE: Think about your work and its potential hazards. Consider sensitive NAS operations and all facility personnel that may be impacted by your work. As an example, construction activities with potential for impacting asbestos materials in or near sensitive operations could result in incidents that may disrupt NAS operations.

Section E. Activity Hazard

Note: Provide further explanation of potential hazards, locations, etc. below and attach additional sheets if necessary.

Potential Hazardous Exposures and/or Activities Consider Sensitive NAS Operations	Potential for Exposure/Release / Incident [Yes/No/N/A]	Description of Hazard
1. Asbestos (e.g., tiles & insulation)		
2. Chemical, Gases, Fumes, Vapors, Mist, Dust, Radiation		
a. Painting/Solvent/Adhesive/Sealant		
b. Grinding/Sanding/Cutting/Welding/Soldering		
c. Indoor Air Quality (e.g., biological agents, mold, odors, CO ₂)		
3. Use and Storage of Hazardous Materials (e.g., flammables, compressed gas)		
4. Waste Management		
5. Impact on HVAC System		
6. Equipment Removal/Installation (e.g., dust disturbance)		
7. Fire Protection (e.g. blocked egress, fire barrier penetration)		

Pre-Construction/Installation Environmental and Occupational Safety and Health Checklist

Potential Hazardous Exposures and/or Activities Consider Sensitive NAS Operations	Potential for Exposure/Release / Incident [Yes/No/N/A]	Description of Hazard
8. Impact to Integrity of Fire Alarm/Suppression System(s)		
9. Lead Exposure (e.g., lead-based paint)		
10. Electrical Safety		
a. Work on Live Electrical Systems		
b. Temporary Wiring		
11. Excessive Noise Exposure		
12. Walking/Working Surfaces (e.g., tripping hazards, work at heights)		
13. Work above Equipment/People		
14. Water Quality/Sanitation		
15. Cranes/Rigging/Hoisting		
16. Lighting		
17. Machinery and Mechanized Equipment (e.g., operator training and certification and equipment certification)		
18. Excavation		
19. Other		

Section F. Site Safety and Health – Controls

After reviewing the potential hazards in Section E, ensure that measures and controls to address applicable site safety and health risks (e.g., through discussions, available site safety plans, or other applicable documents) have been identified. If a hazard has been identified in Section E, briefly describe the controls to be used. Note: Provide further explanation of controls below and attach additional sheets if necessary.

Potential Hazardous Exposures and/or Activities	Identified as a hazard in Section E? [Yes/No/N/A]	Description of Controls (e.g., addressed in Accident Prevention Plan or Site Safety Plan)
1. Asbestos (e.g. tiles & insulation)		
2. Chemical, Gases, Fumes, Vapors, Mist, Dust, Radiation		
a. Painting/Solvent/Adhesive/Sealant		
b. Grinding/Sanding/Cutting/Welding/Soldering		
c. Indoor Air Quality (e.g., biological agents, mold, odors, CO ₂)		
3. Use and Storage of Hazardous Materials (e.g., flammables, compressed gas)		
4. Waste Management		
5. Impact on HVAC System		

Pre-Construction/Installation Environmental and Occupational Safety and Health Checklist

Potential Hazardous Exposures and/or Activities	Identified as a hazard in Section E? [Yes/No/N/A]	Description of Controls (e.g., addressed in Accident Prevention Plan or Site Safety Plan)
6. Equipment Removal/Installation (e.g., dust disturbance)		
7. Fire Protection (e.g., blocked egress, fire barrier penetration)		
8. Impact to Integrity of Fire Alarm/Suppression System(s)		
9. Lead Exposure (e.g., lead-based paint)		
10. Electrical Safety		
a. Work on Live Electrical Systems		
b. Temporary Wiring		
11. Excessive Noise Exposure		
12. Walking/Working Surfaces (e.g., tripping hazards, work at heights)		
13. Work Above Equipment/People		
14. Water Quality/Sanitation		
15. Cranes/Rigging/Hoisting		
16. Lighting		
17. Machinery and Mechanized Equipment (e.g., operator training and certification and equipment certification)		
18. Excavation		
19. Other		

Section G. Site Walk-Through

Time/date of site walk-through with appropriate personnel (e.g., District Office representative, SSC Manager, SECM, Air Traffic Manager, Resident Engineer, COR, Contractor).

Site Walk Through:	
(Date)	(Time)
Appropriate Personnel:	
(Name)	(Organization)
(Name)	(Organization)
(Name)	(Organization)

Pre-Construction/Installation Environmental and Occupational Safety and Health Checklist

Section H. Review Information

The appropriate FAA point-of-contact and the contractor/installation crew lead/specialist print and sign below to document discussion of the items on this form.

Completed By:			
FAA Originator of Work (e.g., Project Engineer, Resident Engineer):			
 (Print or Type Name)	 (Signature)	 (Title)	 (Date)
Contractor Name:			
 (Print or Type Name)	 (Signature)	 (Title)	 (Date)
Reviewed By:			
District Office Manager or Designee:			
 (Print or Type Name)	 (Signature)	 (Title)	 (Date)

Section I. Distribution List

This form must be forwarded to the following as applicable:	Name/Routing Symbol
1. District Office Manager	
2. SECM/District Office EOSH Professional	
3. Engineering Services EOSH Coordinator	
4. Engineering Services Manager	
5. Engineering Services Project Engineer	
6. Contracting Officer (if contractor resources perform the construction work)	
7. Facility Air Traffic Manager	

SECTION 01 32 00 - CONSTRUCTION PROGRESS DOCUMENTATION

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

- A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and other Division 01 Specification Sections, apply to this Section.

1.2 SUMMARY

- A. Section includes administrative and procedural requirements for documenting the progress of construction during performance of the Work, including the following:
 - 1. Startup construction schedule.
 - 2. Contractor's Construction Schedule.
 - 3. Construction schedule updating reports.
 - 4. Site condition reports.
 - 5. Unusual event reports.
- B. Related Requirements:
 - 1. Section 01 40 00 "Quality Requirements" for schedule of tests and inspections.

1.3 INFORMATIONAL SUBMITTALS

- A. Format for Submittals: Submit required submittals in the following format:
 - 1. Working electronic copy of schedule file.
 - 2. PDF file.
- B. Startup construction schedule.
 - 1. Submittal of cost-loaded startup construction schedule will not constitute approval of schedule of values for cost-loaded activities.
- C. Contractor's Construction Schedule: Initial schedule, of size required to display entire schedule for entire construction period.
 - 1. Submit a working digital copy of scheduled labeled to comply with requirements for submittals.
- D. Construction Schedule Updating Reports: Submit with Applications for Payment.

1.4 QUALITY ASSURANCE

- A. Prescheduling Conference: Conduct conference at Project site to comply with requirements in Section 01 31 00 "Project Management and Coordination." Review methods and procedures related to the preliminary construction schedule and Contractor's Construction Schedule, including, but not limited to, the following:
 - 1. Discuss constraints, including phasing, work stages, area separations, interim milestones, and partial FAA occupancy.
 - 2. Review schedule for work of FAA's separate contracts.
 - 3. Review submittal requirements and procedures.
 - 4. Review time required for review of submittals and resubmittals.
 - 5. Review requirements for tests and inspections by independent testing and inspecting agencies.
 - 6. Review time required for Project closeout and FAA startup procedures, including commissioning activities.
 - 7. Review and finalize list of construction activities to be included in schedule.
 - 8. Review procedures for updating schedule.

1.5 COORDINATION

- A. Coordinate Contractor's Construction Schedule with the schedule of values, list of subcontracts, submittal schedule, progress reports, payment requests, and other required schedules and reports.
 - 1. Secure time commitments for performing critical elements of the Work from entities involved.
 - 2. Coordinate each construction activity in the network with other activities, and schedule them in proper sequence.

1.6 GENERAL REQUIREMENTS

- A. Prepare for approval a Project Schedule, as specified herein. Show in the schedule the proposed sequence to perform the work and dates contemplated for starting and completing the schedule activities. The scheduling of the entire project, including the design and construction sequences, is required. Contractor management personnel shall actively participate in its development. Subcontractors and suppliers' designers, subcontractors, and suppliers working on the project shall also contribute in developing and maintaining an accurate project schedule. Provide a schedule that is a forward planning as well as a project monitoring tool.

1.7 BASIS FOR PAYMENT AND COST LOADING

- A. The schedule is the basis for determining contract earnings during each update period and therefore the amount of each progress payment.

1. Activity Cost Loading;
 - a. Activity cost loading shall be reasonable and without front-end loading. Provide additional documentation to demonstrate reasonableness if requested by the Contracting Officer.
 2. Withholdings / Payment Rejection
 - a. Failure to meet the requirements of this Section may result in the disapproval of the schedules or updates and subsequent rejection of payment requests until requirements are met.
- 1.8 If the Contracting Officer directs schedule revisions and those revisions have not been included in subsequent Project Schedule revisions or updates, the Contracting Officer may withhold 10 percent of pay request amount for each payment period until such revisions to the project schedule have been made.
- 1.9 PROJECT SCHEDULE DETAILED REQUIREMENTS
- A. Level of Detail Required
 1. Develop the Project Schedule to the appropriate level of detail to address major milestones and to allow for satisfactory project planning and execution. Failure to develop the Project Schedule to an appropriate level of detail will result in its disapproval. The Contracting Officer will consider, but is not limited to, the following characteristics and requirements to determine appropriate level of detail.
 - B. Activity Duration
 1. Reasonable activity durations are those that allow the progress of ongoing activities to be accurately determined between update periods. Less than 2 percent of all non-procurement activities shall have Original Durations (OD) greater than 20 work days or 30 calendar days.
 - C. Procurement Activities
 1. Include activities associated with the critical submittals and their approvals, procurement, fabrication, and delivery of long lead materials, equipment, fabricated assemblies, and supplies. Long lead procurement activities are those with an anticipated procurement sequence of over 90 calendar days.
 - D. Mandatory Tasks
 1. Include the following activities/tasks in the initial project schedule and all updates.

- a. Submission, review, and acceptance of Preconstruction Submittals (individual activity for each).
- b. Submission, review, and acceptance of major shop/fabrication drawings and submittals (individual activity for each).
- c. Submission and approval of O & M manuals.
- d. Submission and approval of as-built drawings.
- e. Performance Verification testing.
- f. Contractor's pre-final inspection.
- g. Correction of punch list from Contractor's pre-final inspection.
- h. Government's inspection for Substantial Completion (Contractor Acceptance Inspection).
- i. Correction of punch list from Government's inspection for Substantial Completion (Contractor Acceptance Inspection).
- j. Final Cleaning.
- k. Final Completion.

E. FAA Activities

1. Show FAA and other agency activities that could impact progress. These activities include, but are not limited to:
 - a. Approvals
 - b. Inspections

F. Contract Milestones and Constraints

1. Milestone activities shall be used for significant project events including, but not limited to, project phasing, project start and end activities, and interim completion dates. The use of artificial float constraints such as "zero free float" or "zero total float" are prohibited.
2. Mandatory constraints that ignore or affect network logic are prohibited. No constrained dates are allowed in the schedule other than those specified herein. Submit additional constraints to the Contracting Officer for approval on a case-by-case basis.
3. Include, as a minimum the following milestones in the schedule.
 - a. Project start and mobilization to site
 - b. Roofing Tear-off Start/ Completion for each roof segment
 - c. Roofing Start/ Completion for each roof segment
 - d. Start Replacement of mechanical fans
 - e. Start Replacement of Lightning Protection System
 - f. Start Installation of Guardrail systems
 - g. CAI Complete
 - h. CAI Punch List Complete
4. Project Start Date Milestone and Constraint
 - a. The first activity in the project schedule shall be a start milestone titled "NTP Acknowledged," which shall have a "Start On" constraint date equal to the date that the NTP is acknowledged.

5. End Project Finish Milestone and Constraint

- a. The last activity in the schedule shall be a finish milestone titled "End Project".
- b. The project schedule shall be constrained to the Contract Completion Date in such a way that if the schedule calculates an early finish, then the float calculation for "End Project" milestone reflects positive float on the longest path. If the project schedule calculates a late finish, then the "End Project" milestone float calculation reflects negative float on the longest path. The FAA is under no obligation to accelerate FAA activities to support a Contractor's early completion.

6. Interim Completion Dates and Constraints

- a. Constrain contractually specified interim completion dates to show negative float when the calculated late finish date of the last activity in that phase is later than the specified interim completion date.
 - 1) Start Phase
 - a) Use a start milestone as the first activity for a project phase. The start milestone shall be called "Start Phase X" where "X" refers to the phase of work
 - 2) End Phase
 - a) Use a finish milestone as the last activity for a project phase. Call the finish milestone "End Phase X" where "X" refers to the phase of work.

G. Calendars

1. Schedule activities on a calendar to which the activity logically belongs. Develop calendars to accommodate Contract-defined work periods, such as a 7-day calendar for FAA. Acceptance activities, concrete cure times, etc. Develop the default calendar to match the physical work plan with non-work periods identified including weekends and holidays. Develop and assign seasonal calendars to seasonally affected activities.
2. If an activity is weather-sensitive, assign it to a calendar showing non-work days on a monthly basis. The non-work days shall be selected at random across the weeks of the calendar. The assignment of the non-work days should be over a 7-day week since weather records are compiled on 7-day weeks, which will cause some of the weather related non-work days to fall on weekends.
3. If an activity is subject to interruption during an established FAA moratorium period, as specified in Section 01 10 00, assign it to a calendar showing the moratorium dates, as specified in Section 01 10 00, as non-work days.

H. Added and Deleted Activities

1. Do not delete activities from the project schedule or add new activities to the schedule without approval from the Contracting Officer. Activity ID and description changes are considered new activities and shall not be changed without Contracting Officer approval.

I. Original Durations

1. Activity Original Durations (OD) shall be reasonable to perform the work item. OD changes are prohibited unless justification is provided to and approved by the Contracting Officer.

J. Percent Complete

1. Update the percent complete for each activity started, based on the realistic assessment of earned value. Activities which are complete but for remaining minor punch list work and which do not restrain the initiation of successor activities may be declared 100 percent complete to allow for proper schedule management.

K. Remaining Duration

1. Update the remaining duration for each activity based on the number of estimated work days necessary to complete the activity. Remaining duration may not mathematically correlate with percentage found under Paragraph "Percent Complete", above.

L. Cost Loading of Closeout Activities

1. Cost load the "Correction of punch list items from FAA pre-final inspection" activities not less than 1 percent of the present Contract value. Activities may be declared 100 percent complete upon the FAA's verification of completion and correction of the punch list work identified during FAA pre-final inspection(s).

a. As-Built Drawings

- 1) If there is no separate ASSET for as-built drawings, cost load the "Submission and approval of as-built drawings" activity not less than \$35,000 or 1 percent of the present Contract value, whichever is greater, up to \$200,000. Activity will be declared 100 percent complete upon the FAA's approval.

b. O & M Manuals

- 1) Cost load the "Submission and approval of O & M manuals" activity not less than \$20,000. Activity will be declared 100 percent complete upon the FAA's approval of all O & M manuals.

M. Anticipated Adverse Weather

1. Reflect the number of anticipated adverse weather delays allocated to a weather-sensitive activity in the activity's calendar.

N. Early Completion Schedule and the Right to Finish Early

1. An Early Completion Schedule is an Initial Project Schedule (IPS) that indicates the scope of the required contract work will be completed before the contractually required completion date.
 - a. No IPS indicating an Early Completion will be accepted. The time, in calendar days, between the IPS 'NTP Acknowledged' start milestone and its 'End Project' finish milestone shall match the contract's Period of Performance. The 'End Project' finish date, as a consequence, shall be the same as the contractually required completion date.

1.10 PROJECT SCHEDULE SUBMISSION

- A. Provide the submissions as described below. The data files, reports, and network diagrams required for each submission are contained in Paragraph SUBMISSION REQUIREMENTS. If the Contractor fails or refuses to furnish the information and schedule updates as set forth, the Contractor will be deemed not to have provided an estimate upon which a progress payment can be made. Review comments made by the FAA on the schedules do not relieve the Contractor from compliance with the Contract.

1. Preconstruction Project Schedule

- a. As one of the project's Initial Submittals (as listed in Section 01 00 00 - 8), prepare a detailed Preconstruction Project Schedule for the duration of the project. The schedule shall be coordinated with the Contracting Officer's Representative (COR) and include all milestone activities. The scheduling of construction is the responsibility of the Contractor, and Contractor management personnel shall actively participate in its development.
- b. Submit the Preconstruction Project Schedule to the Contracting Officer (CO) within 10 calendar days after contract award.
- c. Format - The Preconstruction Project Schedule shall consist of a diagram or a bar chart showing the start and the finish dates of construction, as well as the major items to be constructed, what work is occurring, length of time anticipated for the activity and the flow of construction.
- d. Diagram(s) shall show the order and interdependence of activities and the sequence in which the diagram will be followed to show how the start of a given activity is dependent on the completion of preceding activities and its completion restricts the start of following activities.
- e. Diagram activities shall include, in addition to construction activities, the submittal, review and approval of samples of materials and shop drawings, the procurement of critical materials and equipment, fabrication of special materials and equipment and their installation and testing. All activities of the FAA and others that affect progress, and contract required dates for completion of all parts of the work shall also be shown.

- f. The Preconstruction Project Schedule shall consist of a minimum of 20 activities. The selection of activities shall be subject to the Contracting officer's approval. Scheduling software may be used to produce this schedule.
2. Preliminary Project Schedule Submission
 - a. Within 15 calendar days after the NTP is acknowledged, submit the Preliminary Project Schedule defining the planned operations detailed for the first 90 calendar days for approval. The approved Preliminary Project Schedule will be used for payment purposes not to exceed 90 calendar days after NTP. The Preliminary Project Schedule may be summary in nature for the remaining performance period. It shall be early start and late finish constrained and logically tied as specified. The Preliminary Project Schedule forms the basis for the Initial Project Schedule specified herein and shall include all of the required plan and program preparations, submissions and approvals identified in the contract (for example, Quality Control Plan, Safety Plan, and Environmental Protection Plan).
3. Initial Project Schedule Submission
 - a. Submit the Initial Project Schedule for approval within 42 calendar days after NTP is issued. The schedule shall demonstrate a reasonable and realistic sequence of activities which represent the work through the entire Contract performance period. No payment will be made for work items not fully detailed in the Project Schedule.
4. Periodic Schedule Updates
 - a. Update the Project Schedule on a regular basis, monthly at a minimum. Provide a draft Periodic Schedule Update for review at the schedule update meetings as prescribed in Paragraph PERIODIC SCHEDULE UPDATE MEETINGS, below. These updates will enable the FAA to assess Contractor's progress.
 - 1) Update information, including Actual Start Dates (AS), Actual Finish Dates (AF), Remaining Durations (RD), and Percent Complete, is subject to the approval of the FAA at the meeting.
 - 2) AS and AF data shall match the dates reported on the Contractor's Quality Control Report for an activity start or finish.

1.11 PROJECT SCHEDULE DETAILED REQUIREMENTS

- A. Submit the following items for the Preliminary Schedule, Initial Schedule, and every Periodic Schedule Update throughout the life of the project:
 1. Schedule Reports

- a. Formatting, filtering, organizing, and sorting each schedule report shall be as directed by the Contracting Officer. Typically, reports shall contain Activity Numbers, Activity
- b. Description, Original Duration, Remaining Duration, Early Start Date, Early Finish Date, Late Start Date, Late Finish Date, Total Float, Actual Start Date, Actual Finish Date, and Percent Complete. Provide the reports electronically in .pdf format. Typical reports that will be requested include:

1.12 PERIODIC SCHEDULE UPDATE

A. Periodic Schedule Update Meetings

1. Conduct periodic schedule update meetings, to review the proposed Periodic Schedule Update, Narrative Report, Schedule Reports, and progress payment. Conduct meetings at least monthly, within 5 days of the proposed schedule data date. Provide a computer with the scheduling software loaded and a projector which allows the meeting participants to view the proposed schedule during the meeting. The Contractor's authorized scheduler shall organize, group, sort, filter, perform schedule revisions as needed and review functions as requested by the Contractor and/or FAA. The meeting is a working interactive exchange which allows the FAA and Contractor the opportunity to review the updated schedule on a real-time and interactive basis. The meeting will last no longer than 8 hours. Provide a draft of the proposed narrative report and schedule data file to the FAA at least 2 workdays in advance of the meeting. The Contractor's Project Manager and scheduler shall attend the meeting with the authorized representative of the Contracting Officer. Superintendents, foremen, and major subcontractors shall attend the meeting as required to discuss the project schedule and work. Following the periodic schedule update meeting, make corrections to the draft submission. Include only those changes approved by the FAA in the submission and invoice for payment.
2. Update Submission Following Progress Meeting
 - a. Submit the complete Periodic Schedule Update, containing the approved progress, revisions, and adjustments, pursuant to Paragraph SUBMISSION REQUIREMENTS not later than 4 work days after the periodic schedule update meeting.

1.13 REQUEST FOR TIME EXTENSION

- A. Provide a justification of delay to the Contracting Officer, in accordance with the Contract provisions and clauses, for approval within 10 days of a delay occurring. Also prepare a time impact analysis for each FAA request for proposal (RFP) to justify time extensions.
 1. Justification of Delay

- a. Provide a description of the event(s) that caused the delay and/or impact to the work. As part of the description, identify the schedule activities impacted. Show that the event that caused the delay/impact was the responsibility of the FAA. Provide a time impact analysis that demonstrates the effects of the delay or impact on the project completion date or interim completion dates. Multiple impacts shall be evaluated chronologically; each with its own justification of delay. With multiple impacts, consider concurrency of delay. A time extension and the schedule fragnet becomes part of the project schedule and future schedule updates upon approval by the Contracting Officer.
2. Impact to Early Completion Schedule
 - a. No extended overhead will be paid for delay prior to the original Contract Completion Date for an Early Completion IPS.

1.14 FAILURE TO ACHIEVE PROGRESS

- A. If the progress falls behind the approved project schedule for reasons other than those that are excusable within the terms of the Contract, the Contracting Officer may require submittal of a written recovery plan for approval. The plan shall detail how progress shall be recovered, including which activities will be accelerated by adding additional crews, longer work hours, extra work days, etc.

1. Artificially Improving Progress
 - a. Artificially improving progress by means such as, but not limited to, revising the schedule logic, modifying or adding constraints, shortening activity durations, or changing calendars in the project schedule is prohibited. Indicate assumptions made and the basis for logic, constraint, duration, and calendar changes used in the creation of the recovery plan. Additional resources, manpower, and daily and weekly work hour changes proposed shall be evident at the work site and documented in the daily report along with the Schedule Narrative Report.
2. Failure to Perform
 - a. Failure to perform work and maintain progress in accordance with the supplemental recovery plan may result in an interim and final unsatisfactory performance rating and/or may result in corrective action directed by the Contracting Officer pursuant to AMS 3.2.2.3-56 "Schedules for Construction Contracts", AMS 3.10.6-6 "Default (Fixed-Price Construction)", and other Contract provisions.

1.15 REPORTS

- A. Daily Construction Reports: Prepare a daily construction report recording the following information concerning events at Project site:

1. List of subcontractors at Project site.
 2. List of separate contractors at Project site.
 3. Approximate count of personnel at Project site.
 4. Equipment at Project site.
 5. Material deliveries.
 6. High and low temperatures and general weather conditions, including presence of rain or snow.
 7. Testing and inspection.
 8. Accidents.
 9. Meetings and significant decisions.
 10. Unusual events.
 11. Stoppages, delays, shortages, and losses.
 12. Meter readings and similar recordings.
 13. Emergency procedures.
 14. Orders and requests of authorities having jurisdiction.
 15. Change Orders received and implemented.
 16. Construction Change Directives received and implemented.
 17. Services connected and disconnected.
 18. Equipment or system tests and startups.
 19. Partial completions and occupancies.
 20. Substantial Completions authorized.
- B. Material Location Reports: At weekly intervals, prepare and submit a comprehensive list of materials delivered to and stored at Project site. List shall be cumulative, showing materials previously reported plus items recently delivered. Include with list a statement of progress on and delivery dates for materials or items of equipment fabricated or stored away from Project site. Indicate the following categories for stored materials:
1. Material stored prior to previous report and remaining in storage.
 2. Material stored prior to previous report and since removed from storage and installed.
 3. Material stored following previous report and remaining in storage.
- C. Site Condition Reports: Immediately on discovery of a difference between site conditions and the Contract Documents, prepare and submit a detailed report. Submit with a Request for Information. Include a detailed description of the differing conditions, together with recommendations for changing the Contract Documents.
- D. Unusual Event Reports: When an event of an unusual and significant nature occurs at Project site, whether or not related directly to the Work, prepare and submit a special report. List chain of events, persons participating, responses by Contractor's personnel, evaluation of results or effects, and similar pertinent information. Advise FAA in advance when these events are known or predictable.
1. Submit unusual event reports directly to FAA within one day(s) of an occurrence. Distribute copies of report to parties affected by the occurrence.

PART 2 - PRODUCTS (Not Used)

PART 3 - EXECUTION (Not Used)

END OF SECTION **01 32 00**

SECTION 01 32 33 - PHOTOGRAPHIC DOCUMENTATION

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

- A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and other Division 01 Specification Sections, apply to this Section.

1.2 SUMMARY

- A. Section includes administrative and procedural requirements for the following:
 - 1. Preconstruction photographs.
 - 2. Concealed Work photographs.
 - 3. Periodic construction photographs.
 - 4. Final Completion construction photographs.
- B. Related Requirements:
 - 1. Section 01 77 00 "Closeout Procedures" for submitting photographic documentation as Project Record Documents at Project closeout.
 - 2. Section 01 79 00 "Demonstration and Training" for submitting video recordings of demonstration of equipment and training of FAA's personnel.
 - 3. Section 02 41 19 "Selective Demolition" for photographic documentation before selective demolition operations commence.

1.3 INFORMATIONAL SUBMITTALS

- A. Key Plan: Submit key plan of Project site and building with notation of vantage points marked for location and direction of each photograph. Indicate elevation or story of construction. Include same information as corresponding photographic documentation.
- B. Digital Photographs: Submit image files within three days of taking photographs.
 - 1. Submit photos on CD-ROM or thumb-drive and by uploading to web-based Project management software site. Include copy of key plan indicating each photograph's location and direction.
 - 2. Identification: Provide the following information with each image description in file metadata tag:
 - a. Name of Project.
 - b. Name and contact information for photographer.
 - c. Name of COR.
 - d. Name of Contractor.
 - e. Date photograph was taken.
 - f. Description of location, vantage point, and direction.

- g. Unique sequential identifier keyed to accompanying key plan.

1.4 QUALITY ASSURANCE

- A. Photographer Qualifications: An individual who has been regularly engaged as a professional photographer of construction projects for not less than three years.

1.5 FORMATS AND MEDIA

- A. Digital Photographs: Provide color images in JPG format, produced by a digital camera with minimum sensor size of 12 megapixels, and at an image resolution of not less than 3200 by 2400 pixels, and with vibration-reduction technology. Use flash in low light levels or backlit conditions.
- B. Digital Images: Submit digital media as originally recorded in the digital camera, without alteration, manipulation, editing, or modifications using image-editing software.
- C. Metadata: Record accurate date and time and GPS location data from camera.
- D. File Names: Name media files with date and Project area and sequential numbering suffix.

1.6 CONSTRUCTION PHOTOGRAPHS

- A. Photographer: Engage a qualified photographer to take construction photographs.
- B. General: Take photographs with maximum depth of field and in focus.
 - 1. Maintain key plan with each set of construction photographs that identifies each photographic location.
- C. Preconstruction Photographs: Before commencement of the Work, take photographs of Project site and surrounding properties, including existing items to remain during construction, from different vantage points, as directed by COR.
 - 1. Flag construction limits before taking construction photographs.
 - 2. Take 20 photographs to show existing conditions adjacent to property before starting the Work.
 - 3. Take 20 photographs of existing buildings either on or adjoining property, to accurately record physical conditions at start of construction.
 - 4. Take additional photographs as required to record settlement or cracking of adjacent structures, pavements, and improvements.
- D. Concealed Work Photographs: Before proceeding with installing work that will conceal other work, take photographs sufficient in number, with annotated descriptions, to record nature and location of concealed Work, including, but not limited to, the following:

1. Underground utilities.
 2. Underslab services.
 3. Piping.
 4. Electrical conduit.
 5. Waterproofing and weather-resistant barriers.
- E. Periodic Construction Photographs: Take 20 photographs weekly. Select vantage points to show status of construction and progress since last photographs were taken.
- F. Time-Lapse Sequence Construction Photographs: Take 20 photographs as indicated, to show status of construction and progress since last photographs were taken.
1. Frequency: Take photographs weekly, on the same day each week.
 2. Vantage Points: Following suggestions by COR and Contractor, photographer shall select vantage points. During each of the following construction phases, take not less than two of the required shots from same vantage point each time, to create a time-lapse sequence as follows:
 - a. Commencement of the Work, through completion of subgrade construction.
 - b. Above-grade structural framing.
 - c. Exterior building enclosure.
 - d. Interior Work, through date of Substantial Completion.
- G. Final Completion Construction Photographs: Take 50 photographs after date of Substantial Completion for submission as Project Record Documents. COR will inform photographer of desired vantage points.

PART 2 - PRODUCTS (Not Used)

PART 3 - EXECUTION (Not Used)

END OF SECTION **01 32 33**

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SECTION 01 33 00 - SUBMITTAL PROCEDURES

PART 1 - GENERAL

1.1 SUMMARY

A. Section Includes:

1. Submittal schedule requirements.
2. Administrative and procedural requirements for submittals.

B. Related Requirements:

1. Section 01 31 00 "Project Management and Coordination" for submitting coordination drawings and subcontract list and for requirements for web-based Project software.
2. Section 01 32 00 "Construction Progress Documentation" for submitting schedules and reports, including Contractor's construction schedule.
3. Section 01 32 33 "Photographic Documentation" for submitting preconstruction photographs, periodic construction photographs, and Final Completion construction photographs.
4. Section 01 40 00 "Quality Requirements" for submitting test and inspection reports, and schedule of tests and inspections.
5. Section 01 77 00 "Closeout Procedures" for submitting closeout submittals and maintenance material submittals.
6. Section 01 78 23 "Operation and Maintenance Data" for submitting operation and maintenance manuals.
7. Section 01 78 39 "Project Record Documents" for submitting record Drawings, record Specifications, and record Product Data.

1.2 DEFINITIONS

- A. Action Submittals:** Written and graphic information and physical samples that require COR's responsive action. Action submittals are those submittals indicated in individual Specification Sections as "action submittals."
- B. Informational Submittals:** Written and graphic information and physical samples that do not require COR's responsive action. Submittals may be rejected for not complying with requirements. Informational submittals are those submittals indicated in individual Specification Sections as "informational submittals."

1.3 SUBMITTAL SCHEDULE

- A. Submittal Schedule: Submit, as an action submittal, a list of submittals, arranged in chronological order by dates required by construction schedule. Include time required for review, ordering, manufacturing, fabrication, and delivery when establishing dates. Include additional time required for making corrections or revisions to submittals noted by COR and additional time for handling and reviewing submittals required by those corrections.
1. Coordinate submittal schedule with list of subcontracts, the schedule of values, and Contractor's construction schedule.
 2. Initial Submittal Schedule: Submit concurrently with startup construction schedule. Include submittals required during the first 60 days of construction. List those submittals required to maintain orderly progress of the Work and those required early because of long lead time for manufacture or fabrication.
 3. Final Submittal Schedule: Submit concurrently with the first complete submittal of Contractor's construction schedule.
 - a. Submit revised submittal schedule as required to reflect changes in current status and timing for submittals.
 4. Format: Arrange the following information in a tabular format:
 - a. Scheduled date for first submittal.
 - b. Specification Section number and title.
 - c. Submittal Category: Action; informational.
 - d. Name of subcontractor.
 - e. Description of the Work covered.
 - f. Scheduled date for COR's final release or approval.
 - g. Scheduled dates for purchasing.
 - h. Scheduled date of fabrication.
 - i. Scheduled dates for installation.
 - j. Activity or event number.

1.4 SUBMITTAL FORMATS

- A. Submittal Information: Include the following information in each submittal:
1. Project name.
 2. Date.
 3. Name of COR.
 4. Name of Construction Manager.
 5. Name of Contractor.
 6. Name of firm or entity that prepared submittal.
 7. Names of subcontractor, manufacturer, and supplier.
 8. Unique submittal number, including revision identifier. Include Specification Section number with sequential alphanumeric identifier and alphanumeric suffix for resubmittals.

9. Category and type of submittal.
 10. Submittal purpose and description.
 11. Number and title of Specification Section, with paragraph number and generic name for each of multiple items.
 12. Drawing number and detail references, as appropriate.
 13. Indication of full or partial submittal.
 14. Location(s) where product is to be installed, as appropriate.
 15. Other necessary identification.
 16. Remarks.
 17. Signature of transmitter.
- B. Options: Identify options requiring selection by COR.
- C. Deviations and Additional Information: On each submittal, clearly indicate deviations from requirements in the Contract Documents, including minor variations and limitations; include relevant additional information and revisions, other than those requested by COR on previous submittals. Indicate by highlighting on each submittal or noting on attached separate sheet.
- D. Paper Submittals: All submittal shall be digital. Prepare submittals as PDF package, incorporating complete information into each PDF file. Name PDF file with submittal number.
1. Place a permanent label or title block on each submittal item for identification; include name of firm or entity that prepared submittal.
 2. Provide a space approximately 6 by 8 inches on label or beside title block to record Contractor's review and approval markings and action taken by COR.
- E. Transmittal for Submittals: Assemble each submittal individually and appropriately for transmittal and handling. Transmit each submittal using the form included at the end of Section 01 10 12 CONSTRUCTION ADMINISTRATION FORMS transmittal form.
- F. Electronic Submittals: Prepare submittals as PDF package, incorporating complete information into each PDF file. Name PDF file with submittal number.
- G. Submittals Utilizing Web-Based Project Software: Prepare submittals as PDF files or other format indicated by Project management software.
- H. Transmittal: Package each submittal individually and appropriately for transmittal and handling. Transmit each submittal using a transmittal form. Transmittal form associated with submittals received from sources other than Contractor will be returned without review. Submittal itself may be returned at the COR discretion.
1. Transmittal Form: Provide locations on form for the following information:
 - a. Project name.
 - b. Date.
 - c. Destination (To:).
 - d. Source (From:).
 - e. Names of subcontractor, manufacturer, and supplier.
 - f. Category and type of submittal.

- g. Submittal purpose and description.
 - h. Specification Section number and title.
 - i. Drawing number and detail references, as appropriate.
 - j. Transmittal number, numbered consecutively.
 - k. Submittal and transmittal distribution record.
 - l. Remarks.
 - m. Signature of transmitter.
- 2. On an attached separate sheet, prepared on Contractor's letterhead, record relevant information, requests for data, revisions other than those requested by COR on previous submittals, and deviations from requirements in the Contract Documents, including minor variations and limitations. Include same label information as related submittal.
- I. Request For Variations: Variations from contract requirements require FAA approval pursuant to contract clause entitled "Specifications and Drawings for Construction" and will be considered where advantageous to the FAA. Where variations are proposed for consideration, submit a written request, with documentation of the nature and features of the variation and why the variation is desirable and beneficial to the FAA and must include cost savings to the FAA. The proposed variation shall be identified separately and included along with the required submittal for the item. When a variation is submitted for approval, the Contractor warrants the following.
 - 1. The Contract has been reviewed to establish that the variation, when incorporated, will be compatible with other elements of the work.
 - 2. The Contractor shall take action and bear the additional cost, including review costs by the FAA, necessary because of the proposed variation.
 - 3. The Contractor shall bear the cost of employing a registered professional engineer to provide stamped calculations certifying that the variation meets the project criteria.
- J. Distribution: Furnish copies of final submittals to manufacturers, subcontractors, suppliers, fabricators, installers, authorities having jurisdiction, and others as necessary for performance of construction activities. Show distribution on transmittal forms.
- K. Use for Construction: Use only final submittals with mark indicating that no exceptions are taken by COR.

1.5 SUBMITTAL PROCEDURES

- A. General: Electronic copies of the CAD files of the Contract Drawings will be provided by COR for Contractor's use to comply with Section 01 31 00 Project Management and Coordination.
- B. Prepare and submit submittals required by individual Specification Sections. Types of submittals are indicated in individual Specification Sections.
 - 1. Email: Prepare submittals as PDF package and transmit to COR by sending via email. Include PDF transmittal form. Include information in email subject line as requested by COR.

- a. COR will return annotated file. Annotate and retain one copy of file as a digital Project Record Document file.
 2. Web-Based Project Management Software: Prepare submittals in PDF form, and upload to web-based Project management software website. Enter required data in web-based software site to fully identify submittal.
 3. Paper: Prepare submittals in paper form and deliver to COR.
- C. Coordination: Coordinate preparation and processing of submittals with performance of construction activities.
1. Coordinate each submittal with fabrication, purchasing, testing, delivery, other submittals, and related activities that require sequential activity.
 2. Submit all submittal items required for each Specification Section concurrently unless partial submittals for portions of the Work are indicated on approved submittal schedule.
 3. Submit action submittals and informational submittals required by the same Specification Section as separate packages under separate transmittals.
 4. Coordinate transmittal of submittals for related parts of the Work specified in different Sections, so processing will not be delayed because of need to review submittals concurrently for coordination.
- a. COR reserves the right to withhold action on a submittal requiring coordination with other submittals until related submittals are received.
- D. Processing Time: Allow time for submittal review, including time for resubmittals, as follows. Time for review shall commence on COR's receipt of submittal. No extension of the Contract Time will be authorized because of failure to transmit submittals enough in advance of the Work to permit processing, including resubmittals.
1. Initial Review: Allow 21 calendar days for initial review of each submittal. Allow additional time if coordination with subsequent submittals is required. COR will advise Contractor when a submittal being processed must be delayed for coordination.
 2. Intermediate Review: If intermediate submittal is necessary, process it in same manner as initial submittal.
 3. Resubmittal Review: Allow 14 calendar days for review of each resubmittal.
 4. Sequential Review: Where sequential review of submittals by COR's consultants, FAA, or other parties is indicated, allow 21 calendar days for initial review of each submittal.
- E. Resubmittals: Make resubmittals in same form and number of copies as initial submittal.
1. Note date and content of previous submittal.
 2. Note date and content of revision in label or title block, and clearly indicate extent of revision.
 3. Resubmit submittals until they are marked with approval notation from COR's action stamp.

4. Resubmittals previous marked “no exception taken” or resubmittals not specifically marked “revise and resubmit” will not be reviewed.
- F. Distribution: Furnish copies of final submittals to manufacturers, subcontractors, suppliers, fabricators, installers, authorities having jurisdiction, and others as necessary for performance of construction activities. Show distribution on transmittal forms.
- G. Use for Construction: Retain complete copies of submittals on Project site. Use only final action submittals that are marked with approval notation from COR's action stamp.

1.6 SUBMITTAL REQUIREMENTS

- A. Product Data: Collect information into a single submittal for each element of construction and type of product or equipment.
 1. If information must be specially prepared for submittal because standard published data are unsuitable for use, submit as Shop Drawings, not as Product Data.
 2. Mark each copy of each submittal to show which products and options are applicable.
 3. Include the following information, as applicable:
 - a. Manufacturer's catalog cuts.
 - b. Manufacturer's product specifications.
 - c. Standard color charts.
 - d. Statement of compliance with specified referenced standards.
 - e. Testing by recognized testing agency.
 - f. Application of testing agency labels and seals.
 - g. Notation of coordination requirements.
 - h. Availability and delivery time information.
 4. For equipment, include the following in addition to the above, as applicable:
 - a. Wiring diagrams that show factory-installed wiring.
 - b. Printed performance curves.
 - c. Operational range diagrams.
 - d. Clearances required to other construction, if not indicated on accompanying Shop Drawings.
 5. Submit Product Data before Shop Drawings, and before or concurrently with Samples.
- B. Shop Drawings: Prepare Project-specific information, drawn accurately to scale. Do not base Shop Drawings on reproductions of the Contract Documents or standard printed data unless submittal based on COR's digital data drawing files is otherwise permitted.
 1. Preparation: Fully illustrate requirements in the Contract Documents. Include the following information, as applicable:

- a. Identification of products.
 - b. Schedules.
 - c. Compliance with specified standards.
 - d. Notation of coordination requirements.
 - e. Notation of dimensions established by field measurement.
 - f. Relationship and attachment to adjoining construction clearly indicated.
 - g. Seal and signature of professional engineer if specified.
 2. Paper Sheet Size: Except for templates, patterns, and similar full-size Drawings, submit Shop Drawings on sheets at least 8-1/2 by 11 inches, but no larger than 30 by 42 inches.
 - a. Two opaque (bond) copies of each submittal. COR, through Construction Manager, will return one copy(ies).
- C. Samples: Submit Samples for review of type, color, pattern, and texture for a check of these characteristics with other materials.
1. Transmit Samples that contain multiple, related components, such as accessories together in one submittal package.
 2. Identification: Permanently attach label on unexposed side of Samples that includes the following:
 - a. Project name and submittal number.
 - b. Generic description of Sample.
 - c. Product name and name of manufacturer.
 - d. Sample source.
 - e. Number and title of applicable Specification Section.
 - f. Specification paragraph number and generic name of each item.
 3. Email Transmittal: Provide PDF transmittal. Include digital image file illustrating Sample characteristics and identification information for record.
 4. Disposition: Maintain sets of approved Samples at Project site, available for quality-control comparisons throughout the course of construction activity. Sample sets may be used to determine final acceptance of construction associated with each set.
 - a. Samples that may be incorporated into the Work are indicated in individual Specification Sections. Such Samples must be in an undamaged condition at time of use.
 - b. Samples not incorporated into the Work, or otherwise designated as FAA's property, are the property of Contractor.
- D. Product Schedule: As required in individual Specification Sections, prepare a written summary indicating types of products required for the Work and their intended location. Include the following information in tabular form:
1. Type of product. Include unique identifier for each product indicated in the Contract Documents or assigned by Contractor if none is indicated.
 2. Manufacturer and product name, and model number if applicable.

3. Number and name of room or space.
 4. Location within room or space.
- E. Qualification Data: Prepare written information that demonstrates capabilities and experience of firm or person. Include lists of completed projects with project names and addresses, contact information of architects and owners, and other information specified.
- F. Design Data: Prepare and submit written and graphic information indicating compliance with indicated performance and design criteria in individual Specification Sections. Include list of assumptions and summary of loads. Include load diagrams if applicable. Provide name and version of software, if any, used for calculations. Number each page of submittal.
- G. Certificates:
1. Certificates and Certifications Submittals: Submit a statement that includes signature of entity responsible for preparing certification. Certificates and certifications shall be signed by an officer or other individual authorized to sign documents on behalf of that entity. Provide a notarized signature where indicated.
 2. Installer Certificates: Submit written statements on manufacturer's letterhead, certifying that Installer complies with requirements in the Contract Documents and, where required, is authorized by manufacturer for this specific Project.
 3. Manufacturer Certificates: Submit written statements on manufacturer's letterhead, certifying that manufacturer complies with requirements in the Contract Documents. Include evidence of manufacturing experience where required.
 4. Material Certificates: Submit written statements on manufacturer's letterhead, certifying that material complies with requirements in the Contract Documents.
 5. Product Certificates: Submit written statements on manufacturer's letterhead, certifying that product complies with requirements in the Contract Documents.
 6. Welding Certificates: Prepare written certification that welding procedures and personnel comply with requirements in the Contract Documents. Submit record of AWS B2.1/B2.1M on AWS forms. Include names of firms and personnel certified.
- H. Test and Research Reports:
1. Compatibility Test Reports: Submit reports written by a qualified testing agency, on testing agency's standard form, indicating and interpreting results of compatibility tests performed before installation of product. Include written recommendations for substrate preparation and primers required.
 2. Field Test Reports: Submit written reports indicating and interpreting results of field tests performed either during installation of product or after product is installed in its final location, for compliance with requirements in the Contract Documents.
 3. Material Test Reports: Submit reports written by a qualified testing agency, on testing agency's standard form, indicating and interpreting test results of material for compliance with requirements in the Contract Documents.

4. Preconstruction Test Reports: Submit reports written by a qualified testing agency, on testing agency's standard form, indicating and interpreting results of tests performed before installation of product, for compliance with performance requirements in the Contract Documents.
5. Product Test Reports: Submit written reports indicating that current product produced by manufacturer complies with requirements in the Contract Documents. Base reports on evaluation of tests performed by manufacturer and witnessed by a qualified testing agency, or on comprehensive tests performed by a qualified testing agency.
6. Research Reports: Submit written evidence, from a model code organization acceptable to authorities having jurisdiction, that product complies with building code in effect for Project. Include the following information:
 - a. Name of evaluation organization.
 - b. Date of evaluation.
 - c. Time period when report is in effect.
 - d. Product and manufacturers' names.
 - e. Description of product.
 - f. Test procedures and results.
 - g. Limitations of use.

1.7 DELEGATED DESIGN SERVICES

- A. Performance and Design Criteria: Where professional design services or certifications by a design professional are specifically required of Contractor by the Contract Documents, provide products and systems complying with specific performance and design criteria indicated.
 1. If criteria indicated are insufficient to perform services or certification required, submit a written request for additional information to Architect.
- B. Delegated Design Services Certification: In addition to Shop Drawings, Product Data, and other required submittals, submit digitally signed PDF file of certificate, signed and sealed by the responsible design professional, for each product and system specifically assigned to Contractor to be designed or certified by a design professional.
 1. Indicate that products and systems comply with performance and design criteria in the Contract Documents. Include list of codes, loads, and other factors used in performing these services.

1.8 CONTRACTOR'S USE OF CAD FILES

- A. General: Contract document CAD files will be provided to Contractor for Contractor's use in connection with Project, subject to the following conditions:
 1. While every effort has been made to ensure the accuracy of the information contained in the CAD drawing files, the FAA shall not be responsible for any mistake or inaccuracy that may be contained herein and all such liability and responsibility are expressly disclaimed by the FAA.

- B. The Contractor shall comply with the requirements of Section 01 31 00, "Project Management and Coordination."

1.9 CONTRACTOR'S REVIEW

- A. Action Submittals and Informational Submittals: Review each submittal and check for coordination with other Work of the Contract and for compliance with the Contract Documents. Note corrections and field dimensions. Mark with approval stamp before submitting to COR.
- B. Contractor's Approval: Indicate Contractor's approval for each submittal with a uniform approval stamp. Include name of reviewer, date of Contractor's approval, and statement certifying that submittal has been reviewed, checked, and approved for compliance with the Contract Documents.
 - 1. COR will not review submittals received from Contractor that do not have Contractor's review and approval.

1.10 ARCHITECT'S REVIEW

- A. General: COR will not review submittals that do not bear Contractor's approval stamp and will return them without action.
- B. Action Submittals: COR will review each submittal, indicate corrections or revisions required, and return.
 - 1. PDF Submittals: COR will indicate, via markup on each submittal, the appropriate action, as follows:
 - a. Approved as Submitted
 - b. Approved as Noted
 - c. Not Approved
 - d. Revise and Resubmit
 - e. For Information Only.
 - 2. The FAA may retain a construction support contractor for submittal review and other engineering support functions. The construction contractor acknowledges that no submittal, RFI, or any other information will be received directly from the construction support contractor. All information received from the construction support contractor must be validated by the FAA COR before it is considered an official response to the submittal RFI, or information inquiry.
 - 3. Paper Submittals: COR will stamp each submittal with an action stamp and will mark stamp appropriately to indicate action, as indicated above:
 - 4. Submittals by Web-Based Project Management Software: COR will indicate, on Project management software website, the appropriate action.

- C. Informational Submittals: COR will review each submittal and will not return it, or will return it if it does not comply with requirements. COR will forward each submittal to appropriate party.
- D. Partial submittals prepared for a portion of the Work will be reviewed when use of partial submittals has received prior approval from COR.
- E. Incomplete submittals are unacceptable, will be considered nonresponsive, and will be returned for resubmittal without review.
- F. COR will return without review submittals received from sources other than Contractor.
- G. Submittals not required by the Contract Documents will be returned by COR without action.

PART 2 - PRODUCTS (Not Used)

PART 3 - EXECUTION (Not Used)

END OF SECTION **01 33 00**

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SECTION 01 35 16 - ALTERATION PROJECT PROCEDURES

PART 1 - GENERAL

1.1 SUMMARY

- A. Section includes special procedures for alteration work.

1.2 DEFINITIONS

- A. Alteration Work: This term includes remodeling, renovation, repair, and maintenance work performed within existing spaces or on existing surfaces as part of the Project.
- B. Consolidate: To strengthen loose or deteriorated materials in place.
- C. Design Reference Sample: A sample that represents the COR's prebid selection of work to be matched; it may be existing work or work specially produced for the Project.
- D. Dismantle: To remove by disassembling or detaching an item from a surface, using gentle methods and equipment to prevent damage to the item and surfaces; disposing of items unless indicated to be salvaged or reinstalled.
- E. Match: To blend with adjacent construction and manifest no apparent difference in material type, species, cut, form, detail, color, grain, texture, or finish; as approved by COR.
- F. Refinish: To remove existing finishes to base material and apply new finish to match original, or as otherwise indicated.
- G. Repair: To correct damage and defects, retaining existing materials, features, and finishes. This includes patching, piecing-in, splicing, consolidating, or otherwise reinforcing or upgrading materials.
- H. Replace: To remove, duplicate, and reinstall entire item with new material. The original item is the pattern for creating duplicates unless otherwise indicated.
- I. Replicate: To reproduce in exact detail, materials, and finish unless otherwise indicated.
- J. Reproduce: To fabricate a new item, accurate in detail to the original, and from either the same or a similar material as the original, unless otherwise indicated.
- K. Retain: To keep an element or detail secure and intact.
- L. Strip: To remove existing finish down to base material unless otherwise indicated.

1.3 COORDINATION

- A. Alteration Work Subschedule: A construction schedule coordinating the sequencing and scheduling of alteration work for entire Project, including each activity to be performed, and based on Contractor's Construction Schedule. Secure time commitments for performing critical construction activities from separate entities responsible for alteration work.
1. Schedule construction operations in sequence required to obtain best Work results.
 2. Coordinate sequence of alteration work activities to accommodate the following:
 - a. FAA's continuing occupancy of portions of existing building.
 - b. Tests and inspections.
 3. Detail sequence of alteration work, with start and end dates.
 4. Utility Services: Indicate how long utility services will be interrupted. Coordinate shutoff, capping, and continuation of utility services.
 5. Use of elevator and stairs.
 6. Equipment Data: List gross loaded weight, axle-load distribution, and wheel-base dimension data for mobile and heavy equipment proposed for use in existing structure. Do not use such equipment without certification from Contractor's professional engineer that the structure can support the imposed loadings without damage.
- B. Pedestrian and Vehicular Circulation: Coordinate alteration work with circulation patterns within Project building(s) and site. Some work is near circulation patterns and adjacent to restricted areas. Circulation patterns cannot be closed off entirely and in places can be only temporarily redirected around small areas of work. Access to restricted areas may not be obstructed. Plan and execute the Work accordingly.

1.4 PROJECT MEETINGS FOR ALTERATION WORK

- A. Preliminary Conference for Alteration Work: Before starting alteration work, conduct conference at Project site.
1. Attendees: In addition to representatives of FAA, COR, and Contractor, testing service representative, specialists, and chemical-cleaner manufacturer(s) shall be represented at the meeting.
 2. Agenda: Discuss items of significance that could affect progress of alteration work, including review of the following:
 - a. Alteration Work Subschedule: Discuss and finalize; verify availability of materials, specialists' personnel, equipment, and facilities needed to make progress and avoid delays.
 - b. Fire-prevention plan.
 - c. Governing regulations.
 - d. Areas where existing construction is to remain and the required protection.

- e. Hauling routes.
 - f. Sequence of alteration work operations.
 - g. Storage, protection, and accounting for salvaged and specially fabricated items.
 - h. Existing conditions, staging, and structural loading limitations of areas where materials are stored.
 - i. Qualifications of personnel assigned to alteration work and assigned duties.
 - j. Requirements for extent and quality of work, tolerances, and required clearances.
 - k. Embedded work such as flashings and lintels, special details, collection of waste, protection of occupants and the public, and condition of other construction that affects the Work or will affect the work.
3. Reporting: Record conference results and distribute copies to everyone in attendance and to others affected by decisions or actions resulting from conference.
- B. Coordination Meetings: Conduct coordination meetings specifically for alteration work at weekly intervals. Coordination meetings are in addition to specific meetings held for other purposes, such as progress meetings and preinstallation conferences.
- 1. Attendees: In addition to representatives of FAA, COR COR, and Contractor, each specialist, supplier, installer, and other entity concerned with progress or involved in planning, coordination, or performance of alteration work activities shall be represented at these meetings. All participants at conference shall be familiar with Project and authorized to conclude matters relating to alteration work.
 - 2. Agenda: Review and correct or approve minutes of previous coordination meeting. Review other items of significance that could affect progress of alteration work. Include topics for discussion as appropriate to status of Project.
 - a. Alteration Work Subschedule: Review progress since last coordination meeting. Determine whether each schedule item is on time, ahead of schedule, or behind schedule. Determine how construction behind schedule will be expedited with retention of quality; secure commitments from parties involved to do so. Discuss whether schedule revisions are required to ensure that current and subsequent activities are completed within the Contract Time.
 - b. Schedule Updating: Revise Contractor's Alteration Work Subschedule after each coordination meeting where revisions to schedule have been made or recognized. Issue revised schedule concurrently with report of each meeting.
 - c. Review present and future needs of each entity present, including review items listed in the "Preliminary Conference for Alteration Work" Paragraph in this article and the following:
 - 1) Interface requirements of alteration work with other Project Work.
 - 2) Status of submittals for alteration work.
 - 3) Access to alteration work locations.
 - 4) Effectiveness of fire-prevention plan.
 - 5) Quality and work standards of alteration work.

6) Change Orders for alteration work.

3. Reporting: Record meeting results and distribute copies to everyone in attendance and to others affected by decisions or actions resulting from each meeting.

1.5 MATERIALS OWNERSHIP

- A. Historic items, relics, and similar objects including, but not limited to, cornerstones and their contents, commemorative plaques and tablets, antiques, and other items of interest or value to FAA that may be encountered or uncovered during the Work, regardless of whether they were previously documented, remain FAA's property.
 1. Carefully dismantle and salvage each item or object in a manner to prevent damage and protect it from damage, then promptly deliver it to FAA where directed at Project site.

1.6 INFORMATIONAL SUBMITTALS

- A. Alteration Work Subschedule:
 1. Submit alteration work subschedule within seven days of date established for commencement of alteration work.
- B. Preconstruction Documentation: Show preexisting conditions of adjoining construction and site improvements that are to remain, including finish surfaces, that might be misconstrued as damage caused by Contractor's alteration work operations.

1.7 QUALITY ASSURANCE

- A. Specialist Qualifications: An experienced firm regularly engaged in specialty work similar in nature, materials, design, and extent to alteration work as specified in each Section and that has completed a minimum of five recent projects with a record of successful in-service performance that demonstrates the firm's qualifications to perform this work.
 1. Field Supervisor Qualifications: Full-time supervisors experienced in specialty work similar in nature, material, design, and extent to that indicated for this Project. Supervisors shall be on-site when specialty work begins and during its progress. Supervisors shall not be changed during Project except for causes beyond the control of the specialist firm.
 - a. Construct new mockups of required work whenever a supervisor is replaced.
- B. Title X Requirement: Each firm conducting activities that disturb painted surfaces shall be a "Lead-Safe Certified Firm" according to 40 CFR 745, Subpart E, and use only workers that are trained in lead-safe work practices.

- C. Alteration Work Program: Prepare a written plan for alteration work for whole Project, including each phase or process and protection of surrounding materials during operations. Show compliance with indicated methods and procedures specified in this and other Sections. Coordinate this whole-Project alteration work program with specific requirements of programs required in other alteration work Sections.
 - 1. Dust and Noise Control: Include locations of proposed temporary dust- and noise-control partitions and means of egress from occupied areas coordinated with continuing on-site operations and other known work in progress.
 - 2. Debris Hauling: Include plans clearly marked to show debris hauling routes, turning radii, and locations and details of temporary protective barriers.
 - D. Fire-Prevention Plan: Prepare a written plan for preventing fires during the Work, including placement of fire extinguishers, fire blankets, rag buckets, and other fire-control devices during each phase or process. Coordinate plan with FAA's fire-protection equipment and requirements. Include fire-watch personnel's training, duties, and authority to enforce fire safety.
 - E. Safety and Health Standard: Comply with ANSI/ASSP A10.6.
- 1.8 STORAGE AND HANDLING OF SALVAGED MATERIALS
- A. Salvaged Materials:
 - 1. Clean loose dirt and debris from salvaged items unless more extensive cleaning is indicated.
 - 2. Pack or crate items after cleaning; cushion against damage during handling. Label contents of containers.
 - 3. Store items in a secure area until delivery to FAA.
 - 4. Transport items to FAA's storage area designated by COR.
 - 5. Protect items from damage during transport and storage.
 - B. Salvaged Materials for Reinstallation:
 - 1. Repair and clean items for reuse as indicated.
 - 2. Pack or crate items after cleaning and repairing; cushion against damage during handling. Label contents of containers.
 - 3. Protect items from damage during transport and storage.
 - 4. Reinstall items in locations indicated. Comply with installation requirements for new materials and equipment unless otherwise indicated. Provide connections, supports, and miscellaneous materials to make items functional for use indicated.
 - C. Existing Materials to Remain: Protect construction indicated to remain against damage and soiling from construction work. Where permitted by COR, items may be dismantled and taken to a suitable, protected storage location during construction work and reinstalled in their original locations after alteration and other construction work in the vicinity is complete.

- D. Storage: Catalog and store items within a weathertight enclosure where they are protected from moisture, weather, condensation, and freezing temperatures.
 - 1. Identify each item for reinstallation with a nonpermanent mark to document its original location. Indicate original locations on plans, elevations, sections, or photographs by annotating the identifying marks.
 - 2. Secure stored materials to protect from theft.
 - 3. Control humidity so that it does not exceed 85 percent. Maintain temperatures 5 deg F or more above the dew point.
- E. Storage Space:
 - 1. FAA will arrange for limited on-site location(s) for free storage of salvaged material. This storage space includes security and climate control for stored material.
 - 2. Arrange for off-site locations for storage and protection of salvaged material that cannot be stored and protected on-site.

1.9 FIELD CONDITIONS

- A. Survey of Existing Conditions: Record existing conditions that affect the Work by use of measured drawings and preconstruction photographs.
 - 1. Comply with requirements specified in Section 01 32 33 "Photographic Documentation."
- B. Discrepancies: Notify COR of discrepancies between existing conditions and Drawings before proceeding with removal and dismantling work.
- C. Size Limitations in Existing Spaces: Materials, products, and equipment used for performing the Work and for transporting debris, materials, and products shall be of sizes that clear surfaces within existing spaces, areas, rooms, and openings, including temporary protection, by 12 inches or more.

PART 2 - PRODUCTS - (Not Used)

PART 3 - EXECUTION

3.1 PROTECTION

- A. Protect persons, motor vehicles, surrounding surfaces of building, building site, plants, and surrounding buildings from harm resulting from alteration work.
 - 1. Use only proven protection methods, appropriate to each area and surface being protected.
 - 2. Provide temporary barricades, barriers, and directional signage to exclude the public from areas where alteration work is being performed.

3. Erect temporary barriers to form and maintain fire-egress routes.
 4. Erect temporary protective covers over walkways and at points of pedestrian and vehicular entrance and exit that must remain in service during alteration work.
 5. Contain dust and debris generated by alteration work, and prevent it from reaching the public or adjacent surfaces.
 6. Provide shoring, bracing, and supports as necessary. Do not overload structural elements.
 7. Protect floors and other surfaces along hauling routes from damage, wear, and staining.
 8. Provide supplemental sound-control treatment to isolate demolition work from other areas of the building.
- B. Temporary Protection of Materials to Remain:
1. Protect existing materials with temporary protections and construction. Do not remove existing materials unless otherwise indicated.
 2. Do not attach temporary protection to existing surfaces except as indicated as part of the alteration work program.
- C. Comply with each product manufacturer's written instructions for protections and precautions. Protect against adverse effects of products and procedures on people and adjacent materials, components, and vegetation.
- D. Utility and Communications Services:
1. Notify FAA, COR, authorities having jurisdiction, and entities owning or controlling wires, conduits, pipes, and other services affected by alteration work before commencing operations.
 2. Disconnect and cap pipes and services as required by authorities having jurisdiction, as required for alteration work.
 3. Maintain existing services unless otherwise indicated; keep in service, and protect against damage during operations. Provide temporary services during interruptions to existing utilities.
- E. Existing Drains: Prior to the start of work in an area, test drainage system to ensure that it is functioning properly. Notify COR immediately of inadequate drainage or blockage. Do not begin work in an area until the drainage system is functioning properly.
1. Prevent solids such as adhesive or mortar residue or other debris from entering the drainage system. Clean out drains and drain lines that become sluggish or blocked by sand or other materials resulting from alteration work.
 2. Protect drains from pollutants. Block drains or filter out sediments, allowing only clean water to pass.
- F. Existing Roofing: Prior to the start of work in an area, install roofing protection as indicated on Drawings.

3.2 PROTECTION FROM FIRE

A. General: Follow fire-prevention plan and the following:

1. Comply with NFPA 241 requirements unless otherwise indicated. Perform duties titled "FAA's Responsibility for Fire Protection."
2. Remove and keep area free of combustibles, including rubbish, paper, waste, and chemicals, unless necessary for the immediate work.
 - a. If combustible material cannot be removed, provide fire blankets to cover such materials.

B. Heat-Generating Equipment and Combustible Materials: Comply with the following procedures while performing work with heat-generating equipment or combustible materials, including welding, torch-cutting, soldering, brazing, removing paint with heat, or other operations where open flames or implements using high heat or combustible solvents and chemicals are anticipated:

1. Obtain FAA's approval for operations involving use of open-flame or welding or other high-heat equipment. Notify FAA at least 72 hours before each occurrence, indicating location of such work.
2. As far as practicable, restrict heat-generating equipment to shop areas or outside the building.
3. Do not perform work with heat-generating equipment in or near rooms or in areas where flammable liquids or explosive vapors are present or thought to be present. Use a combustible gas indicator test to ensure that the area is safe.
4. Use fireproof baffles to prevent flames, sparks, hot gases, or other high-temperature material from reaching surrounding combustible material.
5. Prevent the spread of sparks and particles of hot metal through open windows, doors, holes, and cracks in floors, walls, ceilings, roofs, and other openings.
6. Fire Watch: Before working with heat-generating equipment or combustible materials, station personnel to serve as a fire watch at each location where such work is performed. Fire-watch personnel shall have the authority to enforce fire safety. Station fire watch according to NFPA 51B, NFPA 241, and as follows:
 - a. Train each fire watch in the proper operation of fire-control equipment and alarms.
 - b. Prohibit fire-watch personnel from other work that would be a distraction from fire-watch duties.
 - c. Cease work with heat-generating equipment whenever fire-watch personnel are not present.
 - d. Have fire-watch personnel perform final fire-safety inspection each day beginning no sooner than 30 minutes after conclusion of work in each area to detect hidden or smoldering fires and to ensure that proper fire prevention is maintained.
 - e. Maintain fire-watch personnel at each area of Project site until 60 minutes after conclusion of daily work.

- C. Fire-Control Devices: Provide and maintain fire extinguishers, fire blankets, and rag buckets for disposal of rags with combustible liquids. Maintain each as suitable for the type of fire risk in each work area. Ensure that nearby personnel and the fire-watch personnel are trained in fire-extinguisher and blanket use.
- D. Sprinklers: Where sprinkler protection exists and is functional, maintain it without interruption while operations are being performed. If operations are performed close to sprinklers, shield them temporarily with guards.
 - 1. Remove temporary guards at the end of work shifts, whenever operations are paused, and when nearby work is complete.

3.3 PROTECTION DURING APPLICATION OF CHEMICALS

- A. Protect motor vehicles, surrounding surfaces of building, building site, plants, and surrounding buildings from harm or spillage resulting from applications of chemicals and adhesives.
- B. Cover adjacent surfaces with protective materials that are proven to resist chemicals selected for Project unless chemicals being used will not damage adjacent surfaces as indicated in alteration work program. Use covering materials and masking agents that are waterproof and UV resistant and that will not stain or leave residue on surfaces to which they are applied. Apply protective materials according to manufacturer's written instructions. Do not apply liquid masking agents or adhesives to painted or porous surfaces. When no longer needed, promptly remove protective materials.
- C. Do not apply chemicals during winds of sufficient force to spread them to unprotected surfaces.
- D. Neutralize alkaline and acid wastes and legally dispose of off FAA's property.
- E. Collect and dispose of runoff from chemical operations by legal means and in a manner that prevents soil contamination, soil erosion, undermining of paving and foundations, damage to landscaping, or water penetration into building interior.

3.4 GENERAL ALTERATION WORK

- A. Have specialty work performed only by qualified specialists.
- B. Ensure that supervisory personnel are present when work begins and during its progress.
- C. Record existing work before each procedure (preconstruction), and record progress during the work. Use digital preconstruction documentation photographs. Comply with requirements in Section 01 32 33 "Photographic Documentation."
- D. Perform surveys of Project site as the Work progresses to detect hazards resulting from alterations.

- E. Notify COR of visible changes in the integrity of material or components whether from environmental causes including biological attack, UV degradation, freezing, or thawing or from structural defects including cracks, movement, or distortion.
 - 1. Do not proceed with the work in question until directed by COR.

END OF SECTION 01 35 16

SECTION 01 35 29 – HEALTH, SAFETY AND EMERGENCY RESPONSE PROCEDURES

PART 1 - GENERAL

1.1 REFERENCES

- A. The publications listed below form a part of this specification to the extent referenced. The publications listed below are referenced as the latest edition published as of the date of this document. The publications are referred to within the text by the basic designation only.

AMERICAN NATIONAL STANDARDS INSTITUTE (ANSI)

ANSI A10.32	Personal Fall Protection - Safety Requirements for Construction and Demolition Operations
ANSI Z359.1	Safety Requirements for Personal Fall Arrest Systems, Subsystems and Components
ANSI/ASSE A10.34	Protection of the Public on or Adjacent to Construction Sites
ASME B30.3	Construction Tower Cranes

ASME INTERNATIONAL (ASME)

ASME B30.22	Articulating Boom Cranes
ASME B30.5	Mobile and Locomotive Cranes
ASME B30.8	Floating Cranes and Floating Derricks

NATIONAL FIRE PROTECTION ASSOCIATION (NFPA)

NFPA 10	Portable Fire Extinguishers
NFPA 241	Safeguarding Construction, Alteration, and Demolition Operations
NFPA 51B	Fire Prevention During Welding, Cutting, and Other Hot Work
NFPA 70	National Electrical Code
NFPA 70E	Electrical Safety in the Workplace

U.S. ARMY CORPS OF ENGINEERS (USACE)

COE EM 385-1-1	Safety and Health Requirements Manual
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U.S. NATIONAL ARCHIVES AND RECORDS ADMINISTRATION (NARA)

1.	CFR 1910	Occupational Safety and Health Standards
2.	CFR 1910.146	Permit-required Confined Spaces

3. CFR 1915 Confined and Enclosed Spaces and Other Dangerous Atmospheres in Shipyard Employment
4. CFR 1919 Gear Certification
5. CFR 1926 Safety and Health Regulations for Construction
6. CFR 1926.500 Fall Protection

1.2 SUBMITTALS

A. Preconstruction Submittals

1. Accident Prevention Plan (APP)
2. Activity Hazard Analysis (AHA)
3. Crane Critical Lift Plan
4. Proof of qualification for Crane Operators

B. Test Reports

1. Reports
2. Submit reports as their incidence occurs, in accordance with the requirements of the paragraph entitled, "Reports."
3. Accident Reports
4. Monthly Exposure Reports
5. Crane Reports
6. Regulatory Citations and Violations

C. Certificates

1. Confined Space Entry Permit
2. Hot work permit
3. Contractor Safety Self-Evaluation Checklist
4. Submit one copy of each permit/certificate attached to each Daily Report.

1.3 DEFINITIONS

- A. Competent Person for Fall Protection. A person who is capable of identifying hazardous or dangerous conditions in the personal fall arrest system or any component thereof, as well as their application and use with related equipment, and has the authority to take prompt corrective measures to eliminate the hazards of falling.
- B. High Visibility Accident. Any mishap which may generate publicity and/or high visibility.
- C. Medical Treatment. Treatment administered by a physician or by registered professional personnel under the standing orders of a physician. Medical treatment does not include first aid treatment even through provided by a physician or registered personnel.

- D. Operating Envelope. The area surrounding any crane. Inside this "envelope" is the crane, the operator, riggers and crane walkers, rigging gear between the hook and the load, the load and the crane's supporting structure (ground, rail, etc.).
- E. Qualified Person for Fall Protection. A person with a recognized degree or professional certificate, and with extensive knowledge, training and experience in the field of fall protection; who is capable of performing design, analysis, and evaluation of fall protection systems and equipment.
- F. Recordable Injuries or Illnesses. Any work-related injury or illness that results in:
 - 1. Death, regardless of the time between the injury and death, or the length of the illness;
 - 2. Days away from work (any time lost after day of injury/illness onset);
 - 3. Restricted work;
 - 4. Transfer to another job;
 - 5. Medical treatment beyond first aid;
 - 6. Loss of consciousness; or
 - 7. A significant injury or illness diagnosed by a physician or other licensed health care professional, even if it did not result in (1) through (6) above.
- G. "USACE" property and equipment specified in USACE EM 385-1-1 should be interpreted as Government property and equipment.
- H. Weight Handling Equipment (WHE) Accident. A WHE accident occurs when any one or more of the six elements in the operating envelope fails to perform correctly during operation, including operation during maintenance or testing resulting in personnel injury or death; material or equipment damage; dropped load; derailment; two-blocking; overload; and/or collision, including unplanned contact between the load, crane, and/or other objects. A dropped load, derailment, two-blocking, overload and collision are considered accidents even though no material damage or injury occurs. A component failure (e.g., motor burnout, gear tooth failure, bearing failure) is not considered an accident solely due to material or equipment damage unless the component failure results in damage to other components (e.g., dropped boom, dropped load, roll over, etc.).

1.4 CONTRACTOR SAFETY SELF-EVALUATION CHECKLIST

- A. Contracting Officer will provide a "Contractor Safety Self-Evaluation checklist" to the Contractor at the pre-construction conference. The checklist will be completed monthly by the Contractor and submitted with each request for payment voucher. An acceptable score of 90 or greater is required. Failure to submit the completed safety self-evaluation checklist or achieve a score of at least 90, will result in a retention of up to 10 percent of the voucher.

1.5 PERSONNEL QUALIFICATIONS AND DUTIES

- A. Site Safety and Health Officer (SSHO)

1. Site Safety and Health Officer (SSHO) shall be provided and present at the work site at all times to perform safety and occupational health management, surveillance, inspections, and safety enforcement for the Contractor. The SSHO shall be present at the project site, located so they have full mobility and reasonable access to all major work operations during the shift. An alternate SSH, shall be provided if/when the SSHO cannot be on site at a particular time. The Contractor Quality Control (QC) person cannot be the SSHO or alternate SSHO on this project, even though the QC has safety inspection responsibilities as part of the QC duties.
 2. The SSHO shall report to a senior project (or corporate) official.
 3. The SSHO, as a minimum, must produce a copy of their instructor-signed OSHA 30 hour training card (or course completion if within 90 days of having completed the training and card has not yet been issued). They will have completed:
 - a. The 30-hour OSHA General Industry safety class (may be web-based training if the student is able to directly ask questions of the instructor by chat or phone) or
 - b. The 30-hour OSHA Construction Industry safety class (may be web-based training if the student is able to directly ask questions of the instructor by chat/phone), or
 - c. As an equivalent, formal construction or industry safety and health training covering the subjects of the OSHA 30-hour course and the EM 385-1-1.
 4. SHOs shall maintain competency through having taken 8 hours of documented formal on-line, or self-study safety and health related coursework every year. Examples of continuing education activities that meet this requirement are: writing an article, teaching a class, reading/writing professional articles, attendance/participation in professional societies/meetings, etc.
- B. Alternate SSHO:
1. As identified in the AHA will be assigned to insure SSHO coverage for the project at all times work activities are conducted. The Alternate SSHO must meet the same requirements and assume the responsibilities of the project SSHO. Qualifications for an Alternate SSHO shall be included on the submitted APP for approval.
 2. If the SSHO is off-site for a period longer than 24 hours, an Alternate SSHO shall be provided and shall fulfill the same roles and responsibilities as the primary SSHO.
- C. Competent Person for Confined Space Entry
1. Provide a competent person for confined space meeting the definition and requirements of EM 385-1-1.
- D. Crane Operators

1. Crane operators shall meet the requirements in USACE EM 385-1-1, Section 16 and Appendix G. In addition, for mobile cranes with Original Equipment Manufacturer (OEM) rated capacities of 50,000 pounds or greater, crane operators shall be designated as qualified by a source that qualifies crane operators (i.e., union, a government agency, or an organization that tests and qualifies crane operators). Proof of current qualification shall be provided.

E. Personnel Duties

1. Site Safety and Health Officer (SSHO)
 - a. Conduct daily safety and health inspections and maintain a written log which includes area/operation inspected, date of inspection, identified hazards, recommended corrective actions, estimated and actual dates of corrections. Safety inspection logs shall be attached to the Contractors' daily quality control report.
 - b. Conduct mishap investigations and complete required reports. Maintain the OSHA Form 300 and Daily Production reports for prime and sub-contractors.
 - c. Maintain applicable safety reference material on the job site.
 - d. Attend the pre-construction conference, pre-work meetings including preparatory inspection meeting, and periodic in-progress meetings.
 - e. Implement and enforce accepted APPS and AHAs.
 - f. Maintain a safety and health deficiency tracking system that monitors outstanding deficiencies until resolution. A list of unresolved safety and health deficiencies shall be posted on the safety bulletin board.
 - g. Ensure sub-contractor compliance with safety and health requirements.
2. Failure to perform the above duties will result in dismissal of the superintendent and/or SSHO, and a project work stoppage. The project work stoppage will remain in effect pending approval of a suitable replacement.

1.6 MEETINGS

A. Pre-construction Conference

1. Contractor representatives who have a responsibility or significant role in accident prevention on the project shall attend the preconstruction conference. This includes the project superintendent, site safety and health officer, quality control supervisor, or any other assigned safety and health professionals who participated in the development of the APP (including the Activity Hazard Analyses (AHAs) and special plans, program and procedures associated with it).
2. The Contractor shall discuss the details of the submitted APP to include incorporated plans, programs, procedures and a listing of anticipated AHAs that will be developed and implemented during the performance of the contract. This list of proposed AHAs will be reviewed at the conference and an agreement will be reached between the Contractor and the Contracting Officer's representative as to which phases will require an analysis. In addition, a schedule for the preparation, submittal, review, and acceptance of AHAs shall be established to preclude project delays.

3. Deficiencies in the submitted APP will be brought to the attention of the Contractor at the preconstruction conference, and the Contractor shall revise the plan to correct deficiencies and re-submit it for acceptance. Work shall not begin until there is an accepted APP.
4. The functions of a Preconstruction conference may take place at the Post-Award Kickoff meeting for Design Build Contracts.

B. Safety Meetings

1. Shall be conducted and documented as required by EM 385-1-1. Minutes showing contract title, signatures of attendees and a list of topics discussed shall be attached to the Contractors' daily report.

1.7 ACCIDENT PREVENTION PLAN (APP)

- A. The Contractor shall use a qualified person to prepare the written site-specific APP. Prepare the APP in accordance with the format and requirements of USACE EM 385-1-1 and as supplemented herein. Cover all paragraph and subparagraph elements in USACE EM 385-1-1, Appendix A, "Minimum Basic Outline for Accident Prevention Plan". Specific requirements for some of the APP elements are described below. The APP shall be job-specific and shall address any unusual or unique aspects of the project or activity for which it is written. The APP shall interface with the Contractor's overall safety and health program. Any portions of the Contractor's overall safety and health program referenced in the APP shall be included in the applicable APP element and made site-specific. The Government considers the Prime Contractor to be the "controlling authority" for all work site safety and health of the subcontractors. Contractors are responsible for informing their subcontractors of the safety provisions under the terms of the contract and the penalties for noncompliance, coordinating the work to prevent one craft from interfering with or creating hazardous working conditions for other crafts, and inspecting subcontractor operations to ensure that accident prevention responsibilities are being carried out. The APP shall be signed by the person and firm (senior person) preparing the APP, the Contractor, the on-site superintendent, the designated site safety and health officer and any designated CSP and/or CIH.
- B. Submit the APP to the Contracting Officer 30 calendar days prior to the date of the preconstruction conference for acceptance. Work cannot proceed without an accepted APP.
- C. Once accepted by the Contracting Officer, the APP and attachments will be enforced as part of the contract. Disregarding the provisions of this contract or the accepted APP will be cause for stopping of work, at the discretion of the Contracting Officer, until the matter has been rectified.

- D. Once work begins, changes to the accepted APP shall be made with the knowledge and concurrence of the Contracting Officer, project superintendent, SSHO and quality control manager. Should any hazard become evident, stop work in the area, secure the area, and develop a plan to remove the hazard. Notify the Contracting Officer within 24 hours of discovery. Eliminate/remove the hazard. In the interim, all necessary action shall be taken to restore and maintain safe working conditions in order to safeguard onsite personnel, visitors, the public (as defined by ANSI/ASSE A10.34,) and the environment.
- E. Copies of the accepted plan will be maintained at the resident engineer's office and at the job site.
- F. The APP shall be continuously reviewed and amended, as necessary, throughout the life of the contract. Unusual or high-hazard activities not identified in the original APP shall be incorporated in the plan as they are discovered.

1.8 ACTIVITY HAZARD ANALYSIS (AHA)

- A. The Activity Hazard Analysis (AHA) format shall be in accordance with USACE EM 385-1-1. Submit the AHA for review at least 15 calendar days prior to the start of each phase. Format subsequent AHAs as amendments to the APP. The analysis should be used during daily inspections to ensure the implementation and effectiveness of the activity's safety and health controls.
- B. The AHA list will be reviewed periodically (at least monthly) at the Contractor supervisory safety meeting and updated as necessary when procedures, scheduling, or hazards change.
- C. The activity hazard analyses shall be developed using the project schedule as the basis for the activities performed. Any activities listed on the project schedule will require an AHA. The AHAs will be developed by the contractor, supplier or subcontractor and provided to the prime contractor for submittal to the Contracting Officer.

1.9 DISPLAY OF SAFETY INFORMATION

- A. Within one calendar days after commencement of work, erect a safety bulletin board at the job site. The safety bulletin board shall include information and be maintained as required by EM 385-1-1, section 01. A06. Additional items required to be posted include:
 - 1. Confined space entry permit.
 - 2. Hot work permit.

1.10 SITE SAFETY REFERENCE MATERIALS

- A. Maintain safety-related references applicable to the project, including those listed in the article "References". Maintain applicable equipment manufacturer's manuals.

1.11 EMERGENCY MEDICAL TREATMENT

- A. Contractors will arrange for their own emergency medical treatment. Government has no responsibility to provide emergency medical treatment.

1.12 REPORTS

A. Accident Reports

1. For recordable injuries and illnesses, and property damage accidents resulting in at least \$2,000 in damages, the Prime Contractor shall conduct an accident investigation to establish the root cause(s) of the accident, complete the Navy Contractor Significant Incident Report (CSIR) USACE Accident Report Form 3394 and provide the report to the Contracting Officer within 5 calendar day(s) of the accident. The Contracting Officer will provide copies of any required or special forms.
2. For any weight handling equipment accident (including rigging gear accidents) the Prime Contractor shall conduct an accident investigation to establish the root cause(s) of the accident, complete the WHE Accident Report (Crane and Rigging Gear) form and provide the report to the Contracting Officer within 30 calendar days of the accident. Crane operations shall not proceed until cause is determined and corrective actions have been implemented to the satisfaction of the contracting officer. The Contracting Officer will provide a blank copy of the accident report form.

B. Accident Notification

1. Notify the Contracting Officer as soon as practical, but not later than four hours, after any accident meeting the definition of Recordable Injuries or Illnesses or High Visibility Accidents, property damage equal to or greater than \$2,000, or any weight handling equipment accident. Information shall include contractor name; contract title; type of contract; name of activity, installation or location where accident occurred; date and time of accident; names of personnel injured; extent of property damage, if any; extent of injury, if known, and brief description of accident (to include type of construction equipment used, PPE used, etc.). Preserve the conditions and evidence on the accident site until the Government investigation team arrives on-site and Government investigation is conducted.

C. Monthly Exposure Reports

1. Monthly exposure reporting to the Contracting Officer is required to be attached to the monthly billing request. This report is a compilation of employee-hours worked each month for all site workers, both prime and subcontractor. The Contracting Officer will provide copies of any special forms.

D. Crane Reports

1. Submit crane inspection reports required in accordance with USACE EM 385-1-1, Appendix H and as specified herein with Daily Reports of Inspections.

E. Certificate of Compliance

1. The Contractor shall provide a Certificate of Compliance for each crane entering an activity under this contract (see Contracting Officer for a blank certificate). Certificate shall state that the crane and rigging gear meet applicable OSHA regulations (with the Contractor citing which OSHA regulations are applicable, e.g., cranes used in construction, demolition, or maintenance shall comply with 29 CFR 1926 and USACE EM 385-1-1 section 16 and Appendix H. Certify on the Certificate of Compliance that the crane operator(s) is qualified and trained in the operation of the crane to be used. The Contractor shall also certify that all of its crane operators working on the DOD activity have been trained in the proper use of all safety devices (e.g., anti-two block devices). These certifications shall be posted on the crane.

1.13 LOCKOUT/TAG OUT PROCEDURES

- A. Contractor shall prepare graphical Lock out/Tag out Procedures for all electrical, hydraulic and mechanical equipment having more than one source of energy.
- B. Perform a zero energy state assessment.
- C. Develop graphical lockout/tag out procedures.
- D. Install lockout/tag out procedures on equipment.
- E. Create and install energy source tags.
- F. Provide electronic files and templates of procedures and one binder of additional copies of the procedures.

1.14 FALL HAZARD PREVENTION PROGRAM

- A. Scaffolds: A competent person shall delineate the fall protection requirements necessary during the erection and dismantling operation of scaffolds used on the project in the fall protection plan and activity hazard analysis for the phase of work.
- B. Training: A competent person shall institute a fall protection program. As part of the Fall Protection Program, contractor shall provide training for each employee who might be exposed to fall hazards

1.15 DRUG PREVENTION PROGRAM

- A. Conduct a proactive drug and alcohol use prevention program foal all workers, prime and subcontractor, on the site. Ensure that no employees either use illegal drugs or consume alcohol during work hours. Ensure that no employees are under the influence of drugs or alcohol during work hours. After accidents, collect blood, urine or saliva specimens and test injured employee influence. A copy of the test shall be made available to the Resident Engineer upon request.

1.16 HIGH HAZARD WORK AND LONG DURATION

- A. Work under this contract is potentially hazardous. Pursuant to contract clause “AMS 52.236-13, Accident Prevention, Alternate I,” submit in writing additional proposals for effecting accident prevention under hazardous conditions. Meet in conference with COR to discuss and develop mutual understanding relative to the administration of the overall safety program.

PART 2 - PRODUCTS

2.1 FALL PROTECTION ANCHORAGE

- A. Fall protection anchorages, used by contractors to protect their people, will be left in place and so identified for continued customer use.

2.2 CONFINED SPACE SIGNAGE

- A. Provide permanent signs integral to or securely attached to access covers for new confined spaces. Signs wording: “DANGER—PERMIT REQUIRED CONFINED SPACE – DO NOT ENTER – “on bold letters a minimum of one inch in height and constructed to be clearly legible with all paint removed. The signal word “DANGER” and shall be red and readable from 5 feet.

PART 3 - EXECUTION

3.1 CONSTRUCTION

- A. Comply with COE EM-385-1-1, NFPA 241, the accident prevention plan, the activity hazard analysis and other related submittals and activity fire and safety regulations.

- B. Hazardous Material Exclusions: Notwithstanding any other hazardous material used in this contract, radioactive materials or instruments capable of producing ionizing/non-ionizing radiation as well as materials which contain asbestos, mercury or polychlorinated biphenyls, di-isocyanates, lead-based paint are prohibited. Exceptions to the use of any of the above excluded materials may be considered by COR upon written request by Contractor.
- C. Unforeseen Hazardous Material: If material that may be hazardous to human health upon disturbance during construction operations is encountered, stop that portion of work and notify the COR immediately. Within 14 calendar days the COR will determine if the material is hazardous. If material is not hazardous or poses no danger, the COR will direct the Contractor to proceed without change. If material is hazardous and handling of the material is necessary to accomplish the work, the COR will issue a modification pursuant to “AMS 52.243-4, Changes” and “AMS 52.236-2, Differing Site Conditions”.

3.2 PRE-OUTAGE COORDINATION MEETING

- A. Contractors are required to apply for utility outages a minimum of 15 days in advance. As a minimum, the request should include the location of the outage, utilities being affected, duration of outage and any necessary sketches. Once approved and prior to beginning work on the utility system requiring shut down, the Contractor shall attend a pre-outage coordination meeting with the COR to review the scope of work and the lock out/tag out procedures for work protection.

3.3 PERSONNEL PROTECTION

- A. Hazardous Noise: Provide hazardous noise signs, and hearing protection, wherever equipment and work procedures produce sound-pressure levels greater than 85 dBA steady state or 140 dBA impulse, regardless of the duration of the exposure.
- B. Fall Protection: Enforce use of the fall protection device named for each activity in the AHA all times when an employee is on a surface 4 feet or more above lower levels. Personal fall arrest systems are required when working from an articulating or extendible boom, scissor lifts, swing stages, or suspended platform. Fall protection must comply with ANSI A10.14.
 - 1. Personal Fall Arrest Device: Equipment, subsystems and components shall meet ANSI Z359.1, Personal Fall Arrest Systems. Only with a shock absorbing lanyard is an acceptable personal fall arrest device. Full Body Harness may only be used as positioning devices only such as for steel reinforcing assembly. Body belts are not authorized as a personal fall arrest device. Harnesses must have upper middle back “D” rings for proper body suspension during a fall. Lanyard must be fitted with a double locking snap hook attachment. Webbing, straps, and ropes must be of synthetic fiber or wire rope.
 - 2. Fall Protection for Roofs:

- a. For work within 6 feet of an edge, on low pitched roofs, personnel shall be protected by use of personal fall arrest systems, guardrails, safety nets. Safety monitoring system is not adequate fall protection and is not authorized.
 - b. For work greater than 6 feet from an edge, warning lines shall be erected and installed in accordance with 29 CFR 1926.502(f).
 - c. Safety Nets: Safety nets shall be provided in unguarded workplaces more than 25 feet above surface.
- C. Scaffolding: Employees shall be provided with a safe means of access to the work area on the scaffold. Climbing on any scaffold braces or supports not specifically designed for access is prohibited. Contractor shall ensure that scaffold erection is performed by employees that are qualified. Do not use scaffold without the capability of supporting at least four times the maximum intended load or without appropriate fall protection as delineated in the accepted fall protection plan. Minimum platform size shall be based on the platform not being greater in height than four times the dimension of the smallest width dimension for rolling scaffold. Some Baker type scaffolding has been found not to meet these requirements. Stationary scaffolds must be attached to structural building components to safeguard against tipping forward or backward. The first tie-in shall be at the height equal to 4 times the width of the scaffold base.
- D. Excavations: The competent person for excavation shall be on site when work is being performed in excavation and shall inspect excavations prior to entry by workers. Individual must evaluate for all hazards, including atmospheric, necessary to correct hazards promptly.
- E. Conduct of Electrical Work: Underground electrical spaces must be certified safe for entry before entering to conduct work. Cable intended to be cut must be positively identified and de-energized prior to performing each cut. Perform all high voltage cutting remotely. When racking in or live switching of circuit breakers, no additional person other than the switch operator will be allowed in the space during the actual operation. Plan so that work near energized parts is minimized to the fullest extent possible. Use of electrical outages clear of any energized electrical sources is the preferred method. When working in energized substations, only qualified electrical workers shall be permitted to enter. When work requires Contractor to work near energized circuits as defined by the NFPA 70, high voltage personnel must use personnel protective equipment that includes, as a minimum, electrical hard hat, safety shoes, insulating gloves with leather protective sleeves, fire retarding shirts, coveralls, face shields, and safety glasses. Insulating blankets, hearing protection, and switching suits may be required, depending on the specific job and as delineated in the Contractor AHA.
- F. Work in Manholes: Contractor shall provide mechanical ventilation for all work accomplished in manholes, unless other hazards are present like friable asbestos.
- G. Work in Confined Spaces: Comply with the requirements in Section 06.I of COE EM-385-1-1. Any potential for a hazard in the confined space requires a permit system to be used.

1. Entry Procedures. Prohibit entry into a confined space by personnel for any purpose, including hot work, until the qualified person has conducted appropriate tests to ensure the confined or enclosed space is safe for the work intended and that all potential hazards are controlled or eliminated and documented. (See Section 06.I.05 of COE EM-385-1-1 for entry procedures.) All hazards pertaining to the space shall be reviewed with each employee during review of the AHA.
 2. Forced air ventilation is required for all confined space entry operations and the minimum air exchange requirements must be maintained.
 3. Ensure the use of rescue and retrieval devices in confined spaces greater than 5 feet in depth. Conform to Sections 06.I.09, 06.I.10 and 06.I.11 of COE EM-385-11.
 4. Include training information for employees who will be involved as entrant attendants for the work. Conform to Section 06.I.06 of COE EM-385-1-1.
 5. Entry Permit. Use ENGFORM 5044-R or other form with the same minimum information for the Daily Confined Space Entry Permit, completed by the qualified person. Post the permit in a conspicuous place close to the confined space entrance.
- H. Crystalline Silica: Grinding, abrasive blasting, and foundry operations of construction materials containing crystalline silica, shall comply with OSHA regulations, such as 29 CFR 1910.94, and COE EM-385-1-1, (Appendix C). The Contractor shall develop and implement effective exposure control and elimination procedures to include dust control systems, engineering controls, and establishment of work area boundaries, as well as medical surveillance, training, air monitoring, and personal protective equipment.
- 3.4 ACCIDENT SCENE PRESERVATION
- A. For serious accidents, ensure the accident site is secured and evidence is protected remaining undisturbed until released by the COR. After release is issued, promptly replace used, damaged, or worn equipment.
- 3.5 EQUIPMENT
- A. Material Handling Equipment
1. Material handling equipment such as forklifts shall not be modified with work platform attachments for supporting employees unless specifically delineated in the manufacturer's printed operating instructions.
 2. The use of hooks on equipment for lifting of material must be in accordance with manufacturer's printed instructions.
 3. Operators of forklifts or power industrial trucks shall be licensed in accordance with OSHA.

3.6 EXCAVATIONS

- A. The competent person shall perform soil classification in accordance with 29 CFR 1926.
- B. Utility Locations
 - 1. Excavations: The competent person for excavation shall be on site when work is being performed excavation and shall inspect excavations prior to entry by workers. Individual must evaluate for all hazards, including atmospheric, necessary to correct hazards promptly. Prior to digging, the appropriate digging permit must be obtained. All underground utilities in the work area must be positively identified by a private utility locating service in addition to any station locating service and coordinated with the station utility department. Any markings made during the utility investigation must be maintained throughout the contract.

3.7 UTILITIES WITHIN CONCRETE SLABS

- A. Utilities located within concrete slabs or pier structures, bridges, and the like, are extremely difficult to identify due to the reinforcing steel used in the construction of these structures. Whenever contract work involves concrete chipping, saw cutting, or core drilling, the existing utility location must be coordinated with station utility departments in addition to a private locating service. Outages to isolate utility systems shall be used in circumstances where utilities are unable to be positively identified. The use of historical drawings does not alleviate the contractor from meeting this requirement.
- B. Verify that Section titles referenced in this Section are correct for this Project's Specifications; Section titles may have changed.

END OF SECTION 01 35 29

SECTION 01 40 00 - QUALITY REQUIREMENTS

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

- A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and other Division 01 Specification Sections, apply to this Section.

1.2 SUMMARY

- A. Section includes administrative and procedural requirements for quality assurance and quality control.
- B. Testing and inspection services are required to verify compliance with requirements specified or indicated. These services do not relieve Contractor of responsibility for compliance with the Contract Document requirements.
 - 1. Specific quality-assurance and quality-control requirements for individual work results are specified in their respective Specification Sections. Requirements in individual Sections may also cover production of standard products.
 - 2. Specified tests, inspections, and related actions do not limit Contractor's other quality-assurance and quality-control procedures that facilitate compliance with the Contract Document requirements.
 - 3. Requirements for Contractor to provide quality-assurance and quality-control services required by COR, Owner, or authorities having jurisdiction are not limited by provisions of this Section.

1.3 DEFINITIONS

- A. Experienced: When used with an entity or individual, "experienced," unless otherwise further described, means having successfully completed a minimum of five previous projects similar in nature, size, and extent to this Project; being familiar with special requirements indicated; and having complied with requirements of authorities having jurisdiction.
- B. Field Quality-Control Tests and Inspections: Tests and inspections that are performed on-site for installation of the Work and for completed Work.
- C. Installer/Applicator/Erector: Contractor or another entity engaged by Contractor as an employee, subcontractor, or sub-subcontractor, to perform a particular construction operation, including installation, erection, application, assembly, and similar operations.
 - 1. Use of trade-specific terminology in referring to a Work result does not require that certain construction activities specified apply exclusively to specific trade(s).

- D. Mockups: Physical assemblies of portions of the Work constructed to establish the standard by which the Work will be judged. Mockups are not Samples.
1. Mockups are used for one or more of the following:
 - a. Verify selections made under Sample submittals.
 - b. Demonstrate aesthetic effects.
 - c. Demonstrate the qualities of products and workmanship.
 - d. Demonstrate successful installation of interfaces between components and systems.
 - e. Perform preconstruction testing to determine system performance.
 2. Product Mockups: Mockups that may include multiple products, materials, or systems specified in a single Section.
 3. In-Place Mockups: Mockups constructed on-site in their actual final location as part of permanent construction.
- E. Preconstruction Testing: Tests and inspections performed specifically for Project before products and materials are incorporated into the Work, to verify performance or compliance with specified criteria. Unless otherwise indicated, copies of reports of tests or inspections performed for other than the Project do not meet this definition.
- F. Product Tests: Tests and inspections that are performed by a nationally recognized testing laboratory (NRTL) according to 29 CFR 1910.7, by a testing agency accredited according to NIST's National Voluntary Laboratory Accreditation Program (NVLAP), or by a testing agency qualified to conduct product testing and acceptable to authorities having jurisdiction, to establish product performance and compliance with specified requirements.
- G. Source Quality-Control Tests and Inspections: Tests and inspections that are performed at the source (e.g., plant, mill, factory, or shop).
- H. Testing Agency: An entity engaged to perform specific tests, inspections, or both. The term "testing laboratory" has the same meaning as the term "testing agency."
- I. Quality-Assurance Services: Activities, actions, and procedures performed before and during execution of the Work, to guard against defects and deficiencies and substantiate that proposed construction will comply with requirements.
- J. Quality-Control Services: Tests, inspections, procedures, and related actions during and after execution of the Work, to evaluate that actual products incorporated into the Work and completed construction comply with requirements. Contractor's quality-control services do not include contract administration activities performed by COR.

1.4 DELEGATED DESIGN SERVICES

- A. Performance and Design Criteria: Where professional design services or certifications by a design professional are specifically required of Contractor by the Contract Documents, provide products and systems complying with specific performance and design criteria indicated.
 - 1. If criteria indicated are not sufficient to perform services or certification required, submit a written request for additional information to COR.
- B. Delegated Design Services Statement: Submit a statement signed and sealed by the responsible design professional, licensed in Hawaii for the applicable engineering or architectural specialty, for each product and system specifically assigned to Contractor to be designed or certified by a design professional, indicating that the products and systems are in compliance with performance and design criteria indicated. Include list of codes, loads, and other factors used in performing these services.

1.5 CONFLICTING REQUIREMENTS

- A. Conflicting Standards and Other Requirements: If compliance with two or more standards or requirements is specified and the standards or requirements establish different or conflicting requirements for minimum quantities or quality levels, inform the COR regarding the conflict and obtain clarification prior to proceeding with the Work. Refer conflicting requirements that are different, but apparently equal, to COR for clarification before proceeding.
- B. Minimum Quantity or Quality Levels: The quantity or quality level shown or specified is the minimum provided or performed. The actual installation may comply exactly with the minimum quantity or quality specified, or it may exceed the minimum within reasonable limits. To comply with these requirements, indicated numeric values are minimum or maximum, as appropriate, for the context of requirements. Refer uncertainties to COR for a decision before proceeding.

1.6 INFORMATIONAL SUBMITTALS

- A. Contractor's Quality-Control Plan: For quality-assurance and quality-control activities and responsibilities.
- B. Qualification Data: For Contractor's quality-control personnel.
- C. Contractor's Statement of Responsibility: When required by authorities having jurisdiction, submit copy of written statement of responsibility submitted to authorities having jurisdiction before starting work on the following systems:
 - 1. Seismic-force-resisting system, designated seismic system, or component listed in the Statement of Special Inspections.

2. Primary wind-force-resisting system or a wind-resisting component listed in the Statement of Special Inspections.
- D. Testing Agency Qualifications: For testing agencies specified in "Quality Assurance" Article to demonstrate their capabilities and experience. Include proof of qualifications in the form of a recent report on the inspection of the testing agency by a recognized authority.
- E. Schedule of Tests and Inspections: Prepare in tabular form and include the following:
 1. Specification Section number and title.
 2. Entity responsible for performing tests and inspections.
 3. Description of test and inspection.
 4. Identification of applicable standards.
 5. Identification of test and inspection methods.
 6. Number of tests and inspections required.
 7. Time schedule or time span for tests and inspections.
 8. Requirements for obtaining samples.
 9. Unique characteristics of each quality-control service.
- F. Reports: Prepare and submit certified written reports and documents as specified.
- G. Permits, Licenses, and Certificates: For Owner's record, submit copies of permits, licenses, certifications, inspection reports, releases, jurisdictional settlements, notices, receipts for fee payments, judgments, correspondence, records, and similar documents established for compliance with standards and regulations bearing on performance of the Work.

1.7 CONTRACTOR'S QUALITY-CONTROL PLAN

- A. Quality-Control Plan, General: Submit quality-control plan within 10 days of Notice to Proceed, and not less than five days prior to preconstruction conference. Submit in format acceptable to COR. Identify personnel, procedures, controls, instructions, tests, records, and forms to be used to carry out Contractor's quality-assurance and quality-control responsibilities and to coordinate Owner's quality-assurance and quality-control activities. Coordinate with Contractor's Construction Schedule.
- B. Quality-Control Personnel Qualifications: Engage qualified personnel trained and experienced in managing and executing quality-assurance and quality-control procedures similar in nature and extent to those required for Project.
 1. Project quality-control manager does not have other Project responsibilities.
- C. Submittal Procedure: Describe procedures for ensuring compliance with requirements through review and management of submittal process. Indicate qualifications of personnel responsible for submittal review.
- D. Testing and Inspection: In quality-control plan, include a comprehensive schedule of Work requiring testing or inspection, including the following:

1. Contractor-performed tests and inspections, including subcontractor-performed tests and inspections. Include required tests and inspections and Contractor-elected tests and inspections. Distinguish source quality-control tests and inspections from field quality-control tests and inspections.
 2. Special inspections required by authorities having jurisdiction and indicated on the Statement of Special Inspections.
 3. Owner-performed tests and inspections indicated in the Contract Documents.
- E. Continuous Inspection of Workmanship: Describe process for continuous inspection during construction to identify and correct deficiencies in workmanship in addition to testing and inspection specified. Indicate types of corrective actions to be required to bring the Work into compliance with standards of workmanship established by Contract requirements and approved mockups.
- F. Monitoring and Documentation: Maintain testing and inspection reports, including log of approved and rejected results. Include Work COR has indicated as nonconforming or defective. Indicate corrective actions taken to bring nonconforming Work into compliance with requirements. Comply with requirements of authorities having jurisdiction.

1.8 REPORTS AND DOCUMENTS

- A. Test and Inspection Reports: Prepare and submit certified written reports specified in other Sections. Include the following:
1. Date of issue.
 2. Project title and number.
 3. Name, address, telephone number, and email address of testing agency.
 4. Dates and locations of samples and tests or inspections.
 5. Names of individuals making tests and inspections.
 6. Description of the Work and test and inspection method.
 7. Identification of product and Specification Section.
 8. Complete test or inspection data.
 9. Test and inspection results and an interpretation of test results.
 10. Record of temperature and weather conditions at time of sample-taking and testing and inspection.
 11. Comments or professional opinion on whether tested or inspected Work complies with the Contract Document requirements.
 12. Name and signature of laboratory inspector.
 13. Recommendations on retesting and reinspecting.
- B. Manufacturer's Technical Representative's Field Reports: Prepare written information documenting manufacturer's technical representative's tests and inspections specified in other Sections. Include the following:
1. Name, address, telephone number, and email address of technical representative making report.
 2. Statement on condition of substrates and their acceptability for installation of product.

3. Statement that products at Project site comply with requirements.
 4. Summary of installation procedures being followed, whether they comply with requirements and, if not, what corrective action was taken.
 5. Results of operational and other tests and a statement of whether observed performance complies with requirements.
 6. Statement of whether conditions, products, and installation will affect warranty.
 7. Other required items indicated in individual Specification Sections.
- C. Factory-Authorized Service Representative's Reports: Prepare written information documenting manufacturer's factory-authorized service representative's tests and inspections specified in other Sections. Include the following:
1. Name, address, telephone number, and email address of factory-authorized service representative making report.
 2. Statement that equipment complies with requirements.
 3. Results of operational and other tests and a statement of whether observed performance complies with requirements.
 4. Statement of whether conditions, products, and installation will affect warranty.
 5. Other required items indicated in individual Specification Sections.

1.9 QUALITY ASSURANCE

- A. Qualifications paragraphs in this article establish the minimum qualification levels required; individual Specification Sections specify additional requirements.
- B. Manufacturer Qualifications: A firm experienced in manufacturing products or systems similar to those indicated for this Project and with a record of successful in-service performance, as well as sufficient production capacity to produce required units. As applicable, procure products from manufacturers able to meet qualification requirements, warranty requirements, and technical or factory-authorized service representative requirements.
- C. Fabricator Qualifications: A firm experienced in producing products similar to those indicated for this Project and with a record of successful in-service performance, as well as sufficient production capacity to produce required units.
- D. Installer Qualifications: A firm or individual experienced in installing, erecting, applying, or assembling work similar in material, design, and extent to that indicated for this Project, whose work has resulted in construction with a record of successful in-service performance.
- E. Professional Engineer Qualifications: A professional engineer who is legally qualified to practice in jurisdiction where Project is located and who is experienced in providing engineering services of the kind indicated. Engineering services are defined as those performed for installations of the system, assembly, or product that is similar in material, design, and extent to those indicated for this Project.
- F. Specialists: Certain Specification Sections require that specific construction activities be performed by entities who are recognized experts in those operations. Specialists will satisfy qualification requirements indicated and engage in the activities indicated.

1. Requirements of authorities having jurisdiction supersede requirements for specialists.
- G. Testing and Inspecting Agency Qualifications: An NRTL, an NVLAP, or an independent agency with the experience and capability to conduct testing and inspection indicated, as documented in accordance with ASTM E329, and with additional qualifications specified in individual Sections; and, where required by authorities having jurisdiction, that is acceptable to authorities.
- H. Manufacturer's Technical Representative Qualifications: An authorized representative of manufacturer who is trained and approved by manufacturer to observe and inspect installation of manufacturer's products that are similar in material, design, and extent to those indicated for this Project.
- I. Factory-Authorized Service Representative Qualifications: An authorized representative of manufacturer who is trained and approved by manufacturer to inspect, demonstrate, repair, and perform service on installations of manufacturer's products that are similar in material, design, and extent to those indicated for this Project.

1.10 QUALITY CONTROL

- A. Owner Responsibilities: Where quality-control services are indicated as Owner's responsibility, Owner will engage a qualified testing agency to perform these services.
 1. Owner will furnish Contractor with names, addresses, and telephone numbers of testing agencies engaged and a description of types of testing and inspection they are engaged to perform.
 2. Payment for these services will be made from testing and inspection allowances specified in Section 01 21 00 "Allowances," as authorized by Change Orders.
 3. Costs for retesting and reinspecting construction that replaces or is necessitated by Work that failed to comply with the Contract Documents will be charged to Contractor, and the Contract Sum will be adjusted by Change Order.
- B. Contractor Responsibilities: Tests and inspections not explicitly assigned to Owner are Contractor's responsibility. Perform additional quality-control activities, whether specified or not, to verify and document that the Work complies with requirements.
 1. Unless otherwise indicated, provide quality-control services specified and those required by authorities having jurisdiction. Perform quality-control services required of Contractor by authorities having jurisdiction, whether specified or not.
 2. Engage a qualified testing agency to perform quality-control services.
 - a. Contractor will not employ same entity engaged by Owner, unless agreed to in writing by Owner.
 3. Notify testing agencies at least 24 hours in advance of time when Work that requires testing or inspection will be performed.

4. Where quality-control services are indicated as Contractor's responsibility, submit a certified written report, in duplicate, of each quality-control service.
 5. Testing and inspection requested by Contractor and not required by the Contract Documents are Contractor's responsibility.
 6. Submit additional copies of each written report directly to authorities having jurisdiction, when they so direct.
- C. Retesting/Reinspecting: Regardless of whether original tests or inspections were Contractor's responsibility, provide quality-control services, including retesting and reinspecting, for construction that replaced Work that failed to comply with the Contract Documents.
- D. Testing Agency Responsibilities: Cooperate with COR and Contractor in performance of duties. Provide qualified personnel to perform required tests and inspections.
1. Notify COR and Contractor promptly of irregularities or deficiencies observed in the Work during performance of its services.
 2. Determine the locations from which test samples will be taken and in which in-situ tests are conducted.
 3. Conduct and interpret tests and inspections, and state in each report whether tested and inspected Work complies with or deviates from requirements.
 4. Submit a certified written report, in duplicate, of each test, inspection, and similar quality-control service through Contractor.
 5. Do not release, revoke, alter, or increase the Contract Document requirements or approve or accept any portion of the Work.
 6. Do not perform duties of Contractor.
- E. Manufacturer's Field Services: Where indicated, engage a factory-authorized service representative to inspect field-assembled components and equipment installation, including service connections. Report results in writing as specified in Section 01 33 00 "Submittal Procedures."
- F. Manufacturer's Technical Services: Where indicated, engage a manufacturer's technical representative to observe and inspect the Work. Manufacturer's technical representative's services include participation in preinstallation conferences, examination of substrates and conditions, verification of materials, observation of Installer activities, inspection of completed portions of the Work, and submittal of written reports.
- G. Contractor's Associated Requirements and Services: Cooperate with agencies and representatives performing required tests, inspections, and similar quality-control services, and provide reasonable auxiliary services as requested. Notify agency sufficiently in advance of operations to permit assignment of personnel. Provide the following:
1. Access to the Work.
 2. Incidental labor and facilities necessary to facilitate tests and inspections.
 3. Adequate quantities of representative samples of materials that require testing and inspection. Assist agency in obtaining samples.
 4. Facilities for storage and field curing of test samples.
 5. Delivery of samples to testing agencies.

6. Preliminary design mix proposed for use for material mixes that require control by testing agency.
 7. Security and protection for samples and for testing and inspection equipment at Project site.
- H. Coordination: Coordinate sequence of activities to accommodate required quality-assurance and quality-control services with a minimum of delay and to avoid necessity of removing and replacing construction to accommodate testing and inspection.
1. Schedule times for tests, inspections, obtaining samples, and similar activities.
- I. Schedule of Tests and Inspections: Prepare a schedule of tests, inspections, and similar quality-control services required by the Contract Documents as a component of Contractor's quality-control plan. Coordinate and submit concurrently with Contractor's Construction Schedule. Update and submit with each Application for Payment.
1. Schedule Contents: Include tests, inspections, and quality-control services, including Contractor- and Owner-retained services, commissioning activities, and other Project-required services paid for by other entities.
 2. Distribution: Distribute schedule to Owner, COR, testing agencies, and each party involved in performance of portions of the Work where tests and inspections are required.

1.11 SPECIAL TESTS AND INSPECTIONS

- A. Special Tests and Inspections: Owner will engage a qualified testing agency to conduct special tests and inspections required by authorities having jurisdiction as the responsibility of Owner, as indicated in the Statement of Special Inspections attached to this Section, and as follows:
1. Verifying that manufacturer maintains detailed fabrication and quality-control procedures, and reviewing the completeness and adequacy of those procedures to perform the Work.
 2. Notifying COR and Contractor promptly of irregularities and deficiencies observed in the Work during performance of its services.
 3. Submitting a certified written report of each test, inspection, and similar quality-control service to COR with copy to Contractor and to authorities having jurisdiction.
 4. Submitting a final report of special tests and inspections at Substantial Completion, which includes a list of unresolved deficiencies.
 5. Interpreting tests and inspections, and stating in each report whether tested and inspected Work complies with or deviates from the Contract Documents.
 6. Retesting and reinspecting corrected Work.

PART 2 - PRODUCTS (Not Used)

PART 3 - EXECUTION

3.1 TEST AND INSPECTION LOG

- A. Test and Inspection Log: Prepare a record of tests and inspections. Include the following:
 - 1. Date test or inspection was conducted.
 - 2. Description of the Work tested or inspected.
 - 3. Date test or inspection results were transmitted to COR.
 - 4. Identification of testing agency or special inspector conducting test or inspection.
- B. Maintain log at Project site. Post changes and revisions as they occur. Provide access to test and inspection log for COR's and authorities' having jurisdiction reference during normal working hours.
 - 1. Submit log at Project closeout as part of Project Record Documents.

3.2 REPAIR AND PROTECTION

- A. General: On completion of testing, inspection, sample-taking, and similar services, repair damaged construction and restore substrates and finishes.
 - 1. Provide materials and comply with installation requirements specified in other Specification Sections or matching existing substrates and finishes. Restore patched areas and extend restoration into adjoining areas with durable seams that are as invisible as possible. Comply with the Contract Document requirements for cutting and patching in Section 01 73 00 "Execution."
- B. Protect construction exposed by or for quality-control service activities.
- C. Repair and protection are Contractor's responsibility, regardless of the assignment of responsibility for quality-control services.

END OF SECTION 01 40 00

SECTION 01 42 00 - REFERENCES

PART 1 - GENERAL

1.1 DEFINITIONS

- A. General: Basic Contract definitions are included in the Conditions of the Contract.
- B. "Approved": When used to convey Architect's action on Contractor's submittals, applications, and requests, "approved" is limited to Architect's duties and responsibilities as stated in the Conditions of the Contract.
- C. "Directed": A command or instruction by Architect. Other terms including "requested," "authorized," "selected," "required," and "permitted" have the same meaning as "directed."
- D. "Indicated": Requirements expressed by graphic representations or in written form on Drawings, in Specifications, and in other Contract Documents. Other terms including "shown," "noted," "scheduled," and "specified" have the same meaning as "indicated."
- E. "Regulations": Laws, ordinances, statutes, and lawful orders issued by authorities having jurisdiction, and rules, conventions, and agreements within the construction industry that control performance of the Work.
- F. "Furnish": Supply and deliver to Project site, ready for unloading, unpacking, assembly, installation, and similar operations.
- G. "Install": Unload, temporarily store, unpack, assemble, erect, place, anchor, apply, work to dimension, finish, cure, protect, clean, and similar operations at Project site.
- H. "Provide": Furnish and install, complete and ready for the intended use.
- I. "Project Site": Space available for performing construction activities. The extent of Project site is shown on Drawings and may or may not be identical with the description of the land on which Project is to be built.

1.2 INDUSTRY STANDARDS

- A. Applicability of Standards: Unless the Contract Documents include more stringent requirements, applicable construction industry standards have the same force and effect as if bound or copied directly into the Contract Documents to the extent referenced. Such standards are made a part of the Contract Documents by reference.
- B. Publication Dates: Comply with standards in effect as of date of the Contract Documents unless otherwise indicated.
 - 1. For standards referenced by applicable building codes, comply with dates of standards as listed in building codes.

- C. Copies of Standards: Each entity engaged in construction on Project should be familiar with industry standards applicable to its construction activity. Copies of applicable standards are not bound with the Contract Documents.
 - 1. Where copies of standards are needed to perform a required construction activity, obtain copies directly from publication source.

1.3 ABBREVIATIONS AND ACRONYMS

- A. Code Agencies: Where abbreviations and acronyms are used in Specifications or other Contract Documents, they shall mean the recognized name of the entities in the following list. This information is believed to be accurate as of the date of the Contract Documents.
 - 1. DIN - Deutsches Institut fur Normung e.V.; www.din.de.
 - 2. IAPMO - International Association of Plumbing and Mechanical Officials; www.iapmo.org.
 - 3. ICC - International Code Council; www.iccsafe.org.
 - 4. ICC-ES - ICC Evaluation Service, LLC; www.icc-es.org.
- B. Federal Government Agencies: Where abbreviations and acronyms are used in Specifications or other Contract Documents, they shall mean the recognized name of the entities in the following list. Information is subject to change and is up to date as of the date of the Contract Documents.
 - 1. COE - Army Corps of Engineers; www.usace.army.mil.
 - 2. CPSC - Consumer Product Safety Commission; www.cpsc.gov.
 - 3. DOC - Department of Commerce; National Institute of Standards and Technology; www.nist.gov.
 - 4. DOD - Department of Defense; www.quicksearch.dla.mil.
 - 5. DOE - Department of Energy; www.energy.gov.
 - 6. EPA - Environmental Protection Agency; www.epa.gov.
 - 7. FAA - Federal Aviation Administration; www.faa.gov.
 - 8. FG - Federal Government Publications; www.gpo.gov/fdsys.
 - 9. GSA - General Services Administration; www.gsa.gov.
 - 10. HUD - Department of Housing and Urban Development; www.hud.gov.
 - 11. LBL - Lawrence Berkeley National Laboratory; Environmental Energy Technologies Division; www.eetd.lbl.gov.
 - 12. OSHA - Occupational Safety & Health Administration; www.osha.gov.
 - 13. SD - Department of State; www.state.gov.
 - 14. TRB - Transportation Research Board; National Cooperative Highway Research Program; The National Academies; www.trb.org.
 - 15. USDA - Department of Agriculture; Agriculture Research Service; U.S. Salinity Laboratory; www.ars.usda.gov.
 - 16. USDA - Department of Agriculture; Rural Utilities Service; www.usda.gov.
 - 17. USDOJ - Department of Justice; Office of Justice Programs; National Institute of Justice; www.ojp.usdoj.gov.
 - 18. USP - U.S. Pharmacopeial Convention; www.usp.org.
 - 19. USPS - United States Postal Service; www.usps.com.

- C. Standards and Regulations: Where abbreviations and acronyms are used in Specifications or other Contract Documents, they shall mean the recognized name of the standards and regulations in the following list. This information is subject to change and is believed to be accurate as of the date of the Contract Documents.
1. CFR - Code of Federal Regulations; Available from Government Printing Office; www.govinfo.gov.
 2. DOD - Department of Defense; Military Specifications and Standards; Available from DLA Document Services; www.quicksearch.dla.mil.
 3. DSCC - Defense Supply Center Columbus; (See FS).
 4. FED-STD - Federal Standard; (See FS).
 5. FS - Federal Specification; Available from DLA Document Services; www.quicksearch.dla.mil.
 - a. Available from Defense Standardization Program; www.dsp.dla.mil.
 - b. Available from General Services Administration; www.gsa.gov.
 - c. Available from National Institute of Building Sciences/Whole Building Design Guide; www.wbdg.org.
 6. MILSPEC - Military Specification and Standards; (See DOD).
 7. USAB - United States Access Board; www.access-board.gov.
 8. USATBCB - U.S. Architectural & Transportation Barriers Compliance Board; (See USAB).
- D. State Government Agencies: Where abbreviations and acronyms are used in Specifications or other Contract Documents, they shall mean the recognized name of the entities in the following list. This information is subject to change and is believed to be accurate as of the date of the Contract Documents.
1. CBHF; State of California; Department of Consumer Affairs; Bureau of Electronic and Appliance Repair, Home Furnishings and Thermal Insulation; www.bearhfti.ca.gov.
 2. CCR; California Code of Regulations; Office of Administrative Law; California Title 24 Energy Code; www.calregs.com.
 3. CDHS; California Department of Health Services; (See CDPH).
 4. CDPH; California Department of Public Health; Indoor Air Quality Program; www.cdph.ca.gov/Programs/CCDCPH/DEODC/EHLB/IAQ/Pages/Main-Page.aspx.
 5. CPUC; California Public Utilities Commission; www.cpuc.ca.gov.
 6. SCAQMD; South Coast Air Quality Management District; www.aqmd.gov.
 7. TFS; Texas A&M Forest Service; Sustainable Forestry and Economic Development; www.txforestsERVICE.tamu.edu.

PART 2 - PRODUCTS (Not Used)

PART 3 - EXECUTION (Not Used)

END OF SECTION **01 42 00**

SECTION 01 50 00 - TEMPORARY FACILITIES AND CONTROLS

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

- A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and other Division 01 Specification Sections, apply to this Section.

1.2 SUMMARY

- A. Section includes requirements for temporary utilities, support facilities, and security and protection facilities.
- B. Related Requirements:
 - 1. Section 01 10 00 "Summary" for work restrictions and limitations on utility interruptions.

1.3 USE CHARGES

- A. Installation, removal, and use charges for temporary facilities shall be included in the Contract Sum unless otherwise indicated. Allow other entities engaged in the Project to use temporary services and facilities without cost, including, but not limited to, Owner's construction forces, COR, testing agencies, and authorities having jurisdiction.
- B. Water from Existing System: Water from FAA's existing water system is available for use without metering and without payment of use charges. Provide connections and extensions of services as required for construction operations.
- C. Electric Power Service from Existing System: Electric power from FAA's existing system is available for use without metering and without payment of use charges. Provide connections and extensions of services as required for construction operations.

1.4 INFORMATIONAL SUBMITTALS

- A. Site Utilization Plan: Show temporary facilities, temporary utility lines and connections, staging areas, construction site entrances, vehicle circulation, and parking areas for construction personnel.
- B. Implementation and Termination Schedule: Within 15 days of date established for commencement of the Work, submit schedule indicating implementation and termination dates of each temporary utility.

- C. Project Identification and Temporary Signs: Show fabrication and installation details, including plans, elevations, details, layouts, typestyles, graphic elements, and message content.
- D. Erosion- and Sedimentation-Control Plan: Show compliance with requirements of EPA Construction General Permit or authorities having jurisdiction, whichever is more stringent.
- E. Erosion and Sedimentation Control Plan: Show compliance with requirements of 2003 EPA Construction General Permit or authorities having jurisdiction, whichever is more stringent.
- F. Fire-Safety Program: Show compliance with requirements of NFPA 241 and authorities having jurisdiction. Indicate Contractor personnel responsible for management of fire-prevention program.
- G. Moisture- and Mold-Protection Plan: Describe procedures and controls for protecting materials and construction from water absorption and damage and mold. Describe delivery, handling, storage, installation, and protection provisions for materials subject to water absorption or water damage.
 - 1. Indicate procedures for discarding water-damaged materials, protocols for mitigating water intrusion into completed Work, and requirements for replacing water-damaged Work.
 - 2. Indicate sequencing of work that requires water, such as sprayed fire-resistive materials, plastering, and terrazzo grinding, and describe plans for dealing with water from these operations. Show procedures for verifying that wet construction has dried sufficiently to permit installation of finish materials.
 - 3. Indicate methods to be used to avoid trapping water in finished work.
- H. Dust- and HVAC-Control Plan: Submit coordination drawing and narrative that indicates the dust- and HVAC-control measures proposed for use, proposed locations, and proposed time frame for their operation. Include the following:
 - 1. Locations of dust-control partitions at each phase of work.
 - 2. HVAC system isolation schematic drawing.
 - 3. Location of proposed air-filtration system discharge.
 - 4. Waste-handling procedures.
 - 5. Other dust-control measures.
- I. Noise and Vibration Control Plan: Identify construction activities that may impact the occupancy and use of existing spaces within the building or adjacent existing buildings, whether occupied by others, or occupied by the FAA. Include the following:
 - 1. Methods used to meet the goals and requirements of the FAA.
 - 2. Concrete cutting method(s) to be used.
 - 3. Location of construction devices on the site.
 - 4. Show compliance with the use and maintenance of quieted construction devices for the duration of the Project.

5. Indicate activities that may disturb building occupants and that are planned to be performed during non-standard working hours as coordinated with the FAA.
6. Indicate locations of sensitive equipment areas or other areas requiring special attention as identified by FAA. Indicate means for complying with FAA's requirements.

1.5 QUALITY ASSURANCE

- A. Electric Service: Comply with NECA, NEMA, and UL standards and regulations for temporary electric service. Install service to comply with NFPA 70.
- B. Tests and Inspections: Arrange for authorities having jurisdiction to test and inspect each temporary utility before use. Obtain required certifications and permits.
- C. Accessible Temporary Egress: Comply with applicable provisions in the United States Access Board's ADA-ABA Accessibility Guidelines and ICC/ANSI A117.1.

1.6 PROJECT CONDITIONS

- A. Temporary Use of Permanent Facilities: Engage Installer of each permanent service to assume responsibility for operation, maintenance, and protection of each permanent service during its use as a construction facility before FAA's acceptance, regardless of previously assigned responsibilities.
- B. The Contractor shall apply for and obtain all construction permits and required inspections for this and any other temporary facilities.
- C. The Field Representatives' office shall be installed on the site at the time construction begins. It shall remain on site and usable until Final Construction Acceptance Inspection unless an earlier removal date is requested and approved by the COR.
- D. Maintenance of Traffic
 1. The Contractor shall provide, install, and maintain the temporary traffic control devices, furnish flaggers, and perform all work required to conform to the provisions of this Section.
 2. The Contract Documents show the general location of signs, lights, markings, delineators, special lighting, guardrails, barricades, temporary pavements, flagger stations, and other temporary devices and work required to control traffic at each work sequence area. These and any other measures shall be provided by the contractor to ensure proper traffic control.
 3. Before commencing work in any area, the Contractor shall install the temporary traffic control devices, stations, etc., at the work site, and he shall obtain the approval of the COR before commencing any work that affects, in any way, the existing traffic flow.
 4. At least one lane of traffic shall be maintained at all times on Employee Lot Road and South Terminal Road.

1.7 POSTING OF NOTICES

A. Schedule of Wage Rates and Benefits

1. The Contractor and each subcontractor under him shall post in a conspicuous place on the site (1) the schedule of the specified overall hourly rate for each applicable classification; (2) the amount of liquidated damages for any failure to pay such rates; and (3) the name and address of the responsible official in the County or the U.S. Department of Labor (whichever is applicable) to whom complaints should be given.
2. Copy of this Notice will be provided to the Contractor by the FAA.

B. Non-Discrimination Clause

1. In accordance with AMS Clause No. 3.6.2-9 Equal Opportunity, the Contractor shall post the non-discrimination clause as required by Executive Order 11246.
2. The following is a statement of the required clause: Equal Employment Opportunity is the Law -- Discrimination is prohibited by the Civil Rights Act of 1964 and by Executive Order No. 11246. Title VII of the Civil Rights Act of 1964 -- Administered by: The Equal Employment Opportunity Commission. Prohibits discrimination because of Race, Color, Religion, Sex, or National Origin by Employers with 25 or more employees, by Labor Organizations with a hiring hall of 25 or more members, by Employment Agencies, and by Joint Labor-Management Committees for Apprenticeship or Training. Any person who believes he or she has been discriminated against should contact: The Equal Employment Opportunity Commission. 2401 E Street, NW, Washington, DC 20506.
3. EXECUTIVE ORDER NO. 11246--Administered by: The Office of Federal Contract Compliance Programs prohibits discrimination because of Race, Color, Religion, Sex, or National Origin, and requires affirmative action to ensure equality of opportunity in all aspects of employment by all Federal Government Contractors and Subcontractors, and by Contractors Performing Work Under a Federal Assisted Construction Contract, regardless of the number of employees in either case. Any person who believes he or she has been discriminated against should contact: The Office of Federal Contract Compliance Programs, U.S. Department of Labor, Washington, DC 20210.

PART 2 - PRODUCTS

2.1 MATERIALS

- A. Chain-Link Fencing: Minimum 2-inch, 0.148-inch- thick, galvanized-steel, chain-link fabric fencing; minimum 6 feet high with galvanized-steel pipe posts; minimum 2-3/8-inch- OD line posts and 2-7/8-inch- OD corner and pull posts, with 1-5/8-inch-OD top rails.

- B. Portable Chain-Link Fencing: Minimum 2-inch, 0.148-inch- thick, galvanized-steel, chain-link fabric fencing; minimum 6 feet high with galvanized-steel pipe posts; minimum 2-3/8-inch- OD line posts and 2-7/8-inch- OD corner and pull posts, with 1-5/8-inch- OD top and bottom rails. Provide concrete bases for supporting posts.
- C. Fencing Windscreen Privacy Screen: Polyester fabric scrim with grommets for attachment to chain-link fence, sized to height of fence, in color selected by COR from manufacturer's standard colors.
- D. Polyethylene Sheet: Reinforced, fire-resistive sheet, 10-mil minimum thickness, with flame-spread rating of 15 or less in accordance with ASTM E84 and passing NFPA 701 Test Method 2.
- E. Dust-Control Adhesive-Surface Walk-Off Mats: Provide mats, minimum 36 by 60 inches.
- F. Insulation: Unfaced mineral-fiber blanket, manufactured from glass, slag wool, or rock wool; with maximum flame-spread and smoke-developed indexes of 25 and 50, respectively.
- G. Traffic control devices, warning devices and barriers shall meet the applicable requirements of the current edition of the Department of Transportation Standard Specifications for Road and Bridge Construction and the FHWA Manual or Uniform Traffic Control Devices (MUTCD); subject to COR's approval.

2.2 TEMPORARY FACILITIES

- A. Field Offices: Prefabricated or mobile units with serviceable finishes, temperature controls, and foundations adequate for normal loading.

2.3 EQUIPMENT

- A. Fire Extinguishers: Portable, UL rated; with class and extinguishing agent as required by locations and classes of fire exposures.

PART 3 - EXECUTION

3.1 TEMPORARY FACILITIES, GENERAL

- A. Conservation: Coordinate construction and use of temporary facilities with consideration given to conservation of energy, water, and materials. Coordinate use of temporary utilities to minimize waste.
 - 1. Salvage materials and equipment involved in performance of, but not actually incorporated into, the Work. See other Sections for disposition of salvaged materials that are designated as FAA's property.

3.2 INSTALLATION, GENERAL

- A. Locate facilities where they will serve Project adequately and result in minimum interference with performance of the Work. Relocate and modify facilities as required by progress of the Work.
 - 1. Locate facilities to limit site disturbance as specified in Section 01 10 00 "Summary."
 - 2. Provide well drained, graded and paved, or at least well compacted gravel surface for use by the FAA's staff. Provide not less than five parking spaces dedicated for FAA use.
- B. Provide each facility ready for use when needed to avoid delay. Do not remove until facilities are no longer needed or are replaced by authorized use of completed permanent facilities.

3.3 TEMPORARY UTILITY INSTALLATION

- A. General: Install temporary service or connect to existing service.
 - 1. Arrange with utility company, FAA, and existing users for time when service can be interrupted, if necessary, to make connections for temporary services.
- B. Sewers and Drainage: Provide temporary utilities to remove effluent lawfully.
 - 1. Connect temporary sewers to municipal system as directed by authorities having jurisdiction.
- C. Water Service: Install water service and distribution piping in sizes and pressures adequate for construction.
- D. Water Service: Connect to FAA's existing water service facilities. Clean and maintain water service facilities in a condition acceptable to FAA. At Substantial Completion, restore these facilities to condition existing before initial use.
- E. Sanitary Facilities: Provide temporary toilets, wash facilities, safety shower and eyewash facilities, and drinking water for use of construction personnel. Comply with requirements of authorities having jurisdiction for type, number, location, operation, and maintenance of fixtures and facilities.
- F. Isolation of Work Areas in Occupied Facilities: Prevent dust, fumes, and odors from entering occupied areas.
 - 1. Prior to commencing work, isolate the HVAC system in area where work is to be performed according to coordination drawings.
 - a. Disconnect supply and return ductwork in work area from HVAC systems servicing occupied areas.

- b. Maintain negative air pressure within work area, using HEPA-equipped air-filtration units, starting with commencement of temporary partition construction, and continuing until removal of temporary partitions is complete.
 - 2. Maintain dust partitions during the Work. Use vacuum collection attachments on dust-producing equipment. Isolate limited work within occupied areas using portable dust-containment devices.
 - 3. Perform daily construction cleanup and final cleanup using approved, HEPA-filter-equipped vacuum equipment.
- G. Electric Power Service: Provide electric power service and distribution system of sufficient size, capacity, and power characteristics required for construction operations.
- 1. Install electric power service overhead unless otherwise indicated.
 - 2. Connect temporary service to FAA's existing power source, as directed by FAA.
 - 3. Connect only to receptacles and/or panels where and as approved by the COR. Contactor electrical connection will only be allowed to the non-essential electrical power system, not to essential or critical power.
- H. Lighting: Provide temporary lighting with local switching that provides adequate illumination for construction operations, observations, inspections, and traffic conditions.
- 1. Install and operate temporary lighting that fulfills security and protection requirements without operating entire system.

3.4 SUPPORT FACILITIES INSTALLATION

- A. Comply with the following:
- 1. Provide construction for temporary field offices, shops, and sheds located within construction area or within 30 feet of building lines that is noncombustible in accordance with ASTM E136. Comply with NFPA 241.
 - 2. Utilize designated area within existing building for temporary field offices.
 - 3. Maintain support facilities until COR schedules Substantial Completion inspection. Remove before Substantial Completion. Personnel remaining after Substantial Completion will be permitted to use permanent facilities, under conditions acceptable to FAA.
- B. Traffic Controls: Comply with requirements of authorities having jurisdiction.
- 1. Protect existing site improvements to remain, including curbs, pavement, and utilities.
 - 2. Maintain access for fire-fighting equipment and access to fire hydrants.
- C. Storage and Staging: Use designated areas of Project site for storage and staging needs.
- D. Waste Disposal Facilities: Comply with requirements specified in Section 01 74 19 "Construction Waste Management and Disposal."

- E. Waste Disposal Facilities: Provide waste-collection containers in sizes adequate to handle waste from construction operations. Comply with requirements of authorities having jurisdiction. Comply with progress cleaning requirements in Section 01 73 00 "Execution."
- F. Lifts and Hoists: Provide facilities necessary for hoisting materials and personnel.
 - 1. Truck cranes and similar devices used for hoisting materials are considered "tools and equipment" and not temporary facilities.
- G. Existing Elevator Use: Use of FAA's existing elevators will be permitted, provided elevators are cleaned and maintained in a condition acceptable to FAA. At Substantial Completion, restore elevators to condition existing before initial use, including replacing worn cables, guide shoes, and similar items of limited life.
 - 1. Do not load elevators beyond their rated weight capacity.
 - 2. Provide protective coverings, barriers, devices, signs, or other procedures to protect elevator car and entrance doors and frame. If, despite such protection, elevators become damaged, engage elevator Installer to restore damaged work, so no evidence remains of correction work. Return items that cannot be refinished in field to the shop, make required repairs and refinish entire unit, or provide new units as required.
- H. Existing Stair Usage: Use of FAA's existing stairs will be permitted, provided stairs are cleaned and maintained in a condition acceptable to FAA. At Substantial Completion, restore stairs to condition existing before initial use.
 - 1. Provide protective coverings, barriers, devices, signs, or other procedures to protect stairs and to maintain means of egress. If stairs become damaged, restore damaged areas, so no evidence remains of correction work.
- I. Temporary Use of Permanent Stairs: Use of new stairs for construction traffic will be permitted, provided stairs are protected and finishes restored to new condition at time of Substantial Completion.

3.5 SECURITY AND PROTECTION FACILITIES INSTALLATION

- A. Protection of Existing Facilities: Protect existing vegetation, equipment, structures, utilities, and other improvements at Project site and on adjacent properties, except those indicated to be removed or altered. Repair damage to existing facilities.
 - 1. Where access to adjacent properties is required in order to affect protection of existing facilities, obtain written permission from adjacent property owner to access property for that purpose.
- B. Environmental Protection: Provide protection, operate temporary facilities, and conduct construction as required to comply with environmental regulations and that minimize possible air, waterway, and subsoil contamination or pollution or other undesirable effects.

1. Comply with work restrictions specified in Section 01 10 00 "Summary."
- C. Temporary Erosion and Sedimentation Control: Provide measures to prevent soil erosion and discharge of soil-bearing water runoff and airborne dust to undisturbed areas and to adjacent properties and walkways, according to requirements of EPA Construction General Permit or authorities having jurisdiction, whichever is more stringent.
1. Verify that flows of water redirected from construction areas or generated by construction activity do not enter or cross tree- or plant-protection zones.
 2. Inspect, repair, and maintain erosion- and sedimentation-control measures during construction until permanent vegetation has been established.
 3. Clean, repair, and restore adjoining properties and roads affected by erosion and sedimentation from Project site during the course of Project.
 4. Remove erosion and sedimentation controls, and restore and stabilize areas disturbed during removal.
- D. Site Enclosure Fence: Before construction operations begin, furnish and install site enclosure fence in a manner that will prevent people from easily entering site except by entrance gates.
1. Extent of Fence: As required to enclose entire Project site or portion determined sufficient to accommodate construction operations.
 2. Maintain security by limiting number of keys and restricting distribution to authorized personnel. Furnish one set of keys to FAA.
- E. Security Enclosure and Lockup: Install temporary enclosure around partially completed areas of construction. Provide lockable entrances to prevent unauthorized entrance, vandalism, theft, and similar violations of security. Lock entrances at end of each workday.
- F. Barricades, Warning Signs, and Lights: Comply with requirements of authorities having jurisdiction for erecting structurally adequate barricades, including warning signs and lighting.
- G. Temporary Egress: Provide temporary egress from existing occupied facilities as indicated and as required by authorities having jurisdiction. Provide signage directing occupants to temporary egress.
- H. Temporary Enclosures: Provide temporary enclosures for protection of construction, in progress and completed, from exposure, foul weather, other construction operations, and similar activities. Provide temporary weathertight enclosure for building exterior.
1. Where heating or cooling is needed and permanent enclosure is incomplete, insulate temporary enclosures.

- I. Construction Project Signage: Furnish a construction project sign package, maintain the signs during construction, and remove the signs from the job site upon completion of the project. The construction project sign package consists of : one sign for project identification, directional signage for deliveries and construction employee site access. Locate signage as directed by the COR.

1. Project Identification Signage must show the name of the project, address, FAA representative and Contractor with access numbers.

3.6 TEMPORARY TRAFFIC CONTROL DEVICES, PAVEMENTS, AND FACILITIES

- A. The Contractor shall maintain all traffic control devices in proper repair and working order. The Contractor shall also maintain all pavements constructed or utilized for temporary traffic movement, and shall maintain all other traffic service facilities such as guardrail, area lighting, etc., necessary for the efficient and orderly movement of traffic within the construction area.
- B. In the event of the Contractor's failure to properly maintain any of these devices, pavements or facilities, the FAA may cause such maintenance, as it deems necessary, to be performed by its own or another Contractor's forces and the costs of such maintenance shall be deducted from monies due the Contractor for work performed under this Contract.
- C. Interference with Traffic
 1. The Contractor shall conduct his work so as to cause no unnecessary interference with traffic and it shall comply with all requirements governing its employee parking, areas prohibited to his operation, and access routes to authorized work areas.
 2. The Contractor shall not permit its workers and equipment to interfere with the movement of traffic in those areas adjacent to its work areas. The Contractor shall not obstruct sight lines, create obstructions to lighting nor create hazards or nuisance by allowing spills or wind transported materials to accumulate in traffic areas.
 3. Traffic control personnel shall be provided at all times that any travel lane is obstructed. These personnel shall be stationed at each end of the obstructed area and shall provide safe passage of vehicles through the obstructed area.
 4. All lanes of travel shall be unobstructed at night and at all times when traffic directors are not present. Metal plates shall be provided and secured in place if pavement is not provided.
 5. The Contractor shall promptly remove any spills or wind transported debris occurring on traveled roadways.
- D. After work has been completed, the Contractor shall remove all temporary traffic control devices, temporary pavements and other temporary work and devices installed for traffic control. The Contractor shall restore the site to its original condition or to the revised condition shown on the Plans.

3.7 MOISTURE AND MOLD CONTROL

- A. Moisture and Mold Protection: Protect stored materials and installed Work in accordance with Moisture and Mold Protection Plan.
- B. Controlled Construction Period: After completing and sealing of the building enclosure but prior to the full operation of permanent HVAC systems, maintain as follows:
 - 1. Control moisture and humidity inside building by maintaining effective dry-in conditions.
 - 2. Use temporary or permanent HVAC system to control humidity within ranges specified for installed and stored materials.
 - 3. Comply with manufacturer's written instructions for temperature, relative humidity, and exposure to water limits.
 - a. Hygroscopic materials that may support mold growth, including wood and gypsum-based products, that become wet during the course of construction and remain wet for 48 hours are considered defective and require replacing.
 - b. Measure moisture content of materials that have been exposed to moisture during construction operations or after installation. Record readings beginning at time of exposure and continuing daily for 48 hours. Identify materials containing moisture levels higher than allowed. Report findings in writing to COR.
 - c. Remove and replace materials that cannot be completely restored to their manufactured moisture level within 48 hours.

3.8 OPERATION, TERMINATION, AND REMOVAL

- A. Supervision: Enforce strict discipline in use of temporary facilities. To minimize waste and abuse, limit availability of temporary facilities to essential and intended uses.
- B. Maintenance: Maintain facilities in good operating condition until removal.
 - 1. Maintain operation of temporary enclosures, heating, cooling, humidity control, ventilation, and similar facilities on a 24-hour basis where required to achieve indicated results and to avoid possibility of damage.
 - 2. Daily janitorial service for temporary construction offices including the FAA Office; periodic cleaning and maintenance for storage areas. Weekly trash collection.

- a. The Contractor is responsible for cleaning and maintaining all temporary offices and storage sheds in proper condition acceptable to the COR. All exposed surfaces on the outside and inside of field offices and temporary toilet enclosures and outside of storage sheds shall be painted and maintained with exterior enamel paint. Colors are subject to approval by the COR. All temporary facilities shall be maintained by the Contractor and shall be kept in usable condition at all times until completion of the work and/or their removal is authorized by the COR
 3. Maintain approach walks free of mud and water.
 - a. The Contractor assumes full responsibility for all costs associated with equipment and services provided for the Field Representative's office (including costs for equipment and/or services which are provided by the Contractor, but which are not specifically required by this Article).
 4. Maintain lighting. Promptly replace worn or defective parts and non-working bulbs.
 5. Maintain temporary water system: Maintain system to provide continuous service with adequate pressure to outlets. Maintain connections, pipes, fittings, and fixtures and conserve use of all utilities. Failure to stop leaks or other waste of water will be cause for revocation of permit for the use of said water from the airport system.
 6. Maintain temporary toilet facilities: Clean facilities and surrounding areas daily. Provide toilet paper, paper towels and soap in suitable dispensers
- C. Temporary Facility Changeover: Do not change over from using temporary security and protection facilities to permanent facilities until Substantial Completion.
- D. Termination and Removal: Remove each temporary facility when need for its service has ended, when it has been replaced by authorized use of a permanent facility, or no later than Substantial Completion. Complete or, if necessary, restore permanent construction that may have been delayed because of interference with temporary facility. Repair damaged Work, clean exposed surfaces, and replace construction that cannot be satisfactorily repaired.
1. Materials and facilities that constitute temporary facilities are property of Contractor. FAA reserves right to take possession of Project identification signs.
 2. Remove temporary roads and paved areas not intended for or acceptable for integration into permanent construction. Where area is intended for landscape development, remove soil and aggregate fill that do not comply with requirements for fill or subsoil. Remove materials contaminated with road oil, asphalt and other petrochemical compounds, and other substances that might impair growth of plant materials or lawns. Repair or replace street paving, curbs, and sidewalks at temporary entrances, as required by authorities having jurisdiction.
 3. Remove temporary erosion, sedimentation and pollution control measures upon final stabilization of site.
 4. Remove temporary lighting material and equipment when permanent system is operational.

5. Remove temporary toilet facilities when permanent facilities are available for use, but no later than Substantial Completion.
6. At Substantial Completion, repair, renovate, and clean permanent facilities used during construction period. Comply with final cleaning requirements specified in Section 01 77 00 "Closeout Procedures."

END OF SECTION **01 50 00**

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SECTION 01 60 00 - PRODUCT REQUIREMENTS

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

- A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and other Division 01 Specification Sections, apply to this Section.

1.2 SUMMARY

- A. Section includes administrative and procedural requirements for selection of products for use in Project; product delivery, storage, and handling; manufacturers' standard warranties on products; special warranties; and comparable products.
- B. Related Requirements:
 - 1. Section 01 25 00 "Substitution Procedures" for requests for substitutions.
 - 2. Section 01 42 00 "References" for applicable industry standards for products specified.
 - 3. Section 01770 "Closeout Procedures" for submitting warranties.

1.3 DEFINITIONS

- A. Products: Items obtained for incorporating into the Work, whether purchased for Project or taken from previously purchased stock. The term "product" includes the terms "material," "equipment," "system," and terms of similar intent.
 - 1. Named Products: Items identified by manufacturer's product name, including make or model number or other designation shown or listed in manufacturer's published product literature that is current as of date of the Contract Documents.
 - 2. New Products: Items that have not previously been incorporated into another project or facility. Salvaged items or items reused from other projects are not considered new products. Items that are manufactured or fabricated to include recycled content materials are considered new products, unless indicated otherwise.
 - 3. Comparable Product: Product by named manufacturer that is demonstrated and approved through the comparable product submittal process described in Part 2 "Comparable Products" Article, to have the indicated qualities related to type, function, dimension, in-service performance, physical properties, appearance, and other characteristics that equal or exceed those of specified product.

- B. Basis-of-Design Product Specification: A specification in which a single manufacturer's product is named and accompanied by the words "basis-of-design product," including make or model number or other designation. Published attributes and characteristics of basis-of-design product establish salient characteristics of products.
 - 1. Evaluation of Comparable Products: In addition to the basis-of-design product description, product attributes and characteristics may be listed to establish the significant qualities related to type, function, in-service performance and physical properties, weight, dimension, durability, visual characteristics, and other special features and requirements for purposes of evaluating comparable products of additional manufacturers named in the specification. Manufacturer's published attributes and characteristics of basis-of-design product also establish salient characteristics of products for purposes of evaluating comparable products.
 - C. Subject to Compliance with Requirements: Where the phrase "Subject to compliance with requirements" introduces a product selection procedure in an individual Specification Section, provide products qualified under the specified product procedure. In the event that a named product or product by a named manufacturer does not meet the other requirements of the specifications, select another named product or product from another named manufacturer that does meet the requirements of the specifications; submit a comparable product request or substitution request, if applicable.
 - D. Comparable Product Request Submittal: An action submittal requesting consideration of a comparable product, including the following information:
 - 1. Identification of basis-of-design product or fabrication or installation method to be replaced, including Specification Section number and title and Drawing numbers and titles.
 - 2. Data indicating compliance with the requirements specified in Part 2 "Comparable Products" Article.
 - E. Basis-of-Design Product Specification Submittal: An action submittal complying with requirements in Section 01 33 00 "Submittal Procedures."
 - F. Substitution: Refer to Section 01 25 00 "Substitution Procedures" for definition and limitations on substitutions.
- 1.4 QUALITY ASSURANCE
- A. Compatibility of Options: If Contractor is given option of selecting between two or more products for use on Project, select product compatible with products previously selected, even if previously selected products were also options.
 - 1. Resolution of Compatibility Disputes between Multiple Contractors:

- a. Contractors are responsible for providing products and construction methods compatible with products and construction methods of other contractors.
 - b. If a dispute arises between the multiple contractors over concurrently selectable but incompatible products, COR will determine which products shall be used.
- B. Identification of Products: Except for required labels and operating data, do not attach or imprint manufacturer or product names or trademarks on exposed surfaces of products or equipment that will be exposed to view in occupied spaces or on the exterior.
 1. Labels: Locate required product labels and stamps on a concealed surface, or, where required for observation following installation, on a visually accessible surface that is not conspicuous.
 2. Equipment Nameplates: Provide a permanent nameplate on each item of service- or power-operated equipment. Locate on a visually accessible but inconspicuous surface. Include information essential for operation, including the following:
 - a. Name of product and manufacturer.
 - b. Model and serial number.
 - c. Capacity.
 - d. Speed.
 - e. Ratings.
 3. See individual identification Sections in Divisions 21, 22, 23, and 26 for additional equipment identification requirements.

1.5 COORDINATION

- A. Modify or adjust affected work as necessary to integrate work of approved comparable products and approved substitutions.

1.6 PRODUCT DELIVERY, STORAGE, AND HANDLING

- A. Deliver, store, and handle products, using means and methods that will prevent damage, deterioration, and loss, including theft and vandalism. Comply with manufacturer's written instructions.
- B. Delivery and Handling:
 1. Schedule delivery to minimize long-term storage at Project site and to prevent overcrowding of construction spaces.
 2. Coordinate delivery with installation time to ensure minimum holding time for items that are flammable, hazardous, easily damaged, or sensitive to deterioration, theft, and other losses.

3. Deliver products to Project site in an undamaged condition in manufacturer's original sealed container or other packaging system, complete with labels and instructions for handling, storing, unpacking, protecting, and installing.
4. Inspect products on delivery to determine compliance with the Contract Documents and that products are undamaged and properly protected.

C. Storage:

1. Provide a secure location and enclosure at Project site for storage of materials and equipment.
2. Store products to allow for inspection and measurement of quantity or counting of units.
3. Store materials in a manner that will not endanger Project structure.
4. Store products that are subject to damage by the elements under cover in a weathertight enclosure above ground, with ventilation adequate to prevent condensation and with adequate protection from wind.
5. Protect foam plastic from exposure to sunlight, except to extent necessary for period of installation and concealment.
6. Comply with product manufacturer's written instructions for temperature, humidity, ventilation, and weather-protection requirements for storage.
7. Protect stored products from damage and liquids from freezing.
8. Provide a secure location and enclosure at Project site for storage of materials and equipment by Owner's construction forces. Coordinate location with Owner.

1.7 PRODUCT WARRANTIES

A. Warranties specified in other Sections shall be in addition to, and run concurrent with, other warranties required by the Contract Documents. Manufacturer's disclaimers and limitations on product warranties do not relieve Contractor of obligations under requirements of the Contract Documents.

1. Manufacturer's Warranty: Written standard warranty form furnished by individual manufacturer for a particular product and issued in the name of the Owner or endorsed by manufacturer to Owner.
2. Special Warranty: Written warranty required by the Contract Documents to provide specific rights for Owner and issued in the name of the Owner or endorsed by manufacturer to Owner.

B. Special Warranties: Prepare a written document that contains appropriate terms and identification, ready for execution.

1. Manufacturer's Standard Form: Modified to include Project-specific information and properly executed.
2. Specified Form: When specified forms are included in the Project Manual, prepare a written document, using indicated form properly executed.
3. See other Sections for specific content requirements and particular requirements for submitting special warranties.

C. Submittal Time: Comply with requirements in Section 01 77 00 "Closeout Procedures."

PART 2 - PRODUCTS

2.1 PRODUCT SELECTION PROCEDURES

- A. General Product Requirements: Provide products that comply with the Contract Documents, are undamaged and, unless otherwise indicated, are new at time of installation.
1. Provide products complete with accessories, trim, finish, fasteners, and other items needed for a complete installation and indicated use and effect.
 2. Standard Products: If available, and unless custom products or nonstandard options are specified, provide standard products of types that have been produced and used successfully in similar situations on other projects.
 3. Owner reserves the right to limit selection to products with warranties meeting requirements of the Contract Documents.
 4. Where products are accompanied by the term "as selected," COR will make selection.
 5. Descriptive, performance, and reference standard requirements in the Specifications establish salient characteristics of products.
 6. Or Equal: For products specified by name and accompanied by the term "or equal," "or approved equal," or "or approved," comply with requirements in "Comparable Products" Article to obtain approval for use of an unnamed product.
 - a. Submit additional documentation required by COR in order to establish equivalency of proposed products. Unless otherwise indicated, evaluation of "or equal" product status is by the COR, whose determination is final.
- B. Product Selection Procedures:
1. Sole Product: Where Specifications name a single manufacturer and product, provide the named product that complies with requirements. Comparable products or substitutions for Contractor's convenience will not be considered.
 - a. Sole product may be indicated by the phrase "Subject to compliance with requirements, provide the following."
 2. Sole Manufacturer/Source: Where Specifications name a single manufacturer or source, provide a product by the named manufacturer or source that complies with requirements. Comparable products or substitutions for Contractor's convenience will not be considered.
 - a. Sole manufacturer/source may be indicated by the phrase "Subject to compliance with requirements, provide products by the following."

3. Limited List of Products: Where Specifications include a list of names of both manufacturers and products, provide one of the products listed that complies with requirements. Comparable products or substitutions for Contractor's convenience be considered.
 - a. Limited list of products may be indicated by the phrase "Subject to compliance with requirements, provide one of the following."
4. Non-Limited List of Products: Where Specifications include a list of names of both available manufacturers and products, provide one of the products listed or an unnamed product that complies with requirements.
 - a. Non-limited list of products is indicated by the phrase "Subject to compliance with requirements, available products that may be incorporated in the Work include, but are not limited to, the following."
 - b. Provision of an unnamed product is not considered a substitution, if the product complies with requirements.
5. Limited List of Manufacturers: Where Specifications include a list of manufacturers' names, provide a product by one of the manufacturers listed that complies with requirements. Comparable products or substitutions for Contractor's convenience be considered.
 - a. Limited list of manufacturers is indicated by the phrase "Subject to compliance with requirements, provide products by one of the following."
6. Non-Limited List of Manufacturers: Where Specifications include a list of available manufacturers, provide a product by one of the manufacturers listed or a product by an unnamed manufacturer that complies with requirements.
 - a. Non-limited list of manufacturers is indicated by the phrase "Subject to compliance with requirements, available manufacturers whose products may be incorporated in the Work include, but are not limited to, the following."
 - b. Provision of products of an unnamed manufacturer is not considered a substitution, if the product complies with requirements.
7. Basis-of-Design Product: Where Specifications name a product, or refer to a product indicated on Drawings, and include a list of manufacturers, provide the specified or indicated product or a comparable product by one of the other named manufacturers. Drawings and Specifications may additionally indicate sizes, profiles, dimensions, and other characteristics that are based on the product named. Comply with requirements in "Comparable Products" Article for consideration of an unnamed product by one of the other named manufacturers.
 - a. For approval of products by unnamed manufacturers, comply with requirements in Section 01 25 00 "Substitution Procedures" for substitutions for convenience.

- C. Visual Matching Specification: Where Specifications require the phrase "match COR's sample," provide a product that complies with requirements and matches COR's sample. COR's decision will be final on whether a proposed product matches.
 - 1. If no product available within specified category matches and complies with other specified requirements, comply with requirements in Section 01 25 00 "Substitution Procedures" for proposal of product.
- D. Visual Selection Specification: Where Specifications include the phrase "as selected by COR from manufacturer's full range" or a similar phrase, select a product that complies with requirements. COR will select color, gloss, pattern, density, or texture from manufacturer's product line that includes both standard and premium items.
- E. Sustainable Product Selection: Where Specifications require product to meet sustainable product characteristics, select products complying with indicated requirements. Comply with requirements in Division 01 sustainability requirements Section and individual Specification Sections.
 - 1. Select products for which sustainable design documentation submittals are available from manufacturer.

2.2 COMPARABLE PRODUCTS

- A. Conditions for Consideration of Comparable Products: COR will consider Contractor's request for comparable product when the following conditions are satisfied. If the following conditions are not satisfied, COR may return requests without action, except to record noncompliance with the following requirements:
 - 1. Evidence that proposed product does not require revisions to the Contract Documents, is consistent with the Contract Documents, will produce the indicated results, and is compatible with other portions of the Work.
 - 2. Detailed comparison of significant qualities of proposed product with those of the named basis-of-design product. Significant product qualities include attributes, such as type, function, in-service performance and physical properties, weight, dimension, durability, visual characteristics, and other specific features and requirements.
 - 3. Evidence that proposed product provides specified warranty.
 - 4. List of similar installations for completed projects, with project names and addresses and names and addresses of architects and owners, if requested.
 - 5. Samples, if requested.
- B. COR's Action on Comparable Products Submittal: If necessary, COR will request additional information or documentation for evaluation, as specified in Section 01 33 00 "Submittal Procedures."
 - 1. Form of Approval of Submittal: As specified in Section 01 33 00 "Submittal Procedures."
 - 2. Use product specified if COR does not issue a decision on use of a comparable product request within time allocated.

- C. Submittal Requirements, Two-Step Process: Approval by the COR of Contractor's request for use of comparable product is not intended to satisfy other submittal requirements. Comply with specified submittal requirements.

PART 3 - EXECUTION (Not Used)

END OF SECTION **01 60 00**

SECTION 01 73 00 - EXECUTION

PART 1 - GENERAL

1.1 SUMMARY

- A. Section includes general administrative and procedural requirements governing execution of the Work, including, but not limited to, the following:
 - 1. Construction layout.
 - 2. Field engineering and surveying.
 - 3. Installation of the Work.
 - 4. Progress cleaning.
 - 5. Starting and adjusting.
 - 6. Protection of installed construction.
 - 7. Correction of the Work.
- B. Related Requirements:
 - 1. Section 01 33 00 "Submittal Procedures" for submitting surveys.
 - 2. Section 01 77 00 "Closeout Procedures" for submitting final property survey with Project Record Documents, recording of FAA-accepted deviations from indicated lines and levels, replacing defective work, and final cleaning.
 - 3. Section 02 41 19 "Selective Demolition" for demolition and removal of selected portions of the building.
 - 4. Section 07 84 13 "Penetration Firestopping" for patching penetrations in fire-rated construction.

1.2 DEFINITIONS

- A. Cutting: Removal of in-place construction necessary to permit installation or performance of subsequent work.
- B. Patching: Fitting and repair work required to restore construction to original conditions after installation of subsequent work.

1.3 INFORMATIONAL SUBMITTALS

- A. Landfill Receipts: Submit copy of receipts issued by a landfill facility, licensed to accept hazardous materials, for hazardous waste disposal.

1.4 QUALITY ASSURANCE

CORCOR

- A. Manufacturer's Installation Instructions: Obtain and maintain on-site manufacturer's written recommendations and instructions for installation of specified products and equipment.

PART 2 - PRODUCTS

2.1 MATERIALS

- A. Comply with requirements specified in other Sections.
 - 1. For projects requiring compliance with sustainable design and construction practices and procedures, use products for patching that comply with sustainable design requirements.
- B. In-Place Materials: Use materials for patching identical to in-place materials. For exposed surfaces, use materials that visually match in-place adjacent surfaces to the fullest extent possible.
 - 1. If identical materials are unavailable or cannot be used, use materials that, when installed, will provide a match acceptable to COR for the visual and functional performance of in-place materials. Use materials that are not considered hazardous.
- C. Cleaning Agents: Use cleaning materials and agents recommended by manufacturer or fabricator of the surface to be cleaned. Do not use cleaning agents that are potentially hazardous to health or property or that might damage finished surfaces.

PART 3 - EXECUTION

3.1 EXAMINATION

- A. Existing Conditions: The existence and location of underground and other utilities and construction indicated as existing are not guaranteed. Before beginning sitework, investigate and verify the existence and location of underground utilities, mechanical and electrical systems, and other construction affecting the Work.
 - 1. Before construction, verify the location and invert elevation at points of connection of sanitary sewer, storm sewer, gas service piping, and water-service piping; underground electrical services; and other utilities.
 - 2. Furnish location data for work related to Project that must be performed by public utilities serving Project site.

3. Obtain from the FAA location and marking of underground FAA communications, electrical, grounding, electronic and fiber optics utilities.
- B. Examination and Acceptance of Conditions: Before proceeding with each component of the Work, examine substrates, areas, and conditions, with Installer or Applicator present where indicated, for compliance with requirements for installation tolerances and other conditions affecting performance. Record observations.
 1. Examine roughing-in for mechanical and electrical systems to verify actual locations of connections before equipment and fixture installation.
 2. Examine walls, floors, and roofs for suitable conditions where products and systems are to be installed.
 3. Verify compatibility with and suitability of substrates, including compatibility with existing finishes or primers.
- C. Written Report: Where a written report listing conditions detrimental to performance of the Work is required by other Sections, include the following:
 1. Description of the Work, including Specification Section number and paragraph, and Drawing sheet number and detail, where applicable.
 2. List of detrimental conditions, including substrates.
 3. List of unacceptable installation tolerances.
 4. Recommended corrections.
- D. Proceed with installation only after unsatisfactory conditions have been corrected. Proceeding with the Work indicates acceptance of surfaces and conditions.

3.2 PREPARATION

- A. Existing Utility Information: Furnish information to local utility and COR that is necessary to adjust, move, or relocate existing utility structures, utility poles, lines, services, or other utility appurtenances located in or affected by construction. Coordinate with authorities having jurisdiction.
- B. Field Measurements: Take field measurements as required to fit the Work properly. Recheck measurements before installing each product. Where portions of the Work are indicated to fit to other construction, verify dimensions of other construction by field measurements before fabrication. Coordinate fabrication schedule with construction progress to avoid delaying the Work.
- C. Space Requirements: Verify space requirements and dimensions of items shown diagrammatically on Drawings.
- D. Review of Contract Documents and Field Conditions: Immediately on discovery of the need for clarification of the Contract Documents, submit a request for information to COR in accordance with requirements in Section 01 31 00 "Project Management and Coordination."

3.3 CONSTRUCTION LAYOUT

3.4 FIELD ENGINEERING

- A. Reference Points: Locate existing permanent benchmarks, control points, and similar reference points before beginning the Work. Preserve and protect permanent benchmarks and control points during construction operations.
 - 1. Do not change or relocate existing benchmarks or control points without prior written approval of COR. Report lost or destroyed permanent benchmarks or control points promptly. Report the need to relocate permanent benchmarks or control points to COR before proceeding.
 - 2. Replace lost or destroyed permanent benchmarks and control points promptly. Base replacements on the original survey control points.
- B. Benchmarks: Establish and maintain a minimum of two permanent benchmarks on Project site, referenced to data established by survey control points. Comply with authorities having jurisdiction for type and size of benchmark.
 - 1. Record benchmark locations, with horizontal and vertical data, on Project Record Documents.
 - 2. Where the actual location or elevation of layout points cannot be marked, provide temporary reference points sufficient to locate the Work.
 - 3. Remove temporary reference points when no longer needed. Restore marked construction to its original condition.
- C. Certified Survey: On completion of foundation walls, major site improvements, and other work requiring field-engineering services, prepare a certified survey showing dimensions, locations, angles, and elevations of construction and sitework.

3.5 INSTALLATION

- A. Locate the Work and components of the Work accurately, in correct alignment and elevation, as indicated.
 - 1. Make vertical work plumb, and make horizontal work level.
 - 2. Where space is limited, install components to maximize space available for maintenance and ease of removal for replacement.
 - 3. Conceal pipes, ducts, and wiring in finished areas unless otherwise indicated.
 - 4. Maintain minimum headroom clearance of 96 inches in occupied spaces and 90 inches in unoccupied spaces, unless otherwise indicated on Drawings.
- B. Comply with manufacturer's written instructions and recommendations for installing products in applications indicated.

- C. Install products at the time and under conditions that will ensure satisfactory results as judged by COR. Maintain conditions required for product performance until Substantial Completion.
- D. Conduct construction operations, so no part of the Work is subjected to damaging operations or loading in excess of that expected during normal conditions of occupancy of type expected for Project.
- E. Sequence the Work and allow adequate clearances to accommodate movement of construction items on-site and placement in permanent locations.
- F. Tools and Equipment: Select tools or equipment that minimize production of excessive noise levels.
- G. Templates: Obtain and distribute to the parties involved templates for Work specified to be factory prepared and field installed. Check Shop Drawings of other portions of the Work to confirm that adequate provisions are made for locating and installing products to comply with indicated requirements.
- H. Attachment: Provide blocking and attachment plates and anchors and fasteners of adequate size and number to securely anchor each component in place, accurately located and aligned with other portions of the Work. Where size and type of attachments are not indicated, verify size and type required for load conditions with manufacturer.
 - 1. Mounting Heights: Where mounting heights are not indicated, mount components at heights directed by COR.
 - 2. Allow for building movement, including thermal expansion and contraction.
 - 3. Coordinate installation of anchorages. Furnish setting drawings, templates, and directions for installing anchorages, including sleeves, concrete inserts, anchor bolts, and items with integral anchors, that are to be embedded in concrete or masonry. Deliver such items to Project site in time for installation.
- I. Joints: Make joints of uniform width. Where joint locations in exposed Work are not indicated, arrange joints for the best visual effect, as judged by COR. Fit exposed connections together to form hairline joints.

3.6 PROGRESS CLEANING

- A. Clean Project site and work areas daily, including common areas. Enforce requirements strictly. Dispose of materials lawfully.
 - 1. Comply with requirements in NFPA 241 for removal of combustible waste materials and debris at the end each day.
 - 2. Do not hold waste materials more than seven days during normal weather or three days if the temperature is expected to rise above 80 deg F.
 - 3. Containerize hazardous and unsanitary waste materials separately from other waste. Mark containers appropriately and dispose of legally, according to regulations.

- a. Use containers intended for holding waste materials of type to be stored.
 - b. Provide covered containers for deposit of waste materials, debris and rubbish.
4. Coordinate progress cleaning for joint-use areas where Contractor and other contractors are working concurrently.
- B. Site: Maintain Project site free of waste materials and debris.
- C. Work Areas: Clean areas where Work is in progress to the level of cleanliness necessary for proper execution of the Work.
 1. Remove liquid spills promptly.
 2. Where dust would impair proper execution of the Work, broom-clean or vacuum the entire work area, as appropriate.
 3. Clean interior areas daily to provide suitable conditions for work and to prevent fire or accidents.
 4. Broom clean interior areas prior to start of surface finishing and continue cleaning on a daily basis
- D. Installed Work: Keep installed work clean. Clean installed surfaces according to written instructions of manufacturer or fabricator of product installed, using only cleaning materials specifically recommended. If specific cleaning materials are not recommended, use cleaning materials that are not hazardous to health or property and that will not damage exposed surfaces.
- E. Concealed Spaces: Remove debris from concealed spaces before enclosing the space.
- F. Exposed Surfaces: Clean exposed surfaces and protect as necessary to ensure freedom from damage and deterioration at time of Substantial Completion.
- G. Waste Disposal: Do not bury or burn waste materials on-site. Do not wash waste materials down sewers or into waterways. Comply with waste disposal requirements in Section 01 74 19 "Construction Waste Management and Disposal."
- H. During handling and installation, clean and protect construction in progress and adjoining materials already in place. Apply protective covering where required to ensure protection from damage or deterioration at Substantial Completion.
- I. Clean and provide maintenance on completed construction as frequently as necessary through the remainder of the construction period. Adjust and lubricate operable components to ensure operability without damaging effects.
- J. Limiting Exposures: Supervise construction operations to ensure that no part of the construction, completed or in progress, is subject to harmful, dangerous, damaging, or otherwise deleterious exposure during the construction period.
- K. Control cleaning operations so that dust and other particulates will not adhere to wet or newly-coated surfaces.

- L. Control cleaning operations so that dust and other particulates will not adhere to wet or newly-coated surfaces.

3.7 CONTRACTOR'S FAILURE TO CLEAN

- A. If the Contractor fails to maintain levels of cleanliness in work areas, satisfactory to the COR, then the FAA shall have the right to cause such areas to be cleaned by others. The costs to the FAA for such cleaning, plus 25% for administration, shall be the obligation of the Contractor and shall be deducted from any money due the Contractor hereunder.

3.8 STARTING AND ADJUSTING

- A. Coordinate startup and adjusting of equipment and operating components.
- B. Start equipment and operating components to confirm proper operation. Remove malfunctioning units, replace with new units, and retest.
- C. Adjust equipment for proper operation. Adjust operating components for proper operation without binding.
- D. Test each piece of equipment to verify proper operation. Test and adjust controls and safeties. Replace damaged and malfunctioning controls and equipment.
- E. Manufacturer's Field Service: Comply with qualification requirements in Section 01 40 00 "Quality Requirements."

3.9 PROTECTION OF INSTALLED CONSTRUCTION

- A. Provide final protection and maintain conditions that ensure installed Work is without damage or deterioration at time of Substantial Completion.
- B. Protection of Existing Items: Provide protection and ensure that existing items to remain undisturbed by construction are maintained in condition that existed at commencement of the Work.
- C. Comply with manufacturer's written instructions for temperature and relative humidity.
- D. Provide protective coverings at walls, projections, corners and jambs, sills and soffits of openings in and adjacent to traffic areas.
- E. Cover walls and floors of elevator cabs and jambs of cab doors with 3/4 inch plywood, when elevators are used by construction personnel.
- F. Protect finished floors and stairs from dirt, wear and damage:

1. Secure heavy sheet goods or similar protective materials in place, in areas subject to foot traffic.
2. Lay planking or similar rigid materials in place, in areas subject to movement of heavy objects.
3. Lay planking or similar rigid materials in place, in areas where storage of products will occur.

G. Protect waterproofed and roofed surfaces:

1. Restrict use of surfaces from traffic of any kind and from storage of products.
2. When an activity is mandatory, obtain recommendations for protection of surfaces from manufacturer. Install protection and remove on completion of activity. Restrict use of adjacent unprotected areas.

H. Restrict traffic of any kind across planted lawn and landscape areas.

1. The Contractor shall be responsible for the preservation of all public and private property, and shall protect carefully from disturbance or damage all land monuments and property markers until the COR has witnessed or otherwise referenced their location and shall not move them until directed.
2. The Contractor shall be responsible for all damage or injury to property of any character, during the prosecution of the work, resulting from any act, omission, neglect, or misconduct in its manner or method of executing the work, or at any time due to defective work or materials, and said responsibility will not be released until the work is completed and accepted.
3. When or where any direct or indirect damage or injury is done to public or private property by or on account of any act, omission, neglect, or misconduct in the execution of the work, or in consequence of the nonexecution thereof by the Contractor, the Contractor shall restore, at its own expense, such property to a condition similar or equal to that existing before such damage or injury was done, by repairing, or otherwise restoring as may be directed, or it shall make good such damage or injury in an acceptable manner, at no additional cost to the government.

3.10 CORRECTION OF THE WORK

- A. Repair or remove and replace damaged, defective, or nonconforming Work. Restore damaged substrates and finishes.
 1. Repairing includes replacing defective parts, refinishing damaged surfaces, touching up with matching materials, and properly adjusting operating equipment.
- B. Repair Work previously completed and subsequently damaged during construction period. Repair to like-new condition.

- C. Restore permanent facilities used during construction to their specified condition.
- D. Remove and replace damaged surfaces that are exposed to view if surfaces cannot be repaired without visible evidence of repair.
- E. Repair components that do not operate properly. Remove and replace operating components that cannot be repaired.
- F. Remove and replace chipped, scratched, and broken glass or reflective surfaces.

END OF SECTION **01 73 00**

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SECTION 01 74 19 - CONSTRUCTION WASTE MANAGEMENT AND DISPOSAL

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

- A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and other Division 01 Specification Sections, apply to this Section.

1.2 SUMMARY

- A. Section includes administrative and procedural requirements for the following:
 - 1. Salvaging nonhazardous demolition construction waste.
 - 2. Recycling nonhazardous demolition construction waste.
 - 3. Disposing of nonhazardous demolition construction waste.

1.3 DEFINITIONS

- A. Construction Waste: Building, structure, and site improvement materials and other solid waste resulting from construction, remodeling, renovation, or repair operations. Construction waste includes packaging.
- B. Demolition Waste: Building, structure, and site improvement materials resulting from demolition operations.
- C. Disposal: Removal of demolition or construction waste and subsequent salvage, sale, recycling, or deposit in landfill, incinerator acceptable to authorities having jurisdiction, or designated spoil areas on Owner's property.
- 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.

1.4 MATERIALS OWNERSHIP

- A. Unless otherwise indicated, demolition and construction waste becomes property of Contractor.

- B. Historic items, relics, antiques, and similar objects including, but not limited to, cornerstones and their contents, commemorative plaques and tablets, and other items of interest or value to FAA that may be uncovered during demolition remain the property of FAA.

- 1. Carefully salvage in a manner to prevent damage and promptly return to FAA.

1.5 ACTION SUBMITTALS

- A. Waste Management Plan: Submit plan within 7 days of date established for the Notice to Proceed.

1.6 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. Total quantity of waste in tons.
 - 4. Quantity of waste salvaged, both estimated and actual in tons.
 - 5. Quantity of waste recycled, both estimated and actual in tons.
 - 6. Total quantity of waste recovered (salvaged plus recycled) in tons.
 - 7. 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. 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.
- H. Refrigerant Recovery: Comply with requirements in Section 02 41 19 "Selective Demolition" for refrigerant recovery submittals.

1.7 QUALITY ASSURANCE

- A. Waste Management Coordinator Qualifications: Experienced firm, or individual employed and assigned by General Contractor, with a record of successful waste management coordination of projects with similar requirements. Superintendent may serve as Waste Management Coordinator.
 - 1.
 - 2.
- B. Refrigerant Recovery Technician Qualifications: Comply with requirements in Section 02 41 19 "Selective Demolition."
- C. Regulatory Requirements: Comply with transportation and disposal regulations of authorities having jurisdiction.
- D. Waste Management Conference(s): Conduct conference(s) at Project site to comply with requirements in Section 01 31 00 "Project Management and Coordination." 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 each contractor and 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.

1.8 WASTE MANAGEMENT PLAN

- A. General: Develop a waste management plan according to requirements in this Section. Plan shall consist of waste identification, waste reduction work plan, and cost/revenue analysis. Distinguish between demolition and construction waste. 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. 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. Include points of waste generation, 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 in compliance with Section 02 41 19 "Selective Demolition."
 - 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 where materials separation will be performed.
- D. Cost/Revenue Analysis: Indicate total cost of waste disposal as if there were 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 transportation and tipping fees and cost of collection containers and handling 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 transportation and tipping fees by donating materials.
 - 7. Savings in transportation 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

2.1 RECYCLING RECEIVERS AND PROCESSORS

- A. Subject to compliance with requirements, use licensed locally available recycling receivers and processors.

2.2 PERFORMANCE REQUIREMENTS

- A. General: Achieve end-of-Project rates for salvage/recycling of 50 percent by weight of total nonhazardous 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:

- 1. Demolition Waste:

- a. Wood studs.
- b. Wood joists.
- c. Plywood and oriented strand board.
- d. Structural and miscellaneous steel.
- e. Roofing.
- f. Metal studs.
- g. Equipment.
- h. Electrical conduit.
- i. Copper wiring.

- 2. Construction Waste:

- a. Lumber.
- b. Wood sheet materials.
- c. Wood trim.
- d. Metals.
- e. Roofing.
- f. Insulation.
- g. Piping.
- h. Electrical conduit.
- i. Packaging: Regardless of salvage/recycle goal indicated in "General" Paragraph above, salvage or recycle 100 percent of the following uncontaminated packaging materials:
 - 1) Paper.
 - 2) Cardboard.
 - 3) Boxes.
 - 4) Plastic sheet and film.
 - 5) Polystyrene packaging.
 - 6) Wood crates.

- 7) Wood pallets.
- 8) Plastic pails.
- j. Construction Office Waste: Regardless of salvage/recycle goal indicated in "General" Paragraph above, salvage or recycle 100 percent of the following construction office waste materials:
 - 1) Paper.
 - 2) Aluminum cans.
 - 3) Glass containers.

PART 3 - EXECUTION

3.1 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 operation, termination, and removal requirements in Section 01 50 00 "Temporary Facilities and Controls."
- B. Waste Management Coordinator: Engage a waste management coordinator to 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.
 - 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 and recycled.
 - 2. Comply with Section 01 50 00 "Temporary Facilities and Controls" for controlling dust and dirt, environmental protection, and noise control.
- E. Waste Management in Historic Zones or Areas: Transportation equipment and other materials shall be of sizes that clear surfaces within historic spaces, areas, rooms, and openings, by 12 inches or more.

3.2 SALVAGING DEMOLITION WASTE

- A. Comply with requirements in Section 02 41 19 "Selective Demolition", for salvaging demolition waste.
- B. Salvaged Items for Reuse in the Work: Salvage items for reuse and handle as follows:
 - 1. Clean salvaged items.
 - 2. Pack or crate items after cleaning. Identify contents of containers with label indicating elements, date of removal, quantity, and location where removed.
 - 3. Store items in a secure area until installation.
 - 4. Protect items from damage during transport and storage.
 - 5. Install salvaged items to comply with installation requirements for new materials and equipment. Provide connections, supports, and miscellaneous materials necessary to make items functional for use indicated.
- C. Salvaged Items for Sale and Donation: Not permitted on Project site.
- D. Salvaged Items for FAA's Use: Salvage items for FAA's use and handle as follows:
 - 1. Clean salvaged items.
 - 2. Pack or crate items after cleaning. Identify contents of containers with label indicating elements, date of removal, quantity, and location where removed.
 - 3. Store items in a secure area until delivery to FAA.
 - 4. Transport items to FAA's storage area designated by Owner.
 - 5. Protect items from damage during transport and storage.
- E. Doors and Hardware: Brace open end of door frames. Except for removing door closers, leave door hardware attached to doors.
- F. Equipment: Drain tanks, piping, and fixtures. Seal openings with caps or plugs. Protect equipment from exposure to weather.
- G. Plumbing Fixtures: Separate by type and size.
- H. Lighting Fixtures: Separate lamps by type and protect from breakage.
- I. Electrical Devices: Separate switches, receptacles, switchgear, transformers, meters, panelboards, circuit breakers, and other devices by type.

3.3 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 be shared equally by FAA and 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 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 from FAA's property and transport to recycling receiver or processor as often as required to prevent overfilling bins.

3.4 RECYCLING DEMOLITION WASTE

- A. Wood Materials: Sort and stack members according to size, type, and length. Separate lumber, engineered wood products, panel products, and treated wood materials.
- B. 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.
- C. Conduit: Reduce conduit to straight lengths and store by material and size.

3.5 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. Wood Materials:
 1. Clean Cut-Offs of Lumber: Grind or chip into small pieces.
 2. Clean Sawdust: Bag sawdust that does not contain painted or treated wood.
- C. Paint: Seal containers and store by type.

3.6 DISPOSAL OF WASTE

- A. General: Except for items or materials to be salvaged or recycled, 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. General: Except for items or materials to be salvaged or recycled, remove waste materials and legally dispose of at designated spoil areas on Owner's property.
- C. Burning: Do not burn waste materials.
- D. Burning: Burning of waste materials is permitted only at designated areas on FAA's property, provided required permits are obtained. Provide full-time monitoring for burning materials until fires are extinguished.

3.7 ATTACHMENTS

- 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-5 for cost/revenue analysis of construction waste reduction work plan.
- E. Form CWM-7 for construction waste reduction progress report.

END OF SECTION **01 74 19**

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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 (TONNES)	REMARKS AND ASSUMPTIONS
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:							

* Insert units of measure.

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FORM CWM-2: DEMOLITION WASTE IDENTIFICATION				
MATERIAL DESCRIPTION	EST. QUANTITY	EST. VOLUME CY (CM)	EST. WEIGHT TONS (TONNES)	REMARKS AND ASSUMPTIONS
Asphaltic Concrete Paving				
Concrete				
Brick				
CMU				
Lumber				
Plywood and 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				
Piping Supports and Hangers				
Valves				
Sprinklers				
Mechanical Equipment				
Electrical Conduit				
Copper Wiring				
Light Fixtures				
Lamps				
Lighting Ballasts				
Electrical Devices				
Switchgear and Panelboards				
Transformers				
Other:				

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FORM CWM-3: CONSTRUCTION WASTE REDUCTION WORK PLAN						
MATERIAL CATEGORY	GENERATION POINT	TOTAL EST. QUANTITY OF WASTE TONS (TONNES)	DISPOSAL METHOD AND QUANTITY			HANDLING AND TRANSPORTION PROCEDURES
			EST. AMOUNT SALVAGED TONS (TONNES)	EST. AMOUNT RECYCLED TONS (TONNES)	EST. AMOUNT DISPOSED TO LANDFILL TONS (TONNES)	
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:						

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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:								

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FORM CWM-7: CONSTRUCTION WASTE REDUCTION PROGRESS REPORT								
MATERIAL CATEGORY	GENERATION POINT	TOTAL QUANTITY OF WASTE TONS (TONNES) (A)	QUANTITY OF WASTE SALVAGED		QUANTITY OF WASTE RECYCLED		TOTAL QUANTITY OF WASTE RECOVERED TONS (TONNES) (D = B + C)	TOTAL QUANTITY OF WASTE RECOVERED % (D / A x 100)
			ESTIMATED TONS (TONNES)	ACTUAL TONS (TONNES) (B)	ESTIMATED TONS (TONNES)	ACTUAL TONS (TONNES) (C)		
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:								

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SECTION 01 77 00 - CLOSEOUT PROCEDURES

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

- A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and other Division 01 Specification Sections, apply to this Section.

1.2 SUMMARY

- A. Section includes administrative and procedural requirements for Contract closeout, including, but not limited to, the following:
 - 1. Substantial Completion procedures.
 - 2. Final completion procedures.
 - 3. Warranties.
 - 4. Final cleaning.
 - 5. Completion of Asbestos and Lead Free Certification as per Division 1
 - 6. Completion of Lock Out/Tag Out (LOTO) Procedures as per Division 26
 - 7. Final Punch List
- B. Related Requirements:
 - 1. Section 01 32 33 "Photographic Documentation" for submitting Final Completion construction photographic documentation.
 - 2. Section 01 78 23 "Operation and Maintenance Data" for additional operation and maintenance manual requirements.
 - 3. Section 01 78 39 "Project Record Documents" for submitting Record Drawings, Record Specifications, and Record Product Data.
 - 4. Section 01 79 00 "Demonstration and Training" for requirements to train the FAA's maintenance personnel to adjust, operate, and maintain products, equipment, and systems.

1.3 DEFINITIONS

- A. List of Incomplete Items: Contractor-prepared list of items to be completed or corrected, prepared for the COR's use prior to COR's inspection, to determine if the Work is substantially complete.

1.4 ACTION SUBMITTALS

- A. Product Data: For each type of cleaning agent.
- B. Contractor's List of Incomplete Items: Initial submittal at Substantial Completion.

- C. Certified List of Incomplete Items: Final submittal at Final Completion.

1.5 CLOSEOUT SUBMITTALS

- A. Certificates of Release: From authorities having jurisdiction.
- B. Certificate of Insurance: For continuing coverage.
- C. Field Report: For pest-control inspection.

1.6 MAINTENANCE MATERIAL SUBMITTALS

- A. Schedule of Maintenance Material Items: For maintenance material submittal items required by other Sections.

1.7 SUBSTANTIAL COMPLETION PROCEDURES

- A. Contractor's List of Incomplete Items: Prepare and submit a list of items to be completed and corrected (Contractor's "punch list"), indicating the value of each item on the list and reasons why the Work is incomplete.
- B. Submittals Prior to Substantial Completion: Complete the following a minimum of 10 days prior to requesting inspection for determining date of Substantial Completion. List items below that are incomplete at time of request.
 - 1. Certificates of Release: Obtain and submit releases from authorities having jurisdiction, permitting FAA unrestricted use of the Work and access to services and utilities. Include occupancy permits, operating certificates, and similar releases.
 - 2. Submit closeout submittals specified in other Division 01 Sections, including Project Record Documents, operation and maintenance manuals, damage or settlement surveys, property surveys, and similar final record information.
 - 3. Submit closeout submittals specified in individual Sections, including specific warranties, workmanship bonds, maintenance service agreements, final certifications, and similar documents.
 - 4. Submit maintenance material submittals specified in individual Sections, including tools, spare parts, extra materials, and similar items, and deliver to location designated by COR. Label with manufacturer's name and model number.
 - a. Schedule of Maintenance Material Items: Prepare and submit schedule of maintenance material submittal items, including name and quantity of each item and name and number of related Specification Section. Obtain COR's signature for receipt of submittals.
 - 5. Submit testing, adjusting, and balancing records.
 - 6. Submit sustainable design submittals not previously submitted.

7. Submit changeover information related to FAA's occupancy, use, operation, and maintenance.
- C. Procedures Prior to Substantial Completion: Complete the following a minimum of 10 days prior to requesting inspection for determining date of Substantial Completion. List items below that are incomplete at time of request.
1. Advise FAA of pending insurance changeover requirements.
 2. Make final changeover of permanent locks and deliver keys to FAA. Advise FAA's personnel of changeover in security provisions.
 3. Complete startup and testing of systems and equipment.
 4. Perform preventive maintenance on equipment used prior to Substantial Completion.
 5. Instruct FAA's personnel in operation, adjustment, and maintenance of products, equipment, and systems. Submit demonstration and training video recordings specified in Section 01 79 00 "Demonstration and Training."
 6. Advise FAA of changeover in utility services.
 7. Participate with FAA in conducting inspection and walkthrough with local emergency responders.
 8. Terminate and remove temporary facilities from Project site, along with mockups, construction tools, and similar elements.
 9. Complete final cleaning requirements.
 10. Touch up paint and otherwise repair and restore marred exposed finishes to eliminate visual defects.
- D. Inspection: Submit a written request for inspection to determine Substantial Completion a minimum of 10 days prior to date the Work will be completed and ready for final inspection and tests. On receipt of request, COR will either proceed with inspection or notify Contractor of unfulfilled requirements. COR will prepare the Certificate of Substantial Completion after inspection or will notify Contractor of items, either on Contractor's list or additional items identified by COR, that must be completed or corrected before certificate will be issued.
1. Request reinspection when the Work identified in previous inspections as incomplete is completed or corrected.
 2. Results of completed inspection will form the basis of requirements for Final Completion.

1.8 FINAL COMPLETION PROCEDURES

- A. Submittals Prior to Final Completion: Before requesting final inspection for determining Final Completion, complete the following:
1. Submit a final Application for Payment in accordance with Section 01 29 00 "Payment Procedures."
 2. Certified List of Incomplete Items: Submit certified copy of COR's Substantial Completion inspection list of items to be completed or corrected (punch list), endorsed and dated by COR. Certified copy of the list shall state that each item has been completed or otherwise resolved for acceptance.

3. Certificate of Insurance: Submit evidence of final, continuing insurance coverage complying with insurance requirements.
 4. Submit pest-control final inspection report.
 5. Submit Final Completion photographic documentation.
- B. Inspection: Submit a written request for final inspection to determine acceptance a minimum of 10 days prior to date the Work will be completed and ready for final inspection and tests. On receipt of request, COR will either proceed with inspection or notify Contractor of unfulfilled requirements. COR will prepare a final Certificate for Payment after inspection or will notify Contractor of construction that must be completed or corrected before certificate will be issued.
1. Request reinspection when the Work identified in previous inspections as incomplete is completed or corrected.

1.9 LIST OF INCOMPLETE ITEMS

- A. Organization of List: Include name and identification of each space and area affected by construction operations for incomplete items and items needing correction including, if necessary, areas disturbed by Contractor that are outside the limits of construction.
1. Organize list of spaces in sequential order, starting with exterior areas first and proceeding from lowest floor to highest floor, listed by room or space number.
 2. Organize items applying to each space by major element, including categories for ceilings, individual walls, floors, equipment, and building systems.
 3. Include the following information at the top of each page:
 - a. Project name.
 - b. Date.
 - c. Name of COR.
 - d. Name of Contractor.
 - e. Page number.
 4. Submit list of incomplete items in the following format:
 - a. MS Excel Electronic File: COR will return annotated file.
 - b. PDF Electronic File: COR will return annotated file.
 - c. Web-Based Project Software Upload: Utilize software feature for creating and updating list of incomplete items (punch list).

1.10 SUBMITTAL OF PROJECT WARRANTIES

- A. Time of Submittal: Submit written warranties on request of COR for designated portions of the Work where warranties are indicated to commence on dates other than date of Substantial Completion, or when delay in submittal of warranties might limit FAA's rights under warranty.

- B. Partial Occupancy: Submit properly executed warranties within 15 days of completion of designated portions of the Work that are completed and occupied or used by FAA during construction period by separate agreement with Contractor.
- C. Organize warranty documents into an orderly sequence based on the table of contents of Project Manual.
- D. Warranty Electronic File: Provide warranties and bonds in PDF format. Assemble complete warranty and bond submittal package into a single electronic PDF file with bookmarks enabling navigation to each item. Provide bookmarked table of contents at beginning of document.
 - 1. Submit on digital media acceptable to COR.
- E. Warranties in Paper Form:
 - 1. Bind warranties and bonds in heavy-duty, three-ring, vinyl-covered, loose-leaf binders, thickness as necessary to accommodate contents, and sized to receive 8-1/2-by-11-inch paper.
 - 2. Provide heavy paper dividers with plastic-covered tabs for each separate warranty. Mark tab to identify the product or installation. Provide a typed description of the product or installation, including the name of the product and the name, address, and telephone number of Installer.
 - 3. Identify each binder on the front and spine with the typed or printed title "WARRANTIES," Project name, and name of Contractor.
- F. Provide additional copies of each warranty to include in operation and maintenance manuals.

PART 2 - PRODUCTS

2.1 MATERIALS

- A. Cleaning Agents: Use cleaning materials and agents recommended by manufacturer or fabricator of the surface to be cleaned. Do not use cleaning agents that are potentially hazardous to health or property or that might damage finished surfaces.
 - 1. Use cleaning products that comply with Green Seal's GS-37, or if GS-37 is not applicable, use products that comply with the California Code of Regulations maximum allowable VOC levels.

2.2 EQUIPMENT WARRANTY TAGS AND GUARANTEE LOCAL REPRESENTATIVES

- A. The Contractor shall furnish with each guarantee, the name address, and telephone number of the guarantor, the name, address, and telephone number of the guarantor's representative nearest to the site, who, upon request of the FAA representative, will honor the guarantee during the guaranty period and will provide the service prescribed by the terms of the guarantee. At the time of installation, the Contractor shall tag each item of warranted equipment with a durable, oil and water resistant tag approved by the Contracting Officer's Representative (COR). Tag shall be attached with copper wire and sprayed with a clear silicone, waterproof coating. Leave the date of acceptance and inspectors signature blank until project is accepted for Substantial Completion.
- B. Equipment warranty tags must show the following information:
 - 1. Type of Equipment
 - 2. Accepted Date
 - 3. Warranted Until
 - 4. Under Contract Number
 - 5. Inspector's Signature

PART 3 - EXECUTION

3.1 FINAL CLEANING

- A. General: Perform final cleaning. Conduct cleaning and waste-removal operations to comply with local laws and ordinances and Federal and local environmental and antipollution regulations.
- B. Cleaning: Employ experienced workers or professional cleaners for final cleaning. Clean each surface or unit to condition expected in an average commercial building cleaning and maintenance program. Comply with manufacturer's written instructions.
 - 1. Complete the following cleaning operations before requesting inspection for certification of Substantial Completion for entire Project or for a designated portion of Project:
 - a. Clean Project site of rubbish, waste material, litter, and other foreign substances.
 - b. Sweep paved areas broom clean. Remove petrochemical spills, stains, and other foreign deposits.
 - c. Rake grounds that are not planted, mulched, or paved to a smooth, even-textured surface.
 - d. Remove tools, construction equipment, machinery, and surplus material from Project site.
 - e. Remove snow and ice to provide safe access to building.

- f. Clean exposed exterior and interior hard-surfaced finishes to a dirt-free condition, free of stains, films, and similar foreign substances. Avoid disturbing natural weathering of exterior surfaces. Restore reflective surfaces to their original condition.
 - g. Remove debris and surface dust from limited-access spaces, including roofs, plenums, shafts, trenches, equipment vaults, manholes, attics, and similar spaces.
 - h. Clean flooring, removing debris, dirt, and staining; clean according to manufacturer's recommendations.
 - i. Vacuum and mop concrete.
 - j. Vacuum carpet and similar soft surfaces, removing debris and excess nap; clean according to manufacturer's recommendations if visible soil or stains remain.
 - k. Clean transparent materials, including mirrors and glass in doors and windows. Remove glazing compounds and other noticeable, vision-obscuring materials. Polish mirrors and glass, taking care not to scratch surfaces.
 - l. Remove labels that are not permanent.
 - m. Wipe surfaces of mechanical and electrical equipment and similar equipment. Remove excess lubrication, paint and mortar droppings, and other foreign substances.
 - n. Clean plumbing fixtures to a sanitary condition, free of stains, including stains resulting from water exposure.
 - o. Replace disposable air filters and clean permanent air filters. Clean exposed surfaces of diffusers, registers, and grills.
 - p. Clean ducts, blowers, and coils if units were operated without filters during construction or that display contamination with particulate matter on inspection.
 - 1) Clean HVAC system in compliance with NADCA ACR. Provide written report on completion of cleaning.
 - q. Clean luminaires, lamps, globes, and reflectors to function with full efficiency.
 - r. Clean strainers.
 - s. Leave Project clean and ready for occupancy.
- C. Pest Control: Comply with pest control requirements in Section 01 50 00 "Temporary Facilities and Controls." Prepare written report.
- D. Construction Waste Disposal: Comply with waste-disposal requirements in Section 01 74 19 "Construction Waste Management and Disposal."
- 3.2 REPAIR OF THE WORK
- A. Complete repair and restoration operations required by Section 01 73 00 "Execution" before requesting inspection for determination of Substantial Completion.

END OF SECTION **01 77 00**

SECTION 01 78 23 - OPERATION AND MAINTENANCE DATA

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

- A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and other Division 01 Specification Sections, apply to this Section.

1.2 SUMMARY

- A. Section includes administrative and procedural requirements for preparing operation and maintenance manuals, including the following:
 - 1. Operation and maintenance documentation directory manuals.
 - 2. Emergency manuals.
 - 3. Systems and equipment operation manuals.
 - 4. Systems and equipment maintenance manuals.
 - 5. Product maintenance manuals.
- B. Related Requirements:
 - 1. Section 01 33 00 "Submittal Procedures" for submitting copies of submittals for operation and maintenance manuals.
 - 2. Section 01 91 13 "General Commissioning Requirements" for verification and compilation of data into operation and maintenance manuals.

1.3 DEFINITIONS

- A. System: An organized collection of parts, equipment, or subsystems united by regular interaction.
- B. Subsystem: A portion of a system with characteristics similar to a system.

1.4 CLOSEOUT SUBMITTALS

- A. Submit operation and maintenance manuals indicated. Provide content for each manual as specified in individual Specification Sections, and as reviewed and approved at the time of Section submittals. Submit reviewed manual content formatted and organized as required by this Section.
 - 1. Contractor and Commissioning Authority will comment on whether content of operation and maintenance submittals is acceptable.
- B. Format: Submit operation and maintenance manuals in the following format:

1. Submit by uploading to web-based project software site. Enable reviewer comments on draft submittals.
 2. Submit three paper copies.
- C. Initial Manual Submittal: Submit draft copy of each manual at least 30 days before commencing demonstration and training. Contractor and Commissioning Authority will comment on whether general scope and content of manual are acceptable.
- D. Final Manual Submittal: Submit each manual in final form prior to requesting inspection for Substantial Completion and at least 15 days before commencing demonstration and training. Contractor and Commissioning Authority will return copy with comments.
1. Correct or revise each manual to comply with Contractor's and Commissioning Authority's comments. Submit copies of each corrected manual within 15 days of receipt of Contractor's and Commissioning Authority's comments and prior to commencing demonstration and training.
- E. Comply with Section 01 77 00 "Closeout Procedures" for schedule for submitting operation and maintenance documentation.

1.5 FORMAT OF OPERATION AND MAINTENANCE MANUALS

- A. Manuals, Electronic Files: Submit manuals in the form of a multiple file composite electronic PDF file for each manual type required.
1. Electronic Files: Use electronic files prepared by manufacturer where available. Where scanning of paper documents is required, configure scanned file for minimum readable file size.
 2. File Names and Bookmarks: Bookmark individual documents based on file names. Name document files to correspond to system, subsystem, and equipment names used in manual directory and table of contents. Group documents for each system and subsystem into individual composite bookmarked files, then create composite manual, so that resulting bookmarks reflect the system, subsystem, and equipment names in a readily navigated file tree. Configure electronic manual to display bookmark panel on opening file.
- B. Manuals, Paper Copy: Submit manuals in the form of hard-copy, bound and labeled volumes.
1. Binders: Heavy-duty, three-ring, vinyl-covered, loose-leaf binders, in thickness necessary to accommodate contents, sized to hold 8-1/2-by-11-inch paper; with clear plastic sleeve on spine to hold label describing contents and with pockets inside covers to hold folded oversize sheets.
 - a. If two or more binders are necessary to accommodate data of a system, organize data in each binder into groupings by subsystem and related components. Cross-reference other binders if necessary to provide essential information for proper operation or maintenance of equipment or system.

- b. Identify each binder on front and spine, with printed title "OPERATION AND MAINTENANCE MANUAL," Project title or name and subject matter of contents, and indicate Specification Section number on bottom of spine. Indicate volume number for multiple-volume sets.
2. Dividers: Heavy-paper dividers with plastic-covered tabs for each section of the manual. Mark each tab to indicate contents. Include typed list of products and major components of equipment included in the section on each divider, cross-referenced to Specification Section number and title of Project Manual.
3. Protective Plastic Sleeves: Transparent plastic sleeves designed to enclose diagnostic software storage media for computerized electronic equipment. Enclose title pages and directories in clear plastic sleeves.
4. Supplementary Text: Prepared on 8-1/2-by-11-inch white bond paper.
5. Drawings: Attach reinforced, punched binder tabs on drawings and bind with text.
 - a. If oversize drawings are necessary, fold drawings to same size as text pages and use as foldouts.
 - b. If drawings are too large to be used as foldouts, fold and place drawings in labeled envelopes and bind envelopes in rear of manual. At appropriate locations in manual, insert typewritten pages indicating drawing titles, descriptions of contents, and drawing locations.

1.6 REQUIREMENTS FOR EMERGENCY, OPERATION, AND MAINTENANCE MANUALS

- A. Organization of Manuals: Unless otherwise indicated, organize each manual into a separate section for each system and subsystem, and a separate section for each piece of equipment not part of a system. Each manual shall contain the following materials, in the order listed:

1. Title page.
2. Table of contents.
3. Manual contents.

- B. Title Page: Include the following information:

1. Subject matter included in manual.
2. Name and address of Project.
3. Name and address of FAA.
4. Date of submittal.
5. Name and contact information for Contractor.
6. Name and contact information for Construction Manager.
7. Name and contact information for COR.
8. Name and contact information for Commissioning Authority.
9. Names and contact information for major consultants to the COR that designed the systems contained in the manuals.
10. Cross-reference to related systems in other operation and maintenance manuals.

- C. Table of Contents: List each product included in manual, identified by product name, indexed to the content of the volume, and cross-referenced to Specification Section number in Project Manual.
 - 1. If operation or maintenance documentation requires more than one volume to accommodate data, include comprehensive table of contents for all volumes in each volume of the set.
 - D. Manual Contents: Organize into sets of manageable size. Arrange contents alphabetically by system, subsystem, and equipment. If possible, assemble instructions for subsystems, equipment, and components of one system into a single binder.
 - E. Identification: In the documentation directory and in each operation and maintenance manual, identify each system, subsystem, and piece of equipment with same designation used in the Contract Documents. If no designation exists, assign a designation according to ASHRAE Guideline 4, "Preparation of Operating and Maintenance Documentation for Building Systems."
- 1.7 OPERATION AND MAINTENANCE DOCUMENTATION DIRECTORY MANUAL
- A. Operation and Maintenance Documentation Directory: Prepare a separate manual that provides an organized reference to emergency, operation, and maintenance manuals. List items and their location to facilitate ready access to desired information. Include the following:
 - 1. List of Systems and Subsystems: List systems alphabetically. Include references to operation and maintenance manuals that contain information about each system.
 - 2. List of Equipment: List equipment for each system, organized alphabetically by system. For pieces of equipment not part of system, list alphabetically in separate list.
 - 3. Tables of Contents: Include a table of contents for each emergency, operation, and maintenance manual.
- 1.8 EMERGENCY MANUALS
- A. Emergency Manual: Assemble a complete set of emergency information indicating procedures for use by emergency personnel and by FAA's operating personnel for types of emergencies indicated.
 - B. Content: Organize manual into a separate section for each of the following:
 - 1. Type of emergency.
 - 2. Emergency instructions.
 - 3. Emergency procedures.

- C. Type of Emergency: Where applicable for each type of emergency indicated below, include instructions and procedures for each system, subsystem, piece of equipment, and component:
 - 1. Fire.
 - 2. Flood.
 - 3. Gas leak.
 - 4. Water leak.
 - 5. Power failure.
 - 6. Water outage.
 - 7. System, subsystem, or equipment failure.
 - 8. Chemical release or spill.
- D. Emergency Instructions: Describe and explain warnings, trouble indications, error messages, and similar codes and signals. Include responsibilities of FAA's operating personnel for notification of Installer, supplier, and manufacturer to maintain warranties.
- E. Emergency Procedures: Include the following, as applicable:
 - 1. Instructions on stopping.
 - 2. Shutdown instructions for each type of emergency.
 - 3. Operating instructions for conditions outside normal operating limits.
 - 4. Required sequences for electric or electronic systems.
 - 5. Special operating instructions and procedures.

1.9 SYSTEMS AND EQUIPMENT OPERATION MANUALS

- A. Systems and Equipment Operation Manual: Assemble a complete set of data indicating operation of each system, subsystem, and piece of equipment not part of a system. Include information required for daily operation and management, operating standards, and routine and special operating procedures.
 - 1. Engage a factory-authorized service representative to assemble and prepare information for each system, subsystem, and piece of equipment not part of a system.
 - 2. Prepare a separate manual for each system and subsystem, in the form of an instructional manual for use by FAA's operating personnel.
- B. Content: In addition to requirements in this Section, include operation data required in individual Specification Sections and the following information:
 - 1. System, subsystem, and equipment descriptions. Use designations for systems and equipment indicated on Contract Documents.
 - 2. Performance and design criteria if Contractor has delegated design responsibility.
 - 3. Operating standards.
 - 4. Operating procedures.
 - 5. Operating logs.
 - 6. Wiring diagrams.

7. Control diagrams.
8. Piped system diagrams.
9. Precautions against improper use.
10. License requirements including inspection and renewal dates.

C. Descriptions: Include the following:

1. Product name and model number. Use designations for products indicated on Contract Documents.
2. Manufacturer's name.
3. Equipment identification with serial number of each component.
4. Equipment function.
5. Operating characteristics.
6. Limiting conditions.
7. Performance curves.
8. Engineering data and tests.
9. Complete nomenclature and number of replacement parts.

D. Operating Procedures: Include the following, as applicable:

1. Startup procedures.
2. Equipment or system break-in procedures.
3. Routine and normal operating instructions.
4. Regulation and control procedures.
5. Instructions on stopping.
6. Normal shutdown instructions.
7. Seasonal and weekend operating instructions.
8. Required sequences for electric or electronic systems.
9. Special operating instructions and procedures.

E. Systems and Equipment Controls: Describe the sequence of operation, and diagram controls as installed.

F. Piped Systems: Diagram piping as installed, and identify color coding where required for identification.

1.10 SYSTEMS AND EQUIPMENT MAINTENANCE MANUALS

A. Systems and Equipment Maintenance Manuals: Assemble a complete set of data indicating maintenance of each system, subsystem, and piece of equipment not part of a system. Include manufacturers' maintenance documentation, preventive maintenance procedures and frequency, repair procedures, wiring and systems diagrams, lists of spare parts, and warranty information.

1. Engage a factory-authorized service representative to assemble and prepare information for each system, subsystem, and piece of equipment not part of a system.
2. Prepare a separate manual for each system and subsystem, in the form of an instructional manual for use by FAA's operating personnel.

- B. Content: For each system, subsystem, and piece of equipment not part of a system, include source information, manufacturers' maintenance documentation, maintenance procedures, maintenance and service schedules, spare parts list and source information, maintenance service contracts, and warranties and bonds as described below.
- C. Source Information: List each system, subsystem, and piece of equipment included in manual, identified by product name and arranged to match manual's table of contents. For each product, list name, address, and telephone number of Installer or supplier and maintenance service agent, and cross-reference Specification Section number and title in Project Manual and drawing or schedule designation or identifier where applicable.
- D. Manufacturers' Maintenance Documentation: Include the following information for each component part or piece of equipment:
 - 1. Standard maintenance instructions and bulletins; include only sheets pertinent to product or component installed. Mark each sheet to identify each product or component incorporated into the Work. If data include more than one item in a tabular format, identify each item using appropriate references from the Contract Documents. Identify data applicable to the Work and delete references to information not applicable.
 - a. Prepare supplementary text if manufacturers' standard printed data are not available and where the information is necessary for proper operation and maintenance of equipment or systems.
 - 2. Drawings, diagrams, and instructions required for maintenance, including disassembly and component removal, replacement, and assembly.
 - 3. Identification and nomenclature of parts and components.
 - 4. List of items recommended to be stocked as spare parts.
- E. Maintenance Procedures: Include the following information and items that detail essential maintenance procedures:
 - 1. Test and inspection instructions.
 - 2. Troubleshooting guide.
 - 3. Precautions against improper maintenance.
 - 4. Disassembly; component removal, repair, and replacement; and reassembly instructions.
 - 5. Aligning, adjusting, and checking instructions.
 - 6. Demonstration and training video recording, if available.
- F. Maintenance and Service Schedules: Include service and lubrication requirements, list of required lubricants for equipment, and separate schedules for preventive and routine maintenance and service with standard time allotment.
 - 1. Scheduled Maintenance and Service: Tabulate actions for daily, weekly, monthly, quarterly, semiannual, and annual frequencies.
 - 2. Maintenance and Service Record: Include manufacturers' forms for recording maintenance.

- G. Spare Parts List and Source Information: Include lists of replacement and repair parts, with parts identified and cross-referenced to manufacturers' maintenance documentation and local sources of maintenance materials and related services.
- H. Maintenance Service Contracts: Include copies of maintenance agreements with name and telephone number of service agent.
- I. Warranties and Bonds: Include copies of warranties and bonds and lists of circumstances and conditions that would affect validity of warranties or bonds.
 - 1. Include procedures to follow and required notifications for warranty claims.
- J. Drawings: Prepare drawings supplementing manufacturers' printed data to illustrate the relationship of component parts of equipment and systems and to illustrate control sequence and flow diagrams. Coordinate these drawings with information contained in record Drawings to ensure correct illustration of completed installation.
 - 1. Do not use original project record documents as part of maintenance manuals.

1.11 PRODUCT MAINTENANCE MANUALS

- A. Product Maintenance Manual: Assemble a complete set of maintenance data indicating care and maintenance of each product, material, and finish incorporated into the Work.
- B. Content: Organize manual into a separate section for each product, material, and finish. Include source information, product information, maintenance procedures, repair materials and sources, and warranties and bonds, as described below.
- C. Source Information: List each product included in manual, identified by product name and arranged to match manual's table of contents. For each product, list name, address, and telephone number of Installer or supplier and maintenance service agent, and cross-reference Specification Section number and title in Project Manual and drawing or schedule designation or identifier where applicable.
- D. Product Information: Include the following, as applicable:
 - 1. Product name and model number.
 - 2. Manufacturer's name.
 - 3. Color, pattern, and texture.
 - 4. Material and chemical composition.
 - 5. Reordering information for specially manufactured products.
- E. Maintenance Procedures: Include manufacturer's written recommendations and the following:
 - 1. Inspection procedures.
 - 2. Types of cleaning agents to be used and methods of cleaning.
 - 3. List of cleaning agents and methods of cleaning detrimental to product.
 - 4. Schedule for routine cleaning and maintenance.

- 5. Repair instructions.
- F. Repair Materials and Sources: Include lists of materials and local sources of materials and related services.
- G. Warranties and Bonds: Include copies of warranties and bonds and lists of circumstances and conditions that would affect validity of warranties or bonds.
 - 1. Include procedures to follow and required notifications for warranty claims.

PART 2 - PRODUCTS (Not Used)

PART 3 - EXECUTION (Not Used)

END OF SECTION **01 78 23**

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SECTION 01 78 39 - PROJECT RECORD DOCUMENTS

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

- A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and other Division 01 Specification Sections, apply to this Section.

1.2 SUMMARY

- A. Section includes administrative and procedural requirements for Project Record Documents, including the following:

- 1. Record Drawings.
- 2. Record specifications.
- 3. Record Product Data.
- 4. Miscellaneous record submittals.

- B. Related Requirements:

- 1. Section 01 73 00 "Execution" for final property survey.
- 2. Section 01 77 00 "Closeout Procedures" for general closeout procedures.
- 3. Section 01 78 23 "Operation and Maintenance Data" for operation and maintenance manual requirements.

- C. General

- 1. This section describes the requirements for the creation and maintenance of "As Built Drawings;" referred to herein as Record Documents.
- 2. The Contractor shall use the Government furnished CAD files to electronically reconfigure, modify, and update the Construction Contract Drawings with as-built information so as to develop Record Documents. Government furnished CAD files shall be updated by the Contractor to include as built layout and facility data shown on Shop Drawings, product submittals, and material submittals approved in accordance with Section 01 33 00.
- 3. Maintenance of Record Documents.
- 4. Submittal of Record Documents.

1.3 CLOSEOUT SUBMITTALS

- A. Record Drawings: Comply with the following:

- 1. Number of Copies: Submit one set of marked-up record prints.
- 2. Number of Copies: Submit copies of Record Drawings as follows:
 - a. Final Submittal:

- 1) Submit three paper-copy sets of marked-up record prints.
 - 2) Submit PDF electronic files of scanned Record Prints and three sets of file prints.
 - 3) Print each drawing, whether or not changes and additional information were recorded.
- B. Record Specifications: Submit annotated PDF electronic files and three paper copies of Project's Specifications, including addenda and Contract modifications.
- C. Record Product Data: Submit annotated PDF electronic files and directories and three paper copies of each submittal.
1. Where record Product Data are required as part of operation and maintenance manuals, submit duplicate marked-up Product Data as a component of manual.
- D. Miscellaneous Record Submittals: See other Specification Sections for miscellaneous record-keeping requirements and submittals in connection with various construction activities. Submit annotated PDF electronic files and directories and three paper copies of each submittal.
1. Provide record roof plan drawing showing receptor and cabling locations for remounted lightning protection system.
- E. Reports: Submit written report weekly indicating items incorporated into Project Record Documents concurrent with progress of the Work, including revisions, concealed conditions, field changes, product selections, and other notations incorporated.

1.4 RECORD DRAWINGS

- A. Record Prints: Maintain one set of marked-up paper copies of the Contract Drawings and Shop Drawings, incorporating new and revised drawings as modifications are issued.
1. Preparation: Mark record prints to show the actual installation, where installation varies from that shown originally. Require individual or entity who obtained record data, whether individual or entity is Installer, subcontractor, or similar entity, to provide information for preparation of corresponding marked-up record prints.
 - a. Give particular attention to information on concealed elements that would be difficult to identify or measure and record later.
 - b. Accurately record information in an acceptable drawing technique.
 - c. Record data as soon as possible after obtaining it.
 - d. Record and check the markup before enclosing concealed installations.
 - e. Cross-reference record prints to corresponding photographic documentation.

2. Content: Types of items requiring marking include, but are not limited to, the following:
 - a. Dimensional changes to Drawings.
 - b. Revisions to details shown on Drawings.
 - c. Depths of foundations.
 - d. Locations and depths of underground utilities.
 - e. Revisions to routing of piping and conduits.
 - f. Revisions to electrical circuitry.
 - g. Actual equipment locations.
 - h. Duct size and routing.
 - i. Locations of concealed internal utilities.
 - j. Changes made by Change Order or Work Change Directive.
 - k. Changes made following COR's written orders.
 - l. Details not on the original Contract Drawings.
 - m. Field records for variable and concealed conditions.
 - n. Record information on the Work that is shown only schematically.
 3. Mark the Contract Drawings and Shop Drawings completely and accurately. Use personnel proficient at recording graphic information in production of marked-up record prints.
 4. Mark record prints with erasable, red-colored pencil. Use other colors to distinguish between changes for different categories of the Work at same location.
 5. Mark important additional information that was either shown schematically or omitted from original Drawings.
 6. Note Construction Change Directive numbers, alternate numbers, Change Order numbers, and similar identification, where applicable.
- B. Record Digital Data Files: Immediately before inspection for Certificate of Substantial Completion, review marked-up record prints with Contractor and Project Manager. When authorized, prepare a full set of corrected digital data files of the Contract Drawings, as follows:
1. Format: Same digital data software program, version, and operating system as for the original Contract Drawings.
 2. Format: DWG, Microsoft Windows operating system.
 3. Format: Annotated PDF electronic file with comment function enabled.
 4. Incorporate changes and additional information previously marked on record prints. Delete, redraw, and add details and notations where applicable.
 5. Refer instances of uncertainty to Contractor through Project Manager for resolution.
 6. COR will furnish Contractor with one set of digital data files of the Contract Drawings for use in recording information.
- C. Format: Identify and date each Record Drawing; include the designation "PROJECT RECORD DRAWING" in a prominent location.
1. Record Prints: Organize record prints into manageable sets. Bind each set with durable paper cover sheets. Include identification on cover sheets.

2. Format: Annotated PDF electronic file with comment function enabled.
3. Record Digital Data Files: Organize digital data information into separate electronic files that correspond to each sheet of the Contract Drawings. Name each file with the sheet identification. Include identification in each digital data file.
4. Identification: As follows:
 - a. Project name.
 - b. Date.
 - c. Designation "PROJECT RECORD DRAWINGS."

1.5 RECORD SPECIFICATIONS

- A. Preparation: Mark Specifications to indicate the actual product installation, where installation varies from that indicated in Specifications, addenda, and Contract modifications.
 1. Give particular attention to information on concealed products and installations that cannot be readily identified and recorded later.
 2. Mark copy with the proprietary name and model number of products, materials, and equipment furnished, including substitutions and product options selected.
 3. Record the name of manufacturer, supplier, Installer, and other information necessary to provide a record of selections made.
 4. For each principal product, indicate whether Record Product Data has been submitted in operation and maintenance manuals instead of submitted as Record Product Data.
 5. Note related Change Orders, Record Product Data, and Record Drawings where applicable.
- B. Format: Submit record specifications as annotated PDF electronic file.

1.6 RECORD PRODUCT DATA

- A. Recording: Maintain one copy of each submittal during the construction period for Project Record Document purposes. Post changes and revisions to Project Record Documents as they occur; do not wait until end of Project.
- B. Preparation: Mark Product Data to indicate the actual product installation where installation varies substantially from that indicated in Product Data submittal.
 1. Give particular attention to information on concealed products and installations that cannot be readily identified and recorded later.
 2. Include significant changes in the product delivered to Project site and changes in manufacturer's written instructions for installation.
 3. Note related Change Orders, Record Specifications, and Record Drawings where applicable.
- C. Format: Submit Record Product Data as annotated PDF electronic file.

1. Include Record Product Data directory organized by Specification Section number and title, electronically linked to each item of Record Product Data.

1.7 MISCELLANEOUS RECORD SUBMITTALS

- A. Assemble miscellaneous records required by other Specification Sections for miscellaneous record keeping and submittal in connection with actual performance of the Work. Bind or file miscellaneous records and identify each, ready for continued use and reference.
- B. Format: Submit miscellaneous record submittals as PDF electronic file.
 1. Include miscellaneous record submittals directory organized by Specification Section number and title, electronically linked to each item of miscellaneous record submittals.

1.8 MAINTENANCE OF RECORD DOCUMENTS

- A. Maintenance of Record Documents: Store Record Documents in the field office apart from the Contract Documents used for construction. Do not use Project Record Documents for construction purposes. Maintain Record Documents in good order and in a clean, dry, legible condition, protected from deterioration and loss. Provide access to Project Record Documents for Contractor's reference during normal working hours.
- B. Keep Record Documents and Samples available for inspection by FAA.

PART 2 - PRODUCTS (Not Used)

PART 3 - EXECUTION (Not Used)

END OF SECTION **01 78 39**

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SECTION 02 41 19 - SELECTIVE DEMOLITION

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

- A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 01 Specification Sections, apply to this Section.

1.2 SUMMARY

- A. Section Includes:
 - 1. Demolition and removal of selected portions of building or structure.
- B. Related Requirements:
 - 1. Section 01 10 00 "Summary" for restrictions on the use of the premises, FAA-occupancy requirements, and phasing requirements.

1.3 DEFINITIONS

- A. Remove: Detach items from existing construction and legally dispose of them off-site unless indicated to be removed and salvaged or removed and reinstalled.
- B. Remove and Salvage: Carefully detach from existing construction, in a manner to prevent damage, and deliver to FAA ready for reuse.
- C. Remove and Reinstall/ Save for Reuse: Detach items from existing construction, prepare for reuse, and reinstall where indicated.
- D. Existing to Remain: Existing items of construction that are not to be permanently removed and that are not otherwise indicated to be removed, removed and salvaged, or removed and reinstalled.
- E. HEPA Filter: High Efficiency Particulate Air Filter. A filter capable of trapping and retaining at least 99.97 percent of all mono-dispersed particles of 0.3 micrometers in diameter.

1.4 MATERIALS OWNERSHIP

- A. Unless otherwise indicated, demolition waste becomes property of Contractor.

1.5 PREINSTALLATION MEETINGS

- A. Predemolition Conference: Conduct conference at Project site.
 - 1. Inspect and discuss condition of construction to be selectively demolished.
 - 2. Review structural load limitations of existing structure.
 - 3. Review and finalize selective demolition schedule and verify availability of materials, demolition personnel, equipment, and facilities needed to make progress and avoid delays.
 - 4. Review requirements of work performed by other trades that rely on substrates exposed by selective demolition operations.
 - 5. Review areas where existing construction is to remain and requires protection.
 - 6. Review provisions for temporary power during demolition and construction.
 - 7. Review demolition work with Construction Waste Management requirements.
 - 8. Review roof demolition work, roof work and compliance with safety requirements.

1.6 ACTION SUBMITTALS

- A. Hot Work Permit: Prepare and submit the FAA Hot Work Permit or Contractor's equivalent to the COR. The Contractor shall coordinate all project-related Hot Work with the COR.

1.7 INFORMATIONAL SUBMITTALS

- A. Qualification Data: For refrigerant recovery technician.
- B. Proposed Protection Measures: Submit report, including drawings, that indicates the measures proposed for protecting individuals and property , for dust control and , for noise control. Indicate proposed locations and construction of barriers.
 - 1. Dust Control: Provide Dust Control Plan including proposal for adequate ventilation and accompanying sketches or shop drawings. Proposal shall include Negative Air Machines (NAM) and proposed routing of exhaust. Coordinate with COR.
 - 2. Proposed Noise Control Plan: Submit plan for minimizing construction noise from migrating into occupied spaces and disrupting facility operations. Plan shall include:
 - a. Physical noise control mitigation features.
 - b. Work to be performed during off-hours.
- C. Schedule of Selective Demolition Activities: Indicate the following:
 - 1. Detailed sequence of selective demolition and removal work, with starting and ending dates for each activity. Ensure FAA's building manager's and on-site operations as well as security systems and components are uninterrupted.

2. Interruption of utility services. Interruption of utility and communications services will not be allowed.
 3. Coordination of FAA's continuing occupancy of portions of existing building and of FAA's partial occupancy of completed Work.
- D. Warranties: Documentation indicated that existing warranties are still in effect after completion of selective demolition.

1.8 QUALITY ASSURANCE

- A. Handle waste materials as specified in Section 01 74 19 "Cleaning and Waste Management".

1.9 FIELD CONDITIONS

- A. FAA will occupy portions of building immediately adjacent to selective demolition area. Conduct selective demolition so FAA's operations will not be disrupted.
- B. Conditions existing at time of inspection for bidding purpose will be maintained by FAA as far as practical.
- C. Notify COR of discrepancies between existing conditions and Drawings before proceeding with selective demolition.
- D. Hazardous Materials: It is not expected that hazardous materials will be encountered in the Work other than where identified elsewhere in the Contract Documents.
1. Hazardous materials encountered and not identified elsewhere in the Contract Documents will be removed by COR before start of the Work.
- E. If suspected hazardous materials are encountered, do not disturb; immediately notify COR and COR. Hazardous materials will be removed by COR under a separate contract.
- F. Hazardous Materials: Hazardous materials are present in buildings and structures to be selectively demolished. A report on the presence of hazardous materials is on file for review and use. Examine report to become aware of locations where hazardous materials are present.
1. Hazardous material remediation is specified elsewhere in the Contract Documents.
 2. Do not disturb hazardous materials or items suspected of containing hazardous materials except under procedures specified elsewhere in the Contract Documents.
- G. Storage or sale of removed items or materials on-site is not permitted.
- H. Utility Service: Maintain existing utilities indicated to remain in service and protect them against damage during selective demolition operations.

1. Maintain fire-protection facilities, including sprinkler and fire alarm systems, in service during selective demolition operations

PART 2 - PRODUCTS

2.1 PERFORMANCE REQUIREMENTS

- A. Regulatory Requirements: Comply with governing EPA notification regulations before beginning selective demolition. Comply with hauling and disposal regulations of authorities having jurisdiction.
- B. Standards: Comply with ANSI/ASSE A10.6 and NFPA 241.

2.2 REPAIR MATERIALS

- A. Use repair materials identical to existing materials, except as follows:
 1. Where identical materials are unavailable or cannot be used for exposed surfaces, use materials that visually match existing adjacent surfaces to the fullest extent possible.
 2. Use materials whose installed performance equal or surpasses that of existing materials.

PART 3 - EXECUTION

3.1 EXAMINATION

- A. Verify that utilities have been disconnected and capped before starting selective demolition operations.
- B. Review record documents of existing construction provided by FAA. FAA does not guarantee that existing conditions are same as those indicated in record documents.
- C. Survey existing conditions and correlate with requirements indicated to determine extent of selective demolition required.
- D. When unanticipated mechanical, electrical, or structural elements that conflict with intended function or design are encountered, investigate and measure the nature and extent of conflict. Promptly submit a written report to COR.

3.2 UTILITY SERVICES AND MECHANICAL/ELECTRICAL SYSTEMS

- A. Existing Services/Systems to Remain: Maintain services/systems indicated to remain and protect them against damage.

1. Comply with requirements for existing services/systems interruptions specified in Section 01 10 00 "Summary."

3.3 PREPARATION

- A. Site Access and Temporary Controls: Conduct selective demolition and debris-removal operations to ensure minimum interference with roads, streets, walks, walkways, and other adjacent occupied and used facilities.
 1. Comply with requirements for access and protection specified in Section 01 50 00 "Temporary Facilities and Controls."
- B. Temporary Facilities: Provide temporary barricades and other protection required to prevent injury to people and damage to adjacent buildings and facilities to remain.
 1. Provide protection to ensure safe passage of people around selective demolition area and to and from occupied portions of building.
 2. Provide temporary weather protection, during interval between selective demolition of existing construction on exterior surfaces and new construction, to prevent water leakage and damage to structure and interior areas.
 3. Protect walls, ceilings, floors, and other existing finish work that are to remain or that are exposed during selective demolition operations.
 4. Cover and protect furniture, furnishings, and equipment that have not been removed.
 5. Comply with requirements for temporary enclosures, dust control, heating, and cooling as indicated herein and on the Drawings.

3.4 SELECTIVE DEMOLITION, GENERAL

- A. General: Demolish and remove existing construction only to the extent required by new construction and as indicated. Use methods required to complete the Work within limitations of governing regulations and as follows:
 1. Neatly cut openings and holes plumb, square, and true to dimensions required. Use cutting methods least likely to damage construction to remain or adjoining construction. Use hand tools or small power tools designed for sawing or grinding, not hammering and chopping, to minimize disturbance of adjacent surfaces. Temporarily cover openings to remain.
 2. Do not use cutting torches until work area is cleared of flammable materials. At concealed spaces, such as duct and pipe interiors, verify condition and contents of hidden space before starting flame-cutting operations. Maintain fire watch and portable fire-suppression devices during flame-cutting operations.
 3. Maintain adequate ventilation when using cutting torches.
 4. Remove decayed, vermin-infested, or otherwise dangerous or unsuitable materials and promptly dispose of off-site.
 5. Remove structural framing members and lower to ground by method suitable to avoid free fall and to prevent ground impact or dust generation.

6. Locate selective demolition equipment and remove debris and materials so as not to impose excessive loads on supporting walls, floors, or framing.
 7. Dispose of demolished items and materials promptly. Comply with requirements in Section 01 74 00 "Construction Waste Management and Disposal."]
 8. The edges of concrete to be removed shall be saw-cut with neat, straight lines.
- B. Existing Items to Remain: Protect construction indicated to remain against damage and soiling during selective demolition. When permitted by COR, items may be removed to a suitable, protected storage location during selective demolition and cleaned and reinstalled in their original locations after selective demolition operations are complete.

3.5 SELECTIVE DEMOLITION PROCEDURES FOR SPECIFIC MATERIALS

- A. Roofing: Remove no more existing roofing than is required for the work and that can be covered in one day by new roofing and so that building interior remains watertight and weathertight.

3.6 HOT WORK AND CUTTING

- A. Hot Work is any activity that creates heat, flame, sparks, or smoke. Examples of Hot Work include but are not limited to: Hot Work (gas or arc), Cutting, Grinding, Brazing, Soldering, use of Open Flame Heaters in Buildings, and Hot Tar Operations.
- B. The Contractor shall obtain a Hot Work Permit prior to any activity involving hot work. A fire guard shall remain on station one hour following the cessation of hot work activities to extinguish any incipient stage fires that may develop.
- C. Contractor shall submit a Hot Work and Torch Cutting Plan for approval prior to beginning Hot Work and cutting activities. The Plan shall identify the portions of work where Hot Work and cutting will be performed, locations of the work, types of Hot Work and cutting being proposed, schedule for the proposed Hot Work and cutting activities, and Contractor's plan for protecting the facility and its occupants, operations, and equipment during the Hot Work and cutting activities. Special attention is required for procedures and protection for Hot Work and cutting around or adjacent to existing electronic equipment.
- D. Building electrical power SHALL NOT be used for arc Hot Work. Building components, including structural or miscellaneous steel SHALL NOT be used as grounding return for Hot Work activities.
- E. Ventilation and exhaust to the outside shall be provided during Hot Work and cutting activities to keep the zone clear. Do not weld or cut unless ventilation and exhaust have been deemed acceptable to the Authorities Having Jurisdiction. Provide non-flammable shields to protect persons and property. Keep cylinders upright and chained or secured to their supports.
- F. Remove flammable materials from Hot Work and cutting areas prior to beginning Hot Work and cutting activities. Keep fire extinguishers in the Hot Work and cutting areas.

- G. Perform Hot Work and cutting in accordance with the American Society's Specifications and Safe Practice Codes criteria, and with OSHA Safety Requirements.
- H. Fire Watch: Provide Fire Watch Operations in accordance with requirements and policies of Authorities Having Jurisdiction.

3.7 DISPOSAL OF DEMOLISHED MATERIALS

- A. General: Except for items or materials indicated to be recycled, reused, salvaged, reinstalled, or otherwise indicated to remain FAA's property, remove demolished materials from Project site and legally dispose of them in an EPA-approved landfill.
 - 1. Do not allow demolished materials to accumulate on-site.
 - 2. Remove and transport debris in a manner that will prevent spillage on adjacent surfaces and areas.
 - 3. Remove debris from elevated portions of building by chute, hoist, or other device that will convey debris to grade level in a controlled descent.
 - 4. Comply with requirements specified in Section 01 74 19 "Construction Waste Management and Disposal."
- B. Burning: Do not burn demolished materials.
- C. Disposal: Transport demolished materials off FAAFAA's property and legally dispose of them.

3.8 CLEANING

- A. Clean adjacent structures and improvements of dust, dirt, and debris caused by selective demolition operations. Return adjacent areas to condition existing before selective demolition operations began.
- B. Change filters on air-handling equipment on completion of selective demolition operations.

END OF SECTION **02 41 19**

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SECTION 02 82 00 - ASBESTOS ABATEMENT MANAGEMENT

PART 1 - GENERAL

1.1 SUMMARY

- A. Applicable provisions of Division 1 - General Requirements, drawings, and other provisions and requirements of the Contract Documents apply to work of this Section. This specification is being included as part of the bid package to be followed for the removal of asbestos containing caulking that will be disturbed during the course of the project.
1. The Facility Improvement Project will include asbestos at the exterior cab level.
 2. This Section includes the removal, control and disposal of asbestos containing material (ACM) which shall be encountered during the work at the Honolulu Control Facility in Honolulu, Hawaii. The work may include the construction of temporary enclosures to isolate the work area, the establishment of negative-air pressure within the isolated work area, the removal of ACM from the isolated work area, and the packaging and legal disposal of the removed ACM debris from FAA property.
 - a. Observe all existing conditions prior to submitting a bid. Include in the bid, existing conditions and their impact, particularly to cost of the health and safety of workers and occupants, and proper function and operation of the facility. Be aware of other work being performed. Failure to visit the site shall in no way provide relief from the necessity of furnishing materials or performing any work that may be required to complete the work in accordance with the Contract Documents without additional cost to the FAA. All site visits shall be scheduled with the FAA.
 3. The quantities, locations and the extent of work indicated are only best estimates, which are limited by the physical constraints imposed by occupancy of the facility.
 4. Asbestos Containing Material (ACM) - Refer to the contract drawings for identification of areas and locations of materials to be abated. Coordinate abatement work with all areas of work scheduled for the project.
 5. The following tables indicate the types and locations of ACM identified within the project area. No visual or analytical verification of this data was performed. The FAA has verified presence of ACM at the facility. The items listed in the table below constitute PACM.

Room	Description	Material
Exterior Cab wall panels	Window caulking and wall panel seam ~100 linear feet (200 sq feet)	1.0-5.0% Chrysolite

1.2 REMOVAL AND MANAGEMENT

- A. Asbestos Containing Materials: All ACM shall be removed and disposed of properly as Asbestos Containing Hazardous Waste in accordance with Federal, State and local regulations.

1.3 REFERENCE DOCUMENTS

- A. The following documents are included for general reference and may not be inclusive of all standards applicable for this project. The current issue of the following documents on the date of Invitation for Bids form a part of this specification and are applicable to the extent specified. Work shall conform to applicable federal, state and local government's regulations and to the requirements specified in these Contract Documents. Whenever inconsistencies occur between the referenced materials, the more stringent shall apply. The intent of these documents is to verify the Work is conducted at the highest level of safety.

American National Standards Institute (ANSI)

ANSI Z87.1	Occupational and Educational Eye and Face Protection
ANSI Z88.2	Respiratory Protection
ANSI Z89.1	Hard Hats
ANSI Z9.2	Fundamentals Governing the Design and Operation of Local Exhaust Systems

American Society for Testing and Materials (ASTM)

ASTM C 732	Aging Effects of Artificial Weathering on Latex Sealants
ASTM D 522	Mandrel Bend Test of Attached Organic Coatings
ASTM D 1331	Surface and Interfacial Tension of Solutions of Surface-Active Agents
ASTM D 2794	Resistance of Organic Coatings to the Effects of Rapid Deformation (Impact)
ASTM D 4397	Polyethylene Sheeting for Construction, Industrial, and Agricultural Applications
ASTM E 84	Surface Burning Characteristics of Building Materials
ASTM E 96	Water Vapor Transmission of Materials
ASTM E 119	Fire Tests of Building Construction and Materials
ASTM E 736	Cohesion/Adhesion of Sprayed Fire-Resistive Materials Applied to Structural Members
ASTM E 1368	Visual Inspection of Asbestos Abatement Projects
ASTM D 2986	Evaluation of Air Assay Media by the Monodisperse DOP

(Dioctyl Phthalate) Smoke Test

ASTM D 4884-96 Standard Test Method for Strength of Sewn or Thermally Bonded Seams of Geotextiles

Code of Federal Regulations (CFR)

29 CFR Part 1910	Occupational Safety and Health Standards
Subpart I	Personal Protective Equipment
1910.132	General Requirements
1910.134	Respiratory Protection
Subpart J	General Environmental Controls
1910.145	Specifications for Accident Prevention Signs and Tags
Subpart Z	Toxic and Hazardous Substances
1910.1000	Air Contaminants
1910.1001	Asbestos
1910.1200	Hazard Communication
29 CFR Part 1926	Safety and Health Regulations for the Construction Industry
Subpart D	Occupational Health and Environmental Controls
1926.51	Sanitation
1926.52	Occupational Noise Control
1926.56	Illumination
Subpart E	Personal Protective & Life Saving Equipment
1926.100	Head Protection
1926.101	Hearing Protection
1926.102	Eye and Face Protection
1926.103	Respiratory Protection
1926.104	Safety Belts, Lifelines, and lanyards
Subpart F	Fire Protection and Prevention
1926.150	Fire Protection

	1926.151	Fire Prevention
	1926.154	Temporary Heating Devices
	Subpart J	Welding and Cutting
	1926.350	Gas Welding and Cutting
	1926.352	Fire Prevention
	1926.353	Ventilation and Protection in Welding, Cutting and Heating
	Subpart L	Scaffolds
	1926.450	Scope, Application, and Definitions Applicable to this Subpart
	1926.451	General Requirements
	1926.452	Additional Requirements Applicable to Specific Types of Scaffolds
	1926.453	Aerial Lifts
	1926.454	Training Requirements
	Appendix A	Scaffold Specifications
	Subpart M	Fall Protection
	1926.500	Scope, Applicability, and Definitions Applicable to this Subpart
	1926.501	Duty to Have Fall Protection
	1926.502	Fall Protection Systems Criteria and Practices
	1926.503	Training Requirements
	Subpart N	Cranes, Derricks, Hoists, Elevators, & Conveyors
	1926.552	Material Hoists, Personnel Hoists, and Elevators
	Subpart Z	Toxic & Hazardous Substances
	1926.1101	Asbestos
	Appendix F	Work Practices and Engineering Controls for Major Asbestos Removal, Renovation, and Demolition Operations
	Appendix I	Medical Surveillance Guidelines for Asbestos
40 CFR Part 61	Environmental Protection Agency	
	Subpart M	National Emission Standard for Asbestos

	Part 261	Identification and Listing of Hazardous Waste
	Part 763	Asbestos
	Subpart E	Asbestos-Containing Materials in Schools
	Subpart G	Asbestos Worker Protection
49 CFR Part 173	Department of Transportation	
	Shippers	General Requirements for Shipments and Packaging

National Institute for Occupational Safety and Health (NIOSH). Department of Health and Human Services

Method 7400	Fibers
Method 7402	Asbestos Fibers
Method 7082	Atomic Absorption; Flame
Method 7105	Atomic Absorption; Graphite Furnace

National Fire Protection Association (NFPA)

70	National Electrical Code
241	Construction and Renovations
701	Standard Method of Fire Tests for Flame-Resistant Textiles and Films.

Compressed Gas Association (CGA)

CGA G-7	Compressed Air for Human Respirators
CGA G-7	Commodity Specifications for Air

Underwriters Laboratories (UL)

UL 586	High-Efficiency Particulate Air Filter Units
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Additional Standards

NSF 49	National Sanitation Foundation Class II (Laminar Flow) Biohazard Cabinetry
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Federal Aviation Administration (FAA) Orders

Article 77	Agreement between DOT/FAA and the National Air Traffic Controllers Association (NATCA)
Article 52	Agreement between DOT/FAA and the Professional Airways System Specialists (PASS)
Order 1050.20A	Airway Facilities Asbestos Control
Order 3900.19B	FAA Occupational Safety and Health Program
Order 3900.19C	FAA Chapter 20, Section 20-4, Paragraph H
Local Order	Facility Asbestos Abatement Contingency Plan

Hawaii Administrative Rules (HAR)

Title 11

§11- 501,503-504 Asbestos Requirements, Fees and Certifications

Title 12

§12-145.1-1 Incorporation of Federal Standards

§12-145.1-2 Definitions

2021 Hawaii Revised Statutes

Title 19

§342P Asbestos and Lead

1.4 DEFINITIONS

A. The following terms used in the text shall be defined as follows:

1. CIH: An Industrial Hygienist certified in the comprehensive practice of industrial hygiene by the American Board of Industrial Hygiene.
2. Class I Asbestos Work: Activities involving the removal of thermal system insulation (TSI) and surfacing ACM.
3. Class II Asbestos Work: Activities involving the removal of ACM that is not thermal system insulation or surfacing material. This includes, but is not limited to, the removal of asbestos-containing caulk.

4. Class III Asbestos Work: Repair and maintenance operations where ACM, including TSI and surfacing ACM, is likely to be disturbed. Operations may include drilling, abrading, cutting a hole, cable pulling, crawling through tunnels or attics and spaces above the ceiling, where asbestos or asbestos-containing debris is actively disturbed. Removal of small amounts of ACM that would fit into a single 60 x 60 inch glove bag or disposal bag may be classified as a Class III job.
5. Class IV Asbestos Work: Maintenance and custodial construction activities during which employees contact but do not disturb ACM and activities to clean up dust, waste and debris resulting from Class I, II, and III activities. This may include dusting surfaces where ACM waste and debris and accompanying dust exists and cleaning up loose ACM debris from TSI or surfacing ACM following construction.
6. Competent Person: On all construction work sites the contractor shall designate a competent person having the qualifications and authority for verifying worker safety and health as required by 29 CFR 1926.20; for overseeing asbestos-related work as required by 29 CFR 1926.1101; and for management of the Silica Exposure Control plan as per 29 CFR 1926.1153. The duties of the competent person include, but are not limited to, the following: establishing the negative pressure enclosure, verifying its integrity, controlling entry into and exit from the enclosure, inspecting the work site for consistent use of engineering control, verifying workers wear required personal protective equipment and are trained in the use of hygiene facilities, work practices, and decontamination procedures specified in this specification and applicable regulations.
7. COR: Contracting Officer's Representative
8. Critical Barrier: 2 Layers of 6-mil polyethylene sheeting sealed over the openings in the work area (or other similarly placed physical barrier) sufficient to prevent airborne fibers in the work area from migrating to an adjacent area.
9. Demarcated Area: An area that has been isolated from the remaining portions of the building by installing critical barriers and/or flapped barriers on the doorways/entrances/and other openings to the area, posting the area with OSHA approved warning signage to prevent unauthorized entry, and providing HEPA equipped ventilation equipment to filter the air and provide directed airflow out of the area.
10. Friable ACM: A term as defined in 40 CFR 61, Subpart M and EPA 340/1-90-018 that means any material containing more than one percent asbestos as determined using the method specified in 40 CFR 763, Appendix A, Subpart F, Section 1, Polarized Light Microscopy, that when dry, can be crumbled, pulverized, or reduced to powder by hand pressure.
11. HEPA (High Efficiency Particulate Air) Filter: A filter capable of trapping and retaining at least 99.97 percent of all mono-dispersed particles of 0.3 micrometers in diameter.
12. Immediately: When the contractor is on-site, immediately refers actions required to take place within 15 minutes of being notified. When the contractor is off-site, immediately refers to actions required to take place within 2 hours of being notified.
13. MC (Monitoring Contractor): contracted as a third party to the FAA, to perform inspections and air monitoring.

14. PACM (Presumed Asbestos Containing Material): Thermal system insulation and surfacing material found in buildings constructed no later than 1980 that has not been tested to confirm the presence of asbestos but is presumed to contain asbestos.
15. PEL (Permissible Exposure Limit): OSHA PELs are worker exposure limits regulating the concentration of a substance in air that shall not be exceeded. For example:
 - (1) An airborne concentration of asbestos of 0.1 fibers per cubic centimeter of air (f/cc) as an eight- (8) hour time weighted average (TWA).
 - (2) An airborne concentration of asbestos of 1.0 f/cc as averaged over thirty- (30) minutes (Excursion Limit).
16. TWA (Time-Weighted Average): The TWA is an 8-hour time weighted average concentration. For airborne asbestos fibers (longer than 5 micrometers) per cubic centimeter of air that represents the employee's 8-hour workday as determined by Appendix A of 29 CFR 1926.1101.

1.5 PRE-BID CONTRACTOR QUALIFICATION SELECTION SUBMITTALS

- A. Provide the following pre-bid contractor qualification selection submittals:
- B. Contractor Identification: The Abatement Contractor shall be licensed by the State of Hawaii for the purpose of removal, encapsulation, enclosure, or demolition of asbestos containing construction material (ACCM) where required.
 1. Company name and address (street and mailing if different).
 2. Name of individual supplying information.
 3. Name of parent company, if any.
 4. California State Business License
 5. California Asbestos Abatement Contractors License.
 6. California Lead Abatement Contractors License.
 7. Project Manager Name.
 8. Address of office responsible for this project.
 9. Telephone number.
- C. Insurance: Contractor shall have at a minimum the following insurance.
 1. Commercial General Liability \$5 million per occurrence and aggregate with
bodily injury and property damage
coverages
 2. Automobile Liability \$5 million per occurrence and aggregate with bodily
injury coverage
 3. Worker's Compensation Consistent with state statutory requirements
 4. Employer's Liability \$2 million per occurrence and each employee
 5. Pollution Liability \$5 million per occurrence and aggregate
- D. Staff
 1. Number of full-time company employees.
 2. Names and resumes of local office Company Officers.

3. Names of local office full-time field supervisory personnel, and years of asbestos experience, include resumes.
4. Names of local office part-time field supervisory personnel, and years of asbestos experience, include resumes.
5. Number of local office full-time foreman and laborers.
6. Number of local office part-time foreman and laborers.
7. Name of employees' union(s), if any.
8. Usual ratio of supervisory to labor personnel used.

E. Experience

1. Briefly describe company history.
2. Provide evidence verifying the company has a minimum of three (3) years of successful abatement experience working in the State of Hawaii.
3. Provide a representative list (at least three projects) of successful abatement projects working in occupied facilities. List project name, date, size, duration, removal cost, references and telephone numbers for each project.
4. State average yearly dollar volume of abatement removal work over the past two years.

F. Regulatory (Past 5 Years):

1. List and explain warnings or citations received from Federal, State or Local Regulatory Agencies related to asbestos abatement activities. Include project name, date and resolution.
2. List assessed penalties, liquidated damages or schedule overruns and resolutions, which occurred. Include contract terminations.
3. List projects where the owner, architect or consultant halted project activities. State project name, date, reason for shutdown and resolutions.
4. List asbestos related legal proceedings/claims in which the company (or employees scheduled to participate in this project) have participated or are currently involved. Include descriptions of role, issue and resolution to date.
5. Medical Requirements: Provide a copy of the company's Medical Surveillance Program.

G. Abatement Training: Provide a copy of the company's training program for supervisors and laborers. The program shall include, but is not limited to, how often training is conducted, who conducts the training, when it is conducted, what the duration of the program is and how documentation of training is accomplished for asbestos. Provide copies of current Hawaii State licenses for abatement project supervisors and laborers.

H. Respiratory Protection: Provide a copy of the company's respiratory protection training program.

I. Health and Safety Program: Provide a copy of the company's health and safety program.

J. Submittal Notarization: Sign and date submittal by an officer of the company, indicating name and title of person signing.

1.6 POST-AWARD CONTRACTOR SUBMITTALS

A. Provide the following post-award contractor submittals (Provide two copies of the following):

B. Abatement Documentation:

1. Contractor State Licenses

- a. State Business License
- b. State Asbestos Contractors License
- c. Asbestos abatement regulatory notifications

2. An abatement schedule in timeline format shall include the following (detail each step as necessary)

- a. Preparation Time
- b. Notification Start Date
- c. Duration of Demolition/Abatement Activities
- d. Duration of Cleaning
- e. FAA/CIH Inspection Time
- f. Encapsulation and Drying Time
- g. Final Clearance
- h. Tear Down

3. Interface of trades involved in the construction to support the sequencing of asbestos-related work including, but limited to:

- a. Electricians: Providing electrical power for each containment.
- b. Plumbers: Providing water supply and/or sanitary sewer connections, mechanical plumbing separations, etc.

4. Negative Pressure Calculations for each containment where used/ required.

5. Disposal Requirements:

- a. Asbestos Transporter Identification
- b. Hazardous Waste Transporter Identification
- c. Asbestos Landfill
- d. Hazardous Waste Landfill

C. Prepare a Safety, Health and Accident Prevention Plan (SHAPP) for all abatement work being performed. Incorporate the requirements and procedures of the FAA Honolulu Control Facility Asbestos Abatement Contingency Plan into the SHAPP. At a minimum, the SHAPP shall include the following:

1. Emergency procedures shall be in written form and prominently posted on-site. Everyone, prior to entering the work area, shall be required to read and sign these procedures to acknowledge receipt and understanding of work site layout, location of emergency exits and emergency procedures. Review and designate containment area emergency exits in adequate number and location to safely exit workers. Consideration shall be given to the resultant contamination and required decontamination, but as a second priority to life safety.
2. Emergency planning shall include considerations of fire, explosion, toxic or oxygen deficient atmospheres, electrical hazards, slips, trips and falls, confined spaces and heat/cold related injury. Written procedures shall be developed and employee training in procedures shall be provided.
3. Emergency planning shall include a Hazard Communication Program (HAZCOM). A written HAZCOM program shall be established and implemented according to 29 CFR 1910.1200 Hazard Communications. Copies of Safety Data Sheets (SDS) for chemicals brought on-site by the Contractor shall be attached to the written HAZCOM Program. The FAA has the option of disallowing the use of some chemicals due to high toxicity, objectionable odors, and when more suitable substitutes are available.

D. Project Personnel

1. Provide number of full-time laborers that shall be assigned to this project.
2. Provide number of crews and shifts for this project.
3. Provide documentation for each employee including:
 - a. Documentation from a physician that employees or agents who may be exposed to airborne asbestos, in excess of background levels, have been provided with an opportunity to be medically monitored to determine whether they are physically capable of working while wearing the respirator required without suffering adverse health effects. In addition, document that personnel have received medical monitoring as required in 29 CFR 1926.1101. This documentation shall be submitted for each employee entering the regulated (removal) area and must be current within the past 12 months.
 - b. Submit and maintain current copies of employee-accredited asbestos and lead training certificates and state licenses for asbestos and lead at the work site for the duration of the project.
 - c. Provide a copy of a current (within the last 12 months) and acceptable fit test(s) for all employees with the respirator(s) that shall be used for the abatement.
 - d. Submit signed certificates for each employee stating that each employee has received the following:
 - 1) Received training in the proper handling of materials that contain asbestos as applicable.
 - 2) Understands the health implications and risks involved (including the illnesses possible from exposure to airborne asbestos fibers).
 - 3) Understands the use and limits of the respiratory equipment to be used.

- 4) Understands the results of monitoring of airborne quantities of asbestos as related to health and respiratory equipment.
 - 5) Understands the proper engineering controls utilized to mitigate asbestos fiber release and exposure.
 - 6) Understands the project scope and has been given project specific training.
- E. Laboratories: Submit documentation that the laboratory(ies) to be used for Personnel Samples on this contract is accredited.
 1. For asbestos air samples the laboratory shall be accredited by the American Industrial Hygiene Association (AIHA) for Phase Contrast Microscopy and has successful completion in the last four rounds in the American Industrial Hygiene Association (AIHA) Proficiency Analytical Testing (PAT) Program. All technicians analyzing asbestos air samples shall be a current member in the Asbestos Analyst Registry (AAR).
- F. Product Data: Submit Manufacturer Product Data on the following as applicable:
 1. HEPA equipped Air Filtration Devices (AFDs) Product Data
 2. HEPA equipped vacuum unit Product Data
 3. Disposable Clothing Product Data
 4. Respirator(s) Product Data
 5. Portable Shower Product Data
 6. Wetting Agent Product Data and Safety Data Sheets (SDS)
 7. Encapsulant Product Data and SDS
 8. Chemical Stripper Product Data, SDS, and Manufacturer recommended work practices for the product
 9. Spray Adhesive Product Data and SDS
 10. Low Odor Mastic Remover Product Data and SDS
 11. Polyethylene Sheeting Product Data
 12. Waste Water Filter and Equipment Product Data
 13. Airless Sprayer Product Data
 14. Asbestos Disposal Bag Product Data
- G. Miscellaneous: Provide copies of written notification to any rental company concerning the intended use of rental equipment (including scaffolding), the possibility of asbestos and lead contamination, and the decontamination procedures that shall be used prior to the return of the equipment.
- H. Certified Industrial Hygienist: Provide the name, address, telephone number, and copies of the CIH's current ABIH certificate and resume documenting at least two years of asbestos abatement experience.
- I. Submittal Notarization: The submittal shall be approved, signed and dated by an officer of the company and the contractor's CIH indicating name and title of each person signing. This shall constitute written acceptance of the provided Asbestos Abatement Plan as the project design plan, note any changes from the design, quantities or sequencing.

1.7 ONGOING PROJECT SUBMITTALS

- A. Submit required documentation for new employees, equipment, materials or chemicals that arrive on-site at least one day prior to arrival on-site.
- B. Submit on a weekly basis, previous week's daily field notes and containment sign in sheets for the project.
- C. Submit delivery manifest 48 hours in advance of delivery date.
- D. Submit OSHA compliance monitoring results within 24 hours of collection date.
- E. Submit required Federal, State and Local documentation regarding the transportation and disposal of ACM and lead containing materials at the earliest possible time.

1.8 PROJECT CLOSEOUT SUBMITTALS

- A. Closeout Submittal: Within 30 days of the completion of the work, the Abatement Contractor shall provide a closeout submittal. The closeout submittal shall consist of the following documents:
 - 1. Written certification on final completion of the Work that Work complies with Contract Documents.
 - 2. Certification that items on punch list issued at substantial completion have been completed or corrected and that tools, construction equipment and surplus materials have been removed from the site.
 - 3. Daily logs for abatement work.
 - 4. Entry/exit logs for each containment.
 - 5. Copies of Waste Manifests for the project.
 - 6. Copies of asbestos and lead worker and supervisory personnel certifications, fit test records, and physicians written opinion forms.
 - 7. Copies of air monitoring results.
 - 8. Clearance and testing reports.

1.9 PROJECT CONDITION

- A. The work consists of the containment and removal of asbestos containing materials. Local, state, FAA Orders and federal rules, regulations and laws govern the work.
- B. The FAA shall employ an independent Industrial Hygiene Monitoring Contractor (MC) to verify conformance of the abatement contractor to the Contract Documents.
- C. The Abatement Contractor shall cooperate with the FAA and the Monitoring Contractor. This cooperation shall include allowing access to the work areas to allow for visual and air monitoring, collecting samples, providing requested data on personnel, equipment, scheduling and facilitating FAA monitoring of the work.

- D. Do not allow anyone access to the containments who are not authorized by the FAA to enter the site of work.
- E. Provide warning labels in prominent locations adjacent to asbestos containing material identified in this specification to remain. The labels shall be installed before demolition or construction starts under this contract. The labels shall remain in place, after completion of abatement work, as the property of the FAA. The labels shall be printed in large, bold letters on a contrasting background and conform to the requirements of 29 CFR 1926.1101 and contain the following information:

**DANGER
ASBESTOS
MAY CAUSE CANCER
CAUSES DAMAGE TO LUNGS
AUTHORIZED PERSONNEL ONLY**

- F. Where the use of respirators and protective clothing is required in the regulated area, the warning signs shall include the following:

**WEAR RESPIRATORY PROTECTION AND
PROTECTIVE CLOTHING IN THIS AREA**

- G. The Honolulu Control Facility is a 24-hour per day, 7-day per week facility, which is essential to the safe operation of air traffic in the control area. Immediately notify the FAA in the event of a breach of any regulated work areas. Coordinate construction and abatement activities with the FAA in order to prevent any disruption of FAA operations.
 - 1. Disruption of operations for any amount of time could jeopardize the safety of the flying public and may result in criminal prosecution.
 - 2. The FAA shall occupy the facility during construction activities. Cooperate fully with the FAA during construction operations to minimize conflicts and to facilitate FAA usage. Perform the work so as not to interfere with FAA operations. Provide FAA personnel access to equipment remaining in service. Construct containments to allow travel routes for FAA personnel and to allow moving of necessary equipment.
 - 3. The work shall be limited to specific areas of the building and site. Unlimited access is specifically not permitted. Arrangements for use of the buildings and site shall be restricted to those areas specifically allowed by FAA. Other contractors shall be working at the site. Cooperate with other on-site contractors and prevent work by others from jeopardizing the asbestos work. Construction planning meetings shall be held once a week to discuss other projects that could adversely impact the asbestos abatement project.

1.10 WORK BY FAA

- A. Environmental (IH) monitoring and sample analysis (by separate contract).

- B. The shutdown, lockout/tag out and re-start of mechanical equipment, and all energized sources.
- C. The shutdown, lockout/tag out and re-start of electrical circuits and equipment.

1.11 NOTIFICATION

- A. The Contractor is responsible for asbestos related notifications, permits, and associated fees prior to and following abatement. Notify the FAA ten (10) working days prior to the start of the on-site abatement operations.

1.12 HOURS OF WORK

- A. The Contractor shall strictly adhere to work hours as specified in these specifications and in Division 1. Deviations shall be pre-approved, in writing by the FAA 48 hours in advance. Work methods that result in unacceptable disturbance or rejection by the FAA shall not result in an increase to the contract sum or extension of the contract time.
- B. Request to change work hours or overtime shall require the FAA written approval prior to implementing changes. The rejection of request for change shall not result in an increase to the contract sum or extending contract time.

1.13 SCHEDULE

- A. Adhere to the schedule as defined in the contract documents.

1.14 PRECONSTRUCTION MEETING

- A. The FAA shall schedule a preconstruction meeting after the Notice to Proceed. The minimum agenda shall consist of the following:
 - 1. The FAA will identify the third party monitor (MC).
 - 2. Establishing chain of authority.
 - 3. Abatement schedule.
 - 4. Critical work sequencing, scheduling.
 - 5. Processing of field decisions.
 - 6. Distribution of Submittal Documents.
 - 7. Review the facility Asbestos Contingency Plan.
 - 8. Submittals: schedules, shop drawings, product data and samples, manufacturer's certifications of products, manpower reports, major equipment deliveries and priorities, procedures for maintaining record documents, use of FAA facilities by contractor (access, parking, office area, storage area, and waste load-outs), safety and first aid procedures, security procedures and housekeeping procedures.

PART 2 - PRODUCTS

2.1 MATERIALS AND EQUIPMENT

- A. Material and Equipment - Prior to bringing material and equipment on site it shall be clean of environmental contamination or debris.
- B. Materials and products shall comply with the requirements of 29 CFR 1910.134 and 29 CFR 1926.1101.
- C. Polyethylene Sheeting: ASTM D 4397, 6 mils thick, flame-retardant. Sheeting shall meet flammability requirements of NFPA 701, and flame spread and smoke density requirements of ASTM E84.
- D. Duct Tape: Waterproof, pressure-sensitive adhesive tape, 3 mils thick by 3 inches wide for criticals, containment seams and repairs, and decon units; 2-inch-wide may be used only on disposal bags and personnel clothing.
- E. FSK Tape: Waterproof, pressure-sensitive adhesive tape, 2 mils thick by 3 inches wide for criticals, containment seams, repairs, and decon units.
- F. High Efficiency Particulate Air (HEPA) Filtered Vacuum: Vacuum(s) shall be:
 - 1. Be capable of removing 99.97% of the asbestos particles (0.3 microns or greater in diameter) from the air.
 - 2. Be portable.
 - 3. Be equipped with hoses of sufficient length to reach areas behind pipes, ducts and other obstacles.
 - 4. Have new filters installed at the beginning of the project. The filters shall be changed on a regular basis for the duration of the project.
 - 5. Be tested and certified on-site by the Monitoring Contractor in accordance with NSF-49. Prior to testing by the Monitoring Contractor, the abatement contractor shall have all anticipated required machines for the project available on-site for testing. Testing without cost to the abatement contractor shall occur only one time by the Monitoring Contractor. Any additional machine testing (or re-testing of failed units) cost shall be the responsibility of the abatement contractor.
 - 6. Be removed from the FAA property immediately if they are found to be non-conforming.
- G. HEPA Filtered Ventilation System: Portable ventilation system designed to exhaust and clean the air inside the enclosure prior to exhausting to the outside of the building. The units shall have at least three (3) filter stages, including readily accessible pre- and secondary filters, and a final filter, which shall be a High Efficiency Particulate Air (HEPA) filter. The units shall:
 - 1. Be capable of capturing particles having a diameter of 0.3 micrometers or greater in size with an efficiency of 99.97%.
 - 2. Be equipped with the automatic restart feature.

3. Have new filters installed prior to the onset of abatement activities. The filters shall be changed on a regular basis for the duration of the project.
 4. Be located as far away from the fresh air intakes as possible.
 5. Be tested and certified on-site by the Monitoring Contractor in accordance with NSF-49. Prior to testing by the Monitoring Contractor, the abatement contractor shall have all anticipated required machines for the project available on-site for testing. Testing without cost to the abatement contractor shall occur only one time by the Monitoring Contractor. Any additional machine testing (or re-testing of failed units) cost shall be the responsibility of the abatement contractor.
 6. Be removed from the FAA property immediately if they are found to be non-conforming.
- H. Ducts: All HEPA ventilation ducts from the negative air machines shall be constructed of new and unused two-ply polyvinyl with polyester reinforced tubing. The attachment of the ducts shall be spliced by means of sheet metal connectors and sealed in order to verify an adequate seal. The attachment of the ducts shall withstand the force from the machines for the entire duration of the project. The construction shall be inspected and approved by the Monitoring Contractor prior to the start of abatement activities. The Abatement Contractor's Superintendent shall have the responsibility of inspecting the integrity of the exhaust ducts on a regular basis throughout the duration of the abatement activities.
- I. Wetting Agent: Provide water to which a surfactant has been added. Use a mixture of surfactant and water which results in wetting of the asbestos-containing material and in retardation of fiber release during disturbance of the material, equal to or greater than that provided by the use of one ounce of a surfactant consisting of 50 percent polyoxyethylene ester and 50 percent polyoxyethylene ether mixed with five gallons of water.
- J. Encapsulant: Provide an encapsulant/sealant, which shall be compatible with the existing surfaces, and one, which shall act as a suitable substrate for future surface coatings. Taint (or tint) the encapsulant with a contrasting color, to be approved by the FAA, so as to identify coverage.
- K. Airless Sprayer: Hand-pump type, pressure-can sprayer fabricated of either metal or plastic, equipped with a wand at the end of a hose capable of delivering a stream or spray of liquid under pressure.
- L. Respirators: Personal protective breathing equipment shall be in accordance with 29 CFR 1926.1101
- M. Signs and Labels: Signs and labels shall be provided in accordance with 29 CFR 1926.1101 and 40 CFR 61 subpart M.
- N. Disposal Bags: Leak-tight, 6 mil thick clear polyethylene bags with appropriate hazard warning, per EPA regulations 40 CFR 61.150 (a) (1) (v), OSHA requirement 29 CFR 1926.1101, and DOT.
- O. Miscellaneous Materials: Provide tangible supplies (such as coveralls, duct tape, soap, shampoo, towels, etc.), for persons entering the removal area. This includes FAA personnel, monitoring contractor and other persons approved for entry.

- P. Air Monitoring Equipment. The equipment shall include, but not be limited to:
1. Low-volume, battery powered, body-attachable, portable personal pumps with a power pack capable of sustaining the calibrated flow rate for a minimum of 10 hours.
 2. Standard 25-millimeter diameter, 0.8 micron pore size filters and cassettes in accordance with 29 CFR 1926.1101 for asbestos personal air sampling.
 3. A flow calibrator capable of calibration to within plus or minus 2 percent of reading over a temperature range of minus 20 degrees C (minus 4 degrees F) to plus 60 degrees C (140 degrees F) and traceable to a National Institute of Standards and Technology (NIST) primary standard.

PART 3 - EXECUTION

3.1 GENERAL DESCRIPTION OF WORK

- A. Comply with the requirements of these Specifications and ANSI Z9.2, 29 CFR 1910.145, 29 CFR 1926.1101 and 40 CFR 61 and 763. The most stringent of codes shall apply. The following shall be considered as the typical sequence to the asbestos/lead work. Refer to the following sections for specific procedures for the project.
- B. Environmental Monitoring: Environmental monitoring for airborne asbestos fiber concentrations, airborne lead concentrations, containment pressure differential, and third party inspections shall be accomplished by the FAA's monitoring contractor, who shall be under a separate contract with the FAA. This monitoring contractor shall respond directly to the FAA.
- C. Wet Removal: ACM shall be removed using an amended water wet removal method as recommended by the EPA340/1-90-019 Asbestos NESHAP Adequately Wet Guidance Document and OSHA. The Contractor shall provide for the continual prevention of excessive water accumulation throughout the duration of the project and shall post a minimum of one abatement worker to monitor adjacent spaces of the facility for water leakage outside the containment at all times when removal is in progress.
- D. Housekeeping: Essential parts of abatement dust control are housekeeping and clean up procedures. Maintain surfaces of the abatement work area free of accumulations of asbestos or lead debris. Give meticulous attention to restricting the spread of dust and debris. Keep waste from being distributed over the general area. The use of compressed air to move waste material or dust is prohibited. Material generated during gross removal shall be packaged and removed from the containment at the end of each shift and shall not be allowed to accumulate inside the work area. The FAA shall inspect the removal area daily for residual debris.
- E. Abatement Superintendent: Designate a qualified employee as abatement superintendent. The superintendent shall meet the requirements of a competent person/supervisor in accordance with OSHA and possess at least 5 years asbestos abatement experience. The competent person shall perform the following:

- F. Oversee all abatement personnel performing any abatement related work,
 - 1. Oversee construction of all enclosures, including the worker decontamination chamber and the waste load-out chamber.
 - 2. Control entry to and exit from the removal area.
 - 3. Supervise all employee exposure monitoring required by OSHA.
 - 4. Verify the proper use of protective clothing and equipment.
 - 5. Verify that all occupants of the removal area are properly trained and certified.
 - 6. Verify the proper use of hygiene facilities and decontamination procedures.
 - 7. Verify that all engineering controls are functioning per design.

- G. The abatement contractor will maintain radio or telephone communication with the on-site Jacobs superintendent.

- H. Disposal Supervisor: Designate a qualified individual to oversee the following "clean-up", "housekeeping" and disposal tasks in accordance with these Specifications, specifically:
 - 1. Continuous floor and horizontal surface clean up.
 - 2. Continuous clean up of abatement debris.
 - 3. Continuous collection and disposal of water build-up. No puddling or ponding water shall be tolerated. Water or solvent seeping through the concrete floor or down the curtain wall to a lower floor is not permitted. Polyethylene sheeting shall be used to protect equipment in the lower level if leakage is possible.
 - 4. Regular inspection of disposal procedures to verify conformance with this specification as well as all Federal, State and Local Laws.
 - 5. The disposal supervisor shall be responsible for notifying the FAA prior to delivery of any disposal vehicles. The FAA shall conduct an inspection of every vehicle to verify that it is delivered in a clean and empty condition. The rejected disposal vehicle shall be replaced at no additional cost to the FAA.

- I. Inspection by the FAA: During abatement work, the work shall be subject to on-site inspection by the FAA, who may be assisted by the monitoring contractor.

- J. Work Stoppage: The FAA shall issue a "stop work" order for any of the reasons listed below. No work shall be allowed to resume until the conditions stabilize and upon approval from the FAA. Standby time required to identify and resolve the problem shall be at the expense of the Abatement Contractor and may include the costs incurred by the extended efforts of the FAA's Monitoring Contractor.
 - 1. If asbestos air monitoring results outside the containment indicate the presence of airborne asbestos outside the containment is greater than 0.02 f/cc above baseline.
 - 2. If excessive water accumulations appear or if water leakage or gross contamination is detected in areas adjacent to the removal area.
 - 3. If the work is found to violate specified requirements.
 - 4. If conditions arise that may adversely impact or disrupt the flying operations or working conditions at the facility.

3.2 PERSONAL PROTECTIVE EQUIPMENT

- A. Disposable coveralls for FAA representatives, monitoring contractor and authorized visitors. Abatement contractor respiratory protection shall comply with 29 CFR 1910.134 and 29 CFR 1926.1101.

3.3 TEMPORARY FACILITIES AND UTILITIES

- A. Field Office: The Abatement Contractor shall furnish their temporary office space.
- B. Temporary Electric: The Abatement Contractor shall provide and maintain a specified secondary electrical power center for asbestos removal operations throughout the abatement period. Connection locations and lockout/tag out shall be as directed by the FAA and electric power shall be provided at no charge to the Abatement Contractor. Under no circumstances shall FAA existing electrical circuits be used by the Abatement Contractor for any purpose, without prior authorization from the FAA.
 - 1. The Contractor shall provide:
 - a. Main distribution panel with a capacity of 110-120 volts, single phase and 60 hertz and of sufficient capacity to service the complete project.
 - b. Circuit protection for each circuit.
 - c. Ground fault interruption protection for all circuits.
 - d. Grounded, UL listed extension cords from power centers to the point of operation.

UNDER NO CIRCUMSTANCES SHALL THE CONTRACTOR BE ALLOWED TO CONNECT INTO THE CRITICAL POWER SOURCE AT THE FAA FACILITY

- C. Temporary Lighting: The Abatement Contractor shall provide temporary illumination for construction needs, safe working conditions, public safety and security lighting in compliance with the requirements of 29 CFR 1926.26 and subpart D. Supports and ties shall be constructed of non-conductive materials and exposed two wire conductors shall not be allowed. Lamps shall be covered with safety guards or deeply recessed in reflector and lamps shall not be suspended by their electric cords unless cord and fixture is designed for that purpose.
- D. Temporary Water: The Abatement Contractor shall provide and maintain temporary water service connection throughout the abatement period. The temporary water shall be equipped with an approved backflow protection device. The abatement contractor shall install valves at tie-in locations that shall be turned off and locked-out and tagged-out when the contractor is not present on-site.
- E. Temporary Sanitary: The Abatement Contractor shall provide and maintain temporary sanitary service connection throughout the abatement period.

- F. Existing Systems: The Abatement Contractor may make written arrangements with the FAA to modify, supplement and extend an existing system to meet temporary requirements for the project, subject to approval by the FAA. If existing systems are modified, supplemented and/or extended, the Abatement Contractor shall not overload the system or interfere with FAA's normal use of the system.
- G. Removal of Temporary Systems: The Abatement Contractor shall remove all temporary services and repair all damage caused by the contractor and restore to original conditions.

3.4 ISOLATION OF THE WORK AREA

- A. Prepare the work areas in accordance with 29 CFR 1926.1101, Appendix F and as detailed in this specification and the AAP for the work areas. All efforts shall be made to verify building ventilation systems supplying air into or returning air out of the regulated area shall be shut down and isolated by lockable switch or other positive means in accordance with 29 CFR 1926.417 and the facility's lockout/tagout program.
- B. Establishing Negative Pressure: Establish negative pressure in accordance with the recommendations of 29 CFR 1926.1101 Appendix F.
 - 1. Maintain negative pressure for containments between negative 0.02 and negative 0.10 inches of water gauge. The intent of the design negative pressure is to prevent the contamination of non-abatement areas.
 - 2. Air Filtration Devices shall exhaust to the building's exterior a minimum distance of thirty feet from the buildings HVAC make-up air.
- C. Pre-Abatement Inspection: Upon completion of the work area containment and the establishment of negative pressure, the Abatement Contractor shall receive notification from the FAA before removal work is initiated.
- D. Work Place Entry and Exit: Enforcement is the responsibility of the Contractor's Abatement Supervisor. Entry shall be controlled to prevent unauthorized, accidental access into the containment area.
- E. Maintenance of Enclosure System: The FAA shall be immediately notified of problems that have developed such as a puncture of the containment system, electrical power loss, GFCI failure, equipment failure, accidental discharge into occupied areas, and partial collapse of the critical barrier (plastic sheet fails to remain in place), etc.

3.5 DECONTAMINATION UNIT

- A. Worker Decontamination Unit: Employee decontamination may be required where Class 1 or Class II friable asbestos containing material is removed in containment.

3.6 ABATEMENT PROCEDURES

- A. The sequence of operations to remove asbestos from the facility is described as guidance in the FAA Asbestos Abatement and LCC Demolition Work Plan. Refer to this document for sequencing and guidance to be performed by the contractor.

3.7 PROCEDURE FOR DISPOSAL

- A. Asbestos: Collect asbestos waste, scrap, debris, bags, containers, equipment, and asbestos contaminated clothing, which may produce airborne concentrations of asbestos fibers, and place in sealed impermeable asbestos bags, boxes drums or other approved containers. All wrapped asbestos material shall be contained in a minimum of two layers of 6-mil polyethylene sheeting. All bagged debris shall be double bagged at a minimum. The final bagging shall take place in the decon washroom. Place the generator label between the outer bag and the inner, with the label able to be read through the outer bags. The final asbestos waste bag shall be goose necked. Each bag shall be clear and be pre-printed with an asbestos warning label. Include site-specific labels as required by the local jurisdiction.

1. At a minimum, identify waste bags and containers with waterproof labels as follows:

Federal Aviation Administration
Honolulu Control Facility
760 Worchester Ave.
Honolulu, HI 96818
(Name of Abatement Contractor)

2. Dispose of waste asbestos material at an Environmental Protection Agency (EPA) or local-approved landfill off FAA property. For temporary storage, store sealed impermeable bags in asbestos waste drums or waste storage containers. Storage of waste shall be in an on-site trailer, truck, or dumpster approved for transportation of the ACM waste to the landfill. The contractor shall transport the asbestos waste directly from the FAA facility to the landfill. Procedure for hauling and disposal shall comply with 40 CFR 61 (Subpart B), state, regional, and local standards. Workers unloading the ACM waste shall wear appropriate respirators and personal protective equipment when handling asbestos materials at the disposal site. A fully-sealed and plastic lined dumpster, truck van or trailer shall be used for transportation of all ACM wastes. The Waste Manifests shall be prepared by the contractor and signed by the Generator (FAA), the Waste Transporter and the Approved Landfill.
3. Minimum requirements for a waste manifest are as follows:
 - a. Contain a unique number.
 - b. Be signed by generator when shipping.
 - c. Be signed by transporter when material is picked-up.
 - d. Be signed by disposal facility when received.
 - e. Name and address of pick-up site.
 - f. Estimated quantity of waste.

- g. Specific location within the building where waste was generated.
 - h. Type and number of bags and drums used at each specific location within the building.
 - i. Name of Transporter.
 - j. Disposal site name, location and EPA identification number.
 - k. Copies of the manifest signed by the generator, transporter and disposal site shall be maintained by each entity.
- B. The ACM waste shipment shall be transported directly from the job site to the EPA approved landfill. The Contractor shall notify the landfill of the date and time the ACM waste shall arrive at the landfill. The landfill shall have a hole excavated to receive the ACM waste upon arrival. The waste containers shall be hand-placed into the hole, not tossed or thrown, and immediately covered with 6 inches of soil. Provide asbestos waste shipment records to the FAA within three (3) days after delivery of the ACM to the landfill.
 - 1. The Generator (FAA), the Waste Transporter (Contractor) and the Approved Landfill (Disposal Facility) shall sign waste Manifests.
 - 2. Minimum requirements for information on the waste manifest include:
 - 3. Minimum requirements for information included on the waste manifest include:
 - a. Contain a unique number.
 - b. Be signed by generator when shipping.
 - c. Be signed by transporter when material is picked-up.
 - d. Be signed by disposal facility when received.
 - e. Name and address of pick-up site.
 - f. Estimated quantity of waste.
 - g. Specific location within the building where waste was generated.
 - h. Type and number of bags and drums used at each specific location within the building.
 - i. Name of Transporter.
 - j. Disposal site name, location and EPA identification number.
 - k. Copies of the manifest signed by the generator, transporter and disposal site shall be maintained by each entity.

3.8 ABATEMENT AIR MONITORING

- A. Personal Monitoring: The Abatement Contractor is responsible for Personal Samples required in accordance with OSHA. An independent American Industrial Hygiene Association accredited laboratory shall be used to analyze air samples in accordance with OSHA. Copies of the results of the air samples shall be furnished within 3 days following the day in which they were collected and shall notify monitored employees.
- B. Environmental Monitoring: Environmental monitoring for area airborne asbestos fiber count shall be under a separate contract to the FAA as a third party monitoring contractor.
 - 1. Background Monitoring: Background samples shall be collected prior to the isolation of the work area.
 - 2. Abatement Monitoring:

- a. Prior to asbestos abatement, the monitoring contractor shall collect a minimum of two air samples in the Control Wing work area on the first and basement floors.
- b. Clearance Monitoring:
 - 1) Asbestos: The Contractor shall notify the FAA when the work areas are ready for clearance air monitoring. The FAA shall perform clearance air sampling following either NIOSH 7400 PCM or 40 CFR 763 TEM.

END OF SECTION

ATTACHMENT A

CERTIFICATE OF WORKER'S ACKNOWLEDGMENT

PROJECT NAME _____ CONTRACT NO. _____

PROJECT ADDRESS _____

CONTRACTOR'S NAME _____

EMPLOYEE'S NAME _____

WORKING WITH ASBESTOS CAN BE DANGEROUS. INHALING ASBESTOS FIBERS HAVE BEEN LINKED WITH TYPES OF LUNG DISEASE AND CANCER. IF YOU SMOKE AND INHALE ASBESTOS FIBERS, THE CHANCE THAT YOU WILL DEVELOP LUNG CANCER IS GREATER THAN THAT OF THE NONSMOKING PUBLIC.

Your employer's contract for the above project requires that: you be provided with and complete formal and project specific training, you be supplied with proper personal protective equipment including respirators, that you be trained in its use and that you receive a medical examination to evaluate your physical capacity to perform your assigned work tasks, under the environmental conditions expected, while wearing the required personal protective equipment. These things are to be done at no cost to you. By signing this certification, you are acknowledging that your employer has met these obligations to you.

Date Completed _____

FORMAL TRAINING: I have completed a formal training course for: asbestos abatement workers (for workers) (Contractor/Supervisor) that meets EPA's and this state's requirements

Date Completed _____

In addition, I have completed annual refresher as required by EPA and this state's requirements.

Date Completed _____

PROJECT SPECIFIC TRAINING: I have been provided and have completed the project specific training required by this Contract. My employer's industrial hygienist and competent person/supervisor conducted the training.

Date Completed _____

RESPIRATORY PROTECTION: I have been trained in accordance with the criteria in the Contractor's Respiratory Protection program. I have been trained in the dangers of handling and breathing asbestos dust and in the proper work procedures and use and limitations of the respirator(s) I will wear. I have been trained in and will abide by the facial hair policy of my employer.

Date Completed _____

RESPIRATOR FIT-TEST TRAINING: I have been trained in the proper selection, fit, use, care, cleaning, and maintenance, and storage of the respirator(s) that I will wear. I have been fit-tested in accordance with the criteria in the Contractor's Respiratory Program and have received a satisfactory fit. I have been assigned my individual respirator. I have been taught how to properly perform positive and negative pressure fit-check upon donning negative pressure respirators each time.

Date Completed _____

CERTIFICATE MEDICAL EXAMINATION: I have had a medical examination within the last twelve months, which was paid for by my employer. The examination included: health history, pulmonary function tests, and may have included an evaluation of a chest x-ray. A physician made determination regarding my physical capacity to perform work tasks on the project while wearing personal protective equipment including a respirator. I was personally provided a copy and informed of the results of that examination. My employer's industrial hygienist evaluated the medical certification provided by the physician and checked the appropriate blank below. The physician determined that here:

_____ were no limitations to performing the required work tasks;

_____ were identified physical limitations to performing the required work tasks.

Employees Signature _____ Date _____

Printed Name _____

Employee Number _____

Contractor's Industrial Hygienist Signature _____

Date _____

Printed Name _____

Employee Number _____

Date medical exam completed _____

ATTACHMENT B: ACM INVENTORY

Room Location	Material Description	ACM Type	Sample Location	Total ASB
Eighth Floor Entry	75 sq. ft. of non-friable 1'x1' white floor tile	Chrysotile	Floor	3.0
Eighth Floor Entry	75 sq. ft. of non-friable 1'x1' white floor tile mastic	Chrysotile	Floor	20.0
Eighth Floor Entry	37 sq. ft. of non-friable 1'x1' white floor tile mastic	Chrysotile	Floor	20.0
Exterior Walkway	non-friable roof caulk at seams where outer panels meet concrete deck	Chrysotile	Roof	10.0
Exterior Walkway	non-friable seam sealant caulk at windows & wall panel seam on cab	Chrysotile	Miscellaneous	25.0
Microwave Equipment Room 905	270 sq. ft. of non-friable 1'x1' white floor tile	Chrysotile	Floor	3.0
Microwave Equipment Room 905	270 sq. ft. of non-friable 1'x1' white floor tile mastic	Chrysotile	Floor	20.0
Ninth Floor Entry	90 sq. ft. of non-friable 1'x1' white floor tile mastic	Chrysotile	Floor	20.0
Roof	caulking	Chrysotile	Roof	1.0 – 5.0
Stair to Cab	11 sq. ft. of non-friable 1'x1' white floor tile mastic	Chrysotile	Floor	20.0

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SECTION 03 30 00 - CAST-IN-PLACE CONCRETE

PART 1 - GENERAL

1.1 SUMMARY

A. Section Includes:

1. Cast-in-place concrete, including concrete materials, mixture design, placement procedures, and finishes.

B. Related Requirements:

1. Section 03 10 00 "Concrete Forming and Accessories" for form-facing materials, form liners, insulating concrete forms, and waterstops.
2. Section 03 20 00 "Concrete Reinforcing" for steel reinforcing bars and welded-wire reinforcement.

1.2 DEFINITIONS

- A. Cementitious Materials:** Portland cement alone or in combination with one or more of the following: blended hydraulic cement, fly ash, slag cement, other pozzolans, and silica fume; materials subject to compliance with requirements.
- B. Water/Cement Ratio (w/cm):** The ratio by weight of water to cementitious materials.

1.3 ACTION SUBMITTALS

A. Product Data: For each of the following.

1. Portland cement.
2. Fly ash.
3. Slag cement.
4. Aggregates.
5. Admixtures:
 - a. Include limitations of use, including restrictions on cementitious materials, supplementary cementitious materials, air entrainment, aggregates, temperature at time of concrete placement, relative humidity at time of concrete placement, curing conditions, and use of other admixtures.
6. Curing materials.
 - a. Include documentation from color pigment manufacturer, indicating that proposed methods of curing are recommended by color pigment manufacturer.

B. Design Mixtures: For each concrete mixture, include the following:

1. Mixture identification.
2. Minimum 28-day compressive strength.
3. Durability exposure class.
4. Maximum w/cm.
5. Slump limit.
6. Air content.
7. Nominal maximum aggregate size.
8. Intended placement method.
9. Submit alternate design mixtures when characteristics of materials, Project conditions, weather, test results, or other circumstances warrant adjustments.

C. Shop Drawings:

1. Construction Joint Layout: Indicate proposed construction joints required to construct the structure.
 - a. Location of construction joints is subject to approval of the Architect.

D. Concrete Schedule: For each location of each Class of concrete indicated in "Concrete Mixtures" Article, including the following:

1. Concrete Class designation.
2. Location within Project.
3. Exposure Class designation.
4. Formed Surface Finish designation and final finish.
5. Curing process.

1.4 INFORMATIONAL SUBMITTALS

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

1. Cementitious materials.
2. Admixtures.
3. Curing compounds.
4. Bonding agents.

B. Material Test Reports: For the following, from a qualified testing agency:

1. Portland cement.
2. Fly ash.
3. Slag cement.
4. Aggregates.
5. Admixtures:
 - a. Permeability-Reducing Admixture: Include independent test reports, indicating compliance with specified requirements, including dosage rate used in test.

C. Field quality-control reports.

1.5 QUALITY ASSURANCE

- A. Installer Qualifications: A qualified installer who employs Project personnel qualified as an ACI-certified Flatwork Technician and Finisher and a supervisor who is a certified ACI Flatwork Concrete Finisher/Technician or an ACI Concrete Flatwork Technician with experience installing and finishing concrete, incorporating permeability-reducing admixtures.
 - 1. Post-Installed Concrete Anchors Installers: ACI-certified Adhesive Anchor Installer.
- B. Ready-Mixed Concrete Manufacturer Qualifications: A firm experienced in manufacturing ready-mixed concrete products and that complies with ASTM C94/C94M requirements for production facilities and equipment.
 - 1. Manufacturer certified in accordance with NRMCA's "Certification of Ready Mixed Concrete Production Facilities."
- C. Laboratory Testing Agency Qualifications: A testing agency qualified in accordance with ASTM C1077 and ASTM E329 for testing indicated and employing an ACI-certified Concrete Quality Control Technical Manager.
 - 1. Personnel performing laboratory tests to be an ACI-certified Concrete Strength Testing Technician and Concrete Laboratory Testing Technician, Grade I. Testing agency laboratory supervisor to be an ACI-certified Concrete Laboratory Testing Technician, Grade II.

1.6 DELIVERY, STORAGE, AND HANDLING

- A. Comply with ASTM C94/C94M and ACI 301.

PART 2 - PRODUCTS

2.1 CONCRETE, GENERAL

- A. ACI Publications: Comply with ACI 301 unless modified by requirements in the Contract Documents.

2.2 CONCRETE MATERIALS

- A. Source Limitations:
 - 1. Obtain all concrete mixtures from a single ready-mixed concrete manufacturer for entire Project.
 - 2. Obtain each type or class of cementitious material of the same brand from the same manufacturer's plant.

3. Obtain aggregate from single source.
 4. Obtain each type of admixture from single source from single manufacturer.
- B. Cementitious Materials:
1. Portland Cement: ASTM C150/C150M, Type III .
 2. Fly Ash: ASTM C618, Class C or F.
 3. Slag Cement: ASTM C989/C989M, Grade 100 or 120.
- C. Normal-Weight Aggregates: ASTM C33/C33M, Class 3M coarse aggregate or better, graded. Provide aggregates from a single source.
1. Alkali-Silica Reaction: Comply with one of the following:
 - a. Alkali Content in Concrete: Not more than 4 lb./cu. yd. for moderately reactive aggregate or 3 lb./cu. yd. for highly reactive aggregate, when tested in accordance with ASTM C1293 and categorized in accordance with ASTM C1778, based on alkali content being calculated in accordance with ACI 301.
 2. Maximum Coarse-Aggregate Size: 3/4 inch nominal.
 3. Fine Aggregate: Free of materials with deleterious reactivity to alkali in cement.
- D. Air-Entraining Admixture: ASTM C260/C260M.
- E. Chemical Admixtures: Certified by manufacturer to be compatible with other admixtures that do not contribute water-soluble chloride ions exceeding those permitted in hardened concrete. Do not use calcium chloride or admixtures containing calcium chloride in steel-reinforced concrete.
1. Water-Reducing Admixture: ASTM C494/C494M, Type A.
 2. Retarding Admixture: ASTM C494/C494M, Type B.
 3. Water-Reducing and -Retarding Admixture: ASTM C494/C494M, Type D.
 4. High-Range, Water-Reducing Admixture: ASTM C494/C494M, Type F.
 5. High-Range, Water-Reducing and -Retarding Admixture: ASTM C494/C494M, Type G.
 6. Plasticizing and Retarding Admixture: ASTM C1017/C1017M, Type II.
 7. Set-Accelerating Corrosion-Inhibiting Admixture: Commercially formulated, anodic inhibitor or mixed cathodic and anodic inhibitor; capable of forming a protective barrier and minimizing chloride reactions with steel reinforcement in concrete and complying with ASTM C494/C494M, Type C.
 - 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) Euclid Chemical Company (The); an RPM company.
 - 2) GCP Applied Technologies Inc.
 - 3) Master Builders Solutions.
 - 4) Sika Corporation.

- F. Water and Water Used to Make Ice: ASTM C94/C94M, potable or complying with ASTM C1602/C1602M, including all limits listed in Table 2 and the requirements of paragraph 5.4

2.3 CURING MATERIALS

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

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. Bon Tool Co.
- b. Brickform; a division of Solomon Colors.
- c. ChemMasters, Inc.
- d. Dayton Superior.
- e. Euclid Chemical Company (The); an RPM company.
- f. Kaufman Products, Inc.
- g. Lambert Corporation.
- h. Laticrete International, Inc.
- i. Master Builders Solutions.
- j. Metalcrete Industries.
- k. Nox-Crete Products Group.
- l. Sika Corporation.
- m. SINAK Corporation.
- n. SpecChem, LLC.
- o. TK Products.
- p. Vexcon Chemicals Inc.
- q. W.R. Meadows, Inc.

- B. Water: Potable or complying with ASTM C1602/C1602M.

- C. Clear, Waterborne, Membrane-Forming, Dissipating Curing Compound: ASTM C309, Type 1, Class B.

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. Anti-Hydro International, Inc.
- b. ChemMasters, Inc.
- c. Dayton Superior.
- d. Euclid Chemical Company (The); an RPM company.
- e. Kaufman Products, Inc.
- f. Lambert Corporation.
- g. Laticrete International, Inc.
- h. Nox-Crete Products Group.
- i. SpecChem, LLC.

- j. TK Products.
 - k. Vexcon Chemicals Inc.
 - l. W.R. Meadows, Inc.
- D. Clear, Waterborne, Membrane-Forming, Curing Compound: ASTM C309, Type 1, Class B, 18 to 25 percent solids, nondissipating.
- 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. ChemMasters, Inc.
 - b. Dayton Superior.
 - c. Euclid Chemical Company (The); an RPM company.
 - d. Kaufman Products, Inc.
 - e. Lambert Corporation.
 - f. Laticrete International, Inc.
 - g. Master Builders Solutions.
 - h. Metalcrete Industries.
 - i. Nox-Crete Products Group.
 - j. SpecChem, LLC.
 - k. Vexcon Chemicals Inc.
 - l. V-Seal Concrete Sealers & Specialty Coatings.
 - m. W.R. Meadows, Inc.
- E. Clear, Waterborne, Membrane-Forming, Curing and Sealing Compound: ASTM C1315, Type 1, Class A.
- 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. ChemMasters, Inc.
 - b. Concrete Sealers USA.
 - c. Dayton Superior.
 - d. Euclid Chemical Company (The); an RPM company.
 - e. Kaufman Products, Inc.
 - f. Lambert Corporation.
 - g. Laticrete International, Inc.
 - h. Metalcrete Industries.
 - i. Nox-Crete Products Group.
 - j. Right Pointe.
 - k. SINAK Corporation.
 - l. SpecChem, LLC.
 - m. TK Products.
 - n. Vexcon Chemicals Inc.
 - o. W.R. Meadows, Inc.

2.4 RELATED MATERIALS

- A. Bonding Agent: ASTM C1059/C1059M, Type II, nonredispersible, acrylic emulsion or styrene butadiene.

2.5 CONCRETE MIXTURES, GENERAL

- A. Prepare design mixtures for each type and strength of concrete, proportioned on the basis of laboratory trial mixture or field test data, or both, in accordance with ACI 301.
 - 1. Use a qualified testing agency for preparing and reporting proposed mixture designs, based on laboratory trial mixtures.
- B. Cementitious Materials: Limit percentage, by weight, of cementitious materials other than portland cement in concrete as follows:
 - 1. Fly Ash or Other Pozzolans: 25 percent by mass.
 - 2. Slag Cement: 50 percent by mass.
- C. Admixtures: Use admixtures in accordance with manufacturer's written instructions.
 - 1. Use water-reducing plasticizing admixture in concrete, as required, for placement and workability.
 - 2. Use water-reducing and -retarding admixture when required by high temperatures, low humidity, or other adverse placement conditions.
 - 3. Use water-reducing admixture in pumped concrete, and concrete with a w/cm below 0.50.
 - 4. Use corrosion-inhibiting admixture in concrete mixtures where indicated.

2.6 CONCRETE MIXTURES

- A. General Use: Normal-weight concrete used for footings, sidewalks, piers, topping slab replacement and canopy column grout bed.
 - 1. Exposure Class: ACI 318 F0 S2 W1 C1.
 - 2. Minimum Compressive Strength: 5000 psi at 28 days.
 - 3. Maximum w/cm: 0.50.
 - 4. Slump Limit: 4 inches, plus or minus 1 inch.
 - 6. Limit water-soluble, chloride-ion content in hardened concrete to 1.00 percent by weight of cement.

2.7 CONCRETE MIXING

- A. Ready-Mixed Concrete: Measure, batch, mix, and deliver concrete in accordance with ASTM C94/C94M and ASTM C1116/C1116M, and furnish batch ticket information.

PART 3 - EXECUTION

3.1 EXAMINATION

A. Verification of Conditions:

1. Before placing concrete, verify that installation of concrete forms, accessories, and reinforcement, and embedded items is complete and that required inspections have been performed.
2. Do not proceed until unsatisfactory conditions have been corrected.

3.2 PREPARATION

A. Provide reasonable auxiliary services to accommodate field testing and inspections, acceptable to testing agency, including the following:

1. Daily access to the Work.
2. Incidental labor and facilities necessary to facilitate tests and inspections.
3. Secure space for storage, initial curing, and field curing of test samples, including source of water and continuous electrical power at Project site during site curing period for test samples.
4. Security and protection for test samples and for testing and inspection equipment at Project site.

3.3 INSTALLATION OF EMBEDDED ITEMS

A. Place and secure anchorage devices and other embedded items required for adjoining Work that is attached to or supported by cast-in-place concrete.

1. Use setting drawings, templates, diagrams, instructions, and directions furnished with items to be embedded.
2. Install anchor rods, accurately located, to elevations required and complying with tolerances in Section 7.5 of ANSI/AISC 303.

3.4 JOINTS

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

B. Construction Joints: Coordinate with floor slab pattern and concrete placement sequence.

1. Install so strength and appearance of concrete are not impaired, at locations indicated on Drawings or as approved by Architect.
2. Place joints perpendicular to main reinforcement.

- a. Continue reinforcement across construction joints unless otherwise indicated.
3. Form keyed joints as indicated. Embed keys at least 1-1/2 inches into concrete.
4. Locate joints for beams, slabs, joists, and girders at third points of spans. Offset joints in girders a minimum distance of twice the beam width from a beam-girder intersection.
5. Locate horizontal joints in walls and columns at underside of floors, slabs, beams, and girders and at the top of footings or floor slabs.
6. Use a bonding agent at locations where fresh concrete is placed against hardened or partially hardened concrete surfaces.

3.5 CONCRETE PLACEMENT

- A. Before placing concrete, verify that installation of formwork, reinforcement, embedded items, and vapor retarder is complete and that required inspections are completed.
- B. Notify Architect and testing and inspection agencies 24 hours prior to commencement of concrete placement.
- C. Do not add water to concrete during delivery, at Project site, or during placement unless approved by Architect in writing, but not to exceed the amount indicated on the concrete delivery ticket.
 1. Do not add water to concrete after adding high-range water-reducing admixtures to mixture.
- D. Before test sampling and placing concrete, water may be added at Project site, subject to limitations of ACI 301, but not to exceed the amount indicated on the concrete delivery ticket.
 1. Do not add water to concrete after adding high-range water-reducing admixtures to mixture.
- E. Deposit concrete continuously in one layer or in horizontal layers of such thickness that no new concrete is placed on concrete that has hardened enough to cause seams or planes of weakness.
 1. If a section cannot be placed continuously, provide construction joints as indicated.
 2. Deposit concrete to avoid segregation.
 3. Deposit concrete in horizontal layers of depth not to exceed formwork design pressures and in a manner to avoid inclined construction joints.
 4. Consolidate placed concrete with mechanical vibrating equipment in accordance with ACI 301.
 - a. Do not use vibrators to transport concrete inside forms.
 - b. Insert and withdraw vibrators vertically at uniformly spaced locations to rapidly penetrate placed layer and at least 6 inches into preceding layer.

- c. Do not insert vibrators into lower layers of concrete that have begun to lose plasticity.
- d. At each insertion, limit duration of vibration to time necessary to consolidate concrete, and complete embedment of reinforcement and other embedded items without causing mixture constituents to segregate.

3.6 FINISHING FORMED SURFACES

A. As-Cast Surface Finishes:

- 1. ACI 301 Surface Finish SF-1.0: As-cast concrete texture imparted by form-facing material. Apply to concrete surfaces not exposed to public view.
 - a. Patch voids larger than 1-1/2 inches wide or 1/2 inch deep.
 - b. Remove projections larger than 1 inch.
 - c. Tie holes do not require patching.
 - d. Surface Tolerance: ACI 117 Class D.
- 2. ACI 301 Surface Finish SF-2.0: As-cast concrete texture imparted by form-facing material, arranged in an orderly and symmetrical manner with a minimum of seams.
 - a. Patch voids larger than 3/4 inch wide or 1/2 inch deep.
 - b. Remove projections larger than 1/4 inch.
 - c. Patch tie holes.
 - d. Surface Tolerance: ACI 117 Class B.

B. Related Unformed Surfaces:

- 1. At tops of walls, horizontal offsets, and similar unformed surfaces adjacent to formed surfaces, strike off smooth and finish with a color and texture matching adjacent formed surfaces.
- 2. Continue final surface treatment of formed surfaces uniformly across adjacent unformed surfaces unless otherwise indicated.

3.7 INSTALLATION OF MISCELLANEOUS CONCRETE ITEMS

A. Filling In:

- 1. Fill in holes and openings left in concrete structures after Work of other trades is in place unless otherwise indicated.
- 2. Mix, place, and cure concrete, as specified, to blend with in-place construction.
- 3. Provide other miscellaneous concrete filling indicated or required to complete the Work.

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

3.8 CONCRETE CURING

- A. Protect freshly placed concrete from premature drying and excessive cold or hot temperatures.
 - 1. Comply with ACI 301 and ACI 306.1 for cold weather protection during curing.
 - 2. Comply with ACI 301 and ACI 305.1 for hot-weather protection during curing.
 - 3. Maintain moisture loss no more than 0.2 lb/sq. ft. x h before and during finishing operations.
- B. Curing Formed Surfaces: Comply with ACI 308.1 as follows:
 - 1. Cure formed concrete surfaces, including underside of beams, supported slabs, and other similar surfaces.
 - 2. Cure concrete containing color pigments in accordance with color pigment manufacturer's instructions.
 - 3. If forms remain during curing period, moist cure after loosening forms.
 - 4. If removing forms before end of curing period, continue curing for remainder of curing period, as follows:
 - a. Continuous Fogging: Maintain standing water on concrete surface until final setting of concrete.
 - b. Continuous Sprinkling: Maintain concrete surface continuously wet.
 - c. Membrane-Forming Curing Compound: Apply uniformly in continuous operation by power spray or roller in accordance with manufacturer's written instructions.
 - 1) Recoat areas subject to heavy rainfall within three hours after initial application.
 - 2) Maintain continuity of coating and repair damage during curing period.
- C. Curing Unformed Surfaces: Comply with ACI 308.1 as follows:
 - 1. Begin curing immediately after finishing concrete.

3.9 TOLERANCES

- A. Conform to ACI 117.

3.10 JOINT FILLING

- A. Prepare, clean, and install joint filler in accordance with manufacturer's written instructions.
 - 1. Defer joint filling until concrete has aged at least one month(s).
 - 2. Do not fill joints until construction traffic has permanently ceased.

- B. Remove dirt, debris, saw cuttings, curing compounds, and sealers from joints; leave contact faces of joints clean and dry.
- C. Install semirigid joint filler full depth in saw-cut joints and at least 2 inches deep in formed joints.
- D. Overfill joint, and trim joint filler flush with top of joint after hardening.

3.11 FIELD QUALITY CONTROL

- A. Testing Agency: Owner will engage a qualified testing and inspecting agency to perform tests and inspections and to submit reports.
 - 1. Testing agency to be responsible for providing curing container for composite samples on Site and verifying that field-cured composite samples are cured in accordance with ASTM C31/C31M.
 - 2. Testing agency to immediately report to Architect, Contractor, and concrete manufacturer any failure of Work to comply with Contract Documents.
 - 3. Testing agency to report results of tests and inspections, in writing, to Owner, Architect, Contractor, and concrete manufacturer within 48 hours of inspections and tests.
 - a. Test reports to include reporting requirements of ASTM C31/C31M, ASTM C39/C39M, and ACI 301, including the following as applicable to each test and inspection:
 - 1) Project name.
 - 2) Name of testing agency.
 - 3) Names and certification numbers of field and laboratory technicians performing inspections and testing.
 - 4) Name of concrete manufacturer.
 - 5) Date and time of inspection, sampling, and field testing.
 - 6) Date and time of concrete placement.
 - 7) Location in Work of concrete represented by samples.
 - 8) Date and time sample was obtained.
 - 9) Truck and batch ticket numbers.
 - 10) Design compressive strength at 28 days.
 - 11) Concrete mixture designation, proportions, and materials.
 - 12) Field test results.
 - 13) Information on storage and curing of samples before testing, including curing method and maximum and minimum temperatures during initial curing period.
 - 14) Type of fracture and compressive break strengths at seven days and 28 days.
- B. Batch Tickets: For each load delivered, submit three copies of batch delivery ticket to testing agency, indicating quantity, mix identification, admixtures, design strength, aggregate size, design air content, design slump at time of batching, and amount of water that can be added at Project site.

- C. Inspections:
1. Headed bolts and studs.
 2. Verification of use of required design mixture.
 3. Concrete placement, including conveying and depositing.
 4. Curing procedures and maintenance of curing temperature.
 5. Verification of concrete strength before removal of shores and forms from beams and slabs.
- D. Concrete Tests: Testing of composite samples of fresh concrete obtained in accordance with ASTM C 172/C 172M to be performed in accordance with the following requirements:
1. Testing Frequency: Obtain one composite sample for each day's pour of each concrete mixture exceeding 5 cu. yd., but less than 25 cu. yd., plus one set for each additional 50 cu. yd. or fraction thereof.
 - a. When frequency of testing provides fewer than five compressive-strength tests for each concrete mixture, testing to be conducted from at least five randomly selected batches or from each batch if fewer than five are used.
 2. Slump: ASTM C143/C143M:
 - a. One test at point of placement for each composite sample, but not less than one test for each day's pour of each concrete mixture.
 - b. Perform additional tests when concrete consistency appears to change.
 3. Air Content: ASTM C231/C231M pressure method, for normal-weight concrete;
.
 - a. One test for each composite sample, but not less than one test for each day's pour of each concrete mixture.
 4. Concrete Temperature: ASTM C1064/C1064M:
 - a. One test hourly when air temperature is 40 deg F and below or 80 deg F and above, and one test for each composite sample.
 5. Compression Test Specimens: ASTM C31/C31M:
 - a. Cast and laboratory cure two sets of two 6-inch by 12-inch or 4-inch by 8-inch cylinder specimens for each composite sample.
 - b. Cast, initial cure, and field cure two sets of two standard cylinder specimens for each composite sample.
 6. Compressive-Strength Tests: ASTM C39/C39M.
 - a. Test one set of two laboratory-cured specimens at seven days and one set of two specimens at 28 days.

- b. Test one set of two field-cured specimens at seven days and one set of two specimens at 28 days.
 - c. A compressive-strength test to be the average compressive strength from a set of two specimens obtained from same composite sample and tested at age indicated.
- 7. Strength of each concrete mixture will be satisfactory if every average of any three consecutive compressive-strength tests equals or exceeds specified compressive strength, and no compressive-strength test value falls below specified compressive strength by more than 500 psi if specified compressive strength is 5000 psi, or no compressive strength test value is less than 10 percent of specified compressive strength if specified compressive strength is greater than 5000 psi.
- 8. Nondestructive Testing: Impact hammer, sonoscope, or other nondestructive device may be permitted by Architect but will not be used as sole basis for approval or rejection of concrete.
- 9. Additional Tests:
 - a. Testing and inspecting agency to make additional tests of concrete when test results indicate that slump, air entrainment, compressive strengths, or other requirements have not been met, as directed by Architect.
 - b. Testing and inspecting agency may conduct tests to determine adequacy of concrete by cored cylinders complying with ASTM C42/C42M or by other methods as directed by Architect.
 - 1) Acceptance criteria for concrete strength to be in accordance with ACI 301, Section 1.6.6.3.
- 10. Additional testing and inspecting, at Contractor's expense, will be performed to determine compliance of replaced or additional work with specified requirements.
- 11. Correct deficiencies in the Work that test reports and inspections indicate do not comply with the Contract Documents.

3.12 PROTECTION

A. Protect concrete surfaces as follows:

- 1. Protect from petroleum stains.
- 2. Diaper hydraulic equipment used over concrete surfaces.
- 3. Prohibit use of pipe-cutting machinery over concrete surfaces.
- 4. Prohibit placement of steel items on concrete surfaces.
- 5. Prohibit use of acids or acidic detergents over concrete surfaces.

END OF SECTION 03 30 00

SECTION 05 40 00 - COLD-FORMED METAL FRAMING

PART 1 - GENERAL

1.1 SUMMARY

A. Section Includes:

1. Exterior non-load-bearing wall framing.
2. Soffit framing.

B. Related Requirements:

1. Section 05 50 00 "Metal Fabrications" for miscellaneous steel shapes, masonry shelf angles, and connections used with cold-formed metal framing.
2. Section 09 22 16 "Non-Structural Metal Framing" for standard, interior non-load-bearing, metal-stud framing, with height limitations and ceiling-suspension assemblies.

1.2 ACTION SUBMITTALS

- A. Delegated Design Submittal:** For cold-formed steel framing.

1.3 DELIVERY, STORAGE, AND HANDLING

- A. Protect and store cold-formed steel framing from corrosion, moisture staining, deformation, and other damage during delivery, storage, and handling as required in AISI S202.**

PART 2 - PRODUCTS

2.1 PERFORMANCE REQUIREMENTS

- A. Delegated Design:** Engage a qualified professional engineer, as defined in Section 01 40 00 "Quality Requirements," to design cold-formed steel framing.
- B. Structural Performance:** Provide cold-formed steel framing capable of withstanding design loads within limits and under conditions indicated.
1. Design Loads: Calculated in accordance with ASCE 7 using the criteria listed on the structural drawings. .
 2. Deflection Limits: Design framing systems to withstand design loads without deflections greater than the following:
 - a. Exterior Non-Load-Bearing Framing: Horizontal deflection of 1/600 of the wall height.

- b. Interior Non-Load-Bearing Framing: Horizontal deflection of 1/240 of the wall height under a horizontal load of 5 lbf/sq. ft..
 - c. Ceiling Joist Framing: Vertical deflection of 1/240 of the span for live loads and 1/240 for total loads of the span.
- 3. Design framing systems to provide for movement of framing members located outside the insulated building envelope without damage or overstressing, sheathing failure, connection failure, undue strain on fasteners and anchors, or other detrimental effects when subject to a maximum ambient temperature change of 120 deg F.
- 4. Design framing system to maintain clearances at openings, to allow for construction tolerances, and to accommodate live load deflection of primary building structure as follows:
 - a. Upward and downward movement of 3/4 inch.
- 5. Design exterior non-load-bearing wall framing to accommodate horizontal deflection without regard for contribution of sheathing materials.
- C. Cold-Formed Steel Framing Standards: Unless more stringent requirements are indicated, framing complies with AISI S100 and AISI S240.
- D. Fire-Resistance Ratings: Comply with ASTM E119; testing by a qualified testing agency. Identify products with appropriate markings of applicable testing agency.
 - 1. Indicate design designations from UL's "Fire Resistance Directory" or from the listings of another qualified testing agency acceptable to authorities having jurisdiction.

2.2 COLD-FORMED STEEL FRAMING MATERIALS

- A. Recycled Content of Steel Products: Postconsumer recycled content plus one-half of preconsumer recycled content not less than 25 percent.
- B. Framing Members, General: Comply with ASTM C955 AISI S200 and ASTM C955, Section 8 for conditions indicated.

2.3 EXTERIOR NON-LOAD-BEARING WALL FRAMING

- A. Steel Studs: Manufacturer's standard C-shaped steel studs, of web depths indicated, punched, with stiffened flanges, and as follows:
 - 1. Minimum Base-Metal Thickness: 0.0677 inch.
 - 2. Flange Width: 1-5/8 inches.
- B. Vertical Deflection Clips, Exterior: Manufacturer's standard clips, capable of accommodating upward and downward vertical displacement of primary structure through positive mechanical attachment to stud web.

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. AllSteel & Gypsum Products, Inc.
 - b. ClarkDietrich.
 - c. MarinoWARE.
 - d. SCAFCO Steel Stud Company.
 - e. Simpson Strong-Tie Co., Inc.
- C. Single Deflection Track: Manufacturer's single, deep-leg, U-shaped steel track; unpunched, with unstiffened flanges, of web depth to contain studs while allowing free vertical movement, with flanges designed to support horizontal loads and transfer them to the primary structure, and as follows:
 1. Minimum Base-Metal Thickness: 0.0428 inch 0.0538 inch 0.0677 inch 0.0966 inch Insert dimension.
- D. Double Deflection Tracks: Manufacturer's double, deep-leg, U-shaped steel tracks, consisting of nested inner and outer tracks; unpunched, with unstiffened flanges.
 1. Outer Track: Of web depth to allow free vertical movement of inner track, with flanges designed to support horizontal loads and transfer them to the primary structure, and as follows:
 - a. Minimum Base-Metal Thickness: 0.0329 inch 0.0428 inch 0.0538 inch 0.0677 inch 0.0966 inch Insert dimension.

2.4 FRAMING ACCESSORIES

- A. Fabricate steel-framing accessories from ASTM A1003/A1003M, Structural Grade, Type H, metallic coated steel sheet, of same grade and coating designation used for framing members.
- B. Provide accessories of manufacturer's standard thickness and configuration, unless otherwise indicated, as follows:
 1. Supplementary framing.
 2. Bracing, bridging, and solid blocking.
 3. Web stiffeners.
 4. Anchor clips.
 5. End clips.
 6. Foundation clips.
 7. Gusset plates.
 8. Stud kickers and knee braces.
 9. Joist hangers and end closures.
 10. Hole-reinforcing plates.
 11. Backer plates.

2.5 ANCHORS, CLIPS, AND FASTENERS

- A. Steel Shapes and Clips: ASTM A36/A36M, zinc coated by hot-dip process according to ASTM A123/A123M.

2.6 MISCELLANEOUS MATERIALS

- A. Galvanizing Repair Paint: MIL-P-21035B.

2.7 FABRICATION

- A. Fabricate cold-formed steel framing and accessories plumb, square, and true to line, and with connections securely fastened, according to referenced AISI's specifications and standards, manufacturer's written instructions, and requirements in this Section.
 - 1. Fabricate framing assemblies using jigs or templates.
 - 2. Cut framing members by sawing or shearing; do not torch cut.
 - 3. Fasten cold-formed steel framing members by welding, screw fastening, clinch fastening, pneumatic pin fastening, or riveting as standard with fabricator. Wire tying of framing members is not permitted.
 - a. Comply with AWS D1.3/D1.3M requirements and procedures for welding, appearance and quality of welds, and methods used in correcting welding work.
 - b. Locate mechanical fasteners and install according to Shop Drawings, with screws penetrating joined members by no fewer than three exposed screw threads.
 - 4. Fasten other materials to cold-formed steel framing by welding, bolting, pneumatic pin fastening, or screw fastening, according to Shop Drawings.
- B. Reinforce, stiffen, and brace framing assemblies to withstand handling, delivery, and erection stresses. Lift fabricated assemblies by means that prevent damage or permanent distortion.
- C. Tolerances: Fabricate assemblies level, plumb, and true to line to a maximum allowable variation of 1/8 inch in 10 feet and as follows:
 - 1. Spacing: Space individual framing members no more than plus or minus 1/8 inch from plan location. Cumulative error are not to exceed minimum fastening requirements of sheathing or other finishing materials.
 - 2. Squareness: Fabricate each cold-formed steel framing assembly to a maximum out-of-square tolerance of 1/8 inch.

PART 3 - EXECUTION

3.1 EXAMINATION

- A. Examine substrates, areas, conditions, and abutting structural framing 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.

3.2 PREPARATION

- A. Before sprayed fire-resistive materials are applied, attach continuous angles, supplementary framing, or tracks to structural members indicated to receive sprayed fire-resistive materials.
- B. After applying sprayed fire-resistive materials, remove only as much of these materials as needed to complete installation of cold-formed framing without reducing thickness of fire-resistive materials below that required to obtain fire-resistance ratings indicated. Protect remaining fire-resistive materials from damage.
- C. Install load-bearing shims or grout between the underside of load-bearing wall bottom track and the top of foundation wall or slab at locations with a gap larger than 1/4 inch to ensure a uniform bearing surface on supporting concrete or masonry construction.
- D. Install sill sealer gasket at the underside of wall bottom track or rim track and at the top of foundation wall or slab at stud or joist locations.
- E. Install sill sealer gasket/termite barrier in accordance with manufacturer's written instructions at the underside of wall bottom track or rim track and at the top of foundation wall or slab at stud or joist locations.

3.3 INSTALLATION, GENERAL

- A. Cold-formed steel framing may be shop or field fabricated for installation, or it may be field assembled.
- B. Install cold-formed steel framing according to AISI S200, AISI S202, and manufacturer's written instructions unless more stringent requirements are indicated.
- C. Install shop- or field-fabricated, cold-formed framing and securely anchor to supporting structure.
 - 1. Screw, bolt, or weld wall panels at horizontal and vertical junctures to produce flush, even, true-to-line joints with maximum variation in plane and true position between fabricated panels not exceeding 1/16 inch.

- D. Install cold-formed steel framing and accessories plumb, square, and true to line, and with connections securely fastened.
 - 1. Cut framing members by sawing or shearing; do not torch cut.
 - 2. Fasten cold-formed steel framing members by welding, screw fastening, clinch fastening, or riveting. Wire tying of framing members is not permitted.
 - a. Comply with AWS D1.3/D1.3M requirements and procedures for welding, appearance and quality of welds, and methods used in correcting welding work.
 - b. Locate mechanical fasteners, install according to Shop Drawings, and comply with requirements for spacing, edge distances, and screw penetration.
- E. Install framing members in one-piece lengths unless splice connections are indicated for track or tension members.
- F. Install temporary bracing and supports to secure framing and support loads equal to those for which structure was designed. Maintain braces and supports in place, undisturbed, until entire integrated supporting structure has been completed and permanent connections to framing are secured.
- G. Do not bridge building expansion joints with cold-formed steel framing. Independently frame both sides of joints.
- H. Install insulation, specified in Section 07 21 00 "Thermal Insulation," in framing-assembly members, such as headers, sills, boxed joists, and multiple studs at openings, that are inaccessible on completion of framing work.
- I. Fasten hole-reinforcing plate over web penetrations that exceed size of manufacturer's approved or standard punched openings.

3.4 INSTALLATION OF EXTERIOR NONLOADBEARING WALL FRAMING

- A. Install continuous tracks sized to match studs. Align tracks accurately and securely anchor to supporting structure.
- B. Fasten both flanges of studs to top and bottom track unless otherwise indicated. Space studs as follows:
 - 1. Stud Spacing: 16 inches.
- C. Set studs plumb, except as needed for diagonal bracing or required for nonplumb walls or warped surfaces and similar requirements.
- D. Isolate non-load-bearing steel framing from building structure to prevent transfer of vertical loads while providing lateral support.
 - 1. Install single deep-leg deflection tracks and anchor to building structure.

2. Install double deep-leg deflection tracks and anchor outer track to building structure.
 3. Connect vertical deflection clips to bypassing studs and anchor to building structure.
 4. Connect drift clips to cold-formed steel framing and anchor to building structure.
- E. Install horizontal bridging in wall studs, spaced vertically in rows indicated on Shop Drawings but not more than 48 inches apart. Fasten at each stud intersection.
1. Channel Bridging: Cold-rolled steel channel, welded or mechanically fastened to webs of punched studs.
 2. Strap Bridging: Combination of flat, taut, steel sheet straps of width and thickness indicated and stud-track solid blocking of width and thickness to match studs. Fasten flat straps to stud flanges and secure solid blocking to stud webs or flanges.
 3. Bar Bridging: Proprietary bridging bars installed according to manufacturer's written instructions.
- F. Top Bridging for Single Deflection Track: Install row of horizontal bridging within 12 inches of single deflection track. Install a combination of bridging and stud or stud-track solid blocking of width and thickness matching studs, secured to stud webs or flanges.
1. Install solid blocking at centers indicated on Shop Drawings.
- G. Install miscellaneous framing and connections, including stud kickers, web stiffeners, clip angles, continuous angles, anchors, and fasteners, to provide a complete and stable wall-framing system.

3.5 INSTALLATION TOLERANCES

- A. Install cold-formed steel framing level, plumb, and true to line to a maximum allowable tolerance variation of 1/8 inch in 10 feet and as follows:
1. Space individual framing members no more than plus or minus 1/8 inch from plan location. Cumulative error are not to exceed minimum fastening requirements of sheathing or other finishing materials.

3.6 REPAIR

- A. Galvanizing Repairs: Prepare and repair damaged galvanized coatings on fabricated and installed cold-formed steel framing with galvanized repair paint according to ASTM A780/A780M and manufacturer's written instructions.

3.7 FIELD QUALITY CONTROL

- A. Testing: Owner will engage a qualified independent testing and inspecting agency to perform field tests and inspections and prepare test reports.

- B. Field and shop welds will be subject to testing and inspecting.
- C. Testing agency will report test results promptly and in writing to Contractor and COR.
- D. Cold-formed steel framing will be considered defective if it does not pass tests and inspections.
- E. Additional testing and inspecting, at Contractor's expense, will be performed to determine compliance of replaced or additional work with specified requirements.

3.8 PROTECTION

- A. Provide final protection and maintain conditions, in a manner acceptable to manufacturer and Installer, that ensure that cold-formed steel framing is without damage or deterioration at time of Substantial Completion.

END OF SECTION **05 40 00**

SECTION 05 50 00 - METAL FABRICATIONS

PART 1 - GENERAL

1.1 SUMMARY

A. Section Includes:

1. Steel framing and supports for applications where framing and supports are not specified in other Sections.
2. Metal ladders.

B. Products furnished, but not installed, under this Section include the following:

1. Anchor bolts, steel pipe sleeves, slotted-channel inserts, and wedge-type inserts indicated to be cast into concrete or built into unit masonry.
2. Steel weld plates and angles for casting into concrete for applications where they are not specified in other Sections.

1.2 COORDINATION

- A. Coordinate selection of shop primers with topcoats to be applied over them. Comply with paint and coating manufacturers' written instructions to ensure that shop primers and topcoats are compatible with one another.**

1.3 ACTION SUBMITTALS

A. Product Data: For the following:

1. Slotted channel framing.
2. Manufactured metal ladders.
3. Metal pipe crossovers.
4. Metal bollards.

1.4 INFORMATIONAL SUBMITTALS

- A. Qualification Data: For professional engineer's experience with providing delegated-design engineering services of the kind indicated, including documentation that engineer is licensed in the jurisdiction in which Project is located.**
- B. Welding certificates.**

1.5 QUALITY ASSURANCE

- A. Welding Qualifications: Qualify procedures and personnel in accordance with the following:
 - 1. AWS D1.1/D1.1M, "Structural Welding Code - Steel."
 - 2. AWS D1.2/D1.2M, "Structural Welding Code - Aluminum."
 - 3. AWS D1.6/D1.6M, "Structural Welding Code - Stainless Steel."

1.6 FIELD CONDITIONS

- A. Field Measurements: Verify actual locations of walls, floor slabs, decks, and other construction contiguous with metal fabrications by field measurements before fabrication.

PART 2 - PRODUCTS

2.1 PERFORMANCE REQUIREMENTS

- A. Delegated Design: Engage a qualified professional engineer, as defined in Section 01 40 00 "Quality Requirements," to design ladders .
- B. Structural Performance of metal ladders: Metal ladders are to withstand the effects of gravity loads and the following loads and stresses within limits and under conditions indicated:
 - 1. Uniform Load: 100 lbf/sq. ft..
 - 2. Uniform and concentrated loads need not be assumed to act concurrently.
 - 3. Comply with applicable railing loadings in Section 05 52 13 "Pipe and Tube Railings."
- C. Thermal Movements: Allow for thermal movements from ambient and surface temperature changes acting on exterior metal fabrications by preventing buckling, opening of joints, overstressing of components, failure of connections, and other detrimental effects.

2.2 METALS

- A. Metal Surfaces, General: Provide materials with smooth, flat surfaces unless otherwise indicated. For metal fabrications exposed to view in the completed Work, provide materials without seam marks, roller marks, rolled trade names, or blemishes.
- B. Steel Plates, Shapes, and Bars: ASTM A36/A36M.
- C. Rolled-Steel Floor Plate: ASTM A786/A786M, rolled from plate complying with ASTM A36/A36M or ASTM A283/A283M, Grade C or D.

- D. Steel Tubing: ASTM A500/A500M, cold-formed steel tubing.
- E. Steel Pipe: ASTM A53/A53M, Standard Weight unless otherwise indicated.
- F. Slotted Channel Framing: Cold-formed metal box channels (struts) complying with MFMA-4.

2.3 FASTENERS

- A. General: Unless otherwise indicated, provide Type 316 stainless steel fasteners for exterior use and zinc-plated fasteners with coating complying with ASTM B633 or ASTM F1941/F1941M, Class Fe/Zn 5, at exterior walls. Select fasteners for type, grade, and class required.
 - 1. Provide stainless steel fasteners for fastening aluminum stainless steel nickel silver.
- B. Steel Bolts and Nuts: Regular hexagon-head bolts, ASTM A307, Grade A; with hex nuts, ASTM A563; and, where indicated, flat washers.
- C. Stainless Steel Bolts and Nuts: Regular hexagon-head annealed stainless steel bolts, ASTM F593; with hex nuts, ASTM F594; and, where indicated, flat washers; Alloy .
- D. Anchor Bolts: ASTM F1554, Grade 36, of dimensions indicated; with nuts, ASTM A563; and, where indicated, flat washers.
- E. Anchors, General: Capable of sustaining, without failure, a load equal to six times the load imposed when installed in unit masonry and four times the load imposed when installed in concrete, as determined by testing in accordance with ASTM E488/E488M, conducted by a qualified independent testing agency.
- F. Post-Installed Anchors: Torque-controlled expansion anchors.
 - 1. Material for Exterior Locations and Where Stainless Steel Is Indicated: Alloy stainless steel bolts, ASTM F593, and nuts, ASTM F594.

2.4 MISCELLANEOUS MATERIALS

- A. Shop Primer for Galvanized Steel: Primer formulated for exterior use over zinc-coated metal and compatible with finish paint systems indicated.
- B. Galvanizing Repair Paint: High-zinc-dust-content paint complying with SSPC-Paint 20 and compatible with paints specified to be used over it.

2.5 FABRICATION, GENERAL

- A. Shop Assembly: Preassemble items in the shop to greatest extent possible. Disassemble units only as necessary for shipping and handling limitations. Use connections that maintain structural value of joined pieces. Clearly mark units for reassembly and coordinated installation.
- B. Form bent-metal corners to smallest radius possible without causing grain separation or otherwise impairing work.
- C. Weld corners and seams continuously to comply with the following:
 - 1. Use materials and methods that minimize distortion and develop strength and corrosion resistance of base metals.
 - 2. Obtain fusion without undercut or overlap.
 - 3. Remove welding flux immediately.
 - 4. At exposed connections, finish exposed welds and surfaces smooth and blended so no roughness shows after finishing and contour of welded surface matches that of adjacent surface.
- D. Fabricate seams and other connections that are exposed to weather in a manner to exclude water. Provide weep holes where water may accumulate.
- E. Cut, reinforce, drill, and tap metal fabrications as indicated to receive finish hardware, screws, and similar items.
- F. Provide for anchorage of type indicated; coordinate with supporting structure. Space anchoring devices to secure metal fabrications rigidly in place and to support indicated loads.

2.6 MISCELLANEOUS FRAMING AND SUPPORTS

- A. General: Provide steel framing and supports not specified in other Sections as needed to complete the Work.
- B. Fabricate units from steel shapes, plates, and bars of welded construction unless otherwise indicated. Fabricate to sizes, shapes, and profiles indicated and as necessary to receive adjacent construction.
 - 1. Fabricate units from slotted channel framing where indicated.
- C. Galvanize miscellaneous framing and supports where indicated.

2.7 METAL LADDERS

- A. General:
 - 1. Comply with ANSI A14.3.

B. Steel Ladders:

1. Space siderails 16 inches apart unless otherwise indicated.
2. Siderails: Continuous, 1/2-by-2-1/2-inch steel flat bars, with eased edges.
3. Rungs: 1-inch- diameter, steel bars.
4. Fit rungs in centerline of siderails; plug-weld and grind smooth on outer rail faces.
5. Provide nonslip surfaces on top of each rung, either by coating rung with aluminum-oxide granules set in epoxy-resin adhesive or by using a type of manufactured rung filled with aluminum-oxide grout.
6. Source Limitations: Obtain nonslip surfaces from single source from single manufacturer.
7. Provide platforms as indicated fabricated from FRP grating, supported by steel angles. Limit openings in gratings to no more than 3/4 inch in least dimension.
8. Support each ladder at top and bottom and not more than 60 inches o.c. with welded or bolted steel brackets.
9. Galvanize and prime ladders, including brackets.
10. Prime exterior ladders, including brackets and fasteners, with primer specified in Section 09 96 00 "High-Performance Coatings."

2.8 METAL PIPE CROSSOVERS

- A. Provide metal pipe crossovers where indicated. Fabricate of open-type construction with channel or plate stringers and pipe and tube railings unless otherwise indicated. Provide brackets and fittings for installation.
1. Treads are not to be less than 5 inches exclusive of nosing or less than 8-1/2 inches including the nosing, and riser height is not to be more than 9-1/2 inches.
 2. Fabricate pipe crossovers, including railings from steel.
 3. Fabricate treads and platforms from FRP grating. Limit openings in gratings to no more than 3/4 inch in least dimension.
 4. Comply with applicable railing requirements in Section 05 52 13 "Pipe and Tube Railings."
- B. Galvanize and prime steel pipe crossovers, including treads, railings, brackets, and fasteners.
- C. Prime exterior steel pipe crossovers, including treads, railings, brackets, and fasteners, with primer specified in Section 09 96 00 "High-Performance Coatings."

2.9 MISCELLANEOUS STEEL TRIM

- A. Unless otherwise indicated, fabricate units from steel shapes, plates, and bars of profiles shown with continuously welded joints and smooth exposed edges. Miter corners and use concealed field splices where possible.
- B. Provide cutouts, fittings, and anchorages as needed to coordinate assembly and installation with other work.

2.10 |METAL BOLLARDS

- A. Fabricate metal bollards from Schedule 80 steel pipe .
 - 1. Cap bollards with 1/4-inch- thick, steel plate with domed top.
- B. Prime steel bollards with primer specified in Section 09 96 00 "High-Performance Coatings."

2.11 LOOSE BEARING AND LEVELING PLATES

- A. Galvanize bearing and leveling plates.

2.12 |STEEL WELD PLATES AND ANGLES

- A. Provide steel weld plates and angles not specified in other Sections, for items supported from concrete construction as needed to complete the Work. Provide each unit with no fewer than two integrally welded steel strap anchors for embedding in concrete.

2.13 GENERAL FINISH REQUIREMENTS

- A. Finish metal fabrications after assembly.
- B. Finish exposed surfaces to remove tool and die marks and stretch lines, and to blend into surrounding surface.

2.14 STEEL AND IRON FINISHES

- A. Galvanizing: Hot-dip galvanize items as indicated to comply with ASTM A153/A153M for steel and iron hardware and with ASTM A123/A123M for other steel and iron products.
- B. Preparation for Shop Priming: Prepare surfaces to comply with requirements indicated below:
 - 1. Galvanized-Steel Items: SSPC-SP 16, "Brush-off Blast Cleaning of Coated and Uncoated Galvanized Steel, Stainless Steels, and Non-Ferrous Metals."

PART 3 - EXECUTION

3.1 INSTALLATION, GENERAL

- A. Cutting, Fitting, and Placement: Perform cutting, drilling, and fitting required for installing metal fabrications. Set metal fabrications accurately in location, alignment, and elevation; with edges and surfaces level, plumb, true, and free of rack; and measured from established lines and levels.
- B. Fit exposed connections accurately together to form hairline joints. Weld connections that are not to be left as exposed joints but cannot be shop welded because of shipping size limitations. Do not weld, cut, or abrade surfaces of exterior units that have been hot-dip galvanized after fabrication and are for bolted or screwed field connections.
- C. Fastening to In-Place Construction: Provide anchorage devices and fasteners where metal fabrications are required to be fastened to in-place construction. Provide threaded fasteners for use with concrete and masonry inserts, toggle bolts, through bolts, lag screws, wood screws, and other connectors.
- D. Provide temporary bracing or anchors in formwork for items that are to be built into concrete, masonry, or similar construction.

3.2 INSTALLATION OF MISCELLANEOUS FRAMING AND SUPPORTS

- A. General: Install framing and supports to comply with requirements of items being supported, including manufacturers' written instructions and requirements indicated on Shop Drawings.
- B. Anchor supports for ceiling hung toilet partitions overhead doors overhead grilles securely to, and rigidly brace from, building structure.
- C. Anchor shelf angles securely to existing construction with .
- D. Support steel girders on solid grouted masonry, concrete, or steel pipe columns. Secure girders with anchor bolts embedded in grouted masonry or concrete or with bolts through top plates of pipe columns.
 - 1. Where grout space under bearing plates is indicated for girders supported on concrete or masonry, install as specified in "Installing Bearing and Leveling Plates" Article.
- E. Install pipe columns on concrete footings with grouted baseplates. Position and grout column baseplates as specified in "Installation of Bearing and Leveling Plates" Article.
 - 1. Grout baseplates of columns supporting steel girders after girders are installed and leveled.

3.3 INSTALLATION OF METAL BOLLARDS

- A. Anchor bollards to existing construction with anchor bolts. Provide four 3/4-inch bolts at each bollard unless otherwise indicated.
 - 1. Embed anchor bolts at least 4 inches in concrete.
- B. Anchor bollards in concrete with pipe sleeves preset and anchored into concrete. Fill annular space around bollard solidly with shrinkage-resistant grout; mixed and placed to comply with grout manufacturer's written instructions. Slope grout up approximately 1/8 inch toward bollard.
- C. Anchor internal sleeves for removable bollards in place with concrete footings. Center and align sleeves in holes 3 inches above bottom of excavation. Place concrete and vibrate or tamp for consolidation. Support and brace sleeves in position until concrete has cured.
- D. Place removable bollards over internal sleeves and secure with 3/4-inch machine bolts and nuts. After tightening nuts, drill holes in bolts for inserting padlocks. Owner furnishes padlocks.
- E. Fill bollards solidly with concrete, mounding top surface to shed water.
 - 1. Do not fill removable bollards with concrete.

3.4 INSTALLATION OF BEARING AND LEVELING PLATES

- A. Clean concrete and masonry bearing surfaces of bond-reducing materials, and roughen to improve bond to surfaces. Clean bottom surface of plates.
- B. Set bearing and leveling plates on wedges, shims, or leveling nuts. After bearing members have been positioned and plumbed, tighten anchor bolts. Do not remove wedges or shims but, if protruding, cut off flush with edge of bearing plate before packing with shrinkage-resistant grout. Pack grout solidly between bearing surfaces and plates to ensure that no voids remain.

3.5 REPAIRS

- A. Touchup Painting:
 - 1. Immediately after erection, clean field welds, bolted connections, and abraded areas. Paint uncoated and abraded areas with same material as used for shop painting to comply with SSPC-PA 1 for touching up shop-painted surfaces.
 - a. Apply by brush or spray to provide a minimum 2.0-mil dry film thickness.
 - 2. Cleaning and touchup painting of field welds, bolted connections, and abraded areas of shop paint are specified in Section 09 91 13 "Exterior Painting."

END OF SECTION **05 50 00**

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SECTION 05 52 13 - PIPE AND TUBE RAILINGS

PART 1 - GENERAL

1.1 COORDINATION

- A. Coordinate selection of shop primers with topcoats to be applied over them. Comply with paint and coating manufacturers' written recommendations to ensure that shop primers and topcoats are compatible with one another.
- B. Coordinate installation of anchorages for railings. Furnish setting drawings, templates, and directions for installing anchorages, including sleeves, concrete inserts, anchor bolts, and items with integral anchors, that are to be embedded in concrete or masonry. Deliver such items to Project site in time for installation.

1.2 ACTION SUBMITTALS

- A. Product Data:
 - 1. Manufacturer's product lines of mechanically connected railings.
 - 2. Fasteners.
 - 3. Post-installed anchors.
 - 4. Bituminous paint.
 - 5. Nonshrink, nonmetallic grout.
 - 6. Anchoring cement.
 - 7. Metal finishes.
 - 8. Paint products.
- B. Shop Drawings: Include plans, elevations, sections, details, and attachments to other work.
- C. Samples for Initial Selection: For products involving selection of color, texture, or design, including mechanical finishes.
- D. Delegated Design Submittal: For railings, including analysis data signed and sealed by the qualified professional engineer responsible for their preparation.

1.3 INFORMATIONAL SUBMITTALS

- A. Mill Certificates: Signed by manufacturers of stainless steel products, certifying that products furnished comply with requirements.
- B. Product Test Reports: For tests on railings performed by a qualified testing agency, in accordance with ASTM E894 and ASTM E935.

1.4 DELIVERY, STORAGE, AND HANDLING

- A. Protect mechanical finishes on exposed surfaces of railings from damage by applying a strippable, temporary protective covering before shipping.

1.5 FIELD CONDITIONS

- A. Field Measurements: Verify actual locations of walls and other construction contiguous with railings by field measurements before fabrication.

PART 2 - PRODUCTS

2.1 PERFORMANCE REQUIREMENTS

- A. Delegated Design: Engage a qualified professional engineer, as defined in Section 01 40 00 "Quality Requirements," to design railings, including attachment to building construction.
- B. Structural Performance: Railings, including attachment to building construction, withstand the effects of gravity loads and the following loads and stresses within limits and under conditions indicated:
 - 1. Handrails and Top Rails of Guards:
 - a. Uniform load of 50 lbf/ ft. applied in any direction.
 - b. Concentrated load of 200 lbf applied in any direction.
 - c. Uniform and concentrated loads need not be assumed to act concurrently.
 - 2. Infill of Guards:
 - a. Concentrated load of 50 lbf applied horizontally on an area of 1 sq. ft..
 - b. Infill load and other loads need not be assumed to act concurrently.
- C. Thermal Movements: Allow for thermal movements from ambient and surface temperature changes.
 - 1. Temperature Change: 120 deg F, ambient; 180 deg F, material surfaces.

2.2 FASTENERS

- A. Fasteners for Anchoring Railings to Other Construction: Select fasteners of type, grade, and class required to produce connections suitable for anchoring railings to other types of construction and capable of withstanding design loads.

- B. Post-Installed Anchors: Fastener systems with working capacity greater than or equal to the design load, according to an evaluation report acceptable to authorities having jurisdiction, based on ICC-ES AC193.

2.3 MISCELLANEOUS MATERIALS

- A. Welding Rods and Bare Electrodes: Select in accordance with AWS specifications for metal alloy welded.
 - 1. For railings, provide type and alloy as recommended by producer of metal to be welded and as required for color match, strength, and compatibility in fabricated items.
- B. Galvanizing Repair Paint: High-zinc-dust-content paint, complying with SSPC-Paint 20 and compatible with paints specified to be used over it.
- C. Shop Primer for Galvanized Steel: Primer formulated for exterior use over zinc-coated metal and compatible with finish paint systems indicated.

2.4 FABRICATION

- A. General: Fabricate railings to comply with requirements indicated for design, dimensions, member sizes and spacing, details, finish, and anchorage, but not less than that required to support structural loads.
- B. Shop assemble railings to greatest extent possible to minimize field splicing and assembly. Disassemble units only as necessary for shipping and handling limitations.
 - 1. Clearly mark units for reassembly and coordinated installation.
 - 2. Use connections that maintain structural value of joined pieces.
- C. Cut, drill, and punch metals cleanly and accurately.
 - 1. Remove burrs and ease edges to a radius of approximately 1/32 inch unless otherwise indicated.
 - 2. Remove sharp or rough areas on exposed surfaces.
- D. Form work true to line and level with accurate angles and surfaces.
- E. Fabricate connections that are exposed to weather in a manner that excludes water.
 - 1. Provide weep holes where water may accumulate.
 - 2. Locate weep holes in inconspicuous locations.
- F. Cut, reinforce, drill, and tap as indicated to receive finish hardware, screws, and similar items.
- G. Connections: Fabricate railings with welded connections unless otherwise indicated.

- H. Gates: Form gates from steel tube of same size and shape as top rails, with infill to match guards. Provide with cam-type, self-closing hinges for fastening to wall and overlapping stop with rubber bumper to prevent gate from opening in direction opposite egress.
- I. Welded Connections: Cope components at connections to provide close fit, or use fittings designed for this purpose. Weld all around at connections, including at fittings.
 - 1. Use materials and methods that minimize distortion and develop strength and corrosion resistance of base metals.
 - 2. Obtain fusion without undercut or overlap.
 - 3. Remove flux immediately.
 - 4. At exposed connections, finish exposed welds to comply with NOMMA's "Voluntary Joint Finish Standards" for Finish #1 welds; ornamental quality with no evidence of a welded joint.
- J. Nonwelded Connections: Connect members with concealed mechanical fasteners and fittings. Fabricate members and fittings to produce flush, smooth, rigid, hairline joints.
 - 1. Fabricate splice joints for field connection, using an epoxy structural adhesive, if this is manufacturer's standard splicing method.
- K. Form changes in direction as follows:
 - 1. By bending to smallest radius that will not result in distortion of railing member.
- L. Bend members in jigs to produce uniform curvature for each configuration required. Maintain cross section of member throughout entire bend without buckling, twisting, cracking, or otherwise deforming exposed surfaces of components.
- M. Close exposed ends of hollow railing members with prefabricated cap and end fittings of same metal and finish as railings.
- N. Provide wall returns at ends of wall-mounted handrails unless otherwise indicated. Close ends of returns unless clearance between end of rail and wall is 1/4 inch or less.
- O. Brackets, Flanges, Fittings, and Anchors: Provide wall brackets, flanges, miscellaneous fittings, and anchors to interconnect railing members to other work unless otherwise indicated.
 - 1. At brackets and fittings fastened to plaster or gypsum board partitions, provide crush-resistant fillers or other means to transfer loads through wall finishes to structural supports and prevent bracket or fitting rotation and crushing of substrate.
- P. Provide inserts and other anchorage devices for connecting railings to concrete or masonry work.
 - 1. Fabricate anchorage devices capable of withstanding loads imposed by railings.
 - 2. Coordinate anchorage devices with supporting structure.

- Q. For railing posts set in concrete, provide stainless steel sleeves not less than 6 inches long with inside dimensions not less than 1/2 inch greater than outside dimensions of post, with metal plate forming bottom closure.
- R. For removable railing posts, fabricate slip-fit sockets from stainless steel tube or pipe whose ID is sized for a close fit with posts; limit movement of post without lateral load, measured at top, to not more than one-fortieth of post height.
 - 1. Provide socket covers designed and fabricated to resist being dislodged.
 - 2. Provide chain with eye, snap hook, and staple across gaps formed by removable railing sections at locations indicated. Fabricate from same metal as railings.
- S. Toe Boards: Where indicated, provide toe boards at railings around openings and at edge of open-sided floors and platforms. Fabricate to dimensions and details indicated.

2.5 STEEL AND IRON FINISHES

- A. Galvanized Railings:
 - 1. Hot-dip galvanize exterior steel railings, including hardware, after fabrication.
 - 2. Comply with ASTM A123/A123M for hot-dip galvanized railings.
 - 3. Comply with ASTM A153/A153M for hot-dip galvanized hardware.
 - 4. Do not quench or apply post-galvanizing treatments that might interfere with paint adhesion.
 - 5. Fill vent and drain holes that are exposed in the finished Work, unless indicated to remain as weep holes, by plugging with zinc solder and filing off smooth.
- B. For galvanized railings, provide hot-dip galvanized fittings, brackets, fasteners, sleeves, and other ferrous components.
- C. Preparing Galvanized Railings for Shop Priming: After galvanizing, thoroughly clean railings of grease, dirt, oil, flux, and other foreign matter, and treat with etching cleaner and as follows.
 - 1. Comply with SSPC-SP 16.
- D. For nongalvanized-steel railings, provide nongalvanized ferrous-metal fittings, brackets, fasteners, and sleeves; however, hot-dip galvanize anchors to be embedded in exterior concrete or masonry.

PART 3 - EXECUTION

3.1 EXAMINATION

- A. Examine plaster and gypsum board assemblies, where reinforced to receive anchors, to verify that locations of concealed reinforcements are clearly marked for Installer. Locate reinforcements and mark locations if not already done.

3.2 INSTALLATION, GENERAL

- A. Perform cutting, drilling, and fitting required for installing railings.
 - 1. Fit exposed connections together to form tight, hairline joints.
 - 2. Install railings level, plumb, square, true to line; without distortion, warp, or rack.
 - 3. Set railings accurately in location, alignment, and elevation; measured from established lines and levels.
 - 4. Do not weld, cut, or abrade surfaces of railing components that are coated or finished after fabrication and that are intended for field connection by mechanical or other means without further cutting or fitting.
 - 5. Set posts plumb within a tolerance of 1/16 inch in 3 feet.
 - 6. Align rails so variations from level for horizontal members and variations from parallel with rake of steps and ramps for sloping members do not exceed 1/4 inch in 12 feet.
- B. Control of Corrosion: Prevent galvanic action and other forms of corrosion by insulating metals and other materials from direct contact with incompatible materials.
 - 1. Coat concealed surfaces of aluminum that will be in contact with grout, concrete, masonry, wood, or dissimilar metals, with a heavy coat of bituminous paint.
- C. Adjust railings before anchoring to ensure matching alignment at abutting joints.
- D. Fastening to In-Place Construction: Use anchorage devices and fasteners where necessary for securing railings and for properly transferring loads to in-place construction.

3.3 RAILING CONNECTIONS

- A. Nonwelded Connections: Use mechanical or adhesive joints for permanently connecting railing components. Use wood blocks and padding to prevent damage to railing members and fittings. Seal recessed holes of exposed locking screws, using plastic cement filler colored to match finish of railings.
- B. Welded Connections: Use fully welded joints for permanently connecting railing components. Comply with requirements for welded connections in "Fabrication" Article, whether welding is performed in the shop or in the field.
- C. Expansion Joints: Install expansion joints at locations indicated but not farther apart than required to accommodate thermal movement. Provide slip-joint internal sleeve, extending 2 inches beyond joint on either side; fasten internal sleeve securely to one side; and locate joint within 6 inches of post.

3.4 ANCHORING POSTS

- A. Use stainless steel pipe sleeves preset and anchored into concrete for installing posts. After posts are inserted into sleeves, fill annular space between post and sleeve with , mixed and placed to comply with anchoring material manufacturer's written instructions.
- B. Form or core-drill holes not less than 5 inches deep and 3/4 inch larger than OD of post for installing posts in concrete. Clean holes of loose material, insert posts, and fill annular space between post and concrete with , mixed and placed to comply with anchoring material manufacturer's written instructions.
- C. Cover anchorage joint with flange of same metal as post, attached to post with setscrews.
- D. Anchor posts to metal surfaces with flanges, angle type, or floor type, as required by conditions, connected to posts and to metal supporting members as follows:
 - 1. For steel railings, weld flanges to post and bolt to metal supporting surfaces.
- E. Install removable railing sections, where indicated, in slip-fit stainless steel sockets cast in concrete.

3.5 ATTACHING RAILINGS

- A. Anchor railing ends to concrete and masonry with flanges connected to railing ends and anchored to wall construction with anchors and bolts.
- B. Anchor railing ends to metal surfaces with flanges bolted to metal surfaces and connected to railing ends, using nonwelded connections.
- C. Attach handrails to walls with wall brackets, except where end flanges are used. Provide brackets with 1-1/2-inch clearance from inside face of handrail and finished wall surface.
 - 1. Use type of bracket with flange tapped for concealed anchorage to threaded hanger bolt.
 - 2. Locate brackets as indicated or, if not indicated, at spacing required to support structural loads.
- D. Secure wall brackets and railing end flanges to building construction as follows:
 - 1. For concrete and solid masonry anchorage, use drilled-in expansion shields and hanger or lag bolts.
 - 2. For hollow masonry anchorage, use toggle bolts.
 - 3. For steel-framed partitions, fasten brackets directly to steel framing or concealed steel reinforcements, using self-tapping screws of size and type required to support structural loads.

4. For steel-framed partitions, use toggle bolts installed through flanges of steel framing or through concealed steel reinforcements.
- E. Install railing gates level, plumb, and secure for full opening without interference.
 1. Attach hardware using tamper-resistant or concealed means.
 2. Adjust hardware for smooth operation.

3.6 REPAIR

- A. Touchup Painting:
 1. Immediately after erection, clean field welds, bolted connections, and abraded areas of shop paint, and paint exposed areas with the same material used for shop painting to comply with SSPC-PA 1 for touching up shop-painted surfaces.
 - a. Apply by brush or spray to provide a minimum 2.0-mil dry film thickness.
 2. Cleaning and touchup painting of field welds, bolted connections, and abraded areas of shop paint are specified in Section 09 96 00 "High-Performance Coatings."

3.7 CLEANING

- A. Clean by washing thoroughly with clean water and soap and rinsing with clean water.
- B. Galvanized Surfaces: Clean field welds, bolted connections, and abraded areas, and repair galvanizing to comply with ASTM A780/A780M.

3.8 PROTECTION

- A. Protect finishes of railings from damage during construction period with temporary protective coverings approved by railing manufacturer. Remove protective coverings at time of Substantial Completion.
- B. Restore finishes damaged during installation and construction period, so no evidence remains of correction work. Return items that cannot be refinished in the field to the shop; make required alterations and refinish entire unit, or provide new units.

END OF SECTION 05 52 13

SECTION 07 01 50.19 - PREPARATION FOR REROOFING

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

- A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 01 Specification Sections, apply to this Section.

1.2 SUMMARY

- A. Section Includes:
 - 1. Removal of flashings and counterflashings.

1.3 DEFINITIONS

- A. Full Roof Tear-off: Removal of existing roofing system down to existing structural deck.
- B. Roofing Terminology: Definitions in ASTM D 1079 and glossary of NRCA's "The NRCA Roofing Manual: Membrane Roof Systems" apply to work of this Section.

1.4 PREINSTALLATION MEETINGS

- A. Preliminary Roofing Conference: Before starting removal Work, conduct conference at Project site.
 - 1. Meet with FAA, COR, Construction Manager, FAA's insurer if applicable, testing and inspecting agency representative, roofing Installer, and installers whose work interfaces with or affects roofing, including installers of roof accessories and roof-mounted equipment.
 - 2. Review methods and procedures related to roofing tear-off, including, but not limited to, the following:
 - a. Reroofing preparation, including roofing system manufacturer's written instructions.
 - b. Temporary protection requirements for existing roofing system components that are to remain.
 - c. Existing roof drains and roof drainage during each stage of reroofing, and roof-drain plugging and plug removal.
 - d. Construction schedule and availability of materials, Installer's personnel, equipment, and facilities needed to avoid delays.
 - e. Existing roof deck conditions requiring COR notification.
 - f. Existing roof deck removal procedures and FAA notifications.

- g. Condition and acceptance of existing roof deck and base flashing substrate for reuse.
- h. Structural loading limitations of roof deck during reroofing.
- i. Base flashings, special roofing details, drainage, penetrations, equipment curbs, and condition of other construction that affect reroofing.
- j. HVAC shutdown and sealing of air intakes.
- k. Shutdown of fire-suppression, -protection, and -alarm and -detection systems.
- l. Asbestos removal and discovery of asbestos-containing materials.
- m. Governing regulations and requirements for insurance and certificates if applicable.
- n. Existing conditions that may require COR notification before proceeding.

1.5 FIELD CONDITIONS

- A. Existing Roofing System: Modified Bitumin roof assembly roofing.
- B. FAA will occupy portions of building immediately below reroofing area.
 - 1. Conduct reroofing so FAA's operations are not disrupted.
 - 2. Provide FAA with not less than 10 Working Days' written notice of activities that may affect FAA's operations.
 - 3. Coordinate work activities daily with FAA so FAA has adequate advance notice to place protective dust and water-leakage covers over sensitive equipment and furnishings, shut down HVAC and fire-alarm or -detection equipment if needed, and evacuate occupants from below work area.
 - 4. Before working over structurally impaired areas of deck, notify FAA to evacuate occupants from below affected area.
 - a. Verify that occupants below work area have been evacuated before proceeding with work over impaired deck area.
- C. Protect building to be reroofed, adjacent buildings, walkways, site improvements, exterior plantings, and landscaping from damage or soiling from reroofing operations.
- D. Maintain access to existing walkways, corridors, and other adjacent occupied or used facilities.
- E. Conditions existing at time of inspection for bidding will be maintained by FAA as far as practical.
 - 1. A roof moisture survey of existing roofing system is available for Contractor's reference.
 - 2. The results of an analysis of test cores from existing roofing system are available for Contractor's reference.
 - 3. Construction Drawings for existing roofing system will be provided for Contractor's convenience and information, but they are not a warranty of existing conditions. They are intended to supplement rather than serve in lieu of Contractor's own investigations. Contractor is responsible for conclusions derived from existing documents.

- F. Limit construction loads on existing roof areas to remain, and existing roof areas scheduled to be reroofed to 200 lbs for rooftop equipment wheel loads and 20 psf for uniformly distributed loads.
- G. Weather Limitations: Proceed with reroofing preparation only when existing and the 3 day forecast weather conditions permit roofing work to proceed without water entering existing roofing system or building.
 - 1. Remove only as much roofing in one day as can be made watertight in the same day.
- H. Hazardous Materials: A report on the presence of hazardous materials is on file for review and use. Examine report to become aware of locations where hazardous materials are present.
 - 1. Hazardous material remediation is specified elsewhere in the Contract Documents.
 - 2. Do not disturb hazardous materials or items suspected of containing hazardous materials except according to procedures specified elsewhere in the Contract Documents.
 - 3. Coordinate reroofing preparation with hazardous material remediation to prevent water from entering existing roofing system or building.

PART 2 - PRODUCTS

PART 3 - EXECUTION

3.1 PREPARATION

- A. Prior to each day's or night's work on the roof, consult and coordinate with the COR regarding whether the day's or night's work on the roof requires shut off of any rooftop utilities or service piping.
- B. Test existing roof drains to verify that they are not blocked or restricted.
 - 1. Immediately notify COR of any blockages or restrictions.
- C. Coordinate with FAA to shut down air-intake equipment in the vicinity of the Work.
 - 1. Cover all air-intake louvers before proceeding with reroofing work that could affect indoor air quality or activate smoke detectors in the ductwork.
- D. Maintain roof drains in functioning condition to ensure roof drainage at end of each workday.
 - 1. Prevent debris from entering or blocking roof drains and conductors.
 - a. Use roof-drain plugs specifically designed for this purpose.

- b. Remove roof-drain plugs at end of each workday, when no work is taking place, or when rain is forecast.
 - 2. If roof drains are temporarily blocked or unserviceable due to roofing system removal or partial installation of new roofing system, provide alternative drainage method to remove water and eliminate ponding.
 - a. Do not permit water to enter into or under existing roofing system components that are to remain.
- E. Prepare to temporarily relocate existing lightning protection system to allow reroofing. Additional work on the system is covered in Section 26 41 13 - Lightning Protection for Structures.

3.2 ROOF PREPARATION

- A. Notify FAA each day of extent of roof Work Area proposed for that day and obtain authorization to proceed.
- B. Lower removed roofing materials to ground and onto lower roof levels, using dust-tight chutes or other acceptable means of removing materials from roof areas.
- C. Repair roof bubbles and blister on the existing surface so as to flatten them to allow proper installation of new cover boards.
- D. Roof PreparationRemove existing roofing system components down to the existing roof.
 - 1. Remove base flashings and counter flashings.
 - 2. Remove perimeter edge flashing and gravel stops.
 - 3. Remove copings.
 - 4. Remove expansion-joint covers.
 - 5. Remove flashings at pipes, curbs, mechanical equipment, and other penetrations.
 - 6. Remove roof drains indicated on Drawings to be removed.
- E. Maintain water tightness throughout the work and provide all necessary temporary support for mechanical equipment and utilities/piping

3.3 DECK PREPARATION

- A. Inspect deck after tear-off of roofing system with COR.

3.4 BASE FLASHING REMOVAL

- A. Remove existing base flashings.
 - 1. Clean substrates of contaminants, such as asphalt, sheet materials, dirt, and debris.

- B. Do not damage metal counterflashings that are to remain.
 - 1. Replace metal counterflashings damaged during removal with counterflashings of same metal, weight or thickness, and finish as existing.
- C. Inspect parapet sheathing, wood blocking, curbs, and nailers for deterioration and damage.
 - 1. If parapet sheathing, wood blocking, curbs, or nailers have deteriorated, immediately notify Architect.
- D. When directed by COR, replace parapet framing, wood blocking, curbs, and nailers to comply with Section 06 10 53 Miscellaneous Rough Carpentry."

3.5 FASTENER PULL-OUT TESTING

- A. Perform fastener pull-out tests according to SPRI FX-1, at 1 test for every 100 sq. ft. of roofing to be installed, and submit test report to COR and roofing manufacturer before installing new roofing system.
 - 1. Obtain roofing manufacturer's approval to proceed with specified fastening pattern.
 - a. Roofing manufacturer may furnish revised fastening pattern commensurate with pull-out test results.

3.6 ODOR VERIFICATION TESTING

- A. Prior to work on each area of the roof, provide sample applications of the roofing materials on plywood or other temporary substrate as and where directed by the COR, to verify that no odors emanate into the building that would interfere with air traffic control operations concentration and comfort.

3.7 ACOUSTICAL TESTING

- A. Prior to work on the Ops Area Roof, provide sample drilling, fastener driving, and other roofing procedures with noise potential, as and where directed by the COR, to verify that no noise occurs with the facilitate Operations Area that would interfere with air traffic control operations concentration and comprehension.

3.8 DISPOSAL

- A. Collect demolished materials and place in containers.
 - 1. Promptly dispose of demolished materials.
 - 2. Do not allow demolished materials to accumulate on-site.
 - 3. Storage or sale of demolished items or materials on-site is not permitted.

- B. Transport and legally dispose of demolished materials off FAA's property.

END OF SECTION **07 01 50.19**

SECTION 07 13 26 - SELF-ADHERING SHEET WATERPROOFING

PART 1 - GENERAL

1.1 SUMMARY

A. Section Includes:

1. Sheet waterproofing in the Catwalk access hatch installation.
2. Any incidental need for this material in the Work.

1.2 PREINSTALLATION MEETINGS

A. Preinstallation Conference: Conduct conference at Project site.

1. Review waterproofing requirements including surface preparation, substrate condition and pretreatment, minimum curing period, forecasted weather conditions, special details and sheet flashings, installation procedures, testing and inspection procedures, and protection and repairs.

1.3 ACTION SUBMITTALS

A. Product Data: For each type of product.

1. Include construction details, material descriptions, and tested physical and performance properties of waterproofing.
2. Include manufacturer's written instructions for evaluating, preparing, and treating substrate.

B. Shop Drawings: Show locations and extent of waterproofing and details of substrate joints and cracks, expansion joints, sheet flashings, penetrations, inside and outside corners, tie-ins with adjoining waterproofing, and other termination conditions.

1. Include setting drawings showing layout, sizes, sections, profiles, and joint details of pedestal-supported concrete pavers.

1.4 INFORMATIONAL SUBMITTALS

A. Sample Warranties: For special warranties.

1.5 FIELD CONDITIONS

A. Environmental Limitations: Apply waterproofing within the range of ambient and substrate temperatures recommended in writing by waterproofing manufacturer. Do not apply waterproofing to a damp or wet substrate.

1. Do not apply waterproofing in snow, rain, fog, or mist.
- B. Maintain adequate ventilation during preparation and application of waterproofing materials.

1.6 WARRANTY

- A. Manufacturer's Warranty:
 1. Waterproofing Warranty: Manufacturer agrees to furnish replacement waterproofing material for waterproofing that does not comply with requirements or that fails to remain watertight within specified warranty period.
 - a. Warranty Period: Five years from date of Substantial Completion.
 2. Termite Barrier Warranty: Manufacturer agrees to furnish replacement waterproofing termite barrier material and accessories for waterproofing termite barrier and accessories that do not comply with requirements or that fail to resist penetration by termites within specified warranty period.
 - a. Warranty Period: Ten years from date of Substantial Completion.
- B. Installer's Special Warranty: Specified form, on warranty form at end of this Section, signed by Installer, covering Work of this Section, for warranty period of two years.
 1. Warranty includes removing and reinstalling protection board, drainage panels, insulation, pedestals, and pavers on plaza decks.

PART 2 - PRODUCTS

2.1 SOURCE LIMITATIONS

- A. Source Limitations for Waterproofing System: Obtain waterproofing materials from single source from single manufacturer.

2.2 SHEET WATERPROOFING

- A. Modified Bituminous Deck-Paving Sheet: Minimum 65-mil nominal thickness, self-adhering sheets designed to be overlaid with asphalt paving; consisting of rubberized-asphalt membrane with woven or nonwoven fabric reinforcement laminated to one surface or embedded within the membrane, and with release liner on adhesive side.
 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. Carlisle Coatings & Waterproofing Inc; Carlisle Construction Materials.
- b. Polyguard Products, Inc.
- c. W.R. Meadows, Inc.

2. Physical Properties:

- a. Tensile Strength, Membrane: 50 lbf/in. minimum; ASTM D882.
- b. Pliability: Unaffected when bent 180 degrees over a 1/4-inch mandrel at minus 15 deg F; ASTM D146/D146M.
- c. Puncture Resistance: 100 lbf minimum; ASTM E154/E154M.

2.3 ACCESSORIES

- A. Furnish accessory materials recommended by waterproofing manufacturer for intended use and compatible with sheet waterproofing.
 1. Furnish liquid-type accessory materials that comply with VOC limits of authorities having jurisdiction.
- B. Primer: Liquid waterborne primer recommended for substrate by sheet waterproofing material manufacturer.
- C. Surface Conditioner: Liquid, waterborne surface conditioner recommended for substrate by sheet waterproofing material manufacturer.
- D. Liquid Membrane: Elastomeric, two-component liquid, cold fluid applied, of trowel grade or low viscosity.
- E. Substrate Patching Membrane: Low-viscosity, two-component, modified asphalt coating.

PART 3 - EXECUTION

3.1 EXAMINATION

- A. Examine substrates, areas, and conditions, with Installer present, for compliance with requirements and other conditions affecting performance of waterproofing.
 1. Verify that concrete has cured and aged for minimum time period recommended in writing by waterproofing manufacturer.
 2. Verify that substrate is visibly dry and within the moisture limits recommended in writing by manufacturer. Test for capillary moisture by plastic sheet method in accordance with ASTM D4263.
 3. Verify that compacted subgrade is dry, smooth, sound, and ready to receive waterproofing sheet.
- B. Proceed with installation only after unsatisfactory conditions have been corrected.

3.2 PREPARATION

- A. Clean, prepare, and treat substrates according to manufacturer's written instructions. Provide clean, dust-free, and dry substrates for waterproofing application.
- B. Mask off adjoining surfaces not receiving waterproofing to prevent spillage and overspray affecting other construction.
- C. Remove grease, oil, bitumen, form-release agents, paints, curing compounds, and other penetrating contaminants or film-forming coatings from concrete.
- D. Remove fins, ridges, mortar, and other projections.
- E. Prepare, fill, prime, and treat joints and cracks in substrates. Remove dust and dirt from joints and cracks in accordance with ASTM D4258.
 - 1. Install sheet strips of width according to manufacturer's written instructions and center over treated construction and contraction joints and cracks exceeding a width of 1/8 inch for modified bituminous deck-paving waterproofing.
- F. Bridge and cover isolation joints, expansion joints, and discontinuous deck-to-wall and deck-to-deck joints with overlapping sheet strips of widths according to manufacturer's written instructions.
 - 1. Invert and loosely lay first sheet strip over center of joint. Firmly adhere second sheet strip to first and overlap to substrate.
- G. Corners: Prepare, prime, and treat inside and outside corners in accordance with manufacturer's instructions.
 - 1. Install membrane strips centered over vertical inside corners. Install 3/4-inch fillets of liquid membrane on horizontal inside corners and as follows:
 - a. At footing-to-wall intersections, extend liquid membrane in each direction from corner or install membrane strip centered over corner.
 - b. At plaza-deck-to-wall intersections, extend liquid membrane or sheet strips onto deck waterproofing and to finished height of sheet flashing.
- H. Prepare, treat, and seal vertical and horizontal surfaces at terminations and penetrations through waterproofing and at drains and protrusions.

3.3 INSTALLATION OF SHEET WATERPROOFING

- A. Install modified bituminous sheets according to waterproofing manufacturer's written instructions.
- B. Apply primer to substrates at required rate and allow it to dry. Limit priming to areas that will be covered by sheet waterproofing in same day. Reprime areas exposed for more than 24 hours.

- C. Apply and firmly adhere sheets over area to receive waterproofing. Accurately align sheets and maintain uniform 2-1/2-inch- minimum lap widths and end laps. Overlap and seal seams, and stagger end laps to ensure watertight installation.
 - 1. When ambient and substrate temperatures range between 25 and 40 deg F, install self-adhering, modified bituminous sheets produced for low-temperature application. Do not use low-temperature sheets if ambient or substrate temperature is higher than 60 deg F.
- D. Two-Ply Application: Install sheets to form a membrane with lap widths not less than 50 percent of sheet widths, to provide a minimum of two thicknesses of sheet membrane over areas to receive waterproofing.
- E. Horizontal Application: Apply sheets from low to high points of decks to ensure that laps shed water.
- F. Apply continuous sheets over already-installed sheet strips, bridging substrate cracks, construction, and contraction joints.
- G. Seal edges of sheet waterproofing terminations with mastic.
- H. Install sheet waterproofing and accessory materials to tie into adjacent waterproofing.
- I. Roll waterproofing membrane to firmly adhere to substrate. Roll seams and terminations.
- J. Repair tears, voids, and lapped seams in waterproofing not complying with requirements. Slit and flatten fishmouths and blisters. Patch with sheet waterproofing extending 6 inches beyond repaired areas in all directions.
- K. Immediately install protection course with butted joints over waterproofing membrane.
 - 1. may be used in place of a separate protection course to vertical applications when approved by waterproofing manufacturer and installed immediately.

3.4 INSTALLATION OF MODIFIED BITUMINOUS DECK-PAVING SHEET WATERPROOFING

- A. Install modified bituminous deck-paving sheets according to waterproofing manufacturer's written instructions.
- B. Apply primer to substrates at required rate and allow it to dry. Limit priming to areas that will be covered by sheet waterproofing in same day. Reprime areas exposed for more than 24 hours.
- C. Apply and firmly adhere sheets over areas to receive waterproofing. Accurately align sheets and maintain uniform 2-1/2-inch- minimum side-lap widths and 6-inch end laps. Overlap and seal seams and stagger end laps to ensure watertight installation.

- D. Apply sheet waterproofing from low to high points of decks to ensure that laps shed water.
- E. Apply continuous sheets over already-installed sheet strips, bridging substrate cracks, construction, and contraction joints.
- F. Seal edges of sheet waterproofing terminations with mastic.
- G. Install sheet waterproofing and accessory materials to tie into adjacent waterproofing.
- H. Repair tears, voids, and lapped seams in waterproofing that do not comply with requirements. Slit and flatten fishmouths and blisters. Patch with sheet waterproofing extending 6 inches beyond repaired areas in all directions.

3.5 FIELD QUALITY CONTROL

- A. Testing Agency: FAA will select and Contractor must engage a qualified testing agency to perform tests, and to furnish reports to Architect.
- B. Manufacturer's Field Service: Engage a site representative qualified by waterproofing membrane manufacturer to inspect substrate conditions, surface preparation, membrane application, flashings, protection, and drainage components; and to furnish daily reports to Architect.
- C. Low-Voltage Electrical Conductance Testing: Testing agency is to survey entire roof area and flashings to locate discontinuity in the roof membrane using an exposed metal electrical loop to create an electrical field tested with handheld probes or a scanning platform with integral perimeter electrical loops creating a complete electrical field
 - 1. Testing agency is to test each deck area for leaks using an electronic leak-detection method that locates discontinuities in the waterproofing membrane.
 - 2. Testing agency is to perform tests on abutting or overlapping smaller areas as necessary to cover entire test area.
 - 3. After testing, repair areas of discontinuities, repeat tests, and make further repairs until roofing and flashing installations are contiguous.
 - a. Cost of retesting is Contractor's responsibility.
 - 4. Testing agency is to provide survey report indicating locations of initial discontinuities, if any.
- D. Waterproofing will be considered defective if it does not pass tests and inspections.

3.6 PROTECTION, REPAIR, AND CLEANING

- A. Do not permit foot or vehicular traffic on unprotected membrane.
- B. Protect waterproofing from damage and wear during remainder of construction period.

- C. Protect installed insulation drainage panels from damage due to UV light, harmful weather exposures, physical abuse, and other causes. Provide temporary coverings where insulation is subject to abuse and cannot be concealed and protected by permanent construction immediately after installation.
- D. Correct deficiencies in or remove waterproofing that does not comply with requirements; repair substrates, reapply waterproofing, and repair sheet flashings.
- E. Clean spillage and soiling from adjacent construction using cleaning agents and procedures recommended in writing by manufacturer of affected construction.

END OF SECTION 07 13 26

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SECTION 07 18 00 - TRAFFIC COATINGS

PART 1 - GENERAL

1.1 SUMMARY

- A. Section Includes: Traffic coatings and pavement markings for the following applications:

1. Pedestrian traffic.

1.2 PREINSTALLATION MEETINGS

- A. Preinstallation Conference: Conduct conference at Project site.

1.3 ACTION SUBMITTALS

- A. Product Data: Traffic coatings and pavement markings for the following applications:

1. Pedestrian traffic.

- B. Shop Drawings: For traffic coatings.

1. Include details for treating substrate joints and cracks, flashings, deck penetrations, and other termination conditions that are not included in manufacturer's product data.
2. Include plans showing layout of pavement markings, lane separations, and defined parking spaces. Indicate, with international symbol of accessibility, spaces allocated for people with disabilities.

- C. Samples for Verification: For each type of exposed finish, prepared on rigid backing.

1. Provide stepped Samples on backing to illustrate buildup of traffic coatings.

1.4 INFORMATIONAL SUBMITTALS

- A. Field quality-control reports.

1.5 CLOSEOUT SUBMITTALS

- A. Maintenance Data: For traffic coatings to include in maintenance manuals.

1.6 QUALITY ASSURANCE

- A. Installer Qualifications: An entity that employs installers and supervisors who are trained and approved by manufacturer.

1.7 FIELD CONDITIONS

- A. Environmental Limitations: Apply traffic coatings within the range of ambient and substrate temperatures recommended in writing by manufacturer. Do not apply traffic coatings to damp or wet substrates, when temperatures are below 40 deg F, when relative humidity exceeds 85 percent, or when temperatures are less than 5 deg F above dew point.
 - 1. Do not apply traffic coatings in snow, rain, fog, or mist, or when such weather conditions are imminent during the application and curing period. Apply only when frost-free conditions occur throughout the depth of substrate.
- B. Do not install traffic coating until items that penetrate membrane have been installed.
- C. Pavement-Marking Paint: Proceed with pavement marking only on clean, dry surfaces and at a minimum ambient or surface temperature of 50 deg F for water-based materials, and not exceeding 95 deg F.

1.8 WARRANTY

- A. Manufacturer's Warranty: Manufacturer agrees to repair or replace traffic coating that fails in materials or workmanship within specified warranty period.
 - 1. Failures include, but are not limited to, the following:
 - a. Adhesive or cohesive failures.
 - b. Abrasion or tearing failures.
 - c. Surface crazing or spalling.
 - d. Intrusion of water, oils, gasoline, grease, salt, deicer chemicals, or acids into deck substrate.
 - 2. Warranty Period: Five years from date of Substantial Completion.

PART 2 - PRODUCTS

2.1 PERFORMANCE REQUIREMENTS

- A. Material Compatibility: Provide primers; base coat, intermediate coat, and topcoat; and accessory materials that are compatible with one another and with substrate under conditions of service and application, as demonstrated by manufacturer based on testing and field experience.

2.2 TRAFFIC COATINGS

- A. Traffic Coating Insert drawing designation: Manufacturer's standard, traffic-bearing, seamless, high-solids-content, cold liquid-applied, elastomeric, water-resistant membrane system with integral wearing surface for service condition; according to ASTM C957/C957M.
 - 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. Crossfield Products Corp.
 - b. Euclid Chemical Company (The); an RPM company.
 - c. GCP Applied Technologies Inc.
 - d. Gaco; a brand of Firestone Building Products.
 - e. Tremco Incorporated.
- B. Primer: Liquid primer as recommended in writing for substrate and conditions by traffic-coating manufacturer.
 - 1. Material: Epoxy.
- C. Preparatory and Base Coats: Polyurethane.
 - 1. Thicknesses: Minimum film thickness as recommended in writing by manufacturer for substrate and service conditions indicated.
- D. Intermediate Coat: Polyurethane.
 - 1. Thicknesses: Minimum film thickness as recommended in writing by manufacturer for substrate and service conditions indicated, measured excluding aggregate.
 - 2. Aggregate Content: As recommended in writing by traffic-coating manufacturer for substrate and service conditions indicated.
- E. Topcoat: Polyurethane.
 - 1. Thicknesses: Minimum film thickness as recommended in writing by manufacturer for substrate and service conditions indicated, measured excluding aggregate.
 - 2. Aggregate Content: As recommended in writing by traffic-coating manufacturer for substrate and service conditions indicated.
 - 3. Color: As selected by Architect from manufacturer's full range.
- F. Aggregate: Manufacturer's standard aggregate for each use indicated of particle sizes, shape, and minimum hardness recommended in writing by traffic-coating manufacturer.

- G. Fire-Test-Response Characteristics: Provide traffic-coating materials with the fire-test-response characteristics as determined by testing identical products according to test method below for deck type and slopes indicated by an independent testing and inspecting agency that is acceptable to authorities having jurisdiction.
 - 1. Class A roof covering according to ASTM E108.
- H. VOC Content: 100 g/L or less.
- I. Low-Emitting Materials: Interior coatings shall comply with the testing and product requirements of the California Department of Public Health's "Standard Method for the Testing and Evaluation of Volatile Organic Chemical Emissions from Indoor Sources Using Environmental Chambers."
- J. VOC Content: 100 g/L or less.
- K. Low-Emitting Materials: VOC emissions of interior coatings shall comply with the requirements of the California Department of Public Health's "Standard Method for the Testing and Evaluation of Volatile Organic Chemical Emissions from Indoor Sources Using Environmental Chambers." Formaldehyde emissions shall not exceed 9 mcg/cu. m or 7 ppb, whichever is less.
- L. VOC Content: 100 g/L or less.
- M. Low-Emitting Materials: Interior coatings shall comply with the testing and product requirements of the California Department of Public Health's "Standard Method for the Testing and Evaluation of Volatile Organic Chemical Emissions from Indoor Sources Using Environmental Chambers."
- N. VOC Emissions: Interior coatings shall contain no more than half of the chronic REL of VOCs when tested according to the California Department of Public Health's "Standard Method for the Testing and Evaluation of Volatile Organic Chemical Emissions from Indoor Sources Using Environmental Chambers." The building concentration of formaldehyde shall not exceed half of the indoor recommended exposure limit, or 33 mcg/cu. m, and that of acetaldehyde shall not exceed 9 mcg/cu. m.

2.3 ACCESSORY MATERIALS

- A. Joint Sealants: As specified in Section 07 92 00 "Joint Sealants." Sheet Flashing: Nonstaining sheet material recommended in writing by traffic-coating manufacturer.
 - 1. Thickness: Minimum 60 mils.

PART 3 - EXECUTION

3.1 EXAMINATION

- A. Examine substrates, areas, and conditions, with Installer present, for compliance with requirements for maximum moisture content, surface smoothness, and other conditions affecting performance of traffic-coating work.
- B. Verify that substrates are visibly dry and free of moisture.
 - 1. Test for moisture according to ASTM D4263.
 - 2. Test for moisture content by method recommended in writing by traffic-coating manufacturer.
- C. Prepare written report, endorsed by Installer, listing conditions detrimental to performance of traffic-coating work.
- D. Proceed with installation only after unsatisfactory conditions have been corrected.
 - 1. Begin coating application only after substrate construction and penetrating work have been completed.
 - 2. Begin coating application only after minimum concrete-curing and -drying period recommended in writing by traffic-coating manufacturer has passed and after substrates are dry.
 - 3. Application of coating indicates acceptance of surfaces and conditions.

3.2 PREPARATION

- A. Clean and prepare substrates according to ASTM C1127 and manufacturer's written instructions to produce clean, dust-free, dry substrate for traffic-coating application. Remove projections, fill voids, and seal joints if any, as recommended in writing by traffic-coating manufacturer.
- B. Priming: Unless manufacturer recommends in writing against priming, prime substrates according to manufacturer's written instructions.
 - 1. Limit priming to areas that will be covered by traffic-coating material on same day. Reprime areas exposed for more time than recommended by manufacturer.
- C. Schedule preparation work so dust and other contaminants from process do not fall on wet, newly coated surfaces.
- D. Mask adjoining surfaces not receiving traffic coatings to prevent overspray, spillage, leaking, and migration of coatings. Prevent traffic-coating materials from entering deck substrate penetrations and clogging weep holes and drains.
- E. Concrete Substrates: Mechanically abrade surface to a uniform profile acceptable to manufacturer, according to ASTM D4259. Do not acid etch.

1. Remove grease, oil, paints, and other penetrating contaminants from concrete.
2. Remove concrete fins, ridges, and other projections.
3. Remove laitance, glaze, efflorescence, curing compounds, concrete hardeners, form-release agents, and other incompatible materials that might affect coating adhesion.
4. Remove remaining loose material to provide a sound surface, and clean surfaces according to ASTM D4258.

3.3 TERMINATIONS AND PENETRATIONS

- A. Prepare vertical and horizontal surfaces at terminations and penetrations through traffic coatings and at expansion joints, drains, and sleeves according to ASTM C1127 and manufacturer's written instructions.
- B. Provide sealant cants at penetrations and at reinforced and nonreinforced, deck-to-wall butt joints.
- C. Terminate edges of deck-to-deck expansion joints with preparatory base-coat strip.
- D. Install sheet flashings at deck-to-wall expansion and dynamic joints, and bond to deck and wall substrates according to manufacturer's written recommendations.

3.4 JOINT AND CRACK TREATMENT

- A. Prepare, treat, rout, and fill joints and cracks in substrates according to ASTM C1127 and manufacturer's written recommendations. Before coating surfaces, remove dust and dirt from joints and cracks according to ASTM D4258.
 1. Comply with recommendations in ASTM C1193 for joint-sealant installation.
- B. Apply reinforcing strip in traffic-coating system where recommended in writing by traffic-coating manufacturer.

3.5 INSTALLATION OF TRAFFIC COATINGS

- A. Apply traffic coating according to ASTM C1127 and manufacturer's written instructions.
- B. Apply coats of specified compositions for each type of traffic coating at locations as indicated on Drawings.
- C. Start traffic-coating application in presence of manufacturer's technical representative.
- D. Verify that wet-film thickness of each coat complies with requirements every 100 sq. ft..

- E. Uniformly broadcast and embed aggregate in each coat indicated to receive aggregate according to manufacturer's written instructions. After coat dries, sweep away excess aggregate.
- F. Apply traffic coatings to prepared wall terminations and vertical surfaces to height indicated; omit aggregate on vertical surfaces.
- G. Cure traffic coatings. Prevent contamination and damage during coating application and curing.

3.6 FIELD QUALITY CONTROL

- A. Testing Agency: Owner will select and Contractor must engage a qualified testing agency to perform the following field tests and inspections:
 - 1. Materials Testing:
 - a. Samples of material delivered to Project site are to be taken, identified, sealed, and certified in presence of Owner and Contractor.
 - b. Testing agency must perform tests for characteristics specified, using applicable referenced testing procedures.
 - c. Testing agency must verify thickness of coatings during traffic-coating application for each 600 sq. ft. of installed traffic coating or part thereof.
 - 2. Electronic Leak-Detection Testing:
 - a. Testing agency must test each deck area for leaks using an electronic leak-detection method that locates discontinuities in the traffic-coating membrane.
 - b. Testing agency must perform tests on abutting or overlapping smaller areas as necessary to cover entire test area.
 - c. Testing agency must create a conductive electronic field over the area of traffic coating to be tested and electronically determine locations of discontinuities or leaks, if any, in the traffic coating.
 - d. Testing agency must provide survey report indicating locations of discontinuities, if any.
- B. Final Traffic-Coating Inspection: Arrange for traffic-coating manufacturer's technical personnel to inspect membrane installation on completion.
 - 1. Notify Architect or Owner 48 hours in advance of date and time of inspection.
- C. Waterproofing will be considered defective if it does not pass tests and inspections.
- D. Prepare test and inspection reports.

3.7 PROTECTING AND CLEANING

- A. Protect traffic coatings from damage and wear during remainder of construction period.

- B. Clean spillage and soiling from adjacent construction using cleaning agents and procedures recommended by manufacturer of affected construction.

END OF SECTION 07 18 00

SECTION 07 41 13.16 - STANDING-SEAM METAL ROOF PANELS

PART 1 - GENERAL

1.1 SUMMARY

- A. Section Includes: Standing-seam metal roof panels.
- B. Related Requirements:
 - 1. Section 07 71 00 "Roof Specialties" for gutters at metal roofing.

1.2 ACTION SUBMITTALS

- A. Product Data: For standing-seam metal roof panels. Include construction details, material descriptions, dimensions of individual components and profiles, and finishes for each type of panel and accessory.
- B. Shop Drawings:
 - 1. Include fabrication and installation layouts of metal panels; details of edge conditions, joints, panel profiles, corners, anchorages, attachment system, trim, flashings, closures, and accessories; and special details.
 - 2. Accessories: Include details of the flashing, trim, and anchorage systems, at a scale of not less than 1-1/2 inches per 12 inches.
- C. Samples for Verification: For each type of exposed finish required, prepared on Samples of size indicated below.
 - 1. Metal Panels: 12 inches long by actual panel width. Include clips, fasteners, closures, and other metal panel accessories.

1.3 QUALITY ASSURANCE

- A. Installer Qualifications: An entity that employs installers and supervisors who are trained and approved by manufacturer.

1.4 DELIVERY, STORAGE, AND HANDLING

- A. Deliver components, metal panels, and other manufactured items so as not to be damaged or deformed. Package metal panels for protection during transportation and handling.
- B. Unload, store, and erect metal panels in a manner to prevent bending, warping, twisting, and surface damage.

- C. Stack metal panels horizontally on platforms or pallets, covered with suitable weathertight and ventilated covering. Store metal panels to ensure dryness, with positive slope for drainage of water. Do not store metal panels in contact with other materials that might cause staining, denting, or other surface damage.
- D. Retain strippable protective covering on metal panels during installation.
- E. Copper Panels: Wear gloves when handling to prevent fingerprints and soiling of surface.

1.5 FIELD CONDITIONS

- A. Weather Limitations: Proceed with installation only when existing and forecasted weather conditions permit assembly of metal panels to be performed according to manufacturers' written instructions and warranty requirements.

1.6 COORDINATION

- A. Coordinate sizes and locations of roof curbs, equipment supports, and roof penetrations with actual equipment provided.
- B. Coordinate metal panel installation with rain drainage work, flashing, trim, construction of soffits, and other adjoining work to provide a leakproof, secure, and noncorrosive installation.

1.7 WARRANTY

- A. Special Warranty: Manufacturer's standard form in which manufacturer agrees to repair or replace components of metal panel systems that fail in materials or workmanship within specified warranty period.
 - 1. Failures include, but are not limited to, the following:
 - a. Structural failures including rupturing, cracking, or puncturing.
 - b. Deterioration of metals and other materials beyond normal weathering.
 - 2. Warranty Period: Two years from date of Substantial Completion.
- B. Special Warranty on Panel Finishes: Manufacturer's standard form in which manufacturer agrees to repair finish or replace metal panels that show evidence of deterioration of factory-applied finishes within specified warranty period.
 - 1. Exposed Panel Finish: Deterioration includes, but is not limited to, the following:
 - a. Color fading more than 5 Delta E units when tested according to ASTM D2244.
 - b. Chalking in excess of a No. 8 rating when tested according to ASTM D4214.

- c. Cracking, checking, peeling, or failure of paint to adhere to bare metal.
- 2. Finish Warranty Period: 20 years from date of Substantial Completion.
- C. Special Weathertightness Warranty: Manufacturer's standard form in which manufacturer agrees to repair or replace standing-seam metal roof panel assemblies that fail to remain weathertight, including leaks, within specified warranty period.
 - 1. Warranty Period: 20 years from date of Substantial Completion.

PART 2 - PRODUCTS

2.1 PERFORMANCE REQUIREMENTS

- A. Solar Reflectance Index (SRI): Three-year-aged SRI not less than 32 or initial SRI not less than 39 when calculated according to ASTM E 1980, based on testing identical products by a qualified testing agency.
- B. Structural Performance: Provide metal panel systems capable of withstanding the effects of the following loads, based on testing according to ASTM E1592:
 - 1. Wind Loads: As indicated on Drawings.
 - 2. Other Design Loads: As indicated on Drawings.
 - 3. Deflection Limits: For wind loads, no greater than 1/240 of the span.
- C. Air Infiltration: Air leakage of not more than 0.06 cfm/sq. ft. when tested according to ASTM E1680 or ASTM E283 at the following test-pressure difference:
 - 1. Test-Pressure Difference: 6.24 lbf/sq. ft..
- D. Water Penetration under Static Pressure: No water penetration when tested according to ASTM E1646 or ASTM E331 at the following test-pressure difference:
 - 1. Test-Pressure Difference: 6.24 lbf/sq. ft..
- E. Wind-Uplift Resistance: Provide metal roof panel assemblies that comply with UL 580 for wind-uplift-resistance class indicated.
 - 1. Uplift Rating: UL 90.
- F. FM Global Listing: Provide metal roof panels and component materials that comply with requirements in FM Global 4471 as part of a panel roofing system and that are listed in FM Global's "Approval Guide" for Class 1 or noncombustible construction, as applicable. Identify materials with FM Global markings.
 - 1. Fire/Windstorm Classification: Class 1A-120.
 - 2. Hail Resistance: MH.

- G. Thermal Movements: Allow for thermal movements from ambient and surface temperature changes by preventing buckling, opening of joints, overstressing of components, failure of joint sealants, failure of connections, and other detrimental effects. Base calculations on surface temperatures of materials due to both solar heat gain and nighttime-sky heat loss.

1. Temperature Change (Range): 120 deg F, ambient; 180 deg F, material surfaces.

2.2 STANDING-SEAM METAL ROOF PANELS

- A. Provide factory-formed metal roof panels designed to be installed by lapping and interconnecting raised side edges of adjacent panels with joint type indicated and mechanically attaching panels to supports using concealed clips in side laps. Include clips, cleats, pressure plates, and accessories required for weathertight installation.

1. Steel Panel Systems: Unless more stringent requirements are indicated, comply with ASTM E1514.

- B. The Contractor will need to verify the type and shape of the existing standing seam roofing with the original supplier (HPM Building Supply Company) match existing profile, finish and color. In addition the final color must be verified with the COR prior to ordering material.

- C. Vertical-Rib, Snap-Joint, Standing-Seam Metal Roof Panels : Formed with vertical ribs at panel edges and a flat pan between ribs; designed for sequential installation by mechanically attaching panels to supports using concealed clips located under one side of panels, engaging opposite edge of adjacent panels, and snapping panels together.

1. Manufacturers: Subject to compliance with requirements, provide products by the following:

- a. HPM Building Supply Company.

2. Metallic-Coated Steel Sheet: Zinc-coated (galvanized) steel sheet complying with ASTM A653/A653M, G90 coating designation, or aluminum-zinc alloy-coated steel sheet complying with ASTM A792/A792M, Class AZ50 coating designation; structural quality. Prepainted by the coil-coating process to comply with ASTM A755/A755M.

- a. Nominal Thickness: 0.030 inch.
- b. Exterior Finish: Three-coat fluoropolymer.
- c. Color: Custom to Match COR's samples (existing Roof being replaced).

3. Clips: One-piece fixed to accommodate thermal movement.

- a. 0.028-inch- nominal thickness, zinc-coated (galvanized) or aluminum-zinc alloy-coated steel sheet.

4. Panel Coverage: 12 inches.

5. Panel Height: 1.5 inches.

2.3 UNDERLAYMENT MATERIALS

- A. Self-Adhering, High-Temperature Underlayment: Provide self-adhering, cold-applied, sheet underlayment, a minimum of 30 mils thick, consisting of slip-resistant, polyethylene-film top surface laminated to a layer of butyl or SBS-modified asphalt adhesive, with release-paper backing. Provide primer when recommended by underlayment manufacturer.
 1. Thermal Stability: Stable after testing at 240 deg F; ASTM D1970.
 2. Low-Temperature Flexibility: Passes after testing at minus 20 deg F; ASTM D1970.
 3. 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. ATAS International, Inc.
 - b. Carlisle WIP Products; a brand of Carlisle Construction Materials.
 - c. GCP Applied Technologies Inc.
 - d. Henry Company.

2.4 MISCELLANEOUS MATERIALS

- A. Panel Accessories: Provide components required for a complete, weathertight panel system including trim, copings, fasciae, mullions, sills, corner units, clips, flashings, sealants, gaskets, fillers, closure strips, and similar items. Match material and finish of metal panels unless otherwise indicated.
 1. Closures: Provide closures at eaves and ridges, fabricated of same metal as metal panels.
 2. Closure Strips: Closed-cell, expanded, cellular, rubber or crosslinked, polyolefin-foam or closed-cell laminated polyethylene; minimum 1-inch- thick, flexible closure strips; cut or premolded to match metal panel profile. Provide closure strips where indicated or necessary to ensure weathertight construction.

2.5 FABRICATION

- A. Fabricate and finish metal panels and accessories at the factory, by manufacturer's standard procedures and processes, as necessary to fulfill indicated performance requirements demonstrated by laboratory testing. Comply with indicated profiles and with dimensional and structural requirements.
- B. On-Site Fabrication: Subject to compliance with requirements of this Section, metal panels may be fabricated on-site using UL-certified, portable roll-forming equipment if panels are of same profile and warranted by manufacturer to be equal to factory-formed panels. Fabricate according to equipment manufacturer's written instructions and to comply with details shown.

- C. Provide panel profile, including major ribs and intermediate stiffening ribs, if any, for full length of panel.
- D. Fabricate metal panel joints with factory-installed captive gaskets or separator strips that provide a weathertight seal and prevent metal-to-metal contact, and that minimize noise from movements.
- E. Sheet Metal Flashing and Trim: Fabricate flashing and trim to comply with manufacturer's recommendations and recommendations in SMACNA's "CORural Sheet Metal Manual" that apply to design, dimensions, metal, and other characteristics of item indicated.
 - 1. Form exposed sheet metal accessories that are without excessive oil canning, buckling, and tool marks and that are true to line and levels indicated, with exposed edges folded back to form hems.
 - 2. Seams for Aluminum: Fabricate nonmoving seams with flat-lock seams. Form seams and seal with epoxy seam sealer. Rivet joints for additional strength.
 - 3. Seams for Other Than Aluminum: Fabricate nonmoving seams in accessories with flat-lock seams. Tin edges to be seamed, form seams, and solder.
 - 4. Sealed Joints: Form nonexpansion, but movable, joints in metal to accommodate sealant and to comply with SMACNA standards.
 - 5. Conceal fasteners and expansion provisions where possible. Exposed fasteners are not allowed on faces of accessories exposed to view.
 - 6. Fabricate cleats and attachment devices from same material as accessory being anchored or from compatible, noncorrosive metal recommended in writing by metal panel manufacturer.
 - a. Size: As recommended by SMACNA's "Architecural Sheet Metal Manual" or metal panel manufacturer for application, but not less than thickness of metal being secured.

2.6 FINISHES

- A. Protect mechanical and painted finishes on exposed surfaces from damage by applying a strippable, temporary protective covering before shipping.
- B. Steel Panels and Accessories:
 - 1. Three-Coat Fluoropolymer: AAMA 621. Fluoropolymer finish containing not less than 70 percent polyvinylidene fluoride (PVDF) resin by weight in both color coat and clear topcoat. Prepare, pretreat, and apply coating to exposed metal surfaces to comply with coating and resin manufacturers' written instructions for seacoast and severe environments.

PART 3 - EXECUTION

3.1 EXAMINATION

- A. Examine substrates, areas, and conditions, with Installer present, for compliance with requirements for installation tolerances, metal panel supports, and other conditions affecting performance of the Work.
 - 1. Examine primary and secondary roof framing to verify that rafters, purlins, angles, channels, and other structural panel support members and anchorages have been installed within alignment tolerances required by metal roof panel manufacturer.
 - 2. Examine solid roof sheathing to verify that sheathing joints are supported by framing or blocking and that installation is within flatness tolerances required by metal roof panel manufacturer.
 - a. Verify that air- or water-resistive barriers have been installed over sheathing or backing substrate to prevent air infiltration or water penetration.
- B. Examine roughing-in for components and systems penetrating metal panels to verify actual locations of penetrations relative to seam locations of metal panels before installation.
- C. Proceed with installation only after unsatisfactory conditions have been corrected.

3.2 PREPARATION

- A. Miscellaneous Supports: Install subframing, furring, and other miscellaneous panel support members and anchorages according to ASTM C754 and metal panel manufacturer's written recommendations.

3.3 INSTALLATION OF UNDERLAYMENT

- A. Self-Adhering Sheet Underlayment: Apply primer if required by manufacturer. Comply with temperature restrictions of underlayment manufacturer for installation. Apply at locations indicated on Drawings, wrinkle free, in shingle fashion to shed water, and with end laps of not less than 6 inches staggered 24 inches between courses. Overlap side edges not less than 3-1/2 inches. Roll laps with roller. Cover underlayment within 14 days.
 - 1. Apply over the entire roof surface.
- B. Flashings: Install flashings to cover underlayment to comply with requirements specified in Section 07 62 00 "Sheet Metal Flashing and Trim."

3.4 INSTALLATION OF STANDING-SEAM METAL ROOF PANELS

- A. Install metal panels according to manufacturer's written instructions in orientation, sizes, and locations indicated. Install panels perpendicular to supports unless otherwise indicated. Anchor metal panels and other components of the Work securely in place, with provisions for thermal and structural movement.
 - 1. Shim or otherwise plumb substrates receiving metal panels.
 - 2. Flash and seal metal panels at perimeter of all openings. Fasten with self-tapping screws. Do not begin installation until air- or water-resistive barriers and flashings that will be concealed by metal panels are installed.
 - 3. Install screw fasteners in predrilled holes.
 - 4. Locate and space fastenings in uniform vertical and horizontal alignment.
 - 5. Install flashing and trim as metal panel work proceeds.
 - 6. Locate panel splices over, but not attached to, structural supports. Stagger panel splices and end laps to avoid a four-panel lap splice condition.
 - 7. Align bottoms of metal panels and fasten with blind rivets, bolts, or self-tapping screws. Fasten flashings and trim around openings and similar elements with self-tapping screws.
 - 8. Provide weathertight escutcheons for pipe- and conduit-penetrating panels.
- B. Fasteners:
 - 1. Steel Panels: Use stainless steel fasteners for surfaces exposed to the exterior; use galvanized-steel fasteners for surfaces exposed to the interior.
 - 2. Aluminum Panels: Use aluminum or stainless steel fasteners for surfaces exposed to the exterior; use aluminum or galvanized-steel fasteners for surfaces exposed to the interior.
 - 3. Copper Panels: Use copper, stainless steel, or hardware-bronze fasteners.
 - 4. Stainless Steel Panels: Use stainless steel fasteners.
- C. Anchor Clips: Anchor metal roof panels and other components of the Work securely in place, using manufacturer's approved fasteners according to manufacturers' written instructions.
- D. Metal Protection: Where dissimilar metals contact each other or corrosive substrates, protect against galvanic action as recommended in writing by metal panel manufacturer.
- E. Standing-Seam Metal Roof Panel Installation: Fasten metal roof panels to supports with concealed clips at each standing-seam joint at location, spacing, and with fasteners recommended in writing by manufacturer.
 - 1. Install clips to supports with self-tapping fasteners.
 - 2. Install pressure plates at locations indicated in manufacturer's written installation instructions.
 - 3. Snap Joint: Nest standing seams and fasten together by interlocking and completely engaging factory-applied sealant.

4. Seamed Joint: Crimp standing seams with manufacturer-approved, motorized seamer tool so clip, metal roof panel, and factory-applied sealant are completely engaged.
5. Watertight Installation:
 - a. Apply a continuous ribbon of sealant or tape to seal joints of metal panels, using sealant or tape as recommend in writing by manufacturer as needed to make panels watertight.
 - b. Provide sealant or tape between panels and protruding equipment, vents, and accessories.
 - c. At panel splices, nest panels with minimum 6-inch end lap, sealed with sealant and fastened together by interlocking clamping plates.
- F. Clipless Metal Panel Installation: Fasten metal panels to supports with screw fasteners at each lapped joint at location and spacing recommended by manufacturer.
- G. Accessory Installation: Install accessories with positive anchorage to building and weathertight mounting, and provide for thermal expansion. Coordinate installation with flashings and other components.
 1. Install components required for a complete metal panel system including trim, copings, corners, seam covers, flashings, sealants, gaskets, fillers, closure strips, and similar items. Provide types indicated by metal roof panel manufacturers; or, if not indicated, types recommended by metal roof panel manufacturer.
- H. Pipe Flashing: Form flashing around pipe penetration and metal roof panels. Fasten and seal to metal roof panels as recommended by manufacturer.

3.5 ERECTION TOLERANCES

- A. Installation Tolerances: Shim and align metal panel units within installed tolerance of 1/4 inch in 20 feet on slope and location lines as indicated and within 1/8-inch offset of adjoining faces and of alignment of matching profiles.

3.6 FIELD QUALITY CONTROL

- A. Manufacturer's Field Service: Engage a factory-authorized service representative to test and inspect metal roof panel installation, including accessories. Report results in writing.
- B. Remove and replace applications of metal roof panels where tests and inspections indicate that they do not comply with specified requirements.
- C. Additional tests and inspections, at Contractor's expense, are performed to determine compliance of replaced or additional work with specified requirements.
- D. Prepare test and inspection reports.

3.7 CLEANING AND PROTECTION

- A. Remove temporary protective coverings and strippable films, if any, as metal panels are installed, unless otherwise indicated in manufacturer's written installation instructions. On completion of metal panel installation, clean finished surfaces as recommended by metal panel manufacturer. Maintain in a clean condition during construction.
- B. Replace metal panels that have been damaged or have deteriorated beyond successful repair by finish touchup or similar minor repair procedures.

END OF SECTION **07 41 13.16**

SECTION 07 54 19 - POLYVINYL-CHLORIDE (PVC) ROOFING

PART 1 - GENERAL

1.1 SUMMARY

A. Section Includes:

1. Fully Adhered polyvinyl chloride (PVC) roofing system.
2. Accessory roofing materials.
3. Cover board.
4. Walkways.

1.2 PREINSTALLATION MEETINGS

A. Preliminary Roofing Conference: Before starting roof deck construction, conduct conference at Project site.

1. Meet with FAA, COR, FAA's insurer if applicable, testing and inspecting agency representative, roofing Installer, roofing system manufacturer's representative, deck Installer, air barrier Installer, and installers whose work interfaces with or affects roofing, including installers of roof accessories and roof-mounted equipment.
2. Review methods and procedures related to roofing installation, including manufacturer's written instructions.
3. Review and finalize construction schedule, and verify availability of materials, Installer's personnel, equipment, and facilities needed to make progress and avoid delays.
4. Review deck substrate requirements for conditions and finishes, including flatness and fastening.
5. Review structural loading limitations of roof deck during and after roofing.
6. Review base flashings, special roofing details, roof drainage, roof penetrations, equipment curbs, and condition of other construction that affects roofing system.
7. Review governing regulations and requirements for insurance and certificates if applicable.
8. Review temporary protection requirements for roofing system during and after installation.
9. Review roof observation and repair procedures after roofing installation.

B. Preinstallation Roofing Conference: Conduct conference at Project site.

1. Meet with FAA, COR, FAA's insurer if applicable, testing and inspecting agency representative, roofing Installer, roofing system manufacturer's representative, deck Installer, air barrier Installer, and installers whose work interfaces with or affects roofing, including installers of roof accessories and roof-mounted equipment.

2. Review methods and procedures related to roofing installation, including manufacturer's written instructions.
3. Review and finalize construction schedule, and verify availability of materials, Installer's personnel, equipment, and facilities needed to make progress and avoid delays.
4. Examine deck substrate conditions and finishes for compliance with requirements, including flatness and fastening.
5. Review structural loading limitations of roof deck during and after roofing.
6. Review base flashings, special roofing details, roof drainage, roof penetrations, equipment curbs, and condition of other construction that affects roofing system.
7. Review governing regulations and requirements for insurance and certificates if applicable.
8. Review temporary protection requirements for roofing system during and after installation.
9. Review roof observation and repair procedures after roofing installation.

1.3 ACTION SUBMITTALS

- A. Product Data: For each type of product.
 1. For the entire roofing system assembly and its components, including insulation (where needed), cover-board, fasteners, single-ply membrane, adhesives, termination bars, flashings, etc..
 2. Provide FM Approvals' RoofNav listing information.
- B. Third-Party Certified Life Cycle Assessment: For each product.
- C. Shop Drawings: Include roof plans, sections, details, and attachments to other work, including the following:
 1. Layout and thickness of insulation.
 2. Base flashings and membrane terminations.
 3. Flashing details at penetrations.
 4. Tapered insulation thickness and slopes.
 5. Roof plan showing orientation of steel roof deck and orientation of roof membrane, fastening spacings, and patterns for mechanically fastened roofing system.
 6. Insulation fastening patterns for corner, perimeter, and field-of-roof locations.
 7. Tie-in with air barrier.

1.4 INFORMATIONAL SUBMITTALS

- A. Qualification Data: For Installer and manufacturer. Provide documentation of the manufacturer's and installer's qualifications complying with the requirements of 1.7 QUALITY ASSURANCE in this Specification Section.
- B. Manufacturer Certificates:

1. Performance Requirement Certificate: Signed by roof membrane manufacturer, certifying that roofing system complies with requirements specified in "Performance Requirements" Article.
 - a. Submit evidence of compliance with performance requirements.
 2. Special Warranty Certificate: Signed by roof membrane manufacturer, certifying that all materials supplied under this Section are acceptable for special warranty.
 - C. Product Test Reports: For roof membrane and insulation, tests performed by independent qualified testing agency indicating compliance with specified requirements.
 - D. Evaluation Reports: For components of roofing system, from ICC-ES.
 - E. Field Test Reports:
 1. Concrete internal relative humidity test reports.
 2. Fastener-pullout test results and manufacturer's revised requirements for fastener patterns.
 - F. Field quality-control reports.
 - G. Sample Warranties: For manufacturer's special warranties.
- 1.5 FASTENER PULL OUT, ODOR AND ACOUSTICAL TESTING
- A. See Section 07 01 50.19 Preparation for Reroofing for pre-roofing testing requirements for:
 1. Fasteners pull-out.
 2. Odor verification.
 3. Acoustical testing.
- 1.6 CLOSEOUT SUBMITTALS
- A. Maintenance Data: For roofing system to include in maintenance manuals.
 - B. Certified statement from existing roof membrane manufacturer stating that existing roof warranty has not been affected by Work performed under this Section.
- 1.7 QUALITY ASSURANCE
- A. Qualifications:
 1. Manufacturers: A qualified manufacturer that is listed in FM Approvals' RoofNav for roofing system identical to that used for this Project.

2. Installers: A qualified firm that is approved, authorized, or licensed by roofing system manufacturer to install manufacturer's product and that is eligible to receive manufacturer's special warranty. Minimum experience requirement of 5-10 years of specialized experience with this type of material and roofing system.
3. Testing Agency Qualifications: An agency who employs personnel trained and certified in the inspection and testing of roofing materials by UL, NRCIA or InterNACH to conduct the testing indicated.

1.8 DELIVERY, STORAGE, AND HANDLING

- A. Deliver roofing materials to Project site in original containers with seals unbroken and labeled with manufacturer's name, product brand name and type, date of manufacture, approval or listing agency markings, and directions for storing and mixing with other components. Proceed with installation only when existing and forecast weather conditions for the next 3 days permit roofing system to be installed according to manufacturer's written instructions and warranty requirements.
- B. Store liquid materials in their original undamaged containers in a clean, dry, protected location and within the temperature range required by roofing system manufacturer. Protect stored liquid material from direct sunlight.
 1. Discard and legally dispose of liquid material that cannot be applied within its stated shelf life.
- C. Protect roof insulation materials from physical damage and from deterioration by sunlight, moisture, soiling, and other sources. Store in a dry location. Comply with insulation manufacturer's written instructions for handling, storing, and protecting during installation.
- D. Handle and store roofing materials, and place equipment in a manner to avoid permanent deflection of deck.

1.9 FIELD CONDITIONS

- A. Weather Limitations: Proceed with installation only when existing and forecasted weather conditions permit roofing system to be installed according to manufacturer's written instructions and warranty requirements.

1.10 WARRANTY

- A. Special Warranty: Manufacturer agrees to repair or replace components of roofing system that fail in materials or workmanship within specified warranty period.
 1. Special warranty includes roof membrane, base flashings, fasteners, cover boards, and other components of roofing system.
 2. Warranty Period: 30 years from date of Substantial Completion.

- B. Special Project Warranty: Submit roofing Installer's warranty, on warranty form at end of this Section, signed by Installer, covering the Work of this Section, including all components of roofing system such as roof membrane, base flashing, fasteners, cover boards, and walkway products, for the following warranty period:
 - 1. Warranty Period: Two years from date of Substantial Completion.
 - 2. Warranty Period Extension: For any area repaired within the two year period above the warranty must be extended an additional two years.

PART 2 - PRODUCTS

2.1 PERFORMANCE REQUIREMENTS

- A. General Performance: Installed roofing and base flashings to withstand specified uplift pressures, thermally induced movement, and exposure to weather without failure due to defective manufacture, fabrication, installation, or other defects in construction. Roof system and flashings to remain watertight.
 - 1. Accelerated Weathering: Roof membrane to withstand 2000 hours of exposure when tested according to ASTM G152, ASTM G154, or ASTM G155.
 - 2. Impact Resistance: Roof membrane to resist impact damage when tested according to ASTM D3746, ASTM D4272/D4272M, or the "Resistance to Foot Traffic Test" in FM Approvals 4470.
- B. Material Compatibility: Roofing materials to be compatible with one another and adjacent materials under conditions of service and application required, as demonstrated by roof membrane manufacturer based on testing and field experience.
- C. Wind Uplift Resistance: Design roofing system to resist the following wind uplift pressures when tested according to FM Approvals 4474, UL 580, or UL 1897:
 - 1. The following uplift pressures as noted on Drawing S001, at the locations shown on Drawing S001. (If any of this information differs from the uplift pressures noted on Drawing S001, the information on Drawing S001 governs.)
 - 2. Zone 1 (Roof Area Field): 30 lbf/sq. ft..
 - 3. Zone 2a (Roof Area Outer Edge): 68 lbf/sq. ft..
 - 4. Zone 2b (Roof Area Inner Edge): 51 lbf/sq. ft..
 - 5. Zone 3 (Roof Area Corners): 93 lbf/sq. ft..
- D. FM Approvals' RoofNav Listing: Roof membrane, base flashings, and component materials comply with requirements in FM Approvals 4450 or FM Approvals 4470 as part of a roofing system, and are listed in FM Approvals' RoofNav for Class 1 or noncombustible construction, as applicable. Identify materials with FM Approvals Certification markings.
 - 1. Fire/Windstorm Classification: Class 1A-120.

2. Hail-Resistance Rating: FM Global Property Loss Prevention Data Sheet 1-34 MH.
 - E. SPRI's Directory of Roof Assemblies Listing: Roof membrane, base flashings, and component materials comply with requirements in FM Approvals 4450 or FM Approvals 4470 as part of a roofing system, and are listed in SPRI's Directory of Roof Assemblies for roof assembly identical for that specified for this Project.
 1. Wind Uplift Load Capacity: 120 psf.
 - F. Solar Reflectance Index (SRI): Three-year-aged SRI not less than 64 or initial SRI not less than 82 when calculated according to ASTM E 1980, based on testing identical products by a qualified testing agency.
 - G. ENERGY STAR Listing: Roofing system to be listed on the DOE's ENERGY STAR "Roof Products Qualified Product List" for low -slope roof products.
 - H. Energy Performance: Roofing system to have an initial solar reflectance of not less than 0.70 and an emissivity of not less than 0.75 when tested in accordance with ANSI/CRRC S100.
 - I. Exterior Fire-Test Exposure: ASTM E108 or UL 790, Class A; for application and roof slopes indicated; testing by a qualified testing agency. Identify products with appropriate markings of applicable testing agency.
 - J. Fire-Resistance Ratings: Comply with fire-resistance-rated assembly designs indicated. Identify products with appropriate markings of applicable testing agency.
- 2.2 POLYVINYL CHLORIDE (PVC) ROOFING
- A. PVC Sheet Type II: ASTM D4434/D4434M, glass-fiber reinforced, felt backed.
 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. Sika Sarnafil.
 - b. Carlisle SynTec Systems
 2. Thickness: 80 mils .
 3. Exposed Face Color: white.
 - B. Source Limitations: Obtain components for roofing system from roof membrane manufacturer.
- 2.3 ACCESSORY ROOFING MATERIALS
- A. General: Accessory materials recommended by roofing system manufacturer for intended use and compatible with other roofing components.
 1. Odor: All roofing materials shall be low-odor.

2. Adhesives and Sealants: Comply with VOC limits of authorities having jurisdiction.
3. Adhesives and sealants shall comply with the following limits for VOC content:
 - a. PVC Welding Compounds: 510 g/L.
 - b. Single-Ply Roof Membrane Sealants: 450 g/L.
 - c. Sealant Primers for Nonporous Substrates: 250 g/L.
- B. Sheet Flashing: Manufacturer's standard sheet flashing of same material, type, reinforcement, and color as PVC sheet.
 1. Sheet flashing thickness: 60 mils minimum and not less than manufacturer's required thickness for warranty.
- C. Prefabricated Pipe Flashings: As recommended by roof membrane manufacturer.
- D. Roof Vents: As recommended by roof membrane manufacturer.
 1. Size: Not less than 4-inch diameter.
- E. Bonding Adhesive: Manufacturer's standard, water based.
- F. Metal Termination Bars: Manufacturer's standard, predrilled stainless steel or aluminum bars, approximately 1 by 1/8 inch thick; with anchors.
- G. Miscellaneous Accessories: Provide pourable sealers, preformed cone and vent sheet flashings, preformed inside and outside corner sheet flashings, T-joint covers, lap sealants, termination reglets, and other accessories.

2.4 COVER BOARD

- A. Fasteners: Factory-coated steel fasteners and metal or plastic plates complying with corrosion-resistance provisions in FM Approvals 4470, designed for fastening roof insulation and cover boards to substrate, and acceptable to roofing system manufacturer. Fasteners must be driven into drilled holes in the concrete roof deck under the existing roofing system. Powder actuated fasteners are not allowed.
- B. Glass-Mat Gypsum Cover Board: ASTM C1177/C1177M, water-resistant gypsum board approved by the roofing system manufacturer for use in their roofing system.
 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; SAINT-GOBAIN.
 - b. Georgia-Pacific Gypsum LLC.
 - c. National Gypsum Company.
 - d. USG Corporation.
 2. Thickness: 5/8 inch.
 3. Surface Finish: Fiberglass facer.

2.5 WALKWAYS

- A. Flexible Walkways: Factory-formed, nonporous, heavy-duty, slip-resisting, surface-textured walkway or rolls, approximately 3/16 inch thick and acceptable to roofing system manufacturer.
 - 1. Size: Approximately 36 by 60 inches.

PART 3 - EXECUTION

3.1 EXAMINATION

- A. Examine substrates, areas, and conditions, with Installer present, for compliance with requirements and other conditions affecting performance of the Work.
 - 1. Verify that roof openings and penetrations are in place, curbs are set and braced, and roof-drain bodies are securely clamped in place.
 - 2. Verify that wood blocking, curbs, and nailers are securely anchored to roof deck at penetrations and terminations and that nailers match thicknesses of insulation.

3.2 PREPARATION

- A. Clean substrate of dust, debris, moisture, and other substances detrimental to roofing system installation according to roofing system manufacturer's written instructions. Remove sharp projections.
- B. Perform fastener-pullout tests according to roof system manufacturer's written instructions.
- C. Install sound-absorbing insulation strips according to acoustical roof deck manufacturer's written instructions.
- D. Install roofing system according to roofing system manufacturer's written instructions, FM Approvals' RoofNav listed roof assembly requirements, and FM Global Property Loss Prevention Data Sheet 1-29.
- E. Complete terminations and base flashings and provide temporary seals to prevent water from entering completed sections of roofing system at end of workday or when rain is forecast. Remove and discard temporary seals before beginning work on adjoining roofing.

3.3 INSTALLATION OF COVER BOARDS

- A. Install cover boards over insulation with long joints in continuous straight lines with end joints staggered between rows. Offset joints of insulation below a minimum of 6 inches in each direction.

1. Trim cover board neatly to fit around penetrations and projections, and to fit tight to intersecting sloping roof decks.
 2. At internal roof drains, conform to slope of drain sump.
 - a. Trim cover board so that water flow is unrestricted.
 3. Cut and fit cover board tight to nailers, projections, and penetrations.
- B. Place plates on insulation in required fastening patterns to achieve FM rating and secure in accordance with manufacturer's instructions.
1. Install plates and fasteners tight and flat to substrate with no dimpling, and with fastener extending 1 inch minimum into roof deck; do not overdrive fasteners.

3.4 INSTALLATION OF ADHERED ROOF MEMBRANE

- A. Adhere roof membrane over area to receive roofing according to roofing system manufacturer's written instructions.
- B. Unroll roof membrane and allow to relax before installing.
- C. Start installation of roofing in presence of roofing system manufacturer's technical personnel FAA's selected testing and inspection agency.
- D. Accurately align roof membrane, and maintain uniform side and end laps of minimum dimensions required by manufacturer. Stagger end laps.
- E. Bonding Adhesive: Apply to substrate and underside of roof membrane at rate required by manufacturer, and allow to partially dry before installing roof membrane. Do not apply to splice area of roof membrane.
- F. Fabric-Backed Roof Membrane Adhesive: Apply to substrate at rate required by manufacturer, and install fabric-backed roof membrane.
- G. In addition to adhering, mechanically fasten roof membrane securely at terminations, penetrations, and perimeter of roofing.
- H. Apply roof membrane with side laps shingled with slope of roof deck where possible.
- I. Seams: Clean seam areas, overlap roofing, and hot-air weld side and end laps of roof membrane and sheet flashings to ensure a watertight seam installation.
 1. Test lap edges with probe to verify seam weld continuity. Apply lap sealant to seal cut edges of roof membrane and sheet flashings.
 2. Verify field strength of seams a minimum of twice daily, and repair seam sample areas.
 3. Repair tears, voids, and lapped seams in roof membrane that do not comply with requirements.

- J. Spread sealant bed over deck-drain flange at roof drains, and securely seal roof membrane in place with clamping ring.

3.5 INSTALLATION OF WALKWAYS

- A. Flexible Walkways: Install walkway products according to manufacturer's written instructions.
 - 1. Install flexible walkways at the following locations:
 - a. Perimeter of each rooftop unit.
 - b. Between each rooftop unit location, creating a continuous path connecting rooftop unit locations.
 - c. Between each roof hatch and each rooftop unit location or path connecting rooftop unit locations.
 - d. Top and bottom of each roof access ladder.
 - e. Between each roof access ladder and each rooftop unit location or path connecting rooftop unit locations.
 - f. As required by roof membrane manufacturer's warranty requirements.
 - 2. Provide 6-inch clearance between adjoining pads.
 - 3. Heat weld to substrate or adhere walkway products to substrate with compatible adhesive according to roofing system manufacturer's written instructions.

3.6 FIELD QUALITY CONTROL

- A. Testing Agency: FAA will select and the Contractor must engage a qualified testing agency to inspect substrate conditions, surface preparation, roof membrane application, sheet flashings, protection, and drainage components, and to furnish reports to COR.
- B. Perform the following tests:
 - 1. Infrared Thermography: Testing agency surveys entire roof area using infrared color thermography according to ASTM C1153.
 - a. Perform tests before overlying construction is placed.
 - b. After infrared scan, locate specific areas of leaks by electrical capacitance/impedance testing.
 - c. After testing, repair leaks, repeat tests, and make further repairs until roofing and flashing installations are watertight.
 - 1) Cost of retesting is Contractor's responsibility.
 - d. Testing agency to prepare survey report of initial scan indicating locations of entrapped moisture, if any.

- C. Final Roof Inspection: Arrange for roofing system manufacturer's technical personnel to inspect roofing installation on completion, in presence of Architect, and to prepare inspection report.
- D. Repair or remove and replace components of roofing system where inspections indicate that they do not comply with specified requirements.
- E. Additional testing and inspecting, at Contractor's expense, will be performed to determine if replaced or additional work complies with specified requirements.

3.7 PROTECTING AND CLEANING

- A. Protect roofing system from damage and wear during remainder of construction period. When remaining construction does not affect or endanger roofing, inspect roofing system for deterioration and damage, describing its nature and extent in a written report, with copies to Architect and Owner.
- B. Correct deficiencies in or remove roofing system that does not comply with requirements, repair substrates, and repair or reinstall roofing system to a condition free of damage and deterioration at time of Substantial Completion and according to warranty requirements.
- C. Clean overspray and spillage from adjacent construction using cleaning agents and procedures recommended by manufacturer of affected construction.

END OF SECTION **07 54 19**|

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SECTION 07 62 00 - SHEET METAL FLASHING AND TRIM

PART 1 - GENERAL

1.1 SUMMARY

A. Related Requirements:

1. Section 07 71 00 "Roof Specialties" for manufactured copings, roof-edge specialties, roof-edge drainage systems, reglets, and counterflashings.

1.2 Section 07 72 00 "Roof Accessories" for roof hatchesCOORDINATION

- A.** Coordinate sheet metal flashing and trim layout and seams with sizes and locations of penetrations to be flashed, and joints and seams in adjacent materials.
- B.** Coordinate sheet metal flashing and trim installation with adjoining wall materials, joints, and seams to provide leakproof, secure, and noncorrosive installation.

1.3 PREINSTALLATION MEETINGS

- A.** Preinstallation Conference: Conduct conference at Project site.
1. Review construction schedule. Verify availability of materials, Installer's personnel, equipment, and facilities needed to make progress and avoid delays.
 2. Review requirements for insurance and certificates if applicable.
 3. Review sheet metal flashing observation and repair procedures after flashing installation.

1.4 ACTION SUBMITTALS

- A.** Product Data for each piece of flashing indicated in this section.
- B.** Shop Drawings: For sheet metal flashing and trim.
1. Include plans, elevations, sections, and attachment details.
 2. Detail fabrication and installation layouts, expansion-joint locations, and keyed details. Distinguish between shop- and field-assembled Work.
 3. Include identification of material, thickness, weight, and finish for each item and location in Project.
 4. Include details for forming, including profiles, shapes, seams, and dimensions.
 5. Include details for joining, supporting, and securing, including layout and spacing of fasteners, cleats, clips, and other attachments. Include pattern of seams.
 6. Include details of termination points and assemblies.

7. Include details of expansion joints and expansion-joint covers, including showing direction of expansion and contraction from fixed points.
 8. Include details of roof-penetration flashing.
 9. Include details of edge conditions, including eaves, ridges, valleys, rakes, crickets, flashings, and counterflashings.
 10. Detail formed flashing and trim at scale of not less than 1-1/2 inches per 12 inches.
- C. Samples: For each exposed product and for each color and texture specified, 12 inches long by actual width.
- D. Samples for Verification: For each type of exposed finish.
1. Sheet Metal Flashing: 12 inches long by actual width of unit, including finished seam and in required profile. Include fasteners, cleats, clips, closures, and other attachments.
 2. Unit-Type Accessories and Miscellaneous Materials: Full-size Sample.

1.5 INFORMATIONAL SUBMITTALS

- A. Product Test Reports: For each product, for tests performed by a qualified testing agency.
- B. Evaluation Reports: For copings and roof edge flashing, from ICC-ES showing compliance with ANSI/SPRI/FM 4435/ES-1.

1.6 CLOSEOUT SUBMITTALS

- A. Maintenance Data: For sheet metal flashing and trim, and its accessories, to include in maintenance manuals.

1.7 QUALITY ASSURANCE

- A. Fabricator Qualifications: Employs skilled workers who custom fabricate sheet metal flashing and trim similar to that required for this Project and whose products have a record of successful in-service performance.

PART 2 - PRODUCTS

2.1 PERFORMANCE REQUIREMENTS

- A. Sheet metal flashing and trim assemblies, including cleats, anchors, and fasteners, shall withstand wind loads, structural movement, thermally induced movement, and exposure to weather without failure due to defective manufacture, fabrication, installation, or other defects in construction. Completed sheet metal flashing and trim shall not rattle, leak, or loosen, and shall remain watertight.

- B. Sheet Metal Standard for Flashing and Trim: Comply with SMACNA's "Architectural Sheet Metal Manual" requirements for dimensions and profiles shown unless more stringent requirements are indicated.
- C. Thermal Movements: Allow for thermal movements from ambient and surface temperature changes to prevent buckling, opening of joints, overstressing of components, failure of joint sealants, failure of connections, and other detrimental effects. Base calculations on surface temperatures of materials due to both solar heat gain and nighttime-sky heat loss.
 - 1. Temperature Change: 120 deg F, ambient; 180 deg F, material surfaces.

2.2 SHEET METALS

- A. Aluminum Sheet: ASTM B209, alloy as standard with manufacturer for finish required, with temper as required to suit forming operations and performance required; with smooth, flat surface.
 - 1. Exposed Coil-Coated Finish:
 - a. Three-Coat Fluoropolymer: AAMA 2605. Fluoropolymer finish containing not less than 70 percent polyvinylidene fluoride (PVDF) resin by weight in both color coat and clear topcoat. Prepare, pretreat, and apply coating to exposed metal surfaces to comply with coating and resin manufacturers' written instructions for seacoast and severe environments.
 - b. Siliconized Polyester: Epoxy primer and silicone-modified, polyester-enamel topcoat; with dry film thickness of not less than 0.2 mil for primer and 0.8 mil for topcoat.
 - 2. Color: As indicated by manufacturer's designations Match Architect's sample selected by COR from Manufacturer's full range.
- B. Stainless Steel Sheet: ASTM A240/A240M, Type 316, dead soft, fully annealed; with smooth, flat surface.
 - 1. Finish: ASTM A480/A480M, No. 2B (bright, cold rolled) .
- C. Metallic-Coated Steel Sheet: Provide zinc-coated (galvanized) steel sheet in accordance with ASTM A653/A653M, G90 coating designation; prepainted by coil-coating process to comply with ASTM A755/A755M.
 - 1. Recycled Content: Postconsumer recycled content plus one-half of preconsumer recycled content not less than <Insert value> percent.
 - 2. Surface: Smooth, flat.
 - 3. Exposed Coil-Coated Finish:

- a. Three-Coat Fluoropolymer: AAMA 621. Fluoropolymer finish containing not less than 70 percent polyvinylidene fluoride (PVDF) resin by weight in both color coat and clear topcoat. Prepare, pretreat, and apply coating to exposed metal surfaces to comply with coating and resin manufacturers' written instructions for seacoast and severe environments.
4. Color: Match COR's sample.
5. Concealed Finish: Pretreat with manufacturer's standard white or light-colored acrylic or polyester backer finish, consisting of prime coat and wash coat with minimum total dry film thickness of 0.5 mil.

2.3 UNDERLAYMENT MATERIALS

- A. Self-Adhering, High-Temperature Sheet Underlayment: Minimum 30 mils thick, consisting of a slip-resistant polyethylene- or polypropylene-film top surface laminated to a layer of butyl- or SBS-modified asphalt adhesive, with release-paper backing; specifically designed to withstand high metal temperatures beneath metal roofing. Provide primer in accordance with underlayment manufacturer's written instructions.
 1. Source Limitations: Obtain underlayment from single source from single manufacturer.
 2. Low-Temperature Flexibility: ASTM D1970/D1970M; passes after testing at minus 20 deg F or lower.

2.4 MISCELLANEOUS MATERIALS

- A. Provide materials and types of fasteners, protective coatings, sealants, and other miscellaneous items as required for complete sheet metal flashing and trim installation and as recommended by manufacturer of primary sheet metal or manufactured item unless otherwise indicated.
- B. Fasteners: Fasteners designed to withstand design loads and recommended by manufacturer of primary sheet metal or manufactured item.
 1. General: Blind fasteners or self-drilling screws, gasketed, with hex-washer head.
 2. Fasteners for Stainless Steel Sheet: Series 300 stainless steel.
- C. Sealant Tape: Pressure-sensitive, 100 percent solids, polyisobutylene compound sealant tape with release-paper backing. Provide permanently elastic, nonsag, nontoxic, nonstaining tape 1/2 inch wide and 1/8 inch thick.
- D. Bituminous Coating: Cold-applied asphalt emulsion in accordance with ASTM D1187/D1187M.

2.5 FABRICATION, GENERAL

- A. Custom fabricate sheet metal flashing and trim to comply with details indicated and recommendations in cited sheet metal standard that apply to design, dimensions, geometry, metal thickness, and other characteristics of item required.
 - 1. Fabricate sheet metal flashing and trim in shop to greatest extent possible.
 - 2. Fabricate sheet metal flashing and trim in thickness or weight needed to comply with performance requirements, but not less than that specified for each application and metal.
 - 3. Verify shapes and dimensions of surfaces to be covered and obtain field measurements for accurate fit before shop fabrication.
 - 4. Form sheet metal flashing and trim to fit substrates without excessive oil-canning, buckling, and tool marks; true to line, levels, and slopes; and with exposed edges folded back to form hems.
 - 5. Conceal fasteners and expansion provisions where possible. Do not use exposed fasteners on faces exposed to view.
- B. Fabrication Tolerances:
 - 1. Fabricate sheet metal flashing and trim that is capable of installation to a tolerance of 1/4 inch in 20 feet on slope and location lines indicated on Drawings and within 1/8-inch offset of adjoining faces and of alignment of matching profiles.
 - 2. Fabricate sheet metal flashing and trim that is capable of installation to tolerances specified.
- C. Expansion Provisions: Form metal for thermal expansion of exposed flashing and trim.
 - 1. Form expansion joints of intermeshing hooked flanges, not less than 1 inch deep, filled with butyl sealant concealed within joints.
 - 2. Use lapped expansion joints only where indicated on Drawings.
- D. Sealant Joints: Where movable, nonexpansion-type joints are required, form metal in accordance with cited sheet metal standard to provide for proper installation of elastomeric sealant.
- E. Fabricate cleats and attachment devices from same material as accessory being anchored or from compatible, noncorrosive metal.
- F. Fabricate cleats and attachment devices of sizes as recommended by cited sheet metal standard and by FM Global Property Loss Prevention Data Sheet 1-49 for application, but not less than thickness of metal being secured.
- G. Seams:
 - 1. Fabricate nonmoving seams with flat-lock seams. Form seams and seal with elastomeric sealant unless otherwise recommended by sealant manufacturer for intended use. Rivet joints where necessary for strength.

2.6 WALL SHEET METAL FABRICATIONS

Retain paragraphs in this article to suit Project. Although the most common fabrications are included, insert descriptions of others if required. Examples of locations for continuous through-wall flashing include under masonry copings, at story-height shelf angles, and at sills and lintels of horizontal ribbon windows. Examples of locations for discontinuous through-wall flashing include sills and lintels for punched windows, doors, louvers, and wall-penetrating construction. Base-metal thicknesses cited for copper sheets, for copper-clad stainless steel sheet, and for zinc sheet are from manufacturer's literature.

- A. Through-Wall Flashing: Fabricate continuous flashings in minimum 96-inch- (2400-mm-) long, but not exceeding 12-foot- (3.6-m-) long, sections, under copings, and at shelf angles. Fabricate discontinuous lintel, sill, and similar flashings to extend 6 inches (150 mm) beyond each side of wall openings; and form with 2-inch- (50-mm-) high, end dams. Fabricate from the following materials:
 - 1. Stainless Steel: 0.0156 inch thick.

Retain "Opening Flashings in Frame Construction" Paragraph below for nonmasonry-clad wood or cold-formed steel-framed walls. Claddings may include exterior insulation and finish systems (EIFS), siding, wood shingles, or shakes. Flashing is usually required to surround wall-opening components such as windows, doors, and louvers.

2.7 MISCELLANEOUS SHEET METAL FABRICATIONS

Retain paragraphs in this article to suit Project. Although the most common fabrications are included, insert descriptions of others if required. Base-metal thicknesses cited for copper sheets and for copper-clad stainless steel sheet are from manufacturer's literature.

- A. Equipment Support Flashing: Fabricate from the following materials:
 - 1. Stainless Steel: 0.0188 inch thick.

2.8 LOW-SLOPE ROOF SHEET METAL FABRICATIONS

- A. Base Flashing: Shop fabricate interior and exterior corners. Fabricate from the following materials:
 - 1. Galvanized Steel: 0.022 inch (0.71 mm) thick.
- B. Counterflashing: Shop fabricate interior and exterior corners. Fabricate from the following materials:
 - 1. Galvanized Steel: 0.022 inch thick.

2.9 WALL SHEET METAL FABRICATIONS

- A. Through-Wall Flashing: Fabricate continuous flashings in minimum 96-inch- long, but not exceeding 12-foot- long, sections, under copings, and at shelf angles. Fabricate discontinuous lintel, sill, and similar flashings to extend 6 inches beyond each side of wall openings; and form with 2-inch- high, end dams. Fabricate from the following materials:
 - 1. Stainless Steel: 0.0156 inch thick.

PART 3 - EXECUTION

3.1 EXAMINATION

- A. Examine substrates, areas, and conditions, with installer present, for compliance with requirements for installation tolerances, substrate, and other conditions affecting performance of the Work.
 - 1. Verify compliance with requirements for installation tolerances of substrates.
 - 2. Verify that substrate is sound, dry, smooth, clean, sloped for drainage, and securely anchored.
- B. Proceed with installation only after unsatisfactory conditions have been corrected.

3.2 INSTALLATION OF UNDERLAYMENT

- A. Felt Underlayment: Install felt underlayment, wrinkle free, using adhesive to minimize use of mechanical fasteners under sheet metal flashing and trim.
 - 1. Lap joints not less than 2 inches.

3.3 INSTALLATION, GENERAL

- A. Install sheet metal flashing and trim to comply with details indicated and recommendations of cited sheet metal standard that apply to installation characteristics required unless otherwise indicated on Drawings.
 - 1. Install fasteners, protective coatings, separators, sealants, and other miscellaneous items as required to complete sheet metal flashing and trim system.
 - 2. Install sheet metal flashing and trim true to line, levels, and slopes. Provide uniform, neat seams with minimum exposure of .
 - 3. Anchor sheet metal flashing and trim and other components of the Work securely in place, with provisions for thermal and structural movement.
 - 4. Install sheet metal flashing and trim to fit substrates and to result in watertight performance.

5. Install continuous cleats with fasteners spaced not more than 12 inches o.c.
 6. Space individual cleats not more than 12 inches apart. Attach each cleat with at least two fasteners. Bend tabs over fasteners.
 7. Install exposed sheet metal flashing and trim with limited oil-canning, and free of buckling and tool marks.
 8. Do not field cut sheet metal flashing and trim by torch.
 9. Do not use graphite pencils to mark metal surfaces.
- B. Metal Protection: Where dissimilar metals contact each other, or where metal contacts pressure-treated wood or other corrosive substrates, protect against galvanic action or corrosion by painting contact surfaces with bituminous coating or by other permanent separation as recommended by sheet metal manufacturer or cited sheet metal standard.
1. Coat concealed side of stainless steel sheet metal flashing and trim with bituminous coating where flashing and trim contact wood, ferrous metal, or cementitious construction.
- C. Expansion Provisions: Provide for thermal expansion of exposed flashing and trim.
1. Space movement joints at maximum of 10 feet with no joints within 24 inches of corner or intersection.
 2. Use lapped expansion joints only where indicated on Drawings.
- D. Fasteners: Use fastener sizes that penetrate substrate not less than recommended by fastener manufacturer to achieve maximum pull-out resistance.
- E. Conceal fasteners and expansion provisions where possible in exposed work and locate to minimize possibility of leakage. Cover and seal fasteners and anchors as required for a tight installation.
- F. Seal joints as required for watertight construction.
1. Use sealant-filled joints unless otherwise indicated.
 - a. Adjust setting proportionately for installation at higher ambient temperatures.
 - 1) Do not install sealant-type joints at temperatures below 40 deg F.
- 3.4 INSTALLATION OF ROOF FLASHINGS
- A. Copings:
1. Anchor to resist uplift and outward forces in accordance with recommendations in cited sheet metal standard unless otherwise indicated.
 - a. Interlock exterior bottom edge of coping with continuous cleat anchored to substrate at 24-inch centers.

- B. Counterflashing: Coordinate installation of counterflashing with installation of base flashing.

- 1. Lap counterflashing joints minimum of 4 inches.

3.5 INSTALLATION OF WALL FLASHINGS

- A. Install sheet metal wall flashing to intercept and exclude penetrating moisture in accordance with cited sheet metal standard unless otherwise indicated. Coordinate installation of wall flashing with installation of wall-opening components such as windows, doors, and louvers.

3.6 INSTALLATION TOLERANCES

- A. Installation Tolerances: Shim and align sheet metal flashing and trim within installed tolerance of 1/4 inch in 20 feet on slope and location lines indicated on Drawings and within 1/8-inch offset of adjoining faces and of alignment of matching profiles.

3.7 CLEANING

- A. Clean exposed metal surfaces of substances that interfere with uniform oxidation and weathering.
- B. Clean and neutralize flux materials. Clean off excess solder.
- C. Clean off excess sealants.

3.8 PROTECTION

- A. Remove temporary protective coverings and strippable films as sheet metal flashing and trim are installed unless otherwise indicated in manufacturer's written installation instructions.
- B. On completion of sheet metal flashing and trim installation, remove unused materials and clean finished surfaces as recommended in writing by sheet metal flashing and trim manufacturer.
- C. Maintain sheet metal flashing and trim in clean condition during construction.
- D. Replace sheet metal flashing and trim that have been damaged or that have deteriorated beyond successful repair by finish touchup or similar minor repair procedures, as determined by Architect.

END OF SECTION **07 62 00**

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SECTION 07 71 00 - ROOF SPECIALTIES

PART 1 - GENERAL

1.1 SUMMARY

A. Section Includes:

1. Copings.
2. Roof-edge drainage systems.
3. Reglets and counterflashings.

1.2 ACTION SUBMITTALS

A. Product Data: For each type of product.

1. Include construction details, material descriptions, dimensions of individual components and profiles, and finishes.

B. Shop Drawings: For roof specialties.

1. Include plans, elevations, expansion-joint locations, keyed details, and attachments to other work. Distinguish between plant- and field-assembled work.
2. Include details for expansion and contraction; locations of expansion joints, including direction of expansion and contraction.
3. Indicate profile and pattern of seams and layout of fasteners, cleats, clips, and other attachments.
4. Detail termination points and assemblies, including fixed points.
5. Include details of special conditions.

C. Samples: For each type of roof specialty and for each color and texture specified.

D. Samples for Verification:

1. Include Samples of each type of roof specialty to verify finish and color selection, in manufacturer's standard sizes.
2. Include copings made from 12-inch lengths of full-size components in specified material, and including fasteners, cover joints, accessories, and attachments.

1.3 INFORMATIONAL SUBMITTALS

A. Qualification Data: For manufacturer.

B. Product Certificates: For each type of roof specialty.

C. Product Test Reports: For copings, for tests performed by a qualified testing agency.

- D. Sample Warranty: For manufacturer's special warranty.

1.4 CLOSEOUT SUBMITTALS

- A. Maintenance Data: For roofing specialties to include in maintenance manuals.

1.5 QUALITY ASSURANCE

- A. Manufacturer Qualifications: A qualified manufacturer offering products meeting requirements that are FM Approvals listed for specified class.

1.6 DELIVERY, STORAGE, AND HANDLING

- A. Do not store roof specialties in contact with other materials that might cause staining, denting, or other surface damage. Store roof specialties away from uncured concrete and masonry.
- B. Protect strippable protective covering on roof specialties from exposure to sunlight and high humidity, except to extent necessary for the period of roof-specialty installation.

1.7 FIELD CONDITIONS

- A. Field Measurements: Verify profiles and tolerances of roof-specialty substrates by field measurements before fabrication, and indicate measurements on Shop Drawings.
- B. Coordination: Coordinate roof specialties with flashing, trim, and construction of parapets, roof deck, roof and wall panels, and other adjoining work to provide a leakproof, secure, and noncorrosive installation.

1.8 WARRANTY

- A. Roofing-System Warranty: Roof specialties are included in warranty provisions in Section **07 54 19 - "POLYVINYL-CHLORIDE (PVC) ROOFING."**
- B. Special Warranty on Painted Finishes: Manufacturer agrees to repair finish or replace roof specialties that show evidence of deterioration of factory-applied finishes within specified warranty period.
 - 1. Fluoropolymer Finish: Deterioration includes, but is not limited to, the following:
 - a. Color fading more than 5 Delta E units when tested according to ASTM D2244.
 - b. Chalking in excess of a No. 8 rating when tested according to ASTM D4214.
 - c. Cracking, checking, peeling, or failure of paint to adhere to bare metal.

2. Finish Warranty Period: 20 years from date of Substantial Completion.

PART 2 - PRODUCTS

2.1 SOURCE LIMITATIONS

- A. Obtain roof specialties approved by manufacturer providing roofing-system warranty specified in Section 07 54 19 - "POLYVINYL-CHLORIDE (PVC) ROOFING."

2.2 PERFORMANCE REQUIREMENTS

- A. General Performance: Roof specialties to withstand exposure to weather and resist thermally induced movement without failure, rattling, leaking, or fastener disengagement due to defective manufacture, fabrication, installation, or other defects in construction.
- B. FM Approvals' Listing: Manufacture and install copings that are listed in FM Approvals' "RoofNav" and approved for windstorm classification, Class 1-120. Identify materials with FM Approvals' markings.
- C. SPRI Wind Design Standard: Manufacture and install copings tested according to SPRI ES-1 and capable of resisting the following design pressures:
 1. Design Pressure: As indicated on Drawings.
- D. Thermal Movements: Allow for thermal movements from ambient and surface temperature changes to prevent buckling, opening of joints, hole elongation, over stressing of components, failure of joint sealants, failure of connections, and other detrimental effects. Provide clips that resist rotation and avoid shear stress as a result of thermal movements. Base calculations on surface temperatures of materials due to both solar heat gain and nighttime-sky heat loss.
 1. Temperature Change (Range): 120 deg F, ambient; 180 deg F, material surfaces.

2.3 COPINGS

- A. Metal Copings: Manufactured coping system consisting of metal coping cap in section lengths not exceeding 12 feet, concealed anchorage; with corner units, end cap units, and concealed splice plates with finish matching coping caps.
 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. Architectural Products Company.
 - b. ATAS International, Inc.
 - c. Berridge Manufacturing Company.

- d. Castle Metal Products.
 - e. Cheney Flashing Company.
 - f. Merchant and Evans.
 - g. SAF (Southern Aluminum Finishing Company, Inc.).
2. Metallic-Coated Steel Sheet Coping Caps: Zinc-coated (galvanized) steel, nominal 0.034-inch thickness as required to meet performance requirements.
 - a. Surface: Smooth, flat Embossed finish.
 - b. Finish: High-Performance Organic Finish.
 - c. Color: As selected by COR from manufacturer's full range of PVFD colors and finishes.
 3. Corners: Factory mitered and continuously welded.
 4. Coping-Cap Attachment Method: face leg hooked to continuous cleat with back leg fastener exposed, fabricated from coping-cap material.
 - a. Face-Leg Cleats: Concealed, continuous stainless steel.

2.4 ROOF-EDGE DRAINAGE SYSTEMS AT METAL ROOFING

- 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. ATAS International, Inc.
 2. Berger Building Products, Inc.
 3. Castle Metal Products.
 4. Merchant and Evans.
 5. Metal-Era, Inc.
 6. OMG, Inc.
- B. Gutters: Manufactured in uniform section lengths not exceeding 12 feet, with matching corner units, ends, outlet tubes, and other accessories. Elevate back edge at least 1 inch above front edge. Furnish flat-stock gutter straps, gutter brackets, expansion joints, and expansion-joint covers fabricated from same metal as gutters.
 1. Stainless Steel: Nominal 0.078125-inch thickness.
 2. Gutter Profile: As indicated according to SMACNA's "Architectural Sheet Metal Manual."
 3. Corners: Factory mitered and soldered.
 4. Gutter Supports: Gutter brackets with finish matching the gutters.
 5. Gutter Accessories: Wire ball downspout strainer.
- C. Zinc-Coated Steel Finish: Three-coat fluoropolymer.
 1. Color: Match COR's sample.

2.5 REGLETS AND COUNTERFLASHINGS

- A. Reglets: Manufactured units formed to provide secure interlocking of separate reglet and counterflashing pieces, from the following exposed metal:
 - 1. Formed Aluminum: thick.
- B. Counterflashings: Manufactured units of heights to overlap top edges of base flashings by 4 inches and in lengths not exceeding 12 feet designed to snap into and compress against base flashings with joints lapped, from the following exposed metal:
 - 1. Formed Aluminum: thick.
- C. Zinc-Coated Steel Finish: .
- D. Aluminum Finish: Three-coat fluoropolymer.
 - 1. Color: Match COR's Sample.

2.6 MATERIALS

- A. Zinc-Coated (Galvanized) Steel Sheet: ASTM A653/A653M, G90 coating designation.
- B. Aluminum Sheet: ASTM B209, alloy as standard with manufacturer for finish required, with temper to suit forming operations and performance required.
- C. Stainless Steel Sheet: ASTM A240/A240M or ASTM A666, Type 304.

2.7 UNDERLAYMENT MATERIALS

- A. Self-Adhering, High-Temperature Sheet: Minimum 30 to 40 mils thick, consisting of slip-resisting polyethylene-film top surface laminated to layer of butyl or SBS-modified asphalt adhesive, with release-paper backing; cold applied. Provide primer when recommended by underlayment manufacturer.
 - 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. ATAS International, Inc.
 - b. GCP Applied Technologies Inc.
 - c. Henry Company.
 - d. Protecto Wrap Company.
 - e. SDP Advanced Polymer Products Inc.
 - 2. Thermal Stability: ASTM D1970/D1970M; stable after testing at 240 deg F.
 - 3. Low-Temperature Flexibility: ASTM D1970/D1970M; passes after testing at minus 20 deg F.

- B. Felt: ASTM D226/D226M, Type II (No. 30), asphalt-saturated organic felt, nonperforated.
- C. Slip Sheet: Rosin-sized building paper, 3-lb/100 sq. ft. minimum.

2.8 MISCELLANEOUS MATERIALS

- A. Fasteners: Manufacturer's recommended fasteners, suitable for application and designed to meet performance requirements. Furnish the following unless otherwise indicated:
 - 1. Fasteners for Aluminum: Aluminum or Series 300 stainless steel.
 - 2. Fasteners for Stainless Steel Sheet: Series 300 stainless steel.
 - 3. Fasteners for Zinc-Coated (Galvanized) Steel Sheet: Series 300 stainless steel or hot-dip zinc-coated steel according to ASTM A153/A153M or ASTM F2329.
- B. Elastomeric Sealant: ASTM C920, elastomeric silicone polymer sealant of type, grade, class, and use classifications required by roofing-specialty manufacturer for each application.
- C. Butyl Sealant: ASTM C1311, single-component, solvent-release butyl rubber sealant; polyisobutylene plasticized; heavy bodied for hooked-type joints with limited movement.

2.9 FINISHES

- A. Comply with NAAMM's "Metal Finishes Manual for Architectural and Metal Products" for recommendations for applying and designating finishes.
- B. Protect mechanical and painted finishes on exposed surfaces from damage by applying a strippable, temporary protective covering before shipping.
- C. Appearance of Finished Work: Noticeable variations in same piece are unacceptable. 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.
- D. Coil-Coated Galvanized-Steel Sheet Finishes:
 - 1. High-Performance Organic Finish: Prepare, pretreat, and apply coating to exposed metal surfaces to comply with ASTM A755/A755M and coating and resin manufacturers' written instructions.
 - a. Three-Coat Fluoropolymer: AAMA 621. Fluoropolymer finish containing not less than 70 percent polyvinylidene fluoride (PVDF) resin by weight in both color coat and clear topcoat. Prepare, pretreat, and apply coating to exposed metal surfaces to comply with coating and resin manufacturers' written instructions for seacoast and severe environments.
- E. Coil-Coated Aluminum Sheet Finishes:

1. High-Performance Organic Finish: Prepare, pretreat, and apply coating to exposed metal surfaces to comply with coating and resin manufacturers' written instructions.
 - a. Three-Coat Fluoropolymer: AAMA 2605. Fluoropolymer finish containing not less than 70 percent polyvinylidene fluoride (PVDF) resin by weight in both color coat and clear topcoat. Prepare, pretreat, and apply coating to exposed metal surfaces to comply with coating and resin manufacturers' written instructions.

F. Aluminum Extrusion Finishes:

1. High-Performance Organic Finish: Prepare, pretreat, and apply coating to exposed metal surfaces to comply with coating and resin manufacturers' written instructions.
 - a. Three-Coat Fluoropolymer: AAMA . Fluoropolymer finish containing not less than 70 percent polyvinylidene fluoride (PVDF) resin by weight in both color coat and clear topcoat. Prepare, pretreat, and apply coating to exposed metal surfaces to comply with coating and resin manufacturers' written instructions.

PART 3 - EXECUTION

3.1 EXAMINATION

- A. Examine substrates, areas, and conditions, with Installer present, to verify actual locations, dimensions, and other conditions affecting performance of the Work.
- B. Examine walls, roof edges, and parapets for suitable conditions for roof specialties.
- C. Verify that substrate is sound, dry, smooth, clean, sloped for drainage where applicable, and securely anchored.
- D. Proceed with installation only after unsatisfactory conditions have been corrected.

3.2 INSTALLATION OF UNDERLAYMENT

- A. Self-Adhering Sheet Underlayment: Apply primer if required by manufacturer. Comply with temperature restrictions of underlayment manufacturer for installation. Apply wrinkle free, in shingle fashion to shed water, and with end laps of not less than 6 inches staggered 24 inches between courses. Overlap side edges not less than 3-1/2 inches. Roll laps with roller. Cover underlayment within 14 days.
 1. Apply continuously under copings.
 2. Coordinate application of self-adhering sheet underlayment under roof specialties with requirements for continuity with adjacent air barrier materials.

- B. Felt Underlayment: Install with adhesive for temporary anchorage to minimize use of mechanical fasteners under roof specialties. Apply in shingle fashion to shed water, with lapped joints of not less than 2 inches.
- C. Slip Sheet: Install with tape or adhesive for temporary anchorage to minimize use of mechanical fasteners under roof specialties. Apply in shingle fashion to shed water, with lapped joints of not less than 2 inches.

3.3 INSTALLATION, GENERAL

- A. Install roof specialties according to manufacturer's written instructions. Anchor roof specialties securely in place, with provisions for thermal and structural movement. Use fasteners, solder, protective coatings, separators, underlayments, sealants, and other miscellaneous items as required to complete roof-specialty systems.
 - 1. Install roof specialties level, plumb, true to line and elevation; with limited oil-canning and without warping, jogs in alignment, buckling, or tool marks.
 - 2. Provide uniform, neat seams with minimum exposure of solder and sealant.
 - 3. Install roof specialties to fit substrates and to result in weathertight performance. Verify shapes and dimensions of surfaces to be covered before manufacture.
 - 4. Torch cutting of roof specialties is not permitted.
 - 5. Do not use graphite pencils to mark metal surfaces.
- B. Metal Protection: Protect metals against galvanic action by separating dissimilar metals from contact with each other or with corrosive substrates by painting contact surfaces with bituminous coating or by other permanent separation as recommended by manufacturer.
 - 1. Coat concealed side of uncoated aluminum roof specialties with bituminous coating where in contact with wood, ferrous metal, or cementitious construction.
 - 2. Bed flanges in thick coat of asphalt roofing cement where required by manufacturers of roof specialties for waterproof performance.
- C. Expansion Provisions: Allow for thermal expansion of exposed roof specialties.
 - 1. Space movement joints at a maximum of 12 feet with no joints within 18 inches of corners or intersections unless otherwise indicated on Drawings.
 - 2. When ambient temperature at time of installation is between 40 and 70 deg F, set joint members for 50 percent movement each way. Adjust setting proportionately for installation at higher ambient temperatures.
- D. Fastener Sizes: Use fasteners of sizes that penetrate substrate not less than recommended by fastener manufacturer to achieve maximum pull-out resistance.
- E. Seal concealed joints with butyl sealant as required by roofing-specialty manufacturer.
- F. Seal joints as required for weathertight construction. Place sealant to be completely concealed in joint. Do not install sealants at temperatures below 40 deg F.

- G. Soldered Joints: Clean surfaces to be soldered, removing oils and foreign matter. Pre-tin edges of sheets to be soldered to a width of 1-1/2 inches; however, reduce pre-tinning where pre-tinned surface would show in completed Work. Tin edges of uncoated copper sheets using solder for copper. Do not use torches for soldering. Heat surfaces to receive solder and flow solder into joint. Fill joint completely. Completely remove flux and spatter from exposed surfaces.

3.4 INSTALLATION OF COPINGS

- A. Install cleats, anchor plates, and other anchoring and attachment accessories and devices with concealed fasteners.
- B. Anchor copings with manufacturer's required devices, fasteners, and fastener spacing to meet performance requirements.
 - 1. Interlock face and back leg drip edges of snap-on coping cap into cleated anchor plates anchored to substrate at manufacturer's required spacing that meets performance requirements.
 - 2. Interlock face-leg drip edge into continuous cleat anchored to substrate at 24-inch centers. Anchor back leg of coping with screw fasteners and elastomeric washers at 24-inch centers.

3.5 INSTALLATION OF ROOF-EDGE DRAINAGE SYSTEMS

- A. Install components to produce a complete roof-edge drainage system according to manufacturer's written instructions. Coordinate installation of roof perimeter flashing with installation of roof-edge drainage system.
- B. Gutters: Join and seal gutter lengths. Allow for thermal expansion. Attach gutters to firmly anchored gutter supports spaced not more than 12 inches apart. Attach ends with rivets and seal with sealant to make watertight. Slope to downspouts.
 - 1. Install gutter with expansion joints at locations indicated but not exceeding 50 feet apart. Install expansion-joint caps.
- C. Downspouts: Join sections with manufacturer's standard telescoping joints. Provide hangers with fasteners designed to hold downspouts securely to walls and 1 inch away from walls; locate fasteners at top and bottom and at approximately 60 inches o.c.
 - 1. Provide elbows at base of downspouts at grade to direct water away from building.
 - 2. Connect downspouts to underground drainage system indicated.

3.6 INSTALLATION OF REGLETS AND COUNTERFLASHINGS

- A. Coordinate installation of reglets and counterflashings with installation of base flashings.

- B. Surface-Mounted Reglets: Install reglets to receive flashings where flashing without embedded reglets is indicated on Drawings. Install at height so that inserted counterflashings overlap 4 inches over top edge of base flashings.
- C. Counterflashings: Insert counterflashings into reglets or other indicated receivers; ensure that counterflashings overlap 4 inches over top edge of base flashings. Lap counterflashing joints a minimum of 4 inches and bed with butyl sealant. Fit counterflashings tightly to base flashings.

3.7 CLEANING AND PROTECTION

- A. Clean exposed metal surfaces of substances that interfere with uniform oxidation and weathering.
- B. Clean and neutralize flux materials. Clean off excess solder and sealants.
- C. Remove temporary protective coverings and strippable films as roof specialties are installed. On completion of installation, clean finished surfaces, including removing unused fasteners, metal filings, pop rivet stems, and pieces of flashing. Maintain roof specialties in a clean condition during construction.
- D. Replace roof specialties that have been damaged or that cannot be successfully repaired by finish touchup or similar minor repair procedures.

END OF SECTION **07 71 00**

SECTION 07 71 29 - MANUFACTURED ROOF EXPANSION JOINTS

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

- A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 01 Specification Sections, apply to this Section.

1.2 SUMMARY

- A. Section Includes:

- 1. Flanged bellows-type roof expansion joints.
 - 2. Aluminum roof expansion joints.

- B. Related Requirements:

- 1. Section 07 62 00 "Sheet Metal Flashing and Trim" for shop- and field-fabricated sheet metal expansion-joint systems, flashing, and other sheet metal items.
 - 2. Section 07 72 00 "Roof Accessories" for manufactured and prefabricated metal roof curbs.

1.3 PREINSTALLATION MEETINGS

- A. Preinstallation Conference: Conduct conference at Project site.

1.4 ACTION SUBMITTALS

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

- B. Sustainable Design Submittals:

- 1. Product Data: For adhesives, indicating VOC content.
 - 2. Laboratory Test Reports: For adhesives, indicating compliance with requirements for low-emitting materials.

- C. Shop Drawings: For roof expansion joints.

- 1. Include plans, elevations, sections, and attachment details.
 - 2. Include details of splices, intersections, transitions, fittings, method of field assembly, and location and size of each field splice.

3. Provide isometric drawings of intersections, terminations, changes in joint direction or planes, and transition to other expansion joint systems depicting how components interconnect with each other and adjacent construction to allow movement and achieve waterproof continuity.
- D. Samples: For each exposed product and for each color specified, 6 inches in size.

1.5 INFORMATIONAL SUBMITTALS

- A. Qualification Data: For Installer.
- B. Product Test Reports: For each fire-barrier provided as part of a roof-expansion-joint assembly, for tests performed by a qualified testing agency.
- C. Sample Warranties: For special warranties.

1.6 QUALITY ASSURANCE

- A. Installer Qualifications: Installer of roofing membrane.

1.7 WARRANTY

- A. Special Warranty: Manufacturer and Installer agree to repair or replace roof expansion joints and components that leak, deteriorate beyond normal weathering, or otherwise fail in materials or workmanship within specified warranty period.
 1. Warranty Period: Two years from date of Substantial Completion.
- B. Special Warranty on Painted Finishes: Manufacturer's standard form in which manufacturer agrees to repair finish or replace roof expansion joints that show evidence of deterioration of factory-applied finishes within specified warranty period.
 1. Fluoropolymer Finish: Deterioration includes, but is not limited to, the following:
 - a. Color fading more than 5 Delta E units when tested according to ASTM D2244.
 - b. Chalking in excess of a No. 8 rating when tested according to ASTM D4214.
 - c. Cracking, checking, peeling, or failure of paint to adhere to bare metal.
 2. Warranty Period: 20 years from date of Substantial Completion.

PART 2 - PRODUCTS

2.1 PERFORMANCE REQUIREMENTS

- A. Thermal Movements: Allow for thermal movements from ambient and surface temperature changes to prevent buckling, opening of joints, hole elongation, overstressing of components, failure of joint seals, failure of connections, and other detrimental effects.
 - 1. Temperature Change: 120 deg F, ambient; 180 deg F, material surfaces.
- B. Fire-Resistance Rating: Comply with ASTM E1966 or UL 2079; testing by a qualified testing agency to resist the spread of fire and to accommodate building thermal and seismic movements without impairing its ability to resist the passage of fire and hot gases. Identify products with appropriate markings of applicable testing agency.
 - 1. Rating: Not less than fire-resistance rating of the roof assembly.
 - 2. Indicate design designations from UL's "Fire Resistance Directory" or from the listings of another qualified testing agency.

2.2 ALUMINUM ROOF EXPANSION JOINTS

- A. Aluminum Roof Expansion Joint: Factory-fabricated, continuous, waterproof, joint cover; consisting of a formed or extruded metal cover secured to extruded aluminum frames, with water-resistant gasketing between cover and frames, and with provision for securing assembly to substrate and sealing assembly to roofing membrane or flashing.
 - 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. Architectural Art Manufacturing Inc.; a division of Pittcon Architectural Metals, LLC.
 - b. Balco; a CSW Industrials Company BASF Corp. - Watson Bowman Acme Corp.
 - c. C/S Group.
 - d. MM Systems Corporation.
 - e. Nystrom.
- B. Materials:
 - 1. Aluminum: ASTM B209 for sheet and plate, ASTM B221 for extrusions; alloy as standard with manufacturer for finish required, with temper to suit forming operations and performance required.

- a. Apply manufacturer's standard protective coating on aluminum surfaces to be placed in contact with cementitious or preservative-treated wood materials.
- b. High-Performance Organic Finish: Prepare, pretreat, and apply coating to exposed metal surfaces to comply with coating and resin manufacturers' written instructions.
 - 1) Two-Coat Fluoropolymer: System consisting of primer and fluoropolymer color topcoat containing not less than 70 percent PVDF resin by weight.

2.3 MISCELLANEOUS MATERIALS

- A. Adhesives: As recommended by roof-expansion-joint manufacturer.
 1. Adhesives shall have a VOC content of 70 g/L or less.
 2. Adhesive shall comply with the testing and product requirements of the California Department of Public Health's "Standard Method for the Testing and Evaluation of Volatile Organic Chemical Emissions from Indoor Sources Using Environmental Chambers."
 3. Adhesive shall comply with the testing and product requirements of the California Department of Public Health's "Standard Method for the Testing and Evaluation of Volatile Organic Chemical Emissions from Indoor Sources Using Environmental Chambers." Formaldehyde emissions shall not exceed 9 mcg/cu. m or 7 ppb, whichever is less.
 4. Adhesive shall comply with the testing and product requirements of the California Department of Public Health's "Standard Method for the Testing and Evaluation of Volatile Organic Chemical Emissions from Indoor Sources Using Environmental Chambers."
 5. Adhesive shall comply with the testing and product requirements of the California Department of Public Health's "Standard Method for the Testing and Evaluation of Volatile Organic Chemical Emissions from Indoor Sources Using Environmental Chambers." The building concentration of formaldehyde shall not exceed half of the indoor recommended exposure limit, or 33 mcg/cu. m, and that of acetaldehyde shall not exceed 9 mcg/cu. m.
- B. Fasteners: Manufacturer's recommended fasteners, suitable for application and designed to withstand design loads.
 1. Exposed Fasteners: Gasketed. Use screws with hex washer heads matching color of material being fastened.
- C. Mineral-Fiber Blanket: ASTM C665.

PART 3 - EXECUTION

3.1 EXAMINATION

- A. Examine joint openings, substrates, and expansion-control joint systems that interface with roof expansion joints, for suitable conditions where roof expansion joints will be installed.
- B. Proceed with installation only after unsatisfactory conditions have been corrected.

3.2 INSTALLATION, GENERAL

- A. Comply with manufacturer's written instructions for handling and installing roof expansion joints.
 - 1. Anchor roof expansion joints securely in place, with provisions for required movement. Use fasteners, protective coatings, sealants, and miscellaneous items as required to complete roof expansion joints.
 - 2. Install roof expansion joints true to line and elevation; and without warping, jogs in alignment, buckling, or tool marks.
 - 3. Provide for linear thermal expansion of roof-expansion-joint materials.
 - 4. Provide uniform profile of roof expansion joint throughout its length; do not stretch or squeeze membranes.
 - 5. Provide uniform, neat seams.
 - 6. Install roof expansion joints to fit substrates and to result in watertight performance.
- B. Directional Changes: Install factory-fabricated units at directional changes to provide continuous, uninterrupted, and watertight joints.
- C. Splices: Splice roof expansion joints to provide continuous, uninterrupted, and waterproof joints.
 - 1. Install waterproof splices and prefabricated end dams to prevent leakage of secondary-seal membrane.
- D. Metal Protection: Protect metals against galvanic action by separating dissimilar metals from contact with each other or with corrosive substrates by painting contact surfaces with bituminous coating or by other permanent separation as recommended by manufacturer.

END OF SECTION **07 71 29**

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SECTION 07 72 00 - ROOF ACCESSORIES

PART 1 - GENERAL

1.1 SUMMARY

A. Section Includes:

1. Roof curbs.
2. Catwalk access hatch.
3. Roof walkways.

B. Related Requirements:

1. Section 05 50 00 "Metal Fabrications" for metal vertical ladders, ships' ladders, and stairs for access to roof hatches.
2. Section 07 62 00 "Sheet Metal Flashing and Trim" for shop- and field-formed metal flashing, roof-drainage systems, roof expansion-joint covers, and miscellaneous sheet metal trim and accessories.
3. Section 07 71 00 "Roof Specialties" for manufactured fasciae, copings, gravel stops, gutters and downspouts, and counterflashing.
4. Section 07 71 29 "Manufactured Roof Expansion Joints" for manufactured roof expansion-joint covers.
5. for interconnects to automatically operated heat and smoke vents.

1.2 COORDINATION

- A.** Coordinate layout and installation of roof accessories with roofing membrane and base flashing and interfacing and adjoining construction to provide a leakproof, weathertight, secure, and noncorrosive installation.
- B.** Coordinate dimensions with rough-in information or Shop Drawings of equipment to be supported.

1.3 ACTION SUBMITTALS

A. Product Data: For each type of roof accessory.

1. Include construction details, material descriptions, dimensions of individual components and profiles, and finishes.

B. Shop Drawings: For roof accessories.

1. Include plans, elevations, keyed details, and attachments to other work. Indicate dimensions, loadings, and special conditions. Distinguish between plant- and field-assembled work.

- C. Samples: For each exposed product and for each color and texture specified, prepared on Samples of size to adequately show color.

1.4 INFORMATIONAL SUBMITTALS

- A. Coordination Drawings: Roof plans, drawn to scale, and coordinating penetrations and roof-mounted items. Show the following:
 - 1. Size and location of roof accessories specified in this Section.
 - 2. Method of attaching roof accessories to roof or building structure.
 - 3. Other roof-mounted items including mechanical and electrical equipment, ductwork, piping, and conduit.
 - 4. Required clearances.
- B. Sample Warranties: For manufacturer's special warranties.

1.5 CLOSEOUT SUBMITTALS

- A. Operation and Maintenance Data: For roof accessories to include in operation and maintenance manuals.

1.6 WARRANTY

- A. Special Warranty on Painted Finishes: Manufacturer's standard form in which manufacturer agrees to repair finishes or replace roof accessories that show evidence of deterioration of factory-applied finishes within specified warranty period.
 - 1. Fluoropolymer Finish: Deterioration includes, but is not limited to, the following:
 - a. Color fading more than 5 Delta E units when tested according to ASTM D2244.
 - b. Chalking in excess of a No. 8 rating when tested according to ASTM D4214.
 - c. Cracking, checking, peeling, or failure of paint to adhere to bare metal.
 - 2. Finish Warranty Period: 20 years from date of Substantial Completion.

PART 2 - PRODUCTS

2.1 PERFORMANCE REQUIREMENTS

- A. General Performance: Roof accessories to withstand exposure to weather and resist thermally induced movement without failure, rattling, leaking, or fastener disengagement due to defective manufacture, fabrication, installation, or other defects in construction.

- B. Wind-Restraint Performance: As indicated on Drawings.

2.2 ROOF CURBS

- A. Roof Curbs: Internally reinforced roof-curb units capable of supporting superimposed live and dead loads, including equipment loads and other construction indicated on Drawings, bearing continuously on roof structure, and capable of meeting performance requirements; with welded or mechanically fastened and sealed corner joints, and integrally formed deck-mounting flange at perimeter bottom.
- B. Steel: steel sheet, thick.
- C. Construction:
 - 1. Curb Profile: compatible with roofing system.
 - 2. Fabricate curbs to minimum height of 12 inches above roofing surface unless otherwise indicated.
 - 3. Top Surface: Level top of curb, with roof slope accommodated .
 - 4. Nailer: Factory-installed wood nailer , continuous around curb perimeter.

2.3 CATWALK ACCESS HATCH

- A. Gutter Channel Frame Aluminum Floor Door:
 - 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. Babcock-Davis.
 - b. BILCO Company (The).
 - c. Nystrom.
- B. Type and Size:
 - 1. Frame: Mill finish aluminum, gutter profile, with integral drainage coupling and perimeter gasket.
 - 2. Door: Single leaf; 1/4-inch-thick, diamond-pattern mill-finish aluminum plate.
 - 3. Loading Capacity: 150 lbf/sq. ft. pedestrian live load.
 - 4. .
- C. Loads: Minimum 40-lbf/sq. ft. external live load and 20-lbf/sq. ft. internal uplift load.
- D. Hardware: Spring operators, hold-open arm, steel spring latch with turn handles, galvanized stainless steel butt- or pintle-type hinge system, and padlock hasps inside and outside.
 - 1. Provide two-point latch on lids larger than 84 inches.
 - 2. Provide remote-control operation.

- E. Safety Railing System: Roof-hatch manufacturer's standard system including rails, clamps, fasteners, safety barrier at railing opening, and accessories required for a complete installation; attached to roof hatch and complying with 29 CFR 1910.23 requirements and authorities having jurisdiction.
1. Height: 42 inches above finished roof deck.
 2. Posts and Rails: Galvanized-steel pipe, 1-1/4 inches in diameter or galvanized-steel tube, 1-5/8 inches in diameter.
 3. Flat Bar: Galvanized steel, 2 inches high by 3/8 inch thick.
 4. Post and Rail Tops and Ends: Weather resistant, closed or plugged with prefabricated end fittings.
 5. Provide weep holes or another means to drain entrapped water in hollow sections of handrail and railing members.
 6. Fabricate joints exposed to weather to be watertight.
 7. Fasteners: Manufacturer's standard, finished to match railing system.
 8. Finish: Manufacturer's standard.
 - a. Color: As selected by Architect from manufacturer's full range.
- F. Ladder-Assist Post: Roof-hatch manufacturer's standard device for attachment to roof-access ladder.
1. Operation: Post locks in place on full extension; release mechanism returns post to closed position.
 2. Height: 42 inches above finished roof deck.
 3. Material: Steel tube.
 4. Post: 1-5/8-inch- diameter pipe.
 5. Finish: Manufacturer's standard baked enamel or powder coat.
 - a. Color: As selected by Architect from manufacturer's full range.

2.4 ROOF WALKWAYS

- A. Roof Walkway: Metal planking formed from multiple C-shaped channels with upper surface punched in serrated diamond or rectangular shapes to produce raised slip-resistant surface and drainage holes. Provide support framing, brackets, connectors, nosings, and other accessories and components needed for complete installation.
1. Include step units or stairs of similar construction for changes in elevation. Comply with ASCE-7, 29 CFR 1910.23, and requirements of authorities having jurisdiction.
 2. Equip walkways with safety railings where required.
 3. 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. Cooper B-line; brand of Eaton, Electrical Sector.
 - b. MIRO Industries.

- c. PHP Systems/Design.
- d. Unistrut; Atkore International.
- 4. Plank Width: 24 inches.
- 5. Walkway Width: As indicated.
- 6. Channel Depth: 1-1/2 inches.
- 7. Metal Material: 0.0781-inch- thick stainless steel sheet, perforated, with serrated slip-resistant walking surface.
- 8. Support Stands: Manufacturer's standard, with protective pads compatible with roofing material.
- 9. Finish: Manufacturer's standard.

2.5 METAL MATERIALS

- A. Zinc-Coated (Galvanized) Steel Sheet: ASTM A653/A653M, G90 coating designation.
 - 1. Exposed Coil-Coated Finish: Prepainted by the coil-coating process to comply with ASTM A755/A755M. Prepare, pretreat, and apply coating to exposed metal surfaces to comply with coating and resin manufacturers' written instructions.
 - a. Two-Coat Fluoropolymer Finish: AAMA 621. System consisting of primer and fluoropolymer color topcoat containing not less than 70 percent polyvinylidene fluoride (PVDF) resin by weight.

2.6 MISCELLANEOUS MATERIALS

- A. Provide materials and types of fasteners, protective coatings, sealants, and other miscellaneous items required by manufacturer for a complete installation.
- B. Wood Nailers: Softwood lumber, pressure treated with waterborne preservatives for aboveground use, acceptable to authorities having jurisdiction, containing no arsenic or chromium, and complying with AWWA C2; not less than 1-1/2 inches thick.
- C. Bituminous Coating: Cold-applied asphalt emulsion complying with ASTM D1187/D1187M.
- D. Fasteners: Roof accessory manufacturer's recommended fasteners suitable for application and metals being fastened. Match finish of exposed fasteners with finish of material being fastened. Provide nonremovable fastener heads to exterior exposed fasteners. Furnish the following unless otherwise indicated:
 - 1. Fasteners for Aluminum Sheet: Aluminum or Series 300 stainless steel.
 - 2. Fasteners for Stainless Steel Sheet: Series 300 stainless steel.
- E. Gaskets: Manufacturer's standard tubular or fingered design of neoprene, EPDM, PVC, or silicone or a flat design of foam rubber, sponge neoprene, or cork.

- F. Elastomeric Sealant: ASTM C920, elastomeric silicone polymer sealant as recommended by roof accessory manufacturer for installation indicated; low modulus; of type, grade, class, and use classifications required to seal joints and remain watertight.
- G. Butyl Sealant: ASTM C1311, single-component, solvent-release butyl rubber sealant; polyisobutylene plasticized; heavy bodied for expansion joints with limited movement.

2.7 GENERAL FINISH REQUIREMENTS

- A. Comply with NAAMM's "Metal Finishes Manual for Architectural and Metal Products" for recommendations for applying and designating finishes.
- 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

3.1 EXAMINATION

- A. Examine substrates, areas, and conditions, with Installer present, to verify actual locations, dimensions, and other conditions affecting performance of the Work.
- B. Verify that substrate is sound, dry, smooth, clean, sloped for drainage, and securely anchored.
- C. Verify dimensions of roof openings for roof accessories.
- D. Proceed with installation only after unsatisfactory conditions have been corrected.

3.2 INSTALLATION

- A. Install roof accessories according to manufacturer's written instructions.
 - 1. Install roof accessories level; plumb; true to line and elevation; and without warping, jogs in alignment, buckling, or tool marks.
 - 2. Anchor roof accessories securely in place so they are capable of resisting indicated loads.
 - 3. Use fasteners, separators, sealants, and other miscellaneous items as required to complete installation of roof accessories and fit them to substrates.
 - 4. Install roof accessories to resist exposure to weather without failing, rattling, leaking, or loosening of fasteners and seals.

- B. Metal Protection: Protect metals against galvanic action by separating dissimilar metals from contact with each other or with corrosive substrates by painting contact surfaces with bituminous coating or by other permanent separation as recommended by manufacturer.
 - 1. Coat concealed side of uncoated aluminum roof accessories with bituminous coating where in contact with wood, ferrous metal, or cementitious construction.
 - 2. Bed flanges in thick coat of asphalt roofing cement where required by manufacturers of roof accessories for waterproof performance.
- C. Roof Curb Installation: Install each roof curb so top surface is level.
- D. Roof-Hatch Installation:
 - 1. Verify that roof hatch operates properly. Clean, lubricate, and adjust operating mechanism and hardware.
 - 2. Attach safety railing system to roof-hatch curb.
 - 3. Attach ladder-assist post according to manufacturer's written instructions.
- E. Roof Walkway Installation:
 - 1. Verify that locations of access and servicing points for roof-mounted equipment are served by locations of roof walkways.
 - 2. Remove ballast from top surface of low-slope roofing at locations of contact with roof-walkway supports.
 - 3. Install roof walkway support pads prior to placement of roof walkway support stands onto low-slope roofing.
 - 4. Redistribute removed ballast after installation of support pads.
- F. Seal joints with elastomeric butyl sealant as required by roof accessory manufacturer.

3.3 REPAIR AND CLEANING

- A. Galvanized Surfaces: Clean field welds, bolted connections, and abraded areas and repair galvanizing according to ASTM A780/A780M.
- B. Touch up factory-primed surfaces with compatible primer ready for field painting according to Section 09 91 13 "Exterior Painting."
- C. Clean exposed surfaces according to manufacturer's written instructions.
- D. Clean off excess sealants.
- E. Replace roof accessories that have been damaged or that cannot be successfully repaired by finish touchup or similar minor repair procedures.

END OF SECTION **07 72 00**

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SECTION 07 92 00 - JOINT SEALANTS

PART 1 - GENERAL

1.1 SUMMARY

A. Section Includes:

1. Silicone joint sealants.
2. Butyl joint sealants.
3. Latex joint sealants.

B. Related Requirements:

1. Section 07 91 00 "Preformed Joint Seals" for preformed compressible foam and precured joint seals.

1.2 PREINSTALLATION MEETINGS

- A. Preinstallation Conference:** Conduct conference at Project site.

1.3 ACTION SUBMITTALS

A. Sustainable Design Submittals:

1. Product Data: For sealants, indicating VOC content.
2. Laboratory Test Reports: For sealants, indicating compliance with requirements for low-emitting materials.

1.4 INFORMATIONAL SUBMITTALS

- A. Sample warranties.**

1.5 QUALITY ASSURANCE

- A. Installer Qualifications:** Authorized representative who is trained and approved by manufacturer.

1.6 MOCKUPS

- A. Install sealant in mockups of assemblies specified in other Sections that are indicated to receive joint sealants specified in this Section. Use materials and installation methods specified in this Section.**

1.7 PRECONSTRUCTION TESTING

- A. Preconstruction Laboratory Testing: Submit to joint-sealant manufacturers, for testing indicated below, samples of materials that will contact or affect joint sealants.
1. Adhesion Testing: Use ASTM C794 to determine whether priming and other specific joint preparation techniques are required to obtain rapid, optimum adhesion of joint sealants to joint substrates.
 2. Compatibility Testing: Use ASTM C1087 to determine sealant compatibility when in contact with glazing and gasket materials.
 3. Stain Testing: Use ASTM C1248 to determine stain potential of sealant when in contact with masonry substrates.
 4. Submit manufacturer's recommended number of pieces of each type of material, including joint substrates, joint-sealant backings, and miscellaneous materials.
 5. Schedule sufficient time for testing and analyzing results to prevent delaying the Work.
 6. For materials failing tests, obtain joint-sealant manufacturer's written instructions for corrective measures, including use of specially formulated primers.
 7. Testing will not be required if joint-sealant manufacturers submit data that are based on previous testing, not older than 24 months, of sealant products for adhesion to, staining of, and compatibility with joint substrates and other materials matching those submitted.
- B. Preconstruction Field-Adhesion Testing: Before installing sealants, field test their adhesion to Project joint substrates as follows:
1. Locate test joints where indicated on Project or, if not indicated, as directed by Architect.
 2. Conduct field tests for each kind of sealant and joint substrate.
 3. Notify Architect seven days in advance of dates and times when test joints will be erected.
 4. Arrange for tests to take place with joint-sealant manufacturer's technical representative present.
 5. Test Method: Test joint sealants in accordance with Method A, Tail Procedure, in ASTM C1521.
 - a. For joints with dissimilar substrates, verify adhesion to each substrate separately; extend cut along one side, verifying adhesion to opposite side. Repeat procedure for opposite side.
 6. Report whether sealant failed to adhere to joint substrates or tore cohesively. Include data on pull distance used to test each kind of product and joint substrate. For sealants that fail adhesively, retest until satisfactory adhesion is obtained.
 7. Evaluation of Preconstruction Field-Adhesion-Test Results: Sealants not evidencing adhesive failure from testing, in absence of other indications of noncompliance with requirements, will be considered satisfactory. Do not use sealants that fail to adhere to joint substrates during testing.

1.8 FIELD CONDITIONS

- A. Do not proceed with installation of joint sealants under the following conditions:
1. When ambient and substrate temperature conditions are outside limits permitted by joint-sealant manufacturer or are below 40 deg F.
 2. When joint substrates are wet.
 3. Where joint widths are less than those allowed by joint-sealant manufacturer for applications indicated.
 4. Where contaminants capable of interfering with adhesion have not yet been removed from joint substrates.

1.9 WARRANTY

- A. Special Installer's Warranty: Installer agrees to repair or replace joint sealants that do not comply with performance and other requirements specified in this Section within specified warranty period.
1. Warranty Period: Two years from date of Substantial Completion.
- B. Special Manufacturer's Warranty: Manufacturer agrees to furnish 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.
- C. Special warranties specified in this article exclude deterioration or failure of joint sealants from the following:
1. Movement of the structure caused by stresses on the sealant exceeding sealant manufacturer's written specifications for sealant elongation and compression.
 2. Disintegration of joint substrates from causes exceeding design specifications.
 3. Mechanical damage caused by individuals, tools, or other outside agents.
 4. Changes in sealant appearance caused by accumulation of dirt or other atmospheric contaminants.

PART 2 - PRODUCTS

2.1 SOURCE LIMITATIONS

- A. Obtain joint sealants from single manufacturer.

2.2 JOINT SEALANTS, GENERAL

- A. 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 manufacturer, based on testing and field experience.

- B. VOC Content: Sealants and sealant primers shall comply with the following:
1. Architectural sealants shall have a VOC content of 250 g/L or less.
 2. Sealants and sealant primers for nonporous substrates shall have a VOC content of 250 g/L or less.
 3. Sealants and sealant primers for porous substrates shall have a VOC content of 775 g/L or less.

2.3 SILICONE JOINT SEALANTS

- A. Silicone, S, NS, 50, T, NT: Single-component, nonsag, plus 50 percent and minus 50 percent movement capability, traffic- and nontraffic-use, neutral-curing silicone joint sealant; ASTM C920, Type S, Grade NS, Class 50, Uses T and NT.

2.4 JOINT-SEALANT BACKING

- A. Sealant Backing Material, General: Nonstaining; compatible with joint substrates, sealants, primers, and other joint fillers; and approved for applications indicated by sealant manufacturer based on field experience and laboratory testing.
- B. Cylindrical Sealant Backings: ASTM C1330, , and of size and density to control sealant depth and otherwise contribute to producing optimum sealant performance.

PART 3 - EXECUTION

3.1 EXAMINATION

- A. 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.
- B. Proceed with installation only after unsatisfactory conditions have been corrected.

3.2 PREPARATION

- A. Surface Cleaning of Joints: Clean out joints immediately before installing joint sealants to comply with joint-sealant manufacturer's written instructions and the following requirements:
1. Remove all foreign material from joint substrates that could interfere with adhesion of joint sealant, including dust, paints (except for permanent, protective coatings tested and approved for sealant adhesion and compatibility by sealant manufacturer), old joint sealants, oil, grease, waterproofing, water repellents, water, surface dirt, and frost.

2. Clean porous joint substrate surfaces by brushing, grinding, mechanical abrading, or a combination of these methods to produce a clean, sound substrate capable of developing optimum bond with joint sealants. Remove loose particles remaining after cleaning operations above by vacuuming or blowing out joints with oil-free compressed air. Porous joint substrates include the following:
 - a. Concrete.
 - b. Masonry.
 - c. Unglazed surfaces of ceramic tile.
 - d. Exterior insulation and finish systems.
 3. Remove laitance and form-release agents from concrete.
 4. Clean nonporous joint substrate surfaces with chemical cleaners or other means that do not stain, harm substrates, or leave residues capable of interfering with adhesion of joint sealants. Nonporous joint substrates include the following:
 - a. Metal.
 - b. Glass.
 - c. Porcelain enamel.
 - d. Glazed surfaces of ceramic tile.
- B. Joint Priming: Prime joint substrates where recommended by joint-sealant manufacturer or as indicated by preconstruction joint-sealant-substrate tests or prior experience. 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.

3.3 INSTALLATION OF JOINT SEALANTS

- A. General: Comply with joint-sealant manufacturer's written installation instructions for products and applications indicated, unless more stringent requirements apply.
- B. Sealant Installation Standard: Comply with recommendations in ASTM C1193 for use of joint sealants as applicable to materials, applications, and conditions indicated.
- C. Install sealant backings of type indicated to support sealants during application and at position required to produce cross-sectional shapes and depths of installed sealants relative to joint widths that allow optimum sealant movement capability.
 1. Do not leave gaps between ends of sealant backings.
 2. Do not stretch, twist, puncture, or tear sealant backings.
 3. Remove absorbent sealant backings that have become wet before sealant application, and replace them with dry materials.

- D. Install bond-breaker tape behind sealants where sealant backings are not used between sealants and backs of joints.
- E. Install sealants using proven techniques that comply with the following and at the same time backings are installed:
 - 1. Place sealants so they directly contact and fully wet joint substrates.
 - 2. Completely fill recesses in each joint configuration.
 - 3. Produce uniform, cross-sectional shapes and depths relative to joint widths that allow optimum sealant movement capability.
- F. Tooling of Nonsag Sealants: Immediately after sealant application and before skinning or curing begins, tool sealants according to requirements specified in subparagraphs below to form smooth, uniform beads of configuration indicated; to eliminate air pockets; and to ensure contact and adhesion of sealant with sides of joint.
 - 1. Remove excess sealant from surfaces adjacent to joints.
 - 2. Use tooling agents that are approved in writing by sealant manufacturer and that do not discolor sealants or adjacent surfaces.
 - 3. Provide concave joint profile in accordance with Figure 8A in ASTM C1193 unless otherwise indicated.
 - 4. Provide flush joint profile at locations indicated on Drawings in accordance with Figure 8B in ASTM C1193.
 - 5. Provide recessed joint configuration of recess depth and at locations indicated on Drawings in accordance with Figure 8C in ASTM C1193.
 - a. Use masking tape to protect surfaces adjacent to recessed tooled joints.

3.4 FIELD QUALITY CONTROL

A. Tests and Inspections:

- 1. Field-Adhesion Testing: Field test joint-sealant adhesion to joint substrates as follows:
 - a. Extent of Testing: Test completed and cured sealant joints as follows:
 - 1) Perform 10 tests for the first 1000 ft. of joint length for each kind of sealant and joint substrate.
 - 2) Perform one test for each 1000 ft. of joint length thereafter or one test per each floor per elevation.
 - b. Test Method: Test joint sealants in accordance with Method A, Tail Procedure, in ASTM C1521.
 - 1) For joints with dissimilar substrates, verify adhesion to each substrate separately; extend cut along one side, verifying adhesion to opposite side. Repeat procedure for opposite side.

- c. Inspect tested joints and report on the following:
 - 1) Whether sealants filled joint cavities and are free of voids.
 - 2) Whether sealant dimensions and configurations comply with specified requirements.
 - 3) Whether sealants in joints connected to pulled-out portion failed to adhere to joint substrates or tore cohesively. Include data on pull distance used to test each kind of product and joint substrate. Compare these results to determine if adhesion complies with sealant manufacturer's field-adhesion hand-pull test criteria.
 - d. Record test results in a field-adhesion-test log. Include dates when sealants were installed, names of persons who installed sealants, test dates, test locations, whether joints were primed, adhesion results and percent elongations, sealant material, sealant configuration, and sealant dimensions.
 - e. Repair sealants pulled from test area by applying new sealants following same procedures used originally to seal joints. Ensure that original sealant surfaces are clean and that new sealant contacts original sealant.
2. Evaluation of Field-Adhesion-Test Results: Sealants not evidencing adhesive failure from testing or noncompliance with other indicated requirements will be considered satisfactory. Remove sealants that fail to adhere to joint substrates during testing or to comply with other requirements. Retest failed applications until test results prove sealants comply with indicated requirements.
- B. Prepare test and inspection reports.
- 3.5 CLEANING
- A. 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 joint sealants and of products in which joints occur.
- 3.6 PROTECTION
- A. Protect 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 joint sealants immediately so installations with repaired areas are indistinguishable from original work.

END OF SECTION 07 92 00

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SECTION 09 24 00 - CEMENT PLASTERING

PART 1 - GENERAL

1.1 SUMMARY

A. Section Includes:

1. Base-coat cement plaster.
2. Cement plaster finish coats.
3. Accessories.

1.2 ACTION SUBMITTALS

- A. Product Data:** For each type of product.
- B. Samples:** For each type of factory-prepared finish coat and for each color and texture specified.
- C. Samples for Initial Selection:** For each type of factory-prepared finish coat and for each color and texture specified.

1.3 MOCKUPS

- A. Build mockups to verify selections made under Sample submittals, to demonstrate aesthetic effects, and to set quality standards for materials and execution.**
1. Build mockups for each substrate and finish texture indicated for cement plastering, including accessories.
 - a. Size: 100 sq. ft. in surface area.
 2. For interior plasterwork, simulate finished lighting conditions for review of mockups.
 3. Approval of mockups does not constitute approval of deviations from the Contract Documents contained in mockups unless Architect 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.

1.4 DELIVERY, STORAGE AND HANDLING

- A. Store materials inside under cover, and keep them dry and protected against damage from weather, moisture, direct sunlight, surface contamination, corrosion, construction traffic, and other causes.**

1.5 FIELD CONDITIONS

- A. Comply with ASTM C926 requirements.
- B. Exterior Plasterwork:
 - 1. Apply and cure plaster to prevent plaster drying out during curing period. Use procedures required by climatic conditions, including moist curing, providing coverings, and providing barriers to deflect sunlight and wind.
 - 2. Apply plaster when ambient temperature is greater than 40 deg F.
 - 3. Protect plaster coats from freezing for not less than 48 hours after set of plaster coat has occurred.
- C. Interior Plasterwork: Maintain room temperatures at greater than 40 deg F for at least 48 hours before plaster application, and continuously during and after application.
 - 1. Avoid conditions that result in plaster drying out during curing period. Distribute heat evenly; prevent concentrated or uneven heat on plaster.
 - 2. Ventilate building spaces as required to remove water in excess of that required for hydrating plaster in a manner that prevents drafts of air from contacting surfaces during plaster application and until plaster is dry.
- D. Factory-Prepared Finishes: Comply with manufacturer's written recommendations for environmental conditions for applying finishes.

PART 2 - PRODUCTS

2.1 SOURCE LIMITATIONS

- A. Obtain plaster materials from single source from single manufacturer.

2.2 PERFORMANCE REQUIREMENTS

- A. Fire-Resistance Ratings: Where indicated, provide cement plaster assemblies identical to those of assemblies tested for fire resistance according to ASTM E119 by a qualified testing agency.

2.3 BASE-COAT CEMENT PLASTER

- A. General: Comply with ASTM C926 for applications indicated.
 - 1. Fiber Content: Add fiber to base-coat mixes after ingredients have mixed at least two minutes. Comply with fiber manufacturer's written instructions for fiber quantities in mixes, but do not exceed 1 lb of fiber/cu. yd. of cementitious materials.

- B. Base-Coat Mixes for Use over Low-Absorption Unit Masonry and Concrete: Single base (scratch) coat for two-coat plasterwork on low-absorption plaster bases as follows:
 - 1. Portland Cement Mix: For cementitious material, mix 1 part portland cement and 0 to 3/4 part lime. Use 2-1/2 to 4 parts aggregate per part of cementitious material.
 - 2. Portland and Masonry Cement Mix: For cementitious material, mix 1 part portland cement and 1 part masonry cement. Use 2-1/2 to 4 parts aggregate per part of cementitious material.
- C. Base-Coat Mixes for Use over High-Absorption Unit Masonry and Concrete: Single base (scratch) coat for two-coat plasterwork on high-absorption plaster bases as follows:
 - 1. Portland Cement Mix: For cementitious material, mix 1 part portland cement and 3/4 to 1-1/2 parts lime. Use 2-1/2 to 4 parts aggregate per part of cementitious material.
 - 2. Portland and Masonry Cement Mix: For cementitious material, mix 1 part portland cement and 1 part masonry cement. Use 2-1/2 to 4 parts aggregate per part of cementitious material.

2.4 CEMENT PLASTER FINISH COATS

- A. Job-Mixed Finish-Coat Mixes:
 - 1. Portland Cement Mix: For cementitious materials, mix 1 part portland cement and parts lime. Use 1-1/2 to 3 parts aggregate per part of cementitious material.
 - 2. Portland and Masonry Cement Mix: For cementitious materials, mix 1 part portland cement and 1 part masonry cement. Use 1-1/2 to 3 parts aggregate per part of cementitious material.
- B. Ready-Mixed Finish-Coat Plaster: Mill-mixed portland cement, aggregates, coloring agents, and proprietary ingredients.
- C. Acrylic-Based Finish Coatings: Factory-mixed acrylic-emulsion coating systems formulated with colorfast mineral pigments and fine aggregates; for use over cement plaster base coats. Include manufacturer's recommended primers and sealing topcoats for acrylic-based finishes.

2.5 ACCESSORIES

- A. General: Comply with ASTM C1063, and coordinate depth of trim and accessories with thicknesses and number of plaster coats required.
- B. Metal Accessories:

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. Alabama Metal Industries Company; a Gibraltar Industries company.
 - b. Brand X Metals, Inc.
 - c. CEMCO; California Expanded Metal Products Co.
 - d. ClarkDietrich.
2. Cornerite: Fabricated from metal lath with ASTM A653/A653M, G60, hot-dip galvanized-zinc coating.
3. External- (Outside-) Corner Reinforcement: Fabricated from metal lath with ASTM A653/A653M, G60, hot-dip galvanized-zinc coating.
4. Cornerbeads: Fabricated from zinc-coated (galvanized) steel.
 - a. Smallnose cornerbead with expanded flanges; use unless otherwise indicated.
 - b. Smallnose cornerbead with perforated flanges; use on curved corners.
 - c. Smallnose cornerbead with expanded flanges reinforced by perforated stiffening rib; use on columns and for finishing unit masonry corners.
 - d. Bullnose cornerbead, radius 3/4 inch minimum, with expanded flanges; use at locations indicated on Drawings.
5. Casing Beads: Fabricated from zinc-coated (galvanized) steel; square-edged style; with expanded flanges.
6. Control Joints: Fabricated from zinc-coated (galvanized) steel; one-piece-type, folded pair of unperforated screeds in M-shaped configuration; with perforated flanges and removable protective tape on plaster face of control joint.
7. Expansion Joints: Fabricated from zinc-coated (galvanized) steel; folded pair of unperforated screeds in M-shaped configuration; with expanded flanges.
8. Two-Piece Expansion Joints: Fabricated from zinc-coated (galvanized) steel; formed to produce slip-joint and square-edged reveal that is adjustable from 1/4 to 5/8 inch wide; with perforated flanges.

2.6 PLASTER MATERIALS

- A. Sand Aggregate: ASTM C897.
 1. Color for Job-Mixed Finish Coats: White.

2.7 MISCELLANEOUS MATERIALS

- A. Water for Mixing and Finishing Plaster: Potable and free of substances capable of affecting plaster set or of damaging plaster, lath, or accessories.
- B. Fiber for Base Coat: Alkaline-resistant glass or polypropylene fibers, 1/2 inch long, free of contaminants, manufactured for use in cement plaster.
- C. Bonding Compound: ASTM C932.

PART 3 - EXECUTION

3.1 EXAMINATION

- A. Examine substrates and conditions, 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.

3.2 PREPARATION

- A. Protect adjacent work from soiling, spattering, moisture deterioration, and other harmful effects caused by plastering.
- B. Prepare smooth, solid substrates for plaster according to ASTM C926.

3.3 INSTALLATION OF ACCESSORIES

- A. Install according to ASTM C1063 and at locations indicated on Drawings.
- B. Reinforcement for External (Outside) Corners:
 - 1. Install lath-type, external-corner reinforcement at exterior locations.
 - 2. Install cornerbead at interior locations.
- C. Control Joints: Locate as approved by Architect for visual effect and as follows:
 - 1. As required to delineate plasterwork into areas (panels) of the following maximum sizes:
 - a. Vertical Surfaces: 144 sq. ft..
 - b. Horizontal and Other Nonvertical Surfaces: 100 sq. ft..
 - 2. At distances between control joints of not greater than 18 feet o.c.
 - 3. As required to delineate plasterwork into areas (panels) with length-to-width ratios of not greater than 2-1/2:1.
 - 4. Where control joints occur in surface of construction directly behind plaster.
 - 5. Where plasterwork areas change dimensions, to delineate rectangular-shaped areas (panels) and to relieve the stress that occurs at the corner formed by the dimension change.

3.4 APPLICATION OF BASE-COAT CEMENT PLASTER

- A. General: Comply with ASTM C926.

1. Do not deviate more than plus or minus 1/4 inch in 10 feet from a true plane in finished plaster surfaces when measured by a 10-foot straightedge placed on surface.
2. Finish plaster flush with metal frames and other built-in metal items or accessories that act as a plaster ground unless otherwise indicated. Where casing bead does not terminate plaster at metal frame, cut base coat free from metal frame before plaster sets and groove finish coat at junctures with metal.
3. Provide plaster surfaces that are ready to receive field-applied finishes indicated.

B. Bonding Compound: Apply on unit masonry substrates for direct application of plaster.

3.5 APPLICATION OF CEMENT PLASTER FINISH COATS

- A. Plaster Finish Coats: Apply to provide float finish to match Architect's sample.
- B. Acrylic-Based Finish Coatings: Apply coating system, including primers, finish coats, and sealing topcoats, according to manufacturer's written instructions.
- C. Concealed Interior Plasterwork:
 1. Where plaster application is concealed behind built-in cabinets, similar furnishings, and equipment, apply finish coat.
 2. Where plaster application is concealed above suspended ceilings and in similar locations, omit finish coat.
 3. Where plaster application is used as a base for adhesive application of tile and similar finishes, omit finish coat.

3.6 REPAIR

- A. Repair or replace work to eliminate cracks, dents, blisters, buckles, crazing and check cracking, dry outs, efflorescence, sweat outs, and similar defects and where bond to substrate has failed.

3.7 CLEANING

- A. Remove temporary protection and enclosure of other work after plastering is complete.
- B. Promptly remove plaster from door frames, windows, and other surfaces not indicated to be plastered.
- C. Repair floors, walls, and other surfaces stained, marred, or otherwise damaged during plastering.

END OF SECTION **09 24 00**

SECTION 09 91 13 - EXTERIOR PAINTING

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

- A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 01 Specification Sections, apply to this Section.

1.2 SUMMARY

- A. Section Includes:

- 1. Primers.
 - 2. Finish coatings.

- B. Related Requirements:

- 1. Section 05 12 00 "Structural Steel Framing" Section 05 12 13 "Architecturally Exposed Structural Steel Framing" for shop priming of metal substrates.
 - 2. Section 05 51 16 "Metal Floor Plate Stairs" for shop priming metal floor plate stairs.
 - 3. Section 05 53 16 "Plank Gratings" for shop priming metal gratings.

1.3 ACTION SUBMITTALS

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

- 1. Include preparation requirements and application instructions.
 - 2. Indicate VOC content.

- B. Sustainable Design Submittals:

- 1. Product Data: For paints and coatings, indicating VOC content.
 - 2. Environmental Product Declaration (EPD): For each product.
 - 3. Health Product Declaration (HPD): For each product.
 - 4. Sourcing of Raw Materials: Corporate sustainability report for each manufacturer.
 - 5. Environmental Product Declaration (EPD): For each product.
 - 6. Environmental Product Declaration (EPD): For each product.
 - 7. Environmental Product Declaration (EPD): For each product.
 - 8. Third-Party Certifications: For each product.
 - 9. Third-Party Certified Life-Cycle Assessment: For each product.
 - 10. Manufacturer Inventory: For each product, provide manufacturer's manifest of ingredients.

- C. Product Schedule: Use same designations indicated on Drawings and in the Exterior Painting Schedule to cross-reference paint systems specified in this Section. Include color designations.

1.4 MAINTENANCE MATERIAL SUBMITTALS

- A. Furnish extra materials that match products installed and that are packaged with protective covering for storage and identified with labels describing contents.
 - 1. Paint Products: 5 percent, but not less than 1 gal. of each material and color applied.

1.5 QUALITY ASSURANCE

- A. Mockups: Apply mockups of each paint system indicated and each color and finish selected to verify selections made under Sample submittals, to demonstrate aesthetic effects, and to set quality standards for materials and execution.
 - 1. Architect will select one surface to represent surfaces and conditions for application of each paint system.
 - a. Vertical and Horizontal Surfaces: Provide samples of at least 100 sq. ft..
 - b. Other Items: Architect will designate items or areas required.
 - 2. Final approval of color selections will be based on mockups.
 - a. If preliminary color selections are not approved, apply additional mockups of additional colors selected by Architect at no added cost to Owner.
 - 3. Approval of mockups does not constitute approval of deviations from the Contract Documents contained in mockups unless Architect 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.

1.6 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.

1.7 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.

PART 2 - PRODUCTS

2.1 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. Behr Paint Company; Behr Process Corporation.
 - 2. Benjamin Moore & Co.
 - 3. California Paints.
 - 4. Conco Paints.
 - 5. Coronado Paint; Benjamin Moore & Co.
 - 6. Sherwin-Williams Company (The).
- B. Source Limitations: Obtain each paint product from single source from single manufacturer.

2.2 PAINT PRODUCTS, 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 topcoat manufacturer for use in paint system and on substrate indicated.
- B. VOC Content: For field applications, paints and coatings shall comply with VOC content limits of authorities having jurisdiction and the following VOC content limits:
 - 1. Flat Paints and Coatings: 50 g/L.
 - 2. Nonflat Paints and Coatings: 50 g/L.
 - 3. Dry-Fog Coatings: 150 g/L.
 - 4. Primers, Sealers, and Undercoaters: 100 g/L.
 - 5. Rust-Preventive Coatings: 100 g/L.
 - 6. Zinc-Rich Industrial Maintenance Primers: 100 g/L.
 - 7. Pretreatment Wash Primers: 420 g/L.
 - 8. Shellacs, Clear: 730 g/L.
 - 9. Shellacs, Pigmented: 550 g/L.
- C. Colors: As selected by Architect from manufacturer's full range Match Architect's samples As indicated in a color schedule Insert requirements.

1. percent of surface area will be painted with deep tones.

2.3 PRIMERS

- A. Exterior, Alkali-Resistant, Water-Based Primer: Pigmented, water-based primer formulated for use on alkaline surfaces, such as exterior plaster, vertical concrete, and masonry.

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. Behr Paint Company; Behr Process Corporation.
 - b. Benjamin Moore & Co.
 - c. Dunn-Edwards Corporation (a Nippon Paint Holdings Co. Ltd. company).
 - d. Kelly-Moore Paint Company Inc.
 - e. PPG Paints.
 - f. Rodda Paint Co.
 - g. Rust-Oleum Corporation; a subsidiary of RPM International, Inc.
 - h. Sherwin-Williams Company (The).
 - i. Valspar Corporation (The).
 - j. Vista Paint Corporation.
 - k. Insert manufacturer's name.

- B. Exterior, Latex Block Filler: Water-based, pigmented, high-solids, emulsion coating formulated to bridge and fill porous surfaces of exterior concrete masonry units in preparation for specified subsequent coatings.

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. Behr Paint Company; Behr Process Corporation.
 - b. Benjamin Moore & Co.
 - c. McCormick Paints.
 - d. PPG Paints.
 - e. Sherwin-Williams Company (The).

2. Minimum Solids Content: 50 percent solids by volume.

- C. Zinc-Rich, Inorganic Primer: Corrosion-resistant, inorganic-based, zinc-rich primer formulated for use on prepared steel subject to severe industrial or marine environments.

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. PPG Paints.

- b. Rust-Oleum Corporation; a subsidiary of RPM International, Inc.
 - c. Sherwin-Williams Company (The).
- D. Epoxy Metal Primer: Corrosion-resistant, solvent-based, two-component epoxy primer formulated for use on prepared, exterior ferrous- and galvanized-metal surfaces.
 - 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. PPG Paints.
 - b. Rust-Oleum Corporation; a subsidiary of RPM International, Inc.
 - c. Sherwin-Williams Company (The).

2.4 FINISH COATINGS

- A. Exterior Latex Paint, Flat: Water-based, pigmented coating; formulated for alkali, mold, microbial, and water resistance and for use on exterior surfaces, such as portland cement plaster, concrete, and primed wood.
 - 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. Behr Paint Company; Behr Process Corporation.
 - b. Benjamin Moore & Co.
 - c. McCormick Paints.
 - d. PPG Paints.
 - e. Sherwin-Williams Company (The).
 - 2. Gloss and Sheen: Maximum gloss of 5 units at 60 degrees and maximum sheen of 10 units at 85 degrees when tested in accordance with ASTM D523.
- B. Exterior Latex Paint, Semigloss: Water-based, pigmented emulsion coating formulated for alkali, mold, microbial, and water resistance and for use on exterior surfaces, such as masonry, portland cement plaster, and primed wood and metal.
 - 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. Behr Paint Company; Behr Process Corporation.
 - b. Benjamin Moore & Co.
 - c. McCormick Paints.
 - d. PPG Paints.
 - e. Sherwin-Williams Company (The).
 - 2. Gloss Level: Gloss of 35 to 70 units at 60 degrees when tested in accordance with ASTM D523.

PART 3 - EXECUTION

3.1 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. Fiber-Cement Board: 12 percent.
 - 2. Portland Cement Plaster: 12 percent.
- C. Portland Cement Plaster Substrates: Verify that plaster is fully cured.
- D. Verify suitability of substrates, including surface conditions and compatibility, with finishes and primers.
- E. Proceed with coating application only after unsatisfactory conditions have been corrected.
 - 1. Application of coating indicates acceptance of surfaces and conditions.

3.2 PREPARATION

- A. Comply with manufacturer's written instructions 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.
 - 1. 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.
 - 1. Remove incompatible primers and reprime substrate with compatible primers or apply tie coat as required to produce paint systems specified in this Section.
- D. 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:
 - 1. SSPC-SP 2.

2. SSPC-SP 3.
 3. SSPC-SP 7/NACE No. 4.
 4. SSPC-SP 11.
- E. Shop-Primed Steel Substrates: Clean field welds, bolted connections, and areas where shop paint is abraded. Paint exposed areas with the same material as used for shop priming to comply with SSPC-PA 1 for touching up shop-primed surfaces.
- F. 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.
- G. Aluminum Substrates: Remove loose surface oxidation.
- H. Plastic Trim Fabrication Substrates: Remove dust, dirt, and other foreign material that might impair bond of paints to substrates.

3.3 INSTALLATION

- A. Apply paints in accordance with manufacturer's written instructions.
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 the Exterior Painting Schedule may be omitted on items that are factory primed or factory finished if compatible with intermediate and topcoat coatings and acceptable to intermediate and topcoat paint 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:
1. Paint the following work where exposed to view:

- 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.

3.4 FIELD QUALITY CONTROL

- A. Dry Film Thickness Testing: Owner 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 instructions, Contractor shall pay for testing and apply additional coats as needed to provide dry film thickness that complies with paint manufacturer's written instructions.

3.5 CLEANING AND PROTECTION

- A. At end of each workday, remove rubbish, empty cans, rags, and other discarded materials from Project site.
 1. Do not clean equipment with free-draining water and prevent solvents, thinners, cleaners, and other contaminants from entering into waterways, sanitary and storm drain systems, and ground.
 2. Dispose of contaminants in accordance with requirements of authorities having jurisdiction.
 3. Allow empty paint cans to dry before disposal.
 4. Collect waste paint by type and deliver to recycling or collection facility.
- 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 Architect, and leave in an undamaged condition.
- D. At completion of construction activities of other trades, touch up and restore damaged or defaced painted surfaces.

3.6 EXTERIOR PAINTING SCHEDULE

- A. Steel and Iron Substrates:

1. Water-Based, Light Industrial Coating System :
 - a. Prime Coat: Zinc-rich, inorganic primer Epoxy metal primer.
 - b. Intermediate Coat: Matching topcoat.
 - c. Topcoat: Exterior, water-based, light industrial coating, .
- B. Galvanized-Metal Substrates:
 1. Latex System Insert drawing designation:
 - a. Prime Coat: Water-based, galvanized-metal primer.
 - b. Intermediate Coat: Matching topcoat.
 - c. Topcoat: Exterior latex paint, flat semigloss.
 2. Water-Based, Light Industrial Coating System :
 - a. Prime Coat: Epoxy metal primer.
 - b. Intermediate Coat: Matching topcoat.
 - c. Topcoat: Exterior, water-based, light industrial coating, .
- C. Cementitious Composition Board Substrates: .
 1. Alkyd System :
 - a. Prime Coat: Exterior, latex wood primer.
 - b. Intermediate Coat: Matching topcoat.
 - c. Topcoat: Exterior alkyd enamel, .
- D. Portland Cement Plaster Substrates:
 1. Latex System Insert drawing designation:
 - a. Prime Coat: Exterior, alkali-resistant, water-based primer.
 - b. Intermediate Coat: Matching topcoat.
 - c. Topcoat: Exterior latex paint, semigloss.

END OF SECTION **09 91 13**

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SECTION 26 41 13 - LIGHTNING PROTECTION FOR STRUCTURES

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

- A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 01 Specification Sections, apply to this Section.

1.2 SUMMARY

- A. Work requires systematic removal and re-installation of existing Lightning Protection System (LPS) by phased roof replacement, while maintaining the LPS in adjacent roof areas. New LPS, air terminals and Class II conductors, will be provided on the guard rail. Bonding conductors will be provided from the new air terminals on the guard rail to the existing LPS loop conductors on the roof.
- B. Section includes lightning protection system for the following:
 - 1. Ordinary structures.
 - 2. FAA Terminal Facilities.

1.3 ACTION SUBMITTALS

- A. Product Data: For each type of product. Include the following:
 - 1. Roof adhesive data.
 - 2. Air terminal illustrations.
 - 3. Cable termination components.
- B. Shop Drawings:
 - 1. Include layouts of the lightning protection system, with details of the components to be used in the installation.
 - 2. Include raceway locations needed for the installation of conductors.
 - 3. Details of air terminals, conductor supports, splices, and terminations, including concealment requirements.
 - 4. Include roof attachment details, coordinated with roof installation.

1.4 INFORMATIONAL SUBMITTALS

- A. Coordination Drawings: Lightning protection system Shop Drawings, drawn to scale, on which the following items are shown and coordinated with each other, using input from installers of the items involved:
 - 1. Lightning protection cabling attachments to roofing systems and accessories.

2. Lightning protection strike termination device attachment to roofing systems, coordinated with the roofing system manufacturer.
 3. Lightning protection system components penetrating roofing and moisture protection systems and system components, coordinated with the roofing system manufacturer.
- B. Qualification data for firms and persons specified in "Quality Assurance" Article to demonstrate their capabilities and experience. Include data on listing or certification by nationally recognized testing laboratory (NRTL) or trade association. Include lists of completed projects with project names and addresses, names and addresses of architects and owners, and other information specified.
- C. Product Certificates: For each type of roof adhesive for attaching the roof-mounted air terminal assemblies, approved by the roofing-material manufacturer.
- D. Field quality-control reports indicating compliance with specified requirements.

1.5 CLOSEOUT SUBMITTALS

- A. Maintenance Data: For lightning protection system to include in maintenance manuals.
- B. Completion Certificate:
1. UL Letter of Findings Limited Scope Inspection Report.

1.6 QUALITY ASSURANCE

- A. Installer Qualifications: Engage an experienced installer who is certified by the Lightning Protection Institute as a Master Installer/Designer to install lightning protection system.
- B. Listing and Labeling: Provide products specified in this Section that are listed and labeled by an organization concerned with product evaluations and that can determine compliance with appropriate standards for the current production of listed items.
1. The Terms "Listed" and "Labeled": As defined in the National Electrical Code, Article 100.
 2. Listing and Labeling Agency Qualifications: A NRTL as defined in OSHA Regulation 1910.7.
- C. Conform to NFPA 780.
- D. Conform to UL 96A.

PART 2 - PRODUCTS

2.1 MANUFACTURERS

- A. Manufacturers: Subject to compliance with requirements, provide products by the following:
1. ERICO International Corporation.
 2. Harger Lightning & Grounding.
 3. Thompson Lightning Protection, Inc.
 4. Hubbell Burndy.

2.2 PERFORMANCE REQUIREMENTS

- A. NFPA Lightning Protection Standard: Comply with NFPA 780 requirements for Class II buildings.
- B. UL Lightning Protection Systems Installation: Comply with UL 96A requirements for Class II buildings.
- C. Lightning Protection Components, Devices, and Accessories: Listed and labeled by a qualified testing agency as complying with UL 96, and marked for intended location and application.
- D. All equipment shall be new and of a design and construction to suit the application in accordance with UL 96A requirements. Bronze and stainless steel may be used for some components. Aluminum material shall not be contact with copper material and bimetal connector shall be used for interconnecting copper and aluminum.

2.3 MATERIALS

- A. Air Terminals:
1. Solid Copper, bronze or Aluminum unless otherwise indicated. Copper air terminals may be nickel plated.
 2. 1/2-inch diameter for solid copper air terminals and 5/8-inch in diameter for solid aluminum air terminals.
 3. Minimum 12 inches in height.
 4. Rounded or bullet tip.
 5. Threaded base support.
- B. Air Terminal Bracing:
1. Stainless steel.
 2. 1/4-inch diameter rod.

- C. All lightning protection system conductor, jumper, bonding conductor must be Class II conductors:
 - 1. Stranded Copper: 115,000 circular mils in diameter.
 - 2. Aluminum: 192,000 circular mils in diameter.
- D. Conductor Splices and Connectors: UL 467 and UL 96 listed irreversible compression type bonding connection.
 - 1. Hydraulic compression tool system shall be capable of producing a 12-ton minimum force applied with a tool using matching dies.
- E. Hardware: Hardware shall meet the following requirements:
 - 1. Fasteners: Roof and down conductors shall be fastened at intervals not exceeding 3 feet. Fasteners shall be of the same material as the conductor base material or bracket being fastened, or other equally corrosion resistant material. Galvanized or plated materials shall not be used.
 - 2. Fittings: Bonding devices, cable splices, and miscellaneous connectors shall be suitable for use with the installed conductor. Provide stainless steel, copper, bronze, or aluminum termination materials in accordance with the following:
 - a. Materials: Fitting material shall be suitable for use with the system conductor.
 - b. Straight and 90 Degree Through-Connectors. UL listed straight and 90 degree through-connectors are permitted to facilitate horizontal and vertical routing of system conductors.
- F. Guards: Guards shall be provided for down conductors located in or next to driveways, walkways or other areas where they may be displaced or damaged. Guards shall extend to 6 feet above grade level, and 1 foot below grade level. Guards shall be schedule 40 PVC.

PART 3 - EXECUTION

3.1 INSTALLATION

- A. Where existing LPS are damaged during removal, contractor must replace damaged LPS component with new. New component must comply with requirement indicate in this specification.
- B. Installation of air terminals on the guard rail must be properly secured with UL 96 listed component. Air terminals must be bonded to the existing LPS loop on the roof and form a two-way path.
- C. Air terminals on the guard rail must be installed at maximum 20 feet intervals.
- D. Bond metal stairs to the LPS.

- E. Reinstalled LPS loop conductor on the roof must be reconnected to the existing down conductors.
- F. Install lightning protection components and systems according to UL 96A.
- G. Install conductors with direct paths from air terminals to ground connections. Avoid bends less than 90 degrees, nor shall it have a bend radius less than 8 inches (203 mm).
- H. Route down conductors outside of building facade in PVC conduit.
- I. Air terminals shall be secure against overturning either by attachment to the object to be protected, or by means of braces that are permanently and rigidly attached to the building.
- J. Metallic bodies, on or below roof level, that are subject to induced charges from lightning, include roof drains, plumbing vents, metal coping, metal flashing gutters, downspouts, small metal wall vents, metal stairs, door and window frames, metal balcony railings, any isolated metallic body within 6 feet of an exposed lightning protection system element. These metallic bodies shall be bonded to the lightning protection system using UL approved fittings. Bonding conductors used shall be Class II conductor.
- K. Install conductors exposed on building exterior. Comply with UL 96A requirements .
 - 1. Air Terminals on Single-Ply Membrane Roofing: Comply with adhesive manufacturer's written instructions.
- L. Route down conductors outside of building facade in PVC conduit. Submit system plan which indicates exact location of down conductors, as well as intended equipment locations, to COR for approval prior to installation.

3.2 CONNECTIONS

- A. Above ground concealed connections shall be done by high-compression fittings listed for the purpose.
- B. Above ground exposed connections shall be done using the following types of connectors, listed and labeled for the purpose: UL 467 and UL 96 listed irreversible compression type bonding connections; parallel connector / clamp that provide uniform pressure along the surface cables. Connector's bolt shall not create pinch point that would deform the cable.
- C. Bonding Straps and Jumpers: Install in locations accessible for inspection and maintenance, except where routed through short lengths of conduit.
 - 1. Bonding to Structure: Bond straps directly to basic structure, taking care not to penetrate any adjacent parts.
 - 2. Bonding to Equipment Mounted on Vibration Isolation Hangers and Supports: Install bonding so vibration is not transmitted to rigidly mounted equipment.

- D. Below grade connections shall be done using exothermic weld.

3.3 CORROSION PROTECTION

- A. Do not combine materials that can form an electrolytic couple that will accelerate corrosion in the presence of moisture unless moisture is permanently excluded from junction of such materials.
- B. Use conductors with protective coatings where conditions would cause deterioration or corrosion of conductors.

3.4 FIELD QUALITY CONTROL

- A. Special Inspections: Engage a qualified special inspector and FAA to perform the final inspections and approval.
- B. Prepare test and inspection reports and certificates.

END OF SECTION 26 41 13



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April 22, 2022

Jacobs Engineering Group Inc.
c/o: Andrew Haas, RA, PMP, Project Manager
1100 N. Glebe Road, Ste 500
Arlington, VA 22201

**Re: Steel Column Condition Documentation
Roof Testing Services
2022 Roofing Replacement
ATC Facility
760 Worchester Ave
Honolulu, Hawaii**

PN: 22.7165.01

Dear Mr. Haas,

Allana Buick & Bers, Inc. (ABB) is pleased to present **Jacobs Engineering Group Inc. (Jacobs)** with the attached Steel Column Condition Documentation for the above referenced project site.

Background

The Federal Aviation Administration (FAA) has retained Jacobs to design a reinforced PVC roofing overlay for the existing Daniel K. Inouye International Airport FAA Air Traffic Control facility. The facility is located adjacent to the Airport at Joint Base Pearl Harbor Hickam (JBPHH).

At the FAA's request, Jacobs retained ABB to investigate and document the condition of steel columns enclosed in pre-cast concrete panels that support an open-air steel framed canopy.

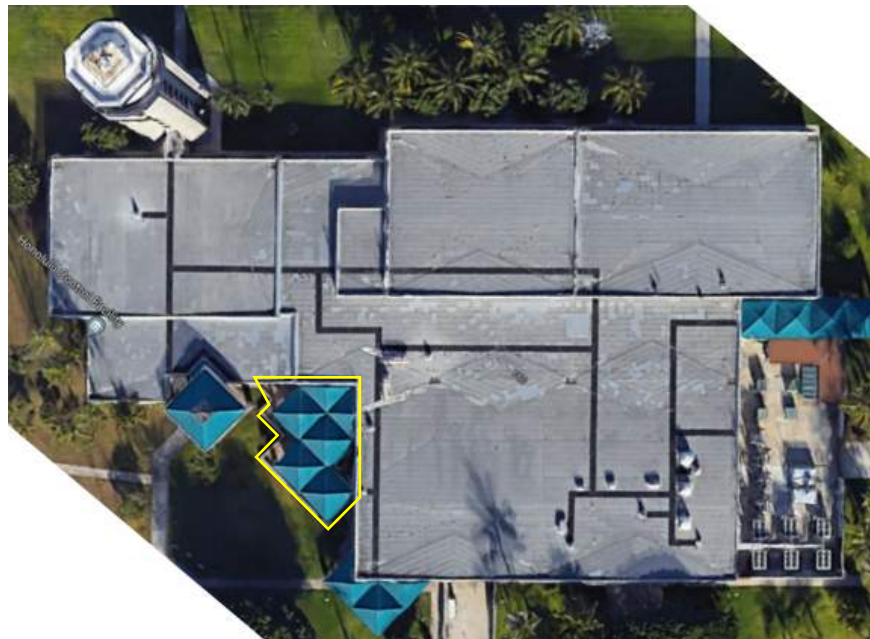


Figure 1. FAA HON ATC Facility located on Joint Base Pearl Harbor-Hickam in Honolulu, Hawaii. Canopy is outlined in yellow. (Image credit Google Earth)



Testing Methodology

ABB used a flexible self-illuminating borescope to view and document the face of the HSS steel beams where they intersect the cast in place concrete plinth. To access the gap between the HSS and pre-cast concrete panels, we retained a contractor to remove the sealant used to connect the panel edge to the adjacent edge.

A photograph of a red Geotek Divergence 11.5 ultrasonic sensor, a coiled black cable, a blue rectangular plate, and a white card with a compass rose and contact information for ASEM Field Station. The sensor is a red, rectangular device with a white label that reads "Divergence 11.5" and "Geotek". The blue plate is a flat, rectangular object with a handle. The white card features a compass rose with the letters N, S, E, and W, and contact information for ASEM Field Station, including a phone number and email address.

April 22, 2022
Page 2 of 3



Findings

ABB's observations and documentation are cataloged in the attached drawings sheets (Key – C-11). Our findings are summarized as follows

Column ID	HSS Condition at Plinth	Comments
1	Good	Plinth dry and clean. No observable HSS corrosion.
2	Good	Plinth dry. Insect debris present. Little HSS corrosion.
3	Good	Plinth dry. Insect and construction debris present. Little HSS corrosion.
4	Good	Plinth wet. Little debris present. Light HSS corrosion observed at plinth to HSS junction.
5	Good	Plinth dry. Insect and construction debris present. Little HSS corrosion.
6	Good	Plinth dry but mostly concealed by insect and construction debris. Little HSS corrosion observed.
7	Good	Plinth dry. Insect and construction debris present. Some isolated HSS corrosion observed at plinth connection. When probed it is superficial.
8	Fair	Plinth dry. Water stains indicate water collected at the bottom of the column up to 6" deep. Probed rust is no deeper than 1/16". South side has significantly more rust involvement than North.
9	Good	Plinth is dry with some organic and construction debris. Some isolated spots of light rusting at plinth to HSS junction. Surficial when probed.
10	Good	Plinth is dry but covered with insect debris. Some isolated spots of rust at joint with plinth. Surficial when probed.
11	Good	Plinth is dry but covered in layer of insect debris. No rusting observed at plinth to HSS junction.

Thank you for this opportunity to be of service to Jacobs and the Federal Aviation Administration. Please call us if you have any questions regarding this testing report.

Sincerely,

Allana Buick & Bers, Inc.

Gerson S. Bers, LEED-AP
Senior Principal, Vice President

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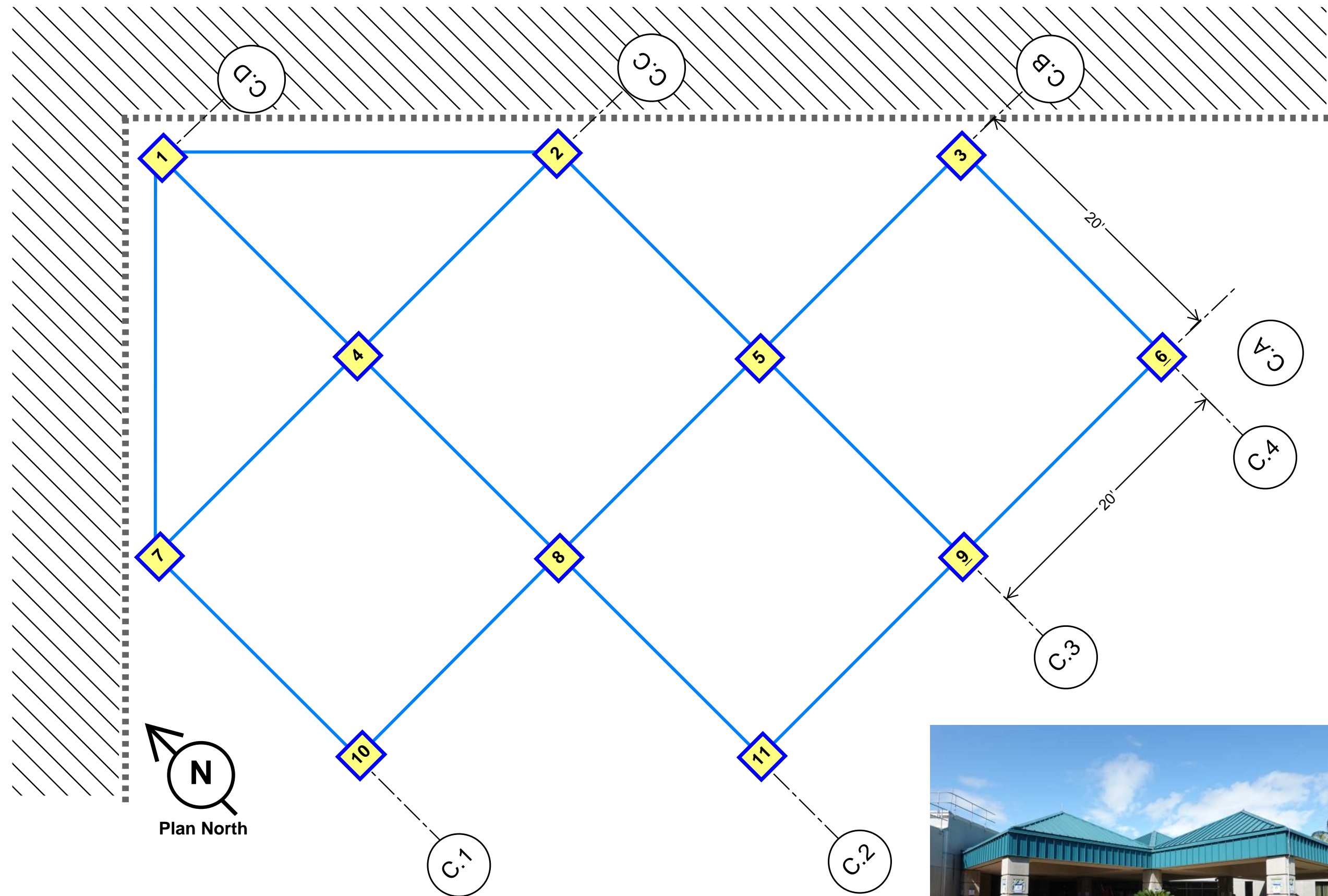
Drawing Key

= Column ID

— = Beam Line





**ABB Field Observations
Steel Column Assessment**
April 6 & 7, 2022
ABB PN: 22.7165.02

Key



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Drawing Key

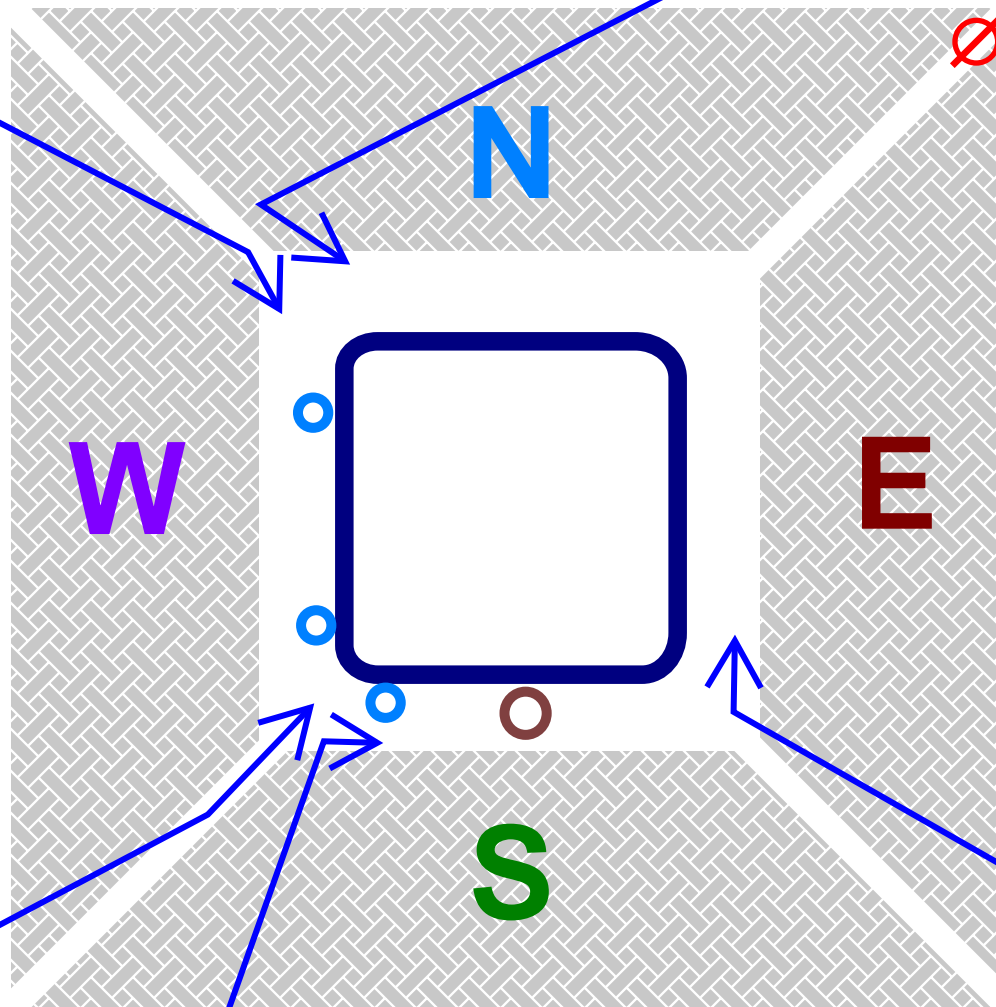
-  = No Access
-  = Debris
-  = Conduit
-  = Cast Iron Drain

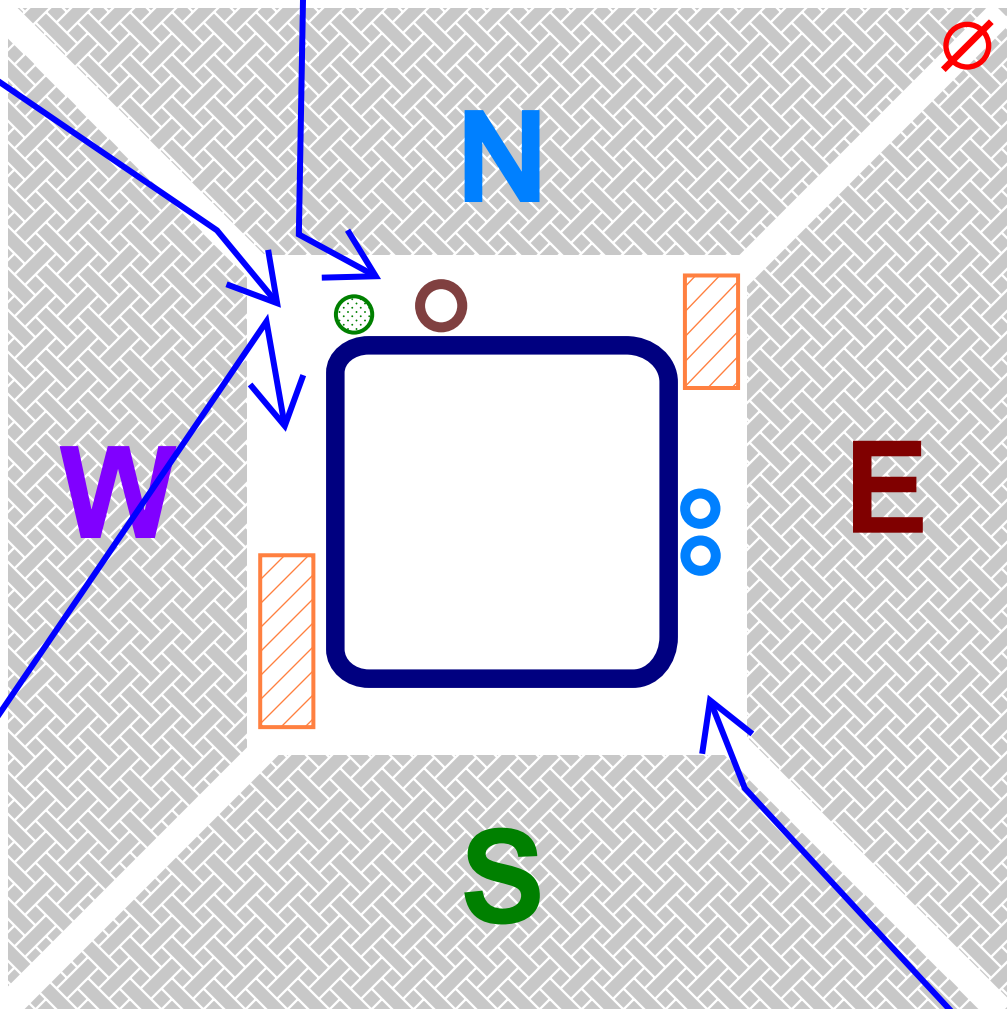
Observation Notes

1. No access to the NE corner.
2. Plinth is dry and with some debris (insect and construction).
3. Steel has little observable corrosion.
4. Steel has concrete placement residue
5. Conduits and cast iron pipe are capped just above the plinth

**ABB Field Observations
Steel Column Assessment**
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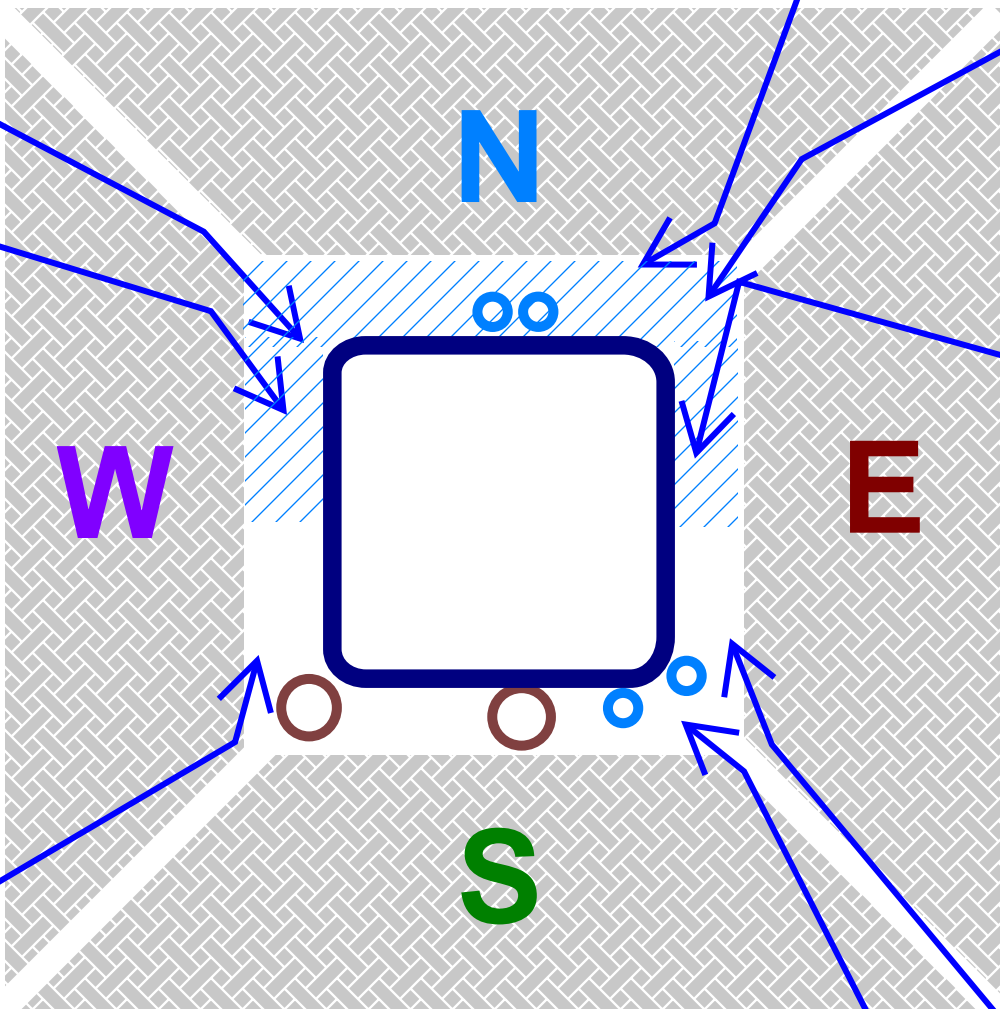
Drawing Key

-  = No Access
-  = Debris
-  = Conduit
-  = Cast Iron Drain
-  = Ground Cable

Observation Notes

1. No access to the NE corner.
2. Plinth is dry and with some debris (insect and construction).
3. Steel has little observable corrosion.
4. Conduits and cast iron pipe are capped just above the plinth





ABB Field Observations
Steel Column Assessment
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Drawing Key

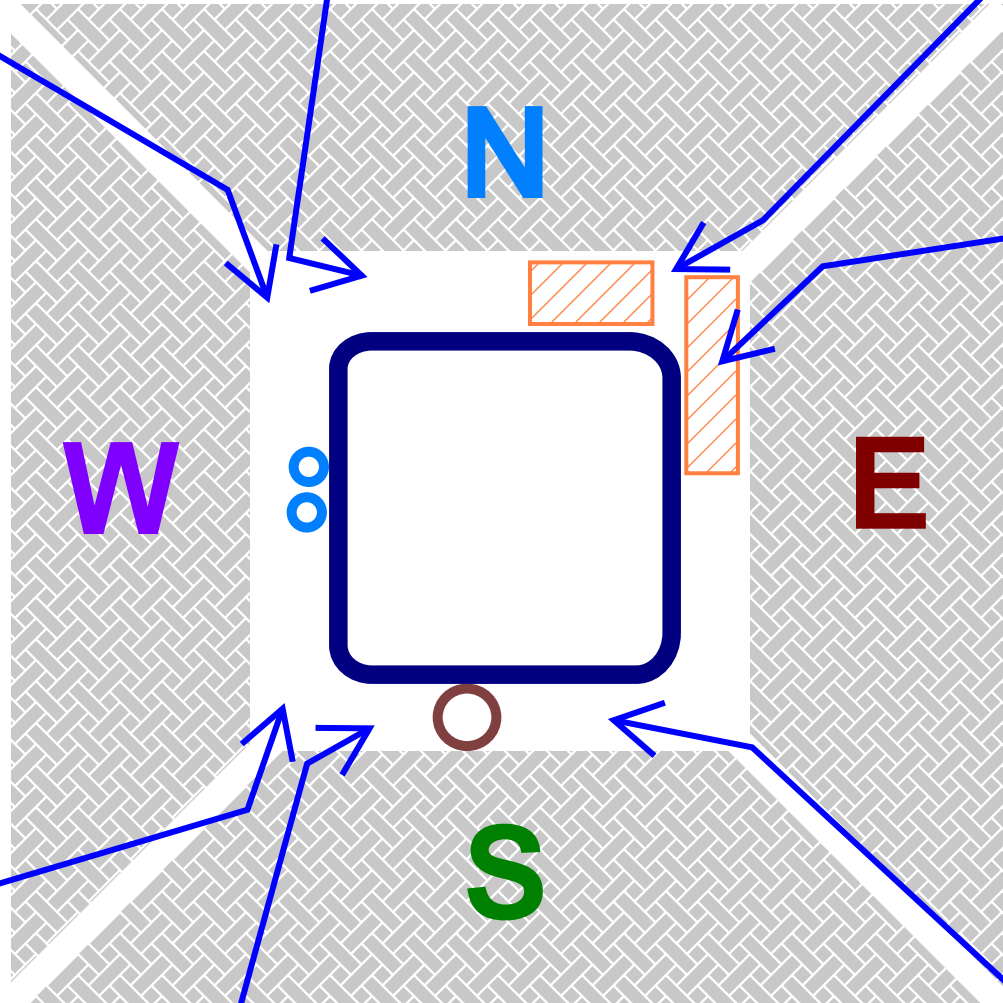
-  = No Access
-  = Wet area
-  = Conduit
-  = Cast Iron Drain
-  = Ground Cable

Observation Notes

1. North side of plinth has 1/4" of standing water
2. Light debris on plinth.
3. Steel has light superficial rust up to about 1/2 above plinth.

ABB Field Observations
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C-4



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Drawing Key

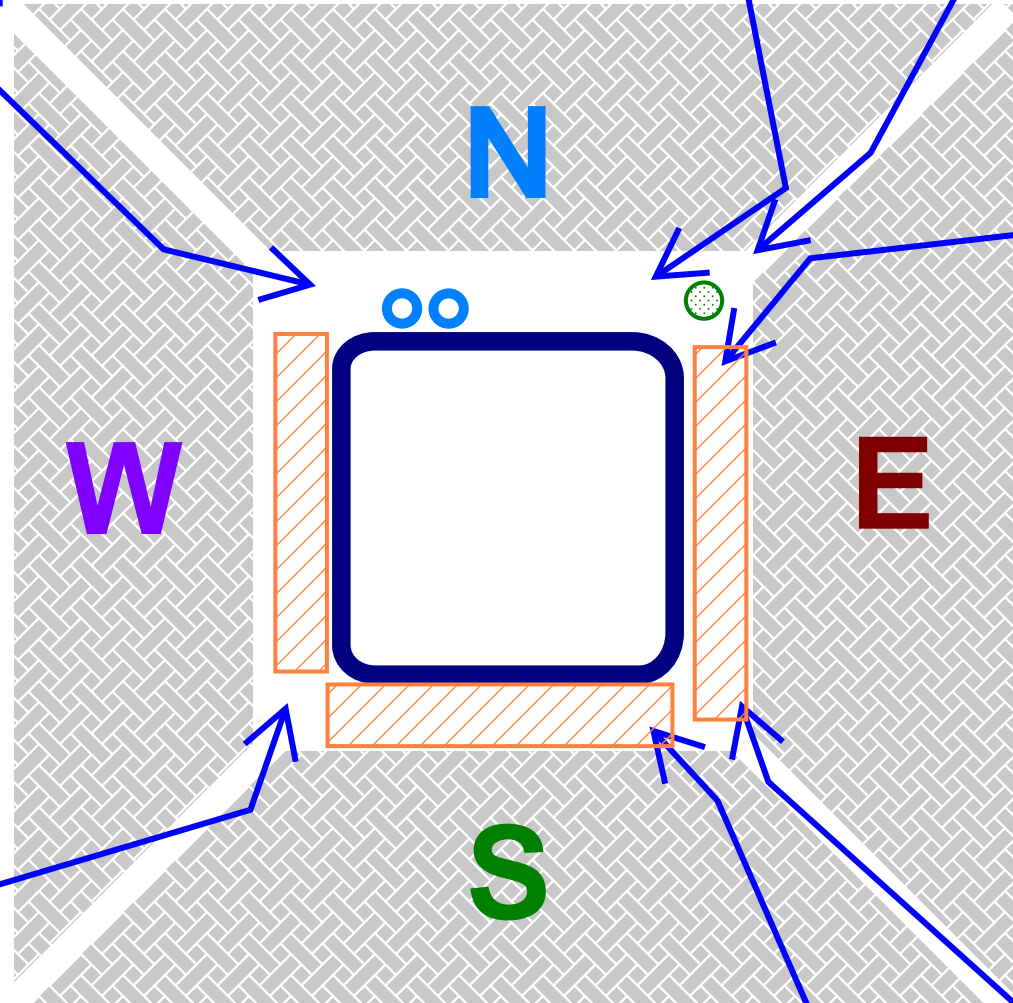
-  = No Access
-  = Debris
-  = Conduit
-  = Cast Iron Drain

Observation Notes

1. Metal construction debris at NE corner.
2. Light debris on plinth.
3. Steel has very little superficial rust up to about 1/4 above plinth.
4. Some insect debris present on plinth





**ABB Field Observations
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C-5



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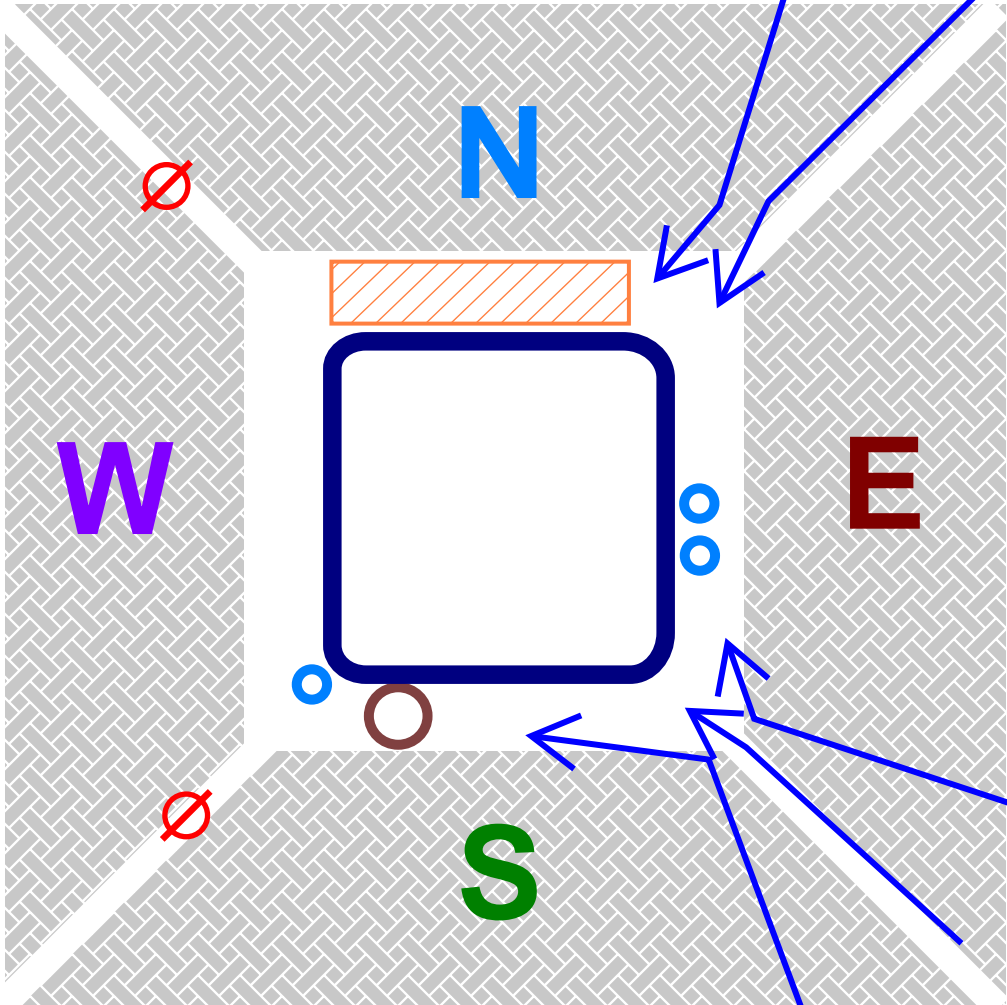
Drawing Key

-  = No Access
-  = Debris
-  = Conduit
-  = Ground cable

Observation Notes





1. Base of column mostly concealed by construction and organic debris.
2. Visible steel area has very little superficial rust up to about 1/4 above plinth.
4. No visible moisture in cavity

**ABB Field Observations
Steel Column Assessment**
April 6 & 7, 2022
ABB PN: 22.7165.02



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Drawing Key

-  = No Access
-  = Debris
-  = Conduit
-  = Cast Iron Drain





Observation Notes

1. Top of plinth dry
2. Light debris on plinth, mostly insect and leaf. North side has larger construction debris blocking view of column at plinth
3. Steel at plinth intersection has spots of surfacing rust extending as high as 1.5".
4. Some insect debris present on plinth

ABB Field Observations
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Drawing Key

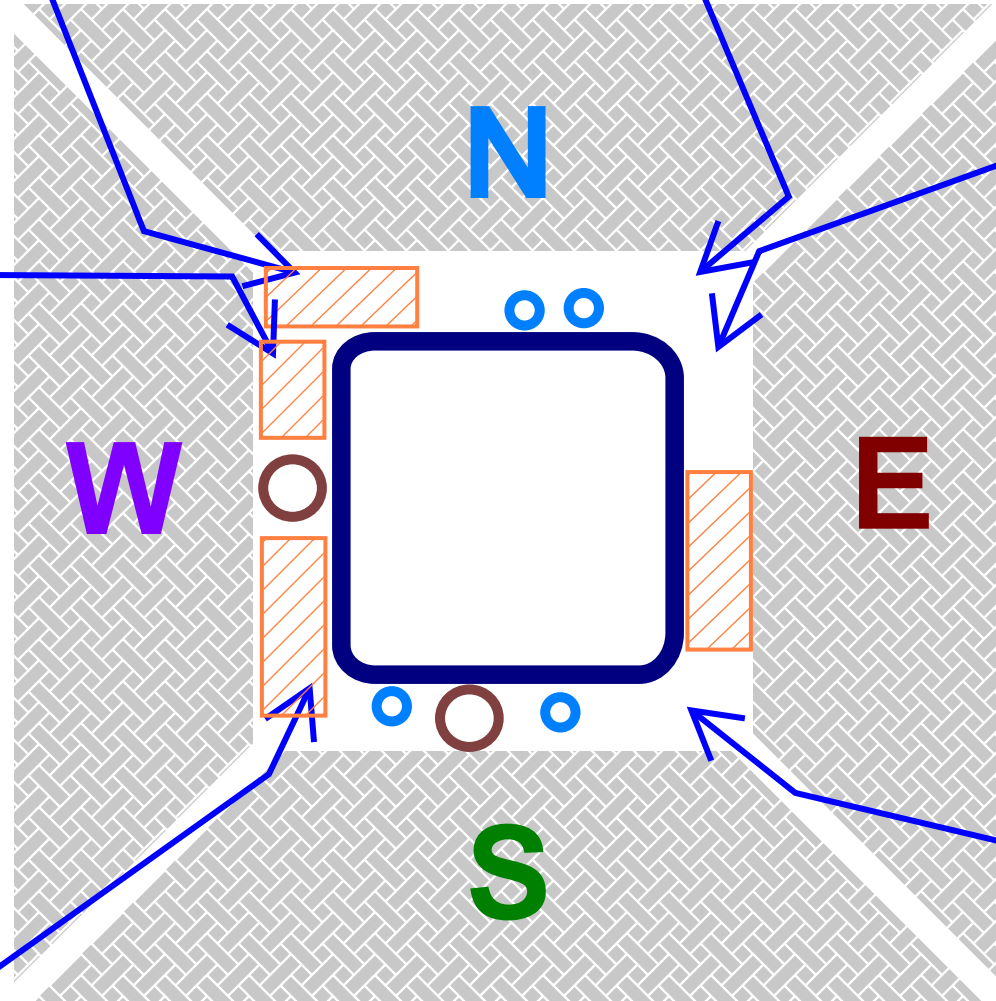
-  = No Access
-  = Debris
-  = Conduit
-  = Cast Iron Drain

Observation Notes

1. Top of plinth dry with some construction and organic debris
2. Strand line is present on steel column 6" above plinth. Water staining is noted below the strand line on all surfaces.
3. Steel at plinth intersection has spots of moderate surfacing rust extending as high as 2.5".
4. Scratched rust and it extended no deeper than 1/16" and is localized. Rust is worst on S and very light on N.





**ABB Field Observations
Steel Column Assessment**
April 6 & 7, 2022
ABB PN: 22.7165.02

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Drawing Key

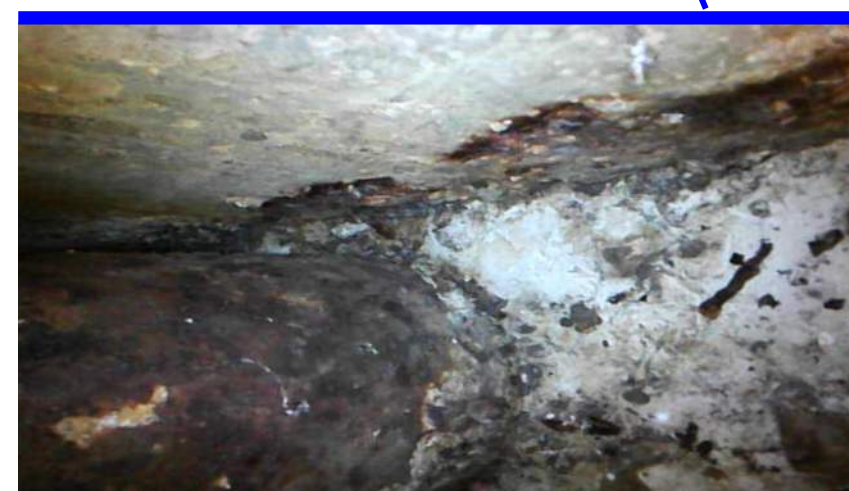
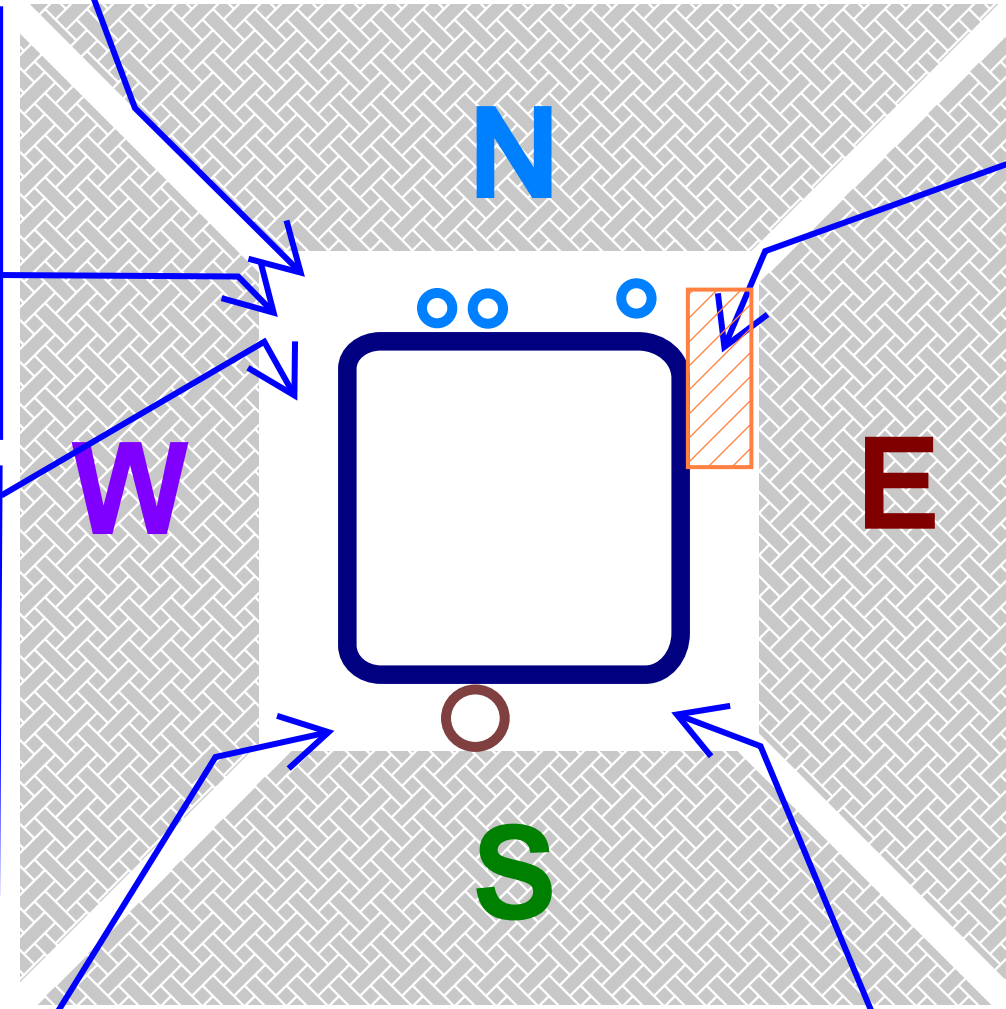
-  = No Access
-  = Debris
-  = Conduit
-  = Cast Iron Drain

Observation Notes

1. Top of plinth dry with some construction and organic debris
2. Steel at plinth intersection has isolated spots of moderate surfacing rust extending as high as 1.5". The majority has little or no rust.





**ABB Field Observations
Steel Column Assessment**
April 6 & 7, 2022
ABB PN: 22.7165.02

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Drawing Key

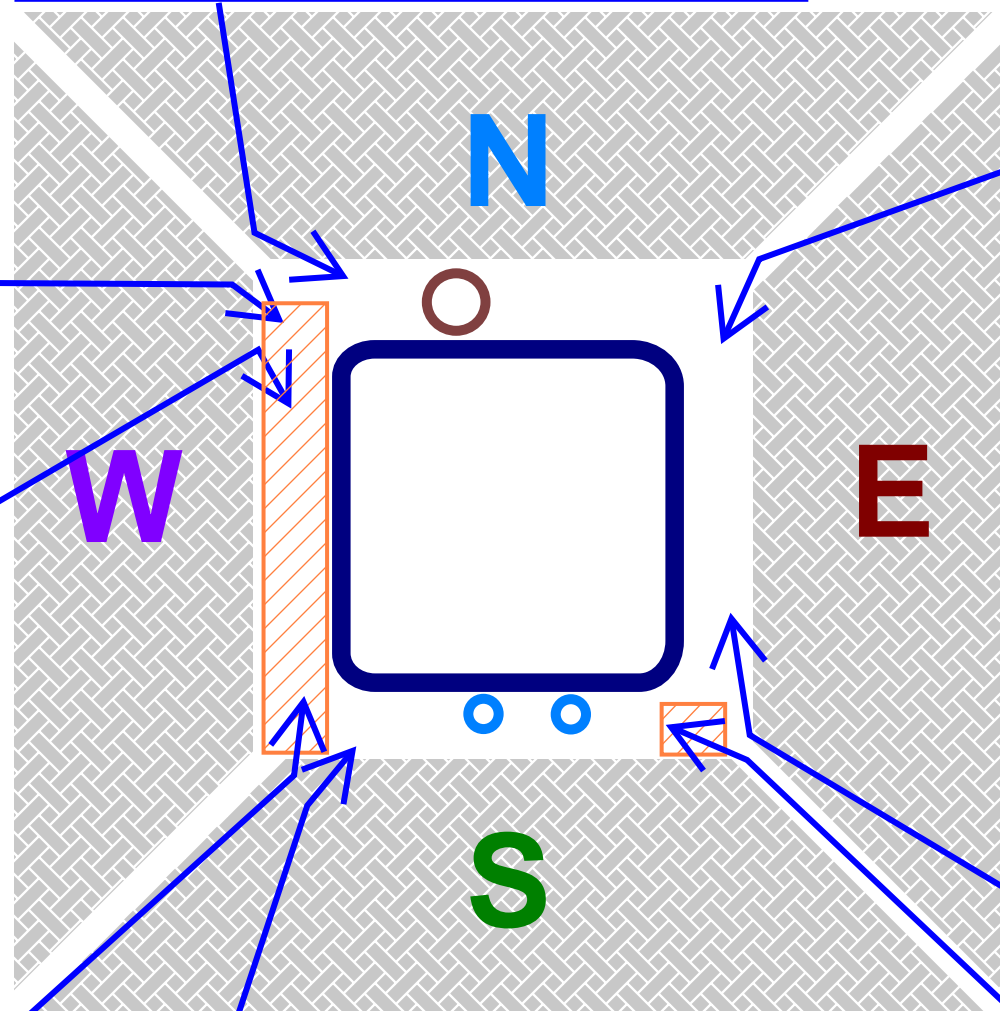
-  = No Access
-  = Debris
-  = Conduit
-  = Cast Iron Drain

Observation Notes

1. Top of plinth dry with some construction debris. N & E sides have about 1/4-1/2" of insect debris on plinth
2. Steel at plinth intersection has isolated spots of light surface rust extending as high as .5". The majority has little or no rust.





**ABB Field Observations
Steel Column Assessment**
April 6 & 7, 2022
ABB PN: 22.7165.02

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Drawing Key

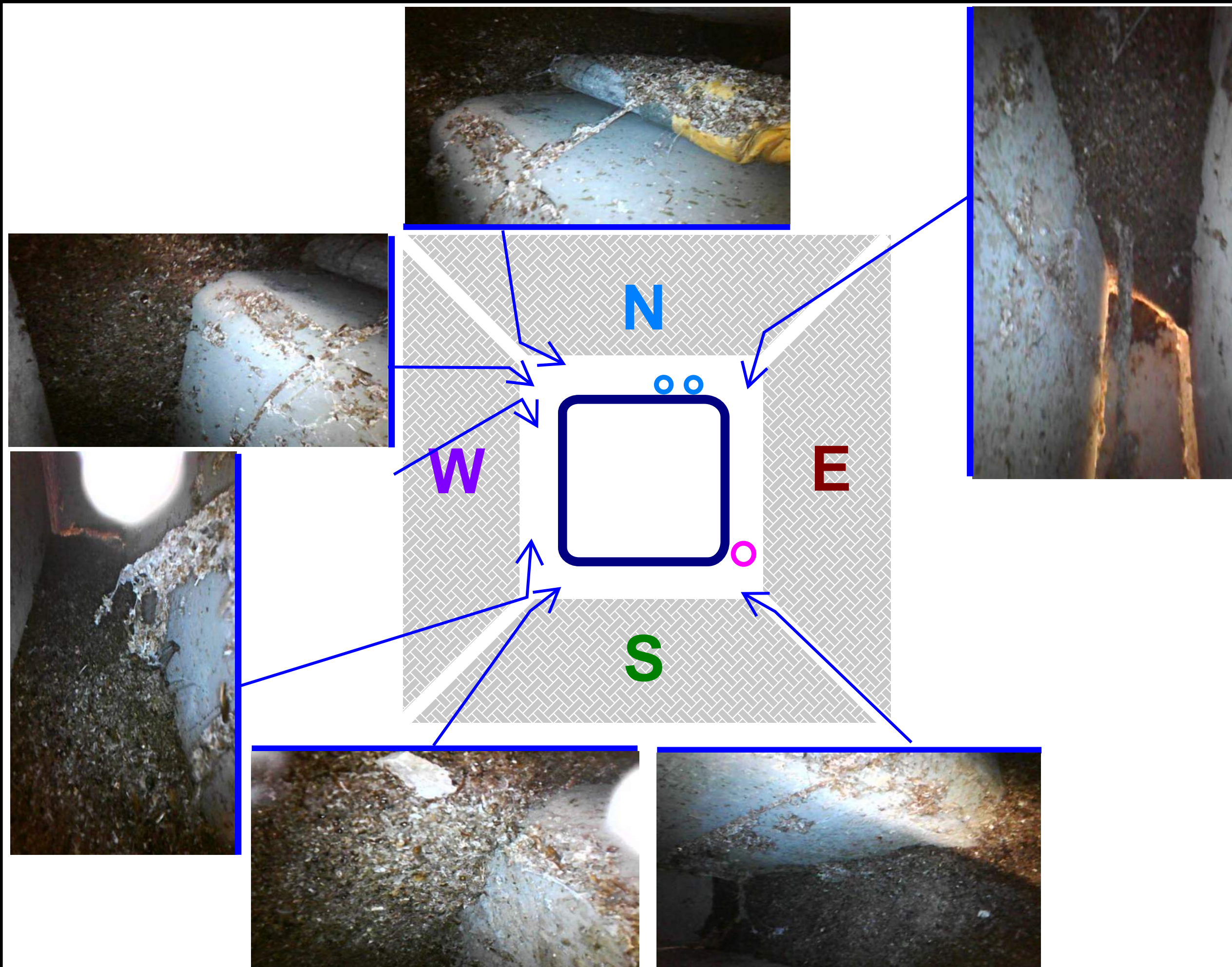
-  = No Access
-  = Debris
-  = Conduit
-  = Insect tunnel

Observation Notes

1. Top of plinth dry with 1/4" - 1/2" of insect debris.
2. Little identifiable rust was observed at this location.

**ABB Field Observations
Steel Column Assessment**
April 6 & 7, 2022
ABB PN: 22.7165.02

C-11





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