

MEMORANDUM

State of Alaska

Department of Transportation and Public Facilities

TO: Distribution

DATE: July 24, 2024

FROM: Matthew Hansen, P.E.
Contracts Section
(907) 269-0422

FILE NO.: Z571830000

SUBJECT: Haines Maintenance and Operations
Station
PS&E Review

Attached for final review and comments is the contract assembly and design analysis for this project.

Comments are due by 5:00 pm Wednesday August 14, 2024.

All review documents (except the Engineer's Estimate) are available for viewing and download at the following location: <https://dot.alaska.gov/creg/design/facilities/review/Z571830000>

An invitation to download the Engineer's Estimate will also be distributed via the ZendTo file transfer system. Note that files can only be stored on the ZendTo system for 7 days, after which the files will be automatically removed.

Please forward your comments to levi.overbeck@alaska.gov using the provided Excel comment spreadsheet.

A review meeting is scheduled for 10:30 a.m. on Thursday, August 22, 2024, in the Construction Conference Room at 4111 Aviation Avenue in Anchorage. For remote participation there is also a Microsoft Teams meeting link included in the Outlook meeting invitation.

The following specific replies are requested in addition to any other comments:

Right of Way	Status of project ROW, material agreements, easements, etc.
Utilities	Utility agreement status.
Project Control	Status of funding considering the current estimate.
Environmental	Permits required and an estimated date when they will be acquired.

Please charge review time to Program No.: Z571830000, Phase: TC2000, Template: TTPJ001, and Activity Code __ _N (insert your own activity code in the blank spaces).

**Haines Maintenance and Operations Station
Z571830000**

PS&E Review

COMMENTS DUE: Wednesday, August 14, 2024
REVIEW MEETING: Thursday, August 22, 2024 – 10:30 a.m.

Distribution, (1 copy unless otherwise noted)

Facilities:

*Levi Overbeck, Project Manager
*Danny Gibson, Director
Bill Campbell, Facilities Manager
*Tim Wolfe, Southeast District Equipment Manager

Leasing:

*Sharyn Augustine, Leasing Specialist

Materials:

*Bob Trousil, Materials Engineer
*Mitch McDonald, Geologist
*Travis Eckhoff, Materials Engineer

Traffic Safety & Utilities:

*Nathan Purves, Traffic & Safety Engineer
*Ken Murphy, Safety Officer
*Liam Carnahan, Utilities Lead

Maintenance and Operations:

Vicky Roberts, Director
Marcus Zimmerman, Regional Maintenance Chief
*Alexander Guthrie, Superintendent, Southeast District
*Matthew Boron, Facility Manager

Quality Assurance:

*Randall Sutak, QA Engineer

* Electronic Only

Outside of DOT&PF

*Mathew Leistico, RESPEC
*Doug Murray, RESPEC

*Wendy Presler, Shannon & Wilson
*Dan McMahon, Shannon & Wilson

Preconstruction:

*Kirk Miller, Preconstruction Engineer

Construction:

*Garrett Paul, Construction Group Chief
*David Lowell, Region Construction Engineer
*Joel Osburn, Reconnaissance Engineer

Contracts:

*Matthew Hansen, Review Engineer
*Brad Doggett, Review Engineer

PD&E:

*Greg Lockwood, PD&E Group Chief
*Benjamin Storey, Reg. Environmental Manager
*Tyler Ruberio, Environmental Analyst
*Ashwin Sreenivasan, Environmental Analyst/ESCP Coordinator
*Kyle Walker, Regional Hydrologist

Right-of-Way

*Greg Weinert, ROW Group Chief

Project Control

*Amber Marshall, Project Control Group Chief

Planning

*Sara Lucey, Planning Group Chief
*Alexandria Lawrence, Transportation Planner

Project Manual For:

**Haines Maintenance and Operations Station
Project No. Z571830000**



Volume 1 of 2

**State of Alaska
Department of Transportation and Public Facilities
Central Region
4111 Aviation Avenue, Anchorage, Alaska 99502**

Advertising Date: August XX, 2024

Document Fee: \$100.00

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STATE OF ALASKA
DEPARTMENT OF TRANSPORTATION AND PUBLIC FACILITIES

INVITATION TO BID

for Construction Contract

Date August xx, 2024

**Haines Maintenance and Operations Station
Program No. Z571830000**

The Department invites bidders to submit bids for furnishing all labor, equipment, and materials and performing all work for the project described below. The Department will only consider bids received **before 2:00 PM local time (per the Department's time source) on the __th day of __ 20XX**. On that date, the Department will assemble, open, and then publicly announce the timely-received bids at Anchorage, Alaska at 2:15 PM, or as soon thereafter as practicable.

Location of Project: Haines, Alaska

Contracting Officer: Christopher Hodgin, P.E., Chief, Statewide Public Facilities

Issuing Office: Central Region

State Funded ☒

Federal Aid ☐

Description of Work:

This state funded project will construct a new M&O facility in Haines, Alaska and demolish the existing facility. It also includes additive alternates for construction offices appended to the facility and a sand storage facility.

The Engineer's Estimate is between \$20,000,000 and \$30,000,000.

All work shall be completed in N/A Calendar Days, or by **August xx, 2028**.

The Department will identify interim completion dates, if any, in the Special Provisions.

The apparent successful bidder must furnish a payment bond in the amount of 100% of the contract and a performance bond in the amount of 100% of the contract as security conditioned for the full, complete and faithful performance of the contract. The apparent successful bidder must execute the said contract and bonds within **ten (10)** calendar days, or such further time as may be allowed in writing by the Contracting Officer, after receiving notification of the acceptance of their bid.

Submission of Bidding Documents

Bidders may submit bidding documents electronically via the Department's approved online bidding service, through the mail or hand delivered. For mailed or hand delivered bids and for electronically submitted bids with a paper bid guaranty, documents shall be submitted in a sealed envelope marked as follows:

Bidding Documents for Project:
Haines Maintenance and Operations Station
Program No. Z571830000

ATTN:
State of Alaska
Department of Transportation & Public Facilities
PO Box 196900
4111 Aviation Avenue
Anchorage, AK 99519-6900

It is incumbent upon the bidder to ensure its bid, any amendments, and/or withdrawal arrive, in its entirety, at the location and before the deadline stated above. A bidder sending a bid amendment or withdrawal via email must transmit its documentation to the Department at this email address: crdotpfcontracts@alaska.gov.

To be responsive, a bid must include a bid guaranty equal to 5% of the amount bid. *(When calculating the bid amount for purposes of determining the 5% value of the bid guaranty, a bidder shall include its base bid amount, plus the amount bid for alternate and supplemental bid items, if any.)*

The Department hereby notifies all bidders that it will affirmatively ensure that in any contract entered into pursuant to this Invitation, Disadvantaged Business Enterprises will be afforded full opportunity to submit bids and will not be discriminated against on the grounds of race, color, national origin, or sex in consideration for an award.

NOTICE TO BIDDERS

Bidders must have a Vendor ID or your bid may not be accepted. More information can be obtained at the following website: <http://dot.alaska.gov/aashtoware/docs/AWP-Vendor-List-Guidance.pdf>

The following data may assist a bidder in preparing its bid:

See attached Special Notice to Bidders for this project.

A bidder may obtain hard copy project plans and specifications for the price of **\$100.00** from:

State of Alaska, Department of Transportation & Public Facilities

Plans Room

4111 Aviation Avenue

PO Box 196900

Anchorage, AK 99519-6900

Phone: (907) 269-0408

If a bidder has a question relating to design features, constructability, quantities, or other technical aspects of the project, it may direct its inquiry to the questions and answers area of the Bid Express proposal page: <https://www.bidx.com/ak/lettings>

A bidder requesting assistance in viewing the project site must make arrangements at least 48 hours in advance.
The point of contract for inquiries for this project is Levi Overbeck, P.E.

Email: levi.overbeck@alaska.gov

Phone: (907) 269-0617

For questions relating to electronic bidding or for assistance with your Bid Express account, contact Bid Express customer support at customer.support@bidx.com or call toll free (888)352-BIDX(2439) Monday through Friday 7:00am to 8:00pm (Eastern).

A bidder may direct questions concerning bidding procedures and requirements to:

Sharon L. Smith, P.E.

Chief of Contracts

PO Box 196900

Anchorage, AK 99519-6900

Email: sharon.smith@alaska.gov

Phone: (907) 269-0414

Other Information:

The Bid Calendar, Plan Holder lists, Bid Results and DBE information are available on the Internet at: www.dot.alaska.gov under Procurement.

Reminder: Alaska Statute AS 36.30.110 requires all Bidders to have a valid Alaska Business License and an Alaska Contractor's Certificate of Registration prior to award. To qualify as an Alaska bidder under AS 36.30.321, a bidder shall have a valid Alaska business license at time designated in the invitation to bid for bid opening.

Special Notice to Bidders

1. Bidders are hereby notified that data to assist in preparing bids is available for viewing on the Bid Express advertising web site as follows:
 - a. Erosion and Sediment Control Plan
 - b. Soil Management Plan, Haines Maintenance & Operations Station, June 2024
2. The Alaska Storm Water Pollution Prevention Plan Guide, March 2021 is available online at:
<http://www.dot.state.ak.us/stwddes/desenviron/resources/stormwater.shtml>
3. The Governor's emergency declaration and mandates relating to COVID-19 expired on February 14, 2021. However, contractors are encouraged to review COVID-19 Response and Recovery Health Advisories that can be accessed at:
<https://covid19.alaska.gov/health-advisories/>

Contractors will still be required to meet any applicable local ordinances or requirements currently in effect, and comply with any future federal, state, or local declarations or mandates that might be adopted while work on the project is ongoing.

Consistent with Section 70-01 of the Standard Specifications for Airport Construction, the Contractor will be responsible for paying all costs and expenses incurred to comply with any COVID-19 Health Mandates or Health Advisories in effect during times when the Contractor is performing project-related work activities. The Contractor will additionally be responsible for preparing any general or site-specific mitigation and response plans required for its forces, along with any attendant schedule delays or impacts.

4. Certified payroll must be submitted electronically through AASHTOWare for contracts awarded after January 1, 2021. In order to submit certified payroll, Contractors, Subcontractors, and lower tier Subcontractors must be active in AASHTOWare, which requires they have a valid Vendor ID with a 913 commodity code. To obtain a Vendor ID, register with the state of Alaska via the Vendor Self-Serve (VSS). Instructions for creating a new account in the VSS system can be found under the Reference Guides and Forms at the following link: <https://iris-vss.alaska.gov/PRDVSS1X1/Advantage4>. For information on certified payroll contact the Department of Labor and Workforce Development, Wage and Hour Administration:
Juneau (907) 465-4842
Anchorage (907) 269-4900
Fairbanks (907) 451-2886

DOT&PF AASHTOWare Project Guidance, including schedule, FAQs, training options: <http://dot.alaska.gov/aashtoware/>

5. Contract Price Adjustment(s): The Department will not provide cost escalation or de-escalation price adjustment for this contract, except for specific items described in the bid package at the time of bid opening.

**STATE OF ALASKA
DEPARTMENT OF TRANSPORTATION AND PUBLIC FACILITIES
DOCUMENT 00700 - ISSUED DECEMBER 2011**

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ACKNOWLEDGMENT

"The State of Alaska, General Conditions of the Construction Contract for Buildings" is based on the "Standard General Conditions of the Construction Contract" as published by the National Society of Professional Engineers (document number 1910-8, 1983 edition) on behalf of the Engineers Joint Construction Documents Committee. Portions of the NSPE General Conditions are reprinted herein by the express permission of NSPE. Modifications to the NSPE text are made to provide for State laws, regulations, and established procedures.

The granting of permission by NSPE to allow the State of Alaska to preprint portions of the NSPE document 1910-8, 1983 edition does not constitute approval of the State of Alaska General Conditions of the Construction Contract for Buildings.

ARTICLE 1 - DEFINITIONS

Wherever used in the Contract Documents the following terms, or pronouns in place of them, are used, the intent and meaning, unless a different intent or meaning is clearly indicated, shall be interpreted as set forth below.

The titles and headings of the articles, sections, and subsections herein are intended for convenience of reference.

Terms not defined below shall have their ordinary accepted meanings within the context which they are used. Words which have a well-known technical or trade meaning when used to describe work, materials or equipment shall be interpreted in accordance with such meaning. Words defined in Article 1 are to be interpreted as defined.

Addenda - All clarifications, corrections, or changes issued graphically or in writing by the DEPARTMENT after the Advertisement but prior to the opening of Proposals.

Advertisement - The public announcement, as required by law, inviting bids for Work to be performed or materials to be furnished.

Application for Payment - The form provided by the DEPARTMENT which is to be used by the CONTRACTOR in requesting progress or final payments and which is to include such supporting documentation as is required by the Contract Documents.

Approved or Approval - 'Approved' or 'Approval' as used in this contract document shall mean that the Department has received a document, form or submittal from the contractor and that the Department has taken "No exceptions" to the item submitted. Unless the context clearly indicates otherwise, approved or approval shall not mean that the Department approves of the methods or means, or that the item or form submitted meets the requirements of the contract or constitutes acceptance of the Contractor's work. Where approved or approval means acceptance, then such approval must be set forth in writing and signed by the contracting officer or his designee.

Architect - Where used in the contract documents, "ARCHITECT" shall mean the DEPARTMENT'S ENGINEER.

Architect/Engineer - Where used in the contract documents, "ARCHITECT/ENGINEER" shall mean the DEPARTMENT'S ENGINEER.

A.S - Initials which stand for Alaska Statute.

Award - The acceptance, by the DEPARTMENT, of the successful bid.

Bid Bond - A type of Proposal Guaranty.

Bidder - Any individual, firm, corporation or any acceptable combination thereof, or joint venture submitting a bid for the advertised Work.

Calendar Day - Every day shown on the calendar, beginning and ending at midnight.

Change Order - A written order by the DEPARTMENT directing changes to the Contract Documents, within their general scope.

Consultant - The person, firm, or corporation retained directly by the DEPARTMENT to prepare Contract Documents, perform construction administration services, or other Project related services.

Contingent Sum Work Item - When the bid schedule contains a Contingent Sum Work Item, the Work covered shall be performed only upon the written Directive of the Project Manager. Payment shall be made as provided in the Directive.

Contract - The written agreement between the DEPARTMENT and the CONTRACTOR setting forth the obligations of the parties and covering the Work to be performed, all as required by the Contract Documents.

Contract Documents - The Contract form, Addenda, the bidding requirements and CONTRACTOR's bid (including all appropriate bid tender forms), the bonds, the Conditions of the Contract and all other Contract requirements, the Specifications, and the Drawings furnished by the DEPARTMENT to the CONTRACTOR, together with all Change Orders and documents approved by the Contracting Officer, for inclusion, modifications and supplements issued on or after the Effective Date of the Contract.

Contracting Officer - The person authorized by the Commissioner to enter into and administer the Contract on behalf of the DEPARTMENT. He has authority to make findings, determinations and decisions with respect to the Contract and, when necessary, to modify or terminate the Contract. The Contracting Officer is identified on the construction Contract.

CONTRACTOR - The individual, firm, corporation or any acceptable combination thereof, contracting with the DEPARTMENT for performance of the Work.

Contract Price - The total moneys payable by the DEPARTMENT to the CONTRACTOR under the terms of the Contract Documents.

Contract Time - The number of Calendar Days following issuance of Notice-to-Proceed in which the project shall be rendered Substantially Complete, or if specified as a calendar date, the Substantial Completion date specified in the Contract Documents

Controlling Item - Any feature of the Work on the critical path of a network schedule.

Defective - Work that is unsatisfactory, faulty or deficient, or does not conform to the Contract Documents.

DEPARTMENT - The Alaska Department of Transportation and Public Facilities. References to "Owner", "State", "Contracting Agency", mean the DEPARTMENT.

Directive - A written communication to the CONTRACTOR from the Contracting Officer interpreting or enforcing a Contract requirement or ordering commencement of an item of Work.

Drawings - The Drawings which show the character and scope of the Work to be performed and which have been furnished by the DEPARTMENT or the DEPARTMENT's Consultant and are by reference made a part of the Contract Documents.

ENGINEER - The DEPARTMENT'S authorized representative of the Contracting Officer, as defined in the DEPARTMENT'S *delegation of authority letter* to be issued after notice-to-proceed, who is responsible for administration of the contract.

Equipment - All machinery together with the necessary supplies for upkeep and maintenance, and also tools and apparatus necessary for the proper construction and acceptable completion of the work.

Final Acceptance - The DEPARTMENT's written acceptance of the Work following Final Completion and the performance of all Contract requirements by the CONTRACTOR.

Final Completion - The Project (or specified part thereof) has progressed to the point that all required Work is complete as determined by the Contracting Officer.

Furnish - To procure, transport, and deliver to the project site materials, labor, or equipment, for installation or use on the project.

General Requirements - Sections of Division 1 of the Specifications which contain administrative and procedural requirements as well as requirements for temporary facilities which apply to Specification Divisions 2 through 16.

Holidays - In the State of Alaska, Legal Holidays occur on:

1. New Years Day - January 1
2. Martin Luther King's Birthday - Third Monday in January
3. President's Day - Third Monday in February
4. Seward's Day - Last Monday in March
5. Memorial Day - Last Monday in May
6. Independence Day - July 4
7. Labor Day - First Monday in September
8. Alaska Day - October 18
9. Veteran's Day - November 11
10. Thanksgiving Day - Fourth Thursday in November
11. Christmas Day - December 25
12. Every Sunday
13. Every day designated by public proclamation by the President of the United States or the Governor of the State as a legal Holiday.

If any Holiday listed above falls on a Saturday, Saturday and the preceding Friday are both legal Holidays. If the Holiday should fall on a Sunday, except (12) above, Sunday and the following Monday are both legal Holidays. See Title 44, Alaska Statutes.

Inspector - The Engineer's authorized representative assigned to make detailed observations relating to contract performance.

Install - Means to build into the Work, ready to be used in complete and operable condition and in compliance with Contract Documents.

Interim Work Authorization - A written order by the Engineer initiating changes to the Contract, within its general scope, until a subsequent Change Order is executed.

Invitation for Bids - A portion of the bidding documents soliciting bids for the Work to be performed.

Laboratory - The official testing laboratories of the DEPARTMENT or such other laboratories as may be designated by the Engineer or identified in the contract documents.

Materials - Any substances specified for use in the construction of the project.

Notice of Intent to Award - The written notice by the DEPARTMENT to all Bidders identifying the apparent successful Bidder and establishing the DEPARTMENT's intent to execute the Contract when all conditions required for execution of the Contract are met.

Notice to Proceed - A written notice to the CONTRACTOR to begin the Work and establishing the date on which the Contract Time begins.

Payment Bond - The security furnished by the CONTRACTOR and his Surety to guarantee payment of the debts covered by the bond.

Performance Bond - The security furnished by the CONTRACTOR and his Surety to guarantee performance and completion of the Work in accordance with the Contract.

Preconstruction Conference - A meeting between the CONTRACTOR and the Engineer, and other parties affected by the construction, to discuss the project before the CONTRACTOR begins work.

Project - The total construction, of which the Work performed under the Contract Documents is the whole or a part, where such total construction may be performed by more than one CONTRACTOR.

Project Manager - The authorized representative of the Contracting Officer who is responsible for administration of the Contract.

Proposal - The offer of a Bidder, on the prescribed forms, to perform the Work at the prices quoted.

Proposal Guaranty - The security furnished with a Proposal to guarantee that the bidder will enter into a Contract if his Proposal is accepted by the DEPARTMENT.

Quality Assurance (QA) - Where referred to in the technical specifications (Divisions 2 through 16), Quality Assurance refers to measures to be provided by the CONTRACTOR as specified.

Quality Control (QC) - Tests and inspections by the CONTRACTOR to insure the acceptability of materials incorporated into the work. QC test reports are used as a basis upon which to determine whether the Work conforms to the requirements of the Contract Documents and to determine its acceptability for payment.

Regulatory Requirements - Laws, rules, regulations, ordinances, codes and/or orders.

Schedule of Values - The DEPARTMENT's document, submitted by the CONTRACTOR and reviewed by the Contracting Officer, which shall serve as the basis for computing payment and for establishing the value of separate items of Work which comprise the Contract Price.

Shop Drawings - All drawings, diagrams, illustrations, schedules and other data which are specifically prepared by or for the CONTRACTOR to illustrate some portion of the Work and all illustrations, brochures, standard schedules, performance charts, instructions, diagrams and other information prepared by a Supplier and submitted by the CONTRACTOR to illustrate material, equipment, fabrication, or erection for some portion of the Work. Where used in the Contract Documents, "Shop Drawings" shall also mean "Submittals".

Specifications - Those portions of the Contract Documents consisting of written technical descriptions of materials, equipment, construction systems, standards and workmanship as applied to the Work and certain administrative and procedural details applicable thereto.

Subcontractor - An individual, firm, or corporation to whom the CONTRACTOR or any other Subcontractor sublets part of the Contract.

Substantial Completion - Although not fully completed, the Work (or a specified part thereof) has progressed to the point where, in the opinion of the Contracting Officer, as evidenced by the DEPARTMENT's written notice, it is sufficiently complete, in accordance with the Contract Documents, so that the Work (or specified part) can be utilized for the purposes for which it is intended. The terms "Substantially Complete" and "Substantially Completed" as applied to any Work refer to Substantial Completion thereof.

Supplemental Agreement - A written agreement between the CONTRACTOR and the DEPARTMENT covering work that is not within the general scope of the Contract.

Supplementary Conditions - The part of the Contract Documents which amends or supplements these General Conditions.

Supplier - A manufacturer, fabricator, distributor, materialman or vendor of materials or equipment.

Surety - The corporation, partnership, or individual, other than the CONTRACTOR, executing a bond furnished by the CONTRACTOR.

Traffic Control Plan (TCP) - A drawing of one or more specific plans that detail the routing of pedestrian, and/or vehicular traffic through or around a construction area.

Unit Price Work - Work to be paid for on the basis of unit prices.

Using Agency - The entity who will occupy or use the completed Project.

Utility - The privately, publicly or cooperatively owned lines, facilities and systems for producing, transmitting or distributing communications, power, electricity, light, heat, gas, oil, crude products, water, steam, waste, storm water not connected with highway or street drainage, and other similar commodities, including publicly owned fire and police signal systems, street lighting systems, and railroads which directly or indirectly serve the public or any part thereof. The term "utility" shall also mean the utility company, inclusive of any wholly owned or controlled subsidiary."

Work - Work is the act of, and the result of, performing services, furnishing labor, furnishing and incorporating materials and equipment into the Project and performing other duties and obligations, all as required by the Contract Documents. Such Work, however incremental, will culminate in the entire completed Project, or the various separately identifiable parts thereof.

ARTICLE 2 - AUTHORIZATION AND LIMITATIONS

2.1 Authorities and Limitations

- 2.1.1 The Contracting Officer alone, shall have the power to bind the DEPARTMENT and to exercise the rights, responsibilities, authorities and functions vested in the Contracting Officer by the Contract Documents. The Contracting Officer shall have the right to designate in writing authorized representatives to act for him. Wherever any provision of the Contract Documents specifies an individual or organization, whether governmental or private, to perform any act on behalf of or in the interest of the DEPARTMENT that individual or organization shall be deemed to be the Contracting Officer's authorized representative under this Contract but only to the extent so specified.
- 2.1.2 The CONTRACTOR shall perform the Work in accordance with any written order (including but not limited to instruction, direction, interpretation or determination) issued by an authorized representative in accordance with the authorized representative's authority to act for the Contracting Officer. The CONTRACTOR assumes all the risk and consequences of performing the Work in accordance with any order (including but not limited to instruction, direction, interpretation or determination) of anyone not authorized to issue such order, and of any order not in writing.
- 2.1.3 Should the Contracting Officer or his authorized representative designate Consultant(s) to act for the DEPARTMENT as provided for in Paragraph 2.1.1, the performance or nonperformance of the Consultant under such authority to act, shall not give rise to any contractual obligation or duty of the Consultant to the CONTRACTOR, any Subcontractor, any Supplier, or any other organization performing any of the Work or any Surety representing them.

2.2 Evaluations by Contracting Officer:

- 2.2.1 The Contracting Officer will decide all questions which may arise as to:
- a. Quality and acceptability of materials furnished;
 - b. Quality and acceptability of Work performed;
 - c. Compliance with the schedule of progress;
 - d. Interpretation of Contract Documents;
 - e. Acceptable fulfillment of the Contract on the part of the CONTRACTOR.
- 2.2.2 In order to avoid cumbersome terms and confusing repetition of expressions in the Contract Documents the terms "as ordered", "as directed", "as required", "as approved" or terms of like effect or import are used, or the adjectives "reasonable", "suitable", "acceptable", "proper" or "satisfactory" or adjectives of like effect or import are used it shall be understood as if the expression were followed by the words "the Contracting Officer".
- When such terms are used to describe a requirement, direction, review or judgment of the Contracting Officer as to the Work, it is intended that such requirement, direction, review or judgment will be solely to evaluate the Work for compliance with the Contract Documents (unless there is a specific statement indicating otherwise).
- 2.2.3 The use of any such term or adjective shall not be effective to assign to the DEPARTMENT any duty of authority to supervise or direct the furnishing or performance of the Work or any duty or authority to undertake responsibility contrary to the provisions of paragraphs 2.3 or 2.4.

2.3 Means & Methods:

The means, methods, techniques, sequences or procedures of construction, or safety precautions and the program incident thereto, and the failure to perform or furnish the Work in accordance with the Contract Documents are the sole responsibility of the CONTRACTOR.

2.4 Visits to Site/Place of Business:

The Contracting Officer will make visits to the site and approved remote storage sites at intervals appropriate to the various stages of construction to observe the progress and quality of the executed Work and to determine, in general, if the Work is proceeding in accordance with the Contract Documents. The Contracting Officer may, at reasonable times, inspect that part of the plant or place of business of the CONTRACTOR or Subcontractor that is related to the performance of the Contract. Such observations or the lack of such observations shall in no way relieve the CONTRACTOR from his duty to perform the Work in accordance with the Contract Documents.

ARTICLE 3 - CONTRACT DOCUMENTS: INTENT, AMENDING, REUSE

3.1 Incomplete Contract Documents:

The submission of a bid by the Bidder is considered a representation that the Bidder examined the Contract Documents to make certain that all sheets and pages were provided and that the Bidder is satisfied as to the conditions to be encountered in performing the Work. The DEPARTMENT expressly denies any responsibility or liability for a bid submitted on the basis of an incomplete set of Contract Documents.

3.2 Copies of Contract Documents:

The DEPARTMENT shall furnish to the CONTRACTOR up to ten copies of the Contract Documents. Additional copies will be furnished, upon request, at the cost of reproduction.

3.3 Scope of Work:

The Contract Documents comprise the entire Contract between the DEPARTMENT and the CONTRACTOR concerning the Work. The Contract Documents are complementary; what is called for by one is as binding as if called for by all. The Contract Documents will be construed in accordance with the Regulatory Requirements of the place of the Project.

It is specifically agreed between the parties executing this Contract that it is not intended by any of the provisions of the Contract to create in the public or any member thereof a third party benefit, or to authorize anyone not a party to this Contract to maintain a suit pursuant to the terms or provisions of the Contract.

3.4 Intent of Contract Documents:

- 3.4.1 It is the intent of the Contract Documents to describe a functionally complete Project to be constructed in accordance with the Contract Documents. Any Work, materials or equipment that may reasonably be inferred from the Contract Documents as being required to produce the intended result will be supplied, without any adjustment in Contract Price or Contract Time, whether or not specifically called for.
- 3.4.2 Reference to standard specifications, manuals or codes of any technical society, organization or association, or to the Regulatory Requirements of any governmental authority, whether such reference be specific or by implication, shall mean the edition stated in the Contract Documents or if not stated the latest standard specification, manual, code or Regulatory Requirements in effect at the time of Advertisement for the Project (or, on the Effective Date of the Contract if there was no Advertisement). However, no provision of any referenced standard specification, manual or code (whether or not specifically incorporated by reference in the Contract Documents) shall be effective to change the duties and responsibilities of the DEPARTMENT and the CONTRACTOR, or any of their consultants, agents or employees from those set forth in the Contract Documents, nor shall it be effective to assign to the DEPARTMENT or any of the DEPARTMENT's Consultants, agents or employees, any duty or authority to supervise or direct the furnishing or performance of the Work or any duty or authority to undertake responsibility contrary to the provisions of paragraphs 2.3 or 2.4.

3.5 Discrepancy in Contract Documents:

- 3.5.1 Before undertaking the Work, the CONTRACTOR shall carefully study and compare the Contract Documents and check and verify pertinent figures, and dimensions shown thereon and all applicable field measurements. Work in the area by the CONTRACTOR shall imply verification of figures, dimensions and field measurements. If, during the above study or during the performance of the Work, the CONTRACTOR finds a conflict, error, discrepancy or omission in the Contract Documents, or a discrepancy between the Contract Documents and any standard specification, manual, code, or Regulatory Requirement which affects the Work, the CONTRACTOR shall promptly report such discrepancy in writing to the Contracting Officer. The CONTRACTOR shall obtain a written interpretation or clarification from the Contracting Officer before proceeding with any Work affected thereby. Any adjustment made by the CONTRACTOR without this

determination shall be at his own risk and expense. However, the CONTRACTOR shall not be liable to the DEPARTMENT for failure to report any conflict, error or discrepancy in the Contract Documents unless the CONTRACTOR had actual knowledge thereof or should reasonably have known thereof.

3.5.2 Discrepancy - Order of Precedence:

When conflicts errors, or discrepancies within the Contract Documents exist, the order of precedence from most governing to least governing will be as follows:

- Contents of Addenda
- Supplementary Conditions
- General Conditions
- General Requirements
- Technical Specifications
- Drawings
- Recorded dimensions will govern over scaled dimensions
- Large scale details over small scale details
- Schedules over plans
- Architectural drawings over structural drawings
- Structural drawings over mechanical and electrical drawings

3.6 Clarifications and Interpretations:

The Contracting Officer will issue with reasonable promptness such written clarifications or interpretations of the requirements of the Contract Documents as the Contracting Officer may determine necessary, which shall be consistent with or reasonably inferable from the overall intent of the Contract Documents.

3.7 Reuse of Documents:

Neither the CONTRACTOR nor any Subcontractor, or Supplier or other person or organization performing or furnishing any of the Work under a direct or indirect contract with the DEPARTMENT shall have or acquire any title to or ownership rights in any of the Contract Documents (or copies thereof) prepared by or for the DEPARTMENT and they shall not reuse any of the Contract Documents on extensions of the Project or any other project without written consent of the Contracting Officer.

Contract Documents prepared by the CONTRACTOR in connection with the Work shall become the property of the DEPARTMENT.

ARTICLE 4 - LANDS AND PHYSICAL CONDITIONS

4.1 Availability of Lands:

The DEPARTMENT shall furnish as indicated in the Contract Documents, the lands upon which the Work is to be performed, rights-of-way and easements for access thereto, and such other lands which are designated for use of the CONTRACTOR in connection with the Work. Easements for permanent structures or permanent changes in existing facilities will be obtained and paid for by the DEPARTMENT, unless otherwise provided in the Contract Documents. The CONTRACTOR shall provide for all additional lands and access thereto that may be required for temporary construction facilities or storage of materials and equipment. The CONTRACTOR shall provide all waste and disposal areas, including disposal areas for hazardous or contaminated materials, at no additional cost to the DEPARTMENT.

4.2 Visit to Site:

The submission of a bid by the CONTRACTOR is considered a representation that the CONTRACTOR has visited and carefully examined the site and is satisfied as to the conditions to be encountered in performing the Work and as to the requirements of the Contract Documents.

4.3 Explorations and Reports:

Reference is made to the Supplementary Conditions for identification of those reports of explorations and tests of subsurface conditions at the site that have been utilized by the DEPARTMENT in preparation of the Contract Documents. The CONTRACTOR may for his purposes rely upon the accuracy of the factual data contained in such reports, but not upon interpretations or opinions drawn from such factual data contained therein or for the completeness or sufficiency thereof. Except as indicated in the immediately preceding sentence and in paragraphs 4.4 and 9.9, CONTRACTOR shall have full responsibility with respect to surface and subsurface conditions at the site.

4.4 Utilities:

The horizontal and vertical locations of known underground utilities as shown or indicated by the Contract Documents are approximate and are based on information and data furnished to the DEPARTMENT by the owners of such underground utilities.

4.4.2 The CONTRACTOR shall have full responsibility for:

- a. Reviewing and checking all information and data concerning utilities.
- b. Locating all underground utilities shown or indicated in the Contract Documents which are affected by the Work.
- c. Coordination of the Work with the owners of all utilities during construction.
- d. Safety and protection of all utilities as provided in paragraph 6.17.
- e. Repair of any damage to utilities resulting from the Work in accordance with 4.4.4 and 4.5.

4.4.3 If Work is to be performed by any utility owner, the CONTRACTOR shall cooperate with such owners to facilitate the Work.

4.4.4 In the event of interruption to any utility service as a result of accidental breakage or as result of being exposed or unsupported, the CONTRACTOR shall promptly notify the utility owner and the Contracting Officer. If service is interrupted, repair work shall be continuous until the service is restored. No Work shall be undertaken around fire hydrants until provisions for continued service has been approved by the local fire

authority.

4.5 Damaged Utilities:

When utilities are damaged by the CONTRACTOR, the utility owner shall have the choice of repairing the utility or having the CONTRACTOR repair the utility. In the following circumstances, the CONTRACTOR shall reimburse the utility owner for repair costs or provide at no cost to the utility owner or the DEPARTMENT, all materials, equipment and labor necessary to complete repair of the damage:

- a. When the utility is shown or indicated in the Contract Documents.
- b. When the utility has been located by the utility owner.
- c. When no locate was requested by the CONTRACTOR for utilities shown or indicated in the Contract Documents.
- d. All visible utilities.
- e. When the CONTRACTOR could have, otherwise, reasonably been expected to be aware of such utility.

4.6 Utilities Not Shown or Indicated:

If, while directly performing the Work, an underground utility is uncovered or revealed at the site which was not shown or indicated in the Contract Documents and which the CONTRACTOR could not reasonably have been expected to be aware of, the CONTRACTOR shall, promptly after becoming aware thereof and before performing any Work affected thereby (except in an emergency as permitted by paragraph 6.19) identify the owner of such underground utility and give written notice thereof to that owner and to the Contracting Officer. The Contracting Officer will promptly review the underground utility to determine the extent to which the Contract Documents and the Work should be modified to reflect the impacts of the discovered utility. The Contract Documents will be amended or supplemented in accordance with paragraph 9.2 and to the extent necessary through the issuance of a change document by the Contracting Officer. During such time, the CONTRACTOR shall be responsible for the safety and protection of such underground utility as provided in paragraph 6.17. The CONTRACTOR may be allowed an increase in the Contract Price or an extension of the Contract Time, or both, to the extent that they are directly attributable to the existence of any underground utility that was not shown or indicated in the Contract Documents and which the CONTRACTOR could not reasonably have been expected to be aware of.

4.7 Survey Control:

The DEPARTMENT will identify sufficient horizontal and vertical control data to enable the CONTRACTOR to survey and layout the Work. All survey work shall be performed under the direct supervision of a registered land surveyor when required by paragraph 7.8. Copies of all survey notes shall be provided to the DEPARTMENT at an interval determined by the Project Manager. The Project Manager may request submission on a weekly or longer period at his discretion. Any variations between the Contract Documents and actual field conditions shall be identified in the survey notes.

ARTICLE 5 - BONDS, INSURANCE, AND INDEMNIFICATION

5.1 Delivery of Bonds:

When the CONTRACTOR delivers the executed Contract to the Contracting Officer, the CONTRACTOR shall also deliver to the Contracting Officer such bonds as the CONTRACTOR may be required to furnish in accordance with paragraph 5.2.

5.2 Bonds:

The CONTRACTOR shall furnish Performance and Payment Bonds, each in an amount as shown on the Contract as security for the faithful performance and payment of all CONTRACTOR's obligations under the Contract Documents. These bonds shall remain in effect for one year after the date of Final Acceptance and until all obligations under this Contract, except special guarantees as per 12.7, have been met. All bonds shall be furnished on forms provided by the DEPARTMENT (or copies thereof) and shall be executed by such Sureties as are authorized to do business in the State of Alaska. The Contracting Officer may at his option copy the Surety with notice of any potential default or liability.

5.3 Replacement of Bond and Surety:

If the Surety on any bond furnished in connection with this Contract is declared bankrupt or becomes insolvent or its right to do business is terminated in any state where any part of the Project is located or it ceases to meet the requirements of paragraph 5.2, or otherwise becomes unacceptable to the DEPARTMENT, or if any such Surety fails to furnish reports as to his financial condition as requested by the DEPARTMENT, the CONTRACTOR shall within five days thereafter substitute another bond and Surety, both of which must be acceptable to DEPARTMENT.

An individual Surety may be replaced by a corporate Surety during the course of the Contract period. If the Surety desires to dispose of the collateral posted, the DEPARTMENT may, at its option, accept substitute collateral.

5.4 Insurance Requirements:

5.4.1 The CONTRACTOR shall provide evidence of insurance with a carrier or carriers satisfactory to the DEPARTMENT covering injury to persons and/or property suffered by the State of Alaska or a third party, as a result of operations which arise both out of and during the course of this Contract by the CONTRACTOR or by any Subcontractor. This coverage will also provide protection against injuries to all employees of the CONTRACTOR and the employees of any Subcontractor engaged in Work under this Contract. The delivery to the DEPARTMENT of a written 30 day notice is required before cancellation of any coverage or reduction in any limits of liability. Insurance carriers shall have an acceptable financial rating.

5.4.2 The CONTRACTOR shall maintain in force at all times during the performance of the work under this agreement the following policies and minimum limits of liability. Failure to maintain insurance may, at the option of the Contracting Officer, be deemed Defective Work and remedied in accordance with the Contract. Where specific limits and coverages are shown, it is understood that they shall be the minimum acceptable. The requirements of this paragraph shall not limit the CONTRACTOR's responsibility to indemnify under paragraph 5.5. Additional insurance requirements specific to this Contract are contained in the Supplementary Conditions, when applicable.

a. Workers' Compensation Insurance: The Contractor shall provide and maintain, for all employees of the Contractor engaged in work under this contract, Workers' Compensation Insurance as required by AS 23.30.045. The Contractor shall be responsible for Workers' Compensation Insurance for any subcontractor who provides services under this contract, to include:

1. Waiver of subrogation against the State and Employer's Liability Protection in the amount of \$500,000 each accident/\$500,000 each disease.

2. If the Contractor directly utilizes labor outside of the State of Alaska in the prosecution of the work, "Other States" endorsement shall be required as a condition of the contract.
 3. Whenever the work involves activity on or about navigable waters, the Workers' Compensation policy shall contain a United States Longshoreman's and Harbor Worker's Act endorsement, and when appropriate, a Maritime Employer's Liability (Jones Act) endorsement with a minimum limit of \$1,000,000.
- b. Comprehensive or Commercial General Liability Insurance: Such insurance shall cover all operations by or on behalf of the CONTRACTOR and provide insurance for bodily injury and property damage liability including coverage for:

premises and operations; products and completed operations; contractual liability insuring obligations assumed under paragraph 5.5, Indemnification; broad form property damage; and personal injury liability.

The minimum limits of liability shall be:

1. If the CONTRACTOR carries a *Comprehensive General Liability* policy, the limits of liability shall not be less than a Combined Single Limit for bodily injury, property damage and Personal Injury Liability of:
\$1,000,000 each occurrence
\$2,000,000 aggregate
2. If the CONTRACTOR carries a *Commercial General Liability* policy, the limits of liability shall not be less than:
\$1,000,000 each occurrence (Combined Single Limit for bodily injury and property damage)
\$1,000,000 for Personal Injury Liability

\$2,000,000 aggregate for Products-Completed Operations
\$2,000,000 general aggregate

The State of Alaska, DEPARTMENT of Transportation and Public Facilities shall be named as an "Additional Insured" under all liability coverages listed above.

- c. Automobile Liability Insurance:
Such insurance shall cover all owned, hired and non-owned vehicles and provide coverage not less than that of the Business Automobile Policy in limits not less than the following:

\$1,000,000 each occurrence
(Combined Single Limit for bodily injury and property damage.)

- d. Builder's Risk Insurance:
Coverage shall be on an "All Risk" completed value basis including "quake and flood" and protect the interests of the DEPARTMENT, the CONTRACTOR and his Subcontractors. Coverage shall include all materials, supplies and equipment that are intended for specific installation in the Project while such materials, supplies and equipment are located at the Project site, in transit from port of arrival to job site and while temporarily located away from the Project site.

In addition to providing the above coverages the CONTRACTOR shall ensure that Subcontractors provide insurance coverages as noted in clauses a., b., and c. of this subparagraph. Builders Risk Insurance will only be required of subcontractors if so stated in the Supplementary Conditions.

- e. Other Coverages:
As specified in the Supplementary Conditions.

- 5.4.3 In addition to providing the above coverages the Contractor shall, in any contract or agreement with subcontractors performing work, require that all indemnities and waivers of subrogation it obtains, and that any stipulation to be named as an additional insured it obtains, also be extended to waive rights of subrogation against the State of Alaska and to add the State of Alaska as additional named indemnitee and as additional insured.

Evidence of insurance shall be furnished to the Department prior to the award of the contract. Such evidence, executed by the carrier's representative and issued to the Department, shall consist of a certificate of insurance or the policy declaration page with required endorsements attached thereto which denote the type, amount, class of operations covered, effective (and retroactive) dates, and dates of expiration. Acceptance by the Department of deficient evidence does not constitute a waiver of contract requirements.

When a certificate of insurance is furnished, it shall contain the following statement:

"This is to certify that the policies described herein comply with all aspects of the insurance requirements of (Project Name and Number)"

5.5 Indemnification:

The CONTRACTOR shall indemnify, save harmless, and defend the DEPARTMENT, its agents and its employees from any and all claims, actions, or liabilities for injuries or damages sustained by any person or property arising directly or indirectly from the construction or the CONTRACTOR's performance of this Contract; however, this provision has no effect if, but only if, the sole proximate cause of the injury or damage is the DEPARTMENT's negligence.

ARTICLE 6 - CONTRACTOR'S RESPONSIBILITIES

6.1 Supervision of Work:

The CONTRACTOR shall supervise and direct the Work competently and efficiently, devoting such attention thereto and applying such skills and expertise as may be necessary to perform the Work in accordance with the Contract Documents. All Work under this Contract shall be performed in a skillful and workmanlike manner. The CONTRACTOR shall be solely responsible for the means, methods, techniques, sequences and procedures of construction.

6.2 Superintendence by CONTRACTOR:

The CONTRACTOR shall keep on the Work at all times during its progress a competent resident superintendent. The Contracting Officer shall be advised in writing of the superintendent's name, local address, and telephone number. This written advice is to be kept current until Final Acceptance by the DEPARTMENT. The superintendent will be the CONTRACTOR's representative at the site and shall have full authority to act and sign documents on behalf of the CONTRACTOR.

All communications given to the superintendent shall be as binding as if given to the CONTRACTOR. The CONTRACTOR shall cooperate with the Contracting Officer in every way possible.

6.3 Character of Workers:

The CONTRACTOR shall provide a sufficient number of competent, suitably qualified personnel to survey and lay out the Work and perform construction as required by the Contract Documents. The CONTRACTOR shall at all times maintain good discipline and order at the site. The Contracting Officer may, in writing, require the CONTRACTOR to remove from the Work any employee the Contracting Officer deems incompetent, careless, or otherwise detrimental to the progress of the Work, but the Contracting Officer shall have no duty to exercise this right.

6.4 CONTRACTOR to Furnish:

Unless otherwise specified in the General Requirements, the CONTRACTOR shall furnish and assume full responsibility for all materials, equipment and machinery, tools, appliances, fuel, power, light, heat, telephone, water, sanitary facilities, temporary facilities and all other facilities and incidentals necessary for the furnishing, performance testing, start-up and completion of the Work.

6.5 Materials and Equipment:

All materials and equipment shall be of specified quality and new, except as otherwise provided in the Contract Documents. If required by the Contracting Officer, the CONTRACTOR shall furnish satisfactory evidence (including reports of required tests) as to the kind and quality of materials and equipment. All materials and equipment shall be applied, installed, connected, erected, used, cleaned, and conditioned in accordance with the instructions of the applicable Supplier except as otherwise provided in the Contract Documents; but no provision of any such instructions will be effective to assign to the DEPARTMENT or any of the DEPARTMENT's Consultants, agents or employees, any duty or authority to supervise or direct the furnishing or performance of the Work or any duty or authority to undertake responsibility contrary to the provisions of paragraphs 2.3 or 2.4.

6.6 Anticipated Schedules:

- 6.6.1 Within fourteen (14) calendar days after the date of the Notice to Proceed, the CONTRACTOR shall submit to the Contracting Officer for review an anticipated progress schedule indicating the starting and completion dates of the various stages of the Work. No individual stage of work shall exceed fourteen (14) calendar days.

- 6.6.2 Within twenty one (21) days after the date of the Notice to Proceed, the CONTRACTOR shall submit to the Contracting Officer for review an anticipated schedule of Shop Drawing submissions
- 6.6.3 Prior to submitting the CONTRACTOR's first Application for Payment, the CONTRACTOR shall submit for review and approval:

Anticipated Schedule of Values for all of the Work which will include quantities and prices of items aggregating the Contract Price and will subdivide the Work into component parts in sufficient detail to serve as the basis for progress payments during construction. Such prices will include an appropriate amount of overhead and profit applicable to each item of Work which will be confirmed in writing by the CONTRACTOR at the time of submission.

6.7 Finalizing Schedules:

Prior to processing the first Application for Payment the Contracting Officer and the CONTRACTOR will finalize schedules required by paragraph 6.6. The finalized progress schedule will be acceptable to the DEPARTMENT as providing information related to the orderly progression of the Work to completion within the Contract Time; but such acceptance will neither impose on the DEPARTMENT nor relieve the CONTRACTOR from full responsibility for the progress or scheduling of the Work. If accepted, the finalized schedule of Shop Drawing and other required submissions will be acknowledgment by the DEPARTMENT as providing a workable arrangement for processing the submissions. If accepted, the finalized Schedule of Values will be acknowledgment by the DEPARTMENT as an approximation of anticipated value of Work accomplished over the anticipated Contract Time. Receipt and acceptance of a schedule submitted by the CONTRACTOR shall not be construed to assign responsibility for performance or contingencies to the DEPARTMENT or relieve the CONTRACTOR of his responsibility to adjust his forces, equipment, and work schedules as may be necessary to insure completion of the Work within prescribed Contract Time. Should the prosecution of the Work be discontinued for any reason, the CONTRACTOR shall notify the Contracting Officer at least 24 hours in advance of resuming operations.

6.8 Adjusting Schedules:

Upon substantial changes to the schedule or upon request the CONTRACTOR shall submit to the Contracting Officer for acceptance (to the extent indicated in paragraph 6.7 and the General Requirements) adjustments in the schedules to reflect the actual present and anticipated progress of the Work.

6.9 Substitutes or "Or-Equal" Items:

- 6.9.1 Whenever materials or equipment are specified or described in the Contract Documents by using the name of a proprietary item or the name of a particular Supplier the naming of the item is intended to establish the type, function and quality required. Unless the name is followed by words indicating that substitution is limited or not permitted, materials or equipment of other Suppliers may be accepted by the Contracting Officer only if sufficient information is submitted by the CONTRACTOR which clearly demonstrates to the Contracting Officer that the material or equipment proposed is equivalent or equal in all aspects to that named. The procedure for review by the Contracting Officer will include the following as supplemented in the General Requirements.
- 6.9.2 Requests for review of substitute items of material and equipment will not be accepted by the Contracting Officer from anyone other than the CONTRACTOR.

- 6.9.3 If the CONTRACTOR wishes to furnish or use a substitute item of material or equipment, the CONTRACTOR shall make written application to the Contracting Officer for Approval thereof, certifying that the proposed substitute will perform adequately the functions and achieve the results called for by the general design, be similar and of equal substance to that specified and be suited to the same use as the specified. The application will state that the evaluation and Approval of the proposed substitute will not delay the CONTRACTOR's timely achievement of Substantial or Final Completion, whether or not acceptance of the substitute for use in the Work will require a change in any of the Contract Documents (or in the provisions of any other direct contract with the DEPARTMENT for Work on the Project) to adapt the design to the proposed substitute and whether or not incorporation or use of the substitute in connection with the Work is subject to payment of any license fee or royalty.
- 6.9.4 All variations of the proposed substitute from that specified will be identified in the application and available maintenance, repair and replacement service will be indicated. The application will also contain an itemized estimate of all costs that will result directly or indirectly from acceptance of such substitute, including costs of redesign and claims of other contractors affected by the resulting change, all of which shall be considered by the DEPARTMENT in evaluating the proposed substitute. The DEPARTMENT may require the CONTRACTOR to furnish at the CONTRACTOR's expense additional data about the proposed substitute. The Contracting Officer may reject any substitution request which the Contracting Officer determines is not in the best interest of the DEPARTMENT.
- 6.9.5 Substitutions shall be permitted during or after the bid period as allowed and in accordance with Document 00020 - Invitation for Bids, Document 00700 – General Conditions, and Document 01630 - Product Options and Substitutions.

6.10 Substitute Means and Methods:

If a specific means, method, technique, sequence or procedure of construction is indicated in or required by the Contract Documents, the CONTRACTOR may furnish or utilize a substitute means, method, sequence, technique or procedure of construction acceptable to the Contracting Officer, if the CONTRACTOR submits sufficient information to allow the Contracting Officer to determine that the substitute proposed is equivalent to that indicated or required by the Contract Documents. The procedure for review by the Contracting Officer will be similar to that provided in paragraph 6.9 as applied by the Contracting Officer and as may be supplemented in the General Requirements.

6.11 Evaluation of Substitution:

The Contracting Officer will be allowed a reasonable time within which to evaluate each proposed substitute. The Contracting Officer will be the sole judge of acceptability, and no substitute will be ordered, installed or utilized without the Contracting Officer's prior written Approval which will be evidenced by either a Change Order or a Shop Drawing Approved in accordance with Sections 6.20 and 6.21. The Contracting Officer may require the CONTRACTOR to furnish at the CONTRACTOR's expense a special performance guarantee or other Surety with respect to any substitute.

6.12 Dividing the Work:

The divisions and sections of the Specifications and the identifications of any Drawings shall not control the CONTRACTOR in dividing the Work among Subcontractors or Suppliers or delineating the Work to be performed by any specific trade.

6.13 Subcontractors:

The CONTRACTOR may utilize the services of appropriately licensed Subcontractors on those parts of the Work which, under normal contracting practices, are performed by Subcontractors, in accordance with the following conditions:

- 6.13.1 The CONTRACTOR shall not award any Work to any Subcontractor without prior written Approval of the Contracting Officer. This Approval will not be given until the CONTRACTOR submits to the Contracting Officer a written statement concerning the proposed award to the Subcontractor which shall contain required Equal Employment Opportunity documents, evidence of insurance whose limits are acceptable to the CONTRACTOR, and an executed copy of the subcontract. All subcontracts shall contain provisions for prompt payment, release of retainage, and interest on late payment amounts and retainage as specified in A.S. 36.90.210. Contracts between subcontractors, regardless of tier, must also contain these provisions. No acceptance by the Contracting Officer of any such Subcontractor shall constitute a waiver of any right of the DEPARTMENT to reject Defective Work.
- 6.13.2 The CONTRACTOR shall be fully responsible to the DEPARTMENT for all acts and omissions of the Subcontractors, Suppliers and other persons and organizations performing or furnishing any of the Work under a direct or indirect contract with CONTRACTOR just as CONTRACTOR is responsible for CONTRACTOR's own acts and omissions.
- 6.13.3 All Work performed for CONTRACTOR by a Subcontractor will be pursuant to an appropriate written agreement between CONTRACTOR and the Subcontractor which specifically binds the Subcontractor to the applicable terms and conditions of the Contract Documents for the benefit of the DEPARTMENT and contains waiver provisions as required by paragraph 13.17 and termination provisions as required by Article 14.
- 6.13.4 Nothing in the Contract Documents shall create any contractual relationship between the DEPARTMENT and any such Subcontractor, Supplier or other person or organization, nor shall it create any obligation on the part of the DEPARTMENT to pay or to see to the payment of any moneys due any such Subcontractor, Supplier or other person or organization except as may otherwise be required by Regulatory Requirements. The DEPARTMENT will not undertake to settle any differences between or among the CONTRACTOR, Subcontractors, or Suppliers.
- 6.13.5 The CONTRACTOR and Subcontractors shall coordinate their work and cooperate with other trades so to facilitate general progress of Work. Each trade shall afford other trades every reasonable opportunity for installation of their work and storage of materials. If cooperative work of one trade must be altered due to lack of proper supervision, or failure to make proper provisions in time by another trade, such conditions shall be remedied by the CONTRACTOR with no change in Contract Price or Contract Time.
- 6.13.6 The CONTRACTOR shall include on his own payrolls any person or persons working on this Contract who are not covered by written subcontract, and shall ensure that all Subcontractors include on their payrolls all persons performing Work under the direction of the Subcontractor.

6.14 Use of Premises:

The CONTRACTOR shall confine construction equipment, the storage of materials and equipment and the operations of workers to the Project limits and approved remote storage sites and lands and areas identified in and permitted by Regulatory Requirements, rights-of-way, permits and easements, and shall not unreasonably encumber the premises with construction equipment or other materials or equipment. The CONTRACTOR shall assume full responsibility for any damage to any such land or area, or to the owner or occupant thereof or of any land or areas contiguous thereto, resulting from the performance of the Work. Should any claim be made against the DEPARTMENT by any such owner or occupant because of the performance of the Work, the CONTRACTOR shall hold the DEPARTMENT harmless.

6.15 Structural Loading:

The CONTRACTOR shall not load nor permit any part of any structure to be loaded in any manner that will endanger the structure, nor shall the CONTRACTOR subject any part of the Work or adjacent property to stresses or pressures that will endanger it.

6.16 Record Documents:

The CONTRACTOR shall maintain in a safe place at the site one record copy of all Drawings, Specifications, Addenda, Directives, Change Orders, Supplemental Agreements, and written interpretations and clarifications (issued pursuant to paragraph 3.6) in good order and annotated to show all changes made during construction. These record documents together with all Approved samples and a counterpart of all Approved Shop Drawings will be available to the Contracting Officer for reference and copying. Upon completion of the Work, the annotated record documents, samples and Shop Drawings will be delivered to the Contracting Officer. Record documents shall accurately record variations in the Work which vary from requirements shown or indicated in the Contract Documents.

6.17 Safety and Protection:

The CONTRACTOR alone shall be responsible for initiating, maintaining and supervising all safety precautions and programs in connection with the Work. The CONTRACTOR shall take all necessary precautions for the safety of, and shall provide the necessary protection to prevent damage, injury or loss to:

- 6.17.1 All employees on the Work and other persons and organizations who may be affected thereby;
- 6.17.2 All the Work and materials and equipment to be incorporated therein, whether in storage on or off the site; and
- 6.17.3 Other property at the site or adjacent thereto, including trees, shrubs, lawns, walks, pavements, roadways, structures, and utilities not designated for removal, relocation or replacement in the course of construction.

The CONTRACTOR shall comply with all applicable Regulatory Requirements of any public body having jurisdiction for the safety of persons or property or to protect them from damage, injury or loss; and shall erect and maintain all necessary safeguards for such safety and protection. The CONTRACTOR shall notify owners of adjacent property and utility owners when prosecution of the Work may affect them, and shall cooperate with them in the protection, removal, relocation and replacement of their property. All damage, injury or loss to any property caused, directly or indirectly, in whole or in part, by the CONTRACTOR, any Subcontractor, Supplier or any other person or organization directly or indirectly employed by any of them to perform or furnish any of the Work or anyone for whose acts any of them may be liable, shall be remedied by the CONTRACTOR with no change in Contract Price or Contract Time except as stated in 4.6, except damage or loss attributable to unforeseeable causes beyond the control of and without the fault or negligence of the CONTRACTOR, including but not restricted to acts of God, of the public enemy or governmental authorities. The CONTRACTOR's duties and responsibilities for the safety and protection of the Work shall continue until Final Acceptance (except as otherwise expressly provided in connection with Substantial Completion).

6.18 Safety Representative:

The CONTRACTOR shall designate a responsible safety representative at the site. This person shall be the CONTRACTOR's superintendent unless otherwise designated in writing by the CONTRACTOR to the Contracting Officer.

6.19 Emergencies:

In emergencies affecting the safety or protection of persons or the Work or property at the site or adjacent thereto, the CONTRACTOR, without special instruction or authorization from the DEPARTMENT, is obligated to act to prevent threatened damage, injury or loss. The CONTRACTOR shall give the Contracting Officer prompt written notice if the CONTRACTOR believes that any significant changes in the Work or variations from the Contract Documents have been caused thereby. If the DEPARTMENT determines that a change in the Contract Documents is required because of the action taken in response to an emergency, a change will be authorized by one of the methods indicated in Paragraph 9.2, as determined appropriate by the Contracting Officer.

6.20 Shop Drawings and Samples:

- 6.20.1 After checking and verifying all field measurements and after complying with applicable procedures specified in the General Requirements, the CONTRACTOR shall submit to the Contracting Officer for review and Approval in accordance with the accepted schedule of Shop Drawing submissions the required number of all Shop Drawings, which will bear a stamp or specific written indication that the CONTRACTOR has satisfied CONTRACTOR's responsibilities under the Contract Documents with respect to the review of the submission. All submissions will be identified as the Contracting Officer may require. The data shown on the Shop Drawings will be complete with respect to quantities, dimensions, specified performance and design criteria, materials and similar data to enable the Contracting Officer to review the information as required.
- 6.20.2 The CONTRACTOR shall also submit to the Contracting Officer for review and Approval with such promptness as to cause no delay in Work, all samples required by the Contract Documents. All samples will have been checked by and accompanied by a specific written indication that the CONTRACTOR has satisfied CONTRACTOR's responsibilities under the Contract Documents with respect to the review of the submission and will be identified clearly as to material, Supplier, pertinent data such as catalog numbers and the use for which intended.
- 6.20.3 Before submission of each Shop Drawing or sample the CONTRACTOR shall have determined and verified all quantities, dimensions, specified performance criteria, installation requirements, materials, catalog numbers and similar data with respect thereto and reviewed or coordinated each Shop Drawing or sample with other Shop Drawings and samples and with the requirements of the Work and the Contract Documents.
- 6.20.4 At the time of each submission the CONTRACTOR shall give the Contracting Officer specific written notice of each variation that the Shop Drawings or samples may have from the requirements of the Contract Documents, and, in addition, shall cause a specific notation to be made on each Shop Drawing submitted to the Contracting Officer for review and Approval of each such variation. All variations of the proposed Shop Drawing from that specified will be identified in the submission and available maintenance, repair and replacement service will be indicated. The submittal will also contain an itemized estimate of all costs that will result directly or indirectly from acceptance of such variation, including costs of redesign and claims of other Contractors affected by the resulting change, all of which shall be considered by the DEPARTMENT in evaluating the proposed variation. If the variation may result in a change of Contract Time or Price, or Contract responsibility, and is not minor in nature; the CONTRACTOR must submit a written request for Change Order with the variation to notify the DEPARTMENT of his intent. The DEPARTMENT may require the CONTRACTOR to furnish at the CONTRACTOR's expense additional data about the proposed variation. The Contracting Officer may reject any variation request which the Contracting Officer determines is not in the best interest of the DEPARTMENT.

6.21 Shop Drawing and Sample Review:

- 6.21.1 The Contracting Officer will review with reasonable promptness Shop Drawings and samples, but the Contracting Officer's review will be only for conformance with the design concept of the Project and for compliance with the information given in the Contract Documents and shall not extend to means, methods, techniques, sequences or procedures of construction (except where a specific means, method, technique, sequence or procedure of construction is indicated in or required by the Contract Documents) or to safety precautions or programs incident thereto. The review of a separate item as such will not indicate acceptance of the assembly in which the item functions. The CONTRACTOR shall make corrections required by the Contracting Officer and shall return the required number of corrected copies of Shop Drawings and submit as required new samples for review. The CONTRACTOR shall direct specific attention in writing to revisions other than the corrections called for by the Contracting Officer on previous submittals.
- 6.21.2 The Contracting Officer's review of Shop Drawings or samples shall not relieve CONTRACTOR from responsibility for any variation from the requirements of the Contract Documents unless the CONTRACTOR has in writing advised the Contracting Officer of each such variation at the time of submission as required by paragraph 6.20.4. The Contracting Officer if he so determines, may give written Approval of each such variation by Change Order, except that, if the variation is minor and no Change Order has been requested a

specific written notation thereof incorporated in or accompanying the Shop Drawing or sample review comments shall suffice as a modification. Approval by the Contracting Officer will not relieve the CONTRACTOR from responsibility for errors or omissions in the Shop Drawings or from responsibility for having complied with the provisions of paragraph 6.20.3.

- 6.21.3 The DEPARTMENT shall be responsible for all DEPARTMENT review costs resulting from the initial submission and the first resubmittal. The CONTRACTOR shall, at the discretion of the Contracting Agency, pay all review costs incurred by the DEPARTMENT as a result of any additional re-submittals.
- 6.21.4 Where a Shop Drawing or sample is required by the Specifications, any related Work performed prior to the Contracting Officer's review and Approval of the pertinent submission will be the sole expense and responsibility of the CONTRACTOR.

6.22 Maintenance During Construction:

The CONTRACTOR shall maintain the Work during construction and until Substantial Completion, at which time the responsibility for maintenance shall be established in accordance with paragraph 13.10.

6.23 Continuing the Work:

The CONTRACTOR shall carry on the Work and adhere to the progress schedule during all disputes or disagreements with the DEPARTMENT. No Work shall be delayed or postponed pending resolution of any disputes, disagreements, or claims except as the CONTRACTOR and the Contracting Officer may otherwise agree in writing.

6.24 Consent to Assignment:

The CONTRACTOR shall obtain the prior written consent of the Contracting Officer to any proposed assignment of any interest in, or part of this Contract. The consent to any assignment or transfer shall not operate to relieve the CONTRACTOR or his Sureties of any of his or its obligations under this Contract or the Performance Bonds. Nothing herein contained shall be construed to hinder, prevent, or affect an assignment of monies due, or to become due hereunder, made for the benefit of the CONTRACTOR's creditors pursuant to law.

6.25 Use of Explosives:

- 6.25.1 When the use of explosives is necessary for the prosecution of the Work, the CONTRACTOR shall exercise the utmost care not to endanger life or property, including new Work and shall follow all Regulatory Requirements applicable to the use of explosives. The CONTRACTOR shall be responsible for all damage resulting from the use of explosives.
- 6.25.2 All explosives shall be stored in a secure manner in compliance with all Regulatory Requirements, and all such storage places shall be clearly marked. Where no Regulatory Requirements apply, safe storage shall be provided not closer than 1,000 feet from any building, camping area, or place of human occupancy.
- 6.25.3 The CONTRACTOR shall notify each public utility owner having structures in proximity to the site of his intention to use explosives. Such notice shall be given sufficiently in advance to enable utility owners to take such steps as they may deem necessary to protect their property from injury. However, the CONTRACTOR shall be responsible for all damage resulting from the use of the explosives, whether or not, utility owners act to protect their property.

6.26 CONTRACTOR's Records:

- 6.26.1 Records of the CONTRACTOR and Subcontractors relating to personnel, payrolls, invoices of materials, and any and all other data relevant to the performance of this Contract, must be kept on a generally recognized accounting system. Such records must be available during normal work hours to the Contracting Officer for purposes of investigation to ascertain compliance with Regulatory Requirements and provisions of the Contract

Documents.

- 6.26.2 Payroll records must contain the name and address of each employee, his correct classification, rate of pay, daily and weekly number of hours of work, deductions made, and actual wages paid. The CONTRACTOR and Subcontractors shall make employment records available for inspection by the Contracting Officer and representatives of the U.S. and/or State Department of Labor and will permit such representatives to interview employees during working hours on the Project.
- 6.26.3 Records of all communications between the DEPARTMENT and the CONTRACTOR and other parties, where such communications affected performance of this Contract, must be kept by the CONTRACTOR and maintained for a period of three years from Final Acceptance. The DEPARTMENT or its assigned representative may perform an audit of these records during normal work hours after written notice to the CONTRACTOR.
- 6.27 Load Restrictions

The CONTRACTOR shall comply with all load restrictions as set forth in the "Administrative Permit Manual", and Title 17, Chapter 25, of the Alaska Administrative Code in the hauling of materials on public roads, beyond the limits of the project, and on all public roads within the project limits that are scheduled to remain in use upon completion of the project.

Overload permits may, at the discretion of the State, be issued for travel beyond the project limits for purposes of mobilization and/or demobilization. Issuance of such a permit will not relieve the CONTRACTOR of liability for damage which may result from the moving of equipment.

The operation of equipment of such weight or so loaded as to cause damage to any type of construction will not be permitted. No overloads will be permitted on the base course or surface course under construction. No loads will be permitted on a concrete pavement, base or structure before the expiration of the curing period. The CONTRACTOR shall be responsible for all damage done by his equipment.

ARTICLE 7 - LAWS AND REGULATIONS

7.1 Laws to be Observed

The CONTRACTOR shall keep fully informed of all federal and state Regulatory Requirements and all orders and decrees of bodies or tribunals having any jurisdiction or authority, which in any manner affect those engaged or employed on the Work, or which in any way affect the conduct of the Work. The CONTRACTOR shall at all times observe and comply with all such Regulatory Requirements, orders and decrees; and shall protect and indemnify the DEPARTMENT and its representatives against claim or liability arising from or based on the violation of any such Regulatory Requirement, order, or decree whether by the CONTRACTOR, Subcontractor, or any employee of either. Except where otherwise expressly required by applicable Regulatory Requirements, the DEPARTMENT shall not be responsible for monitoring CONTRACTOR's compliance with any Regulatory Requirements.

7.2 Permits, Licenses, and Taxes

- 7.2.1 The CONTRACTOR shall procure all permits and licenses, pay all charges, fees and taxes, and give all notices necessary and incidental to the due and lawful prosecution of the Work. As a condition of performance of this Contract, the CONTRACTOR shall pay all federal, state and local taxes incurred by the CONTRACTOR, in the performance of this Contract. Proof of payment of these taxes is a condition precedent to final payment by the DEPARTMENT under this Contract.
- 7.2.2 The CONTRACTOR's certification that taxes have been paid (as contained in the *Release of Contract*) will be verified with the Department of Revenue and Department of Labor, prior to final payment.
- 7.2.3 If any federal, state or local tax is imposed, charged, or repealed after the date of bid opening and is made applicable to and paid by the CONTRACTOR on the articles or supplies herein contracted for, then the Contract shall be increased or decreased accordingly by a Change Order.

7.3 Patented Devices, Materials and Processes

If the CONTRACTOR employs any design, device, material, or process covered by letters of patent, trademark or copyright, the CONTRACTOR shall provide for such use by suitable legal agreement with the patentee or owner. The CONTRACTOR and the Surety shall indemnify and save harmless the DEPARTMENT, any affected third party, or political subdivision from any and all claims for infringement by reason of the use of any such patented design, device, material or process, or any trademark or copyright, and shall indemnify the DEPARTMENT for any costs, expenses, and damages which it may be obliged to pay by reason of any infringement, at any time during the prosecution or after the completion of the Work.

7.4 Compliance of Specifications and Drawings:

If the CONTRACTOR observes that the Specifications and Drawings supplied by the DEPARTMENT are at variance with any Regulatory Requirements, CONTRACTOR shall give the Contracting Officer prompt written notice thereof, and any necessary changes will be authorized by one of the methods indicated in paragraph 9.2. as determined appropriate by the Contracting Officer. If the CONTRACTOR performs any Work knowing or having reason to know that it is contrary to such Regulatory Requirements, and without such notice to the Contracting Officer, the CONTRACTOR shall bear all costs arising therefrom; however, it shall not be the CONTRACTOR's primary responsibility to make certain that the Specifications and Drawings supplied by the DEPARTMENT are in accordance with such Regulatory Requirements.

7.5 Accident Prevention:

The CONTRACTOR shall comply with AS 18.60.075 and all pertinent provisions of the Construction Code Occupational Safety and Health Standards issued by the Alaska Department of Labor.

7.6 Sanitary Provisions:

The CONTRACTOR shall provide and maintain in a neat and sanitary condition such accommodations for the use of his employees and DEPARTMENT representatives as may be necessary to comply with the requirements of the State and local Boards of Health, or of other bodies or tribunals having jurisdiction.

7.7 Business Registration:

Comply with AS 08.18.011, as follows: "it is unlawful for a person to submit a bid or work as a contractor until he has been issued a certificate of registration by the Department of Commerce. A partnership or joint venture shall be considered registered if one of the general partners or venturers whose name appears in the name under which the partnership or venture does business is registered."

7.8 Professional Registration and Certification:

All craft trades, architects, engineers and land surveyors, electrical administrators, and explosive handlers employed under the Contract shall specifically comply with applicable provisions of AS 08.18, 08.48, 08.40, and 08.52. Provide copies of individual licenses within seven days following a request from the Contracting Officer.

7.9 Local Building Codes:

The CONTRACTOR shall comply with AS 35.10.025 which requires construction in accordance with applicable local building codes to include the obtaining of required permits.

7.10 Air Quality Control:

The CONTRACTOR shall comply with all applicable provisions of AS 46.03.04 as pertains to Air Pollution Control.

7.11 Archaeological or Paleontological Discoveries:

When the CONTRACTOR's operation encounters prehistoric artifacts, burials, remains of dwelling sites, or paleontological remains, such as shell heaps, land or sea mammal bones or tusks, the CONTRACTOR shall cease operations immediately and notify the Contracting Officer. No artifacts or specimens shall be further disturbed or removed from the ground and no further operations shall be performed at the site until so directed. Should the Contracting Officer order suspension of the CONTRACTOR's operations in order to protect an archaeological or historical finding, or order the CONTRACTOR to perform extra Work, such shall be covered by an appropriate Contract change document.

7.12 Applicable Alaska Preferences:

- 7.12.1 In determining the low bidder for State funded projects, a 5% bid preference has been given to "Alaska bidders", as required under AS 36.30.170. "Alaska bidder" means a person who:
- (1) holds a current Alaska business license;
 - (2) submits a bid for goods, services, or construction under the name as appearing on the person's current Alaska business license
 - (3) has maintained a place of business within the state staffed by the bidder or an employee of the bidder for a period of six months immediately preceding the date of the bid;
 - (4) is incorporated or qualified to do business under the laws of the state, is a sole proprietorship, and the proprietor is a resident of the state or is a partnership, and all partners are residents of the state; and
 - (5) if a joint venture, is composed entirely of ventures that qualify under (1) through (4), above.
- 7.12.2 In determining the low bidder for State funded projects, an "Alaska products" preference has been given as required under AS 36.30.326 - 36.30.332, when the bidder designates the use of Alaska products. The Bidder shall complete the Alaska Products Preference Worksheet per its instructions and submit it with the Bid

Proposal. If the successful Bidder/CONTRACTOR proposes to use an Alaska product and does not do so, a penalty will be assessed against the successful Bidder/CONTRACTOR in an amount equal to the product preference percentage granted to the successful Bidder/CONTRACTOR plus one percent multiplied by the total declared value of the Alaska products proposed but not used.

- 7.12.3 Pursuant to AS 36.15.050 and AS 36.30.322, "agricultural/wood" products harvested in Alaska shall be used in State funded projects whenever they are priced no more than seven percent above agricultural/wood products harvested outside the state and are of a like quality as compared with agricultural/wood products harvested outside the state, when such products are not utilized, the CONTRACTOR shall document the efforts he made towards obtaining agricultural/wood products harvested in Alaska and include in this documentation a written statement that he contacted the manufacturers and suppliers identified on the Department of Commerce and Economic Development's list of suppliers of Alaska forest products concerning the availability of agricultural/wood products harvested in Alaska and, if available, the product prices. The CONTRACTOR's use of agricultural/wood products that fail to meet the requirements of this section shall be subject to the provisions of paragraphs 12.6 through 12.9 relating to Defective Work.
- 7.12.4 The CONTRACTOR shall maintain records, in a format acceptable to the Contracting Officer, which establish the type and extent of "agricultural/wood" and "Alaska" products utilized. All record keeping and documentation associated with the requirements 7.12.2 and 7.12.3 of this paragraph, must be provided to the DEPARTMENT upon written request or as otherwise provided within the Contract Documents.

7.13 Wages and Hours of Labor:

- 7.13.1 One certified copy of all payrolls shall be submitted weekly to the State Department of Labor and, upon request, to the Contracting Officer to assure compliance with AS 36.05.040, *Filing Schedule of Employees Wages Paid and Other Information*. The CONTRACTOR shall be responsible for the submission of certified copies of payrolls of all Subcontractors. The certification shall affirm that the payrolls are current and complete, that the wage rates contained therein are not less than the applicable rates referenced in these Contract Documents, and that the classification set forth for each laborer or mechanic conforms with the Work he performed. The CONTRACTOR and his Subcontractors shall attend all hearings and conferences and produce such books, papers, and documents all as requested by the Department of Labor. Should federal funds be involved, the appropriate federal agency shall also receive a copy of the CONTRACTOR's certified payrolls. Regardless of project funding source, copies of all certified payrolls supplied to the State Department of Labor by the CONTRACTOR shall be supplied also to the Project Manager upon request, including submittals made by, or on behalf of, subcontractors.
- 7.13.2 The following labor provisions shall also apply to this Contract:
- a. The CONTRACTOR and his Subcontractors shall pay all employees unconditionally and not less than once a week;
 - b. wages may not be less than those stated under AS 36.05.010, regardless of the contractual relationship between the CONTRACTOR or Subcontractors and laborers, mechanics, or field surveyors;
 - c. the scale of wages to be paid shall be posted by the CONTRACTOR in a prominent and easily accessible place at the site of the Work;
 - d. the DEPARTMENT shall withhold so much of the accrued payments as is necessary to pay to laborers, mechanics, or field surveyors employed by the CONTRACTOR or Subcontractors the difference between
 1. the rates of wages required by the Contract to be paid laborers, mechanics, or field surveyors on the Work, and
 2. the rates of wages in fact received by laborers, mechanics or field surveyors.

- 7.13.3 Within three calendar days of award of a construction contract, the CONTRACTOR shall file a "Notice of Work" with the Department of Labor and shall pay all related fees. The Contracting Officer will not issue Notice to Proceed to the CONTRACTOR until such notice and fees have been paid to the State Department of Labor. Failure of the CONTRACTOR to file the Notice of Work and pay fees within this timeframe shall not constitute grounds for an extension of contract time or adjustment of contract price.

7.14 Overtime Work Hours and Compensation:

Pursuant to 40 U.S.C. 327-330 and AS 23.10.060 -.110, the CONTRACTOR shall not require nor permit any laborer or mechanic in any workweek in which he is employed on any Work under this Contract to work in excess of eight hours in any Calendar Day or in excess of forty hours in such workweek on Work subject to the provisions of the *Contract Work Hours and Safety Standards Act* unless such laborer or mechanic receives compensation at a rate not less than one and one half times his basic rate of pay for all such hours worked in excess of eight hours in any Calendar Day or in excess of forty hours in such workweek whichever is the greater number of overtime hours. In the event of any violation of this provision, the CONTRACTOR shall be liable to any affected employee for any amounts due and penalties and to the DEPARTMENT for liquidated damages. Such liquidated damages shall be computed with respect to each individual laborer or mechanic employed in violation of this provision in the sum of \$10.00 for each Calendar Day on which such employee was required or permitted to be employed on such Work in excess of eight hours or in excess of the standard workweek of forty hours without payment of the overtime wages required by this paragraph.

ARTICLE 8 - OTHER WORK

8.1 Related Work at Site:

- 8.1.1 The DEPARTMENT reserves the right at any time to contract for and perform other or additional work on or near the Work covered by the Contract.
- 8.1.2 When separate contracts are let within the limits of the Project, the CONTRACTOR shall conduct his Work so as not to interfere with or hinder the work being performed by other contractors. The CONTRACTOR when working on the same Project with other contractors shall cooperate with such other contractors. The CONTRACTOR shall join his Work with that of the others in an acceptable manner and shall perform it in proper sequence to that of others.
- 8.1.3 If the fact that other such work is to be performed is identified or shown in the Contract Documents the CONTRACTOR shall assume all liability, financial or otherwise, in connection with this Contract and indemnify and save harmless the DEPARTMENT from any and all damages or claims that may arise because of inconvenience, delay, or loss experienced by the CONTRACTOR because of the presence and operations of other contractors.
- 8.1.4 If the fact that such other work is to be performed was not identified or shown in the Contract Documents, written notice thereof will be given to the CONTRACTOR prior to starting any such other work. If the CONTRACTOR believes that such performance will require an increase in Contract Price or Contract Time, the CONTRACTOR shall notify the Contracting Officer of such required increase within fifteen (15) calendar days following receipt of the Contracting Officer's notice. Should the Contracting Officer find such increase(s) to be justified, a Change Order will be executed.

8.2 Access, Cutting, and Patching:

The CONTRACTOR shall afford each utility owner and any other contractor who is a party to such a direct contract with the DEPARTMENT (or the DEPARTMENT, if the DEPARTMENT is performing the additional work with the DEPARTMENT's employees) proper and safe access to the site and a reasonable opportunity for the introduction and storage of materials and equipment and the execution of such work, and shall properly connect and coordinate the Work with the work of others. The CONTRACTOR shall do all cutting, fitting and patching of the Work that may be required to make its several parts come together properly and integrate with such other work, the CONTRACTOR shall not endanger any work of others by cutting, excavating or otherwise altering their work and will only cut or alter such other work with the written consent of the Contracting Officer. The duties and responsibilities of the CONTRACTOR under this paragraph are for the benefit of other contractors to the extent that there are comparable provisions for the benefit of the CONTRACTOR in said direct contracts between the DEPARTMENT and other contractors.

8.3 Defective Work by Others:

If any part of the CONTRACTOR's Work depends for proper execution or results upon the work of any such other contractor, utility owner, or the DEPARTMENT, the CONTRACTOR shall inspect and promptly report to the Contracting Officer in writing any delays, defects or deficiencies in such work that render it unavailable or unsuitable for such proper execution and results. The CONTRACTOR's failure to so report will constitute an acceptance of the other work as fit and proper for integration with CONTRACTOR's Work except for latent or nonapparent defects and deficiencies in the other work.

8.4 Coordination:

If the DEPARTMENT contracts with others for the performance of other work at the site, Contracting Officer will have authority and responsibility for coordination of the activities among the various prime contractors.

ARTICLE 9 - CHANGES

9.1 DEPARTMENT's Right to Change:

Without invalidating the Contract and without notice to any Surety, the DEPARTMENT may, at any time or from time to time, order additions, deletions or revisions in the Work within the general scope of the Contract, including but not limited to changes:

- 9.1.1 In the Contract Documents;
- 9.1.2 In the method or manner of performance of the Work;
- 9.1.3 In State-furnished facilities, equipment, materials, services, or site;
- 9.1.4 Directing acceleration in the performance of the Work.

9.2 Authorization of Changes within the General Scope:

Additions, deletions, or revisions in the Work within the general scope of the Contract as specified in 9.1 shall be authorized by one or more of following ways:

- 9.2.1 Directive (pursuant to paragraph 9.3)
- 9.2.2 A Change Order (pursuant to paragraph 9.4)
- 9.2.3 DEPARTMENT's acceptance of Shop Drawing variations from the Contract Documents as specifically identified by the CONTRACTOR as required by paragraph 6.20.4.

9.3 Directive:

- 9.3.1 The Contracting Officer shall provide written clarification or interpretation of the Contract Documents (pursuant to paragraph 3.6).
- 9.3.2 The Contracting Officer may authorize minor variations in the Work from the requirements of the Contract Documents which do not involve an adjustment in the Contract Price or the Contract Time and are consistent with the overall intent of the Contract Documents.
- 9.3.3 The Contracting Officer may order the Contractor to correct Defective Work or methods which are not in conformance with the Contract Documents.
- 9.3.4 The Contracting Officer may direct the commencement or suspension of Work or emergency related Work (as provided in paragraph 6.19).
- 9.3.5 Upon the issuance of a Directive to the CONTRACTOR by the Contracting Officer, the CONTRACTOR shall proceed with the performance of the Work as prescribed by such Directive.
- 9.3.6 If the CONTRACTOR believes that the changes noted in a Directive may cause an increase in the Contract Price or an extension of Contract Time, the CONTRACTOR shall immediately provide written notice to the Contracting Officer depicting such increases before proceeding with the Directive, except in the case of an emergency. If the Contracting Officer finds the increase in Contract Price or the extension of Contract Time justified, a Change Order will be issued. If however, the Contracting Officer does not find that a Change Order is justified, the Contracting Officer may direct the CONTRACTOR to proceed with the Work. The CONTRACTOR shall cooperate with the Contracting Officer in keeping complete daily records of the cost of such Work. If a Change Order is ultimately determined to be justified, in the absence of agreed prices and unit prices, payment for such Work will be made on a "cost of the work basis" as provided in 10.4

9.4 Change Order:

A change in Contract Time, Contract Price, or responsibility may be made for changes within the scope of the Work by Change Order. Upon receipt of an executed Change Order, the CONTRACTOR shall promptly proceed with the Work involved which will be performed under the applicable conditions of the Contract Documents except as otherwise specifically provided. Changes in Contract Price and Contract Time shall be made in accordance with Articles 10 and 11. A Change Order shall be considered executed when it is signed by the DEPARTMENT.

9.5 Shop Drawing Variations:

Variations by shop drawings shall only be eligible for consideration under 9.4 when the conditions affecting the price, time, or responsibility are identified by the CONTRACTOR in writing and a request for a Change Order is submitted as per 6.20.4.

9.6 Changes Outside the General Scope; Supplemental Agreement:

Any change which is outside the general scope of the Contract, as determined by the Contracting Officer, must be authorized by a Supplemental Agreement signed by the appropriate representatives of the DEPARTMENT and the CONTRACTOR.

9.7 Unauthorized Work:

The CONTRACTOR shall not be entitled to an increase in the Contract Price or an extension of the Contract Time with respect to any work performed that is not required by the Contract Documents as amended, modified and supplemented as provided in this Article 9, except in the case of an emergency as provided in paragraph 6.19 and except in the case of uncovering Work as provided in paragraph 12.4.2.

9.8 Notification of Surety:

If notice of any change affecting the general scope of the Work or the provisions of the Contract Documents (including, but not limited to, Contract Price or Contract Time) is required by the provisions of any bond to be given to a Surety, the giving of any such notice will be the CONTRACTOR's responsibility, and the amount of each applicable bond will be adjusted accordingly.

9.9 Differing Site Conditions:

- 9.9.1 The CONTRACTOR shall promptly, and before such conditions are disturbed (except in an emergency as permitted by paragraph 6.19), notify the Contracting Officer in writing of: (1) subsurface or latent physical conditions at the site differing materially from those indicated in the Contract, and which could not have been discovered by a careful examination of the site, or (2) unknown physical conditions at the site, of an unusual nature, differing materially from those ordinarily encountered and generally recognized as inherent in work of the character provided for in this Contract. The Contracting Officer shall promptly investigate the conditions, and if the Contracting Officer finds that such conditions do materially so differ and cause an increase or decrease in the CONTRACTOR's cost of, or time required for, performance of this Contract, an adjustment shall be made and the Contract modified in writing accordingly. An adjustment in compensation shall be computed under Article 10.
- 9.9.2 Any claim for additional compensation by the CONTRACTOR under this clause shall be made in accordance with Article 15. In the event that the Contracting Officer and the CONTRACTOR are unable to reach an agreement concerning an alleged differing site condition, the CONTRACTOR will be required to keep an accurate and detailed record which will indicate the actual "cost of the work" done under the alleged differing site condition. Failure to keep such a record shall be a bar to any recovery by reason of such alleged differing site conditions. The Contracting Officer shall be given the opportunity to supervise and check the keeping of such records.

9.10 **Interim Work Authorization:**

An Interim Work Authorization may be used to establish a change within the scope of the Work; however, only a Change Order shall establish associated changes in Contract Time and Price. Work authorized by Interim Work Authorization shall be converted to a Change Order. The basis of payment shall be as stated in the Interim Work Authorization, unless it states that the basis of payment has not been established and is to be negotiated, in which case the Cost of the Work shall be documented pursuant to Article 10.4, to establish a basis for negotiating a lump sum price for the Change Order.

ARTICLE 10 - CONTRACT PRICE; COMPUTATION AND CHANGE

10.1 Contract Price:

The Contract Price constitutes the total compensation (subject to authorized adjustments) payable to the CONTRACTOR for performing the Work. All duties, responsibilities and obligations assigned to or undertaken by the CONTRACTOR shall be at his expense without change in the Contract Price. The Contract Price may only be changed by a Change Order or Supplemental Agreement.

10.2 Claim for Price Change:

Any claim for an increase or decrease in the Contract Price shall be submitted in accordance with the terms of Article 15, and shall not be allowed unless notice requirements of this Contract have been met.

10.3 Change Order Price Determination:

The value of any Work covered by a Change Order for an increase or decrease in the Contract Price shall be determined in one of the following ways:

- 10.3.1 Where the Work involved is covered by unit prices contained in the Contract Documents, by application of unit prices to the quantities of the items involved (subject to the provisions of subparagraphs 10.9.1 through 10.9.3, inclusive).
- 10.3.2 By mutual acceptance of a lump sum (fixed price) which includes overhead and profit. The lump sum (fixed price) shall be negotiated on the basis of the estimated "cost of the work" in accordance with Articles 10.4 and 10.5. The following maximum rates of cost markup (to cover both overhead and profit of the CONTRACTOR) shall be used in the negotiation of a Lump Sum Change Order:
 - a. For costs incurred under paragraphs 10.4.1 and 10.4.2, the CONTRACTOR's fee shall be twenty percent;
 - b. For costs incurred under paragraph 10.4.3, the CONTRACTOR's fee shall be ten percent; and if a subcontract is on the basis of "cost of the work" plus a fee, the maximum allowable to CONTRACTOR on account of overhead and profit for itself and all Subcontractors and multiple tiers thereof shall be fifteen percent of the cost incurred by the subcontractor actually performing the work;
 - c. No fee shall be payable on the basis of costs itemized under paragraphs 10.4.4, 10.4.5 and 10.5;
 - d. The amount of credit to be allowed by the CONTRACTOR to the DEPARTMENT for any such change which results in a net decrease in cost will be the amount of the actual net decrease plus a deduction in CONTRACTOR's fee by an amount equal to twenty percent of the net decrease; and
 - e. When both additions and credits are involved in any one change, the adjustment in CONTRACTOR's fee shall be computed on the basis of the net change in accordance with paragraphs 10.3.2.a through 10.3.2.d, inclusive
- 10.3.3 When 10.3.1 and 10.3.2 are inapplicable, on the basis of the "cost of the work" (determined as provided in paragraphs 10.4 and 10.5) plus a CONTRACTOR's fee for overhead and profit (determined as provided in paragraph 10.6).
- 10.3.4 Before a Change Order or Supplemental Agreement is Approved, the CONTRACTOR shall submit cost or pricing data regarding the changed or extra Work. The CONTRACTOR shall certify that the data submitted is, to his best knowledge and belief, accurate, complete and current as of a mutually determined specified date and that such data will continue to be accurate and complete during the performance of the changed or extra Work.

10.4 Cost of the Work:

The term "cost of the work" means the sum of all costs necessarily incurred and paid by the CONTRACTOR in the proper performance of the Work. Except as otherwise may be agreed to in writing by the DEPARTMENT, such costs shall be in amount no higher than those prevailing in the locality of the Project, shall include only the following items and shall not include any of the costs itemized in subparagraph 10.5:

- 10.4.1 Payroll costs for employees in the direct employ of the CONTRACTOR in the performance of the Work under schedules of job classifications agreed upon by the DEPARTMENT and the CONTRACTOR. Payroll costs for employees not employed full time on the Work shall be apportioned on the basis of their time spent on the Work. Payroll costs shall be limited to, salaries and wages plus the cost of fringe benefits which shall include social security contributions, unemployment, excise and payroll taxes, workers' or workmen's compensation, health and retirement benefits, bonuses, sick leave, vacation and holiday pay applicable thereto. Such employees shall include manual workers up through the level of foreman but shall not include general foremen, superintendents, and non-manual employees. The expenses of performing Work after regular working hours, on Saturday, Sunday or legal holidays, shall be included in the above to the extent authorized by the DEPARTMENT.
- 10.4.2 Cost of all materials and equipment furnished and incorporated or consumed in the Work, including costs of transportation and storage thereof, and Suppliers' field services required in connection therewith. All cash discounts shall accrue to the CONTRACTOR unless the DEPARTMENT deposits funds with the CONTRACTOR with which to make payments, in which case the cash discounts shall accrue to the DEPARTMENT. All trade discounts, rebates and refunds and all returns from sale of surplus materials and equipment shall accrue to the DEPARTMENT, and the CONTRACTOR shall make provisions so that they may be obtained.
- 10.4.3 Payments made by the CONTRACTOR to Subcontractors for Work performed by Subcontractors. If required by the DEPARTMENT, CONTRACTOR shall obtain competitive quotes from Subcontractors or Suppliers acceptable to the CONTRACTOR and shall deliver such quotes to the DEPARTMENT who will then determine which quotes will be accepted. If a subcontract provides that the Subcontractor is to be paid on the basis of "cost of the work" plus a fee, the Subcontractor's "cost of the work" shall be determined in the same manner as the CONTRACTOR's "cost of work" as described in paragraphs 10.4 through 10.5; and the Subcontractor's fee shall be established as provided for under subparagraph 10.6.2 clause b. All subcontracts shall be subject to the other provisions of the Contract Documents insofar as applicable.
- 10.4.4 Costs of special consultants (including but not limited to engineers, architects, testing laboratories, and surveyors) employed for services necessary for the completion of the Work.
- 10.4.5 Supplemental costs including the following:
 - a. The proportion of necessary transportation, travel and subsistence expenses of the CONTRACTOR's employees incurred in discharge of duties connected with the Work.
 - b. Cost, including transportation and maintenance, of all materials, supplies, equipment, machinery, appliances, office and temporary facilities at the site and hand tools not owned by the workers, which are consumed in the performance of the Work, and cost less market value of such items used but not consumed which remain the property of the CONTRACTOR.
 - c. Rentals of all construction equipment and machinery and the parts thereof whether rented from the CONTRACTOR or others in accordance with rental agreements Approved by the DEPARTMENT and the costs of transportation, loading, unloading, installation, dismantling and removal thereof - all in accordance with terms of said rental agreements. The rental of any such equipment, machinery or parts shall cease when the use thereof is no longer necessary for the Work.

For any machinery or special equipment (other than small tools) which has been authorized by the Project

Manager, the CONTRACTOR shall receive the rental rates in the current edition and appropriate volume of the "Rental Rate Blue Book for Construction Equipment", published by Dataquest, Inc., 1290 Ridder Park Drive, San Jose, CA 95131. Hourly rental rates shall be determined as follows:

The established hourly rental rate shall be equal to the adjusted monthly rate for the basic equipment plus the adjusted monthly rate for applicable attachments, both divided by 176, and multiplied by the area adjustment factor, plus the estimated hourly operating cost.

The adjusted monthly rate is that resulting from application of the rate adjustment formula in order to eliminate replacement cost allowances in machine depreciation and contingency cost allowances.

Attachments shall not be included unless required for the time and materials work.

For equipment not listed in The Blue Book, the CONTRACTOR shall receive a rental rate as agreed upon before such work is begun. If agreement cannot be reached, the DEPARTMENT reserves the right to establish a rate based on similar equipment in the Blue Book or prevailing commercial rates in the area.

These rates shall apply for equipment used during the CONTRACTOR's regular shift of 10 hours per day. Where the equipment is used more than 10 hours per day, either on the CONTRACTOR's normal work or on time and materials, and either on single or multiple shifts, an overtime rate, computed as follows, shall apply:

The hourly overtime rate shall be equal to the adjusted monthly rate for the basic equipment plus the adjusted monthly rate for applicable attachments, both divided by 352, and multiplied by the area adjustment factor, plus the estimated hourly operating cost.

Equipment which must be rented or leased specifically for work required under this section shall be authorized in writing by the Project Manager. The CONTRACTOR shall be paid invoice price plus 15%.

When it is necessary to obtain equipment from sources beyond the project limits exclusively for time and materials, work, the actual cost of transferring the equipment to the site of the work and return will be allowed as an additional item of expense. Where the move is made by common carrier, the move-in allowance will be limited to the amount of the freight bill or invoice. If the CONTRACTOR hauls the equipment with his own forces, the allowance will be limited to the rental rate for the hauling unit plus operator wages. In the event that the equipment is transferred under its own power, the moving allowance will be limited to one-half of the normal hourly rental rate plus operator's wages. In the event that the move-out is to a different location, payment will in no instance exceed the amount of the move-in. Move-in allowance shall not be made for equipment brought to the project for time and materials work which is subsequently retained on the project and utilized for completion of contract items, camp maintenance, or related work.

Equipment ordered to be on a stand-by basis shall be paid for at the stand-by rental rate for the number of hours in the CONTRACTOR'S normal work shift, but not to exceed 8 hours per day. The stand-by rental rate shall be computed as follows:

The hourly stand-by rate shall be equal to the adjusted monthly rate for the basic equipment plus the adjusted monthly rate for applicable attachments, both divided by 352, all multiplied by the area adjustment factor.

Time will be recorded to the nearest one-quarter hour for purposes of computing compensation to the CONTRACTOR for equipment utilized under these rates.

The equipment rates as determined above shall be full compensation, including overhead and profit, for providing the required equipment and no additional compensation will be made for other costs such as, but not limited to, fuels, lubricants, replacement parts or maintenance costs. Cost of repairs, both major and minor, as well as charges for mechanic's time utilized in servicing equipment to ready it for use prior to moving to the project and similar charges will not be allowed.

- d. Sales, consumer, use or similar taxes related to the Work, and for which the CONTRACTOR is liable, imposed by Regulatory Requirements.
- e. Deposits lost for causes other than negligence of the CONTRACTOR, any Subcontractor or anyone directly or indirectly employed by any of them or for whose acts any of them may be liable, and royalty payments and fees for permits and licenses.
- f. Losses and damages (and related expenses), not compensated by insurance or otherwise, to the Work or otherwise sustained by the CONTRACTOR in connection with the performance and furnishing of the Work provided they have resulted from causes other than the negligence of the CONTRACTOR, any Subcontractor, or anyone directly or indirectly employed by any of them or for whose acts any of them may be liable. Such losses shall include settlements made with the written consent and Approval of the DEPARTMENT. No such losses, damages and expenses shall be included in the "cost of the work" for the purpose of determining the CONTRACTOR's fee. If, however, any such loss or damage requires reconstruction and the CONTRACTOR is placed in charge thereof, the CONTRACTOR shall be paid for services a fee proportionate to that stated in paragraphs 10.6.2.a and 10.6.2.b.
- g. The cost of utilities, fuel and sanitary facilities at the site.
- h. Minor expenses such as telegrams, long distance telephone calls, telephone service at the site, expressage and similar petty cash items in connection with the Work.
- I. Cost of premiums for additional bonds and insurance required because of changes in the Work and premiums for property insurance coverage within the limits of the deductible amounts established by the DEPARTMENT in accordance with Article 5.

10.5 Excluded Costs:

The term "cost of the work" shall not include any of the following:

- 10.5.1 Payroll costs and other compensation of CONTRACTOR's officers, executives, principals (of partnership and sole proprietorships), general managers, engineers, architects, estimators, attorneys, auditors, accountants, purchasing and contracting agency, expeditors, timekeepers, clerks and other personnel employed by CONTRACTOR whether at the site or in CONTRACTOR's principal or a branch office for general administration of the Work and not specifically included in the agreed upon schedule of job classifications referred to in paragraph 10.4.1 or specifically covered by paragraph 10.4.4 all of which are to be considered administrative costs covered by the CONTRACTOR's fee.
- 10.5.2 Expenses of CONTRACTOR's principal and branch offices other than CONTRACTOR's office at the site.
- 10.5.3 Any part of CONTRACTOR's capital expenses including interest on CONTRACTOR's capital employed for the Work and charges against CONTRACTOR for delinquent payments.
- 10.5.4 Cost of premiums for all bonds and for all insurance whether or not CONTRACTOR is required by the Contract Documents to purchase and maintain the same (except for the cost of premiums covered by subparagraph 10.4.5.i above).
- 10.5.5 Costs due to the negligence of CONTRACTOR, any Subcontractor, or anyone directly or indirectly employed by any of them or for whose acts any of them may be liable, including but not limited to, the correction of Defective Work, disposal of materials or equipment wrongly supplied and making good any damage to property.
- 10.5.6 Other overhead or general expense costs of any kind and the costs of any item not specifically and expressly included in paragraph 10.4.

10.6 CONTRACTOR's Fee:

The CONTRACTOR's fee allowed to CONTRACTOR for overhead and profit shall be determined as follows.

10.6.1 A mutually acceptable fixed fee; or if none can be agreed upon.

10.6.2 A fee based on the following percentages of the various portions of the "cost of the work":

- a. For costs incurred under paragraphs 10.4.1 and 10.4.2, the CONTRACTOR's fee shall be fifteen percent;
- b. For costs incurred under paragraph 10.4.3, the CONTRACTOR's fee shall be ten percent; and if a subcontract is on the basis of "cost of the work" plus a fee, the maximum allowable to CONTRACTOR on account of overhead and profit for itself and all Subcontractors and multiple tiers thereof shall be fifteen percent of the cost incurred by the subcontractor actually performing the work;
- c. No fee shall be payable on the basis of costs itemized under paragraphs 10.4.4, 10.4.5 and 10.5;
- d. The amount of credit to be allowed by the CONTRACTOR to the DEPARTMENT for any such change which results in a net decrease in cost will be the amount of the actual net decrease plus a deduction in CONTRACTOR's fee by an amount equal to fifteen percent of the net decrease; and
- e. When both additions and credits are involved in any one change, the adjustment in CONTRACTOR's fee shall be computed on the basis of the net change in accordance with paragraphs 10.6.2.a through 10.6.2.d, inclusive.

10.7 Cost Breakdown:

Whenever the cost of any Work is to be determined pursuant to paragraphs 10.4 and 10.5, the CONTRACTOR will submit in a form acceptable to the DEPARTMENT an itemized cost breakdown together with supporting data.

10.8 Cash Allowances:

It is understood that CONTRACTOR has included in the Contract Price all allowances so named in the Contract Documents and shall cause the Work so covered to be done by such Subcontractors or Suppliers and for such sums within the limit of the allowances as may be acceptable to the Contracting Officer. CONTRACTOR agrees that:

- 10.8.1 The allowances include the cost to CONTRACTOR (less any applicable trade discounts) of materials and equipment required by the allowances to be delivered at the site, and all applicable taxes; and
- 10.8.2 CONTRACTOR's cost for unloading and handling on the site, labor, installation costs, overhead, profit and other expenses contemplated for the allowances have been included in the Contract Price and not in the allowances. No demand for additional payment on account of any thereof will be valid.

Prior to final payment, an appropriate Change Order will be issued to reflect actual amounts due the CONTRACTOR on account of Work covered by allowances, and the Contract Price shall be correspondingly adjusted.

10.9 Unit Price Work:

- 10.9.1 Where the Contract Documents provide that all or part of the Work is to be Unit Price Work, initially the Contract Price will be deemed to include for all Unit Price Work an amount equal to the sum of the established unit prices for each separately identified item of Unit Price Work times the estimated quantity of each item as indicated in the Contract. The estimated quantities of items of Unit Price Work are not guaranteed and are solely for the purpose of comparison of bids and determining an initial Contract Price. Determinations of the actual quantities and classifications of Unit Price Work performed by the CONTRACTOR will be made by the

DEPARTMENT in accordance with paragraph 10.10.

- 10.9.2 Each unit price will be deemed to include an amount considered by the CONTRACTOR to be adequate to cover the CONTRACTOR's overhead and profit for each separately identified item. If the "Basis of Payment" clause in the Contract Documents relating to any unit price in the bid schedule requires that the said unit price cover and be considered compensation for certain work or material essential to the item, this same work or material will not also be measured or paid for under any other pay item which may appear elsewhere in the Contract Documents.
- 10.9.3 Payment to the CONTRACTOR shall be made only for the actual quantities of Work performed and accepted or materials furnished, in conformance with the Contract Documents. When the accepted quantities of Work or materials vary from the quantities stated in the bid schedule, or change documents, the CONTRACTOR shall accept as payment in full, payment at the stated unit prices for the accepted quantities of Work and materials furnished, completed and accepted; except as provided below:
- a. When the quantity of Work to be done or material to be furnished under any item, for which the total cost of the item exceeds 10% of the total Contract Price, is increased by more than 25 percent of the quantity stated in the bid schedule, or change documents, either party to the Contract, upon demand, shall be entitled to an equitable unit price adjustment on that portion of the Work above 125 percent of the quantity stated in the bid schedule.
 - b. When the quantity of Work to be done or material to be furnished under any major item, for which the total cost of the item exceeds 10% of the total Contract Price, is decreased by more than 25 percent of the quantity stated in the bid schedule, or change documents either party to the Contract, upon demand, shall be entitled to an equitable price adjustment for the quantity of Work performed or material furnished, limited to a total payment of not more than 75 percent of the amount originally bid for the item.

10.10 Determinations for Unit Prices:

The Contracting Officer will determine the actual quantities and classifications of Unit Price Work performed by the CONTRACTOR. The Contracting Officer will review with the CONTRACTOR preliminary determinations on such matters before finalizing the costs and quantities on the Schedule of Values. The Contracting Officer's acknowledgment thereof will be final and binding on the CONTRACTOR, unless, within 10 days after the date of any such decisions, the CONTRACTOR delivers to the Contracting Officer written notice of intention to appeal from such a decision.

ARTICLE 11 - CONTRACT TIME; COMPUTATION AND CHANGE

11.1 Commencement of Contract Time; Notice to Proceed:

The Contract Time will commence to run on the day indicated in the Notice to Proceed.

11.2 Starting the Work:

No Work on Contract items shall be performed before the effective date of the Notice to Proceed. The CONTRACTOR shall notify the Contracting Officer at least 24 hours in advance of the time actual construction operations will begin. The CONTRACTOR may request a limited Notice to Proceed after Award has been made, to permit him to order long lead materials which could cause delays in Project completion. However, granting is within the sole discretion of the Contracting Officer, and refusal or failure to grant a limited Notice to Proceed shall not be a basis for claiming for delay, extension of time, or alteration of price.

11.3 Computation of Contract Time:

- 11.3.1 When the Contract Time is specified on a Calendar Day basis, all Work under the Contract shall be completed within the number of Calendar Days specified. The count of Contract Time begins on the day following receipt of the Notice to Proceed by the CONTRACTOR, if no starting day is stipulated therein.

Calendar Days shall continue to be counted against Contract Time until and including the date of Substantial Completion of the Work.

- 11.3.2 When the Contract completion time is specified as a fixed calendar date, it shall be the date of Substantial Completion.

- 11.3.3 The Contract Time shall be as stated on form 25D-9, Proposal.

11.4 Time Change:

The Contract Time may only be changed by a Change Order or Supplemental Agreement.

11.5 Extension Due to Delays:

The right of the CONTRACTOR to proceed shall not be terminated nor the CONTRACTOR charged with liquidated or actual damages because of delays to the completion of the Work due to unforeseeable causes beyond the control and without the fault or negligence of the CONTRACTOR, including, but not restricted to the following: acts of God or of the public enemy, acts of the DEPARTMENT in its contractual capacity, acts of another contractor in the performance of a contract with the DEPARTMENT, floods, fires, epidemics, quarantine restrictions, strikes, freight embargoes, unusually severe weather and delays of Subcontractors or Suppliers due to such causes. Any delay in receipt of materials on the site, caused by other than one of the specifically mentioned occurrences above, does not of itself justify a time extension, provided that the CONTRACTOR shall within twenty four (24) hours from the beginning of any such delay (unless the Contracting Officer shall grant a further period of the time prior to the date of final settlement of the Contract), notify the Contracting Officer in writing of the cause of delay. The Contracting Officer shall ascertain the facts and the extent of the delay and extend the time for completing the Work when the findings of fact justify such an extension.

11.6 Essence of Contract:

All time limits stated in the Contract Documents are of the essence of the Contract.

11.7 Reasonable Completion Time:

It is expressly understood and agreed by and between the CONTRACTOR and the DEPARTMENT that the date of

beginning and the time for Substantial Completion of the Work described herein are reasonable times for the completion of the Work.

11.8 Delay Damages:

Whether or not the CONTRACTOR's right to proceed with the Work is terminated, he and his Sureties shall be liable for damages resulting from his refusal or failure to complete the Work within the specified time.

Liquidated and actual damages for delay shall be paid by the CONTRACTOR or his Surety to the DEPARTMENT in the amount as specified in the Supplementary Conditions for each Calendar Day the completion of the Work or any part thereof is delayed beyond the time required by the Contract, or any extension thereof. If a listing of incidents resulting from a delay and expected to give rise to actual or liquidated damages is not established by the Contract Documents, then the CONTRACTOR and his Surety shall be liable to the DEPARTMENT for any actual damages occasioned by such delay. The CONTRACTOR acknowledges that the liquidated damages established herein are not a penalty but rather constitute an estimate of damages that the DEPARTMENT will sustain by reason of delayed completion. These liquidated and actual damages are intended as compensation for losses anticipated to arise, and include those items enumerated in the Supplementary Conditions.

These damages will continue to run both before and after termination in the event of default termination. These liquidated damages do not cover excess costs of completion or DEPARTMENT costs, fees, and charges related to reprocurement. If a default termination occurs, the CONTRACTOR or his Surety shall pay in addition to these damages, all excess costs and expenses related to completion as provided by Article 14.2.5.

ARTICLE 12 - QUALITY ASSURANCE

12.1 Warranty and Guaranty:

The CONTRACTOR warrants and guarantees to the DEPARTMENT that all Work will be in accordance with the Contract Documents and will not be Defective. Prompt notice of all defects shall be given to the CONTRACTOR. All Defective Work, whether or not in place, may be rejected, corrected or accepted as provided for in this article.

12.2 Access to Work:

The DEPARTMENT and the DEPARTMENT's representatives, testing agencies and governmental agencies with jurisdiction interests will have access to the Work at reasonable times for their observation, inspecting and testing. The CONTRACTOR shall provide proper and safe conditions for such access.

12.3 Tests and Inspections:

- 12.3.1 The CONTRACTOR shall give the Contracting Officer timely notice of readiness of the Work for all required inspections, tests or Approvals.
- 12.3.2 If Regulatory Requirements of any public body having jurisdiction require any Work (or part thereof) to specifically be inspected, tested or approved, the CONTRACTOR shall assume full responsibility therefor, pay all costs in connection therewith and furnish the Contracting Officer the required certificates of inspection, testing or approval. The CONTRACTOR shall also be responsible for and shall pay all costs in connection with any inspection or testing required in connection with DEPARTMENT's acceptance of a Supplier of materials or equipment proposed to be incorporated in the Work, or of materials or equipment submitted for Approval prior to the CONTRACTOR's purchase thereof for incorporation in the Work. The cost of all inspections, tests and approvals in addition to the above which are required by the Contract Documents shall be paid by the CONTRACTOR. The DEPARTMENT may perform additional tests and inspections which it deems necessary to insure quality control. All such failed tests or inspections shall be at the CONTRACTOR's expense.
- 12.3.4 If any Work (including the work of others) that is to be inspected, tested or Approved is covered without written concurrence of the Contracting Officer, it must, if requested by the Contracting Officer, be uncovered for observation. Such uncovering shall be at the CONTRACTOR's expense unless the CONTRACTOR has given the Contracting Officer timely notice of CONTRACTOR's intention to cover the same and the Contracting Officer has not acted with reasonable promptness in response to such notice.
- 12.3.5 Neither observations nor inspections, tests or Approvals by the DEPARTMENT or others shall relieve the CONTRACTOR from the CONTRACTOR's obligations to perform the Work in accordance with the Contract Documents.

12.4 Uncovering Work:

- 12.4.1 If any Work is covered contrary to the written request of the Contracting Officer, it must, if requested by the Contracting Officer, be uncovered for the Contracting Officer's observation and replaced at the CONTRACTOR's expense.

- 12.4.2 If the Contracting Officer considers it necessary or advisable that covered Work be observed inspected or tested, the CONTRACTOR, at the Contracting Officer's request, shall uncover, expose or otherwise make available for observation, inspection or testing as the Contracting Officer may require, that portion of the Work in question, furnishing all necessary labor, material and equipment. If it is found that such Work is Defective, the CONTRACTOR shall bear all direct, indirect and consequential costs of such uncovering, exposure, observation, inspection and testing and of satisfactory reconstruction, (including but not limited to fees and charges of engineers, architects, attorneys and other professionals) and the DEPARTMENT shall be entitled to an appropriate decrease in the Contract Price. If, however, such Work is not found to be Defective, the CONTRACTOR shall be allowed an increase in the Contract Price or an extension of the Contract Time, or both, directly attributable to such uncovering, exposure, observation, inspection, testing and reconstruction.

12.5 DEPARTMENT May Stop the Work:

If the Work is Defective, or the CONTRACTOR fails to supply suitable materials or equipment, or fails to furnish or perform the Work in such a way that the completed Work will conform to the Contract Documents, the Contracting Officer may order the CONTRACTOR to stop the Work, or any portion thereof, until the cause for such order has been eliminated; however, this right of the Contracting Officer to stop the Work shall not give rise to any duty on the part of the Contracting Officer to exercise this right for the benefit of the CONTRACTOR or any other party.

12.6 Correction or Removal of Defective Work:

If required by the Contracting Officer, the CONTRACTOR shall promptly, as directed, either correct all Defective Work, whether or not fabricated, installed or completed, or, if the Work has been rejected by the Contracting Officer, remove it from the site and replace it with Work which conforms to the requirements of the Contract Documents. The CONTRACTOR shall bear all direct, indirect and consequential costs of such correction or removal (including but not limited to fees and charges of engineers, architects, attorneys and other professionals) made necessary thereby.

12.7 One Year Correction Period:

If within one year after the date of Substantial Completion of the relevant portion of the work or such longer period of time as may be prescribed by Regulatory Requirements or by the terms of any applicable special guarantee required by the Contract Documents or by any specific provision of the Contract Documents, any Work is found to be Defective, the CONTRACTOR shall promptly, without cost to the DEPARTMENT and in accordance with the Contracting Officer's written instructions, either correct such Defective Work, or, if it has been rejected by the Contracting Officer, remove it from the site and replace it with conforming Work. If the CONTRACTOR does not promptly comply with the terms of such instructions, or in an emergency where delay would cause serious risk of loss or damage, the DEPARTMENT may have the Defective Work corrected or the rejected Work removed and replaced, and all direct, indirect and consequential costs of such removal and replacement (including but not limited to fees and charges of engineers, architects, attorneys and other professionals) will be paid by the CONTRACTOR. In special circumstances where a particular item of equipment is placed in continuous service for the benefit of the DEPARTMENT before Substantial Completion of all the Work, the correction period for that item may begin on an earlier date if so provided in the Specifications or by Change Order. Provisions of this paragraph are not intended to shorten the statute of limitations for bringing an action.

12.8 Acceptance of Defective Work:

Instead of requiring correction or removal and replacement of Defective Work, the Contracting Officer may accept Defective Work, the CONTRACTOR shall bear all direct, indirect and consequential costs attributable to the Contracting Officer's evaluation of and determination to accept such Defective Work (costs to include but not be limited to fees and charges of engineers, architects, attorneys and other professionals). If any such acceptance occurs prior to final payment, a Change Order will be issued incorporating the necessary revisions in the Contract Documents with respect to the Work; and the DEPARTMENT shall be entitled to an appropriate decrease in the Contract Price. If the DEPARTMENT has already made final payment to the CONTRACTOR, an appropriate amount shall be paid by the CONTRACTOR or his Surety to the DEPARTMENT.

12.9 DEPARTMENT May Correct Defective Work:

If the CONTRACTOR fails within a reasonable time after written notice from the Contracting Officer to proceed to correct Defective Work or to remove and replace rejected Work as required by the Contracting Officer in accordance with paragraph 12.6, or if the CONTRACTOR fails to perform the Work in accordance with the Contract Documents, or if the CONTRACTOR fails to comply with any other provision of the Contract Documents, the DEPARTMENT may, after 7 days' written notice to the CONTRACTOR, correct and remedy any such deficiency. In exercising the rights and remedies under this paragraph the DEPARTMENT shall proceed expeditiously. To the extent necessary to complete corrective and remedial action, the Contracting Officer may exclude the CONTRACTOR from all or part of the site, take possession of all or part of the Work, and suspend the CONTRACTOR's services related thereto, take possession of the CONTRACTOR's tools, appliances, construction equipment and machinery at the site and incorporate in the Work all materials and equipment stored at the site or approved remote storage sites or for which the DEPARTMENT has paid the CONTRACTOR but which are stored elsewhere. The CONTRACTOR shall allow the Contracting Officer and his authorized representatives such access to the site as may be necessary to enable the Contracting Officer to exercise the rights and remedies under this paragraph. All direct, indirect and consequential costs of the DEPARTMENT in exercising such rights and remedies will be charged against the CONTRACTOR, and a Change Order will be issued incorporating the necessary revisions in the Contract Documents with respect to the Work; and the DEPARTMENT shall be entitled to an appropriate decrease in the Contract Price. Such direct, indirect and consequential costs will include but not be limited to fees and charges of engineers, architects, attorneys and other professionals, all court and arbitration costs and all costs of repair and replacement of work of others destroyed or damaged by correction, removal or replacement of the CONTRACTOR's Defective Work. The CONTRACTOR shall not be allowed an extension of time because of any delay in performance of the work attributable to the exercise, by the Contracting Officer, of the DEPARTMENT's rights and remedies hereunder.

ARTICLE 13 - PAYMENTS TO CONTRACTOR AND COMPLETION

13.1 Schedule of Values:

The Schedule of Values established as provided in paragraph 6.6 will serve as the basis for progress payments and will be incorporated into a form of Application for Payment acceptable to the Contracting Officer. Progress payments on account of Unit Price Work will be based on the number of units completed.

13.2 Preliminary Payments:

Upon approval of the Schedule of Values the CONTRACTOR may be paid for direct costs substantiated by paid invoices and other prerequisite documents required by the General Requirements. Direct costs shall include the cost of bonds, insurance, approved materials stored on the site or at approved remote storage sites, deposits required by a Supplier prior to fabricating materials, and other approved direct mobilization costs substantiated as indicated above. These payments shall be included as a part of the total Contract Price as stated in the Contract.

13.3 Application for Progress Payment:

The CONTRACTOR shall submit to the Contracting Officer for review an Application for Payment filled out and signed by the CONTRACTOR covering the Work completed as of the date of the Application for Payment and accompanied by such supporting documentation as is required by the Contract Documents. Progress payments will be made as the Work progresses on a monthly basis.

13.4 Review of Applications for Progress Payment:

Contracting Officer will either indicate in writing a recommendation of payment or return the Application for Payment to the CONTRACTOR indicating in writing the Contracting Officer's reasons for refusing to recommend payment. In the latter case, the CONTRACTOR may make the necessary corrections and resubmit the Application for Payment.

13.5 Stored Materials and Equipment:

If payment is requested on the basis of materials and equipment not incorporated in the Work but delivered and suitably stored at the site or at another location agreed to in writing, the Application for Payment shall also be accompanied by a bill of sale, paid invoice or other documentation warranting that the DEPARTMENT has received the materials and equipment free and clear of all charges, security interests and encumbrances and evidence that the materials and equipment are covered by appropriate property insurance and other arrangements to protect the DEPARTMENT's interest therein, all of which will be satisfactory to the Contracting Officer. No payment will be made for perishable materials that could be rendered useless because of long storage periods. No progress payment will be made for living plant materials until planted.

13.6 CONTRACTOR's Warranty of Title:

The CONTRACTOR warrants and guarantees that title to all Work, materials and equipment covered by any Application for Payment, whether incorporated in the Project or not, will pass to the DEPARTMENT no later than the time of payment free and clear of any claims, liens, security interests and further obligations.

13.7 Withholding of Payments:

The DEPARTMENT may withhold or refuse payment for any of the reasons listed below provided it gives written notice of its intent to withhold and of the basis for withholding:

- 13.7.1 The Work is Defective, or completed Work has been damaged requiring correction or replacement, or has been installed without Approval of Shop Drawings, or by an unapproved Subcontractor, or for unsuitable storage of materials and equipment.

- 13.7.2 The Contract Price has been reduced by Change Order,
- 13.7.3 The DEPARTMENT has been required to correct Defective Work or complete Work in accordance with paragraph 12.9.
- 13.7.4 The DEPARTMENT's actual knowledge of the occurrence of any of the events enumerated in paragraphs 14.2.1.a through 14.2.1.k inclusive.
- 13.7.5 Claims have been made against the DEPARTMENT or against the funds held by the DEPARTMENT on account of the CONTRACTOR's actions or inactions in performing this Contract, or there are other items entitling the DEPARTMENT to a set off.
- 13.7.6 Subsequently discovered evidence or the results of subsequent inspections or test, nullify any previous payments for reasons stated in subparagraphs 13.7.1 through 13.7.5.
- 13.7.7 The CONTRACTOR has failed to fulfill or is in violation of any of his obligations under any provision of this Contract.

13.8 Retainage:

At any time the DEPARTMENT finds that satisfactory progress is not being made it may in addition to the amounts withheld under 13.7 retain a maximum amount equal to 10% of the total amount earned on all subsequent progress payments. This retainage may be released at such time as the Contracting Officer finds that satisfactory progress is being made.

13.9 Request for Release of Funds:

If the CONTRACTOR believes the basis for withholding is invalid or no longer exists, immediate written notice of the facts and Contract provisions on which the CONTRACTOR relies, shall be given to the DEPARTMENT, together with a request for release of funds and adequate documentary evidence proving that the problem has been cured. In the case of withholding which has occurred at the request of the Department of Labor, the CONTRACTOR shall provide a letter from the Department of Labor stating that withholding is no longer requested. Following such a submittal by the CONTRACTOR, the DEPARTMENT shall have a reasonable time to investigate and verify the facts and seek additional assurances before determining whether release of withheld payments is justified.

13.10 Substantial Completion:

When the CONTRACTOR considers the Work ready for its intended use the CONTRACTOR shall notify the Contracting Officer in writing that the Work or a portion of Work which has been specifically identified in the Contract Documents is substantially complete (except for items specifically listed by the CONTRACTOR as incomplete) and request that the DEPARTMENT issue a certificate of Substantial Completion. Within a reasonable time thereafter, the Contracting Officer, the CONTRACTOR and appropriate Consultant(s) shall make an inspection of the Work to determine the status of completion. If the Contracting Officer does not consider the Work substantially complete, the Contracting Officer will notify the CONTRACTOR in writing giving the reasons therefor. If the Contracting Officer considers the Work substantially complete, the Contracting Officer will within fourteen days execute and deliver to the CONTRACTOR a certificate of Substantial Completion with tentative list of items to be completed or corrected. At the time of delivery of the certificate of Substantial Completion the Contracting Officer will deliver to the CONTRACTOR a written division of responsibilities pending Final Completion with respect to security, operation, safety, maintenance, heat, utilities, insurance and warranties which shall be consistent with the terms of the Contract Documents.

The DEPARTMENT shall be responsible for all DEPARTMENT costs resulting from the initial inspection and the first re-inspection, the CONTRACTOR shall pay all costs incurred by the DEPARTMENT resulting from re-

inspections, thereafter.

13.11 Access Following Substantial Completion:

The DEPARTMENT shall have the right to exclude the CONTRACTOR from the Work after the date of Substantial Completion, but the DEPARTMENT shall allow CONTRACTOR reasonable access to complete or correct items on the tentative list.

13.12 Final Inspection:

Upon written notice from the CONTRACTOR that the entire Work or an agreed portion thereof is complete, the Contracting Officer will make a final inspection with the CONTRACTOR and appropriate Consultant(s) and will notify the CONTRACTOR in writing of all particulars in which this inspection reveals that the Work is incomplete or Defective. The CONTRACTOR shall immediately take such measures as are necessary to remedy such deficiencies. The CONTRACTOR shall pay for all costs incurred by the DEPARTMENT resulting from re-inspections.

13.13 Final Completion and Application for Payment:

After the CONTRACTOR has completed all such corrections to the satisfaction of the Contracting Officer and delivered all schedules, guarantees, bonds, certificates of payment to all laborers, Subcontractors and Suppliers, and other documents - all as required by the Contract Documents; and after the Contracting Officer has indicated in writing that the Work has met the requirements for Final Completion, and subject to the provisions of paragraph 13.18, the CONTRACTOR may make application for final payment following the procedure for progress payments. The final Application for Payment shall be accompanied by all remaining certificates, warranties, guarantees, releases, affidavits, and other documentation required by the Contract Documents.

13.14 Final Payment:

- 13.14.1 If on the basis of the Contracting Officer's observation of the Work during construction and final inspection, and the Contracting Officer's review of the final Application for Payment and accompanying documentation - all as required by the Contract Documents; and the Contracting Officer is satisfied that the Work has been completed and the CONTRACTOR's other obligations under the Contract Documents have been fulfilled, the DEPARTMENT will process final Application for Payment. Otherwise, the Contracting Officer will return the Application for Payment to the CONTRACTOR, indicating in writing the reasons for refusing to process final payment, in which case the CONTRACTOR shall make the necessary corrections and resubmit the final Application for Payment.
- 13.14.2 If, through no fault of the CONTRACTOR, Final Completion of the Work is significantly delayed, the Contracting Officer shall, upon receipt of the CONTRACTOR's final Application for Payment, and without terminating the Contract, make payment of the balance due for that portion of the Work fully completed and accepted. If the remaining balance to be held by the DEPARTMENT for Work not fully completed or corrected is less than the retainage provided for in paragraph 13.9, and if bonds have been furnished as required in paragraph 5.1, the written consent of the Surety to the payment of the balance due for that portion of the Work fully completed and accepted shall be submitted by the CONTRACTOR to the DEPARTMENT with the application for such payment. Such payment shall be made under the terms and conditions governing final payment, except that it shall not constitute a waiver of claims.

13.15 Final Acceptance:

Following certification of payment of payroll and revenue taxes, and final payment to the CONTRACTOR, the DEPARTMENT will issue a letter of Final Acceptance, releasing the CONTRACTOR from further obligations under the Contract, except as provided in paragraph 13.17.

13.16 CONTRACTOR's Continuing Obligation:

The CONTRACTOR's obligation to perform and complete the Work and pay all laborers, Subcontractors, and materialmen in accordance with the Contract Documents shall be absolute. Neither any progress or final payment by the DEPARTMENT, nor the issuance of a certificate of Substantial Completion, nor any use or occupancy of the Work or any part thereof by the DEPARTMENT or Using Agency, nor any act of acceptance by the DEPARTMENT nor any failure to do so, nor any review and Approval of a Shop Drawing or sample submission, nor any correction of Defective Work by the DEPARTMENT will constitute an acceptance of Work not in accordance with the Contract Documents or a release of the CONTRACTOR's obligation to perform the Work in accordance with the Contract Documents.

When it is anticipated that restarting, testing, adjusting, or balancing of systems will be required following Final Acceptance and said requirements are noted in Section(s) 01650, such Work shall constitute a continuing obligation under the Contract.

13.17 Waiver of Claims by CONTRACTOR:

The making and acceptance of final payment will constitute a waiver of all claims by the CONTRACTOR against the DEPARTMENT other than those previously made in writing and still unsettled.

13.18 No Waiver of Legal Rights:

The DEPARTMENT shall not be precluded or be estopped by any payment, measurement, estimate, or certificate made either before or after the completion and acceptance of the Work and payment therefor, from showing the true amount and character of the Work performed and materials furnished by the CONTRACTOR, nor from showing that any payment, measurement, estimate or certificate is untrue or is incorrectly made, or that the Work or materials are Defective. The DEPARTMENT shall not be precluded or estopped, notwithstanding any such measurement, estimate, or certificate and payment in accordance therewith, from recovering from the CONTRACTOR or his Sureties, or both, such damages as it may sustain by reason of his failure to comply with requirements of the Contract Documents. Neither the acceptance by the DEPARTMENT, or any representative of the DEPARTMENT, nor any payment for or acceptance of the whole or any part of the Work, nor any extension of the Contract Time, nor any possession taken by the DEPARTMENT, shall operate as a waiver of any portion of the Contract or of any power herein reserved, or of any right to damages. A waiver by the DEPARTMENT of any breach of the Contract shall not be held to be a waiver of any other subsequent breach.

ARTICLE 14 - SUSPENSION OF WORK, DEFAULT AND TERMINATION

14.1 DEPARTMENT May Suspend Work:

- 14.1.1 The DEPARTMENT may, at any time, suspend the Work or any portion thereof by notice in writing to the CONTRACTOR. If the Work is suspended without cause the CONTRACTOR shall be allowed an increase in the Contract Price or an extension of the Contract Time, or both, directly attributable to any suspension if the CONTRACTOR makes an Approved claim therefor as provided in Article 15. However, no adjustment shall be made under this clause for any suspension, delay, or interruption to the extent that suspension is due to the fault or negligence of the CONTRACTOR, or that suspension is necessary for Contract compliance, or that performance would have been so suspended, delayed, or interrupted by any other cause, including the fault or negligence of the CONTRACTOR.
- 14.1.2 In case of suspension of Work, the CONTRACTOR shall be responsible for preventing damage to or loss of any of the Work already performed and of all materials whether stored on or off the site or Approved remote storage sites.

14.2 Default of Contract:

- 14.2.1 The Contracting Officer may give the CONTRACTOR and its surety a written Notice to Cure Default if the CONTRACTOR:
- a. fails to begin work in the time specified,
 - b. fails to use sufficient resources to assure prompt completion of the work,
 - c. performs the work unsuitably or neglects or refuses to remove and replace rejected materials or work,
 - d. stops work,
 - e. fails to resume stopped work after receiving notice to do so,
 - f. becomes insolvent (except that if the CONTRACTOR declares bankruptcy, termination will be under Title 11 US Code 362 and/or 365. The CONTRACTOR'S bankruptcy does not relieve the surety of any obligations to assume the Contract and complete the work in a timely manner.
 - g. Allows any final judgment to stand against him unsatisfied for period of 60 days, or
 - h. Makes an assignment for the benefit of creditors without the consent of the Contracting Officer, or
 - i. Disregards Regulatory Requirements of any public body having jurisdiction, or
 - j. Otherwise violates in any substantial way any provisions of the Contract Documents, or
 - k. fails to comply with Contract minimum wage payments or civil rights requirements, or
 - l. is a party to fraud, deception, misrepresentation , or
 - m. for any cause whatsoever, fails to carry on the Work in an acceptable manner.
- 14.2.2 The Notice to Cure Default will detail the conditions determined to be in default, the time within which to cure the default and may, in the Contracting Officer's discretion, specify the actions necessary to cure the default. Failure to cure the delay, neglect or default within the time specified in the Contracting Officer's written notice to cure authorizes the DEPARTMENT to terminate the contract. The Contracting Officer may allow more time to cure than originally stated in the Notice to Cure Default if he deems it to be in the best interests of the DEPARTMENT. The DEPARTMENT will provide the CONTRACTOR or its surety with a written Notice of Default Termination that details the default and the failure to cure it.
- 14.2.3 If the CONTRACTOR or its Surety, within the time specified in the above notice of default, shall not proceed in accordance therewith, then the DEPARTMENT may, upon written notification from the Contracting Officer of the fact of such delay, neglect or default and the CONTRACTOR's failure to comply with such notice, have full power and authority without violating the Contract, to take the prosecution of the Work out of the hands of the CONTRACTOR. The DEPARTMENT may terminate the services of the CONTRACTOR, exclude the CONTRACTOR from the site and take possession of the Work and of all the CONTRACTOR's tools, appliances, construction equipment and machinery at the site and use the same to the full extent they could be

used by the CONTRACTOR (without liability to the CONTRACTOR for trespass or conversion), incorporate in the Work all materials and equipment stored at the site or for which the DEPARTMENT has paid the CONTRACTOR but which are stored elsewhere, and finish the Work as the DEPARTMENT may deem expedient. The DEPARTMENT may enter into an agreement for the completion of said Contract according to the terms and provisions thereof, or use such other methods that in the opinion of the Contracting Officer are required for the completion of said Contract in an acceptable manner.

- 14.2.4 The Contracting Officer may, by written notice to the CONTRACTOR and its Surety or its representative, transfer the employment of the Work from the CONTRACTOR to the Surety, or if the CONTRACTOR abandons the Work undertaken under the Contract, the Contracting Officer may, at its option with written notice to the Surety and without any written notice to the CONTRACTOR, transfer the employment for said Work directly to the Surety. The Surety shall submit its plan for completion of the Work, including any contracts or agreements with third parties for such completion, to the DEPARTMENT for approval prior to beginning completion of the Work. Approval of such contracts shall be in accordance with all applicable requirements and procedures for approval of subcontracts as stated in the Contract Documents.
- 14.2.5 After the notice of termination is issued, the DEPARTMENT may take over the work and complete it by contract or otherwise and may take possession of and use materials, appliances, equipment or plant on the work site necessary for completing the work.
- 14.2.6 Rather than taking over the work itself, the DEPARTMENT may transfer the obligation to perform the work from the CONTRACTOR to its surety. The surety must submit its plan for completion of the work, including any contracts or agreements with third parties for completion, to the DEPARTMENT for approval prior to beginning work. The surety must follow the Contract requirements for approval of subcontracts, except that the limitation on percent of work subcontracted will not apply.
- 14.2.7 On receipt of the transfer notice, the surety must take possession of all materials, tools, and appliances at the work site, employ an appropriate work force, and complete the Contract work, as specified. The Contract specifications and requirements shall remain in effect. However the DEPARTMENT will make subsequent Contract payments directly to the Surety for work performed under the terms of the Contract. The CONTRACTOR shall forfeit any right to claim for the same work or any part thereof. The CONTRACTOR shall not be entitled to receive any further balance of the amount to be paid under the Contract.
- 14.2.8 Upon receipt of the notice terminating the services of the CONTRACTOR, the Surety shall enter upon the premises and take possession of all materials, tools, and appliances thereon for the purpose of completing the Work included under the Contract and employ by contract or otherwise any person or persons to finish the Work and provide the materials therefore, without termination of the continuing full force and effect of this Contract. In case of such transfer of employment to the Surety, the Surety shall be paid in its own name on estimates covering Work subsequently performed under the terms of the Contract and according to the terms thereof without any right of the CONTRACTOR to make any claim for the same or any part thereof.
- 14.2.9 If the Contract is terminated for default, the CONTRACTOR and the Surety shall be jointly and severally liable for damages for delay as provided by paragraph 11.8, and for the excess cost of completion, and all costs and expenses incurred by the DEPARTMENT in completing the Work or arranging for completion of the Work, including but not limited to costs of assessing the Work to be done, costs associated with advertising, soliciting or negotiating for bids or proposals for completion, and other procurement costs. Following termination the CONTRACTOR shall not be entitled to receive any further balance of the amount to be paid under the Contract until the Work is fully finished and accepted, at which time if the unpaid balance exceeds the amount due the DEPARTMENT and any amounts due to persons for whose benefit the DEPARTMENT has withheld funds, such excess shall be paid by the DEPARTMENT to the CONTRACTOR. If the damages, costs, and expenses due the DEPARTMENT exceed the unpaid balance, the CONTRACTOR and its Surety shall pay the difference.
- 14.2.10 If, after notice of termination of the CONTRACTOR's right to proceed under the provisions of this clause, it is determined for any reason that the CONTRACTOR was not in default under the provisions of this clause, or that the delay was excusable under the provisions of this clause, or that termination was wrongful, the rights and obligations of the parties shall be determined in accordance with the clause providing for convenience termination.

14.3 Rights or Remedies:

Where the CONTRACTOR's services have been so terminated by the DEPARTMENT, the termination will not affect any rights or remedies of the DEPARTMENT against the CONTRACTOR then existing or which may thereafter accrue. Any retention or payment of moneys due the CONTRACTOR by the DEPARTMENT will not release the CONTRACTOR from liability.

14.4 Convenience Termination:

14.4.1 The performance of the Work may be terminated by the DEPARTMENT in accordance with this section in whole or in part, whenever, for any reason the Contracting Officer shall determine that such termination is in the best interest of the DEPARTMENT. Any such termination shall be effected by delivery to the CONTRACTOR of a Notice of Termination, specifying termination is for the convenience of the DEPARTMENT the extent to which performance of Work is terminated, and the date upon which such termination becomes effective.

14.4.2 Immediately upon receipt of a Notice of Termination and except as otherwise directed by the Contracting Officer, the CONTRACTOR shall:

- a. Stop Work on the date and to the extent specified in the Notice of Termination;
- b. Place no further orders or subcontracts for materials, services, or facilities except as may be necessary for completion of such portion of the Work as is not terminated;
- c. Terminate all orders and subcontracts to the extent that they relate to the performance of Work terminated by the Notice of Termination;
- d. With the written Approval of the Contracting Officer, to the extent he may require, settle all outstanding liabilities and all claims arising out of such termination of orders and subcontracts, the cost of which would be reimbursable, in whole, or in part, in accordance with the provisions of the Contract;
- e. Submit to the Contracting Officer a list, certified as to quantity and quality, of any or all items of termination inventory exclusive of items the disposition of which had been directed or authorized by the Contracting Officer;
- f. Transfer to the Contracting Officer the completed or partially completed record drawings, Shop Drawings, information, and other property which, if the Contract had been completed, would be required to be furnished to the DEPARTMENT;
- g. Take such action as may be necessary, or as the Contracting Officer may direct, for the protection and preservation of the property related to the Contract which is in the possession of the CONTRACTOR and in which the DEPARTMENT has or may acquire any interest.

The CONTRACTOR shall proceed immediately with the performance of the above obligations.

14.4.3 When the DEPARTMENT orders termination of the Work effective on a certain date, all Work in place as of that date will be paid for in accordance with Article 13 of the Contract. Materials required for completion and on hand but not incorporated in the Work will be paid for at invoice cost plus 15% with materials becoming the property of the DEPARTMENT - or the CONTRACTOR may retain title to the materials and be paid an agreed upon lump sum. Materials on order shall be cancelled, and the DEPARTMENT shall pay reasonable factory cancellation charges with the option of taking delivery of the materials in lieu of payment of cancellation charges. The CONTRACTOR shall be paid 10% of the cost, freight not included, of materials cancelled, and direct expenses only for CONTRACTOR chartered freight transport which cannot be cancelled without charges, to the extent that the CONTRACTOR can establish them. The extra costs due to cancellation of bonds and insurance and that part of job start-up and phase-out costs not amortized by the amount of Work accomplished shall be paid by the DEPARTMENT. Charges for loss of profit or consequential damages shall not be recoverable except as provided above.

- a. The following costs are not payable under a termination settlement agreement or Contracting Officer's determination of the termination claim:
 1. Loss of anticipated profits or consequential or compensatory damages

2. Unabsorbed home office overhead (also termed "General & Administrative Expense") related to ongoing business operations
 3. Bidding and project investigative costs
 4. Direct costs of repairing equipment to render it operable for use on the terminated work
- 14.4.4 The termination claim shall be submitted promptly, but in no event later than 90 days from the effective date of termination, unless extensions in writing are granted by the Contracting Officer upon written request of the CONTRACTOR made within the 90-day period. Upon failure of the CONTRACTOR to submit his termination claim within the time allowed, the Contracting Officer may determine, on the basis of information available to him, the amount, if any, due to the CONTRACTOR by reason of the termination and shall thereupon pay to the CONTRACTOR the amount so determined.
- 14.4.5 The CONTRACTOR and the Contracting Officer may agree upon whole or any part of the amount or amounts to be paid to the CONTRACTOR by reason of the total or partial termination of Work pursuant to this section. The Contract shall be amended accordingly, and the CONTRACTOR shall be paid the agreed amount.
- 14.4.6 In the event of the failure of the CONTRACTOR and the Contracting Officer to agree in whole or in part, as provided heretofore, as to the amounts with respect to costs to be paid to the CONTRACTOR in connection with the termination of the Work the Contracting Officer shall determine, on the basis of information available to him, the amount, if any, due to the CONTRACTOR by reason of the termination and shall pay to the CONTRACTOR the amount determined as follows:
- a. All costs and expenses reimbursable in accordance with the Contract not previously paid to the CONTRACTOR for the performance of the Work prior to the effective date of the Notice of Termination;
 - b. So far as not included under "a" above, the cost of settling and paying claims arising out of the termination of the Work under subcontracts or orders which are properly chargeable to the terminated portions of the Contract;
 - c. So far as practicable, claims by the CONTRACTOR for idled or stand-by equipment shall be made as follows: Equipment claims will be reimbursed as follows:
 1. Contractor-owned equipment usage, based on the CONTRACTOR'S ownership and operating costs for each piece of equipment as determined from the CONTRACTOR'S accounting records. Under no circumstance, may the CONTRACTOR base equipment claims on published rental rates.
 2. Idle or stand-by time for Contractor-owned equipment, based on the CONTRACTOR'S internal ownership and depreciation costs. Idle or stand-by equipment time is limited to the actual period of time equipment is idle or on stand-by as a direct result of the termination, not to exceed 30 days. Operating expenses will not be included for payment of idle or stand-by equipment time.
 3. Rented equipment, based on reasonable, actual rental costs. Equipment leased under "capital leases" as defined in Financial Accounting Standard No. 13 will be considered Contractor-owned equipment. Equipment leased from an affiliate, division, subsidiary or other organization under common control with the CONTRACTOR will be considered Contractor-owned equipment, unless the lessor has an established record of leasing to unaffiliated lessees at competitive rates consistent with the rates the CONTRACTOR has agreed to pay and no more than forty percent of the lessor's leasing business, measured in dollars, is with organizations affiliated with the lessor.
- 14.4.7 The CONTRACTOR shall have the right of appeal under the DEPARTMENT's claim procedures, as defined in Article 15, for any determination made by the Contracting Officer, except if the CONTRACTOR has failed to submit his claim within the time provided and has failed to request extension of such time, CONTRACTOR shall have no such right of appeal. In arriving at the amount due the CONTRACTOR under this section, there shall be deducted:
- a. All previous payments made to the CONTRACTOR for the performance of Work under the Contract prior to termination;
 - b. Any claim for which the DEPARTMENT may have against the CONTRACTOR;
 - c. The agreed price for, or the proceeds of sale of, any materials, supplies, or other things acquired by the

CONTRACTOR or sold pursuant to the provisions of this section and not otherwise recovered by or credited to the DEPARTMENT; and,

- d. All progress payments made to the CONTRACTOR under the provisions of this section.
- 14.4.8 Where the Work has been terminated by the DEPARTMENT said termination shall not affect or terminate any of the rights of the DEPARTMENT against the CONTRACTOR or his Surety then existing or which may thereafter accrue because of such default. Any retention or payment of monies by the DEPARTMENT due to the CONTRACTOR under the terms of the Contract shall not release the CONTRACTOR or its Surety from liability.
- 14.4.9 The CONTRACTOR's termination claim may not include claims that pre dated the notice for termination for convenience. Those claims shall be prosecuted by the CONTRACTOR under Article 15.
- 14.4.10 The CONTRACTOR'S termination claim may not exceed the total dollar value of the contract as awarded plus agreed upon change orders less the amounts that have been paid for work completed.
- a. Unless otherwise provided for in the Contract Documents, or by applicable statute, the CONTRACTOR, from the effective date of termination and for a period of three years after final settlement under this Contract, shall preserve and make available to the DEPARTMENT at all reasonable times at the office of the CONTRACTOR, all its books, records, documents, and other evidence bearing on the cost and expenses of the CONTRACTOR under his Contract and relating to the Work terminated hereunder.
 - b. Definitions. In this Subsection 108-1.09, the term "cost" and the term "expense" mean a monetary amount in U.S. Dollars actually incurred by the CONTRACTOR, actually reflected in its contemporaneously maintained accounting or other financial records and supported by original source documentation.
 - c. Cost Principles. The DEPARTMENT may use the federal cost principles at 48 CFR §§ 31.201-1 to 31.205-52 (or succeeding cost principles for fixed price contracts) as guidelines in determining allowable costs under this Subsection to the extent they are applicable to construction contracts and consistent with the specifications of this Contract. The provisions of this contract control where they are more restrictive than, or inconsistent with, these federal cost principles."

ARTICLE 15 - CLAIMS FOR ADJUSTMENT AND DISPUTES

15.1 Notification

- 15.1.1 The CONTRACTOR shall notify the DEPARTMENT in writing as soon as the CONTRACTOR becomes aware of any act or occurrence which may form the basis of a claim for additional compensation or an extension of Contract Time or of any dispute regarding a question of fact or interpretation of the Contract. The DEPARTMENT has no obligation to investigate any fact or occurrence that might form the basis of a claim or to provide any additional compensation or extension of Contract Time unless the CONTRACTOR has notified the DEPARTMENT in writing in a timely manner of all facts the CONTRACTOR believes form the basis for the claim.
- 15.1.2 If the CONTRACTOR believes that he is entitled to an extension of Contract Time, then the CONTRACTOR must state the contract section on which he basis his extension request, provide the DEPARTMENT with sufficient information to demonstrate that the CONTRACTOR has suffered excusable delay, and show the specific amount of time to which the CONTRACTOR is entitled. The DEPARTMENT will not grant an extension of Contract Time if the CONTRACTOR does not timely submit revised schedules under **Section 01310**.
- 15.1.3 If the matter is not resolved by agreement within 7 days, the CONTRACTOR shall submit an Intent to Claim, in writing, to the DEPARTMENT within the next 14 days.
- 15.1.4 If the CONTRACTOR believes additional compensation or time is warranted, then he must immediately begin keeping complete, accurate, and specific daily records concerning every detail of the potential claim including actual costs incurred. The CONTRACTOR shall provide the DEPARTMENT access to any such records and furnish the DEPARTMENT copies, if requested. Equipment costs must be based on the CONTRACTOR's internal rates for ownership, depreciation, and operating expenses and not on published rental rates. In computing damages, or costs claimed for a change order, or for any other claim against the DEPARTMENT for additional time, compensation or both, the CONTRACTOR must prove actual damages based on internal costs for equipment, labor or efficiencies. Total cost, modified total cost or jury verdict forms of presentation of damage claims are not permissible to show damages. Labor inefficiencies must be shown to actually have occurred and can be proven solely based on job records. Theoretical studies are not a permissible means of showing labor inefficiencies. Home office overhead will not be allowed as a component of any claim against the DEPARTMENT.
- 15.1.5 If the claim or dispute is not resolved by the DEPARTMENT, then the CONTRACTOR shall submit a written Claim to the Contracting Officer within 90 days after the CONTRACTOR becomes aware of the basis of the claim or should have known the basis of the claim, whichever is earlier. The Contracting Officer will issue written acknowledge of the receipt of the Claim.
- 15.1.6 The CONTRACTOR waives any right to claim if the DEPARTMENT was not notified properly or afforded the opportunity to inspect conditions or monitor actual costs or if the Claim is not filed on the date required.

15.2 Presenting the Claim

- 15.2.1 The Claim must include all of the following:
- a. The act, event, or condition the claim is based on
 - b. The Contract provisions which apply to the claim and provide relief
 - c. The item or items of Contract work affected and how they are affected
 - d. The specific relief requested, including Contract Time if applicable, and the basis upon which it was calculated
 - e. A statement certifying that the claim is made in good faith, that the supporting cost and pricing data are accurate and complete to the best of your knowledge and belief, and that the amount requested accurately reflects the Contract adjustment which the CONTRACTOR believes is due.

15.3 Claim Validity, Additional Information, and DEPARTMENT's Action

- 15.3.1 The Claim, in order to be valid, must not only show that the CONTRACTOR suffered damages or delay but that it was caused by the act, event, or condition complained of and that the Contract provides entitlement to relief for such act, event, or condition.
- 15.3.2 The DEPARTMENT can make written request to the CONTRACTOR at any time for additional information relative to the Claim. The CONTRACTOR shall provide the DEPARTMENT the additional information within 30 days of receipt of such a request. Failure to furnish the additional information may be regarded as a waiver of the Claim.

15.4 Contracting Officer's Decision

The CONTRACTOR will be furnished the Contracting Officer's Decision within 90 days, unless the Contracting Officer requests additional information or gives the CONTRACTOR notice that the time for issuing a decision is being extended for a specified period under AS 36.30.620. The Contracting Officer's decision is final and conclusive unless, within 14 days of receipt of the decision, the CONTRACTOR delivers a Notice of Appeal to the Appeals Officer. Procedures for appeals are covered under AS 36.30.625 and AS 36.30.630.

15.5 Fraud and Misrepresentation in Making Claims

Criminal and Civil penalties authorized under AS 36.30.687 (including, but not limited to, forfeiture of all claimed amounts) may be imposed on the CONTRACTOR if the CONTRACTOR makes or uses a misrepresentation in support of a claim or defraud or attempt to defraud the DEPARTMENT at any stage of prosecuting a claim under this Contract.

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SECTION 00800
SUPPLEMENTARY CONDITIONS
MODIFICATIONS TO THE GENERAL CONDITIONS
(STATE FUNDED CONTRACTS)

The following supplements modify, change, delete from, add to the "General Conditions of the Construction Contract for Buildings", revised December, 2011. Where any article of the General Conditions is modified, or and Paragraph, Subparagraph, or Clause thereof is modified or deleted by these Supplementary Conditions, the unaltered provisions of that Article, Paragraph, Subparagraph, of Clause shall remain in effect.

SC-1 – DEFINITIONS

At definition for "General Requirements" change the phrase "Divisions 2 through 16" to read:

"Divisions 2 through 48."

At definition for "Quality Assurance (QA)" change the phrase "Divisions 2 through 16" to read:

"Divisions 2 through 48."

At definition for "Quality Assurance (QA)" change the phrase "to be provided by the CONTRACTOR" to read: "to be provided by DEPARTMENT"

Add the following definitions:

1. **OWNER** – The State of Alaska.
2. **QUALITY ASSURANCE ACCEPTANCE TESTING** – This is all sampling and testing performed by the DEPARTMENT to determine at what level the product or service will be accepted for payment. Qualified personnel and laboratories will perform sampling and testing. The DEPARTMENT pays for this testing.
3. **QUALITY CONTROL PROGRAM (QC PROGRAM)** - The CONTRACTOR'S, Subcontractor's or Supplier's operational techniques and activities that maintain control of the manufacturing process to fulfill the Contract requirements. This may include materials handling, construction procedures, calibration and maintenance of equipment, production process control, material sampling, testing and inspection, and data analysis
4. **RESIDENT ENGINEER** - The Engineer's authorized representative assigned to make detailed observations relating to contract performance.

SC-2.4 – VISITS TO SITE/PLACE OF BUSINESS

At General Conditions Article 2.4, delete the first four words of the first sentence ("The Contracting Officer will ...") and replace with the following words "The Contracting Officer has the right to, but is not obligated to..."

SC-4.2–VISIT TO SITE

At General Conditions Article 4.2, delete this article in its entirety and replace with the following article:

- “4.2.1 A formal visit to the site will occur as noted on the Invitation to Bid. The Bidders may not visit the site at any other time during the bidding period.
- 4.2.2 The submission of a bid by the CONTACTOR is considered a representation that the CONTRACTOR has reviewed and carefully examined the site and is satisfied as to the conditions to be encountered in performing the Work and as to the requirements of the Contract Documents.”

SC-4.3 – EXPLORATIONS AND REPORTS

At General Conditions Article 4.3, add the following paragraph:

“All reports and other records (if available) are provided for informational purposes only to all plan holders listed with the DEPARTMENT as General Contractors, and are available to other planholders upon request. They are made available so Bidders have access to the same information available to the DEPARTMENT. The reports and other records are not intended as a substitute for independent investigation, interpretation, or judgment of the Bidder. The DEPARTMENT is not responsible for any interpretation or conclusion drawn from its records by the Bidder. While referenced by or provided with the Contract Documents; the recommendations, engineering details, and other information contained in these reports of explorations shall not be construed to supersede or constitute conditions of the Contract Documents.”

Reports and other records available to bidders:

1. 2024 Geotechnical Recommendations Hanes Maintenance & Operations Station; Project No 57183-B
2. Erosion and Sediment Control Plan for Haines Maintenance and Operations Station
3. Draft Soil Management Plan for Haines Maintenance and Operations Station

SC-5.4.1 – INSURANCE REQUIREMENTS

At General Condition Article 5.4.1, delete the second to the last sentence and replace with the following:
“The delivery to the DEPARTMENT of a written notice in accordance with the policy provisions is required before cancellation of any coverage or reduction in any limits of liability.”

SC-5.4.2a – WORKERS COMPENSATION INSURANCE

At General Condition Article 5.4.2a, delete paragraph “a” in its entirety and replace with the following:

- "a. Workers' Compensation Insurance: The Contractor shall provide and maintain, for all employees of the Contractor engaged in work under this contract, Workers' Compensation Insurance as required by AS 23.30.045. The Contractor shall be responsible for Workers' Compensation Insurance for any subcontractor who provides services under this contract. Coverage shall include:

-
1. Waiver of subrogation against the State.
 2. Employer's Liability Protection in the amount of \$500,000 each accident / \$500,000 each disease.
 3. If the Contractor directly utilizes labor outside of the State of Alaska in the prosecution of the work, "Other States" endorsement shall be required as a condition of the contract.
 4. Whenever the work involves activity on or about navigable waters, the Workers' Compensation policy shall contain a United States Longshoreman's and Harbor Worker's Act endorsement, and when appropriate, a Maritime Employer's Liability (Jones Act) endorsement with a minimum limit of \$1,000,000."

SC-5.4.2b1 – MINIMUM LIMITS of LIABILITY

At General Condition Article 5.4.2b1, delete "\$2,000,00" and replace with "\$2,000,000".

SC-6.6.2 – SCHEDULE OF SHOP DRAWINGS AND SCHEDULE OF VALUES

At General Condition Article 6.6.2, Schedule of Values, add the following text:

"Specific line item values as indicated below shall be minimum acceptable amounts and must be included on all approved Schedules of Values and Applications for Payment.

1. Mobilization and Demobilization: Value of Preconstruction activities, costs and submittals shall be limited to three and a half percent (3.5%) of the total Contract Price. Value of Demobilization shall be not less than one and a half percent (1.5%) of the total Contract Price.

SC-6.9 – SUBSTITUTES OR "OR EQUAL" ITEMS

In Paragraph 6.9.5, delete "Document 01630 – Product Options and Substitutions" and replace with "Document 01 60 00 – Material and Equipment."

SC-6.13 – SUBCONTRACT PROVISIONS

Add new general conditions Article 6.13.7 as follows:

- "6.13.7 The Contractor may, without penalty, replace a subcontractor who:
1. Fails to comply with the licensing and registration requirements of AS 08.18;
 2. Fails to obtain or maintain a valid Alaska Business License;
 3. Files for bankruptcy or becomes insolvent;
 4. Fails to execute a subcontract or performance of the work for which the subcontractor was listed, and the Contractor has acted in good faith;
 5. Fails to obtain bonding acceptable to the DEPARTMENT;
 6. Fails to obtain insurance acceptable to the DEPARTMENT;
 7. Fails to perform subcontract work for which the subcontractor was listed;

8. Must be replaced to meet the Contractor's required state or federal affirmative action requirements.
9. Refuses to agree to abide by the Contractor's labor agreement; or
10. Is determined by the DEPARTMENT to be not responsible.

In addition to the circumstances described above, a Contractor may in writing request permission from the DEPARTMENT to add a new subcontractor or replace a listed subcontractor. The DEPARTMENT will approve the request if it determines in writing that allowing the addition or replacement is in the best interest of the state.

The Contractor shall submit a written request to add a new Subcontractor or replace a listed Subcontractor to the Contracting Officer a minimum of five working days prior to the date the new Subcontractor is scheduled to begin work on the construction site. The request must state the basis for the request and include supporting documentation acceptable to the Contracting Officer.

If a Contractor violates this article, the Contracting Officer may:

1. Cancel the Contract after Award without any damages accruing to the Department; or
2. After notice and hearing, assess a penalty on the bidder in an amount not exceeding 10 percent of the value of the subcontract at issue.

SC-7.2-PERMITS, LICENSES, AND TAXES

In Paragraph 7.2.1, add the following subparagraphs:

"The terms, conditions, and stipulations in permits obtained either by the DEPARTMENT or by the CONTRACTOR are made part of this Contract.

a) Obtained Permits:

1. The DEPARTMENT has or will be acquiring the following permits:

a. State Fire Marshal Building Permit .

2. The DEPARTMENT will make this permit available after it is acquired.

b) The CONTRACTOR shall procure all other permits and licenses required to complete the project, pay all charges, fees and taxes, and give all notices necessary and incidental to the due and lawful prosecution of the Work.

SC-7.12 – APPLICABLE ALASKA PREFERENCES

A. Add the following paragraph:

7.12.5 Alaska Veteran's Preference (AS 36.30.321). In determining the low bidder for State funded projects, a 5% bid preference has been given to a bidder who qualifies under AS 36.30.321(f) as an Alaska bidder and is a Qualifying Entity. This preference may not exceed \$5,000.00. In this subsection a "Qualifying Entity" means a:

-
- (1) Sole proprietorship owned by an Alaska Veteran;
 - (2) Partnership under AS 32.06 or AS 32.11 if a majority of the members are Alaska veterans;
 - (3) Limited liability company organized under AS 10.50 and if a majority of the members are Alaska veterans; or
 - (4) Corporation that is wholly owned by individuals and a majority of the individuals are Alaska veterans.

A preference under this section is in addition to any other preference for which the bidder qualifies. To qualify for this preference, the bidders must add value by the bidder actually performing, controlling, managing and supervising a significant part of the services provided or the bidder must have sold supplies or the general nature solicited to other state agencies, governments, or the general public. An Alaska veteran shall be a resident of this state and an individual who served in the Armed forces of the United States, including a reserve unit of the United States armed forces; or Alaska Territorial Guard, the Alaska Army National Guard, or the Alaska Navel Militia; and was separated from service under a condition that was not dishonorable.

The bidder shall provide an Alaskan Veteran's Preference Affidavit on Form 25D-17, certifying they qualify as an Alaska bidder eligible for Alaska Veteran's preference according to AS 36.30."

SC-9.4-CHANGE ORDER

At General Conditions Article 9.4, add the following sentence:

"The DEPARTMENT will issue Change Orders for the CONTRACTOR to sign. A Change Order shall be considered executed when the DEPARTMENT signs it. The CONTRACTOR'S signature indicates that they either accept the Change Order or acknowledge it. Acknowledgement of a Change Order does not surrender the CONTRACTOR'S right to claim."

SC-11.8 – DELAY DAMAGES

At General Condition Article 11.8, add the following paragraphs:

11.8.1 Failure to Meet Substantial Completion Date. All work for Basic Bid Item 1 must be substantially complete by October 31, 2027. For each calendar day that all work for Basic Bid Item 1 is not Substantially Complete after the Substantial Completion Date has passed, the DEPARTMENT shall deduct **Five Hundred Dollars** (\$500.00) from progress payments.

All work must be substantially complete by July 31, 2028. For each calendar day that all work is not Substantially Complete after the expiration of the Contract Time or the Substantial Completion Date has passed, the DEPARTMENT shall deduct **Five Hundred Dollars** (\$500.00) from progress payments.

11.8.2 Failure to Meet Final Completion Date. The Final completion date shall be defined as the date 60 calendar days following the substantial completion date. For each calendar day that the work is substantially complete, but the project is not at Final Completion, after the

Final Completion Date has passed, the DEPARTMENT shall deduct **Three Hundred Dollars** (\$300.00) from progress payments.

11.8.3 If no money is due the CONTRACTOR, the DEPARTMENT shall have the right to recover these sums from the CONTRACTOR, from the Surety, or from both. These are liquidated damages and not penalties. These charges shall reimburse the DEPARTMENT for its additional expenses incurred due to CONTRACTOR'S failure to complete the work within the time specified.

11.8.4 Permitting the CONTRACTOR to continue and finish the work or any part of it after the Contract time has elapsed or the completion date has passed does not waive the DEPARTMENT'S rights to collect liquidated damages under this section.

SC-12.1 – WARRANTY AND GUARANTEE

At General Condition Article 12.1, add the following:

"The failure of the DEPARTMENT to strictly enforce the Contract in one or more instances does not waive its right to do so in other or future instances."

SC-13.5 – STORED MATERIALS AND EQUIPMENT

At General Condition Article 13.5, add the following:

"No payment will be made for an individual/unique item of material or equipment with a total value less than \$10,000 per item or for any item of material or equipment scheduled for incorporation into the work in less than 60 days from its arrival on site."

SC-15.1–NOTIFICATION

In Paragraph 15.1.2, delete "Section 01310" and replace with "Section 01 11 13."

END OF SECTION 00800

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SECTION 00850
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S12	FOUNDATION AND SLAB PLAN - SAND STORAGE FACILITY
S13	FOUNDATION DETAILS
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S15	BRACED FRAME ELEVATIONS
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SECTION 01 11 13
SUMMARY OF WORK

PART 1 - GENERAL

1.01 RELATED REQUIREMENTS

- A. All Contract Documents are related to this Section.
- B. Section 01 57 10 – Erosion, Sediment and Pollution Control

1.02 WORK COVERED BY CONTRACT DOCUMENTS

- A. Work under this Contract includes all Work required for the project in Haines, Alaska, all in accordance with the terms and conditions of the Contract Documents.

1.03 CONTRACT

- A. General: Construct all Work through a single construction contract in accordance with the Contract Documents.

1.04 WORK BY OTHERS

- A. Other State projects may be scheduled to be under construction in the vicinity of the Project. There are no known projects scheduled at this time.

1.05 WORK SEQUENCE AND MILESTONES

- A. Upon receipt of Notice to Proceed (NTP) the CONTRACTOR will be expected to prepare submittals and begin the purchase of critical materials.
- B. The CONTRACTOR shall submit a preliminary Schedule of Values and an Anticipated Construction Schedule at the pre-construction conference. The CONTRACTOR shall submit a final Schedule of Values within 3 weeks of the Notice-to-Proceed.
- C. The Department will transfer equipment and personnel from the existing facility to the new facility within 6 weeks from Substantial Completion, but not less than 2 weeks from Final Completion, to allow the commencement of demolishing the existing facility.

1.06 PARKING

- A. Parking shall be limited to designated areas only. If insufficient area exists, the CONTRACTOR shall make other arrangements.

1.07 SHUTOFFS AND DISRUPTIONS TO UTILITY SERVICE

- A. At least two (2) weeks prior to the first planned outage, submit a schedule showing all proposed utility outages. Upon request, submit a written plan describing the justification for

the outages and possible impacts to the Using Agency. The CONTRACTOR shall revise the schedule to show any planned changes and shall submit the revised schedule promptly to the DEPARTMENT.

- B. Plan work to minimize down time. Work with DEPARTMENT to schedule disruption for time periods that minimize impacts to the Using Agency. Shutoffs and disruption to service shall not be allowed during designated critical operating hours.

1.08 CONTRACTOR'S USE OF PREMISES

- A. Coordinate use of the premises under direction of DEPARTMENT.
- B. Assume full responsibility for protection and safekeeping of furnished products.
- C. Assume full responsibility for the protection of roads and grounds in the project vicinity from construction related activities.
- D. Obtain and pay for use of additional storage, Work, or parking areas needed for construction operations.
- E. Do not stop or otherwise impede vehicle traffic without prior written approval from the DEPARTMENT. The CONTRACTOR shall make all necessary provisions, including but not limited to detours, bypasses, and permits, to maintain traffic flow. Submit traffic control plan and schedule for approval no less than twenty (20) working days prior to anticipated traffic disruptions.
- F. Work and Staging Areas - With the exception of vehicle movement for access to and from Work and Staging Areas, restrict all Work to within the limits of construction designated on the plans.
- G. Coordinate use of the premises under direction of DEPARTMENT. Limit use of site and premises to not impede owner's use of existing facilities including full compliance to 015400 Security

1.09 USING AGENCY OCCUPANCY

- A. The using agency at the project location is the Department of Transportation and Public Facilities.
- B. Upon the issuance of a Certificate of Substantial Completion by the DEPARTMENT, the Using Agency shall take ownership of the facility and may occupy it.
- C. Refer to the General Conditions for access following substantial completion.
- D. Not Used

1.10 PERMITS

- A. Where a building permit is required by the Authority Having Jurisdiction, the plan review fee and the building permit fee have been paid by the DEPARTMENT. The CONTRACTOR

shall obtain the building permit in its name and shall procure all other permits and licenses, pay all charges, fees and taxes and give all notices necessary and incidental to the due and lawful prosecution of the work.

- B. Notwithstanding 1.10.A above the CONTRACTOR shall obtain and pay for the State of Alaska Fire Marshal plan review.

1.11 HAUL ROUTES

- A. Contractor shall determine the requirements for and shall comply with applicable local, municipal, and DOT/PF haul requirements, routes and restrictions.
- B. Obtain required approvals for the use of haul routes, and submit to the DEPARTMENT upon request.

1.12 STORMWATER PREVENTION POLLUTION PLAN (SWPPP)

- A. If a SWPPP is specified elsewhere and made part of the Contract Documents, the CONTRACTOR shall prepare the SWPPP and shall submit it to the DEPARTMENT for review.

PART 2 - PRODUCTS

Not Used

PART 3 - EXECUTION

Not Used

END OF SECTION

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SECTION 01 12 19
CONTRACTOR'S CERTIFICATION OF SUBCONTRACTS

PART 1 - GENERAL

1.01 SECTION INCLUDES

- A. Procedures for preparing, submitting and accepting subcontracts.

1.02 RELATED REQUIREMENTS

- A. Section 00100 - Instructions to Proposer
- B. Section 00430 - Subcontractor List
- C. Section 00700 - General Conditions: Subcontractor Certification and Approval
- D. Section 00800 – Supplementary Conditions: Subcontract Provisions
- E. Section 01 33 00 - Submittals: Submittal Procedures

1.03 PREPARATION OF CERTIFICATION

- A. Certification Forms: Use forms provided by DEPARTMENT.
- B. CONTRACTOR shall prepare certification form and submit to the DEPARTMENT prior to the start of work. Where required, attach additional information to the certification form.
- C. Substitute certification forms will not be considered.

1.04 SUBMITTAL OF CERTIFICATION

- A. The CONTRACTOR shall submit certification forms for all subcontractors for review and approval by the DEPARTMENT.

1.05 CONSIDERATION OF CERTIFICATION

- A. Following receipt of submitted subcontractor certification forms, the DEPARTMENT will review for the following, at minimum:
 - 1. Completeness of forms and attachments
 - 2. Proper execution (signatures) of forms and attachments
- B. Incomplete or improperly executed subcontractor certification forms will be returned to the CONTRACTOR for revision and resubmittal.
- C. CONTRACTOR shall remove its subcontractor from the project site until its subcontractor certification form is submitted, reviewed, and approved.

- D. The DEPARTMENT will not process payments for work performed by a non-certified subcontractor.

1.06 ACKNOWLEDGMENT OF CERTIFICATION

- A. Submittals which have been examined by the DEPARTMENT and are determined to be complete and properly executed shall be acknowledged as such by the Project Engineer's signature.

PART 2 - PRODUCTS

Not Used

PART 3 - EXECUTION

Not Used

END OF SECTION

**STATE OF ALASKA
DOT & PF
STATEWIDE PUBLIC FACILITIES**

**SUBCONTRACTOR
CERTIFICATION**



Note: The Contractor shall provide this form for ALL subcontractors and lower tier subcontractors working on this project. This form is applicable to all projects, including Small Procurement Contracts, and must be completed in full. The Department will not allow the subcontractor to work on the project before the Department has received this signed certification (Form 25D-042A) and supporting documentation.

Project: _____ Project #: _____ Federal Aid #: _____
Prime Contractor: _____ Subcontract being certified: _____

Pursuant to the Contract Documents, we hereby stipulate the following concerning the award of Work to the last Subcontractor on the following list:

- | | | | | |
|----|---------------------------------|------|------------------------------|-----------------------------|
| 1. | First Tier Subcontractor: _____ | DBE? | Yes <input type="checkbox"/> | No <input type="checkbox"/> |
| | Second Tier: _____ | DBE? | Yes <input type="checkbox"/> | No <input type="checkbox"/> |
| | Third Tier: _____ | DBE? | Yes <input type="checkbox"/> | No <input type="checkbox"/> |
| | Fourth Tier: _____ | DBE? | Yes <input type="checkbox"/> | No <input type="checkbox"/> |

If the subcontractor is performing work as a DBE, the dollar amount of DBE work is: \$ _____

2. Date of Subcontract: _____

3. Estimated Start Date of Sub-contracted work: _____

4. Amount of Subcontract: \$ _____

5. Subcontract amount is _____ % of the total Contract Award Amount

Cumulative signed subcontract amount (including this Agreement) is: _____ % of the total Contract Award Amount

6. Scope of Work: _____

7. Are the following documents kept on file by both the Contractor and the Subcontractor? (^F = Federal Projects Only)

EEO-1 Certification (Form 25A-304), ^F	Yes <input type="checkbox"/>	No <input type="checkbox"/>
Contract Minimum Wage Schedule	Yes <input type="checkbox"/>	No <input type="checkbox"/>
Civil Rights Representative (Form 25A-302) ^F	Yes <input type="checkbox"/>	No <input type="checkbox"/>
Required Contract Provisions for Federal Aid (Form 25D-55A or 25D-55H) ^F	Yes <input type="checkbox"/>	No <input type="checkbox"/>
As required to demonstrate conformance with DBE Contract Provisions ^F	Yes <input type="checkbox"/>	No <input type="checkbox"/>
FAA Required Certification Regarding Tax Delinquency / Felony Convictions (25D-159) ^F	Yes <input type="checkbox"/>	No <input type="checkbox"/>

8. Is the Subcontractor qualified to do the work, in accordance with all contract documents?
Yes ☐ No ☐

9. Is the Subcontractor listed on the Bidder's Registration List?
Yes ☐ No ☐

10. Does the Subcontract contain provisions for prompt payment, release of retainage, and interest on late payment and retainage conforming to AS 36.90.210?
Yes ☐ No ☐

11. Does the Subcontract specifically bind the Subcontractor to the applicable terms and conditions of the Contract Documents for the benefit of the Department and does it contain waiver provisions and termination provisions as required by the Contract Documents?
Yes ☐ No ☐

12. Does the Subcontractor have adequate insurance coverages as specified in the Contract Documents?

Yes ☐ No ☐

a). If not, does the Contractor stipulate that the insurance limits of the Subcontractor are acceptable to the Contractor and that he has notified his insurance carrier of the reduced insurance limits?

Yes ☐ No ☐

b). Does the evidence of insurance certify that the policies described thereon comply with all aspects of the insurance requirements for this project?

Yes ☐ No ☐

c). Does the evidence of insurance list the Department as an "Additional Insured" or "Certificate Holder"?

Yes ☐ No ☐

d). Does the evidence of insurance commit to providing written notice in accordance with the policy provisions before cancellation or reduction of any coverage or reduction in any limits of liability?

Yes ☐ No ☐

e). Insurance Expiration dates:

Comprehensive or Commercial General Liability: _____

Automobile: _____ Workers' Compensation: _____

(Other): _____

13. Does the Contractor certify firms or individuals debarred or suspended by the Department, FAA, or FHWA are not employed or subcontracted under this construction project?

Yes ☐ No ☐

14. Copies of the following professional certifications, licenses, and registrations are attached (circle all that apply):

Federal Employer Identification Number (EIN) - If no Federal I.D. Number, Use owner's SSN (all subcontracts)

Business License (all subcontracts)

Contractor License (all subcontracts)

Land Surveyor's License (survey subcontract)

Electrical Administrator's License (electrical subcontract)

Mechanical Administrator's License (mechanical subcontract)

Phone Number: () _____

Address: _____ City: _____ State: _____

15. Does the Contractor certify the following?:

The Contractor remains responsible for all quality control and proper performance of all requirements of the contract.

Yes ☐ No ☐

For federal projects, the Contractor will continue to perform at least thirty percent (30%) of the contract work with his own organization.

Yes ☐ No ☐

This Contractor Self Certification does not relieve the Contractor and his surety, or either the Contractor or surety from any liability or responsibility under the contract.

Yes ☐ No ☐

Department's Request for Information – If the Department at any time makes written request for the Agreement, licenses, proof of insurance, or any other information relating to the certifications contained herein, the Contractor will deliver an executed copy of the Agreement and/or requested information to the Department within five calendar days. If the Contractor fails to provide the requested information within five calendar days, or if the Contractor fails to include required language and conditions in the Agreement, the Department may suspend all work relating to the Agreement. The Contractor shall not be due any additional compensation or contract time if the Department suspends work due to the Contractor's failure to provide requested information or failure to include required language and conditions in the Agreement.

Yes ☐ No ☐

False Statement or Omission – If a false statement or omission is made in connection with this Contractor Self Certification the Contractor will be excluded from participating in the self-certification process for the remainder of this Contract and for the following construction season. Contractors excluded from the self-certification process will be required to submit all necessary information for the Department's approval of proposed Subcontractors or Lower Tier Subcontractors.

Any false statement or omission made in connection with this Contractor Self Certification may be cause for suspension, a determination of non-responsibility on future bids, and may be cause for revocation of award, default, or disbarment. The person or entity making false statement or omission is subject to any and all civil and criminal penalties available pursuant to applicable state and federal law.

Yes ☐ No ☐

16. Exceptions to any of the above are explained as follows: _____

CERTIFICATION (to be completed and signed by PRIME CONTRACTOR): I certify all the above information to be true, correct and complete.

Signature: _____

Printed Name: _____ ; Title: _____

Company: _____ Date: _____

SUBCONTRACTOR ACKNOWLEDGEMENT: I hereby acknowledge that all requirements and pertinent provisions of the Contract, including but not limited to: Form 25D-55a (included in the contract), Required Contract Provisions for Federal Aid Construction Contracts, DBE provisions, prompt payment, and minimum wage rates, are included in the agreement and have been received.

Signature: _____

Printed Name: _____ ; Title: _____

Company: _____ Date: _____

DEPARTMENT'S APPROVAL/DISAPPROVAL

The subject subcontract is **APPROVED**. Nothing in this approval should be construed as relieving the Prime Contractor of the responsibility for complete performance of the work or as a waiver of any right of the Department to reject defective work.

SIGNATURE: _____ **DATE:** _____
Project Engineer

The subject subcontract is **NOT APPROVED** for the following reasons:

SIGNATURE: _____ **DATE:** _____
Project Engineer

SECTION 01 26 63
CHANGE PROCEDURES

PART 1 - GENERAL

1.01 RELATED REQUIREMENTS

- A. Section 00312 - Bid Schedule
- B. Section 00510 – Construction Contract
- C. Section 00700 - General Conditions
- D. Section 00800 - Supplementary Conditions: Modifications to General Conditions Section 00700
- E. Section 01 32 00 – Work Schedules and Reports
- F. Section 01 29 76 – Application for Payment
- G. Section 01 29 73 - Schedule of Values
- H. Section 01 73 00 – Execution Requirements: Project Record Documents

1.02 SUBMITTALS

- A. Submit the name of the individual authorized to accept changes, and to be responsible for informing others in CONTRACTOR's employ of changes in the Work.
- B. Submit with each price proposal a complete, detailed, itemized cost breakdown defining all impacts on Contract Price and Contract Time, in sufficient detail to fully explain the basis for the proposal.
- C. All change forms shall be provided by the DEPARTMENT.

1.03 CHANGE AUTHORIZATION

- A. In accordance with Section 00700 - General Conditions, Part 9 Changes, the DEPARTMENT may authorize changes to the Work. The DEPARTMENT may authorize changes in one of the following ways:
 - 1. Directive (Section 00700, Article 9.3)
 - 2. Change Order (CO) (Section 00700, Article 9.4)
 - 3. Acceptance of Shop Drawing variations, which have been identified by CONTRACTOR. (Section 00700, Article 9.5)
 - 4. Interim Work Authorization (IWA) (Section 00700, Article 9.10)
 - 5. Contingency Authorization (for CM/GC contracts only) (Section 00700, Paragraph 13.0.3 (b) (2))

1.04 CHANGE PROCEDURES

- A. The DEPARTMENT may initiate change to the contract by issuing to the CONTRACTOR a Request for Proposal (RFP) document. The RFP may include:
 - 1. Change narrative.
 - 2. Supplementary revised drawings, specifications, additional details, or sketches.
 - 3. Other information as deemed appropriate.
- B. The CONTRACTOR shall request a change to the contract by submitting to the DEPARTMENT a written Change Notice on a form provided by the DEPARTMENT. The DEPARTMENT may respond by rejecting it, or with a RFP to initiate contract change. The CONTRACTOR'S Change Notice shall include, at minimum:
 - 1. A description of the proposed change with a statement of the justification of the change.
 - 2. Statement of the effect of the change on Contract Price and Contract Time.
 - 3. The information required in Section 00700 - General Conditions, Part 15 Claims for Adjustments and Disputes.
- C. Upon receipt of a Request for Proposal (RFP) from the DEPARTMENT, the CONTRACTOR shall respond with a price proposal. The CONTRACTOR shall make every effort to return its price proposal in response to the RFP within the time frame requested by the DEPARTMENT, but in no event later than 14 calendar days from date the RFP is issued. For work to be performed after the execution of a Change Order or Contingency Authorization, the basis of pricing shall be estimated. For work performed prior to the execution of a Change Order or Contingency Authorization, the pricing shall be based upon documentation of actual incurred costs. The price proposal shall include:
 - 1. A complete, detailed, itemized price breakdown.
 - 2. For the prime contractor and subcontractors, detailed documentation of costs for direct costs, labor, equipment, consultants, sub-contractor markups, overhead and profit, and other items set forth in General Conditions Section 00700, Part 10.
 - 3. Other information as required by the DEPARTMENT.
- D. Upon receipt of pricing response to a RFP, the DEPARTMENT may execute a change to the contract. The issuance of an RFP or the receipt of pricing response to an RFP shall not obligate the DEPARTMENT to execute a change to the contract.

1.05 DIRECTIVES

- A. The DEPARTMENT may issue Directives as per Section 00700 – General Conditions, Article 9.3.

1.06 INTERIM WORK AUTHORIZATIONS (IWA)

- A. The DEPARTMENT may issue Interim Work Authorizations in accordance with Section 00700 – General Conditions, Article 9.10.

- B. IWAs may be issued to authorize the commencement of additional work in advance of the execution of a Change Order or Contingency Authorization.
- C. Work authorized by IWA shall be converted to a negotiated Change Order except that, for CM/GC contracts only, the work authorized by an IWA may be converted to a Contingency Authorization provided it does not result in an extension of Contract Time.
- D. The price on the IWA form shall be an estimated limit not to be exceeded by the CONTRACTOR without prior amendment of the IWA by the DEPARTMENT. The DEPARTMENT shall not be obligated to compensate the CONTRACTOR for costs in excess of the amount on the IWA.
- E. Upon the execution of an IWA, the CONTRACTOR is authorized to begin the specified work. The CONTRACTOR shall track its costs using Cost of Work procedures. The CONTRACTOR shall use the DEPARTMENT's Cost of the Work form and shall submit the data to the DEPARTMENT at the close of each work day. A separate Cost of Work form is required for each IWA.

1.07 CHANGE ORDER

- A. Any change in Contract Time, Contract Price, or associated responsibility within the general scope of the Contract, shall be made by Change Order.
- B. The CONTRACTOR shall use forms furnished by the DEPARTMENT for Change Orders.

1.08 CONTINGENCY AUTHORIZATIONS (CM/GC Contracts Only)

- A. Not Used

1.09 CHANGE PRICING AND TIME ANALYSIS

- A. Unless specified elsewhere, Section 00700 - General Conditions, Part 10 shall be applied to the negotiation of all changes to the scope of the contract.
 - 1. Unit Price, when unit prices are contained in the Contract.
 - 2. Mutually acceptable Lump Sum Price, including overhead and profit.
 - 3. Cost of the Work
- B. UNIT PRICE CHANGE - For unit price CHANGE PROCEDURES, prices shall be determined by multiplying the contractual unit price(s) by the estimated quantities of Work associated with changed scope. Payment will be based on the actual installed quantities. Document actual installed quantities and submit information requested by the DEPARTMENT on a daily basis for its approval and certification. Refer to Section 00700 - General Conditions, Part 10 for additional requirements.
- C. LUMP SUM PRICE CHANGE - The CONTRACTOR and the DEPARTMENT shall negotiate an equitable price (and time adjustment if appropriate) in good faith. If negotiations do not result in a mutually acceptable lump sum price, the DEPARTMENT may, at its discretion, direct the CONTRACTOR to perform the work under Cost of the Work Change Order.

- D. COST OF THE WORK CHANGE – The CONTRACTOR shall document Cost of the Work on forms acceptable to the DEPARTMENT, and shall submit documented costs to the DEPARTMENT daily for verification and certification. Cost of the Work pricing proposals shall be supported by invoices for substantiation of purchase and rental costs and with additional data as may be requested by DEPARTMENT.
- E. Time Analysis for CHANGE ORDER PROCEDURES shall be performed as described in Section 01 32 00 – Work Schedules and Reports.
- F. The DEPARTMENT shall have the right to audit all records in possession of CONTRACTOR relating to activities covered by CONTRACTOR's pricing of Contract CHANGE ORDER PROCEDURES, including Cost of the Work pricing, as set forth in Section 00700 - General Conditions. If CONTRACTOR is a joint venture, the right of DEPARTMENT shall apply collaterally to the same extent to the records of joint venture sponsor, and of each individual joint venture member.

1.10 FORM EXECUTION

- A. Contract forms issued under this section shall be effective the date the DEPARTMENT's authorized person signs the form.
- B. For Change Orders, CONTRACTOR signature will indicate acceptance of the terms or acknowledgment of order, depending on box checked. Acknowledgment of Change Order does not substitute for notification requirements of Section 00700 - General Conditions, Article 15.1.

1.11 PAYMENT

- A. The CONTRACTOR shall promptly revise its Schedule of Values and Application for Payment forms to record each authorized Change Order and each authorized Contingency Authorization as a separate line item. For Change Orders, adjust the Contract Price as shown on the Change Order.
- B. The CONTRACTOR shall promptly revise and resubmit its progress schedules to reflect any change in Contract Time, including adjustments for other items of Work affected by the change.
- C. Payment for contract changes shall be made only following the execution of Change Orders or Contingency Authorizations and the inclusion of these change documents by reference on the Application for Payment form.
- D. Payment shall not be made for Work authorized via Interim Work Authorization.

PART 2 – PRODUCTS

Not Used

PART 3 – EXECUTION

Not Used

END OF SECTION

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SECTION 01 29 73
SCHEDULE OF VALUES

PART 1 - GENERAL

1.01 SECTION INCLUDES

- A. Requirements for preparing and submitting the schedule of values.

1.02 RELATED REQUIREMENTS

- A. Section 00700 - General Conditions: Schedule of Values.
- B. Section 01 11 13 - Summary of Work: Work sequence.
- C. Section 01 26 63 – Change Procedures
- D. Section 01 29 76 - Applications for Payment: Procedures for Applications for Payment.
- E. Section 01 32 00 – Work Schedules and Reports
- F. Section 01 33 00 – Submittal Procedures
- G. Section 01 77 00 – Contract Closeout Procedures
- H. Section 01 71 13 – Mobilization and Demobilization
- I. Section 01 91 00 - Commissioning

1.03 FORMAT

- A. Form and content must be acceptable to DEPARTMENT.
- B. Form shall have a signature block for submission by CONTRACTOR and a signature block for approval by DEPARTMENT.
- C. Content shall include the following column headings.
 - 1. CPM Activity Number
 - 2. CPM Activity Description
 - 3. CPM Dollar Value
 - 4. Current Percent Complete
 - 5. Current Dollar Complete
 - 6. Previous Percent Complete
 - 7. Previous Dollar Complete
 - 8. Percent Complete this Period
 - 9. Dollar Complete this Period

1.04 CONTENT

- A. List installed value of each activity shown on the submitted and approved CPM Schedule.
- B. For items on which payments will be requested for stored products, list sub values for cost of stored products with taxes paid.
- C. Limits for specific line item values shall be as specified below and shall be included on all approved Schedules of Values and Applications for Payment.
 - 1. Mobilization and Demobilization: Unless specified elsewhere, the assigned values for mobilization and demobilization shall be based upon the estimated value of specified Work for each of these tasks.
 - 2. Contract Closeout Procedures: Unless specified elsewhere, the assigned values for tasks specified under Contract Closeout Procedures shall be based upon the estimated value of each task. The breakdown shall include separate amounts for the requirements of Final Completion and Final Acceptance, as set forth below:

Contract Price	Value for <u>Final Completion</u>	Value for <u>Final Acceptance</u>
Less than \$200,000	\$2,000	\$2,000
\$200,000 - \$500,000	\$5,000	\$5,000
\$500,001 - \$1,000,000	\$10,000	\$10,000
\$1,000,001 - \$5,000,000	\$20,000	\$20,000
Greater than \$5,000,000	\$30,000	\$30,000

- D. The sum of values listed on the Schedule of Values shall equal total Contract Price.
- E. A Schedule of Values containing costs for early activities in excess of actual value ("front end loading") will be rejected by the DEPARTMENT until the CONTRACTOR corrects the deficiency. The DEPARTMENT shall not be obligated to pay the CONTRACTOR until front end loading is eliminated and the Schedule of Values is approved.

1.05 SUBMITTAL

- A. Submit proposed Schedule of Values with updated CPM Schedule per specification sections for Summary of Work, Work Schedules and Reports, and Submittals.
- B. Submit Schedule of Values with updated completion percentages sufficiently in advance of each Application for Payment to enable the DEPARTMENT to resolve differences.

1.06 SUBSTANTIATING DATA

- A. When the DEPARTMENT requires substantiating information, submit data justifying line item amounts in question.
- B. Provide one copy of data with cover letter for each copy of the Application for Payment. Show application number and date, and line item by number and description.

PART 2 - PRODUCTS

Not Used

PART 3 - EXECUTION

Not Used

END OF SECTION

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SECTION 01 29 76
APPLICATION FOR PAYMENT

PART 1 - GENERAL

1.01 SECTION INCLUDES

- A. Procedures for preparation and submittal of Application for Payment.

1.02 RELATED REQUIREMENTS

- A. Section 00312 – Bid Schedule
- B. Section 00700 - General Conditions
- C. Section 00800 – Supplementary Conditions
- D. Section 01 11 13 – Summary of Work
- E. Section 01 26 63 – Change Order Procedures
- F. Section 01 31 13 – Job Site Administration
- G. Section 01 32 00 – Work Schedules and Reports
- H. Section 01 33 00 –Submittal Procedures
- I. Section 01 29 73 - Schedule of Values
- J. Section 01 45 00 – Quality Control
- K. Section 01 45 29 – Testing Laboratory Services
- L. Section 01 51 00 – Construction Facilities
- M. Section 01 52 13 – Field Offices and Sheds
- N. Section 01 57 10 – Erosion, Sediment and Pollution Control
- O. Section 01 71 13 – Mobilization
- P. Section 01 77 00 - Contract Closeout Procedures
- Q. Section 01 78 39 – Project Record Documents

1.03 FORMAT

- A. Submit Application for Payment on form approved by the DEPARTMENT.

1.04 PREPARATION OF APPLICATIONS

- A. Type required information on Application for Payment form acceptable to the DEPARTMENT.
- B. Execute certification by original signature of authorized officer upon each copy of the Application for Payment.
- C. Show breakdown of costs for each item of the Work on accepted Schedule of Values as specified in Section 01 29 73 – Schedule of Values.
- D. List each authorized Change Order as an extension on continuation sheet, listing Change Order number and dollar amount as for an original item of Work.
- E. Submit Stored Materials Worksheet with every Application for Payment requesting payment for stored materials. Show only direct costs of materials and freight. Submit documentation in accordance with Section 00700 – General Conditions, Article 13.5 Stored Materials and Equipment, for materials shown in column titled “New Material This Pay Request Period.”

1.05 SUBMITTAL PROCEDURES

- A. Submit two originals of each Application for Payment at one-month intervals. Each document shall bear original signature of authorized executive.
- B. Submit with DEPARTMENT-approved transmittal letter bearing DEPARTMENT's project number.

1.06 SUBSTANTIATING DATA

- A. When DEPARTMENT requires substantiating information, submit all requested data justifying line item amounts in question.
- B. Provide one copy of data with cover letter for each copy of Application for Payment. Show Application for Payment number and date, and line item by number and description.

1.07 SUBMITTALS WITH APPLICATION FOR PAYMENT

- A. Submit the following for review sufficiently in advance of Application for Payment to allow detailed review by DEPARTMENT and resolution of differences.
 - 1. Schedule of Values with updated percentages of completion as required by Section 01 29 73 – Schedule of Values.
- B. Submit the following with each Application for Payment.
 - 1. Updated construction schedule as required by Section 01 32 00 – Work Schedules and Reports.
 - 2. Updated Project Record Documents as required by Section 01 78 39 – Project Record Documents.

3. Letter certifying that all Project Record Documents, including record drawings and submittals are current.

1.08 ADDITIONAL REQUIREMENTS FOR FIRST APPLICATION FOR PAYMENT

- A. The first Application for Payment will be processed after the Resident Engineer has received all of the following:
 1. Superintendent Data (Section 00700 – General Conditions, Article 6.2)
 2. Progress Schedule (Section 00700 – General Conditions, Paragraph 6.6.1, & Section 01 32 00 – Work Schedules and Reports)
 3. Schedule of Values (Section 00700 – General Conditions, Paragraph 6.6.2, & Section 01 29 73 – Schedule of Values)
 4. Submittal Schedule (Section 00700 – General Conditions, Paragraph 6.6.2)
 5. Safety Representative Designation (Section 00700 – General Conditions, Article 6.18)
 6. Building Permits (Section 00700 – General Conditions, Article 7.2)
 7. Name of Individual Authorized to Accept Changes (Section 01 26 63 – Change Order Procedures)
 8. CONTRACTOR's Management Team (Section 01 31 13 – Job Site Administration)
 9. CONTRACTOR Quality Control Program and Plan (Section 01 45 00 – Quality Control)
 10. National Bureau of Standards Inspection Report (Section 01 45 29 – Testing Laboratory Services)
 11. Freeze Protection Plan (Section 01 51 00 – Construction Facilities)
 12. Construction Site Layout Plan (Section 01 71 13 – Mobilization and Demobilization)
 13. Traffic Control Plan and Haul Routes (Section 01 11 13 – Summary of Work)
 14. Schedule for Dust and Air Pollution Abatement (Section 01 57 10 – Erosion, Sediment and Pollution Control)
 15. Pre-Construction Property and Structure Assessments (Section 01 51 00 – Construction Facilities)
 16. Hazardous Material Control Plan (Section 01 57 10 – Erosion, Sediment and Pollution Control)
 17. Notice of Intent (Section 01 57 10 – Erosion, Sediment and Pollution Control)
 18. Project Summary (Section 01 57 10 – Erosion, Sediment and Pollution Control)
 19. Temporary Facilities Plan. (Section 01 52 13 – Field Offices and Sheds)

PART 2 - PRODUCTS

Not Used

PART 3 - EXECUTION

Not Used

END OF SECTION

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SECTION 01 31 13
JOB SITE ADMINISTRATION

PART 1 - GENERAL

1.01 SECTION INCLUDES

- A. General requirements for the administration of the construction contract.

1.02 RELATED REQUIREMENTS

- A. Section 00700 – General Conditions
- B. Section 01 29 76 – Application for Payment
- C. Section 01 31 14 – Work Coordination
- D. Section 01 32 00 – Work Schedules and Reports
- E. Section 01 33 00 – Submittal Procedures
- F. Section 01 45 00 – Quality Control
- G. Section 01 77 00 – Contract Closeout Procedures
- H. Section 01 79 00 – Demonstration and Training

1.03 DEPARTMENT PROJECT MANAGEMENT TEAM

- A. The DEPARTMENT's Contracting Officer will issue a Delegation of Authority letter to the CONTRACTOR after Contract Award.
- B. The Delegation of Authority letter will designate the members of the DEPARTMENT's project management team, and delegate levels and limitations of contractual authority, all in accordance with Section 00700 - General Conditions, Article 2.1 Authorities and Limitations.
- C. The CONTRACTOR shall sign the Delegation of Authority letter to acknowledge its understanding of the instructions contained therein.

1.04 CONTRACTOR'S PROJECT MANAGEMENT TEAM

- A. For Construction Manager/General Contractor (CM/GC) construction contracts, the CONTRACTOR shall staff the construction project for its entire duration with the same personnel as proposed in the CM/GC proposal for pre-construction services.
- B. Regardless of delivery method, the CONTRACTOR's Project Management Team shall be capable of performing the following duties, including but not limited to:

1. Maintain the schedule in the progress of Work and resolve construction related issues.
2. Coordinate permitting and construction activities to ensure timely completion of the Work.
3. Maintain a CPM schedule as specified in Section 01 32 00 - Work Schedules and Reports.
4. Coordinate construction activities of suppliers and subcontractors with those of the CONTRACTOR and each other to ensure timely deliveries for installation.
5. Coordinate and effectively manage the construction activities of subcontractors to maintain the Contract schedule and quality requirements.
6. Coordinate necessary inspections with the DEPARTMENT, approved Testing Laboratory, and other agencies as required for the progress of the Work.
7. Participate in Project meetings with the DEPARTMENT and the Architect/Engineering Team to review the progress of the construction, and identify and resolve outstanding construction-related issues.
8. Coordinate the installation, operation and maintenance of temporary utilities required during construction.
9. Prior to submittal of Shop Drawings, Product Data, Samples and other submittals, as specified in Section 01 33 00 -- Submittal Procedures, review for compliance with the Contract Documents and coordination with other work.
 - a. Check field dimensions and clearance dimensions.
 - b. Check relation to available space.
 - c. Check anchor bolt settings.
 - d. Review the effect of changes, if any, on the Work of other subcontracts or by others.
 - e. Check compatibility of equipment and work of the various trades.
 - f. Check motor voltages and control characteristics.
 - g. Coordinate controls and interlocks: Voltages and wiring of electric switches and relays.
 - h. Coordinate wiring and control diagrams.
 - i. Certify compliance with Contract Documents or list differences.
10. Prepare coordination drawings, as specified in Section 01 31 14 - Work Coordination.
 - a. Prepare, as required to ensure coordination of Work of, or affected by mechanical and electrical Work, or to resolve conflicts
 - b. Reproduce and distribute reviewed copies to all concerned parties
11. Observe required testing and maintain a record of tests. Document in the record:
 - a. Testing Laboratory and name of inspector
 - b. Subcontractor
 - c. Manufacturer's representative present
 - d. Date and time of testing
 - e. Type of product or equipment
 - f. Type of test, and test results
 - g. Location of each test
 - h. Retesting required

- i. Other documentation upon request
 - 12. Verify that Subcontractors maintain an accurate and up-to-date set of Contract Documents and record documents.
 - 13. Observe the work for compliance with requirements of the Contract Documents, maintaining a list of observed deficiencies and discrepancies.
 - 14. Equipment Start-up:
 - a. Check to ensure that utilities and specified connections are complete and that equipment is in operable condition.
 - b. Observe testing, adjusting, and balancing.
 - c. Record results, including time and date of start-up.
 - 15. Inspection of Equipment:
 - a. Prior to inspection, check that equipment is clean, repainted as required, tested, and operational.
 - b. Assist inspector; prepare list of items to be completed or corrected.
 - 16. Assemble Project Record Documents from subcontractors and ensure that completed Project Record Documents are submitted to the DEPARTMENT in accordance with Section 01 77 00 - Contract Closeout Procedures, and other requirements of the Contract Documents.
- C. Execute Request for Information (RFI) Procedures.
- 1. Submit RFIs in writing to the DEPARTMENT in a format approved by the DEPARTMENT.
 - 2. The response to the RFI is formally issued to the CONTRACTOR when the DEPARTMENT signs and issues formal direction to the CONTRACTOR.
 - 3. The DEPARTMENT may request it's Architect/Engineers of record to provide recommendations before the DEPARTMENT issues the RFI response to the CONTRACTOR.
- D. Upon request, the CONTRACTOR shall submit all correspondence, including letters, memoranda, meeting minutes, transmittals, Request for Information, technical submittal transmittals, Requests for Change, specified Notices, and any other documentation using forms and format provided by or otherwise approved by the DEPARTMENT.

PART 2 – PRODUCTS

Not Used

PART 3 – EXECUTION

Not Used

END OF SECTION

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SECTION 01 31 14
WORK COORDINATION

PART 1 - GENERAL

1.01 SECTION INCLUDES

- A. Project Work coordination, and coordination with work of other contracts.

1.02 RELATED REQUIREMENTS

- A. Section 00700 – General Conditions
- B. Section 01 11 13 – Summary of Work
- C. Section 01 31 13 – Job Site Administration
- D. Section 01 72 00 – Utilities Coordination
- E. Section 01 73 29 – Cutting and Patching

1.03 REQUIREMENTS

- A. Coordinate work of various sections of Specifications to assure efficient and orderly sequence of installation of construction elements, with provisions for accommodating items installed by DEPARTMENT or under separate contracts.
- B. Verify that characteristics of elements of interrelated operating equipment are compatible; coordinate work of various sections that have interdependent responsibilities for installing connection to, and placing such equipment in service.
- C. Coordinate space requirements and installation of electrical, mechanical, and other special work, which are indicated diagrammatically on the Contract Drawings. Follow routing shown for ducts, conduits, pipes etc., as closely as practicable; make runs parallel with lines of buildings and roads. Utilize spaces efficiently to maximize accessibility for other installations, for maintenance, and for repairs.
- D. Conceal ducts, wiring, and pipes in finished areas unless otherwise indicated. Coordinate locations of fixtures and outlets with finish elements.
- E. Whenever the Work of a Subcontractor is dependent upon the Work of other Subcontractors, contractors, or utility company contractors installing utilities under contract with the DEPARTMENT, then the CONTRACTOR shall require the Subcontractor to:
 - 1. Coordinate its Work with the dependent work.
 - 2. Provide dependent data and requirements.
 - 3. Supply and install items to be built into dependent work of others.
 - 4. Make provisions for dependent work of others.
 - 5. Examine dependent drawings, specifications and submittals.

6. Examine previously placed dependent work.
7. Check and verify dependent dimensions of previously placed work.
8. Notify CONTRACTOR of previously placed dependent work or dependent dimensions, which are unsatisfactory or will prevent a satisfactory installation of its Work.
9. Not proceed with its Work until the unsatisfactory dependent conditions have been corrected.
10. CONTRACTOR shall require subcontractors to participate in coordination meetings as required by the DEPARTMENT.

F. Not Used

PART 2 – PRODUCTS

Not Used

PART 3 – EXECUTION

Not Used

END OF SECTION

SECTION 01 31 19
PROJECT MEETINGS

PART 1 - GENERAL

1.01 SECTION INCLUDES

- A. Requirements for various meetings during the construction project.

1.02 RELATED REQUIREMENTS

- A. Section 01 11 13 - Summary of Work: Coordination of Work.
- B. Section 01 32 00 – Work Schedules and Reports: Progress Schedules.
- C. Section 01 33 23 - Shop Drawings, Product Data, and Samples.
- D. Section 01 45 00 - Quality Control: CONTRACTOR responsibilities.
- E. Section 01 73 00 – Execution Requirements; Project Record Documents; Operation and Maintenance Data.
- F. Section 01 79 00 – Demonstration and Training

1.03 PRECONSTRUCTION CONFERENCES

- A. DEPARTMENT will administer preconstruction conference for execution of Contract and exchange of preliminary submittals. Attendance by all key CONTRACTOR and Subcontractor project personnel is required. The CONTRACTOR shall notify and invite in writing to the pre-construction conference all serving utilities at least 72 hours in advance of the conference.
- B. DEPARTMENT may administer site mobilization conference at Project site for clarification of CONTRACTOR responsibilities in use of site and for review of administrative procedures.
- C. DEPARTMENT will document the meeting and distribute minutes within 48-hours of adjournment. Minutes will be typed, reflecting date, list of attendees and in format to facilitate correction of previous meeting minutes. Distribution will be to all attendees and those affected by discussions or decisions made at meeting.

1.04 PREINSTALLATION CONFERENCES

- A. When required in an individual specification section, and as shown in the CONTRACTOR's quality control plan, or as directed by the DEPARTMENT, convene a pre-installation conference prior to commencing Work for a specific item.
- B. Require attendance of entities directly affecting, or affected by, Work of the section.

- C. Review conditions of installation, preparation and installation procedures, and coordination with related Work.
- D. Record significant discussions and agreements and disagreements of each conference, and approved schedule. Distribute record of conference to all attendees within 24-hours of adjournment.

1.05 WEEKLY PROGRESS MEETINGS

- A. The CONTRACTOR shall administer Weekly Progress Meetings on a regular day and time, which is mutually convenient to both the DEPARTMENT and the CONTRACTOR. These meetings shall be documented by the CONTRACTOR.
- B. Weekly Progress Meeting shall be attended by all key CONTRACTOR and, as appropriate, Subcontractor project personnel.
- C. The CONTRACTOR shall furnish copies of its current Two Week Look Ahead Schedule, per Section 01 32 00 – Work Schedules and Reports, to all attendees of the meeting. This schedule will be reviewed in detail during the meeting and will be used for the coordination of activities by others.
- D. Weekly Progress Meetings will also be used to review other key aspects of the Work, such as safety, quality, critical items, etc.
- E. Meeting Minutes: The CONTRACTOR shall document the meetings and distribute minutes within 48-hours of adjournment. Minutes shall be typed, reflecting date, attendees, and in format to facilitate correction of previous meeting minutes. Distribution shall be to all attendees and those affected by discussions or decisions made at meeting.

1.06 SAFETY MEETING

- A. The CONTRACTOR shall conduct Safety Meetings as required by its project Safety Program.
- B. The CONTRACTOR shall invite the DEPARTMENT to attend Safety Meetings.

1.07 OTHER MEETINGS

- A. At various times throughout the duration of the Contract, the CONTRACTOR will be required to attend meetings as requested by the DEPARTMENT. It is anticipated that such meetings will involve coordination with others, project schedule review, problem resolution, change order negotiations, and other topics of mutual importance.

PART 2 – PRODUCTS

Not Used

PART 3 – EXECUTION

Not Used

END OF SECTION

SECTION 01 32 00
WORK SCHEDULES AND REPORTS

PART 1 – GENERAL

1.01 SECTION INCLUDES

- A. Requirements for the preparation and maintenance of the construction CPM schedule, recovery schedules, time impact evaluation, monthly project status reports, two week look-ahead schedules, and daily construction reports.

1.02 RELATED REQUIREMENTS

- A. Section 00700 – General Conditions
- B. Section 00800 – Supplementary Conditions
- C. Section 01 11 13 – Summary of Work
- D. Section 01 26 63 – Change Order Procedures
- E. Section 01 29 73 – Schedule of Values
- F. Section 01 29 76 – Application for Payment
- G. Section 01 31 13 – Job Site Administration
- H. Section 01 31 19 – Project Meetings
- I. Section 01 33 00 – Submittal Procedures

1.03 SUMMARY

- A. Scheduling of Work under this Contract shall be performed by CONTRACTOR in accordance with the requirements of this Section.
- B. CPM Schedule shall be based upon, and incorporate, Contract milestone and completion dates as specified in Section 00800, Supplementary Conditions, and Section 01 11 13, Summary of Work.
- C. Definitions
 - 1. Project Schedule - The schedule prepared or updated by the CONTRACTOR to the requirements specified herein. The project schedule shall be used to measure the progress of the work and aid in the evaluation of time impacts to the project.
 - 2. Anticipated CPM Schedule - The schedule prepared by the CONTRACTOR defining the planned work in the first 90 calendar days of the contract.
 - 3. Interim CPM Schedule for Design Build - The schedule prepared by the CONTRACTOR for Design Build projects where the Finalized CPM Schedule cannot be completed until after completion of design.

4. Finalized CPM Schedule - The baseline schedule prepared by the CONTRACTOR that shows the sequence and dates in which the CONTRACTOR proposes to perform the work. Once approved, it becomes the basis upon which the CONTRACTOR performs periodic schedule updates.
5. Periodic Schedule Updates - Progress updates to the approved project schedule, shall occur monthly prior to, and included with, each pay application.
6. Time Impact Evaluation (TIE) - Forward looking schedule analysis technique that adds a modeled delay to an accepted contract schedule to determine the possible impact of that delay to the project completion.
7. Fragnet - A sequence of new activities that are proposed to be added to project schedule to demonstrate the influence of the delay or impact to the project's contractual dates. A Fragnet is created using a 'Reflection' of the approved project schedule that immediately preceded the delay.

D. Required Schedules

1. Anticipated CPM Schedule - Submit the Anticipated CPM Schedule, defining the CONTRACTOR's planned operations for the first 90 Calendar days after Notice-to-Proceed, for approval within 15 Calendar days after the NTP is acknowledged, or at the preconstruction conference, whichever comes first. The approved Anticipated Preliminary Project Schedule will be used for payment purposes not to exceed 90 Calendar days after NTP. It may be summary in nature for the remaining performance period. It must be early start (Start On) and late finish (Finish On or Before) constrained and logically tied as specified in this Section. The Anticipated CPM Schedule forms the basis for the Finalized CPM Schedule specified herein, and must include all of the required Plan and Program preparations, submissions, and approvals identified in the contract (for example, Quality Control Plan, Safety Plan, Environmental Protection Plan, etc.) as well as, if applicable, design activities, the planned submissions of all early design packages, permitting activities, design review conference activities and other non-construction activities intended to occur within the first 90 Calendar days. Schedule any Construction activities planned for the first 90 Calendar days after NTP. DEPARTMENT acceptance of the associated design package(s), if applicable, and all other specified Plan and Program approvals that must occur prior to any planned construction activities by CONTRACTOR. The DEPARTMENT and CONTRACTOR shall meet to discuss the Anticipated CPM Schedule within 10 working days after its submittal. The CONTRACTOR shall make corrections to the schedule necessary to comply with Contract requirements and shall adjust the schedule to incorporate any missing information requested by the DEPARTMENT. The CONTRACTOR shall resubmit the Anticipated CPM Schedule if requested by DEPARTMENT.
2. Finalized CPM Schedule - Submit the Finalized CPM Schedule for approval within 60 Calendar days after NTP. The schedule shall demonstrate a reasonable and realistic sequence of activities which represent all work through the entire contract performance period. In accordance with Section 00700 - General Conditions, the Finalized CPM Schedule shall be submitted prior to the first progress payment. The DEPARTMENT's review and approval of the Finalized CPM schedule shall be a prerequisite to the application for the second progress payment. The Finalized CPM

Schedule shall be at a reasonable level of detail as determined by the DEPARTMENT.

3. Monthly Updates and Status Reports
- E. CPM Schedule shall be the basis for Two Week Look Ahead Schedule presentation at Weekly Progress Meeting as specified in Section 01 31 19, Project Meetings.

1.04 SCHEDULER QUALIFICATIONS

- A. Not Used

1.05 SOFTWARE REQUIREMENTS

- A. Development of Schedule, Monthly Payment Requests, Schedule Updates, and Project Status Reporting Requirements of the Contract shall employ computerized Critical Path Method (CPM) scheduling, using Primavera P6 Rel 6.2 or later.

1.06 GENERAL REQUIREMENTS

- A. Develop the Project Schedule to an appropriate level of detail, as determined by the DEPARTMENT. Failure to develop the Project Schedule to the appropriate level of detail will result in its disapproval. Inaccuracy and/or the omission of any element of the Work by the CONTRACTOR will not relieve the CONTRACTOR of the responsibility for accomplishing the Work, in accordance with Contract Documents. The DEPARTMENT's acceptance of the schedule shall be for its use in monitoring and evaluating job progress, payment requests, time extension requests, and the like; and shall not, in any manner, impose a duty of care upon the DEPARTMENT; nor act to relieve the CONTRACTOR of its responsibility for the means and methods of construction. The DEPARTMENT will consider, but is not limited to, the following characteristics and requirements to determine appropriate level of detail:
 1. Activity Durations - Reasonable activity durations are those that allow the progress of ongoing activities to be accurately determined between update periods. No construction activity shall have Original Durations greater than one month's worth of work (20 working days or 30 calendar days).
 2. Design and Permit Activities - Include design and permit activities with the necessary conferences and follow-up actions and design package submission dates. Include the design schedule in the project schedule showing the sequence of events involved in carrying out the project design tasks within the specific contract period. This shall be at a detailed level of scheduling sufficient to identify all major design tasks, including those that control the flow of work. The schedule shall include review and correction periods associated with each item.
 3. Procurement Activities - Include activities associated with the submittal, approval, procurement, fabrication and delivery; of critical materials, equipment, fabricated assemblies and supplies. This will include all procurement activities that will have a direct impact on construction activities. Additionally, include activities on all long lead materials, equipment, fabricated assemblies and supplies. Long lead procurement activities are those with an anticipated procurement sequence of over 30 calendar

- days. These activities shall be logically tied to the submission and approval of product info/shop drawings, and the related construction installation activity.
4. **Mandatory Task** - The following activities shall be included in the initial project schedule and all updates. The CONTRACTOR shall be responsible for all impacts resulting from resubmittal of shop drawings and submittals.
- a. Submission and approval of design packages, if applicable.
 - b. Submission and approval of SWPPP
 - c. Long material procurement activities.
 - d. Submission and approval of mechanical and electrical equipment.
 - e. Submission and approval of O&M Manuals.
 - f. Submission and approval of Record drawings.
 - g. Submission of Certificate of Occupancy.
 - h. Submission of Spare Parts & Maintenance Materials.
 - i. Submission of Warranties and Bonds.
 - j. Submission of Keys and Keying Schedule.
 - k. Request for Substantial Completion Inspection as specified in 01 77 00 Contract Closeout Procedures.
 - l. Submission and approval of Testing and Air Balance (TAB) results.
 - m. Submission and approval of HVAC commissioning/testing plans and data. (Develop the schedule logic associated with testing and commissioning of mechanical systems to a level of detail consistent with the contract commissioning requirements.)
 - n. Submission and approval of Controls Testing Plan.
 - o. Controls Testing.
 - p. Performance Verification Testing.
 - q. Other systems testing, if required.
 - r. Demonstration and Training
 - s. Final Cleaning.
 - t. Substantial Completion Inspection.
 - u. Substantial Completion.
 - v. Final Completion Inspection.
 - w. Final Completion.
5. **DEPARTMENT Activities** - Show DEPARTMENT and other agency activities that could impact progress. These activities include, but are not limited to, DEPARTMENT approvals, design reviews, review conferences, release for construction of design package(s), environmental permit approvals by State regulators, inspections, utility tie-ins, DEPARTMENT furnished equipment and Notice to Proceed (NTP) for phasing requirements. Unless otherwise agreed upon by CONTRACTOR and DEPARTMENT, DEPARTMENT approval activities shall be on a 7 day calendar with an Original Duration of 30 days.
6. **Contract Constraints and Milestones** - The CONTRACTOR shall follow the parameters as specified herein for all schedules.

- a. Constraints - The schedule shall have no constrained dates other than those specified herein. Additional constraints may be approved by the DEPARTMENT on a case by case basis. The use of artificial float constraints, such as 'zero free float' or 'zero total float,' are prohibited. Additionally, Mandatory Start, Mandatory Finish, Finish On, and As Late As Possible constraints are prohibited.
 - i. Project Start Date Constraint - The first activity in the project schedule shall have a Start On constraint equal to the date that the NTP was acknowledged.
 - ii. Substantial Completion Constraint - The Substantial Completion activity shall have a Finish On or Before constraint equal to the contractual Substantial Completion Date.
- b. Milestones - Use of milestone activities shall be held to a minimum. Milestone activities may be used for significant project events including, but not limited to, project phasing, project start and end activities, or interim completion dates. The following are required Milestone activities:
 - i. Project Start Date Milestone - The first activity in the project schedule shall be a Start Milestone titled 'Start Project (NTP).'
 - ii. Substantial Completion Milestone - The Substantial Completion activity shall be a Finish Milestone titled 'Substantial Completion DD-MMM-YY.' If the schedule calculates an early finish, then the float calculation for the 'Substantial Completion DD-MMM-YY' milestone shall reflect positive float on the longest path of logic. If the project schedule calculates a late finish, then the 'Substantial Completion DD-MMM-YY' milestone float calculation shall reflect negative float on the longest path. The DEPARTMENT is under no obligation to accelerate DEPARTMENT activities to support CONTRACTOR's early completion. The DEPARTMENT may reject an earlier (advanced) schedule, i.e. one that shows early completion dates for the Contract Milestones.
 - iii. Final Completion Milestone - The last activity in the schedule shall be a Finish Milestone titled 'Final Completion.'
- 7. The CONTRACTOR shall not be entitled to extra compensation in the event that a schedule is approved showing an earlier completion than is contractually required; but then completes the project, for whatever reason, beyond the completion date shown in the earlier approved schedule; but within the Contract performance period.
- 8. Ownership of Float - Float available in the schedule, at any time, shall not be considered for the exclusive use of either the DEPARTMENT, nor the CONTRACTOR. This includes Activity Float and Project Float. Activity Float is the length of time that an activity can be delayed without causing a delay to the 'End Project (CCD)' finish milestone. Project Float is the length of time between the CONTRACTOR's projected early finish and the Contract Completion Date milestone.
- 9. Calendars - Activities will be assigned a Project Specific Calendar to which the activity logically belongs. Calendars should be developed to accommodate any contract defined work period such as a '7-day no holidays' calendar for

DEPARTMENT approval periods, concrete cure times, etc. The Default Calendar on the Project Level should be developed to include weekends and holidays. At a minimum, there should be both '7-day no holidays' and a '5-day w/ holidays' Project Specific calendars. For projects that include activities that are affected by adverse weather, an additional Project Specific calendar that includes weekends and holidays, as applicable, should be developed that blocks out the Winter Shut-down period as non-work days. When setting up the Project Specific calendars, with the 'Detailed work hours/day' radio button checked, click on the Workweek button on the bottom right hand side. Set the Standard work hours to be from 0800 to 1600 with no 'lunch' break blocked out. (Elsewhere in this specification, the required project administrative parameters set a 'day' as equivalent to 8 hours. For the purposes of establishing Original Durations, a day is a day. Even if CONTRACTOR intends to work 10 hrs/day or 12 hrs/day, to accurately calculate progress, the Calendars must match the 8 hrs/day setting.)

10. Open Ended Logic - There shall be only two open ended activities; the first activity 'Start Project (NTP)' shall have no Predecessor logic, and the last activity "Final Completion" shall have no Successor logic. Predecessor open ended logic may be allowed in time impact analyses, upon the DEPARTMENT's approval.
11. Default Progress Data Disallowed - Actual Start and Finish dates shall not automatically update with default mechanisms included in the scheduling software. Updating of the percent complete and the remaining duration of any activity shall be independent functions. Program features that calculate one of these parameters from the other shall be disabled. Activity Actual Start (AS) and Actual Finish (AF) dates assigned during the updating process shall match those dates provided in the CONTRACTOR Quality Control Reports. Failure of the CONTRACTOR to document the AS and AF dates in the Daily Quality Control report shall result in disapproval of the CONTRACTOR's schedule.
12. Out-of Sequence Progress - Activities that have progressed before all preceding logic has been satisfied (Out-of-Sequence progress) are not allowed. Logic must be corrected (e.g. changing the relationship from FS to SS to match actual field conditions) so that the error log is clear of any Out-of-Sequence logic.
13. Original Duration - Activity Original Duration (OD) changes are prohibited unless approved by DEPARTMENT. Remaining duration shall be used to make activity duration changes, after an activity has started, when progressing the project schedule.
14. Negative Lags and Start to Finish (SF) Relationships - Lag durations contained in the project schedule shall not have a negative value under any circumstances. Start to Finish (SF) relationships are prohibited.
15. Retained Logic - Schedule calculations shall retain the logic between predecessors and successors ('Retained Logic' mode) even when the successor activity has started and the predecessor activity has not yet finished (Out-of-Sequence logic). Software features that in effect sever the tie between predecessor and successor activities when the successor has started and the predecessor logic is not satisfied ('Progress Override") is not allowed.

B. PROGRESSING THE SCHEDULE

1. Percent Complete – CONTRACTOR and DEPARTMENT shall on a monthly basis review project progress and establish the approved percent complete for each activity started, based upon the realistic assessment of earned value. CONTRACTOR will then update the schedule with Actual Start, Actual Finish, Percent Complete, and Remaining Duration. 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. The Substantial Completion Inspection activity may be declared 100 percent complete upon completion and correction of all punch list work identified during DEPARTMENT Substantial Completion Inspection(s).
 2. Remaining Duration - Update the Remaining Duration on any activity that has started but is not yet finished. Remaining Duration should be a realistic assessment of the amount of days remaining to complete that activity.
- C. PROJECT SCHEDULE SUBMISSIONS - Provide the submissions as described below. The data CD, reports, and Network Diagrams required for each submission are contained in paragraph 5.4.2.
1. Periodic Schedule Updates
 - a. The CONTRACTOR shall update the project schedule on a monthly basis. The updated project schedule shall be submitted to the DEPARTMENT for approval at the periodic schedule update meetings as prescribed in paragraph 5.4.3. These submissions will enable the DEPARTMENT to assess CONTRACTOR's progress. If the CONTRACTOR fails or refuses to furnish the information and schedule updates as set forth herein, then the CONTRACTOR shall be deemed not to have provided an estimate upon which a progress payment can be made. For Design-Build projects, update the schedule to include detailed construction activities as the design progresses, but not later than the submission of the final, un-reviewed design submission for each separate design package. The Contracting Officer may require submission of detailed schedule activities for any distinct construction that is started prior to submission of a final design submission, if such activity is authorized.
 - b. Neither updating, changing or revising of any report, curve, schedule or narrative submitted to the DEPARTMENT by the CONTRACTOR under this Contract, nor the DEPARTMENT's review or acceptance of any such report, curve, schedule or narrative shall have the effect of amending or modifying, in any way, the Contract Substantial Completion date or milestone dates or of modifying or limiting, in any way, the CONTRACTOR's obligations under this Contract.
 2. Periodic Schedule Update Meetings - Conduct periodic schedule update meetings for the purpose of reviewing the CONTRACTOR's proposed Periodic Schedule Update, Narrative Report, Schedule Reports, and progress payment. Meetings shall occur at least monthly within five days of the proposed schedule Data Date. The CONTRACTOR shall provide a computer with the scheduling software loaded on the computer and a projector, which allows all meeting participants to view the proposed schedule during the meeting. The CONTRACTOR's scheduler will be available

during the meeting to organize, group, sort, and filter the schedule as requested by the DEPARTMENT. An electronic version of the proposed schedule update, narrative, and all reports will be provided at least 48 hours in advance of the meeting. The CONTRACTOR's Project Manager, superintendent, foreman, and major Subcontractors shall attend the meeting as required to discuss the project schedule and work. CONTRACTOR will present the current status of the project and will review the narrative report. Following the Periodic Schedule Update Meeting, the CONTRACTOR shall make corrections to its draft submission. Only those changes approved by the DEPARTMENT will be included in the submission and invoice for payment.

3. Update Submission Following Progress Meeting - Submit a complete update of the project schedule containing all approved progress, revisions, and adjustments; pursuant to paragraph SUBMISSION REQUIREMENTS not later than 4 working days after the Periodic Schedule Update meeting.

D. REQUESTS FOR TIME EXTENSIONS

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.

- E. WEEKLY PROGRESS MEETINGS** - The CONTRACTOR shall meet weekly with the DEPARTMENT (or as otherwise mutually agreed to) between the meetings described in paragraph PERIODIC SCHEDULE UPDATE MEETINGS for the purpose of jointly reviewing the actual progress of the project as compared to the as planned progress, and to review planned activities for the upcoming two weeks. The current approved schedule update shall be used for the purposes of this meeting and for the production and review of reports. The weekly progress meeting will address the status of RFI's, RFP's and Submittals. CONTRACTOR shall provide and present a time scaled two-week look ahead schedule that is based and correlated to the current CPM schedule. The schedule shall look out two weeks from the day of the Weekly Progress Meeting.

- F. SUBCONTRACTOR AGREEMENT** - Submit for each Subcontractor and supplier on their corporate letterhead, a statement certifying that the Subcontractor or supplier accepts the CONTRACTOR's Finalized CPM Schedule, and that the Subcontractors' or suppliers' related schedules have been properly incorporated. Include with the certification a copy of each Subcontractors' or suppliers' schedules upon which the proposed Finalized CPM Schedule was built. The certification statements shall confirm that task durations, cost and resource loading variables have been correctly included in the Finalized CPM schedule. Failure to provide Subcontractor agreements may result in denial of the project schedule submission.

- G. DAILY CONSTRUCTION REPORTS** - The CONTRACTOR shall, on a daily basis, submit a daily task report to the DEPARTMENT for each working day, including weekends and holidays, when worked. The CONTRACTOR shall develop the daily construction reports on a computer-generated database capable of sorting daily Work, manpower and labor hours by the CONTRACTOR, Subcontractor, area, and Change Order. Upon request of the DEPARTMENT, the CONTRACTOR shall furnish computer disk of this database. The CONTRACTOR shall obtain the DEPARTMENT's written approval of database format for daily construction reports prior to implementation. The following shall be included in report:

1. Project name and Project number
2. CONTRACTOR's name and address
3. Weather, temperature and any unusual site conditions.
4. Was this day adversely affected by the weather?
5. Brief description and location of the day's scheduled activities and any special problems and accidents, including Work implemented by Subcontractors.
6. Activities Started today.
7. Activities Completed today.
8. Worker quantities for prime and for Subcontractors of any tier. Include the trade of the worker, ie. Superintendent, Quality Control, Electrician, Operator, etc., and number of hours worked.
9. Equipment, other than hand tools, utilized by CONTRACTOR and Subcontractors. Include equipment identification, number of hours in service and number of hours idle. Include any equipment inspections and equipment maintenance performed, if any.

PART 2 – PRODUCTS**Not Used****PART 3 – EXECUTION****Not Used****END OF SECTION**

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SECTION 01 33 00
SUBMITTAL PROCEDURES

PART 1 – GENERAL

1.01 SECTION INCLUDES

- A. Procedures for the preparation, tracking, and review of submittals for the project.

1.02 RELATED REQUIREMENTS

- A. Section 00700 – General Requirements
- B. Section 00800 – Supplementary Conditions
- C. Section 01 11 13 - Summary of Work: Work sequence
- D. Section 01 12 19 – Subcontractor Certifications
- E. Section 01 29 73 - Schedule of Values: Submittal of Schedule of Values
- F. Section 01 29 76 - Applications for Payment: Submittal of Applications
- G. Section 01 31 13 – Job Site Administration
- H. Section 01 32 00 – Work Schedules and Reports
- I. Section 01 33 23 – Shop Drawings Product Data and Samples.
- J. Section 01 45 00 - Quality Control: Manufacturers' field service reports, Testing laboratory reports
- K. Section 01 45 29 – Testing Laboratory Services
- L. Section 01 60 00 - Material and Equipment: Substitutions
- M. Section 01 71 23 – Field Engineering
- N. Section 01 73 00 – Execution Requirements: Project Record Documents, Warranties and Bonds: Closeout submittals
- O. Section 01 77 00 - Contract Closeout Procedures: Closeout submittals
- P. Section 01 79 00 – Demonstration and Training
- Q. Technical Product Specifications
- R. Commissioning Specifications
- S. Operations and Maintenance Manuals

- T. Equipment Installation Data

1.03 SCHEDULE OF SUBMITTALS

- A. Submit preliminary Schedule of Submittals as required by Section 00700 - General Conditions. In addition to shop drawing submissions, include all submittals required by the Contract Documents in the Schedule of Submittals.
- B. Schedule of Submittals will be used by the DEPARTMENT to schedule time in their activities relating to review of submittals. Schedule of Submittals shall portray an orderly sequence of submittals, early submittals for long lead-time items, and submittals which require extensive review.
- C. Schedule of Submittals shall be reviewed by the DEPARTMENT and shall be revised and resubmitted until accepted by the DEPARTMENT.

1.04 CONTRACTOR REVIEW

- A. The CONTRACTOR shall prepare and review submittals as required by the provisions of Section 00700 – General Conditions and Section 00800 – Supplementary Conditions.

1.05 SUBMITTAL REQUIREMENTS

- A. Number of copies: Submit the number of copies of submittals which the CONTRACTOR requires to be returned to it following review, plus four (4) copies for retention by the DEPARTMENT.
- B. Submit each submittal with a Submittal Summary form as its face document. Use a Submittal Summary form provided by the DEPARTMENT, or a substitute approved by the DEPARTMENT.
- C. Label submittals with a numbering system approved by the DEPARTMENT. Identify the project by title and DEPARTMENT'S project number; identify Work and product by Specification section and Article number.
- D. Submit items required by individual specification sections. Sequence the submission of submittals to correspond with the approved Schedule of Submittals.
- E. Before the submission of each submittal, the CONTRACTOR shall have determined and verified all quantities, dimensions, specified performance criteria, installation requirements, materials, catalog numbers and similar data with respect thereto and reviewed or coordinated each submittal with other submittals and with the requirements of the Work and the Contract Documents, upon which the CONTRACTOR shall certify in writing on each submittal that it has made this determination. The failure to review and certify a submittal shall be cause for the DEPARTMENT to return the submittal without review.
- F. On the submittal, notify the DEPARTMENT in writing of any deviations from requirements of the Contract Documents.
- G. Organize the submittals into logical groupings to facilitate the processing of related submittals, such as:

1. Finishes which involve DEPARTMENT selection of colors, textures, or patterns.
 2. Items required by the individual Technical Product Specification Sections.
 3. Associated items, which require correlation for efficient function or for installation.
- H. Submit all required color and finish samples in order to receive approval for colors and finishes.

1.06 RESUBMITTALS

- A. Provide the same number of submittals required for the first submission. For example, if 6 are required and 2 are returned marked "rejected" or "revise and resubmit", re-submit 6 copies. The DEPARTMENT will not return any of its copies from the prior submittal for the CONTRACTOR'S use in preparing the re-submittal.
- B. Provide complete copies of re-submittals. Do not re-submit partial copies of submittals for incorporation into the DEPARTMENT'S retained submittals from the prior submission.
- C. If drawings, product submittals, samples, mockups, or other required submittals are incomplete or not properly submitted, the DEPARTMENT will not review the submittal and will return it to the CONTRACTOR. The DEPARTMENT will review a submittal no more than 2 times without additional charge to the CONTRACTOR (incomplete or improperly submitted submittals count as one). The CONTRACTOR shall pay all review costs associated with more than 2 reviews.

1.07 DEPARTMENT REVIEW

- A. The DEPARTMENT will review submittals and re-submittals, and return submittal comments within 30 calendar days of receipt.
- B. The DEPARTMENT or authorized agent will receive, review and return submittals to the CONTRACTOR with one of the following dispositions noted:

"No Exceptions Taken" – denotes that the submittal is generally consistent with the requirements of the Contract Documents. A resubmittal is not required.

"Make Corrections Noted" – denotes that the submittal is generally consistent with the requirements of the Contract Documents but only as conditioned by notes and corrections made on the submittal. A resubmittal is not required provided the CONTRACTOR understands the review comments and desires no further clarification.

"Revise and Resubmit" – denotes that revisions are required in the submittal in order for the submittal to be generally consistent with the requirements of the Contract Documents. The DEPARTMENT will indicate on the returned submittal what revisions are necessary. A resubmittal is required.

"Rejected" – denotes that the submittal does not meet the requirements of the Contract Documents and shall not be used in the Work. The DEPARTMENT will indicate on the returned submittal the reasons for its rejection. A resubmittal is required

- C. Review by the DEPARTMENT of submittals shall not be construed as a complete check, but will indicate only that the general method of construction and detailing is consistent with the requirements of the Contract Documents. Review of submittals shall not relieve the CONTRACTOR of the responsibility for compliance with the requirements of the Contract Documents or for errors, dimensions, and quantities unless specific exception is requested and approved on the submittal.
- D. The DEPARTMENT's review shall not extend to the means, methods, techniques, sequences or procedures of construction or to safety precautions or programs incident thereto. The review and approval of a separate item as such will not indicate approval of the assembly in which the item functions.

1.08 DISTRIBUTION

- A. The CONTRACTOR shall be responsible for making and distributing any reproductions of approved submittals that it may require for its use.
- B. The CONTRACTOR shall perform work in accordance with approved submittals.

PART 2 – PRODUCTS

Not Used

PART 3 – EXECUTION

Not Used

END OF SECTION

SECTION 01 33 23

SHOP DRAWINGS, PRODUCT DATA, AND SAMPLES

PART 1 - GENERAL

1.01 RELATED REQUIREMENTS

- A. Section 00700 - General Conditions
- B. Section 01 11 13 - Summary of Work
- C. Section 01 31 19 – Project Meetings
- D. Section 01 33 00 - Submittals: Schedules for submittals and submittal requirements
- E. Section 01 45 00 - Quality Control: Mockups and samples for testing
- F. Section 01 60 00 - Material and Equipment
- G. Section 01 73 00 - Execution Requirements
- H. Section 01 78 39 – Project Record Documents
- I. Technical Specifications: Identification of submittal requirements

1.02 SHOP DRAWINGS

- A. Present in a clear and thorough manner. Label each Shop Drawing with DEPARTMENT's Project name, Project number and date of submittal. Identify each element of the Shop Drawings by reference to specification section, sheet number and detail, schedule, or room number of Contract Documents.
- B. The data shown on the Shop Drawings shall be complete with respect to specified performance and design criteria, materials and similar data to show the DEPARTMENT materials and equipment the CONTRACTOR proposes to provide.
- C. Identify dimensions; show relation to adjacent or critical features or Work or products.
- D. Designation of work "by others," if shown in submittals, shall mean that work will be responsibility of CONTRACTOR rather than subcontractor or supplier who has prepared submittals.
- E. Minimum Sheet Size: 11"x17".

1.03 PRODUCT DATA

- A. Submit only pages which are pertinent; mark each copy of standard printed data to identify pertinent products, referenced to Specification section and Article number. Show reference standards, performance characteristics and capacities; wiring and piping diagrams and controls; component parts; finishes; dimensions; and required clearances.

- B. Modify manufacturer's standard schematic drawings and diagrams to supplement standard information and to provide information specifically applicable to the Work. Delete information not applicable.
- C. Submit manufacturer's instructions for storage, preparation, assembly, installation, start up, adjusting, balancing, and finishing.

1.04 SAMPLES

- A. Submit full range of manufacturer's standard finishes except when more restrictive requirements are specified, indicating colors, textures and patterns, for DEPARTMENT selection as specified in technical product sections.
- B. Submit samples to illustrate functional characteristics of products, including parts and attachments.
- C. Approved samples, which may be used in the Work, are indicated in the Specification section.
- D. Samples shall be identified clearly as to material, supplier, pertinent data such as catalog numbers and the use for which they are intended and otherwise as the DEPARTMENT may require, to enable the DEPARTMENT to review the submittal.
- E. Label each sample with identification required for transmittal letter.
- F. Provide field sample mockup of finishes at Project, at location acceptable to DEPARTMENT, as required by individual Specification section. Install each sample complete and finished. Acceptable finishes in place may be retained in completed Work.

PART 2 – PRODUCTS

Not Used

PART 3 - EXECUTION

Not Used

END OF SECTION

SECTION 01 35 45 - AIRBORNE CONTAMINANT CONTROL

PART 1 - GENERAL

1.01 SUMMARY:

A. Related sections:

1. Section 02 26 00 Hazardous Materials Assessment
2. Section 02 41 00 Demolition
3. Section 02 82 33 Removal and Disposal of Asbestos Containing Materials
4. Section 02 83 33 Removal and Disposal of Materials Containing Lead
5. Section 02 84 18 Removal and Disposal of Chemical Hazards

- B. Notification of Potential Hazards: Asbestos, lead and other potentially hazardous materials are present in the building that may impact the work of all trades. Regulated air contaminants, including asbestos and lead, are also present in settled and concealed dust in and on architectural, structural, mechanical and electrical components or systems throughout the building. All trades shall coordinate with other trades and conduct their work to prevent worker exposure or site contamination. Refer to Specification Divisions 0, 1 and 2 for specific information concerning disturbing, removing and disposing of these materials and the installation of new materials or components. This notification is provided in accordance with EPA and OSHA requirements.

1.02 DEFINITIONS:

- A. "Airborne Contaminants" are those contaminants listed in 29 CFR 1926.55 and 8 AAC 61.1100 that have the potential to become airborne due to various work activities being performed by the Contractor. Additionally, airborne contaminants include those fumes and odors that may be objectionable to personnel in Occupied Areas of the facility even though they are not listed in the reference regulations. Airborne contaminants may be broadly categorized as Pre-Existing or Activity Generated. Contaminant producing activities include, but are not limited to:

1. Demolition, removal, installation and disposal of walls, floors, ceilings, steel, and other architectural or structural materials.
2. Disturbance or removal of existing settled and concealed dusts.
3. Demolition, relocation, installation and disposal of plumbing, mechanical and electrical systems and equipment.
4. Finish operations such as sanding, preparation, painting, and application of special surface coatings.
5. Any construction activity, which can generate aerosols, dust, smoke, or fumes.
6. Temporary heat sources.
7. Other on-site work operations not described above.

- B. "Pre-Existing Contaminants" are those contaminants that are present in the facility prior to the start of any work. These contaminants, including asbestos and lead, are assumed to be also present in settled and concealed dust throughout the building in areas not subject to routine cleaning, including the roof and inside and on top of architectural, mechanical, electrical and structural elements. The dust generally contains several common components including, but not limited to asbestos, cellulose, cotton, fiberglass, lead, silica and other Particulates Not Otherwise Regulated. Representative dusts throughout the facility have been examined by an EPA Certified Building Inspector and determined not to be "asbestos debris" from adjacent "Asbestos-Containing Building Materials" (ACBM). Based on similar sampling from similar buildings, the inspector also determined that the dusts are unlikely to contain more than one percent (1%) asbestos by weight, and therefore are not an asbestos-containing material (ACM). Reference 40 CFR 763.83 for asbestos, and 29 CFR 1926.1153 for silica. Refer to Section 02 26 00,

- Hazardous Materials Assessment. Dust and debris related to adjacent damaged asbestos containing materials are addressed in Section 02 82 33, Removal and Disposal of Asbestos Containing Materials.
- C. “Activity Generated Contaminants” are those contaminants generated by the various demolition or construction related activities of the Contractor. Examples of typical Activity Generated Contaminants include wood dust (cellulose), cement dust (silica), gypsum dust (particulates not otherwise regulated), paint fumes, and welding fumes. A complete list of regulated air contaminants is available in 29 CFR 1926.55 and 8 AAC 61.1100.
 - D. “Work Areas”: Areas of demolition, renovation, construction, adjacent staging and storage areas, and passage areas for workers, supplies, and waste. This may include but is not limited to attic spaces, spaces above ceilings, crawl spaces, mechanical and electrical spaces, confined spaces and other spaces not normally accessed or occupied.
 - E. “Occupied Areas”: Areas as determined by Owner’s Representative and as shown on contract drawings. Typically, these include areas adjacent to Work Areas or containment areas, either occupied or used for passage, as well as areas connected to construction area by mechanical system air intake, exhaust, and ductwork. Contaminant control procedures may be relaxed during periods when the building is not occupied as allowed by the Contractor’s approved work plan.
 - F. “Critical Clean Areas”: Areas inside or outside the Work Area with equipment or occupants that cannot tolerate airborne contamination, and are to be maintained under positive pressure by High-Efficiency, Particulate, Air (HEPA) filtered equipment relative to the surrounding air. These areas will be described or shown in contract documents or drawings.
 - G. “Contractor” is defined to include all trades and all subcontractors performing work on the work site.
 - H. “Negative Initial Determination” is a determination made either through air monitoring or other objective data that indicates worker exposure to regulated airborne contaminants are below or expected to be below the regulated limits.

1.03 AIRBORNE CONTAMINANT CONTROL

- A. There is no requirement to remove Pre-Existing Contaminants from the facility. The Contractor may remove Pre-Existing Contaminants from their work areas if they determine that to be a more cost effective means of completing the work.
- B. The Contractors shall establish and maintain control over the generation and containment of all potential airborne contaminants so that workers, facilities, staff, programs, equipment, and operations are not adversely affected, including adverse effects on air monitoring. Construction activities that disturb existing materials or create airborne contaminants must be conducted in Work Areas specifically constructed, ventilated, and/or equipped to prevent the movement of contaminants into Occupied or Critical Clean Areas.
- C. The Contractor shall establish and maintain control over Activity Generated Contaminants within the Work Area to prevent abnormally high levels of airborne contaminants from settling on architectural, mechanical, electrical or structural components within the work areas, or interference with monitoring conducted for other work. The Contractor shall be required to clean all surfaces within a work area where abnormally high levels of Activity Generated Contaminants are deposited.
- D. The Contractor shall ensure that all workers are aware of the Occupied and Critical Clean Areas, the potential air contaminants present and the means and methods established in the work plan to control those contaminants.

- E. The Contractor shall ensure workers have the proper protective equipment needed for the job being performed.

1.04 TRAINING

- A. The Contractor shall ensure that all workers/trades performing work on the project site are trained in accordance with OSHA standards for hazard communication (29 CFR 1910.1200) and proper protective equipment (29 CFR 1926), as well as engineering controls and work methods required to prevent exposure to regulated air contaminants that might be generated or encountered as a results of their work, including 29 CFR 1926.1153.

1.05 RESPONSIBILITY:

A. Owner's Responsibilities

- 1. The Owner shall identify in contract documents Occupied Areas and Critical Clean Areas prior to allowing the Contractor to begin work. The Contractor shall be notified of all changes to these areas as work progresses.

B. Contractor's Responsibilities:

- 1. Preparing proposed work plans and procedures for control of airborne contaminants during demolition and construction.
- 2. Identifying and implementing specific means and methods of achieving and maintaining control of airborne contaminants.
- 3. Controlling the generation and spread of airborne contaminants from the Contractor's Work Areas.
- 4. Cleaning and decontaminating all areas contaminated as the result of their operation. The Owner has the right to review and approve of any and all clean-up and decontamination procedures, chemicals, and processes.
- 5. Notifying Owner's Representative a minimum of 48 hours prior to starting construction activities that might be expected to produce excess levels of airborne contaminants in Work Area so that precautions may be taken.

1.06 SUBMITTALS:

- A. Submittals Required: Submit the following documentation to the Owner for approval. The submittal shall be coordinated with all the Contractor's subcontractors and trades and be submitted as one submittal for all work covered by this section. **WORK SHALL NOT PROCEED UNTIL THE SUBMITTAL PACKAGE IS APPROVED, AND THE PRE-CONSTRUCTION MEETING HAS BEEN HELD.**

- 1. Shop Drawings: Make all shop drawings accurately and to a scale sufficiently large to show all pertinent features of the work. Shop Drawings shall show:
 - a. Boundaries of each Work Area, Occupied Areas and Critical Clean Areas.
 - b. Location of barriers, negative pressure areas, positive pressure areas, and exhaust fan units (if required).
 - c. Locations of windows, louvers, ducts and other penetrations into Occupied Areas and/or Critical Clean Areas that need to be protected from airborne contamination.
 - d. Disposal Routes.
 - e. Locations of contaminant producing operations like painting or sanding which could be moved away from Occupied Areas.
- 2. Work Plan: The Work Plan shall be prepared for this specific job in the form of checklists and shall include:
 - a. Work area set-up and protection procedures during occupied times.
 - b. Work area set-up and protection procedures during periods of limited occupancy

- (vacation and holidays).
 - c. Work procedures to minimize generation of airborne contaminants.
 - d. Worker protection procedures.
 - e. Daily cleanup procedures and activities.
 - f. Procedures to follow if air contaminants enter Occupied or Critical Clean Areas.
 - g. Exposure assessment procedures if a "negative initial determination" has not been completed (note that negative initial determinations are not allowed related to silica exposure). A record of "negative initial determinations" shall be maintained by the Contractor and be available on the job site for review by the Owner or regulatory agencies.
- 3. Safety Data Sheets (SDSs): The Contractor shall maintain on the job site, at a location approved by the owner, SDSs for each encapsulant, surfactant, solvent, detergent, and other material proposed to be used.
- B. Monitoring Results: The Contractor shall submit copies of all air monitoring and testing results to the Owner within 24 hours of receipt of results.

1.07 WORKER PROTECTION:

- A. The Contractor shall review the SDS's for the substances that will be used, data provided by these specifications, proposed means and methods, manufacturers data and other available data to determine the potential for worker exposure.
- B. Conduct air monitoring of worker exposures as necessary to show that workers are not being exposed above the permissible exposure limits established by 29 CFR 1926 and 8 AAC 61.1100 (negative initial determination). Not all contaminants or substances will require exposure monitoring. All sampling by the Contractor shall be at their own cost.
- C. In lieu of worker exposure monitoring, the Contractor may rely on objective data from recognized trade groups, manufacturer or previous exposure monitoring data that establish that worker exposure above the permissible exposure limits is not probable under conditions "closely resembling" the processes, types of materials, control methods, work practices and environmental conditions in the current job.

PART 2 - PRODUCTS Not Used

PART 3 - EXECUTION

3.01 WORK PRACTICES:

- A. General: All construction/demolition work shall be isolated, either by enclosures, and/or work practices and equipment to prevent worker exposures above the permissible exposure limit(s), and prevent the migration of contaminants (dust, fumes, smoke, etc.) into Occupied Areas and Critical Clean Areas of the facility. Exposures to occupants shall be maintained at least 10 times lower than the permissible exposure limit(s) for airborne contaminants. Conduct disturbance of concrete, brick, stone, mortar, etc. in accordance with 29 CFR 1926.1153 related to crystalline silica. If the Contractor's work practices are not effective in controlling airborne contaminants, as evidenced by dust, fumes, smoke, odors, etc. in Occupied or Critical Clean Areas, the Contractor shall provide a sealed barrier at the perimeter of the work area and exhaust the work area to maintain a negative pressure and/or provide a filtered positive pressure to Critical Clean and Occupied areas to keep airborne contaminants out. Maintain a positive pressure of 0.05 inches of water column relative to the air outside the Critical Clean Areas, with a minimum 100 feet per minute velocity through cracks, openings, etc.
- B. Direct exhaust from fume or smoke producing equipment away from building air intakes, windows and other penetrations into Occupied and Critical Clean Areas.

- C. The Contractor shall provide “walk-off” mats, at all connections between Work Areas and Occupied Areas, vacuumed or changed daily when there is traffic between the Work Area and the Occupied Areas.
- D. Enclosures, where used, shall be dust tight and withstand air pressure.
- E. Prohibited Materials: The use or application of the following materials is prohibited:
 - 1. All cleaners and aerosol products not submitted and approved by the Owner.
 - 2. All flammable or chlorinated hydrocarbon solvents, unless approved by the Owner.
- F. Any dust or debris tracked outside of Work Areas into Occupied Areas shall be cleaned up immediately. Contractor shall have the necessary manpower and equipment (dust and wet mops, HEPA vacuums, buckets and clean wiping rags) to keep adjacent Occupied Areas clean at all times.
- G. Dry Sweeping is prohibited. All vacuums used for cleaning shall be equipped with HEPA filters.
- H. Traffic between Work Areas and Occupied Areas shall be kept to a minimum. Keep doors between such areas closed at all times. Transport refuse through Occupied Areas in covered containers.
- I. Notify the Owner’s Representative immediately of any release of airborne contaminants into Occupied Areas.

3.02 ENFORCEMENT:

- A. The Contractor shall periodically inspect Occupied Areas at the perimeter of the work area and Critical Clean Areas to verify that airborne contaminants have not spread into those areas.
- B. Failure to properly maintain airborne contaminant control in Work Areas, Occupied or Critical Clean Areas will result in issuance of a written warning. If the problem is not corrected immediately, the Owner will have cause to stop work.
- C. Failure of the Contractor to correct deficiencies in controlling airborne contaminants will result in corrective action taken by the Owner and deduction of all costs from the Contract.

3.03 WORK STOPPAGE:

- A. The Contractor shall stop work and notify the Owner whenever their work has caused visible dust, smoke, fumes or objectionable odors in Occupied or Critical Clean Areas.
- B. When such work stoppage occurs, the area shall be restored to its original condition by the Contractor at no expense to the Owner. The Contractor is responsible for removing dust, fumes and debris that were generated as a result of their work.

3.04 WORK COMPLETION:

- A. Provide thorough cleaning of finished surfaces that become exposed to dust or other airborne contaminants. Cleaning of Pre-Existing contaminants is not required.
- B. Removal of construction barriers and airborne contaminant control equipment shall be performed in a manner to minimize disturbance of airborne contaminants into occupied spaces. HEPA vacuum and clean all finished surfaces free of dust after the removal of barriers and equipment.

END OF SECTION

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**SECTION 01 41 00
SPECIAL REGULATORY REQUIREMENTS**

PART 1 - GENERAL

1.01 SECTION INCLUDES

- A. Compliance with Governmental Regulatory Permit requirements and conditions.

1.02 RELATED REQUIREMENTS

- A. Section 00700 - General Conditions

1.03 SPECIAL REGULATORY REQUIREMENTS

- A. The CONTRACTOR shall comply with all the requirements enumerated in the Contract Documents. In addition, the CONTRACTOR shall comply with the following codes and permits, as amended by the Authority Having Jurisdiction.
 - 1. Current Edition of the International Building Code
 - 2. Current Edition of the International Fire Code
 - 3. Current edition of Uniform Plumbing Code
 - 4. Current edition of International Mechanical Code
 - 5. Current edition of NFPA 70 National Electrical Code
 - 6. Current edition of NFPA 70E Standard for Electrical Safety in the Workplace
 - 7. Current Edition of Americans with Disability Act Guidelines
 - 8. Current edition of Occupational safety and Health Administration standards
 - 9. NFPA 101 – Life Safety Code
 - 10. ASCE 7-05
 - 11. Required Permits of the Authority Having Jurisdiction
 - 12. Environmental Protection Agency (EPA), Section 402/40 CFR 125, National Pollutant Discharge Elimination System (NPDES) Nationwide Permit Compliance, with compliance with all permit requirements; Storm Water Pollution Prevention (SWPP) Plan, Notice of Intent (NOI), and Notice of Termination (NOT)
 - 13. State of Alaska, Department of Transportation & Public Facilities (DOT/PF), Utility Permit.
 - 14. Seismic safety requirements of 49 CFR § 41.120.
 - 15. State Energy Conservation Requirements (as applicable).

1.04 CONTRACTOR SUBMITTALS

- A. Not Used

PART 2 – PRODUCTS **NOT USED**

PART 3 – EXECUTION **NOT USED**

END OF SECTION

SECTION 01 42 19
REFERENCE STANDARDS

PART 1 - GENERAL

1.01 RELATED SECTIONS

- A. Section 00700 - General Conditions

1.02 QUALITY ASSURANCE

- A. For Products or workmanship specified by association, trade, or other technical standards: comply with requirements of the standard, except when more rigid requirements are specified or are required by applicable codes.
- B. Conform to reference standard by date of issue current on date of bid advertisement, unless otherwise stated in the Contract Documents.
- C. Provide copies of standards through the submittal process when required by the Contract Documents. Maintain a copy of each reference standard on site during construction.
- D. Should specified reference standards conflict with Contract Documents, request clarification from the DEPARTMENT before proceeding. Local code requirements, where more stringent than referenced standards, shall govern.
- E. Neither the contractual relationship, duties, and responsibilities of the parties to the Contract, nor those of the Architect/Engineer, shall be altered by the Contract Documents by mention or inference otherwise in any reference document.

PART 2 - PRODUCTS

Not Used

PART 3 - EXECUTION

Not Used

END OF SECTION

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SECTION 01 45 00
QUALITY CONTROL

PART 1 – GENERAL

1.01 SECTION INCLUDES

- A. Quality Control program requirements
- B. Manufacturer field services requirements
- C. Testing laboratory requirements
- D. Record keeping for quality control
- E. Quality surveillance by DEPARTMENT

1.02 RELATED SECTIONS

- A. Section 00700 - General Conditions
- B. Section 01 29 76 – Application for Payment
- C. Section 01 31 19 – Project Meetings
- D. Section 01 33 00 – Submittal Schedule, Submittal Procedures
- E. Section 01 33 23 – Shop Drawings, Product Data, and Samples
- F. Section 01 42 19 – Reference Standards
- G. Section 01 45 23 – Departmental Inspection Service
- H. Section 01 45 29 – Testing Laboratory Services
- I. Section 01 60 00 – Material and Equipment
- J. Section 01 77 00 – Contract Closeout
- K. Individual Specification Sections: Quality Control

1.03 REFERENCES

- A. Comply with Section 01 42 19 – Reference Standards and the individual technical product specification sections.

1.04 DESCRIPTION

- A. The CONTRACTOR shall provide and maintain an effective Quality Control Program related to testing and inspection. The CONTRACTOR shall perform Quality Control Testing

as specified and shall provide copies of all results to the DEPARTMENT for use in observing contract compliance.

- B. The CONTRACTOR's Quality Control Program shall include, but is not limited to: administration, management, supervision, reports, record-keeping, submittals, services of independent testing agencies and labs, and other related services.
- C. Quality Control is the sole responsibility of the CONTRACTOR.
- D. The CONTRACTOR's Quality Control program does not include I.B.C. required special inspection performed by the DEPARTMENT as described in Section 01 45 23 – Departmental Inspection Service.
- E. Quality Control services are required to verify compliance with requirements specified or indicated and do not relieve the CONTRACTOR of responsibility for compliance with the Contract Documents.
- F. Specific Quality Control requirements for individual construction fabrication and procurement activities are included in the Technical Product Specifications. General Quality Control requirements entail ensuring that all aspects of the Work conform to the technical requirements of the Contract Documents.
- G. The CONTRACTOR's Quality Control Program described herein is not intended to limit the CONTRACTOR's Quality Control activities, which may be necessary to achieve compliance with the Contract Documents.
- H. The CONTRACTOR shall have a full-time Quality Control Manager whose sole responsibility is to ensure compliance with Contract Documents and manage the CONTRACTOR Quality Control Program, except that the Quality Control Manager may also serve as the site safety officer.

1.05 JOB CONDITIONS

- A. Where Specifications require work to be field-tested or approved, it shall be tested in the presence of the DEPARTMENT after timely notice of its readiness for inspection and testing, and the work after testing shall be concealed only upon approval of DEPARTMENT.
- B. The DEPARTMENT shall have the right to witness all off site tests. The CONTRACTOR shall notify the DEPARTMENT at least seven (7) calendar days prior to testing.
- C. The results of tests are for use by the DEPARTMENT to evaluate the acceptability of materials with respect to specified testing requirements. Regardless of the test results, CONTRACTOR is solely responsible for quality of workmanship and materials and for compliance with requirements of Contract Documents.
- D. Maintain quality control over suppliers, manufacturers, products, services, site conditions, and workmanship to produce work of specified quality. Verify applicability and follow all manufacturers' recommendations and instructions for assembly, installation and testing of materials and equipment. In any case where the CONTRACTOR believes that such

recommendations or instructions are not applicable, the CONTRACTOR shall so notify the DEPARTMENT and state the reasons for the CONTRACTOR's determination. The CONTRACTOR shall then follow the DEPARTMENT's written direction on whether to follow manufacturer's recommendations and instructions.

- E. Upon failure of materials and equipment, which have been tested or inspected, previous acceptance may be withdrawn and material may be subject to removal and replacement with material meeting Specification requirements, at no cost to the DEPARTMENT.

1.06 MANUFACTURER'S FIELD SERVICES

- A. Required when technical specifications require the manufacturer or supplier to provide qualified personnel to observe field conditions, conditions of surfaces and installation, quality of workmanship, and to start, test, and adjust equipment as applicable.
- B. Submit to the DEPARTMENT the manufacturer representative's written reports containing observations and recommendations. Provide three (3) copies and a digital version.

1.07 TESTING LABORATORY DUTIES

- A. Testing laboratories retained by the CONTRACTOR shall comply with the requirements of Section 01 45 29 – Testing Laboratory Services.

PART 2 – PRODUCTS

Not Used

PART 3 - EXECUTION

3.01 GENERAL

- A. The CONTRACTOR shall provide full and complete documentation of Quality Control procedures and activities in a Quality Control Program and Plan.

3.02 QUALITY CONTROL

- A. The CONTRACTOR shall establish a Quality Control Program (Program) which shall establish an independent organization and a methodology to perform the CONTRACTOR's inspection and tests of all items including that of its subcontractors. The Program shall ensure conformance to applicable technical specifications and drawings with respect to the materials, codes, workmanship, storage, installation, construction, finishes, functional performance, and identification. The Program shall be established for all construction work performed under this Contract, including assigned subcontract work. The Program shall specifically include surveillance and tests required in the technical specifications.
- B. The CONTRACTOR shall coordinate all work requiring special inspection with the DEPARTMENT to ensure full access by the DEPARTMENT's Special Inspectors and Quality Assurance testing personnel to work, work performance, and testing preparation, operations and results.
- C. CONTRACTOR shall describe the Program in a detailed Quality Control Plan that must be approved by the DEPARTMENT prior to the start of any construction or offsite fabrication.

- D. The Program shall include, as a minimum, the following components for all definable features of work:
1. Preparatory Inspection Meeting: CONTRACTOR shall schedule and attend a preparatory meeting to review testing procedures a minimum of a week prior to beginning work on any element of Work which has been identified in the Contract Documents to require testing and inspection by the CONTRACTOR testing and inspection by the DEPARTMENT, or code-required inspections. Subsequent meetings shall be conducted as necessary to ensure continued accuracy of testing procedures.
 2. Document Control: CONTRACTOR's Program to include procedure for ensuring that all Work is performed in accordance with the following:
 - a. Conformed sets of Contract Drawings and Specifications
 - b. Contract Change Order documents
 - c. Approved Submittals, most current revision
 - d. Applicable Requests for Information (RFI's)
 - e. Manufacturer's Instruction.
 3. In Progress Inspection: CONTRACTOR shall perform in-progress inspections as work progresses on the Work which shall include, but not be limited to:
 - a. Examination of the quality of workmanship with respect to Contract Drawings, Technical Specifications and Approved Submittals.
 - b. Review of control testing for compliance with Contract requirements.
 - c. Inspection for use of defective or damaged materials, omissions and dimensional requirements.
 - d. Review of timeliness and scheduling requirements for all tests, retests and eventual approvals.
 - e. CONTRACTOR Deficiency Reports and punch lists as appropriate to the level of completion of the work.
 4. Non-Conformance Procedure: CONTRACTOR's program shall include procedure for identifying, documenting, tracking, and resolving items in the Work which do not comply with Contract Documents, Specifications, Approved Submittals, or Manufacturer's Instructions. If a quality control test indicates that the tested material does not conform to the requirements of the contract documents, the CONTRACTOR shall eventually take supplemental tests at the same location from which the non-conforming result was obtained, to document conformance and acceptability for payment. Otherwise, the DEPARTMENT reserves the right to reject materials for which final Quality Control tests indicate non-conformance with the contract documents.
 5. Code Required Inspection: CONTRACTOR shall coordinate and make timely requests for inspections, tests and other activities required by codes and regulations as specified, which are to be provided by others. This requirement includes coordinating with and providing access to the Authority Having Jurisdiction. (AHJ)

3.03 RECORD KEEPING

- A. The CONTRACTOR shall maintain current Quality Control records, on forms acceptable to the DEPARTMENT, of all inspections and tests performed. The records shall include factual evidence that the required inspections or tests have been performed, including, but not limited to, the following information for each such test and inspection: specification reference, date, type and number of inspections or test involved; results of the inspections, tests or retests; the nature of defect, causes for rejection, proposed remedial action, corrective action(s) taken, and similar information related to any reinspection.
- B. The CONTRACTOR shall maintain and submit to the DEPARTMENT the following Quality Control records and reports:
 - 1. Daily Reports: The CONTRACTOR shall maintain a daily log of all inspections performed for both CONTRACTOR and subcontractor operations. The Daily Log shall include compliance with shop submittals, identification by specification section and schedule activity of inspections, tests, and retests conducted, results of inspections and tests, location and nature of defects found, causes for rejection, and remedial or corrective actions taken or proposed. One copy of Daily Reports shall be submitted to the DEPARTMENT by 12:00 noon of the next business day.
 - 2. Immediate Notification of Deficiencies: CONTRACTOR shall provide immediate notification to the DEPARTMENT whenever a failed nonconforming test or inspection occurs. This immediate notification shall be followed up with the required written reports.
 - 3. Nonconformance Report: CONTRACTOR shall submit three copies of a weekly Nonconformance Report to the DEPARTMENT identifying all substandard inspections and tests taken during the week including identification by specification section and schedule activity of the inspection or test, location and nature of defects, causes for rejection and remedial actions taken or proposed. The Nonconformance Report shall also identify corrective actions taken or proposed for any open items on prior Nonconformance Reports including a scheduled date for resolution of each item. The Nonconformance Report shall be submitted and discussed in each Weekly Progress Meeting.
 - 4. Inspection Control Log: CONTRACTOR shall maintain an inspection control log chronologically recording each inspection and test performed by the CONTRACTOR, including the nature of the inspection, test or retest, the date performed, the results, causes for rejection, remedial action or corrective action taken and dates of subsequent inspections and retests, and final acceptance. The CONTRACTOR shall submit three (3) copies plus an electronic copy of the updated Inspection Control Log weekly to the DEPARTMENT; the Log will be discussed in each Weekly Progress Meeting.
 - 5. Testing Laboratory Data: Maintain and submit to DEPARTMENT in accordance with Section 01 45 29.

3.04 ORGANIZATION

- A. The Program shall be implemented by the establishment of a Quality Control Organization which shall as a minimum, consist of the following: Quality Control personnel shall be dedicated to Quality Control duties only, and independent of the production and commercial aspects of the CONTRACTOR's full organization.

1. Quality Control Manager: The Quality Control Manager shall have the following qualifications: Minimum of 5 years experience in a supervisory Quality Control position whose sole responsibility is to ensure compliance with the Contract Documents. This person shall be employed on this Project only, shall be physically on the Project site during performance of all Contract Work, and shall be in charge of the CONTRACTOR's Quality Control Organization. The Quality Control Manager shall report directly to the responsible corporate officer of the firm.
 2. Quality Control Inspectors: The Quality Control Inspectors shall report directly to the Quality Control Manager. Quality Control Inspectors shall be provided as required to meet requirements of the Contract Documents for CONTRACTOR testing and inspection and as needed to verify that all aspects of the Work comply with the technical requirements of the Contract. Inspectors shall have minimum 5 years experience inspecting the type of work being inspected. Submit qualifications as part of the Quality Control Plan.
 3. Independent Testing and Inspection Laboratories: Provide and pay for an industry-recognized, independent laboratory or laboratories to perform all Quality Control tests and/or inspections as may be indicated by the nature of the construction or as specifically required under the terms of the Contract.
 4. Electrical and Mechanical Testing: If specified elsewhere, provide and pay for an independent testing firm (or firms) performing electrical and mechanical testing. The testing firm shall be a corporately and financially independent testing organization that can function as an unbiased testing authority, professionally independent of the manufacturers, suppliers, and installers of equipment or systems evaluated by the testing firm. Follow Technical Product Specifications Quality Control requirements and testing responsibilities.
 5. Manufacturers' Representative: Provide review and inspection by qualified technical non-sales manufacturers' representatives for specific work as appropriate, or as directed by the DEPARTMENT including but not limited to, roofing, waterproofing, skylights, window wall and building system, and fireproofing.
- B. Staffing Levels: Provide sufficient qualified personnel to monitor the work quality at all times. The scheduling and coordinating of all inspection and testing must match the type and pace of work activity.
1. In cases where multiple trades, disciplines or subcontractors are on site at the same time, each activity shall be inspected and tested by personnel skilled in that portion of the work.
 2. In cases where multiple shifts are employed, the Quality Control staff shall be increased as required to monitor the work on each shift.

3.05 QUALITY CONTROL PLAN

- A. Provide a Quality Control Plan to the DEPARTMENT as soon as practicable, and in no event later than 15 days after Notice to Proceed. Plan shall be updated as required by "Detailed Quality Control Procedures" below, and approved by the DEPARTMENT prior to construction.
- B. Quality Control Plan Contents: Include the personnel, procedures, instructions and documents to be used.

1. Organization: A description of the CONTRACTOR's Quality Control Organization, including:
 - a. An organization chart showing lines of authority and relationship of the quality control organization to other CONTRACTOR management and project personnel.
 - b. Names and resumes of work experience and qualifications of personnel in the quality control organization.
 - c. Area of responsibility and authority of each individual in the quality control organization.
2. Inspection:
 - a. Methods of performing quality control inspections including those for each subcontractor's work.
 - b. Detailed lists of inspection activities for each specification section. See "Detailed Quality Control Procedures" below.
3. Testing:
 - a. Description of how testing will be performed including identification and qualifications of the industry recognized testing laboratory or laboratories proposed for the work.
 - b. Identify the testing methods, frequency, and number to be taken of each type of material requiring Quality Control testing. To facilitate the development of a testing plan, the DEPARTMENT will provide a tabular schedule of minimum testing requirements, to be derived from the requirements contained in the contract documents. The CONTRACTOR shall be responsible for taking the tests summarized in the schedule, in conjunction with any other tests that may be required in the contract documents.
4. Documentation: Method of documenting Quality Control operation, inspection and testing.
5. Administration: Methods of administering Quality Control operations document control, non-conformance procedure, inspection and testing.
6. Letter of Authority: A copy of a letter of direction to the CONTRACTOR's Quality Control Manager responsible for quality control outlining that person's duties and responsibilities and signed by responsible officer of the firm. This letter shall include the authority to halt construction and direct removal and replacement of work not in compliance with the Contract.
7. Forms: Sample copies of all forms and reports to be used, a flow chart describing their distribution, and identification of those documents to be retained by the CONTRACTOR.
8. Subcontractor's Quality Control: The CONTRACTOR shall include, as part of its Quality Control Plan, specific methods of performing quality control inspections of onsite and offsite subcontractors.
9. Detailed Quality Control Procedures: Detailed descriptions of quality control activities for work under each section of the specifications. Include list of all tests, inspection and frequencies, personnel, and instruction prior to starting such work. The

procedures shall be updated each month incorporating any changes. Changes shall be submitted at least one month prior to Work effected by any change.

C. Quality Control Plan Approval

1. Before the CONTRACTOR's Quality Control Plan is officially submitted, the CONTRACTOR shall meet with the DEPARTMENT and discuss the CONTRACTOR's Quality Control Plan. The CONTRACTOR and the DEPARTMENT shall jointly develop a mutual understanding of the details of the plan, including the forms to be used for recording the quality control operations, inspections, administration of the plan for both onsite and offsite work, and the interrelationship of CONTRACTOR and DEPARTMENT inspection. The CONTRACTOR shall prepare minutes of the meeting, which shall be incorporated in the CONTRACTOR's Quality Control Plan, which shall then be officially submitted for approval.
2. If the DEPARTMENT determines that the Quality Control Plan, personnel, inspections, tests, or records are not adequate, corrective actions shall be taken as directed prior to payment of the next monthly CONTRACTOR's Progress Report.
3. Notify the DEPARTMENT in writing of any proposed change to the CONTRACTOR's Quality Control Plan; no such change shall be implemented prior to approval in writing by the DEPARTMENT.

- D. Quality Control Plan Implementation:** Implementation of the Quality Control Plan is the responsibility of the CONTRACTOR. This implementation will be monitored by the DEPARTMENT and deficiencies therein will be corrected at the sole expense of the CONTRACTOR.

3.06 QUALITY SURVEILLANCE BY THE DEPARTMENT

- A.** All items of materials and equipment shall be subject to surveillance testing and inspection by the DEPARTMENT at the point of production, manufacture or shipment to determine if the producer, manufacturer or shipper maintains an adequate inspection system which insures conformance to the applicable specifications and drawings with respect to materials, workmanship, construction, finish, functional performance and identification. In addition, all items or materials, equipment and work in place shall be subject to surveillance testing and inspection by the DEPARTMENT at the site for the same purposes. Surveillance by the DEPARTMENT does not relieve the CONTRACTOR of performing Quality Control inspections and testing of either onsite or offsite CONTRACTOR's or subcontractor's workplace or manufacturing assembly plant.

END OF SECTION

SECTION 01 45 23
DEPARTMENTAL INSPECTION SERVICES

PART 1 - GENERAL

1.01 SECTION INCLUDES

- A. Testing and inspection services provided by the DEPARTMENT.

1.02 RELATED REQUIREMENTS

- A. Section 00700 - General Conditions
- B. Section 00700 - General Conditions: Article 13, Substantial Completion, Final Inspection.
- C. Section 01 45 00 - Quality Control
- D. Section 01 45 29 - Testing Laboratory Services
- E. Section 01 73 00 - Execution Requirements
- F. Individual Specifications Sections: Inspections and tests required, and standards for testing.

1.03 REFERENCES

- A. International Building Code
- B. Special Inspection Program as approved by Authority Having Jurisdiction (AHJ)

1.04 DESCRIPTION

- A. In accordance with the International Building Code, the DEPARTMENT will provide Special Inspection Services. These services are in addition to those inspection and testing services provided by the CONTRACTOR under Section 01 45 00 – Quality Control and Section 01 45 29 – Testing Laboratory Services and AHJ permit inspections.
- B. The CONTRACTOR is responsible for requesting Special Inspection Services from the DEPARTMENT for the following work activities:
 - 1. Soil compaction: Special Inspector to monitor the soils compaction process and review soils compaction testing data provided by the CONTRACTOR.
 - 2. Asphalt: Special Inspector to monitor placement of asphalt and review asphalt testing data provided by the CONTRACTOR.
 - 3. Concrete and concrete reinforcement: Special Inspector to monitor placement of concrete reinforcing steel, review concrete sampling and testing data provided by the CONTRACTOR, perform other related inspections as required by the IBC.
 - 4. Concrete post-tensioned assemblies: Special Inspector to monitor placement of post tension assemblies and review post tensioning test data as provided by the CONTRACTOR (strand sampling, jacking and elongation records).
 - 5. Structural steel field bolting and welding: Special Inspector to monitor placement of post installed anchors and bolts and provide high strength bolt tension testing. The Special Inspector will monitor erection of structural assemblies and provide weld testing.

6. Pile and pier foundations: The special inspector will provide inspections during installation and testing, as set forth in the IBC.
7. Masonry and masonry reinforcement: The special inspector will inspect masonry reinforcement, masonry and grouting procedures.
8. Wind requirements: The special inspector will inspect for wind requirements as required for cold-formed steel light-frame construction, wood construction, roof and wall cladding.
9. Seismic resistance: Special inspections will be performed for seismic resistance elements as required by the IBC.
10. Sprayed fire resistive materials, mastic and intumescent fire-resistant coatings: The special inspector will inspect these materials applied to structural elements and decks, in accordance with the IBC.
11. Exterior insulation and finish systems (EIFS): Require inspection as set forth by the IBC.
12. Smoke control systems: Require inspection and testing as set forth by the IBC.
13. Other special inspections and activities required by the IBC and Authority Having Jurisdiction (AHJ)

1.05 REQUEST AND PAYMENT

- A. The CONTRACTOR shall request services provided by the DEPARTMENT to perform specified inspection and testing.
- B. Inspection by the DEPARTMENT or its agents shall in no way relieve CONTRACTOR of obligation to perform Work in accordance with requirements of Contract Documents

1.06 CONTRACTOR SUBMITTALS

- A. The CONTRACTOR shall coordinate with the DEPARTMENT to provide adequate advance notice to enable the DEPARTMENT'S special inspector(s) to be present when necessary.
- B. A Materials Placement Schedule shall also be submitted each Thursday for the work scheduled for the following week, if requested by the DEPARTMENT. This schedule shall include the date and time each material, required to have materials testing or inspection, is scheduled for placement or observation. A schedule of material deliveries to the site of materials stored for incorporation into work items, which require Special Inspection, may also be required upon notification from the Department.
- C. The CONTRACTOR shall provide a minimum of 8 hours written notification counting only working hours and working days of a change in the Special Inspection schedule of time and/or date. Submit written notification, which provides the Project name and location, CONTRACTOR's name, and phone number, inspection cancelled, time changed or added, and reason for the change. Failure to provide this notification will result in a reduction of the Contract value for extra costs incurred by the DEPARTMENT.
- D. A CONTRACTOR request for re inspection of previous Work shall include the DEPARTMENT's prior report, listing of deficiencies, and remedies provided since prior inspection.

1.07 DEPARTMENT RESPONSIBILITIES

- A. Review schedules and request for inspections as submitted by CONTRACTOR for timeliness and conformance.

- B. Provide qualified personnel at site after due notice; cooperate with CONTRACTOR in performance of services.
- C. Perform specified inspection, inventorying, and testing of products in accordance with specified standards.
- D. Promptly notify CONTRACTOR of observed irregularities or non-conformance of Work or products.
- E. Perform additional inspections and re-tests required by the Contract Documents.
- F. When applicable provide to the CONTRACTOR a written description of the DEPARTMENT's costs attributed to the inspection.

1.08 DEPARTMENT REPORTS

- A. After each inspection or test, the DEPARTMENT will promptly submit one copy of inspection report to the CONTRACTOR. The report will include: date issued, project title, DEPARTMENT project number, name of inspector(s), date and time of inspection, identification of product and Specifications section, location in the Project, type of inspection or test, results of inspection or tests, and conformance with Contract Documents. When requested in writing by the CONTRACTOR, the DEPARTMENT will interpret the results.

1.09 LIMITS ON AUTHORITY RESULTING FROM INSPECTIONS

- A. The DEPARTMENT may not release, revoke, alter, or enlarge on requirements of the Contract Documents through the issuance of an inspection report.
- B. The DEPARTMENT may not approve or accept any portion of the Work through the issuance of an inspection report.
- C. The DEPARTMENT may not assume any duties of the CONTRACTOR through the issuance of an inspection report.
- D. The DEPARTMENT inspection report shall not constitute a stop work order.

1.10 CONTRACTOR RESPONSIBILITIES

- A. Pre-construction Inspection Meeting. The CONTRACTOR shall arrange a meeting of all parties involved with Special Inspection, Inspection, and testing to be conducted by the Authority Having Jurisdiction (AHJ), to review all inspection requirements, particularly those involving Special Inspection.
- B. Special Inspection Notification: The CONTRACTOR shall notify the DEPARTMENT 72 hours in advance of each required special inspection. The CONTRACTOR is responsible for notifying the DEPARTMENT in a timely manner regarding individual inspections for items listed in the Specifications and as noted in the Special Inspection Program approved by the AHJ. Adequate notice shall also be provided so that the Special Inspector has time to become familiar with the project.
- C. Inspector access to approved plans: The CONTRACTOR shall be responsible for providing the Special Inspector access to or copies of approved plans at the job site.
- D. Availability of Test Reports: The CONTRACTOR shall make copies of all test reports that are pertinent to the responsibilities of the Special Inspector available to that individual.

- E. Access to Areas of Work: The CONTRACTOR shall provide adequate, safe means for the Special Inspector to access the areas to be inspected.
- F. Retention of Special Inspection Records.: The CONTRACTOR shall be responsible for retaining at the job site copies of all special Inspection records submitted by the Special Inspector and copies of test reports, material ticket, etc. These records shall be available for review by the AHJ upon request.
- G. Cooperate with DEPARTMENT personnel, and provide access to work and to manufacturer's facilities.
- H. Provide incidental labor and facilities to provide safe access to work to be inspected, to obtain and furnish incidental supplies at the site or at source of products to be inspected, to facilitate tests and inspections, and for storage and curing of test samples when appropriate.
- I. Notify the DEPARTMENT as required above in CONTRACTOR Submittals for operations requiring inspection, special inspection and testing services.
- J. Pay costs of DEPARTMENT furnished services for all re-inspections as required by Contract Documents.

PART 2 - PRODUCTS

Not Used

PART 3 – EXECUTION

Not Used

END OF SECTION

SECTION 01 45 29
TESTING LABORATORY SERVICES

PART 1 - GENERAL

1.01 SECTION INCLUDES

- A. CONTRACTOR'S requirements for quality control inspections and testing.

1.02 RELATED REQUIREMENTS

- A. Section 00700 General Conditions: Inspections, testing, and approvals required by public authorities
- B. Section 01 33 00- Submittal Procedure
- C. Section 01 45 00 Quality Control
- D. Section 01 45 23 – Departmental Inspection Service.
- E. Section 01 73 00 – Execution Requirements
- F. Individual Specification Sections: Inspections and tests required, and standards for testing

1.03 REFERENCES

- A. ANSI/ASTM E329 – Specification for Agencies Engaged in the Testing and/or Inspection of Materials used in Construction.

1.04 SELECTION AND PAYMENT

- A. The CONTRACTOR shall employ and pay for the services of an independent, industry-recognized testing laboratory or laboratories to perform specified inspection and testing. The laboratory shall be corporately and financially independent of the CONTRACTOR's organization, as well as of any organization which is associated with performing the Work, such that it can offer an unbiased professional appraisal of compliance with the technical requirements of the Contract. The qualifications of the proposed testing laboratory and personnel shall be submitted to the DEPARTMENT for review and approval, 30 days prior to any inspection or testing by the laboratory.
- B. Employment of testing laboratory shall in no way relieve the CONTRACTOR of obligation to perform Work in accordance with requirements of the Contract Documents.

1.05 QUALITY ASSURANCE

- A. Comply with requirements of ANSI/ASTM E329.
- B. The testing laboratory shall maintain an Alaska registered Engineer on staff to review services.
- C. The laboratory shall be authorized to operate in State in which testing is performed.

- D. Testing equipment shall be calibrated at reasonable intervals with devices of having an accuracy traceable to either NBS Standards or accepted values of natural physical constants.

1.06 CONTRACTOR SUBMITTALS

- A. Prior to the start of Work, submit testing laboratory name, address, and telephone number, and names of registered Engineer and responsible officer.
- B. Submit copy of report of laboratory facilities inspection made by Materials Reference Laboratory of National Bureau of Standards during most recent tour of inspection, with memorandum of remedies of any deficiencies reported by the inspection.

1.07 LABORATORY RESPONSIBILITIES

- A. Test samples of materials and mixes submitted by CONTRACTOR.
- B. Provide qualified personnel at site after due notice; cooperate with the DEPARTMENT and the CONTRACTOR for the performance of services.
- C. Perform specified inspection, sampling, and testing of products and installations in accordance with specified standards. When requested, perform these services at locations designated by the DEPARTMENT.
- D. Ascertain compliance of materials and mixes with requirements of the Contract Documents.
- E. Promptly notify the DEPARTMENT and the CONTRACTOR of observed irregularities or non-conforming Work or products.
- F. Perform additional inspections and tests required by the DEPARTMENT.

1.08 LABORATORY REPORTS

- A. Inspection reports shall be transmitted in duplicate each day to the DEPARTMENT and the Engineer of Record.
- B. Reports for tests conducted shall be submitted to the DEPARTMENT immediately after the results are determined and no later than when the testing agency leaves the site for the day.
- C. Within 24 hours of the completion of each inspection and test, submit ONE copy of the laboratory report directly to the DEPARTMENT in addition to copies required by the CONTRACTOR. Include: date issued, project title and DEPARTMENT project number, name of inspector, date and time of sampling or inspection, identification of product and specifications section, location in the Project, type of inspection or test, date of test, results of tests, and conformance with Contract Documents. When requested by the DEPARTMENT, provide written interpretations of test results.

1.09 LIMITS ON TESTING LABORATORY AUTHORITY

- A. The testing laboratory may not release, revoke, alter, or enlarge on requirements of Contract Documents.
- B. The laboratory may not approve or accept any portion of the Work.

- C. The laboratory may not assume any duties specified to be performed directly by the CONTRACTOR.
- D. The laboratory has no authority to stop Work.

1.10 CONTRACTOR RESPONSIBILITIES

- A. Deliver to the testing laboratory, at a designated location, adequate samples of materials proposed to be used which require testing, together with proposed mix designs.
- B. Cooperate with laboratory personnel, and provide safe access to Work.
- C. Provide incidental labor and facilities to provide safe access to work to be tested, to obtain and handle samples at the site or at source of products to be tested, to facilitate tests and inspections, and for storage and curing of test samples.
- D. Notify the DEPARTMENT and the CONTRACTOR's laboratory 48 hours prior to expected time for operations requiring inspection and testing services.
- E. Provide the DEPARTMENT 4 hours written notification of change in date and/or time of inspection and/or testing services.
- F. Pay costs of testing laboratory services for all tests.

PART 2 - PRODUCTS

Not Used

PART 3 - EXECUTION

Not Used

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SECTION 01 51 00
CONSTRUCTION FACILITIES

PART 1 - GENERAL

1.01 SECTION INCLUDES

- A. Requirements for furnishing and maintaining construction facilities during the project.

1.02 RELATED REQUIREMENTS

- A. Section 01 11 13 – Summary of Work
- B. Section 01 29 76 – Application for Payment
- C. Section 01 52 13 – Field Offices and Sheds
- D. Section 01 71 13 – Mobilization and Demobilization
- E. Section 01 71 23 – Field Engineering
- F. Section 01 73 00 – Execution Requirements

1.03 TEMPORARY ELECTRICITY

- A. Unless specified elsewhere, the CONTRACTOR shall make its own provisions for temporary electrical service.
- B. Provide lighting for construction operations.
- C. Not Used

1.04 TEMPORARY HEAT

- A. Provide and pay for heat devices, insulated enclosure, tenting, and heat as required to maintain specified conditions for construction operations, to protect materials and finishes from damage due to temperature or humidity.

1.05 TEMPORARY VENTILATION

- A. Provide and pay for ventilation of enclosed areas to cure materials, to disperse humidity, to prevent accumulations of dust, fumes, vapors, or gases, and to maintain a safe work environment.

1.06 TEMPORARY WATER SERVICE

- A. Unless specified elsewhere, the CONTRACTOR shall make its own provisions for temporary water service.
- B. Not Used

1.07 TEMPORARY SANITARY FACILITIES

- A. Unless specified elsewhere, provide and maintain required facilities and enclosures. Use of existing toilet facilities by CONTRACTOR is prohibited.
- B. Not Used

1.08 TEMPORARY TELEPHONE SERVICE

- A. Unless specified elsewhere, provide, maintain and pay for telephone service to the CONTRACTOR field offices.
- B. Not Used

1.09 BARRIERS

- A. Provide as required to prevent entry to construction areas and to protect adjacent properties from damage from construction operations
- B. Maintain lights of such size and location each night between the hours of sunset and sunrise upon all obstructions resulting from work which may endanger or obstruct vehicle traffic, and be responsible for all damages to persons and property resulting from failure to maintain lights. Designate personnel to replace or relight markers or barricades and provide the DEPARTMENT with their names and telephone numbers for use in summoning them as necessary.
- C. Not Used

1.10 FREEZE PROTECTION

- A. Provide freeze protection for all water service piping, valves, and other components.
- B. Prior to submitting the first application for payment, the CONTRACTOR shall submit a Freeze Protection Plan. The plan shall describe when freeze protection will be implemented during construction, and the methods to be used.
- C. Permanent building heating equipment furnished and installed as part of this Contract shall not be used for the purpose of freeze protection during construction. When the permanent building heating equipment is started up and commissioned as scheduled for service for building occupancy, the CONTRACTOR is allowed to realize the incidental benefit of freeze protection. Reference applicable Division 15 Sections for permanent heating equipment and system requirements.
- D. Freeze Protection shall be maintained in place throughout the season when freezing temperatures may exist and affect the work.
- E. The CONTRACTOR shall remove all freeze protection materials and equipment when no longer required unless it is required to remain in place by other provisions of this Contract.
- F. All costs for freeze protection shall be incidental to the CONTRACTOR's contract price.
- G. Not Used

1.11 ENCLOSURES

- A. Not used

1.12 CONSTRUCTION FENCES

- A. Include all supplementary parts necessary or required for a complete and satisfactory installation of temporary fences. All runs of the fence shall present the same general appearance.
- B. Material requirements, unless shown otherwise on the Drawings:
 - 1. Fabric: No. 9 ASW gage zinc coated or approved equal.

2. Barbed Wire (Zinc-coated): 3-strand twisted No. 12 ½ ASW gage galvanized steel wire with 4-point barbs of No. 14 ASW gage galvanized steel wire, or approved equal. The barbs shall be spaced approximately 4 inches apart.
 3. Wire ties and tension wire: No. 7 ASW gage marcelled steel wire with same coating as fabric and conforming to ASTM A824.
 4. Plywood, if used shall be painted.
- C. Other requirements:
1. Used materials may be installed provided the used materials are good, sound, and are suitable for the purpose intended.
 2. Posts and braces shall be galvanized steel pipe conforming to the requirements of ASTM F1038 and sized in accordance with Tables 1 through VI of Federal Specifications RR-F-191/3. Posts shall be spaced more than 10 feet apart.
 3. Galvanizing of steel items will be required.
 4. Temporary fences that are damaged from any cause during the progress of the work shall be repaired or replaced by the CONTRACTOR at the CONTRACTOR's expense.
 5. If no longer required for the Work as determined by the DEPARTMENT, temporary fences shall be removed. Removed facilities shall become the property of the CONTRACTOR and shall be removed from the site of the work.
 6. In secure areas away from traffic, fence shall be 8 feet high. Fence construction shall include top and bottom tension wires. All fabric tension wire and barbed wire shall be installed taught with no more than 2 inch open gaps between bottom of fence and underlying surface.
 7. Not Used

1.13 PROTECTION OF INSTALLED WORK

- A. Protect installed Work and provide special protection where specified in individual specification sections.
- B. Provide temporary and removable protection for installed Products. Control activity in immediate work area to prevent damage.
- C. Not Used

1.14 SECURITY

- A. Provide security and facilities to protect Work from unauthorized entry, vandalism, or theft.

1.15 REMOVAL OF UTILITIES AND FACILITIES

- A. Remove CONSTRUCTION FACILITIES, equipment, facilities, and materials, prior to Substantial Completion inspection.
- B. Remove underground installations to a minimum depth of 3 feet below finish grades. Grade site as indicated.
- C. Clean and repair damage caused by installation or use of temporary work.
- D. Restore permanent facilities used during construction to specified condition.

1.16 SHORING AND BRACING

- A. The CONTRACTOR is responsible for designing and providing shoring and bracing permit required to accomplish the work. This includes shoring adjacent facilities, shoring for excavation work, and shoring and bracing for installation of concrete, masonry, and steel.
- B. The CONTRACTOR's shoring and bracing for protecting existing facilities, for stabilizing excavations, for supporting elevated slabs, and for resisting loads that could result in damage to existing construction or injury to workers, shall be designed by an Alaska registered civil engineer.
- C. Provide a sealed and signed copy of shoring and bracing calculations and drawings to the DEPARTMENT for informational purposes only. The submission of calculations to the DEPARTMENT shall not transfer responsibility for the design of shoring and bracing to the DEPARTMENT. Rather, the DEPARTMENT will receive the calculations to verify they have been done by a registered engineer.

1.17 PRE-CONSTRUCTION PROPERTY AND STRUCTURE ASSESSMENTS

- A. Not Used

1.18 COST RESPONSIBILITY

- A. Except as otherwise noted, the cost of construction facilities and utilities shall be the responsibility of CONTRACTOR.

PART 2 - PRODUCTS

Not Used

PART 3 - EXECUTION

Not Used

END OF SECTION

SECTION 01 52 13
FIELD OFFICES AND SHEDS

PART 1 - GENERAL

1.01 SECTION INCLUDES

- A. Requirements for field offices and sheds for use by the CONTRACTOR and the DEPARTMENT during construction.

1.02 RELATED REQUIREMENTS

- A. Section 01 11 13 – Summary of Work
- B. Section 01 29 76 – Application for Payment
- C. Section 01 51 00 – Construction Facilities
- D. Section 01 71 13 – Mobilization and Demobilization

1.03 CONSTRUCTION

- A. Coordinate Construction of Field offices to meet the requirements of the Authority Having Jurisdiction.

1.04 CONTRACTOR OFFICE

- A. Provide field office(s) to provide adequate office space for the CONTRACTOR'S on-site administrative personnel. Offices shall be weather-tight, with lighting, electrical outlets, heating and ventilating equipment, telephone and fax service, and equipped with furniture.
- B. The CONTRACTOR shall provide any office equipment, supplies, and utilities that it deems necessary to support its on-site operations.

1.05 STORAGE SHED

- A. Provide as required for Tools, Materials, and Equipment. The sheds shall be Weather-tight, with adequate heat and ventilation for products requiring controlled conditions, with adequate space for organized storage and access, and adequate lighting for inspection of stored materials.
- B. Provide adequate security to protect the contents of storage sheds.

1.06 DEPARTMENT FIELD OFFICE

- A. Provide One (1) mobile building with electric, power and parking facilities, hereinafter called "field office," for the use of the DEPARTMENT's engineering and construction administration staff. The field office shall have not less than Six Hundred (300) square feet of usable floor area. Flooring shall be vinyl that is free of rips, tears, or other major blemishes that would hamper floor cleaning.
- B. The field office shall be situated at the project construction site at a specific location approved by the DEPARTMENT. It shall be situated to provide a view from within the field office of the building construction site.

- C. The field office shall be no more than two years old. It shall be completely furnished with two plan tables with one chair each, 2 desks with chairs, two 4 drawer legal size file cabinets, and two six-shelf bookshelves.
- D. Unless specified elsewhere, the DEPARTMENT'S field office shall be ready for occupancy by the DEPARTMENT at the project site prior to the commencement of any Work at the site.
- E. All costs associated with furnishing and installing, maintenance, utilities and demobilization of the field office shall be included within the Contract price.
- F. All materials shall be good commercial quality.
- G. Provide the DEPARTMENT's field office complete with the following features and facilities:
 - 1. Lighting minimum of 100 foot-candles at desk height uniformly in all areas.
 - 2. Duplex electrical receptacles and telephone jacks along interior walls at approximately ten-foot spacing.
 - 3. An automatically controlled heating system capable of maintaining an ambient temperature of 72 degrees Fahrenheit, plus or minus 4 degrees, in winter.
 - 4. Electric utility connections as necessary.
 - 5. Parking to accommodate four vehicles immediately adjacent to the field, graded for drainage and surfaced to a standard equivalent to that of CONTRACTOR's parking area.
 - 6. Provide secure entrance doors to the field office. If more than one entrance is furnished, all door locks shall be keyed alike. Provide the DEPARTMENT 3 keys or sets of keys.
 - 7. The field office shall include steps with railings to the entrance.
 - 8. Submit details of the DEPARTMENT's field office with the mobilization submittal.
 - 9. Prior to procurement and installation, submit a Temporary Facilities Plan, which shall include but not be limited to: CONTRACTOR field offices, DEPARTMENT's field office, fencing, access, parking, stairs, storage, temporary utilities, trailers, transportation methods, and layout.
 - 10. Provide communication services to the projects office. Communication service shall include One (1) separate telephone numbers with internet connectivity for up to One (1) computers. The separate telephone numbers shall come with caller ID functionality. The CONTRACTOR shall pay connection and service costs. All long distance calls made by the DEPARTMENT's personnel shall be reimbursed to the CONTRACTOR. The communication service shall be established prior to occupancy of the field office by the DEPARTMENT.
 - 11. Provide and install an outdoor sign entitled "State of Alaska DOT/PF Project Office", at a location approved by the DEPARTMENT.
- H. Equipment - Purchase new equipment as listed below for use in the field office. The CONTRACTOR shall retain possession and ownership of all equipment upon the issuance of Final Completion.
 - 1. 1 each, bottle water-drinking fountain with supply of bottle drinking water and cups.
 - 2. 1 each, fire extinguisher – Dry Chemical, Multi-Purpose ABC (minimum size, 10 pounds) equipped with a visual air pressure gage. The fire extinguisher shall be

checked monthly for stored pressure, and as required by the manufacturer. Check and tag annually and after each use by a licensed company.

3. 1 each, First Aid Kit equivalent to 24-unit first aid kit described in "Standard First Aid and Personal Safety" by The American National Red Cross. The first aid kit shall be checked monthly and replenished to full complement monthly and after any incident.
4. One (1) cordless telephone sets and 1 each internet line. Internet line shall be DSL service or equivalent, (1Mb/1Mb for a minimum of Four (4) simultaneous users. Also provide a wireless router.
5. 1 each refrigerator, compact size (10 gal minimum capacity).
6. 1 each microwave oven, countertop type.

PART 2 - PRODUCTS

Not Used

PART 3 - EXECUTION

Not Used

END OF SECTION

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SECTION 01 57 10 EROSION, SEDIMENT AND POLLUTION CONTROL

PART 1 – GENERAL

1.01 SECTION INCLUDES

- A. Provide project administration and Work relating to control of erosion, sedimentation, and discharge of pollutants, according to this section and applicable local, state, and federal requirements, including the APDES Construction General Permit. The state APDES program is administered by DEC. Section 301(a) of the Clean Water Act (CWA) and 18AAC 83.015 provide that the discharge of pollutants to water of the U.S. is unlawful except in accordance with the permit.

1.02 RELATED DOCUMENTS

- A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 1 Specifications Sections apply to this Section.

1.03 DEFINITIONS

These definitions apply only to Section 01 57 10

- A. **Active Treatment System Operator.** CGP, Appendix C.
- B. **Alaska Certified Erosion and Sediment Control Lead (AK-CESCL).** A person who has completed training, testing, and other requirements of, and is currently certified as, an AK-CESCL from an AK-CESCL Training Program (a program developed under a Memorandum of Understanding between the Department and others). The Department recognizes AK-CESCLs as “qualified personnel” required by the CGP. An AK-CESCL must be recertified every three years.
- C. **Alaska Department of Environmental Conservation (DEC).** The state agency authorized by EPA to administer the Clean Water Act’s National Pollutant Discharge Elimination System.
- D. **Alaska Excavation, Dewatering General Permit (EDGP).** The permit authorizing excavation dewatering discharges from Construction Activities.
- E. **Alaska Pollutant Discharge Elimination System (APDES).** A system administered by DEC that issues and tracks permits for storm water discharges.
- F. **Best Management Practices (BMPs).** CGP, Appendix C.
- G. **Clean Water Act (CWA).** Federal Water Pollution Control Amendments of 1972, as amended (33 U.S.C. 1251 et seq.).
- H. **Construction Activity.** Physical activity by the Contractor, Subcontractor or utility company within the Project Zone; that may result in erosion, sedimentation, or a discharge of pollutants into storm water. Construction Activity includes soil disturbing activities (e.g. clearing, grading, excavating); and construction materials or equipment storage or maintenance (e.g. material piles, borrow area, concrete truck chute washdown, fueling); and other industrial storm water directly related to the construction process (e.g. concrete or asphalt batch plants).
- I. **Construction General Permit (CGP).** The permit authorizing storm water discharges from Construction Activities, issued and enforced by DEC. The CGP is available online at: <https://dec.alaska.gov/water/wastewater/stormwater>.

- J. **Electronic Notice of Intent (eNOI).** The electronic Notice of Intent submitted to DEC, to obtain coverage under the CGP.
- K. **Electronic Notice of Termination (eNOT).** The electronic Notice of Termination submitted to DEC, to end coverage under the CGP.
- L. **Environmental Protection Agency (EPA).** A federal agency charged to protect human health and the environment.
- M. **Erosion and Sediment Control Plan (ESCP).** The Department's project specific document that illustrates measures to control erosion and sediment on the project. The ESCP provides bidders with the basis for cost estimating and guidance for developing an acceptable Storm Water Pollutant Prevention Plan (SWPPP).
- N. **Erodible Stockpile.** The material storage or stockpile of material, organic and mineral aggregate, with greater than five percent passing the #200 sieve, wind or water transport, Engineer determined potential for material transport, or a combination thereof.
- O. **Final Stabilization.** CGP Part 4.5 and Appendix C.
- P. **Hazardous Material Control Plan (HMCP).** The Contractor's detailed project specific plan for prevention of pollution from storage, use, transfer, containment, cleanup, and disposal of hazardous material (including, but are not limited to, petroleum products related to construction activities and equipment). The HMCP is included as an appendix to the SWPPP.
- Q. **Inspection.** An inspection required by the CGP or the SWPPP, usually performed together by the Contractor's SWPPP Manager and Department's Stormwater Inspector.
- R. **Low-Erodible Stockpile.** The material storage or stockpile of material identified in the CGP definition for Final Stabilization with no more than five percent organic and/or mineral aggregate passing the #200 sieve, unless approved. Sediment transport due to water or wind erosion is not permitted.
- S. **Municipal Separate Storm Sewer System (MS4) Permit.** An DEC storm water discharge permit issued to certain local governments and other public bodies, for operation of storm water conveyances and drainage systems. See CGP for further definition.
- T. **Multi-Sector General Permit (MSGP).** The Alaska Pollutant Discharge Elimination System General Permit for storm water discharges associated with industrial activity.
- U. **Operator(s).** The party(s) responsible to obtain CGP permit coverage. CGP, Appendix:
 - 1. Contractor – is an Operator inside and outside the Project Zone.
 - 2. Department – is an Operator inside the Project Zone.
- V. **Pollutant.** Includes sediments and defined in the CGP, Appendix C.
- W. **Project Zone.** The Contract furnished physical area for construction.
- X. **Qualified Person.** CGP, Appendix C, and Subsection 01 57 10 1.05
- Y. **Records.** Any record, report, information, document or photograph required to be created or maintained pursuant to the requirements of the CGP, the CGP storm water requirements of the Clean Water Act; and applicable local, state, and federal laws and regulations regarding document preservation.

- Z. **Spill Prevention, Control and Countermeasure Plan (SPCC Plan).** The Contractor's detailed plan for petroleum spill prevention and control measures that meet the requirements of 40 CFR 112.
- AA. **Spill Response Field Representative.** The Contractor's representative with authority and responsibility for managing, implementing, and executing the HMCP and SPCC Plan.
- BB. **Storm Event.** CGP, Appendix C.
- CC. **Storm Water Pollution Prevention Plan (SWPPP).** CGP, Appendix C.
- DD. **Storm Water Pollution Prevention Plan Two (SWPPP2).** The Contractor's detailed project specific plan to comply with CGP or MSGP requirements, for Contractor construction-related activities outside the Project Zone.
- EE. **Subcontractor Spill Response Coordinator.** The subcontractor's representative with authority and responsibility for coordinating the subcontractor's activities in compliance with the HMCP and SPCC Plan.
- FF. **Subcontractor SWPPP Coordinator.** The subcontractor's representative with authority to direct the subcontractor's work, and who is responsible for coordination with the Superintendent and SWPPP Manager, and for the subcontractor's compliance with the SWPPP.
- GG. **Superintendent.** The Contractor's duly authorized representative in responsible charge of the work. The Superintendent has responsibility and authority for the overall operation of the Project and for Contractor furnished sites and facilities directly related to the Project.
- HH. **SWPPP Amendment.** A modification to the SWPPP, CGP Part 5.0.
- II. **SWPPP Manager.** The Contractor's qualified representative with authority and responsibility. CPP, Appendix C.
- JJ. **SWPPP Preparer.** The Contractor's qualified representative who is responsible for developing the initial SWPPP.
- KK. **Temporary Stabilization.** CGP, Appendix C.
- LL. **U.S. Corp of Engineers Permit (USACOE Permit).** A U.S. Army Corp of Engineers Permit for construction in waters of the US. Such permit may be issued under Section 10 of the Rivers and Harbors Act of 1899, or Section 404 of the Clean Water Act.
- MM. **Utility Spill Response Coordinator.** The Utility's representative with authority and responsibility for coordinating the Utility's activities in compliance with the HMCP and SPCC Plan.
- NN. **Utility SWPPP Coordinator.** The Utility's representative with authority to direct the Utility's work, and who is responsible for coordination with the Superintendent and SWPPP Manager, and for the Utility's compliance with the SWPPP.

1.04 PLAN AND PERMIT SUBMITTALS.

- A. Partial and incomplete submittals will not be accepted for review. Any submittal that is re-submitted or revised after submission, but before the review is completed, will restart the submittal review timeline. No additional Contract time or additional compensation will be allowed due to delays caused by partial or incomplete submittals, or required re-submittals.

1. Storm Water Pollution Prevention Plan. Submit an electronic copy and three hard copies of the SWPPP to the Department for approval. Deliver these documents to the Department at least 21 days before beginning Construction Activity. Organize and bind the SWPPP and related documents for submittal according to the requirements of Subsection 01 57 10 3.01 B.

The Department will review the SWPPP submittals within 14-calendar days after they are received. Submittals will be returned to the Contractor, and marked as either "rejected" with reasons listed or as "approved" by the Department. When the submittal is rejected, the Contractor must revise and resubmit the SWPPP. The 14-day review period will restart when the contractor submits an electronic copy and three hard copies of the revised SWPPP to the Department for approval.

After the SWPPP is approved and certified by the Department using Form 25D-109, the Contractor will certify the approved SWPPP Form 25D-111. See Item 4 of this list for further SWPPP submittal requirements.

2. Hazardous Material Control Plan. The HMCP Template can be found in the forms section at the following webpage:
http://www.dot.state.ak.us/stwddes/dcsconst/pop_constforms.shtml. Submit an electronic copy and one hard copy of the HMCP, as an appendix to the SWPPP, to the Department for approval. The HMCP submittal and review timeline, and signature requirements are the same as the SWPPP.
3. Spill Prevention, Control and Countermeasure Plan. When a SPCC Plan is required under Subsection 01 57 10 3.03, submit an electronic copy and three signed hard copies of the SPCC Plan to the Department. Deliver these documents to the Department at least 21 days before beginning Construction Activity. The Department reserves the right to review the SPCC Plan and require modifications.
4. Construction General Permit Coverage. The Contractor is responsible for permitting of Contractor and subcontractor Construction Activities related to the Project. The Contractor cannot use the SWPPP for construction activities outside the Project Zone where the Department is not an operator.

After the Department certifies the SWPPP and prior to beginning Construction Activity, submit an eNOI with the required fee to DEC for coverage under the Construction General Permit (CGP). Submit a copy of the signed eNOI and DEC's written acknowledgement (by letter or other document) to the Department as soon as practicable and no later than three days after filing eNOI or receiving a written response. For projects less than one acre refrain from filing for an eNOI, unless directed by the Department or DEC.

Do not begin Construction Activity until the conditions listed in Subsection 01 57 10 3.06 (B) are completed.

The Department will submit an eNOI to DEC for Construction Activities inside the Project Zone. The Department will provide the Contractor with a copy of the Department's eNOI and DEC's written acknowledgment (by letter or other document), for inclusion in the SWPPP.

Before Construction Activities occur, transmit to the Department an electronic copy of the approved and certified SWPPP, with signed Delegation of Signature Authorities Forms 25D-107 and 25D-108, SWPPP Certifications 25D-111 and 25D-109, both permittee's signed eNOIs and DEC's written acknowledgement.

5. Ending CGP Coverage. Submit an eNOT to DEC within 30 days after the Department has determined the conditions listed in Subsection 01 57 10 3.06 G have been met. Submit a

copy of the signed eNOT and DEC's acknowledgement to the Department within three days of filing the eNOT or receiving a written response.

6. DEC SWPPP Review. When CGP, Part 2.1.3 requires DEC SWPPP review:
 - a. Transmit a copy of the Department-approved SWPPP to DEC using delivery receipt confirmation;
 - b. Transmit a copy of the delivery receipt confirmation to the Department within seven days of receiving the confirmation; and
 - c. Retain a copy of delivery receipt confirmation in the SWPPP.

Local Government SWPPP Review. When CGP, Part 2.1.4 requires local government review:

- a. Transmit a copy of the Department-approved SWPPP and other information as required to local government, with the required fee. Use delivery receipt confirmation;
 - b. Transmit a copy of the delivery receipt confirmation to the Department within seven days of receiving the confirmation;
 - c. Transmit a copy of any comments by the local government to the Department within seven days of receipt;
 - d. Amend the SWPPP as necessary to address local government comments and transmit SWPPP Amendments to the Department within seven days of receipt of the comments; and
 - e. Include a copy of local government SWPPP review letter in the SWPPP; and
 - f. File a notification with local government that the project is ending.
7. Modifying Contractor's eNOI.
 - a. When required by the CGP Part 2.7.1, modify the Contractor's eNOI to update or correct information within 30 calendar days of the change. Reasons for modification include change in start or end dates, change in Owner/Operator address and contact information, change in site information, any changes in number of acres to be disturbed, change in decision to use or not use treatment chemicals, or change in location of SWPPP Records.
 - b. The Contractor must submit an eNOT and then submit a new eNOI instead of an eNOI modification when:
 1. The operator has changed

1.05 PERSONNEL QUALIFICATIONS

- A. Provide documentation in the SWPPP that the individuals serving in these positions meet the personnel qualifications. The Department accepts the following certificates as equivalent to AK-CESCL: CPESC, Certified Professional in Erosion and Sediment Control or CISEC, Certified Inspector in Sediment and Erosion Control, which are found in the CGP Appendix C and repeated below.

Table 01 57 01
Personal Qualifications

Personnel Title	Required Qualifications
SWPPP Preparer	Current certification as a Certified Professional in Erosion and Sediment Control (CPESC); OR Current certification as AK-CESCL, and at least two years' experience in erosion and sediment control, as a SWPPP Manager or SWPPP writer, or equivalent. OR Professional Engineer registered in the State of Alaska with current certification as AK-CESCL.
Superintendent	Current AK-CESCL or substitute training from CGP Appendix C Qualified Person Table 4
SWPPP Manager	Current AK-CESCL or substitute training from CGP Appendix C Qualified Person Table 4
Active Treatment System Operator	Current AK-CESCL or substitute training from CGP Appendix C Qualified Person Table 4. ATS operator should possess a recognized certification, or professional standing, or who by extensive knowledge, training, and experience has successfully demonstrated the ability to meet the ATS requirement.

1.06 SIGNATURE/CERTIFICATION REQUIREMENTS AND DELEGATIONS

- A. eNOI and eNOT. The eNOI and eNOT must be signed and certified by a responsible corporate officer according to CGP Appendix A, Part 1.12. Signature and certification authority for the eNOI and eNOT cannot be delegated.
- B. Delegation of Signature Authority for Other SWPPP Documents and Reports. Use Form 25D-108 to delegate signature authority and certification authority to the Superintendent position, according to CGP Appendix A, Part 1.12.3, for the SWPPP, Inspection Reports and other reports required by the CGP. The Superintendent position is responsible for signing and certifying the SWPPP, Inspection Report, and other reports required by the CGP, except the eNOI, eNOT, and NOI Modifications.
- C. The Department's delegation Form 25D-107, which the Contractor must include in the SWPPP will be provided.
- D. Subcontractor Certification. Subcontractors must certify that they have read and will abide by the CGP and the conditions of the project SWPPP Form 25D-105.
- E. Signature and Initials. Handwrite signatures or initials on CGP documents and SWPPP forms, wherever a signature or initial is required.

1.07 RESPONSIBILITY FOR STORM WATER PERMIT COVERAGE

- A. The Department and the Contractor are jointly responsible for permitting and permit compliance within the Project Zone.
- B. The Contractor is responsible for permitting and permit compliance outside the Project Zone. The Contractor has sole responsibility for compliance with DEC, USACOE and other applicable federal, state, and local requirements, and for securing all necessary clearances, rights, and

permits. The Contractor shall be responsible for protection, care, and upkeep of all work, and all associated off-site zones.

- C. The Contractor is responsible for obtaining a DEC General Permit for Excavation Dewatering (AKG0020000) if construction activities are within 1,500 feet of a DEC-identified contaminated site or groundwater plume.
- D. An entity that owns or operates, a commercial plant or material source or disposal site outside the Project Zone, is responsible for permitting and permit compliance. The Contractor has sole responsibility to verify that the entity has appropriate permit coverage.
- E. The Department is not responsible for permitting or permit compliance, and is not liable for fines resulting from noncompliance with permit conditions:
 - 1. For Construction Activity and Support Activities outside the Project Zone; and
 - 2. For commercial plants, commercial material sources, and commercial disposal sites.

1.08 UTILITY. (Reserved)

PART 2 – PRODUCTS

2.01 MATERIALS

- A. Use materials suitable to withstand hydraulic, wind, and soil forces, and to control erosion and trap sediments according to the requirements of the CGP and the Specifications.
- B. Use seed mixture specified in the contract or as directed by the Engineer.
- C. Use soil stabilization material as specified.
- D. Use silt fences as specified.
- E. Use straw and straw product certified weed free of prohibited and restricted noxious weed seed and quarantined pests, according to Alaska Administrative Code, Title 11, Chapter 34 (11 AAC 34). When straw or straw products certified according to 11 AAC 34 are not available, use non-certified products manufactured within Alaska before certified products manufactured in another state, country, or territory. Non-certified straw or straw products manufactured in another state, country, or territory shall not be used. Grass, legumes, or any other herbaceous plants produced as hay, shall not be substituted for straw or straw products.
- F. Use Oregon Scientific RGR126 wireless rain gauge with temperature, or Taylor 2751 Digital Wireless Rain Gauge with Thermometer, or approved equivalent.

PART 3 – EXECUTION

3.01 STORM WATER POLLUTION PREVENTION PLAN (SWPPP) REQUIREMENTS

- A. SWPPP Preparer and Pre-Construction Site Visit.
 - 1. Use a SWPPP Preparer to develop the SWPPP and associated documents, according to the requirements of the CGP and USACOE permit. The SWPPP Preparer must put their name, qualifications (including the expiration date of any certifications), title and company name in the SWPPP.
 - 2. The SWPPP Preparer must conduct a pre-construction inspection at the Project site before construction activity begins. If the SWPPP Preparer is not a Contractor employee, the

SWPPP Preparer must visit the site accompanied by the Contractor. Give the Department at least seven days' notice of the site visit, so that the Department may participate.

3. During the pre-construction inspection, the SWPPP Preparer must identify, or if a draft of the SWPPP has already been prepared verify that the SWPPP fully addresses and describes:
 - a. Opportunities to phase construction activities;
 - b. Appropriate BMPs and their sequencing; and
 - c. Sediment controls that must be installed prior to beginning Construction Activities.
 4. Document the SWPPP Preparer's pre-construction inspection in the SWPPP on Form 25D-106, SWPPP Pre-Construction Site Visit, including the names of attendees and the date.
- B. Developing the SWPPP.
1. Use the Department's ESCP, Environmental Commitments, and other Contract documents as a starting point for developing the SWPPP. The approved SWPPP will be based on the current ESCP. BMPs identified in the ESCP must be addressed in the SWPPP.
 2. Develop the SWPPP with sections and appendices, according to the current DOT&PF SWPPP template. Included information required by the Contract and described in the CGP, Part 5.0.
 - a. Obtain the following forms after they have been completed by the Department and include them in the SWPPP:
 - i. SWPPP Delegation of Signature Authority – DOT&PF (25D-107)
 - ii. SWPPP Certification for DOT&PF (25D-109)
 - iii. SWPPP Delayed Action Item Report (25D-113) completed by the Department, if needed.
 - b. Use the following Department forms for recording information in the SWPPP:
 - i. SWPPP Amendment Log (25D-114)
 - ii. SWPPP Certification for Contractor (25D-111)
 - iii. SWPPP Construction Site Inspection Report (25D-100)
 - iv. SWPPP Corrective Action Log (25D-112)
 - v. SWPPP Daily Record of Rainfall (25D-115)
 - vi. SWPPP Delegation of Signature Authority – Contractor (25D-108)
 - vii. SWPPP Grading and Stabilization Activities Log (25D-110)
 - viii. SWPPP Pre-Construction Site Visit (25D-106)
 - ix. SWPPP Project Staff Tracking (25D-127)
 - x. SWPPP Subcontractor Certification (25D-105)
 - xi. SWPPP Training Log (25D-125)
 - xii. SWPPP Noncompliance (25D-143)
 - c. SWPPP Template, Forms, and Instructions are available online at:
<https://dot.alaska.gov/stwddes/dcsconst/index.shtml> Compile the SWPPP in three ring binders with tabbed and labeled dividers for each section and appendix.
- C. SWPPP Considerations and Contents.
1. The SWPPP must provide erosion and sediment control measures for all Construction Activity within the Project Zone. Construction activity outside the Project Zone must have

permit coverage, using separate SWPPP2(s), using a separate SWPPP2, and separate Contractor Inspections.

2. The SWPPP must consider the activities of the Contractor and all subcontractors and utility companies performing work in the Project Zone. The SWPPP must describe the roles and responsibilities of the Contractor, subcontractors, utility companies, and the Department with regard to implementation of the SWPPP. The SWPPP must identify all operators for the Project, including utility companies performing Construction Activity, and identify the areas:
 - a. Over which each operator has operational control; and
 - b. Where the Department and Contractor are co-operators.
3. For work outside the Project Zone the SWPPP must identify the entity that has stormwater permit coverage, the operator, and the areas that are:
 - a. Dedicated to the Project and where the Department is not an operator; and
 - b. Not dedicated to the project, but used for the project.
4. Develop the SWPPP according to the requirements of the CGP Part 5.0 and this specification. Utilize the DEC CGP SWPPP Template in conjunction with the DOT&PF SWPPP Template to develop the SWPPP. Account for the Contractor's construction methods and phasing. Identify the amount of mean annual precipitation.
5. Comply with the CGP Part 1.4.3 Authorized Non-Storm Water Discharges. List locations where authorized non-storm water will be used, including the types of water that will be used on-site.
6. If the project discharges to a Tier III, Outstanding Natural Resource Water, comply with CGP Part 2.1.6. Submittal deadlines apply prior to filing an eNOI and beginning construction activities. As noted, none have been designated in the state of Alaska as of the issuance of the 2021 CGP.
7. There are special requirements in the CGP Part 3.2, for storm water discharges into an impaired water body, and they may include monitoring of storm water discharges. For Projects meeting the permit criteria, the Contractor will implement a monitoring plan approved by the Department for the storm water within the Project Zone and will provide the required information and reports for inclusion in the SWPPP. The Contractor is responsible for monitoring and reporting outside the Project Zone.
8. Minimize the amount of soil exposed and preserve topsoil on site, unless infeasible according to the CPG Part 4.2.2.
9. Delineate the site according to CGP Part 4.2.1.
10. The SWPPP must identify specific areas where potential erosion, sedimentation, or pollution may occur. The potential for wind erosion must be addressed. The potential for erosion at drainage structures must be addressed.

Describe methods and time limits, to initiate temporary or final soil stabilization.

11. Include in the "Stabilize Soils" section of the SWPPP, a description of how you will minimize the amount of disturbed and unstabilized ground in the fall season. Identify anticipated dates of fall freeze-up and spring thaw. Describe how you will stabilize areas when it is close to or past the seasonal time of snow cover or frozen conditions, and before the first seasonal thaw. Include a plan for final stabilization
12. Plans for Active Treatment Systems (ATS) must meet with the requirements in the CGP Part 2.1.5.

13. The SWPPP must provide designated area for equipment and wheel washing, equipment fueling and maintenance, chemical storage, staging or material storage, waste or disposal sites, concrete washouts, paint and stucco washouts, and sanitary toilets. These activities must be done in designated areas that are located, to the extent practicable, away from drain inlets, conveyance channels, and waters of the US. No discharges are allowed from concrete washouts, paint and stucco washout; or from release oils, curing compounds, fuels, oils, soaps, and solvents. Equipment and wheel washing water that does not contain detergency may be discharged on-site if it is treated before discharge.
 14. Design temporary BMPs to accommodate a two year 24 hour storm event. . All installed control measures must be described and documented in the SWPPP according to the CGP Part 5.3.6. Amendments, including source controls, sediment controls, discharge points, and all temporary and permanent stabilization measures. Describe the design, placement, installation, and maintenance of each BMP, using words and drawings as appropriate. Describe the design capacity of sediment basins (including sediment ponds and traps). Provide a citation to the BMP Manual or publication used as a source for the BMP, including the manufacturers or BMP manual specifications for installation CGP Part 5.3.6.2. If no published source was used to select or design a BMP, then the SWPPP or SWPPP amendment must state that "No BMP manual or publication was used for this design."
 15. Describe the sequence and timing of activities that disturb soils and of BMP implementation and removal. Phase earth disturbing activities to minimize unstabilized areas, and to achieve temporary or final stabilization quickly. Whenever practicable incorporate final stabilization work into excavation, embankment and grading activities.
 16. Provide a legible site map or set of maps in the SWPPP, showing the entire site and identify boundaries of the property where construction and earth-disturbing activities will occur. Include all the elements described in the CGP Part 5.3.5 and the DEC CGP SWPPP Template Section 5.0.
 17. Identify the inspection frequency in the SWPPP according to the CGP Part 6.1.
 18. Linear Projects Inspections, described in CGP Part 6.5, are not applicable to this contract.
 19. The SWPPP must cite and incorporate applicable requirements of the Project permits, environmental commitments, USACOE permit and commitments related to historic preservation. Make additional consultations or obtain permits as necessary for Contractor specific activities which were not included in the Department's permitting and consultation.
 20. The SWPPP is a dynamic document. Keep the SWPPP current by noting installation, modification, and removal of BMPs, and by using amendments, SWPPP amendment logs, Inspection Reports, corrective action logs, records of land disturbance and stabilization, and any other records necessary to document storm water pollution prevention activities and to satisfy the requirements of the CGP and this specification. See Subsection 01 57 10, 3.08 for more information.
- D. Recording Personnel and Contact Information in the SWPPP.
1. Identify the SWPPP Manager as the Storm Water Lead and Storm Water Inspector positions in the SWPPP. Document the SWPPP Manager's responsibilities in Section 2.0 Storm Water Contacts, of the SWPPP template and:
 - a. Identify that the SWPPP Manager does not have the authority to sign inspection reports (unless the SWPPP Manager is also the designated Project Superintendent).
 - b. Identify that the SWPPP Manager cannot prepare the SWPPP unless the SWPPP Manager meets the Contract requirements for the SWPPP Preparer.

2. Include in the SWPPP, proof of AK-CESCL or equivalent certifications for the Superintendent and SWPPP Manager, and for any acting Superintendent and acting SWPPP Managers. If the Superintendent or SWPPP Manager is replaced permanently or temporarily, by an acting Superintendent or acting SWPPP Manager; record in the SWPPP (use Form 25D-127) the names of the replacement personnel, the date of the replacement. For temporary personnel record their beginning and ending dates.
3. Provide 24-hour contact information for the Superintendent and SWPPP Manager. The Superintendent and SWPPP Manager must have 24-hour contact information for all Subcontractor SWPPP Coordinators and Utility SWPPP Coordinators.
4. Include in the SWPPP, proof of AK-CESCL, or equivalent certifications of ATS operators. Record names of ATS operators and their beginning and ending dates on Form 25D-127.
5. The Department will provide proof of AK-CESCL or equivalent certifications for the Project Engineer the Stormwater Inspectors, and Monitoring Person (if applicable), and names and dates they are acting in that position. Include the Department's Records in the SWPPP Appendix E. Include the Department's Storm Water Inspector and Storm Water Monitoring Person (if applicable) in Section 2.0 of the SWPPP.

3.02 HAZARDOUS MATERIAL CONTROL PLAN (HMCP) REQUIREMENTS

- A. Prepare the HMCP using the DOTPF template for the prevention of pollution from storage, use, containment, cleanup, and disposal of all hazardous material, including petroleum products related to construction activities and equipment. Include the HMCP as an appendix to the SWPPP. Compile Material Safety Data Sheets in one location and reference that location in the HMCP.
- B. Designate a Contractor's Spill Response Field Representative with 24-hour contact information. Designate a Subcontractor Spill Response Coordinator for each subcontractor. The Superintendent and Contractor's Spill Response Field Representative must have 24-hour contact information for each Subcontractor Spill Response Coordinator and the Utility Spill Response Coordinator.
- C. List and give the location and estimated quantities of hazardous materials (Including materials or substances listed in 40 CFR 117 and 302, and petroleum products) to be used or stored on the Project. Hazardous materials must be stored in covered storage areas. Include secondary containment for all hazardous material storage areas.
- D. Identify the locations where fueling and maintenance activities will take place, describe the activities, and list controls to prevent the accidental spillage of petroleum products and other hazardous materials. Controls include placing absorbent pads or other suitable containment under fill ports while fueling, and under equipment during maintenance or repairs.
- E. Use secondary containment under all stationary equipment (equipment that does not have a seat for driving) that contains petroleum products. Use secondary containment under pumps, compressors, and generators.
- F. List the types and approximate quantities of response equipment and cleanup materials available on the Project. Include a list and location map of cleanup materials, at each different work site and readily available off site (materials sources, material processing sites, disposal sites, staging areas, etc.). Spill response materials must be stored in sufficient quantity at each work location, appropriate to the hazards associated with that site.
- G. Describe procedures for containment and cleanup of hazardous materials. Describe a plan for the prevention, containment, cleanup, and disposal of soil and water contaminated by spills.

Describe a plan for dealing with contaminated soil and water encountered during construction. Clean up spills or contaminated surfaces immediately.

- H. Describe methods of disposing of waste petroleum products and other hazardous materials generated by the Project, including routine maintenance. Identify haul methods and final disposal areas. Assure final disposal areas are permitted for hazardous material disposal.
- I. Describe methods of complying with the requirements of AS 46.04.010-900, Oil and Hazardous Substances Pollution Control, and 18 AAC 75. Include contact information for reporting hazardous materials and petroleum product spills to the Department and reporting to federal, state and local agencies.

3.03 SPILL PREVENTION, CONTROL AND COUNTERMEASURE PLAN (SPCC Plan) REQUIREMENTS

- A. Prepare and implement an SPCC Plan when required by 40 CFR 112; when both of the following conditions are present on the Project:
 - 1. Oil or petroleum products from a spill may reach navigable waters (as defined in 40 CFR 112); and
 - 2. Total above ground storage capacity for oil and any petroleum products is greater than 1,320 gallons (not including onboard tanks for fuel or hydraulic fluid used primarily to power the movement of a motor vehicle or ancillary onboard oil-filled operational equipment, and not including containers with a storage capacity of less than 55 gallons).
- B. Reference the SPCC Plan in the HMCP and SWPPP.

3.04 RESPONSIBILITY AND AUTHORITY OF THE SUPERINTENDENT AND SWPPP MANAGER

- A. The Superintendent is responsible for the overall operation of the Project and all Contractor furnished sites and facilities directly related to the Project. The Superintendent shall sign and certify the SWPPP, Inspection Reports, and other reports required by the CGP, except the eNOI and eNOT. The Superintendent may not delegate the task or responsibility of signing and certifying the SWPPP submitted under Subsection 01 57 10 1.04, Inspection Reports, and other reports required by the CGP.
- B. The Superintendent may assign certain duties to the SWPPP Manager; those duties may include:
 - 1. Ensuring Contractor's and subcontractor's compliance with the SWPPP and CGP;
 - 2. Ensuring the control of erosion, sedimentation, or discharge of pollutants;
 - 3. Directing and overseeing installation, maintenance, and removal of BMPs;
 - 4. Performing Inspections; and
 - 5. Updating the SWPPP including adding amendments and forms.
- C. If the Contactor utilizes a SWPPP Manager, the SWPPP Manager must be available at all times to administer SWPPP requirements, be physically present within the Project Zone or the project office, for at least eight hours per day when construction activities are occurring.
- D. The Superintendent and SWPPP Manager shall be knowledgeable in the requirements of this Section, the SWPPP, CGP, BMPs, HMCP, SPCC Plan, environmental permits, environmental commitments, and historic preservation commitments.

- E. The Superintendent and SWPPP Manager shall have the Contractor's complete authority and be responsible for suspending construction activities that do not conform to the SWPPP or CGP.

3.05 CONTRACTOR REQUIREMENTS

- A. The Contractor must be familiar with the conditions and requirements of the CGP because Contractor's employees will be conducting duties that relate to compliance with the CGP.

3.06 CONSTRUCTION REQUIREMENTS

- A. Comply with the SWPPP and the requirements of the CGP Part 5.0.
- B. Before Construction Activity may Begin.
 - 1. The following actions must be completed before Construction Activity begins:
 - a. The SWPPP Preparer must visit the Project, the visit must be documented in the SWPPP (Form 25D-106), and the SWPPP must be developed (or amended) with findings from the visit.
 - b. The SWPPP must be approved by the Department (Form 25D-109).
 - c. The Contractor must be authorized to begin by the Department.
 - d. The Project eNOIs for the Department and for the Contractor, as well as any other eNOIs if there are additional operators, must be listed as Active Status on the DEC website.
 - e. The Department approved SWPPP must be submitted to DEC and Local Government per CGP Part 2.1.2 Part 2.1.3, Part 2.4.1, or when required.
 - f. The Contractor has transmitted to the Department an electronic copy of the approved SWPPP.
 - g. The Delegation of Authority Form for both the Contractor and the Department are signed (25D-108 and 25D-107).
 - 2. Main entrance signage must meet requirements of GCP Part 5.10.2. Post notices must contain the following information:
 - a. Permit authorization number assigned to the eNOIs;
 - b. Operator contact name and phone number;
 - c. Location of the SWPPP or the name and phone number of the contact person for scheduling SWPPP reviewing times.
 - d. Post notices on the outside wall of the Contractor's project office, and near the main entrance of the construction project. Do not use retroreflective signs for the SWPPP posting. Do not locate SWPPP signs in locations where signs may be confused with traffic control signs or devices. Update the notices if the listed information changes.
 - 3. Track precipitation according to CGP Part 7.3.9. Submit the method to track precipitation to the Engineer for approval.
 - 4. Delineate the site according to the CGP Part 4.2.1. Install sediment control and other BMPs that must be placed prior to the initiation of ground disturbance.
- C. During Construction.
 - 1. Before subcontractors or utility companies begin soil disturbing activities, provide copies of applicable portions of the SWPPP, and require them to sign a SWPPP Subcontractor Certification (Form 25D-105). Include SWPPP Subcontractor Certifications as an appendix to the SWPPP. Ensure subcontractors and utility companies understand and comply with the SWPPP and the CGP. Inform subcontractors and utility companies of SWPPP amendments that affect them in a timely manner. Coordinate with subcontractors and utility

companies doing work in the Project Zone so BMPs, including temporary and permanent stabilization are installed, maintained, and protected from damage.

2. Provide on-going training to employees, subcontractors, and utility companies on control measures at the site and applicable storm water pollution prevention procedures according to CGP Part 4.14. Training must be given at a frequency that will be adequate to ensure proper implementation and protection of control measures, no less frequently than once a month during construction activity. Document on the SWPPP Training Log. Form 25D-125, the dates and attendees to these trainings. Include the SWPPP Training Log in the SWPPP Appendix I.
3. Notify the Department immediately if the actions of any utility company or subcontractor do not comply with the SWPPP and the CGP.
4. Comply with the CGP Part 4.8.4 and Section 00700 Articles 6.14 and 6.17 for concrete washout. Do not install concrete washout containment within 100 feet of wetlands and/or other water bodies.
5. Comply with CGP Part 4.8.2 for Fueling and Maintenance activities. Place absorbent pads or other suitable containment under fill ports while fueling, and under equipment during maintenance or repairs. Install secondary containment under all stationary equipment that contains petroleum products.
6. Comply with requirements of the HMCP and SPCC Plan, and all local, state and federal regulations that pertain to the handling, storage, containment, cleanup, and disposal of petroleum products or other hazardous materials.
7. Keep the SWPPP and HMCP current (refer to Paragraph 3.01 (C), SWPPP Considerations and Contents)

D. Pollutant and Hazardous Materials Reporting Requirements.

1. Any release of hazardous substance must be reported immediately to the Engineer as soon as the person has knowledge of the discharge. Report spills of petroleum products or other hazardous materials to the Engineer and other agencies as required by law, and according to CGP Part 9.3.
 - a. To water, any amount released must be reported immediately to the Engineer, DEC, and the Coast Guard.
 - b. To land:
 - i. Any release of a petroleum product in excess of 55 gallons must be reported as soon as the person has knowledge of the discharge CGP Part 9.3.2.
 - ii. Any release of a petroleum product in excess of 10 gallons but less than 55 gallons must be reported to the Engineer and must be reported to DEC within 48 hours after the person has knowledge of the discharge CGP Part 9.3.2.
 - iii. Any release of a petroleum product in excess of 1 gallon to 10 gallons must be recorded and logged and provided to DEC on a monthly basis.
 - c. Use the HMCP and SPCC Plan (if available) for contact information to report spills to regulatory agencies.
 - d. Implement measures to prevent the reoccurrence of and to respond to such releases.
 - e. Prior to disposal of contaminated material, submit a Contaminated Media Transport and Treatment Disposal Approval Form to DEC Spill Prevention and Response. Dispose as approved by DEC.

E. Corrective Action and Maintenance of BMPs.

1. Implement maintenance as required by the CGP Part 4.13 and Part 8.0, SWPPP, and manufacturer's specification, whichever is more restrictive.
2. Implement corrective action:
 - a. To comply CGP Part 8.0, Part 8.2, and the SWPPP.
 - b. If identified in an Inspection or the Department identifies the SWPPP or any part of the SWPPP is ineffective in preventing erosion, sedimentation or the discharge of pollutants
 - c. If a required BMP was not installed according to the SWPPP schedule or phasing, or was installed incorrectly, or was not installed according to the CGP Part 4.0;
 - d. If BMP is not operating as intended, has not been maintained in an effective operation condition, or is unable to effectively perform the intended function;
 - e. If a prohibited discharge of pollutants, as specified in CGP Part 4.7, is occurring or will occur;
 - f. If there is accumulation of sediment or other pollutants, that is in or near any storm water conveyance channels, or that may enter a discharge point or storm sewer system. If there is accumulation of sediment or other pollutants that is being tracked outside the project zone.
3. If a corrective action is not completed according to the CGP 8.2, document the conditions in the Corrective Action Log, notify the Engineer, and implemented the corrective action as soon as possible.
4. If a corrective Action could affect a subcontractor, notify the subcontractor within three days of taking the corrective action. Require in your written subcontract, that subcontractors must notify the Contractor within 24 hours of becoming aware of a condition that requires a corrective action.

F. Stabilization.

1. All soil stabilization requirements must be met in accordance with CGP Part 4.5 and the SWPPP.
2. When temporary or permanent seeding is required, provide a working hydro seeding equipment located within 100 miles of the project by road; with 1,000 gallon or more tank capacity, paddle agitation of tank, and the capability to reach the seed areas with an uniform mixture of water, seed, mulch and tackifier. If the project is located in an isolated community the hydro-seeder must be located at the project.
3. Apply temporary seed and stabilization measures after preparing the surface to reduce erosion potential and to facilitate germination and growth of vegetative cover. Apply seed and maintain seeded areas. Reseed areas where growth of temporary vegetative cover is inadequate to stabilize disturbed ground.
4. Apply permanent seed and stabilization measures after ground disturbing activity has permanently ceased. Comply with the CGP, SWPPP, and Contract requirements.
5. Incorporate final or temporary stabilization immediately after installing culverts or other drainage structures to satisfy CGP Part 4.5, the SWPPP, and the Engineer. Stabilization in areas upstream and downstream of culverts, drainages and areas disturbed by related construction activities after installation, or before deactivating stream bypass or diversion.
6. Stabilization before Fall Freeze up and Spring Thaw.

- a. Stabilize Construction Activities within the Project Zone with appropriate BMPs prior to the anticipated date of fall freeze up, in accordance with the SWPPP and CGP Part 4.12.
- b. Exceptions to stabilization prior to anticipated date of fall freeze up include:
 - i. Where temporary stabilization activities are precluded by snow cover or frozen ground conditions prior to the anticipated date of fall freeze up, stabilization measures must be initiated as soon as practicable following the actual spring thaw.
 - ii. When winter construction activity is authorized by the Engineer and conducted according to the contract9.

G. Ending CGP Coverage

1. The Engineer will determine the date that all the following conditions for ending CGP coverage have been met within the Project Zone:
 - a. Land disturbing activities have ceased;
 - b. Final Stabilization has been achieved on all portions of the Project Zone, in accordance with CGP Part 4.5.2 (including at Department furnished material sources, disposal sites, staging areas, equipment areas, etc.); and
 - c. Temporary BMPs have been removed.
2. After the Engineer has determined the conditions for ending CGP coverage have been met according to CGP Part 10.2, the Department will:
 - a. Send written notice to the Contractor with the date that the conditions were met;
 - b. Submit an eNOT to DEC within 30 days; and
 - c. Provide a copy of the eNOT and DEC's acknowledgement letter to the Contractor.
3. The Contractor is responsible for ending permit coverage within the Project Zone, by submitting an eNOT to DEC within 30 days of meeting the conditions for ending CGP coverage. The Contractor is responsible for BMP maintenance and SWPPP updates until permit coverage is ended.
4. If the Contractor's CGP eNOI acreage includes areas where the Department is not an Operator, the Contractor may not be able to file an eNOT at the same time as the Department. In this case, the Contractor must amend the SWPPP and separate SWPPP2(s), to indicate the Department's CGP coverage has ended, and the Department is no longer an Operator within the Project Zone.
5. The Contractor must indicate in the SWPPP the areas that have reached Final Stabilization, and the dates land disturbing activities ended, and Final Stabilization was achieved. The Contractor must submit an eNOT to DEC, and insert copies of the Department's and the Contractor's eNOTs with DEC's acknowledgement letters in the appendix of the SWPPP.
6. The Contractor must submit a copy of each signed eNOT and DEC's acknowledgement letter to the Department within three days of filling the eNOT or receiving a written response.
7. The Contractor is responsible for coordinating local government inspection of work and ending permit coverage with local government.

H. Transmit final SWPPP.

1. Transmit one copy of the final SWPPP, including all amendments and appendices, to the Department when the project eNOTs are filed, or within 30 days of the Department's eNOT being filed, whichever is sooner. Transmittal must be by both electronic and hard copy.

3.07 SWPPP DOCUMENTS, LOCATION ON-SITE AND RECORD RETENTION

- A. The SWPPP and related documents maintained by the Contractor are the Record for demonstrating compliance with the CGP. Copies of SWPPP documents transmitted to the Department under the requirements of this specification are informational and do not relieve the Contractor's responsibility to maintain complete records as required by the CGP and this specification.
- B. Keep the SWPPP, HMCP and SPCC Plan at the on-site project office. If there is not an on-site project office, keep the documents at a locally available location that meets CGP requirements and is approved by the Department. Records may be moved to another office for record retention after the eNOTs are filed. Records may be moved to another office during winter shutdown. Update on-site postings if records are relocated during winter shutdown. Provide the Department with copies of all Records
- C. Retain Records and a copy of the SWPPP, for at least three years after the date of eNOT. If EPA or DEC inspects the project, issues a Notice of Violation (NOV), or begins investigation for a potential NOV before the retention period expires, retain the SWPPP and all Records related to the SWPPP and CGP until at least three years after EPA and/or DEC has determined all issues related to the investigation are settled.
- D. The SWPPP and related documents must be made available for review and copy, to the Department and other regulatory agencies that request them. See CGP Part 5.10, CGP Part 6.6 and CGP Part 9.5.

3.08 SWPPP INSPECTIONS, AMENDMENTS, REPORTS, AND LOGS

- A. Perform Inspections, prepare Inspection Reports, and prepare SWPPP Amendments in compliance with the SWPPP and the CGP using Department forms found at the DOT&PF Construction Forms website.
- B. Inspection during Construction.
 1. Conduct Inspections according to the schedule and requirements of the SWPPP and CGP Part 6.0. When the project is on a 14-calendar day inspection frequency, conduct Post-Storm Event Inspections within 24 hours of the end of a storm event, as required in addition to the 14-day predetermined inspection cycle.
 2. Inspections required by the CGP and SWPPP must be performed by the Contractor's SWPPP Manager and the Department's Stormwater Inspector jointly, unless approved by the Engineer when:
 - a. One inspector is not on site, access is only by air, and weather delayed or canceled flights;
 - b. One of the inspectors is sick;
 - c. The project is on a reduced frequency inspection schedule with no staff on site, the only access to the site is by air, and it is economical to send only one inspector, or;
 - d. When the Engineer determines a safety concern that makes joint inspection impracticable.
 3. When this is the case, the Operator who conducts the inspection must provide a copy of the Inspection Report to the other Operator within three days of the inspection date and document the date of the report transmittal in the SWPPP Appendix K.

C. Inspection Reports.

1. Use only the DOT&PF SWPPP Construction Site Inspection Report, Form 25D-100 to record Inspections. Changes or revisions to Form 25D-100 are not permitted; except for adding or deleting data fields that list: Location of Discharge Points, and Site Specific BMPs. Complete all fields included on the Inspection Report form; do not leave any field blank. Refer to the DOT&PF Construction Forms webpage for instructions to complete Form 25D-100.
2. Insert a Complete-by-Date for each corrective action listed that complies with:
 - a. Section 01 57 10 3.06 E.
 - b. The CGP Part 8.2.
3. Provide a copy of the completed, unsigned Inspection Report to the Department by the end of the next business day following the inspection.
4. The Superintendent must review, correct errors, and sign and certify the Inspection Report, within three days of the date of Inspection. The Project Engineer may coordinate with the Superintendent to review and correct any errors or omissions before the Superintendent signs the report. Corrections are limited to adding missing information or correcting entries to match field notes and conditions present at the time the Inspection was performed. Deliver the signed and certified Inspection Report to the Project Engineer on the same day the Superintendent signs it.
5. The Project Engineer will sign and certify the Inspection Report and will return the original to the Contractor within three working days.
6. The Project Engineer may make corrections after the Superintendent has signed and certified the Inspection Report. The Project Engineer will initial and date each correction. If the Project Engineer makes corrections, the Superintendent must recertify the Inspection Report by entering a new signature and date in the white space below the original signature and date lines. Send a copy of the recertified Inspection Report to the Project Engineer on the day it is recertified.
7. If subsequent corrections to the certified Inspection Report are needed, document the corrections in an amendment that addresses only the omitted or erroneous portions of the original Inspection Report. The Superintendent and the Project Engineer must both sign and certify the amendment. The issuance of an amendment does not relieve the Contractor of liquidated damages that may have been incurred as a result of the error on the original certified inspection report.

D. Inspection before Seasonal Suspension of Work.

1. Conduct an Inspection before seasonal suspension of work to confirm BMPs are installed and functioning according to the requirements of the SWPPP and CGP.

E. Reduced Inspection Frequencies.

1. Conduct Inspections according to the inspection schedule indicated in the approved SWPPP. Any change in inspection frequency must be approved by the Department and beginning and ending dates documented as an amendment to the SWPPP.
2. If the Engineer approves and the entire site is stabilized, the frequency of inspections may be reduced in accordance to the CGP Part 6.2.1. At actively staffed sites, inspect within two business days of the end of a storm event that results in a discharge from the site.

F. Winter Shutdown Inspections

1. Conduct winter shutdown inspection 14 calendar days after the anticipated fall freeze up date and conditions under the CGP Parts 4.12 and 6.2.3, and the SWPPP are met. The Engineer may approve suspension of inspections and waive requirements for updating the Grading and Stabilization Activities Log and Daily Record of Rainfall Form during Winter Shutdown.
 2. Inspections must resume on a regular frequency or reduced inspection frequency identified in the SWPPP, at least 21 days before anticipated spring thaw CGP Part 6.2.3. Resume updating the Daily Record of Rainfall Form at the start of the 21-day spring thaw inspection.
- G. Inspection before Project Completion
1. Conduct inspection to ensure Final Stabilization is complete throughout the Project, and temporary BMPs that are required to be removed are removed. Temporary BMPs that are biodegradable and are specifically designed and installed with the intent of remaining in place until they degrade, may remain in place after project completion if approved by the Project Engineer.
- H. SWPPP Amendments and SWPPP Amendment Log.
1. The SWPPP Amendment Log Form 25D-114 must be filled out by an individual who holds a current AK-CESCL, or equivalent certification. The Superintendent or the SWPPP Manager must sign and date amendments to the SWPPP and updates to the SWPPP Amendment Log.
 2. SWPPP Amendments must be approved by the Project Engineer.
 3. Amendments must occur:
 - a. Whenever there is a change in design, construction operation, or maintenance at the construction site that has or could cause erosion, sedimentation or the discharge of pollutants that has not been previously addressed in the SWPPP;
 - b. If an Inspection identifies that any portion of the SWPPP is ineffective in preventing erosion, sedimentation, or the discharge of pollutants;
 - c. Whenever an Inspection identifies a problem that requires additional or modified BMPs;
 - d. Whenever a BMP is modified during construction, or a BMP not shown in the original SWPPP is added;
 - e. If the Inspection frequency is modified (note beginning and ending dates); or
 - f. When there is a change in personnel who are named in the SWPPP, according to Subsection 01 57 10 3.01 D;
 - g. When an inspection is not conducted jointly;
 - h. When a NOI modification is filed;
 - i. When a Noncompliance Report is filed with DEC.
 4. Place all correspondence with DEC, EPA or MS4s in Appendix Q.
 5. Amend the SWPPP narrative as soon as practicable after any change or modification, but in no case, later than seven days following identification of the need for an amendment. All SWPPP Amendments must be signed and dated. Cross-reference the amendment

number with the Corrective Action Log or SWPPP page number, as applicable. When a BMP is modified or added, describe the BMP according to Subsection 01 57 10 3.01 C 14.

6. Keep the SWPPP Amendment Log current. Prior to performing each scheduled Inspection, submit to the Department a copy of the pages of the Amendment Log that contain new entries since the last submittal. Include copies of any documents amending the SWPPP.
 7. Keep the SWPPP Amendment Log in Appendix M.
- I. Site Maps.
1. Maintain site maps in accordance with CGP Part 5.3.5 and the SWPPP template 5.0. It is acceptable to have separate site maps for BMPs and grading and stabilization activities.
- J. Corrective Action Log.
1. The Superintendent and SWPPP Manager are the only persons authorized to make entries on the SWPPP Corrective Action Log, Form 25D-112. Document the need for corrective action within 24 hours of either:
 - a. Identification during an inspection; or
 - b. Discovery by the Department's or Contractor's staff, a subcontractor, or a regulatory agency inspector.
 - c. If a corrective action is discovered outside of an inspection, update the log with the date of discovery, the proposed corrective action, and the date the corrective action was completed.
 2. Modification or replacement of a BMP, installation of a new BMP not shown in the original SWPPP, or overdue maintenance is a corrective action and must be documented on the Corrective Action Log. Maintenance includes but not limited to sediment accumulated in sediment basins (including sediment traps or ponds) exceeds 50% of design capacity; or after sediment accumulates to more than half the above ground height on check dams or berms, or when sediment accumulates to more than one-third the above ground height on silt fences. Do not record removal of BMPs on the Corrective Action Log.
 3. Keep the Corrective Action Log current and submit a copy to the Department prior to performing each scheduled SWPPP Inspection.
 4. Keep the Corrective Action Log as an Appendix J to the SWPPP.
- K. Grading and Stabilization Activities Log.
1. The Superintendent and SWPPP Manager are the only persons authorized to date and initial entries on the SWPPP Grading and Stabilization Activities Log, Form 25D-110. Use the SWPPP Grading and Stabilization Activities Log, to record land disturbance and stabilization activities.
 2. Keep the Grading and Stabilization Activities Log current and submit a copy to the Department prior to performing each scheduled SWPPP Inspection. Keep the Grading and Stabilization Activities Log organized and completed to demonstrate compliance with CGP Part 4.5.
 3. Keep the Grading and Stabilization Activities Log as an Appendix G of the SWPPP.
- L. Daily Record of Rainfall.

1. Use SWPPP Daily Record of Rainfall, Form 25D-115, to comply with CGP Part 7.3.9. Submit a copy to the Engineer with each completed Inspection Report. Keep the Daily Record of Rainfall current in Appendix N of the SWPPP

M. Staff Tracking Log

1. Use the SWPPP Project Staff Tracking Form 25D-127, to identify project staff that are required to be AK-CESCL certified or hold an equivalent qualification CGP Appendix C. Complete this form to document the following positions; Superintendent, SWPPP Manager, Project Engineer, DOT&PF Stormwater Inspector, and when positions have changed in personnel, either permanent or temporary. Update the SWPPP Tracking Log within 24 hours of any changes in personnel, qualifications, or other staffing items related to administration of the CGP or Specification 10 57 10.

3.09 FAILURE TO PERFORM WORK

- A. The Department has authority to suspend work and withhold monies, for an incident of non-compliance with the CGP, or SWPPP, that may endanger health or the environment or for failure to perform work related to Section 01 57 10. If the suspension is to protect workers, the public, or the environment from imminent harm, the Department may orally order the suspension of work. Following an oral order of suspension, the Department will promptly give written notice of suspension. In other circumstances, the Department will give the Contractor written notice of suspension before suspension of work. A notice of suspension will state the defects or reasons for a suspension, the corrective actions required to stop suspension, and the time allowed to complete corrective actions. If the Contractor fails to take the corrective action within the specified time, the Department may:
 1. Suspend the work until corrective action is completed;
 2. Withhold monies due the Contractor until corrective action is completed;
 3. Assess damages or equitable adjustments against the Contract Amount; and
 4. Employ others to perform the corrective action and deduct the cost from the Contract amount.
- B. Reasons for the Department to take action under this section include, but are not limited to, the Contractor's failure to:
 1. Obtain appropriate permits before Construction Activities occur;
 2. Perform SWPPP Administration;
 3. Perform timely Inspections;
 4. Update the SWPPP;
 5. Transmit updated SWPPP, Inspection Reports, and other updated SWPPP forms to the Department;
 6. Maintain effective BMPs to control erosion, sedimentation, and pollution in accordance with the SWPPP, the CGP, and applicable local, state, and federal requirements;
 7. Perform duties according to the requirements of Section 01 57 10; or
 8. Meet requirements of the CGP, SWPPP, or other permits, laws, and regulations related to erosion, sediment, or pollution control.

- C. No additional Contract time or additional compensation will be allowed due to delays caused by the Department's suspension of work under this section.

3.10 ACCESS TO WORK

- A. The Project, including any related off-site areas of support activities, must be made available for inspection, or sampling and monitoring, by the Department and other regulatory agencies. See CGP Part 6.6.

3.11 LIQUIDATED DAMAGES FOR VIOLATING TERMS OF THE CGP

- A. Liquidated Damages assessed according to Table 01 57 10-1 Version B are not an adjustment to the Contract amount. These damages charges are related to Contract performance but are billed by the Department to the Contractor, independent of the Contract amount. An amount equal to the Liquidated Damages may be withheld for unsatisfactory performance, from payment due under the Contract, until the Contractor remits payment for billed Liquidated Damages.

TABLE 01 57 10-1 Version B
EROSION, SEDIMENT AND POLLUTION CONTROL – LIQUIDATED DAMAGES

Code	Specification Subsection Number and Description	Deductible Amount in Dollars	Cumulative Deductible Amounts in Dollars
A	01 57 10 1.05 Failure to have a qualified (AK-CESCL or equivalent) Superintendent or SWPPP Manager	Calculated in Code B or F	
B	Failure to meet SWPPP requirements of: (1) 01 57 10 3.01 A Name of SWPPP Preparer (2) Not Applicable (3) 01 57 10 3.08 I Sign and Date SWPPP amendments with qualified person. 01 57 10 3.01 D SWPPP Include approving person's name and AK-CESCL expiration date. (4) 01 57 10 3.07 Records maintained at project and made available for review	\$750 per omission	
C	Not Applicable		
D	01 57 10 3.06 F Failure to stabilize a Project prior to Fall Freeze Up	\$5,000 per Project per year	
E	01 57 10 3.01 A Failure to conduct pre-construction inspections before Construction Activities on all projects greater than 1 acre	\$2,000 per Project	
F*	01 57 10 3.08 A Failure to conduct and record CGP Inspections 01 57 10 3.08 B Personnel conducting Inspections and Frequency 01 57 10 3.08 C Inspection Reports, use Form 25D-100, completed with all required information	\$750 per Inspection	Additional \$750 for every additional 7 day period without completing the required inspection

G	01 57 10 3.06 E Corrective Action, Failure to timely accomplish BMP maintenance and/or repairs, In effect until BMP maintenance and/or repair is completed.	\$500 per Project per day	
H	01 57 10 3.06 D Failure to provide to the Department and DEC a timely oral noncompliance report of violations or for a deficient oral endangerment report.	\$750 for the first day the report is late or deficient	Additional \$750 for every 14 day period without the required information
I	01 57 10 3.06 D Failure to provide to the Department and DEC a timely written noncompliance report, Form 25D-143, of violations or for a deficient written endangerment report.	\$750 for the first day the report is late or deficient	Additional \$750 for every 14 day period without the required information
J	01 57 10 3.09 Failure to comply with the requirements of the CGP, approved SWPPP, or Specification 01 57 10, except as listed above	\$750 per occurrence for the first day	Additional \$750 for every day the deficiency remains uncorrected

CODE F* Liquidated Damages according to Code F will not be billed for typographic errors and minor data entry errors except the liquidated damages will be assessed for the errors when:

- a. The contractor has previously been notified and subsequent inspection reports repeat the same or similar error
- b. Multiple inspection reports are submitted after submission due date and the same or similar errors are repeated on multiple overdue reports,
- c. An error in recording the inspector's AK-CESCL certification date results in an inspector performing the inspection during a period when their certification was lapse or was otherwise invalid.

END OF SECTION



State of Alaska Department of Transportation & Public Facilities
Statewide Design & Engineering Services

PROJECT NAME: _____ AKSAS#: _____ Invoice Date: _____

COMPANY NAME: _____ State Vendor No. _____

FINANCIAL CODING _____ Amount this Bill \$ _____

**TABLE 01 57 10 Version B
EROSION, SEDIMENT AND POLLUTION CONTROL – LIQUIDATED DAMAGES**

Code	Description	Deductible Amount in Dollars	Cumulative Deductible Amounts in Dollars	Date(s) of Occurrence	Subtotal in Dollars
A	01 57 10-1.05-C Failure to have a qualified (AK-CESCL or equivalent) Superintendent or SWPPP Manager	Calculated in Code B or F			0.00
B	Failure to meet SWPPP requirements of: (1) 01 57 10-3.01-A Name of SWPPP Preparer (2) 01 57 10-3.01-D Date of Pre-Construction Inspection (3) Not Applicable (4) 01 57 10-3.06-L.1 Sign and Date SWPPP amendments with qualified person. 01 57 10-1.05-A SWPPP Include approving person's name and AK-CESCL expiration date. (4) 01 57 10-3.05-A Records maintained at project and made available for review	\$750 per omission			0.00
C	01 57 10-3.01-E Failure to either reference a BMP manual or publication, or state that no BMP manual or publication was used	\$250 per omission			0.00
D	01 57 10-3.01-E and 01 57 10-3.06-C Failure to stabilize a Project prior to Seasonal Thaw	\$5,000 per Project per year			0.00
E	01 57 10-3.01-D & 01 57 10-3.06-B Failure to conduct pre-	\$2,000 per Project			0.00

	construction inspections before Construction Activities				
F	01 57 10-3.06. Failure to conduct and record CGP Inspections 01 57 10-3.06-A Personnel conducting Inspections and Frequency 01 57 10-3.06-J Inspection Reports, use Form 25D-100, completed with all required information according to the Consent Decree paragraph 7.c, parts (1) through (11)	\$750 per Inspection			0.00
G	01 57 10-3.06-F Failure to timely accomplish BMP maintenance and/or repairs, In effect until BMP maintenance and/or repairs is completed.	\$500 per Project per day			0.00
H	01 57 10-3.04-E.3 Failure to provide to the Engineer and ADEC a timely oral endangerment report of violations or for a deficient oral endangerment report	\$750 for the first day the report is late or deficient	Additional \$750 for every 14 day period without the required information		0.00
I	01 57 10-3.04-E.3 Failure to provide to the Engineer and ADEC a timely written endangerment report of violations or for a deficient written endangerment report	\$750 for the first day the report is late or deficient	Additional \$750 for every 14 day period without the required information		0.00
Subtotal					0.00

Comments:

Calculating Person's Signature _____ Date _____
Printed Name _____ Printed Department Position _____
Project Engineer's Signature _____ Date _____
Printed Name: _____ Printed Department Position _____
Regional Approving Person Signature _____ Date _____
Printed Name _____ Printed Department Position _____

Notes:

- Regional Approving Person is the Construction Engineer or delegate at the Project Manager/Group Chief level. Document approval procedure and signature authority in regional files.
- Route completed form to Regional Fiscal Office Attn: Accounts Receivable.
- Invoices will be processed by Regional Accounts Receivable in coordination with D&ES Administrative Officer.
- Financial Coding to be: Collocation Code: **25873843** - Ledger Code - 22511 (Account Code).
- Further guidance is by CE Directive.



State of Alaska Department of Transportation & Public Facilities
Statewide Design & Engineering Services

PROJECT NAME: _____ AKSAS#: _____ Invoice Date: _____

COMPANY NAME: _____ State Vendor No. _____

FINANCIAL CODING _____ Amount this Bill \$ _____

TABLE 01 57 10 Version B
EROSION, SEDIMENT AND POLLUTION CONTROL – LIQUIDATED DAMAGES

Code	Description	Deductible Amount in Dollars	Cumulative Deductible Amounts in Dollars	Date(s) of Occurrence	Subtotal in Dollars
A	01 57 10-1.05-C Failure to have a qualified (AK-CESCL or equivalent) Superintendent or SWPPP Manager	Calculated in Code B or F			0.00
B	Failure to meet SWPPP requirements of: (1) 01 57 10-3.01-A Name of SWPPP Preparer (2) 01 57 10-3.01-D Date of Pre-Construction Inspection (3) Not Applicable (4) 01 57 10-3.06-L.1 Sign and Date SWPPP amendments with qualified person. 01 57 10-1.05-A SWPPP Include approving person's name and AK-CESCL expiration date. (4) 01 57 10-3.05-A Records maintained at project and made available for review	\$750 per omission			0.00
C	01 57 10-3.01-E Failure to either reference a BMP manual or publication, or state that no BMP manual or publication was used	\$250 per omission			0.00
D	01 57 10-3.01-E and 01 57 10-3.06-C Failure to stabilize a Project prior to Seasonal Thaw	\$5,000 per Project per year			0.00
E	01 57 10-3.01-D & 01 57 10-3.06-B Failure to conduct pre-	\$2,000 per Project			0.00

	construction inspections before Construction Activities				
F	01 57 10-3.06. Failure to conduct and record CGP Inspections 01 57 10-3.06-A Personnel conducting Inspections and Frequency 01 57 10-3.06-J Inspection Reports, use Form 25D-100, completed with all required information according to the Consent Decree paragraph 7.c, parts (1) through (11)	\$750 per Inspection			0.00
G	01 57 10-3.06-F Failure to timely accomplish BMP maintenance and/or repairs, In effect until BMP maintenance and/or repairs is completed.	\$500 per Project per day			0.00
H	01 57 10-3.04-E.3 Failure to provide to the Engineer and ADEC a timely oral endangerment report of violations or for a deficient oral endangerment report	\$750 for the first day the report is late or deficient	Additional \$750 for every 14 day period without the required information		0.00
I	01 57 10-3.04-E.3 Failure to provide to the Engineer and ADEC a timely written endangerment report of violations or for a deficient written endangerment report	\$750 for the first day the report is late or deficient	Additional \$750 for every 14 day period without the required information		0.00
Subtotal					0.00

Comments:

Calculating Person's Signature _____ Date _____
 Printed Name _____ Printed Department Position _____
 Project Engineer's Signature _____ Date _____
 Printed Name: _____ Printed Department Position _____
 Regional Approving Person Signature _____ Date _____
 Printed Name _____ Printed Department Position _____

Notes:

- Regional Approving Person is the Construction Engineer or delegate at the Project Manager/Group Chief level. Document approval procedure and signature authority in regional files.
- Route completed form to Regional Fiscal Office Attn: Accounts Receivable.
- Invoices will be processed by Regional Accounts Receivable in coordination with D&ES Administrative Officer.
- Financial Coding to be: Collocation Code: **25873843** - Ledger Code - 22511 (Account Code).
- Further guidance is by CE Directive.

SECTION 01 57 21
INDOOR AIR QUALITY CONTROLS

PART 1 GENERAL

1.01 SECTION INCLUDES

- A. Construction procedures to promote adequate indoor air quality after construction.
- B. Building flush-out after construction and before occupancy.
- C. Testing indoor air quality after completion of construction.

1.02 PROJECT GOALS

- A. Dust and Airborne Particulates: Prevent deposition of dust and other particulates in HVAC ducts and equipment.
 - 1. Cleaning of ductwork is not contemplated under this Contract.
 - 2. Contractor shall bear the cost of cleaning required due to failure to protect ducts and equipment from construction dust.
 - 3. Establish condition of existing ducts and equipment prior to start of alterations.
- B. Airborne Contaminants: Procedures and products have been specified to minimize indoor air pollutants.
 - 1. Furnish products meeting the specifications.
 - 2. Avoid construction practices that could result in contamination of installed products leading to indoor air pollution.

1.03 REFERENCE STANDARDS

- A. ASHRAE Std 52.2 - Method of Testing General Ventilation Air-Cleaning Devices for Removal Efficiency by Particle Size; 2007.
- B. ASHRAE Std 62.1 - Ventilation For Acceptable Indoor Air Quality; 2010.
- C. SMACNA (OCC) - IAQ Guideline for Occupied Buildings Under Construction; 2007.

1.04 DEFINITIONS

- A. Adsorptive Materials: Gypsum board, acoustical ceiling tile and panels, carpet and carpet tile, fabrics, fibrous insulation, and other similar products.
- B. Contaminants: Gases, vapors, regulated pollutants, airborne mold and mildew, and the like, as specified.
- C. Particulates: Dust, dirt, and other airborne solid matter.

- D. Wet Work: Concrete, plaster, coatings, and other products that emit water vapor or volatile organic compounds during installation, drying, or curing.

PART 2 - PRODUCTS

2.01 MATERIALS

- A. Auxiliary Air Filters: MERV of 8, minimum, when tested in accordance with ASHRAE 52.2.

PART 3 - EXECUTION

3.01 CONSTRUCTION PROCEDURES

- A. Prevent the absorption of moisture and humidity by adsorptive materials by:
 - 1. Sequencing the delivery of such materials so that they are not present in the building until wet work is completed and dry.
 - 2. Delivery and storage of such materials in fully sealed moisture-impermeable packaging.
 - 3. Provide sufficient ventilation for drying within reasonable time frame.
- B. If extremely dusty or dirty work must be conducted inside the building, shut down HVAC systems for the duration; remove dust and dirt completely before restarting systems.
- C. When working in a portion of an occupied building, prevent movement of air from construction area to occupied area.
- D. HVAC equipment and supply air ductwork may be used for ventilation during construction:
 - 1. Ensure that air filters are correctly installed prior to starting use; replace filters when they lose efficiency.
 - 2. Do not use return air ductwork for ventilation unless absolutely necessary.
 - 3. Where return air ducts must be used for ventilation, install auxiliary filters at return inlets, sealed to ducts; use filters with at least the equivalent efficiency as those required at supply air side; inspect and replace filters when they lose efficiency.
- E. Do not store construction materials or waste in mechanical or electrical rooms.
- F. Prior to use of return air ductwork without intake filters clean up and remove dust and debris generated by construction activities.
 - 1. Inspect duct intakes, return air grilles, and terminal units for dust.
 - 2. Clean plenum spaces, including top sides of lay-in ceilings, outsides of ducts, tops of pipes and conduit.
 - 3. Clean tops of doors and frames.
 - 4. Clean mechanical and electrical rooms, including tops of pipes, ducts, and conduit, equipment, and supports.
 - 5. Clean return plenums of air handling units.
 - 6. Remove intake filters last, after cleaning is complete.
- G. Do not perform dusty or dirty work after starting use of return air ducts without intake filters.

- H. Use other relevant recommendations of SMACNA IAQ Guideline for Occupied Buildings Under Construction for avoiding unnecessary contamination due to construction procedures.

3.02 BUILDING FLUSH-OUT

- A. Contractor's Option: Either full continuous flush-out OR satisfactory air contaminant testing is required, not both.
- B. Perform building flush-out before occupancy.
- C. Do not start flush-out until:
 - 1. All construction is complete.
 - 2. HVAC systems have been tested, adjusted, and balanced for proper operation.
 - 3. Inspection of inside of return air ducts and terminal units confirms that cleaning is not necessary.
 - 4. New HVAC filtration media have been installed.
- D. Building Flush-Out: Operate all ventilation systems at normal flow rates with 100 percent outside air until a total air volume of 14,000 cubic feet per square foot of floor area has been supplied.
 - 1. Obtain Department's concurrence that construction is complete enough before beginning flush-out.
 - 2. Maintain interior temperature of at least 60 degrees F and interior relative humidity no higher than 60 percent.
 - 3. If additional construction involving materials that produce particulates or any of the specified contaminants is conducted during flush-out, start flush-out over.
 - 4. If interior spaces must be occupied prior to completion of the flush-out, supply a minimum of 25 percent of the total air volume prior to occupancy, and:
 - a. Begin ventilation at least three hours prior to daily occupancy.
 - b. Continue ventilation during all occupied periods.
 - c. Provide minimum outside air volume of 0.30 cfm per square foot or design minimum outside air rate, whichever is greater.
- E. Install new HVAC filtration media after completion of flush-out and before occupancy or further testing.

3.03 AIR CONTAMINANT TESTING

- A. Contractor's Option: Either full continuous flush-out OR satisfactory air contaminant testing is required, not both.
- B. Perform air contaminant testing before occupancy.
- C. Do not start air contaminant testing until:
 - 1. All construction is complete, including interior finishes.

2. HVAC systems have been tested, adjusted, and balanced for proper operation.
 3. New HVAC filtration media have been installed.
- D. Indoor Air Samples: Collect from spaces representative of occupied areas:
1. Collect samples while operable windows and exterior doors are closed, HVAC system is running normally as if occupied, with design minimum outdoor air, but with the building unoccupied.
 2. Collect samples from spaces in each contiguous floor area in each air handler zone, but not less than one sample per 25,000 square feet; take samples from areas having the least ventilation and those having the greatest presumed source strength.
 3. Collect samples from height from 36 inches to 72 inches above floor.
 4. Collect samples from same locations on 3 consecutive days during normal business hours; average the results of each set of 3 samples.
 5. Exception: Areas with normal very high outside air ventilation rates, such as laboratories, do not need to be tested.
 6. When retesting the same building areas, take samples from at least the same locations as in first test.
- E. Outdoor Air Samples: Collect samples at outside air intake of each air handler at the same time as indoor samples are taken.
- F. Analyze air samples and submit report.
- G. Air Contaminant Concentration Determination and Limits:
1. Carbon Monoxide: Not more than 9 parts per million and not more than 2 parts per million higher than outdoor air.
 2. Airborne Mold and Mildew: Measure in relation to outside air ; not higher than outside air.
 3. Formaldehyde: Not more than 50 parts per billion.
 4. Formaldehyde: Measure in micrograms per cubic meter, in relation to outside air ; not more than 20 micrograms per cubic meter higher than outside air.
 5. Total Volatile Organic Compounds (TVOC): Not more than 500 micrograms per cubic meter.
 6. Total Volatile Organic Compounds (TVOC): Measure in micrograms per cubic meter, in relation to outside air ; not more than 200 micrograms per cubic meter higher than outside air.
 7. Particulates (PM10): Not more than 50 micrograms per cubic meter.
 8. Total Particulates (PM): Measure in micrograms per cubic meter, in relation to outside air; not more than 20 micrograms per cubic meter higher than outside air.

END OF SECTION

SECTION 01 60 00
MATERIAL AND EQUIPMENT

PART 1 - GENERAL

1.01 SECTION INCLUDES

- A. Requirements for transportation and handling, storage and protection, substitutions, and product options.

1.02 RELATED REQUIREMENTS

- A. Section 00700 – General Conditions
- B. Section 01 33 23 – Shop Drawings
- C. Section 01 42 19 Reference Standards
- D. Section 01 33 00 - Submittal Procedures
- E. Section 01 45 00 – Quality Control
- F. Section 01 51 00 – Construction Facilities
- G. Section 01 60 00A – Substitution Request Form
- H. Section 01 73 00 – Execution Requirements

1.03 TRANSPORTATION AND HANDLING

- A. Transport products by methods to avoid product damage; deliver in undamaged condition in manufacturer's unopened containers or packaging, dry.
- B. Provide equipment and personnel to handle products by methods to prevent soiling or damage.
- C. Immediately on delivery, inspect shipment to assure:
 - 1. Product complies with requirements of Contract Documents and reviewed submittals.
 - 2. Quantities are correct.
 - 3. Accessories and installation hardware are correct.
 - 4. Containers and packages are intact and labels legible.
 - 5. Products are protected and undamaged.

1.04 STORAGE AND PROTECTION

- A. Handle and store materials for construction, products of demolition, and other items to avoid damage to existing buildings, and infrastructure. All materials stored or staged on the roof shall be properly covered and anchored to prevent materials from being blown off the roof. Do not overload the structure.
- B. Store products in accordance with manufacturer's instructions, with seals and labels intact and legible. Store sensitive products in weather tight enclosures; maintain within temperature and humidity ranges required by manufacturer's instructions.
- C. For exterior storage of fabricated products, place on sloped supports above ground. Cover products subject to deterioration with impervious sheet covering; provide ventilation to avoid condensation.
- D. Store loose granular materials on solid surfaces in a well-drained area; prevent mixing with foreign matter. Cover such material to prevent material from being blown or transported away from the stockpile.
- E. Arrange storage to provide access for inspection. Periodically inspect to assure products are undamaged, and are maintained under required conditions.

1.05 SUBSTITUTIONS

- A. Substitutions shall be allowed during the Bidding period only if Document 00100, Information to Bidders, designates a time for submitting requests for substitutions under requirements specified in this Section.
- B. Only one request for substitution will be considered for each product from each Prime Bidder/CONTRACTOR. When substitution is not accepted, Prime Bidder/CONTRACTOR shall provide specified product.
- C. DEPARTMENT will consider requests for Substitutions only within 90 days after date established in Notice to Proceed.
- D. Substitutions may be considered when a Product becomes unavailable through no fault of the CONTRACTOR.
- E. Document each request with complete data substantiating compatibility of proposed Substitution with Contract Documents.
- F. Substitutions will not be considered when they are indicated or implied on shop drawing or product data submittals, without separate written request, or when acceptance will require revision to the Contract Documents.

1.06 SUBSTITUTION SUBMITTAL PROCEDURE:

- A. Submit four copies of Request for Substitution for consideration on Substitution Request form provided by DEPARTMENT (Section 01 60 00-A). Limit each request to one proposed Substitution.
- B. Submit certification signed by the CONTRACTOR: that the CONTRACTOR:
 - 1. Has investigated proposed Product and determined that it meets or exceeds the quality level of the specified Product. List similar projects using proposed product, dates of installation and user telephone number.
 - 2. Will provide an equivalent warranty for the Substitution as for the specified Product.
 - 3. Will coordinate installation and make changes to other Work, which may be required for the Work to be complete with no additional cost to DEPARTMENT.
 - 4. Waives claims for additional costs or time extension, which may subsequently become apparent from indirect costs.
 - 5. Will reimburse Department for review or redesign services associated with re-approval by Authorities.
- C. Submit shop drawings, manufacturers' product data, and certified test results attesting to the proposed Product equivalence and variations between substitute and specified product. The burden of proof is on proposer.
- D. The DEPARTMENT will notify CONTRACTOR in writing of decision to accept or reject request.

PART 2 - PRODUCTS

2.01 PRODUCTS

- A. Products include material, equipment, and systems.
- B. Comply with Specifications and referenced standards as minimum requirements.
- C. Components required to be supplied in quantity within a Specification section shall be the same, and shall be interchangeable.
- D. Do not use materials and equipment removed from existing structure, except as specifically required, or allowed, by Contract Documents.

2.02 PRODUCT OPTIONS

- A. Products Specified by Reference Standards or by Description Only: Any Product meeting those standards or description.
- B. Products Specified by Naming One or More Manufacturers followed by the term "No Substitutions": use only specified manufacturers, no substitutions allowed.
- C. Products Specified by Naming One or More Manufacturers with a Provision for Substitutions: Submit a request for substitution for any manufacturer not specifically named that meets the description specifications of the named manufacturers.

PART 3 - EXECUTION

Not Used

END OF SECTION

STATE OF ALASKA
DOT & PF
STATEWIDE PUBLIC FACILITIES

SUBSTITUTION REQUEST FORM
(after Award)



Project:

Project No.:

Contractor: _____

Specified item for which substitution is requested: _____
(reference specification section and paragraph)

The following product is submitted for substitution: _____
(describe proposed substitution and differences from specified item; attach complete technical, performance, and test data; state whether substitution affects dimensions and functional clearances shown on drawings or affects other trades, and include complete information for changes to drawings and/or specifications which proposed substitution will require for its proper installation.)

I certify the following:

- | Yes | No | |
|--------------------------|--------------------------|---|
| <input type="checkbox"/> | <input type="checkbox"/> | The substitute will perform adequately and achieve the results called for by the general design. |
| <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> The substitute is similar, of equal substance, suited to the same use, and will provide the same warranty as the product specified. |
| <input type="checkbox"/> | <input type="checkbox"/> | An equivalent source of replacement parts is available. |
| <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> The evaluation and approval of the proposed substitute will not delay the Substantial or Final Completion of the project. |
| <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> Any change in the design necessitated by the proposed substitution will not delay the Substantial or Final Completion of the project. |
| <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> The cost of any change in the design necessitated by the proposed substitution, including engineering and detailing costs, and construction costs caused by the substitution will be paid by the contractor at no cost to the State. |
| <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> The cost of any license fee or royalty necessitated by the proposed substitution will be paid by the contractor at no cost to the State. |

The undersigned states that the function, appearance and quality are equivalent or superior to the specified item.

Signed: _____ Date: _____
Authorized Contractor Signature

Architect/Engineer Recommendation:

☐ Accepted ☐ Accepted as Noted ☐ Not Accepted ☐ Received Too Late

Remarks:

Signed: _____ Date: _____
Architect/Engineer

Recommend Acceptance / Rejection

(circle one)

☐ Accepted

☐ Rejected

Resident Engineer

Date: _____

Project Manager

Date: _____

SECTION 01 71 13
MOBILIZATION AND DEMOBILIZATION

PART 1 - GENERAL

1.01 SECTION INCLUDES

- A. Requirements for mobilization and demobilization.

1.02 RELATED REQUIREMENTS

- A. Section 01 11 13 – Summary of Work
- B. Section 01 29 73 – Schedule of Values
- C. Section 01 29 76 – Application for Payment
- D. Section 01 51 00 – Construction Facilities
- E. Section 01 52 13 – Field Office and Sheds
- F. Section 01 77 00 – Contract Closeout

1.03 DEFINITIONS

- A. Mobilization and Demobilization includes:
 - 1. CONTRACTOR's work to prepare Site for Work under Contract and to marshal workers, materials and equipment, and those of subcontractors, to accomplish the Work.
 - 2. Mobilization of all construction equipment, materials, suppliers, appurtenances, and the like, staffed and ready for commencing and prosecuting the Work, and the subsequent demobilization and removal from the site of said equipment, appurtenances, and the like upon completion of the Work.
 - 3. Assembly and delivery to the site of plant, equipment, materials, and supplies necessary for the prosecution of Work which are not intended to be incorporated in the work; the clearing of and preparation of the CONTRACTOR's work area; the complete assembly, in working order, of equipment necessary to perform the required work; personnel services preparatory to commencing actual work; all other preparatory work required to permit commencement of the actual work on construction items for which payment is provided under the Contract.

1.04 REQUIREMENTS

- A. Haul routes, staging areas, and security guard and flagger positions will be designated and/or subject to approval by DEPARTMENT, who will coordinate with CONTRACTOR to determine requirements and locations.

- B. Cooperate with DEPARTMENT in allocation and use of MOBILIZATION AND DEMOBILIZATION areas of Site, field offices and sheds, materials storage, traffic, and parking facilities.
- C. During construction, coordinate use of Site and facilities through DEPARTMENT.
- D. Comply with DEPARTMENT'S procedures of contract communications; submittals, reports and records, schedules, coordination drawings, and recommendations; and resolution of ambiguities and conflicts.
- E. Comply with instructions of DEPARTMENT for use of utilities and construction facilities.
- F. Coordinate field engineering and layout Work under instructions of DEPARTMENT.
- G. Walk through Site with DEPARTMENT prior to start of Work.

1.05 SUBMITTALS

- A. Refer to Section 01 33 00 - Submittal Procedure, for submittal requirements.
- B. If requested by DEPARTMENT, submit a plan of the proposed layout of the construction site, including fences, roads, parking, buildings, staging, and storage areas, within seven (7) days after Notice to Proceed.

PART 2 – PRODUCTS**Not used****PART 3 - EXECUTION**

3.01 Delivery: Delivery to the jobsite of construction tools, equipment, materials, and supplies shall be accomplished in conformance with local governing ordinances and regulations and the requirements of the Contract Documents.

3.02 Upon completion of the Work, remove construction tools, apparatus, equipment, unused materials and supplies, plant, and personnel from the jobsite.

END OF SECTION

SECTION 01 71 23
FIELD ENGINEERING

PART 1 - GENERAL

1.01 SECTION INCLUDES

- A. Requirements for field surveying.

1.02 PERFORMANCE REQUIREMENTS:

- A. The CONTRACTOR shall conduct pre-construction inspection and documentation surveys, accompanied by a representative of the DEPARTMENT, prior to start of work.

1.03 RELATED REQUIREMENTS

- A. Section 00700 - General Conditions: Basic requirements.
- B. Section 01 11 13 - Summary of Work: Work sequence, Use of premises, and Using Agency occupancy
- C. Section 01 33 00 –Submittal Procedures
- D. Section 01 51 00 – Construction Facilities
- E. Section 01 73 00 – Execution Requirements

1.04 QUALITY CONTROL

- A. Land Surveyor: Registered in the State of Alaska, and acceptable to DEPARTMENT.
- B. Professional Engineer: Registered Professional Engineer of the discipline required elsewhere in the Contract Documents for specific service on Project, licensed in the State of Alaska.
- C. DEPARTMENT reserves the right to field verify all survey data provided by the CONTRACTOR.

1.05 SUBMITTALS

- A. Submit name, address, and telephone number of Surveyor/ Engineer before starting survey Work.
- B. Submit survey notes as required by Sections 00700 and 00800.
- C. On request, submit documentation verifying accuracy of survey Work.

1. Submit certificate signed by CONTRACTOR's Surveyor and Engineer, certifying that elevations and locations of improvements constructed under this contract are in conformance, or non-conformance, with Contract Documents.
- D. Submit two copies of each survey or inspection report. The DEPARTMENT will retain both copies.

1.06 SURVEY RECORD DOCUMENTS

- A. Maintain complete, accurate log of control and survey Work as it progresses.
- B. On completion of foundation walls, buried utilities, and major site improvements, prepare a certified survey showing dimensions, locations, angles, and elevations of Work completed to permanent surface features, sufficient to develop a certified as-built plot plan and to obtain a certificate of occupancy from the Authority Having Jurisdiction.
- C. Submit record documents under provisions of Section 01 78 39 – Project Record Documents.

PART 2 – PRODUCTS**Not Used****PART 3 - EXECUTION****3.01 INSPECTION**

- A. Verify locations of survey control points prior to starting Work. Promptly notify DEPARTMENT of any discrepancies discovered.

3.02 SURVEY REFERENCE POINTS

- A. Protect survey control points prior to starting site Work; preserve permanent reference points during construction. Make no changes without prior written notice to DEPARTMENT.
- B. Promptly report to DEPARTMENT the loss or destruction of any reference point or relocation required because of changes in grades or other reasons. Replace dislocated survey control points based on original survey control.

3.03 SURVEY REQUIREMENTS

- A. Establish a minimum of one permanent bench mark on site, referenced to established control points. Record locations, with horizontal and vertical data, on project record documents.
- B. Establish lines and levels, locate and lay out by instrumentation and similar appropriate means:
 1. Site improvements, including pavements; stakes for grading, fill and topsoil replacement; and utility locations, slopes, invert elevations, switch cabinets, etc.
 2. Grid or axis for structures.
 3. Building foundation, column locations, and ground floor elevations.

- A. Periodically verify layouts by same means.
- B. The CONTRACTOR shall obtain all field measurements for the accurate fabrication and installation of the work included in the Contract. Exact measurements are the CONTRACTOR's responsibility.
- C. The CONTRACTOR shall furnish or obtain templates, patterns, and installation instructions as required for the installation of work. All dimensions shall be verified in the field.
- D. Establish and maintain records of all existing and new utility locations.

3.04 SURVEYING ACCURACY AND TOLERANCES

- A. Control Traverse surveys, computations and staking of the building grid control points shall be performed to the Third Order, Class I traverse surveys (1:10,000) as specified in the "Standards and Specifications for Geodetic Control Surveys," Federal Geodetic Control Committee.
- B. Vertical Accuracy requirements for building foundations will meet the Survey Accuracy Requirements for Bridges as defined in "Construction Surveying Requirements," State of Alaska Department of Transportation and Public Facilities.
- C. All other construction survey will be performed in accordance with "Construction Surveying Requirements".

3.05 DEPARTMENT AS-BUILT SURVEY

- A. Department completed a boundary survey as part of the project. Survey will be made available to CONTRACTOR in cad and/or hard copy upon request.

END OF SECTION

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SECTION 01 72 00
UTILITIES COORDINATION

PART 1 - GENERAL

1.01 SECTION INCLUDES

- A. Coordination of utilities to be provided by the CONTRACTOR, DEPARTMENT, and others, and utility locates.

1.02 RELATED DOCUMENTS

- A. Section 00700 – General Conditions
- B. Section 01 11 13 – Summary of Work
- C. Section 01 31 14 – Work Coordination
- D. Related Technical Specification Sections

1.03 UTILITIES PROVIDED BY OTHERS

- A. The DEPARTMENT will provide permanent utilities listed in this section, to points of demarcation shown in the Contract Documents, under separate agreements with utility companies. The CONTRACTOR shall coordinate with the DEPARTMENT to sequence the provision of utilities provided by others with its Work.
- B. Utilities to be provided by the DEPARTMENT are described below.
 - 1. None Provided
- C. The CONTRACTOR shall notify the DEPARTMENT at least Thirty (30) calendar days before it needs utility companies retained by the DEPARTMENT to begin work on the site. Coordinate with the DEPARTMENT to enable the utilities to be installed as per the requirements of the CONTRACTOR'S schedule.
- D. Not Used

1.04 UTILITIES PROVIDED BY CONTRACTOR

- A. The CONTRACTOR shall provide permanent utilities listed in this section as shown in the contract documents.
- B. Utilities to be provided by the CONTRACTOR are described below.
 - 1. Water and Sewer Utilities: Haines Borough – (907) 766-6414 – 315 Haines Highway, Haines, AK 99827
 - 2. Electrical Service: AP&T Haines – (907) 766-6500 – 205 Main Street, Haines, AK 99827

3. Heating Oil Service: Delta Western – (907) 766-3190 – 900 Main Street, Haines, AK 99827
4. Telecommunications: AP&T Haines – (907) 766-6500 – 205 Main Street, Haines, AK 99827

C. Not Used

PART 2 - PRODUCTS

Not Used

PART 3 - EXECUTION**3.01 UTILITY LOCATES**

- A. The CONTRACTOR shall request field locates from all utilities having facilities in the area a minimum of seven (7) calendar days prior to excavation. Utility company telephone numbers are summarized below:

Not Used

- B. The location and elevation of existing utilities shown on the Plans are approximate only. Additional utilities may exist that are not shown on the Plans. Before starting construction, the CONTRACTOR shall request all utility owners to locate their utilities and, at points of possible conflict, the CONTRACTOR shall uncover the located utilities.
- C. The CONTRACTOR shall repair any damage caused to utilities by the CONTRACTOR's operations at no cost to the DEPARTMENT.
- D. The CONTRACTOR shall protect and work around existing underground utilities.
- E. Comply with requirements of utility companies when working with, in, or around their utilities.
- F. Not Used

3.02 NOTIFICATION FOR COORDINATION WITH UTILITY COMPANIES

- A. Provide the DEPARTMENT and affected utility companies a minimum of thirty (30) calendar days advance written notice of any work requiring coordination with utility companies, or longer notification as required by the utility companies. The utility companies will not be required to work at more than one location at a time, and shall be allowed to complete work at a specific location prior to commencing with work at another specific location.
- B. Not Used

3.03 STAGING DURING THE WORK

- A. Coordinate with utility companies, whether retained by the DEPARTMENT or the CONTRACTOR, to allow adequate staging area on-site for utility companies to perform their work.

- B. Designate and dedicate area seven calendar days prior to required Utility mobilization.
Allow for multiple mobilizations as required to accommodate Contractor schedule.
- C. Not Used

END OF SECTION

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SECTION 01 73 00
EXECUTION REQUIREMENTS

PART 1 - GENERAL

1.01 SECTION INCLUDES

- A. Requirements for addressing defects, cleaning, operating and maintenance manuals, spare parts, training, warranties and bonds, and maintenance service.

1.02 RELATED REQUIREMENTS

- A. Section 00700 - General Conditions: Fiscal provisions, legal submittals, and other administrative requirements
- B. Section 01 26 63 – Change Procedures
- C. Section 01 31 19 – Project Meetings
- D. Section 01 33 00 –Submittal Procedures
- E. Section 01 33 23 – Shop Drawings, Product Data, and Samples
- F. Section 01 45 23 – Departmental Inspection Services
- G. Section 01 45 29 – Testing Laboratory Services
- H. Section 01 60 00 – Material and Equipment
- I. Section 01 71 23 – Field Engineering
- J. Section 01 79 00 – Demonstration and Training.

1.03 CLOSEOUT PROCEDURES

- A. Comply with Section 01 77 00 - Contract Closeout Procedures.

1.04 DEFECTS

- A. Product defects shall be all items that affect the visual appearance or function of the Products. Defects shall be as identified below unless more stringent requirements are specified within specific sections.
- B. Products shall be shall typically be viewed from a distance of 30.0 inches (760 mm).
- C. Defects shall be solely determined by the Project Manager.
- D. Defects, Product:

1. Cuts, Scrapes, Gouges Abrasions 0.250 inch (6 mm) long or longer than and 0.03125 inches (0.79375 mm) wide or wider that are visible at a distance of 30.0 inches (762 mm) shall be considered defects.
 2. Abrasions less than the above shall be accepted.
 3. Burns of any size that permanently discolor the surface material shall be considered defects.
 4. Product color variation.
- E. Defects, Joint:
1. Non-alignment of Products. Visual defects and non-alignment of joints shall be considered defective.
- F. Defects, Structural:
1. Bent members or other structural damage shall be considered defective.
 2. Incorrectly manufactured members shall be considered defective.
- G. Defects, Corrosion:
1. Surface corrosion not exceeding one percent (1%) of the surface area shall be considered a visual defect.
 2. Surface corrosion exceeding one percent (1%) and not exceeding five percent (5%) of the surface area shall be evaluated by the Project Manager.
 3. Surface corrosion exceeding five percent (5%) of the surface area shall be shall be considered a structural defect.
- H. Defects shall be repaired or replaced as solely determined by the Project Manager at no additional cost to the DEPARTMENT.
1. Structural defects shall be replaced, no exceptions.
 2. Visual defects shall be repaired or replaced as solely determined by the Project Manager.

1.05 PROGRESS CLEANING AND WASTE REMOVAL

- A. Maintain work and storage areas free of waste materials, debris, and rubbish. Maintain site in a neat and orderly condition to maintain safe passage and exits and to avoid fire hazard. Provide covered containers for deposit of waste materials.
- B. Collect and remove waste materials, debris, and rubbish from site periodically and at least weekly, and dispose off-site. Have equipment and personnel available on-site daily to sweep and scrub roads and parking areas, which are work sites or haul routes.
- C. Pavement striping and markings that cannot be effectively cleaned shall be replaced at expense of CONTRACTOR.

1.06 FINAL CLEANING

- A. Execute final cleaning prior to Substantial Completion inspection.
- B. Clean interior and exterior surfaces exposed to view; remove temporary labels, stains and foreign substances.

- C. Use materials which will not create hazards to health or property, and which will not damage surfaces. Follow manufacturer's recommendations.
- D. Maintain cleaning until DEPARTMENT issues certificate of Substantial Completion.
- E. Remove waste, debris, and surplus materials from site. Clean grounds; remove stains, spills, and foreign substances from paved areas and sweep clean. Rake clean other exterior surfaces.

1.08 ADJUSTING

- A. Adjust operating Products and equipment to ensure smooth and unhindered operation.

1.09 OPERATION AND MAINTENANCE DATA

- A. Submit data bound in 3-ring slant "D" presentation ring binders, maximum 11-5/5" high and 11-1/4" deep. Spine, front, and back shall be heavy virgin vinyl sealed over heavy board. Binders shall have clear, full size pockets on spine and front cover. Thickness of content shall not exceed 75% of binder manufacturer's stated capacity. All pages shall be 8 1/2" x 11", or 11" x 17" folded to 8 1/2" x 11" in a manner to permit unfolding without removal from binder.

- B. O&M Manual binders shall be black, clearly and permanently labeled as follows:

- a. Spine

Project Name

Project Number

Operations & Maintenance Manual, Volume ____ of ____

Building Name:

- b. Front Cover:

Project Name:

Project No.:

Building Name:

CONTRACTOR:

Address

City, State, ZIP

Phone:

Fax:

Consultant:

Address

City, State, ZIP

Phone:

Fax:

Operations & Maintenance Manual, Volume ____ of ____

Discipline:

Date:

- C. Internally subdivide the binder contents with permanent page dividers, logically organized as described below; with tab titling clearly printed under reinforced laminated plastic tabs.
- D. Contents: Prepare a Table of Contents for each volume, with each Product or system description identified, typed on 24 pound white paper, in three parts as follows:
 - 1. Part 1: Directory, listing names, addresses, and telephone numbers of Architect/Engineer, CONTRACTOR, Subcontractors, and major equipment suppliers.
 - 2. Part 2: Operation and maintenance instructions, arranged by system process flow and subdivided by specification section. For each category, identify names, addresses, and telephone numbers of Subcontractors and suppliers. Identify the following:
 - a. Significant design criteria.
 - b. List of equipment.
 - c. Parts list for each component.
 - d. Operating instructions.
 - e. Maintenance instructions for equipment and systems.
 - f. Maintenance instructions for [special] finishes, including recommended cleaning methods and materials, and special precautions identifying detrimental agents.
 - 3. Part 3: Project documents and certificates, including the following:
 - a. Shop drawings and product data.
 - b. Air and water balance reports.
 - c. Certificates.
 - d. Originals of warranties and bonds.
- E. Submit 1 draft copy of completed volumes 90 working days prior to Training or Substantial Completion inspection, whichever is earliest. This copy will be reviewed and returned, with DEPARTMENT comments. Revise content of all document sets as required prior to final submission.
- F. Submit three sets of revised final volumes 45 days prior to Training or Substantial Completion inspection, whichever is earliest.

- G. In addition to required hard copies, provide electronic copy on .pdf format with table of contents hyperlinked to all referenced sections.

1.10 TRAINING

- A. Before Substantial Completion, instruct DEPARTMENT designated personnel in operation, adjustment, and maintenance of products, equipment, and systems, at agreed upon times. For equipment requiring seasonal operation, or placed into operation subsequent to Final Completion, perform instructions within six months.
- B. Refer to Section 01 79 00 for additional training requirements.
- C. Use operation and maintenance manuals as basis of instruction. Review contents of manual with personnel in detail to explain all aspects of operation and maintenance.
- D. Unless specified elsewhere, the duration of on-site instruction shall be as specified.
- E. Provide digital video recordings of all provided instruction in format approved by DEPARTMENT. Training videos shall be submitted prior to Substantial Completion.
- F. Prepare and insert additional data in Operation and Maintenance Manual when need for such data becomes apparent during instruction.

1.11 SPARE PARTS AND MAINTENANCE PRODUCTS

- A. Provide spare parts, maintenance, and extra Products in quantities specified in individual specification sections. These shall be labeled and stored per manufacturer's recommendations.
- B. Deliver to Project site and place in location as directed; obtain receipt prior to Substantial Completion payment.

1.12 WARRANTIES AND BONDS

- A. Provide duplicate notarized copies.
- B. Execute and assemble transferable warranty documents from Subcontractors, suppliers, and manufacturers.
- C. Provide Table of Contents and assemble in three D side ring binder with durable plastic cover.
- D. For items of Work delayed beyond date of Substantial Completion, provide updated submittal within 10 days after acceptance, listing date of acceptance as start of warranty period.

1.13 MAINTENANCE SERVICE

- A. Furnish service and maintenance of components indicated in specification sections for one year from date of Substantial Completion.

- B. Examine system components at a frequency consistent with reliable operation. Clean, adjust, and lubricate as required.
- C. Include systematic examination, adjustment, and lubrication of components. Repair or replace parts whenever required. Use parts produced by the manufacturer of the original component.
- D. Maintenance service shall not be assigned or transferred to any agent or Subcontractor without prior written consent of the DEPARTMENT.

PART 2 - PRODUCTS**Not Used****PART 3 - EXECUTION REQUIREMENTS****Not Used****END OF SECTION**

SECTION 01 73 29
CUTTING AND PATCHING

PART 1 - GENERAL

1.01 SECTION INCLUDES

- A. Related Documents and Requirements
- B. General Requirements
- C. Submittals
- D. Structural Work
- E. Operational Systems
- F. Visual Requirements
- G. Existing Warranties
- H. Materials
- I. Inspection
- J. Preparation
- K. Performance
- L. Cleaning

1.02 RELATED REQUIREMENTS

- A. Section 01 11 13 - Summary of Work
- B. Section 01 31 14 - Work Coordination
- C. Section 01 33 00 – Submittal Procedures
- D. Section 01 60 00 - Material and Equipment

1.03 REQUIREMENTS

- A. Cut in-place construction to provide for installation of other components or performance of other construction, and subsequently patch as required to restore surfaces to their original condition.
- B. Repairs and Patching: CONTRACTOR shall repair or patch all cut or disturbed areas as incidental to the Work. All patching and repairs shall match adjacent areas in texture, color, materials, and quality of workmanship.

- C. Employ skilled and qualified workers to perform cutting and patching.

1.04 SUBMITTALS

- A. Cutting and Patching Proposal: Prior to proceeding with cutting and patching, submit and obtain DEPARTMENT'S review of proposed cutting and patching procedures.
- B. Include the following information, as applicable, in proposal:
 - 1. Describe extent of cutting and patching required. Show how it will be performed and indicate why it is unavoidable.
 - 2. Describe anticipated results in terms of changes to existing construction. Include changes to structural elements and operating components as well as changes in building's appearance and other significant visual elements.
 - 3. List products to be used and firms or entities that will perform Work.
 - 4. Indicate dates and times when cutting and patching will be performed.
 - 5. Describe how the Work may affect operations of the facility user and what measures will be taken to mitigate them.
 - 6. Utilities: List utilities cutting and patching procedures will disturb or affect. Describe how service from affected utilities will be bypassed if necessary to maintain uninterrupted service.
 - 7. Structural: Where cutting and patching involves adding reinforcement to structural elements, submit details and engineering calculations showing integration of reinforcement with original structure.
 - 8. Roofing and Exterior Architectural Systems: Submit information on proposed cutting and patching procedures adequate for the DEPARTMENT to obtain in writing from the manufacturer of the existing system that the proposed procedures will not void the manufacturer's warranty. Work shall be performed by an installer authorized by the existing system manufacturer.
- C. The DEPARTMENT'S review of cutting and patching proposals does not waive its right to later require complete removal and replacement of unsatisfactory work.

1.05 STRUCTURAL

- A. Requirements for Structural Work: Do not cut and patch structural elements in manner that would change their load-carrying capacity or load-deflection ratio.
- B. Obtain approval of cutting and patching proposal before cutting and patching following structural elements:
 - 1. Foundations
 - 2. bearing and retaining walls
 - 3. structural concrete and masonry units
 - 4. structural steel
 - 5. Lintels
 - 6. timber and primary wood framing
 - 7. structural decking
 - 8. stair systems

9. miscellaneous structural metals
10. exterior curtain-wall constructions
11. equipment supports
12. piping, ductwork, vessel, and equipment
13. structural systems of special construction
14. others as deemed necessary by the DEPARTMENT

1.06 OPERATIONAL SYSTEMS

- A. Obtain approval of cutting and patching proposal before performing cutting and patching work affecting the following operating elements or safety related systems:
 1. primary operational system and equipment
 2. air or smoke barriers
 3. water, moisture or vapor barriers
 4. membranes and flashings
 5. fire protection system
 6. noise and vibration control elements and systems
 7. control systems
 8. communication systems
 9. conveying systems
 10. electrical wiring systems
 11. operating system of special construction
 12. others as deemed necessary by the DEPARTMENT
- B. Provide bypass or backup systems to minimize downtime and operational impact to existing facility.

1.07 EXISTING WARRANTIES

- A. Remove, replace, patch, and repair materials and surfaces cut or damaged during installation or cutting and patching operations, by methods and with materials so as not to void existing warranties.
- B. Work on existing roofing and other items covered by warranty shall be done by firm or craftsman authorized by warranty issuer.

PART 2 - PRODUCTS**PART 3 - EXECUTION****3.01 INSPECTION**

- A. Before proceeding meet at Project Site with DEPARTMENT'S representative and parties involved in cutting and patching, including related trades.
- B. Examine surfaces to be cut and patched and conditions under which cutting and patching is to be performed.

- C. Review areas of potential interference and conflict; coordinate procedures and resolve before proceeding.

3.02 PREPARATION

- A. Temporary Support: Provide temporary support of work to be cut.
- B. Protection: Protect in-place construction during cutting and patching to prevent damage. Provide protection from adverse weather conditions for portions of Project that might be exposed during cutting and patching operations.
- C. Adjacent Occupied Areas: Avoid interference with use of adjoining areas or interruption of free passage to adjoining areas.

3.03 PERFORMANCE

- A. Cutting: Cut in-place construction by sawing, drilling, breaking, chipping, grinding, and similar operations, including excavation, using methods least likely to damage elements retained or adjoining construction. If possible, review proposed procedures with original Installer; comply with original Installer's written recommendations.
 - 1. In general, use hand or small power tools designed for sawing and grinding, not hammering and chopping. Cut holes and slots neatly to minimum size required, and with minimum disturbance of adjacent surfaces. Temporarily cover openings when not in use.
 - 2. Finished Surfaces: Cut or drill from the exposed or finished side into concealed surfaces.
 - 3. Concrete: Cut using a cutting machine, such as an abrasive saw or a diamond-core drill.
 - 4. Mechanical and Electrical Services: Cut off pipe or conduit in walls or partitions to be removed. Cap, valve, or plug and seal remaining portion of pipe or conduit to prevent entrance of moisture or other foreign matter after cutting.
 - 5. Proceed with patching after construction operations requiring cutting are complete.
- B. Patching: Patch construction by filling, repairing, refinishing, closing up, and similar operations following performance of other work. Patch with durable seams that are as invisible as practicable. Provide materials and comply with installation requirements specified in other Sections, where applicable.
 - 1. Inspection: Where feasible, test and inspect patched areas after completion to demonstrate physical integrity of installation.
 - 2. Exposed Finishes: Restore exposed finishes of patched areas and extend finish restoration into retained adjoining construction in a manner that will minimize evidence of patching and refinishing.
 - 3. Floors and Walls: Where walls or partitions that are removed extend one finished area into another, patch and repair floor and wall surfaces in the new space. Provide an even surface of uniform finish, color, texture, and appearance. Remove in-place floor and wall coverings and replace with new materials, if necessary, to achieve uniform color and appearance.

4. Ceilings: Patch, repair, or rehang in-place ceilings as necessary to provide an even-plane surface of uniform appearance.
5. Exterior Building Enclosure: Patch components in a manner that restores enclosure to a weather-tight condition and ensures thermal and moisture integrity of building enclosure.

3.04 CLEANING

- A. Clean areas and spaces where cutting and patching are performed. Remove paint, mortar, oils, putty, and similar materials from adjacent finished surfaces.

END OF SECTION

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**SECTION 01 77 00
CONTRACT CLOSEOUT PROCEDURES**

PART 1 - GENERAL

1.01 SECTION INCLUDES

- A. Requirements for Substantial Completion
- B. Requirements for Final Completion
- C. Requirements for Final Payment and Final Acceptance

1.02 RELATED SECTIONS

- A. Section 00700 - General Conditions: Substantial Completion, Final Completion, Final Payment, Final Acceptance
- B. Section 01 11 13 - Summary of Work: Using Agency occupancy
- C. Section 01 33 00 – Submittal Procedures
- D. Section 01 29 73 – Schedule of Values
- E. Section 01 29 76 – Application for Payment
- F. Section 01 31 13 – Job Site Administration
- G. Section 01 45 23 – Departmental Inspection Service: CONTRACTOR'S Responsibilities
- H. Section 01 71 13 – Mobilization and Demobilization
- I. Section 01 73 00 – Execution Requirements: Final cleaning, Project Record Documents, Operation and Maintenance Data, Warranties and Bonds, Spare Parts and Maintenance Materials
- J. Section 01 78 39 – Project Record Documents
- K. Section 01 79 00 – Demonstration and Training
- L. Section 01 91 00 - Commissioning

1.03 SUBSTANTIAL COMPLETION SUBMITTALS

Submit the following prior to requesting the Substantial Completion Inspection:

- A. Evidence of Compliance with Requirements of Authority Having Jurisdiction:
 - 1. Certificate of Occupancy

2. Required Certificates of Inspection
 3. Other approvals as may be required
- B. Project Record Documents
- C. Operation and Maintenance Data
- D. Spare Parts and Maintenance Materials
- E. Warranties and Bonds
- F. Keys and Keying Schedule
- G. No progress payments will be made for Substantial Completion until all required submittals have been submitted and accepted by the DEPARTMENT.

1.04 SUBSTANTIAL COMPLETION

- A. In accordance with Section 00700 - General Conditions, Article 13.10 Substantial Completion, the CONTRACTOR shall notify the DEPARTMENT in writing that the Work or a portion of the Work which has been specifically identified in the Contract Documents (except for items specifically listed by the CONTRACTOR as incomplete) is substantially complete and request that the DEPARTMENT issue a Certificate of Substantial Completion. The DEPARTMENT will consider the CONTRACTOR'S request for Substantial Completion only when:
1. Written request for Substantial Completion is provided at least 14 calendar days in advance of the DEPARTMENT'S scheduled Substantial Completion inspection date.
 2. List of items to be completed or corrected is submitted.
 3. All Operation and Maintenance Manuals are submitted and approved by the DEPARTMENT.
 4. All commissioning requirements have been met.
 5. All equipment and systems have been tested, adjusted, balanced and are fully operational.
 6. All demonstration and training requirements have been met.
 7. All automated and manual controls are fully operational.
 8. Operation of all equipment and systems has been demonstrated to DEPARTMENT.
 9. Certificate of Occupancy is submitted.
 10. Certificates of Inspection for required inspections have been submitted.
 11. Project Record Documents for the Work or the portion of the Work being accepted are submitted and approved.
 12. Spare parts and maintenance materials are turned over to DEPARTMENT.
 13. All keys are turned over to the DEPARTMENT.
 14. All warranties and bonds are submitted and approved.
 15. Final cleaning has been completed to the satisfaction of the DEPARTMENT.
- B. When all of the preceding requirements for the consideration of Substantial Completion have been met, the DEPARTMENT will conduct a scheduled Substantial Completion inspection with its Architect/Engineers and Using Agency representatives. If upon the completion of the inspection, the DEPARTMENT should find that the Work is not

substantially complete, DEPARTMENT will promptly notify CONTRACTOR in writing, listing observed deficiencies.

- C. The CONTRACTOR shall remedy deficiencies and send a second written notice of Substantial Completion.
- D. When the DEPARTMENT finds the Work is substantially complete, it will have 14 days to issue a certificate of Substantial Completion with an attached punch list of deficiencies, all in accordance with the provisions of the General Conditions.
- E. The CONTRACTOR shall be responsible for scheduling the activities required for Substantial Completion to enable completion within the Contract Time.

1.05 FINAL COMPLETION

- A. In accordance with Section 00700 – General Conditions, Article 13.13 Final Completion, when the CONTRACTOR considers that it has completed all the deficiencies listed on the Substantial Completion punch list, and that the Work is otherwise complete, it shall submit written certification that:
 - 1. Contract Documents have been reviewed
 - 2. Work has been completed in accordance with Contract Documents, and deficiencies listed with certificate of Substantial Completion have been corrected
 - 3. Work is complete and ready for final inspection
- B. Upon the receipt of the preceding written notice, the DEPARTMENT will conduct a Final Completion inspection. If the DEPARTMENT should then find the Work to be incomplete, it will promptly notify the CONTRACTOR in writing with a list of observed deficiencies.
- C. The CONTRACTOR shall remedy deficiencies and transmit to the DEPARTMENT a second certification of Final Completion.
- D. When the DEPARTMENT determines the Work is complete, all in accordance with the General Conditions article, “Final Completion and Application for Payment”, the CONTRACTOR may make application for Final Payment.

1.06 REINSPECTION FEES

- A. In accordance with Section 00700 – General Conditions, Articles 13.10 Substantial Completion and 13.12 Final Inspection, the CONTRACTOR shall pay for all costs incurred by the DEPARTMENT for re-inspection.
- B. The DEPARTMENT may deduct the re-inspection costs from the application for final payment.

1.07 FINAL ACCEPTANCE

- A. Following the issuance of Final Completion, and subject to the completion of requirements specified in Section 00700 - General Conditions, Articles 13.14 Final Payment and 13.15 Final Acceptance, the DEPARTMENT will review the project files for completeness. The

DEPARTMENT may require the CONTRACTOR to submit or re-submit any of the following documents, upon request:

1. Contractor's transmittal letter: O&M Manuals
 2. Contractor's transmittal letter: Warranty/Bonds
 3. Contractor's transmittal letter: Record Documents
 4. Spare parts, maintenance materials receipts
 5. Contractor's transmittal letter: keys & keying schedule
 6. Contractor's certification of insurance
 7. Submittals and miscellaneous registers
 8. Original final pay estimate
 9. Contractor's release
 10. Department of Labor Notice of Completion (NOC)
 11. Other documentation as required by the DEPARTMENT
- B. Statement of Adjustment of Accounts – The DEPARTMENT may require the CONTRACTOR to submit a final statement reflecting adjustments to the Contract Price showing:
1. Original Contract Price
 2. Previous Change Orders
 3. Changes under allowances
 4. Changes under Unit Prices
 5. Deductions for uncorrected Work
 6. Penalties and bonuses
 7. Deductions for liquidated damages
 8. Deductions for re-inspection fees
 9. Other adjustments to Contract Price
 10. Total Contract Price as adjusted
 11. Previous payments
 12. Sum remaining due
- C. DEPARTMENT will issue a final Change Order reflecting all remaining adjustments to Contract Price not previously made by Change Orders.
- D. See Section 01 29 73 - Schedule of Values for minimum value that shall be assigned for Final Acceptance.
- E. The CONTRACTOR shall cooperate with the DEPARTMENT and shall provide the requested documentation.
- F. When the DEPARTMENT determines its files are complete, it may make final payment and issue a letter of Final Acceptance.

PART 2 - PRODUCTS

Not Used

PART 3 - EXECUTION

Not Used

END OF SECTION

**SECTION 01 78 39
PROJECT RECORD DOCUMENTS**

PART 1 - GENERAL

1.01 SECTION INCLUDES

- A. Maintenance of Record Documents and Samples
- B. Submittal of Record Documents and Samples

1.02 RELATED REQUIREMENTS

- A. Section 00700 - General Conditions: Record Documents
- B. Section 01 11 13 – Summary of Work: Record survey
- C. Section 01 29 76 – Application for Payment
- D. Section 01 33 23 – Shop Drawings, Product Data, and Samples
- E. Section 01 77 00 – Contract Closeout Procedures
- F. Individual Specifications Sections: Manufacturer's certificates and certificates of inspection

1.03 MAINTENANCE OF DOCUMENTS AND SAMPLES

- A. In addition to requirements in General Conditions, maintain at the site for DEPARTMENT one accurate record copy of:
 - 1. Contract Drawings
 - 2. Specifications
 - 3. Addenda
 - 4. Change Orders and other modifications to the Contract
 - 5. Reviewed Shop Drawings, product data, and samples
 - 6. Survey and field records
 - 7. Field test records
 - 8. Inspection certificates
 - 9. Manufacturer's certificates
- B. Prior to Substantial Completion, provide original or legible copies of each item maintained by CONTRACTOR as listed in 01 78 39.1.02.B,C, and D above.
- C. Delegate responsibility for management of maintenance of Record Documents to one person on CONTRACTOR's staff as approved in advance by Contracting Officer.
- D. Promptly following award of Contract, secure from DEPARTMENT, at no cost to the CONTRACTOR, one complete set of all Documents comprising the Contract.

- E. Immediately upon receipt of job set described above, identify each Document with title "RECORD DOCUMENTS - JOB SET".
- F. Store record documents and samples in field office apart from documents used for construction. Provide files, racks, and secure storage for record documents and samples.
- G. Label and file record documents and samples in accordance with section number listings in table of contents of this Project manual. Label each document "PROJECT RECORD" in neat, large, printed letters.
- H. Maintain record documents in a clean, dry and legible condition. Do not use record documents for construction purposes.
- I. Use all means necessary to maintain job set of Record Documents completely protected from deterioration and from loss and damage until completion of Work and transfer of recorded data to Contracting Officer.
- J. Keep record documents and samples available for inspection by DEPARTMENT.
- K. Upon request by the DEPARTMENT and at time of each Application for Payment enable inspection of record documents by the DEPARTMENT for review as to completeness.
- L. Contracting Officer's approval of current status of Record Documents will be prerequisite to Contracting Officer's approval of requests for progress payments and request for final payment.
 - 1. Prior to submitting each request for progress payment, secure Contracting Officer's approval of Record Documents as currently maintained.
 - 2. Prior to submitting request for Final Payment, obtain Contracting Officer's approval of final Record Documents.
- M. Do not use job set for any purpose except entry of new data and for review and copying by Contracting Officer.

1.04 RECORDING

- A. Record information on a set of blue line opaque Drawings, and in a copy of a Project manual, provided by DEPARTMENT.
- B. Using felt tip marking pens or colored pencil, maintaining separate colors for each major system, clearly describe changes by note and by graphic line, as required. Date all entries. Call attention to entry by a "cloud" around area or areas affected.
- C. Thoroughly coordinate all changes within Record Documents, making adequate and proper entries on each Specification Section and each sheet of Drawings and other Documents where such entry is required to properly show change or selection.
- D. When a change within Record Documents is referenced to another document, such as a RFI, Shop Drawing or Change Order, attach a copy of the referenced document to the respective Record Drawing or Record Specification where the entry is made.

- E. Contract Drawings and Shop Drawings: Legibly mark each item to record actual construction, including:
1. Measured depths of elements of foundation in relation to finish first floor datum. Accurate to the nearest inch.
 2. Measured horizontal and vertical locations of underground utilities and appurtenances, referenced to permanent surface improvements. Accurate to the nearest inch.
 3. Measured locations of internal utilities and appurtenances concealed in construction, referenced to visible and accessible features of construction.
 4. Field changes of dimension and detail.
 5. Changes made by modifications.
 6. Details not on original Contract Drawings.
 7. References to related Shop Drawings and modifications
 8. Clearly label all changes and show dimensions to establish size and location. All identifications shall be sufficiently descriptive to relate reliably to Specifications.
- F. Other Documents: Maintain manufacturer's certifications, inspection certifications, and field test records required by individual Specifications sections.

1.05 SUBMITTALS

- A. Upon submittal of the completed Record Documents, make changes in Record Documents as required by the Contracting Officer.
- B. Transmit with cover letter in duplicate, listing:
1. Date
 2. DEPARTMENT's Project title and number
 3. CONTRACTOR's name, address, and telephone number
 4. Number and title of each record document
 5. Signature of CONTRACTOR or authorized representative.
- C. Final Record Documents shall include both hard copies and digitally scanned copies in .pdf format (high quality greyscale scans, minimum 200 pixels/inch). Scans shall include front and back of drawings/documents where information occurs on both sides.

PART 2 – PRODUCTS**Not Used****PART 3 - EXECUTION****Not Used****END OF SECTION**

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**SECTION 01 79 00
DEMONSTRATION AND TRAINING**

PART 1 – GENERAL

1.01 SECTION INCLUDES

- A. Administrative and procedural requirements for instructing DEPARTMENT's personnel. Major topics include the following:
 - 1. Demonstration of operation of systems, subsystems, and equipment.
 - 2. Training in operation and maintenance of systems, subsystems, and equipment.

1.02 RELATED REQUIREMENTS

- A. Section 00700 – General Conditions
- B. Section 01 11 13 – Summary of Work
- C. Section 01 31 13 – Job Site Administration
- D. Section 01 31 19 – Project Meetings
- E. Section 01 33 00 – Submittal Procedures
- F. Section 01 73 00 – Execution Requirements
- G. Section 01 77 00 – Contract Closeout Procedures
- H. Section 01 91 00 – Commissioning

1.03 SUBMITTALS

- A. Instruction Program: Submit three copies of outline of instructional program for demonstration and training, including a schedule of proposed dates, times, length of instruction time, and instructors' names for each training module. Include learning objective and outline for each training module.
 - 1. At completion of training, submit two complete training manual(s) for DEPARTMENT's use.
- B. Qualification Data: For facilitator and instructor.
- C. Attendance Record: For each training module, submit list of participants and length of instruction time.

1.04 QUALITY ASSURANCE

- A. **Facilitator Qualifications:** A firm or individual experienced in training or educating maintenance personnel in a training program similar in content and extent to that indicated for this Project, and whose work has resulted in training or education with a record of successful learning performance.
- B. **Instructor Qualifications:** A factory-authorized service representative, complying with requirements in Division 1 Section "Quality Requirements," experienced in operation and maintenance procedures and training.
- C. **Pre-instruction Conference:** Conduct conference at Project site to comply with requirements in Division 1 Section "Project Meetings." Review methods and procedures related to demonstration and training including, but not limited to, the following:
 - 1. Inspect and discuss locations and other facilities required for instruction.
 - 2. Review and finalize instruction schedule and verify availability of educational materials, instructors' personnel and facilities needed to avoid delays.
 - 3. Review required content of instruction.
 - 4. For instruction that must occur outside, review weather and forecasted weather conditions and procedures to follow if conditions are unfavorable.

1.05 COORDINATION

- A. Coordinate instruction schedule with DEPARTMENT's operations. Adjust schedule as required to minimize disrupting DEPARTMENT's operations.
- B. Coordinate instructors, including providing notification of dates, times, length of instruction time, and course content.
- C. Coordinate content of training modules with content of approved emergency, operation, and maintenance manuals. Do not submit instruction program until operation and maintenance data has been reviewed and approved by Department.

PART 2 - PRODUCTS**2.01 INSTRUCTION PROGRAM**

- A. **Program Structure:** Develop an instruction program that includes individual training modules for each system and equipment not part of a system, as required by individual Specification Sections, and as follows:
 - 1. Door hardware
 - 2. Equipment, including projection screens, A/V, and laboratory fume hoods
 - 3. Fire-protection systems, including fire alarm, fire pumps and fire-extinguishing systems
 - 4. Intrusion detection and security systems
 - 5. Laboratory equipment, including laboratory air and vacuum equipment and piping, and laboratory fume hoods

6. Heat generation, including boilers, feed water equipment, pumps, and water distribution piping
 7. HVAC systems, including air-handling equipment, air distribution systems and terminal equipment and devices
 8. HVAC instrumentation and controls
 9. Electrical service and distribution, including transformers, switchboards, panel boards, uninterruptible power supplies and motor controls
 10. Packaged engine generators, including transfer switches
 11. Lighting equipment and controls
 12. Communication systems, including intercommunication and voice and data equipment.
- B. Training Modules: Develop a learning objective and teaching outline for each module. Include a description of specific skills and knowledge that participant is expected to master. For each module, include instruction for the following:
1. Basis of System Design, Operational Requirements, and Criteria: Include the following:
 - a. System, subsystem, and equipment descriptions
 - b. Performance and design criteria if CONTRACTOR is delegated design responsibility
 - c. Operating standards
 - d. Regulatory requirements
 - e. Equipment function
 - f. Operating characteristics
 - g. Limiting conditions
 - h. Performance curves
 2. Documentation: Review the following items in detail:
 - a. Emergency manuals
 - b. Operations manuals
 - c. Maintenance manuals
 - d. Project Record Documents
 - e. Identification systems
 - f. Warranties and bonds
 - g. Maintenance service agreements and similar continuing commitments
 3. Emergencies: Include the following, as applicable:
 - a. Instructions on meaning of warnings, trouble indications, and error messages
 - b. Instructions on stopping
 - c. Shutdown instructions for each type of emergency
 - d. Operating instructions for conditions outside of normal operating limits
 - e. Sequences for electric or electronic systems
 - f. Special operating instructions and procedures

4. Operations: Include the following, as applicable:
 - a. Startup procedures
 - b. Equipment or system break-in procedures
 - c. Routine and normal operating instructions
 - d. Regulation and control procedures
 - e. Control sequences
 - f. Safety procedures
 - g. Instructions on stopping
 - h. Normal shutdown instructions
 - i. Operating procedures for emergencies
 - j. Operating procedures for system, subsystem, or equipment failure
 - k. Seasonal and weekend operating instructions
 - l. Required sequences for electric or electronic systems
 - m. Special operating instructions and procedures
5. Adjustments: Include the following:
 - a. Alignments
 - b. Checking adjustments
 - c. Noise and vibration adjustments
 - d. Economy and efficiency adjustments
6. Troubleshooting: Include the following:
 - a. Diagnostic instructions
 - b. Test and inspection procedures
7. Maintenance: Include the following:
 - a. Inspection procedures
 - b. Types of cleaning agents to be used and methods of cleaning
 - c. List of cleaning agents and methods of cleaning detrimental to product
 - d. Procedures for routine cleaning
 - e. Procedures for preventive maintenance
 - f. Procedures for routine maintenance
 - g. Instruction on use of special tools
8. Repairs: Include the following:
 - a. Diagnosis instructions
 - b. Repair instructions
 - c. Disassembly; component removal, repair, and replacement; and reassembly instructions
 - d. Instructions for identifying parts and components
 - e. Review of spare parts needed for operation and maintenance.

PART 3 - EXECUTION**3.01 PREPARATION**

- A. Assemble educational materials necessary for instruction, including documentation and training module. Assemble training modules into a combined training manual.
- B. Set up instructional equipment at instruction location.

3.02 INSTRUCTION

- A. Facilitator: Engage a qualified facilitator to prepare instruction program and training modules, to coordinate instructors, and to coordinate between CONTRACTOR and DEPARTMENT for number of participants, instruction times, and location.
- B. Engage qualified instructors to instruct DEPARTMENT's personnel to adjust, operate, and maintain systems, subsystems, and equipment not part of a system.
 - 1. Architect/Engineer will furnish a representative to describe basis of system design, operational requirements, criteria, and regulatory requirements.
 - 2. DEPARTMENT will furnish an instructor to describe DEPARTMENT's operational philosophy.
 - 3. DEPARTMENT will furnish CONTRACTOR with names and positions of participants.
- C. Scheduling: Provide instruction at mutually agreed on times. For equipment that requires seasonal operation, provide similar instruction at start of each season.
 - 1. Schedule training with DEPARTMENT with at least 14 days' advance notice.
- D. Cleanup: Collect used and leftover educational materials and give to DEPARTMENT. Remove instructional equipment. Restore systems and equipment to condition existing before initial training use.

END OF SECTION

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SECTION 01 91 00

COMMISSIONING

PART 1 - GENERAL

1.1 SUMMAR

- A. As defined by ASHRAE Standard 202, the commissioning process is a quality focused process for enhancing the delivery of a project. The process focuses upon verifying and documenting that all the commissioned systems and assemblies are planned, designed, installed, tested, operated, and maintained to meet the Owner's Project Requirements (OPR). For the commissioning of this project, the bid documents shall be considered the OPR.

Section Includes:

B.

1. Description of Commissioning Work. Equipment
2. and Systems to be Commissioned. Submittals.
3. Commissioning Plan.
4. Equipment and system verification checks.
- 5.

C. Related Sections:

1. Section 22 08 00 - Commissioning of Plumbing.
2. Section 23 08 00 - Commissioning of HVAC.
3. Division 26: Electrical - Lighting Control Systems, Transfer Switch, Receptacle Control.

1.2 REFERENCES

- A. American Society of Heating, Refrigeration, and Air Conditioning Engineers:
1. ASHRAE 202 - Commissioning Process for Buildings and Systems.

1.3 DESCRIPTION OF

- A. Work includes the completion of formal commissioning procedures on selected equipment and systems. Commissioning is defined as the process of verifying and documenting that the installation and performance of selected building systems meet the specified design criteria and therefore satisfies the design intent and the Owner's operational needs. The Contractor shall be responsible for participation in the commissioning process.

- B. Commissioning procedures will be designed and conducted under the direction of the Commissioning Authority (CxA) hired by the Contractor.

1.4 QUALIFICATION

- A. Installer: Company specializing in performing work of this section with minimum three years experience.
- B. The CxA shall be certified as a commissioning professional by American Society of Heating, Refrigeration and Air Conditioning Engineers (ASHRAE), the Associated Air Balancing Council Commissioning Group (ACG), Building Commissioning Association (BCA), the University of Wisconsin - Madison (UWM), or the National Environmental Balancing Bureau (NEBB).

1.5 DEFINITION

- A. Commissioning Authority (CxA): The independent Commissioning Authority shall be hired directly by the prime contractor and shall not be a member of the design team, employed by the design firms, or employed by the installing contractor. The Commissioning Authority shall be solely responsible for the performance of all commissioning activities and may not subrogate any duties to any other member of the construction team. The commissioning authority shall lead, review and oversee the completion of the commissioning process activities.
- B. Functional Performance Test (FPT): Component and Control System sequence of operations verification. The systems are run through all control system's sequences of operation and components are verified to be responding as the sequences state. The Commissioning Team utilizes the FPT Checklist for the verification test procedures. Forms are updated throughout the construction process to include any changes, additions, or other modifications to the equipment, system, or control sequences.

1.6 SUBMITTALS

- A. The following Commissioning Documentation shall be submitted in accordance with accepted submittal procedures:
 - 1. Submittals for Review:
 - a. Commissioning Authority current certification and qualifications.
 - b. Commissioning Guidelines to be utilized on the project and under which certification is maintained.
 - c. Commissioning Plan.
 - d. Commissioning Schedule.

- e. Functional Performance Test (FPT) Checklists. Submit a minimum of 30 days prior to the on-site commissioning activities.
- 2. Closeout Submittals
 - a. Draft Commissioning Report for Owner Review.
 - b. Final Commissioning Review.

PART 2 - PRODUCTS

2.1 NOT USED

PART 3 - EXECUTION

3.1 COMMISSIONING

- A. The Commissioning Team will include Contracting Representatives, Facility Users/Maintenance, construction contractors, designers of record and the commissioning agent. The specific members of the team or their delegate are as follows: Commissioning Authority (CxA); Owner's Representative or Project Manager; User or Facility Manager; General Contractor; Designer of Record; Mechanical Contractor; Electrical Contractor; Controls Contractor; Testing, Adjusting, and Balancing Contractor.

3.2 COMMISSIONING

- A. Commissioning Plan identifies the scope, strategies and responsibilities for all the team members within the commissioning process for the construction phase of the project. It outlines the overall process, sequence, organization, responsibilities and documentation for the commissioning process. The following items are also included in the Commissioning Plan:
 - 1. Cx Team Member Names and Contact Information. Current
 - 2. Project Schedule integrated with Cx Activities.
 - 3. Communications Protocol.
 - 4. Equipment List.
 - 5. Functional Performance Test Checklists. Issues
 - 6. Log, Meetings, and Meeting Minutes.
- B. Commissioning Team Roles:
 - 1. CxA: Coordinates and documents the Cx process, develops and updates Commissioning Plan, maintains issues log, writes tests; oversees and documents performance tests; develops the Commissioning Report.

2. CxA: The CxA documents the commissioning process through use of progress reports, field reports, issues log and meeting minutes.
 3. CxA: The CxA leads the functional testing process on site to demonstrate the equipment and systems are functioning in accordance with the design intent and owner's expectations.
 4. Contractor: Facilitates the commissioning process, ensures that Subcontractors perform their requirements and integrates commissioning into the construction process and schedule. The Contractor provides lifts, equipment, tools, and testing materials necessary to access, operate, verify, and observe tests to be performed.
Subcontractors: Attend commissioning meetings, verify proper operation of equipment and systems prior to functional performance test, demonstrate proper system performance during functional performance test.
 5. Design Team: Reviews submittals, assists in resolving issues.
 - 6.
- C. Commissioning Meetings: All Commissioning Team Members shall attend all commissioning meetings. After approval of the CxA and Commissioning Plan, and 30 days prior to FPT, the Contractor and CxA shall schedule and lead a meeting via teleconference, to address the commissioning process, review the commissioning plan, review commissioned equipment and systems, review commissioning schedule, review commissioning documents, review project status, and discuss potential issues. The CxA shall lead the meeting and provide meeting minutes. Additional meetings shall be scheduled by the CxA as required to successfully accomplish the commissioning process.

3.3 COMMISSIONING REPORT

- A. The report shall include an Executive Summary; Completed Checklists; Overview of Commissioning and Testing Scope; Issues Log; list of any equipment or systems that do not meet Contract Document requirements at completion of the commissioning process and summarize steps made or steps to be made to correct or improve the condition. Each non-compliance issue shall be referenced in the Issues Log to the specific functional performance test, inspection, trend log, etc. where the deficiency is documents.
- B. Recommendations for improvement to equipment, equipment operations, or commissioning process changes, including lessons learned, are to be listed in the report.

3.4 COMMISSIONING MASTER EQUIPMENT AND SYSTEMS LOG

- A. The following sample Cx Master Equipment and Systems Log is provided to show general format only and does not include all the equipment and systems to be commissioned. Refer to Divisions 22, 23, and 26 for specific systems, subsystems and equipment to be commissioned.

3.5 COMMISSIONING MASTER EQUIPMENT AND SYSTEMS

PRODUCTS	System/Equipment Tag	System/Equipment Description	Equipment Submittal Approved	PC and FT Checklists Approved	PC Completed	FT Completed	Training Completed
Divisions 21, 22, 23 - Mechanical							
4							
5							
6							
Divisions 26, 27 and 28 - Electrical							
72							
73							
74							

3.6 COMMISSIONING PRE-FUNCTIONAL INSTALLATION (PC) AND FUNCTIONAL PERFORMANCE TEST (FC) CHECKLISTS (SAMPLES)

- A. The following sample Cx checklists are provided to show general format only and do not include all equipment and systems to be commissioned. Refer to Divisions 22, 23, and 26 for specific systems, subsystems and equipment to be commissioned.

Pre-Functional Installation Checklist(PC)

Air Handling Unit

PROJECT: _____		UNIT NO: _____	
LOCATION: _____		SERVICE: _____	
MANUFACTURER: _____		MODEL: _____	
ITEM	OK	COMMENT	
<u>PRE-START-UP INSPECTION</u>			
Mountings Checked (Shipping Bolts Removed)			
Vibration Isolators Installed			
Seismic Restraints Installed			
Equipment Guards Installed			
Pulleys Aligned and Belt Tension Correct			
Plenums Clear and Free of Loose Material			
Fans Rotate Freely			
Fans, Motors and Linkages Lubricated			
Fire & Balance Dampers Positioned			
Temporary Start-up Filters Installed			
Electrical Connections Completed			
Disconnect Switch Installed			
Overload Heaters in Place (Sized Correctly)			
Heating Coil Clean and Clear – Piping Complete			
Cooling Coil Clean and Clear – Piping Complete			
Condensate Drains Clear			
Humidifier Section Installation Completed			
Safety Controls Operational			
Building & Fan Room Clean For Start-up			
Duct Cleaning Completed			
Control System Completed (End to End Checks)			
Review (Foreman): _____		DATE: _____	
Review (CCR): _____		DATE: _____	
Approved (Department's Representative): _____		DATE: _____	

Functional Performance Checklist (FC)

Air Handling Unit

PROJECT: _____ LOCATION: _____ MANUFACTURER: _____	UNIT NO: _____ SERVICE: _____ MODEL: _____	_____ _____ _____								
ITEM <u>START-UP INSPECTION</u> Start-up By Manufacturer's Representative Fan Rotation Correct Electrical Interlocks Verified Fan Status Indicators Verified (Local / Remote) Freeze Protection Operational Local Air Leakage Acceptable Vibration & Noise Level Acceptable Motor Amps – Rated _____ Actual _____ Motor Volts – Rated _____ Actual _____ Final Operating Filters Installed	OK 	COMMENT 								
COMMENTS: _____ _____ _____ _____										
<table style="width: 100%;"> <tr> <td style="width: 60%;">Functional Testing By: _____</td> <td style="width: 40%;">DATE: _____</td> </tr> <tr> <td>Review (Foreman): _____</td> <td>DATE: _____</td> </tr> <tr> <td>Approved (CCR): _____</td> <td>DATE: _____</td> </tr> <tr> <td>Approved (Department's Representative): _____</td> <td>DATE: _____</td> </tr> </table>			Functional Testing By: _____	DATE: _____	Review (Foreman): _____	DATE: _____	Approved (CCR): _____	DATE: _____	Approved (Department's Representative): _____	DATE: _____
Functional Testing By: _____	DATE: _____									
Review (Foreman): _____	DATE: _____									
Approved (CCR): _____	DATE: _____									
Approved (Department's Representative): _____	DATE: _____									

END OF SECTION

SECTION 02 26 00 – HAZARDOUS MATERIALS ASSESSMENT

PART 1 - GENERAL

1.01 SECTION INCLUDES

- A. The Hazardous Materials Assessment for the proposed construction is included with these Contract Documents.

1.02 USE OF INFORMATION

- A. The Hazardous Materials Assessment is provided for the Contractor's information and use in the planning and performance of work in areas containing hazardous or potentially hazardous materials as outlined in Paragraph 1.03.
 - 1. The information provided in the Hazardous Materials Assessment is based on samples collected in various locations of the building. Thus, the Owner and/or its Representative cannot guarantee or warrant that actual conditions encountered might not vary from the information presented in these reports.
 - 2. The data reported in the Hazardous Materials Assessment is accurate to the best of the Owner's and it's Representative's knowledge. The requirements contained in these specifications and in the relevant state and federal regulations pertaining to the performance of work in areas containing hazardous or potentially hazardous materials provide guidance for the contractor for performance of work in these areas. The Owner and its Representative disclaim all responsibility for the Contractor's erroneous conclusions regarding the information presented in these reports; the requirements contained in these specifications; and the requirements of applicable state and federal regulations pertaining to performance of work in these areas.
 - 3. The Contractor shall be responsible for obtaining additional information if Contractor deems it necessary to carry out the work.
- B. It is highly recommended that the contractor visit the site to acquaint themselves with existing conditions.
- C. Attached Hazardous Materials Assessment

1.03 HAZARDOUS MATERIALS NOTIFICATION:

- A. Notification of Potential Hazards: Asbestos, lead and other potentially hazardous materials are present in the building that may impact the work of all trades. Regulated air contaminants, including asbestos and lead, are also present in settled and concealed dust in and on architectural, structural, mechanical, and electrical components or systems throughout the building. All trades shall coordinate with other trades and conduct their work to prevent worker exposure or site contamination. Refer to Specification Divisions 0, 1 and 2 for specific information concerning disturbing, removing and disposing of these materials and the installation of new materials or components. This notification is provided in accordance with EPA and OSHA requirements.

PART 2 - PRODUCTS
Not Used

PART 3 - EXECUTION
Not Used

NESHAP COMPLIANT HAZARDOUS MATERIALS ASSESSMENT REPORT



DOT&PF MAINTENANCE & OPERATION STATION & COLD SHED HAINES, ALASKA

**Travis Miller, Project Manager
DOT&PF**

**Surveyed
January 5, 2023**

**Report Date
March 1, 2024**

EHS, ALASKA, INC.
ENGINEERING, HEALTH & SAFETY CONSULTANTS
11901 BUSINESS BLVD., SUITE 208
EAGLE RIVER, ALASKA 99577-7701

**NESHAP HAZARDOUS MATERIALS ASSESSMENT
DOT&PF MAINTENANCE & OPERATION STATION**

HAINES, ALASKA

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Appendix A	Asbestos Bulk Field Survey Data Sheets and Lab Reports
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NESHAP HAZARDOUS MATERIALS ASSESSMENT DOT&PF MAINTENANCE & OPERATION STATION

HAINES, ALASKA

OVERVIEW

The Maintenance and Operation Station and the adjacent “Cold Shed” located in Haines, Alaska, were surveyed for the presence of asbestos-containing materials (ACM), and other potentially hazardous materials as a part of the pre-demolition NESHAP compliant hazardous materials survey for the State of Alaska Department of Transportation and Public Facilities (DOT&PF). The survey also provided a “good faith” inspection for hazardous materials that may be disturbed during the construction. The proposed work includes the disturbance, demolition, removal and disposal of lead-containing paints and/or lead-containing materials that is incidental to the renovation and remodeling project. Mr. Rob G. Klaswick of EHS-Alaska, Inc. (EHS-Alaska) conducted the inspections in 2023. It will be the contractor’s responsibility to take this baseline data, and to conduct hazardous materials removal in compliance with all regulatory requirements.

A. GENERALIZED REQUIREMENTS FOR HAZARDOUS MATERIALS

Potentially hazardous materials have been identified in the Maintenance & Operations Station that will be affected by the demolition. Those materials include asbestos, lead, polychlorinated bi-phenyls (PCBs), mercury, and radioactive materials. Not all materials were tested for potentially hazardous components, other potentially hazardous materials, including those exterior to the building, such as contamination from underground fuel tanks may be present, but are not part of this report.

Buildings or portions of buildings that were constructed prior to 1978 which are residences, or contain day care facilities, kindergarten classes or other activities frequently visited by children under 6 years of age are classified as *child occupied facilities*. All work which is NOT classified as “minor repair and maintenance activities” (as defined by the regulations), that takes place in the “*child occupied*” portions of facilities must comply with the requirements of 40 CFR 745. These buildings are not classified as a *child occupied facility* and therefore the requirements of 40 CFR 745 are not applicable.

Only the materials that will be directly affected by this project are required to be removed. The quantities and types of materials are incorporated into the design documents for this renovation. The removal and disposal of potentially hazardous materials are highly regulated, and it is anticipated that removal and disposal of asbestos, lead and chemical hazards will be conducted by a subcontractor to the general contractor who is qualified for such removal. It is anticipated that the general contractor and other trades will be able to conduct their work using engineering controls and work practices to control worker exposure and to keep airborne contaminants out of occupied areas of the building. Refer to Section 01 35 45, Airborne Contaminant Control.

Settled and concealed dusts in areas not subject to routine cleaning are present throughout the building, including the roof, and inside and on top of architectural, mechanical, electrical, and structural elements, and those dusts are assumed to contain regulated air contaminants. This should not be read to imply that there is an existing hazard to building occupants (normal occupants of the building as opposed to construction workers working in the affected areas). However, depending on the specific work items involved and on the means and methods employed when working in the affected areas, construction workers could be exposed to regulated air contaminants from those dusts in excess of the OSHA Permissible Exposure Limits (PELs).

The settled and concealed dusts were examined by an EPA Certified Building Inspector but were not sampled. The inspector determined that the dusts are not “asbestos debris” from an asbestos-containing building material (ACBM). Based on similar sampling from similar buildings, the inspector also determined

that the dusts are unlikely to contain more than one percent (1%) asbestos by weight, and therefore are not an asbestos-containing material (ACM). Reference 40 CFR 763.83.

“Awareness training” (typically 2 hours) and possibly respiratory protection will be required for all Contractor Personnel who will be disturbing the dusts. The extent of the training and protective measures will depend upon the airborne concentrations measured during air monitoring of the contractors work force, which depends on the means and methods employed to control the dusts. The air monitoring may be discontinued following a “negative exposure assessment” showing that worker exposures are below the OSHA permissible exposure limits for the type of work and means and methods employed. Previous air monitoring from similar jobs with similar conditions may be used as historical data to establish a “negative exposure assessment.”

B. BUILDING DESCRIPTION

The Maintenance & Operation Station was reportedly originally constructed in 1957 according to a note on the 1988 Fire Damage Repair drawing provided by the DOT&PF. The building is a 6,400 square foot steel-framed building with metal siding. The center 40'x80' portion of the building has a high bay and the 20'x80' portion on each side has a lower metal roof. The floor is concrete slab. There is a ~14'x20' office with a restroom located in the NW section. Other areas include a Parts Room, Boiler Room, Warehouse and Warm Storage area, Repair and Warm Storage area, General Maintenance area, and a Warm Storage Vehicle area.

Reportedly, there was a fire rehab in 1988 which was primarily centered around the middle section of the building in the “high bay.” During the fire rehab, the existing metal roofing, ridge vent and the windows, trim and exterior battens were removed and replaced. The reportedly original wood siding with battens was also replaced with metal siding. The interior work included removing and replacing the plywood paneling and insulation from the roof and walls above 16' high, replacing the rafters with 2x12's, adding gusset plates, adding 2x10 fascia boards, and providing gypsum wallboard on all walls throughout and in the high bay. The interior side of exterior walls has a plywood wainscot to eight feet which was also added during the 1988 fire rehab. The upper walls and ceiling has untextured gypsum wallboard.

Heating is provided by a Weil McLain Model 80 light oil boiler which provides steam to suspended unit heaters. The steam pipe insulation is a combination of both asbestos-containing pipe insulation and fiberglass.

Exterior lighting is provided by HID's, and interior lighting is a combination of ceiling and wall-mounted fluorescent light fixtures. There are two large bi-fold, 2-partition hinged side swinging wood garage doors on each end of the high bay section of the building and one on each end of the south side lower portion. All but one of the large garage doors also have a built-in man door. The north side lower portion has a man door on the west side providing access to the office and what appears to be remnants of a framed-in garage door opening on the east end.

Cold Shed. The date of construction for the separate “Cold Shed” building is unknown. It is an unheated, uninsulated metal building of approximately 42' x 100' square feet in area with 4 bays each equipped with two sliding top-hung metal doors. The building is aligned with the long axis north to south. There are 5 steel girders with three major interior girders and a minor girder at each end. It appears that the girders are approximately 25 feet apart and have purlins spaced at ~20"-24" on center running north to south. There is a concrete slab but no other interior walls or finishes. The building is equipped with electricity but otherwise no other utilities such as gas or water were noted. Interior lighting was provided by 10 large lights that appeared to be high-pressure sodium which were suspended from the ceiling and exterior lighting appears to be HID lighting with two in the east (front) one on the south, and two on the west exterior walls mounted near the roof line. The west exterior wall in each bay has a cut out near the ceiling of approximately 3' wide by 6' tall that has a semi-opaque covering for light. There are two large (assumed) water tanks located on the ground along the north end of the west exterior wall outside of the building which were not there prior to 2017. Historical images showed a large vertical steel tank in this location prior to when the two (assumed) water tanks were installed.

C. SAMPLING AND ANALYSIS

1. Asbestos-Containing Materials

The survey included sampling of suspect ACM materials that had not been sampled in prior asbestos surveys. The samples were analyzed for the presence of asbestos using polarized light microscopy (PLM), analysis, as recommended by EPA, to determine the composition of suspected ACMs (EPA method 600/M4-82-020). Only materials containing more than 1% total asbestos were classified as “asbestos-containing” based on EPA and OSHA criteria. Samples analyzed to have less than 10% asbestos were “point-counted” by the laboratory for more accuracy. Samples listed as having a “Trace by Point Count” had asbestos fibers found in the material, but the fibers were not present at the counting grids. Table 1 in Part D below contains a summary list of the asbestos bulk samples and the applicable results.

The Bulk Asbestos samples were analyzed for asbestos content by International Asbestos Testing Laboratories (IATL), Mt. Laurel, New Jersey a National Voluntary Laboratory Accreditation Program (NVLAP) accredited laboratory.

EPA regulations under 40 CFR 763 require the use of PLM to determine whether or not a material contains asbestos. While PLM analysis does a good job for most materials, it does have some limitations. Fibers may be undetectable if their small size prevents visibility under a standard optical microscope, or if they are bound in an organic matrix to the point that the fibers are obscured. At the discretion of the building inspector and the client, some types of samples may be analyzed or re-analyzed by what is called Transmission Electron Microscopy for Non-Friable Organically Bound (TEM NOB) materials. TEM NOB is the definitive method for determining if asbestos is present, but TEM NOB use is not required by the EPA. TEM NOB analysis was not done for this project.

Field survey data sheets and laboratory reports of the bulk samples are included in Appendix A. Drawings showing sample locations are included as Appendix C.

2. Lead-Containing Materials

Nearly all surfaces in the buildings were coated with paint and most surfaces had been repainted. EHS-Alaska tested representative paints throughout the affected areas of the building using an Heuresis Pb200i X-Ray Fluorescence (XRF) lead paint analyzer (Serial # 1770 with software version 4.0-21). The lead testing conducted was not a Lead-Based Paint Inspection or Screening as defined by Department of Housing and Urban Development (HUD) or EPA regulations but was done to test surfaces that may be representative of those likely to be affected by this project. If surfaces and materials other than those tested are identified, the Contractor shall test and treat appropriately. Refer to the Lead Analyzer Test Results Table in Appendix B that identifies the surfaces tested, and the results. The Lead Test Locations are shown in Appendix C.

A Performance Characteristic Sheet (PCS) for the Heuresis Pb200i is available upon request. This PCS data provides supplemental information to be used in conjunction with Chapter 7 of the “HUD Guidelines”. Performance parameters provided in the PCS are applicable when operating the instrument using the manufacturer’s instructions and the procedures described in Chapter 7 of the “HUD Guidelines”. The instrument was operated in accordance with manufacturer’s instructions and Chapter 7 of the HUD Guidelines. No substrate correction is required for this instrument. There is no inconclusive classification for this instrument when using the 1.0 mg/cm² threshold.

3. Testing of Paints and Sealants for PCB’s

No testing of paints or sealants for PCB’s was authorized for this project, and no sampling occurred.

D. SURVEY RESULTS

1. Asbestos-Containing Materials

The following Table 1A lists the samples taken in January 2023 in the Operations & Maintenance building, and the results of the laboratory analysis. No suspect materials were identified in the “Cold Shed” and therefore no samples were collected but it is likely that metal siding seam sealants may be present. Asbestos field survey data sheets and laboratory reports are included as Appendix A. Refer to Appendix C for sample locations.

TABLE 1A

SAMPLE NUMBER	MATERIAL	LOCATION	ASBESTOS CONTENT
HM&O2301-A01	White GWB	Breakroom, Ceiling. Photo P133	None Detected
HM&O2301-A02	White Joint Compound	Breakroom, Ceiling. Photo P133	None Detected
HM&O2301-A03	White Joint Compound	Breakroom, East Wall (North End), Fluorescent Light Fixture GWB Wall Penetration. Photo P134	None Detected
HM&O2301-A04	White Joint Compound	Breakroom, East Wall (South End), Fluorescent Light Fixture GWB Wall Penetration. Photo P135	None Detected
HM&O2301-A05	Off-White Caulk	Bay #1, North Wall, Vertical Conduit Against GWB Wall, Outside Tire Room. Photo P145	None Detected
HM&O2301-A06	Off-White Caulk	Bay #1, North Wall, Vertical Conduit Against GWB Wall, Outside Tire Room. Photo P145	None Detected
HM&O2301-A07	Tan Thermal System Insulation	Bay #1, North Wall, “Elbow” Pipe Fitting. Photo P138	None Detected
HM&O2301-A08	White Thermal System Insulation. Lab also reported white wrap	Bay #1, North Wall, Straight Vertical Pipe. Photo P137	Both layers - None Detected
HM&O2301-A09	Off-White Thermal System Insulation	Storage Loft, Along South Wall, Horizontal Pipe Run, Above Breakroom, Access is Via Tire Room. Photo P144	15% Amosite 1% Chrysotile
HM&O2301-A10	Off-White Joint Compound	Bay #1, North Wall, Above Entrance to Tire Room. Photo P146	None Detected
HM&O2301-A11	White GWB	Bay #1, North Wall, Above Entrance to Tire Room. Photo P146	None Detected
HM&O2301-A12	Off-White Joint Compound	Bay #1, North Wall, Above Entrance to Boiler Room. Photo P147	None Detected
HM&O2301-A13	Off-White Thermal System Insulation. Lab also reported white wrap	Bay #1, Outside Boiler Room, Vertical Pipe Run, East of HVAC. Photo P148	Both layers - None Detected
HM&O2301-A14	Off-White Thermal System Insulation	Bay #1, Above Office Entrance, “Elbow” Pipe Fitting Insulation is Under PVC Protective Cap. Photo P151	None Detected
HM&O2301-A15	Off-White Joint Compound	Bay #1, North Wall, Above Entrance to Office. Photo P152	None Detected
HM&O2301-A16	Off-White Joint Compound	Boiler Room, S.W. Corner. Photo P153	None Detected

SAMPLE NUMBER	MATERIAL	LOCATION	ASBESTOS CONTENT
HM&O2301-A17	Off-White Joint Compound	Boiler Room, Above Door. Photo P154	None Detected
HM&O2301-A18	Off-White Thermal System Insulation	Boiler Room, Pipe Insulation at "T" Fitting, Along South Wall. Photo P155	15% Amosite 1% Chrysotile
HM&O2301-A19	Green Gasket	Boiler Room, Flange, Top of Boiler. Photo P156	None Detected
HM&O2301-A20	Gray Gasket	Boiler Room, Steam Trap, Front of Boiler. Photo P157	None Detected
HM&O2301-A21	Brown Peel & Stick Floor Tile	Office, Raised Floor Area. Photo P161	None Detected
HM&O2301-A22	Off-White Joint Compound	Bat #2, South Wall. Photo P163	None Detected
HM&O2301-A23	Off-White Thermal System Insulation	Bay #2, South Wall, "Elbow" Pipe Fitting Insulation is Under PVC Protective Cap. Photo P165	None Detected
The testing method used (polarized light microscopy [PLM]) is not consistently reliable in detecting asbestos in floor coverings and similar non-friable organically bound materials. Before this material can be considered or treated as non-asbestos containing, confirmation should be made by quantitative transmission electron microscopy (TEM).			

The following materials have been found to contain asbestos in this survey or were assumed to contain asbestos. The contractor is encouraged to have an EPA certified asbestos-containing building inspector conduct NESHAP compliant testing of materials that are assumed to contain asbestos.

Maintenance & Operations

1. Hard and chalky pipe insulation on runs and fittings (confirmed asbestos).
2. Gaskets and valve packings at piping (assumed asbestos-containing).
3. Boiler and Oil burner stove gaskets and sealants (assumed asbestos-containing).
4. Metal roofing seam sealant (assumed asbestos-containing).
5. Metal siding seam sealant including at windows and doors (assumed asbestos-containing).
6. Metal fire door insulation (assumed asbestos-containing).
7. Refractory, including hand-packing at concrete chimney (assumed asbestos-containing).

"Cold Shed"

1. Metal siding seam sealant (assumed asbestos-containing).
2. Metal roofing seam sealant (assumed asbestos-containing).

The effects of the above asbestos-containing materials on the proposed demolition are discussed below.

Pipe Insulation

Heat piping exposed in the storage loft and in the boiler room in the O&M building is insulated at fittings and pipe runs with asbestos-containing insulation. The insulation is generally in good condition and is considered friable asbestos-containing material. The asbestos-containing pipe insulation is required to be removed prior to demolition.

Flange Gaskets and Valve Packing

Due to their age, gaskets and valve packing on mechanical equipment throughout the building, but mostly in mechanical rooms are assumed to be asbestos-containing. These materials are difficult to sample without disassembly of equipment and consequently no sampling was performed. These materials were in good condition but may become friable if the joints are split apart. The gaskets and packings may remain in place during demolition if disposed of at a landfill permitted to accept non-friable asbestos.

Boiler Gaskets and Sealants

Due to their age, gaskets and sealants on the boiler and is assumed to be asbestos-containing. These materials are difficult to sample without disassembly of equipment and consequently limited sampling was performed. These materials are classified as a Category I or Category II nonfriable asbestos-containing material and may remain in place during demolition if disposed of at a landfill permitted to accept non-friable asbestos.

Gaskets and Sealants on the Ceiling Mounted Heaters

The ceiling-mounted heaters in the M&O shop are assumed to have asbestos-containing gaskets and sealants that were not accessible for sampling or inspections. The inaccessible gaskets and sealants are assumed to be in good condition and not friable. These materials are typically classified as Category I or Category II non-friable asbestos-containing material and may remain in place during demolition if disposed of at a landfill permitted to accept non-friable asbestos.

Metal Roofing Sealants and Patching Tars

The metal roofing was not accessible to survey. Roofing over the building is a standing seam style metal roof. Patching tars and sealants which are assumed to be present at flashings, vents, and other equipment penetrating the roofing are assumed to contain asbestos. The sealants and patching tars are assumed to be in good condition and not friable. The roofing materials will be removed by this project. These materials are classified as a Category I or Category II nonfriable asbestos-containing material may remain in place during demolition if disposed of at a landfill permitted to accept non-friable asbestos.

Metal Siding Sealants

Siding over the building is a corrugated metal siding. Sealants which are assumed to be present at piping, windows, doors, and other equipment penetrating the siding are assumed to contain asbestos. The sealants are assumed to be in good condition and not friable. The siding materials will be removed by this project. These materials are classified as a Category II nonfriable asbestos-containing material may remain in place during demolition if disposed of at a landfill permitted to accept non-friable asbestos.

Metal Fire Door Insulation

The metal fire door at the boiler room is assumed to have asbestos-containing insulation. The door is required to be removed prior to demolition.

Refractory of Concrete Chimney

The concrete boiler chimney is assumed to have asbestos-containing hand-packed "grouting" at the refractory lining of the concrete chimney. The chimney is required to be removed prior to demolition.

2. Asbestos in Dusts

The settled and concealed dusts were examined by an EPA Certified Building Inspector but no samples for asbestos in dusts were authorized for this project. Based on their visual inspection and experience from similar buildings, the inspector determined that the typical settled and concealed dusts are not "asbestos debris" from an asbestos-containing building material (ACBM). Based on similar sampling from similar buildings, the inspector also determined that the dusts are unlikely to contain more than one percent (1%) asbestos by weight, and therefore are not an asbestos-containing material (ACM).

3. Lead-Containing Materials

Lead-Testing

EHS-Alaska tested paint and other materials throughout the two buildings using a Heuresis XRF lead paint analyzer. Lead in paints tested varied from a trace amount to 12.7 mg/cm². Lead in other materials tested have only a trace amount of lead. Refer to the Lead Analyzer Test Results Table in Appendix B that identifies the surfaces tested, and the results. The Lead Test Locations are shown in the Drawings in Appendix C.

Paints

There were varying lead contents found in the paints, based on what surfaces they are on, with most surfaces containing little lead (but are still classified as lead-containing materials by OSHA). The highest levels of lead were found on structural members and miscellaneous steel, with lower levels on walls and other painted surfaces, and lowest levels on pre-finished materials.

Lead based paints (paint containing more than 1.0 mg/cm² of lead) were identified in the project on steel components such as a beam and column, piping and even a painted door hinge. It is anticipated that other components which are hidden, concealed, or otherwise not tested may be painted with lead-based paint. Lead was detected at very low levels in most of the painted floor, wall, and ceiling surfaces. XRF testing is not able to "prove" that "no" lead exists in the paint. Low levels of lead found by XRF testing does not mean that the paints are free of lead, the paints may contain lead. However, these paints may not present a hazard to occupants or workers performing renovation or demolition if lead-safe work practices are followed.

Ceramic Glazing

Relatively high concentrations of lead were found in the glazing of ceramic plumbing fixtures. The glazing of the bathroom sink, urinal, and toilet contained measurable lead levels. The concentrations of lead in ceramic glazing compounds should not be compared to lead-based paint criteria, as the glazing is inherently less likely to cause lead to be present in dusts or on surfaces, where it can be ingested. Lead in ceramic tile glazing may not pose a hazard to occupants, or workers performing renovation or demolition if lead-safe work practices are followed. All ceramic tiles and fixtures in the facility should be assumed to contain lead.

Metallic Lead in Batteries, Pipe Solder and Flashing

Metallic lead items identified in the building included lead soldering at the sheet metal roof flashings, lead solder at copper piping, and poured lead sealants at bell and spigot joints of waste and vent piping and lead acid batteries in emergency lights and other battery backup equipment. When removed during the demolition they should be recycled or disposed of as hazardous waste.

Lead Dusts

The settled and concealed dusts were examined but no samples for lead in dusts were authorized for this project. Based on their visual inspection and similar sampling from similar buildings, the inspector also determined that the dusts are likely to have measurable concentrations of lead in the dusts.

Demolition Waste

No TCLP samples were collected, and TCLP sampling of the waste stream(s) will need to be conducted by the Contractor as they determine their waste stream(s).

4. PCB-Containing Materials

Light Ballasts

Older fluorescent lights typically have PCB-containing ballasts. PCB-containing ballasts in fluorescent lights were banned in 1978, but manufacturers were allowed to use up existing stocks, and lights may have been reused from other facilities. The survey included examination of what were considered to be representative light fixtures, but not all fixtures were able to be accessed. All lights shall be inspected during removal. Unless ballasts were marked "No PCBs," they must be assumed to contain PCBs and must be disposed of as a hazardous waste when removed for disposal. Fluorescent light fixtures with PCB-containing ballasts are assumed to be present in the building. The fluorescent light fixtures will be removed prior to the demolition of the building.

Older HID lights may have PCB-containing ballasts. Due to height restrictions and sealed ballast enclosures, the HID fixtures were not able to be accessed. All HID lights shall be inspected during removal or relocation. If ballasts are not marked "No PCBs," we suggest contacting the manufacturer of the lights to determine if the ballasts contain PCB's, or assume that they contain PCB's and be disposed of as a

hazardous waste. HID light fixtures with assumed PCB-containing ballasts will be removed prior to the demolition of the building.

Bulk Products

Some older paints, sealants and other building materials may contain measurable amounts of PCB's. PCB use in paints and sealants was supposed to have been discontinued in 1979. The EPA does not require the sampling of bulk products, and no sampling of "Bulk Products" were authorized for this project.

5. Mercury-Containing Materials

Fluorescent Lamps

Fluorescent lamps use mercury to excite the phosphor crystals that coat the inside of the lamp. These lamps contain from 15 to 48 milligrams of mercury depending on their age and manufacturer. Fluorescent light fixtures will be removed prior to the demolition.

High Intensity Discharge Lamps

High Intensity Discharge (HID) lamps use mercury and sodium vapors in the lamp, and also typically have lead-containing solders at the bases. These lamps contain varying amounts of mercury depending on their age and manufacturer. HID light fixtures will be removed prior to the building demolition.

All mercury-containing items being removed by this project are required to be disposed of as hazardous waste or recycled.

6. Other Hazardous Materials

Self-Illuminating Exit Signs and Smoke Detectors

Several radioactive, self-illuminating exit signs and smoke detectors were found in the renovation area. All radioactive items removed by this project are required to be disposed of as hazardous waste or recycled.

Household Chemicals

Common household chemicals were present in the building, possible including quantities of construction repair materials, acids, paint products, paint thinners, caustics, cleaners, pesticides, herbicides, disinfectants, poisons, printing, glycol (antifreeze), floor or furniture wax, furniture or paint strippers, solvents, fuel, new or used lubrication products, wood preservatives, old medications, resins, and adhesives. These loose containers will be relocated by the owner or may remain for disposal by the contractor.

Soil Contamination

The scope of work for EHS-Alaska, Inc. did not include investigation of soils for petroleum or other contaminations.

Refrigerants

Several refrigerators and an "air dryer" at the air compressor were identified in the O&M building that may contain ozone depleting refrigerants. Ozone depleting substances (ODS) are regulated by the EPA and must be removed by certified technicians prior to equipment disposal. Coordinate possible salvage of the refrigeration equipment with the Owner.

Heat Transfer Fluids

The existing heating system in the O&M building is assumed to contain heat transfer fluids, including glycol or other boiler treatment chemicals. Any heat transfer fluids removed from the heating system shall be recovered and properly disposed of or recycled. Remove, test and dispose of heating system fluids in accordance with the test results.

E. REGULATORY CONSTRAINTS

1. Asbestos-Containing Materials

The Federal Occupational Safety and Health Administration (29 CFR 1926.1101) and the State of Alaska Department of Labor (8 AAC 61) have promulgated regulations requiring testing for airborne asbestos fibers; setting allowable exposure limits for workers potentially exposed to airborne asbestos fibers; establishing contamination controls, work practices, and medical surveillance; and setting worker certification and protection requirements. These regulations apply to all workplace activities involving asbestos-containing materials.

The EPA regulations, 40 CFR 61, Subpart M of the National Emission Standards for Hazardous Air Pollutants (NESHAP), established procedures for handling ACM during removal and disposal. The NESHAP regulations address three categories of ACM in a building being demolished:

1. Friable, or regulated ACM (RACM) which must be removed from a building before the building is demolished
2. Category I non-friable ACM (resilient flooring, asphalt roofing products, packing and gaskets)
3. Category II non-friable ACM (non-friable ACM other than Category I ACM).

If allowed by the disposal site, the EPA allows Category I and II non-friable ACM to remain in a building during demolition if: (1) Category I ACM is not in poor condition and is not friable and (2) the probability is low that Category II ACM will become crumbled, pulverized or reduced to powder during demolition. The condition of the ACM and method of demolition will generally determine if Category I and II non-friable ACM may be left in the building during demolition. This EPA standard also requires that no visible emissions be generated from the ACM during removal and transportation and does not allow intentional burning of any building containing ACM.

The EPA regulations require an owner (or the owner's contractor) to notify the EPA of asbestos removal operations and to establish responsibility for the removal, transportation, and disposal of asbestos-containing materials.

The disposal of asbestos waste is regulated by the EPA, the Alaska Department of Environmental Conservation, and the disposal site operator. Wastes being transported to the disposal site must be sealed in leak tight containers prior to disposal and must be accompanied by disposal permits and waste manifests.

2. Dusts with Asbestos

Settled and concealed dusts above ceilings, and at other areas that are not routinely cleaned (such as inside ducts and at roofs, etc.) are assumed to have measurable concentrations of asbestos. Based on sampling of similar settled and concealed dusts at similar buildings, those dusts are assumed to contain less than 1 percent asbestos. Normal settled and concealed dusts are distinct and treated differently from debris resulting from damaged asbestos-containing materials.

Background levels of asbestos in dusts for a particular location will depend on many factors, including whether or not asbestos occurs naturally in soils in the area.

Likely sources of asbestos in dusts include natural occurrences of asbestos.

The types of asbestos found in settled and concealed dusts often contain actinolite, anthophyllite and tremolite forms of asbestos which are not commonly found in bulk samples taken of materials from buildings. Those forms of asbestos may come from natural occurrences of asbestos in an outside source, such as rock or ore deposits, which appear to be common in Alaska.

Because the type of disturbance, concentration of asbestos in the dusts, cohesiveness of the dusts and

room sizes will change, the airborne asbestos levels expected during the project will depend on the contractor's means and methods of conducting the work. The mere presence of asbestos in the dusts does not necessarily imply that a "hazard" exists which would require the use of specially trained workers to "abate" the "hazard". All dusts will likely be required to be removed from the areas where asbestos-containing materials are being removed (abatement areas) in order to achieve clearances. The dusts in the other areas are to be controlled so as to limit worker exposures and prevent contamination of occupied areas of the building.

There is no established correlation between settled or adhered dusts with measurable concentrations of asbestos and airborne concentrations. The definition in the OSHA regulations of asbestos-containing materials as those materials that contain 1 percent or more asbestos by weight, apply to cohesive materials and not to dusts. The OSHA regulations are essentially "performance based," if workers are exposed above the permissible exposure limits, then all of the requirements in the regulations become effective.

3. Lead-Containing Materials

The EPA Standard 40 CFR 745, Lead-Based Paint Poisoning Prevention in Certain Residential Structures, defines lead-based paint hazards and regulates lead based paint activities in target housing and child-occupied facilities. The requirements of this regulation include training certification, pre-work notifications, work practice standards and record keeping. Areas typically classified as child occupied facilities may include but are not limited to: day care facilities, preschools, kindergarten classrooms, restrooms, multipurpose rooms, cafeterias, gyms, libraries and other areas routinely used by children under 6 years of age. Training requirements for Firms (Contractors) and Renovators (Workers) became effective on April 22, 2010. The building is not classified as a child occupied facility therefore the requirements of 40 CFR 745 do not apply.

Federal OSHA (29 CFR 1926.62) and the State of Alaska (8 AAC Chapter 61) have promulgated regulations that apply to all construction work where employees may be exposed to lead. The disturbance of any surfaces painted with lead-containing paint requires lead-trained personnel, personnel protective procedures, and air monitoring until exposure levels can be determined. If initial monitoring verifies that the work practices being used are not exposing workers, monitoring and protection procedures may be relaxed. Experience has shown that some paints in most buildings will contain low concentrations of lead and disturbance of those paints are still regulated under the OSHA lead standard, 29 CFR 1926.62. Low levels of lead found by XRF testing does not mean that the paints are free of lead, the paints may contain lead, and OSHA regulations apply anytime measurable amounts of lead are present in paints.

Settled and concealed dust above ceilings, and at other areas that are not routinely cleaned are assumed to have measurable concentrations of lead. Background levels of lead in dusts for a particular location will depend on many factors, including whether or not engines utilizing leaded gasoline were run in or near a building, and upon the age of the building, and thus the age of the dusts. Because the type of disturbance, quantity of lead dusts, cohesiveness of the dusts and room sizes will change, the airborne lead levels expected during the project will depend on the contractor's means and methods of conducting the work. The mere presence of lead in the dusts does not necessarily imply that a "hazard" exists which would require the use of specially trained workers to "abate" the "hazard".

There is no established correlation between settled or adhered lead dust concentrations and airborne concentrations. The OSHA regulations are essentially "performance based", if workers are exposed above the permissible exposure limits, then all of the requirements in the regulations become effective.

The EPA requires that actual construction or demolition debris that contains lead or lead-containing paint or other heavy metals be tested using the TCLP test to determine if the waste must be treated as hazardous waste. All federal, state and local standards regulating lead and lead-containing wastes are required to be followed during the renovation or demolition of portions of this building.

If the TCLP tests done on the waste stream(s) that are produced by the contractor are found to be classified as hazardous wastes, then those waste stream(s) will have to be packaged for shipping and disposal in

accordance with hazardous waste and transportation regulations. Because there are no hazardous waste landfills in Alaska, this report assumes that any hazardous waste disposal will take place in Seattle or elsewhere in the Pacific Northwest.

4. PCB-Containing Materials

The EPA has promulgated regulations (40 CFR Part 761) that cover the proper handling and disposal of PCB-containing materials. If any PCB-containing equipment is discovered, those materials are required to be disposed of at fully permitted hazardous waste facilities. The EPA regulates liquid PCBs differently from non-liquid materials. Workers who remove or handle PCB-containing or PCB-contaminated materials or who transport or dispose of PCB wastes must be trained and certified in hazardous waste operations and emergency response (HAZWOPER) as required by 29 CFR 1910.120 and the State of Alaska Department of Labor (8 AAC 61). The Department of Transportation under 49 CFR Parts 100-199 regulates the marking, packaging, handling and transportation of hazardous materials. All federal, state, and local standards regulating PCBs and PCB waste must be followed during this project.

5. Mercury-Containing Materials

Mercury-containing lamps are classified by the EPA as Universal Wastes. The EPA encourages that all Universal Wastes be recycled in accordance with 40 CFR 273. Mercury and mercury-containing products are considered hazardous waste if TCLP testing of the waste for mercury confirms the mercury content to be greater than the EPA criteria of 0.2 mg/l.

6. Other Hazardous Materials

Refrigerants

Refrigerators were present in breakroom and maintenance area that may be relocated prior to the demolition or become part of the demo debris. An "air dryer" was assumed to be present as part of the air compressor system. Typically, refrigeration systems with ODS shall be maintained in order to prevent discharge of ODS. Systems that are to be removed, or dismantled shall have refrigerants containing ODS recovered and disposed of or recycled in accordance with 40 CFR 82.

Chemical Hazards

The EPA has promulgated regulations (40 CFR Parts 260 to 299 amongst others) that cover the proper handling and disposal of waste chemicals, including listed wastes, which are ignitable, corrosive, reactive, toxic, or an acute hazardous waste or wastes that exhibit the characteristics of toxicity. All construction workers who are required to remove or handle chemical hazards or to transport or dispose of chemical wastes shall be trained and certified as required by the U.S. Department of Labor (29 CFR 1910.120) and the State of Alaska Department of Labor (8 AAC 61). Transportation of chemical hazards are regulated by Department of Transportation regulations under 49 CFR Parts 171 to 178 amongst others.

Waste heat transfer fluids (such as used heating/cooling system glycol or other circulating heating/cooling fluids) are a potentially hazardous waste and are required to be TCLP tested prior to disposal to determine if the fluids are classified as hazardous or non-hazardous waste per the EPA's RCRA regulations governing hazardous wastes. According to a study performed by the University of Northern Iowa, standard TCLP analysis using ICP SW 6010 testing procedures commonly report levels of Arsenic and Selenium over regulatory thresholds due to interferences in the matrix. That report concluded that additional analysis should be performed to refute the presence of Arsenic or Selenium over the regulatory levels by either mass spectrometry using method SW 6020, or by graphite furnace using method SW 7060. Some heat transfer fluids may also contain potentially hazardous additives that modify the properties of the fluids for use in a particular system. It is recommended that the contractor consult with the persons responsible for maintaining the system to determine if any additives that may be potentially hazardous were used in the system to further determine disposal requirements.

Radioactive Materials

Self-luminous products that contain Tritium, Krypton-85, or Promethium-147 are considered radioactive. There are special disposal requirements for products that contain Tritium, Krypton-85, or Promethium-147 that are generally licensed. Data from the Nuclear Regulatory Commission (NRC) indicates that most all Tritium powered exit signs are generally licensed and therefore must be disposed of at a licensed disposal facility or returned to the manufacturer/distributor for disposal. Licensed radioactive products are regulated by Nuclear Regulatory Commission standard 10 CFR 20 and 10 CFR 32. Smoke detectors were present in the project area that may contain a radioactive material. If the detectors are of the ionization type they typically contain a small amount of Americium. When removed prior to demolition, the detectors should be returned to the owner for reuse or returned to the manufacturer for disposal or recycling. There are no licensed disposal facilities for radioactive wastes in Alaska.

F. RECOMMENDATIONS

Disposal of hazardous materials is often difficult and expensive in Rural Alaska. It is possible to obtain a one-time permit to dispose of non-friable, non-RACM asbestos materials from the Alaska Department of Environmental Conservation, however that process is neither fast nor inexpensive. Because Haines receives barge services, it is likely to be less expensive to barge out asbestos materials. Lead-containing materials, if they are not also asbestos-containing materials are often possible to dispose of locally, but in general, painted materials, with lead at measurable concentrations, are not allowed to be burned. Lead-containing materials which have been classified as hazardous waste, and chemical hazards are required to be disposed of at permitted landfills, which will require air freight or barge for disposal.

1. Asbestos-Containing Materials

The asbestos-containing materials identified in the building are typically intact condition and are classified as both friable and non-friable ACM. All asbestos-containing materials that will be disturbed by the planned renovation work are required to be removed by trained asbestos workers. All friable asbestos-containing materials are required to be removed by trained asbestos workers. Refer to Section 02 82 33 Removal and Disposal of Asbestos Containing Materials.

2. Dusts with Asbestos

Dusts with measurable concentrations of asbestos are assumed to be present, but are not classified as asbestos-containing materials, or as debris from asbestos-containing materials. Workers disturbing dusts are required to have hazard communication training in accordance with OSHA regulations but are not required to receive 40 hours of training, which is required for asbestos workers. The contractor will need to choose means and methods to control worker exposures to airborne contaminants. At least an initial exposure assessment or data from previous air monitoring is needed to show that worker exposures are maintained below the OSHA permissible exposure limits (PELs). Refer to Section 01 35 45 Airborne Contaminant Control.

3. Lead-Containing Materials

Federal OSHA (29 CFR 1926.62) and the State of Alaska (8 AAC Chapter 61) have promulgated regulations that apply to all construction work where employees may be exposed to lead, including disturbance of paints with low concentrations of lead.

Worker exposure to lead may be able to be controlled below the OSHA permissible exposure limit if proper engineering controls and procedures are used during renovation. Lead is a potentially hazardous waste, and the EPA requires that all wastes that contains lead be tested to determine if they must be treated as hazardous waste. A TCLP test of the waste stream(s) produced by the Contractor's means and methods are required to be performed to determine if those wastes will be classified as hazardous or non-hazardous. Refer to Section 01 35 45 Airborne Contaminant Control and Section 02 83 33 Removal and Disposal of Materials Containing Lead.

4. PCB-Containing Materials

PCB-containing ballasts scheduled for removal or replacement will need to be removed, handled, packaged and disposed of in accordance with all regulations. Refer to Section 02 84 18 Removal and Disposal of Chemical Hazards.

5. Mercury-Containing Materials

Mercury-containing materials will need to be removed, handled, packaged, and disposed of in accordance with all regulations. If mercury-containing lamps are handled and disposed of in accordance with the Universal Waste Regulations, no TCLP test is required. If the Contractor chooses to perform a TCLP test of fluorescent lamps, the test shall be conducted in accordance with the requirements of ANSI/NEMA Standard Procedure for Fluorescent Lamp Sample Preparation and Toxicity Characteristic Leaching Procedure, C78.LL 1256-2003 or latest version. Refer to Section 02 84 18 Removal and Disposal of Chemical Hazards.

6. Other Hazardous Materials

Radioactive materials scheduled for removal will need to be removed, handled, packaged and disposed of in accordance with all regulations. Refer to Section 02 84 18 Removal and Disposal of Chemical Hazards.

Refrigeration units with ODS scheduled for removal will need to be removed, handled, packaged, and disposed of in accordance with all regulations. ODS will need to be removed, handled, packaged, and disposed of in accordance with all regulations. Refer to Section 02 84 18 Removal and Disposal of Chemical Hazards.

The common household chemicals shall be properly disposed of in accordance with all regulations and the requirements of the disposal site. Refer to Section 02 84 18 Removal and Disposal of Chemical Hazards.

Heat transfer fluids will need to be removed, handled, packaged, and disposed of in accordance with all regulations. Refer to Section 02 84 18 Removal and Disposal of Chemical Hazards.

G. LIMITATIONS

The conclusions and recommendations contained in this report are based upon professional opinions with regard to the subject matter. These opinions have been arrived at in accordance with currently accepted environmental consulting and engineering standards and practices and are subject to the following inherent limitations:

1. Accuracy of Information

The laboratory reports utilized in this assessment were provided by the accredited laboratories cited in this report. Although the conclusions, opinions, and recommendations are based in part on such information, our services did not include the verification of accuracy or authenticity of such reports. Should such information provided be found to be inaccurate or unreliable, EHS-Alaska, Inc. reserves the right to amend or revise its conclusions, opinions, and/or recommendations.

2. Site Conditions

This limited survey did not include investigation of the entire site and may not be valid outside the survey area. The intent of this survey was to identify common hazardous materials that will be disturbed during the demolition. This survey is not intended to be utilized as the sole design document for abatement. This survey was conducted while the site was occupied. All inspections were performed with furniture, equipment and/or stored items in place. The scope of work for this survey did not include identification of all potentially hazardous materials that may be present at this site and was limited to the scope of work agreed upon with our client. Although a concerted effort was made to identify those common hazardous materials likely to be affected by this project, some hazardous materials may have been hidden by furniture, equipment or stored items and may not have been identified. The survey investigated representative materials and items, such as lights and mechanical components. Variations may occur between materials and items that appear to be the same, but are actually of different construction or materials. Other asbestos-containing or potentially hazardous materials may be present in the facilities that were concealed by structural members, walls, ceilings or floor coverings, or in materials where testing was not conducted.

3. Changing Regulatory Constraints

The regulations concerning hazardous materials are constantly changing, including the interpretations of the regulations by the local and national regulating agencies. Should the regulations or their interpretation be changed from our current understanding, EHS-Alaska, Inc. reserves the right to amend or revise its conclusions, opinions, and/or recommendations.

APPENDIX A

Asbestos Bulk Sample Field Survey Data Sheets and Laboratory Reports



EHS ALASKA
INCORPORATED

EHS-Alaska, Inc.

11901 Business Blvd., Suite 208, Eagle River, AK 99577

(907) 694-1383 • (907) 694-1382 fax

e-mail • ehsak@ehs-alaska.com

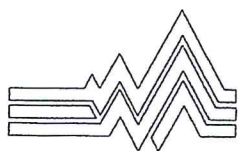
PROJECT NO: 8000-01	PROJECT NAME: DOTPF Haines M & O Building	FACILITY: 800 Haines Hwy Haines, AK 99827	COLLECTION DATE: 01/05/23
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CHAIN OF CUSTODY RECORD

ANALYSIS REQUESTED:	<input checked="" type="checkbox"/> PLM BULK <input type="checkbox"/> LEAD DUST <input type="checkbox"/> TEM MICROVAC DUST (ASTM 5756)	<input type="checkbox"/> PLM DUST <input type="checkbox"/> LEAD TCLP <input type="checkbox"/> LEAD PPM	<input type="checkbox"/> TEM BULK <input type="checkbox"/> LEAD PPM	TYPE: <input checked="" type="checkbox"/> ASBESTOS <input type="checkbox"/> LEAD	TURNAROUND: 3 DAYS	DISPOSAL: NORMAL	QUANTITY: 23
COLLECTED BY (signature) Rob Klaswick PRINTED NAME 0000-5391 / T-30171-516 CERT# / AHERA# FedEx SHIPPING METHOD 7710 1190 5999 COURIER (signature) 1-12-23 / 11:00am DATE/TIME		IATL SELECTED LABORATORY SAMPLES ACCEPTED BY DATE/TIME JAN 13 2023 ANALYST'S SIGNATURE DATE JAN 13 2023		SPECIAL INSTRUCTIONS / COMMENTS: LAB: RETURN A SIGNED COPY OF THIS FORM WITH THE FINAL REPORT TO EHS-ALASKA, INC. See sample location drawing for more detailed explanation of exact locations.			

FIELD SURVEY DATA

EHS SAMPLE NO. LAB ID NO	SAMPLE DESCRIPTION, (COLOR, MATERIAL TYPE, LAYERS, FRIABILITY)	LOCATION/COMMENTS (INCLUDING PHOTO/XREF)	RESULTS FOR EHS-ALASKA USE ONLY
HM&O2301-A01 7553032	White GWB	Breakroom, Ceiling. Photo P133	ND
HM&O2301-A02 7553033	White Joint Compound	Breakroom, Ceiling. Photo P133	ND
HM&O2301-A03 7553034	White Joint Compound	Breakroom, East Wall (North End), Fluorescent Light Fixture GWB Wall Penetration. Photo P134	ND
HM&O2301-A04 7553035	White Joint Compound	Breakroom, East Wall (South End), Fluorescent Light Fixture GWB Wall Penetration. Photo P135	ND
HM&O2301-A05 7553036	Off-White Caulk	Bay #1, North Wall, Vertical Conduit Against GWB Wall, Outside Tire Room. Photo P145	ND
HM&O2301-A06 7553037	Off-White Caulk	Bay #1, North Wall, Vertical Conduit Against GWB Wall, Outside Tire Room. Photo P145	ND
HM&O2301-A07 7553038	Tan Thermal System Insulation	Bay #1, North Wall, "Elbow" Pipe Fitting. Photo P138	ND
HM&O2301-A08 7553039	White Thermal System Insulation <i>lab</i> <i>also reported white wraps</i>	Bay #1, North Wall, Straight Vertical Pipe. Photo P137	<i>Both layers</i> -ND
HM&O2301-A09 7553040	Off-White Thermal System Insulation	Storage Loft, Along South Wall, Horizontal Pipe Run, Above Breakroom, Access is Via Tire Room. Photo P144	15% Asbestos 1% Chrysotile



EHS ALASKA
INCORPORATED

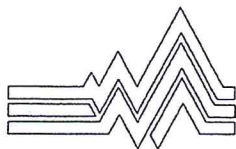
EHS-Alaska, Inc.

11901 Business Blvd., Suite 208, Eagle River, AK 99577

(907) 694-1383 • (907) 694-1382 fax

e-mail • ehsak@ehs-alaska.com

PROJECT NO:	PROJECT NAME:	FACILITY:	COLLECTION DATE:
8000-01	DOTPF Haines M & O Building	800 Haines Hwy Haines, AK 99827	01/05/23
FIELD SURVEY DATA			
EHS SAMPLE NO.	SAMPLE DESCRIPTION, (COLOR, MATERIAL TYPE, LAYERS, FRIABILITY)	LOCATION/COMMENTS (INCLUDING PHOTO/XREF)	RESULTS FOR EHS-ALASKA USE ONLY
LAB ID NO			
HM&O2301-A10 7553041	Off-White Joint Compound	Bay #1, North Wall, Above Entrance to Tire Room. Photo P146	ND
HM&O2301-A11 7553042	White GWB	Bay #1, North Wall, Above Entrance to Tire Room. Photo P146	ND
HM&O2301-A12 7553043	Off-White Joint Compound	Bay #1, North Wall, Above Entrance to Boiler Room. Photo P147	ND
HM&O2301-A13 7553044	Off-White Thermal System Insulation <i>lab also reported white wrap</i>	Bay #1, Outside Boiler Room, Vertical Pipe Run, East of HVAC. Photo P148	<i>Both Layers - ND</i>
HM&O2301-A14 7553045	Off-White Thermal System Insulation	Bay #1, Above Office Entrance, "Elbow" Pipe Fitting Insulation is Under PVC Protective Cap. Photo P151	ND
HM&O2301-A15 7553046	Off-White Joint Compound	Bay #1, North Wall, Above Entrance to Office. Photo P152	ND
HM&O2301-A16 7553047	Off-White Joint Compound	Boiler Room, S.W. Corner. Photo P153	ND
HM&O2301-A17 7553048	Off-White Joint Compound	Boiler Room, Above Door. Photo P154	ND
HM&O2301-A18 7553049	Off-White Thermal System Insulation	Boiler Room, Pipe Insulation at "T" Fitting, Along South Wall. Photo P155	<i>1500 Amstar 170 Chemcrete</i>
HM&O2301-A19 7553050	Green Gasket	Boiler Room, Flange, Top of Boiler. Photo P156	ND
HM&O2301-A20 7553051	Gray Gasket	Boiler Room, Steam Trap, Front of Boiler. Photo P157	ND
HM&O2301-A21 7553052	Brown Peel & Stick Floor Tile	Office, Raised Floor Area. Photo P161	ND
HM&O2301-A22 7553053	Off-White Joint Compound	Bat #2, South Wall. Photo P163	ND
HM&O2301-A23 7553054	Off-White Thermal System Insulation	Bay #2, South Wall, "Elbow" Pipe Fitting Insulation is Under PVC Protective Cap. Photo P165	ND



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e-mail • ehsak@ehs-alaska.com

PROJECT NO: 8000-01	PROJECT NAME: DOTPF Haines M & O Building	FACILITY: 800 Haines Hwy Haines, AK 99827	COLLECTION DATE: 01/05/23
FIELD SURVEY DATA			
EHS SAMPLE NO.	SAMPLE DESCRIPTION, (COLOR, MATERIAL TYPE, LAYERS, FRIABILITY)	LOCATION/COMMENTS (INCLUDING PHOTO/XREF)	RESULTS FOR EHS-ALASKA USE ONLY
LAB ID NO			
END	END	END	

CERTIFICATE OF ANALYSIS

Client: EHS Alaska Incorporated
11901 Business Blvd., Ste 208
Eagle River AK 99577


Report Date: 1/17/2023
Report No.: 676214 - PLM
Project: DOTPF Haines M&O Bldg; 800 Haines Hwy
Project No.: 8000-01

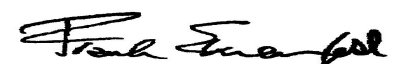
Client: EHS511

PLM BULK SAMPLE ANALYSIS SUMMARY

Lab No.: 7553032 Client No.: HMO2301-A01 <u>Percent Asbestos:</u> <i>None Detected</i>	Analyst Observation: White Drywall Client Description: White GWB <u>Percent Non-Asbestos Fibrous Material:</u> None Detected	Location: Breakroom Ceiling - Photo P133 Facility: <u>Percent Non-Fibrous Material:</u> 100
Lab No.: 7553033 Client No.: HMO2301-A02 <u>Percent Asbestos:</u> <i>None Detected</i>	Analyst Observation: White Joint Compound Client Description: White Joint Compound <u>Percent Non-Asbestos Fibrous Material:</u> None Detected	Location: Breakroom Ceiling - Photo P133 Facility: <u>Percent Non-Fibrous Material:</u> 100
Lab No.: 7553034 Client No.: HMO2301-A03 <u>Percent Asbestos:</u> <i>None Detected</i>	Analyst Observation: White Joint Compound Client Description: White Joint Compound <u>Percent Non-Asbestos Fibrous Material:</u> None Detected	Location: Breakroom, East Wall (North End) - Photo P134 Facility: <u>Percent Non-Fibrous Material:</u> 100
Lab No.: 7553035 Client No.: HMO2301-A04 <u>Percent Asbestos:</u> <i>None Detected</i>	Analyst Observation: White Joint Compound Client Description: White Joint Compound <u>Percent Non-Asbestos Fibrous Material:</u> None Detected	Location: Breakroom, East Wall (South End) - Photo P135 Facility: <u>Percent Non-Fibrous Material:</u> 100
Lab No.: 7553036 Client No.: HMO2301-A05 <u>Percent Asbestos:</u> <i>None Detected</i>	Analyst Observation: Off-White Caulk Client Description: Off-White Caulk <u>Percent Non-Asbestos Fibrous Material:</u> None Detected	Location: Bay #1, North Wall, Vertical Conduit - Photo P145 Facility: <u>Percent Non-Fibrous Material:</u> 100
Lab No.: 7553037 Client No.: HMO2301-A06 <u>Percent Asbestos:</u> <i>None Detected</i>	Analyst Observation: Off-White Caulk Client Description: Off-White Caulk <u>Percent Non-Asbestos Fibrous Material:</u> None Detected	Location: Bay #1, North Wall, Vertical Conduit - Photo P145 Facility: <u>Percent Non-Fibrous Material:</u> 100

Please refer to the Appendix of this report for further information regarding your analysis.

Date Received: 1/13/2023
Date Analyzed: 01/17/2023
Signature: 
Analyst: David Hayes

Approved By: 
Frank E. Ehrenfeld, III
Laboratory Director

CERTIFICATE OF ANALYSIS

Client: EHS Alaska Incorporated
11901 Business Blvd., Ste 208
Eagle River AK 99577

Report Date: 1/17/2023
Report No.: 676214 - PLM
Project: DOTPF Haines M&O Bldg; 800 Haines Hwy
Project No.: 8000-01

Client: EHS511

PLM BULK SAMPLE ANALYSIS SUMMARY

Lab No.: 7553038 Client No.: HMO2301-A07	Analyst Observation: Lt Grey Insulation Client Description: Tan Thermal System Insulation	Location: Bay #1, North Wall, "Elbow" Pipe Fitting - Photo P138 Facility: Percent Non-Fibrous Material:
Percent Asbestos: <i>None Detected</i>	Percent Non-Asbestos Fibrous Material: 15 Fibrous Glass 1 Cellulose	84


Lab No.: 7553039 Client No.: HMO2301-A08	Analyst Observation: White Wrap Client Description: White Thermal System Insulation	Location: Bay #1, North Wall, Straight Vertical Pipe - Photo P137 Facility: Percent Non-Fibrous Material:
Percent Asbestos: <i>None Detected</i>	Percent Non-Asbestos Fibrous Material: 65 Cellulose	35

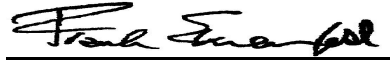
Lab No.: 7553039(L2) Client No.: HMO2301-A08	Analyst Observation: White Insulation Client Description: White Thermal System Insulation	Location: Bay #1, North Wall, Straight Vertical Pipe - Photo P137 Facility: Percent Non-Fibrous Material:
Percent Asbestos: <i>None Detected</i>	Percent Non-Asbestos Fibrous Material: 5 Synthetic Trace Cellulose	95

Lab No.: 7553040 Client No.: HMO2301-A09	Analyst Observation: Off-White Insulation Client Description: Off-White Thermal System Insulation	Location: Storage Loft, Along South Wall - Photo P144 Facility: Percent Non-Fibrous Material:
Percent Asbestos: <i>15 Amosite</i> <i>PC 1 Chrysotile</i>	Percent Non-Asbestos Fibrous Material: None Detected	84

Lab No.: 7553041 Client No.: HMO2301-A10	Analyst Observation: Off-White Joint Compound Client Description: Off-White Joint Compound	Location: Bay #1, North Wall, Above Entrance to Tire Room - Photo P146 Facility: Percent Non-Fibrous Material:
Percent Asbestos: <i>None Detected</i>	Percent Non-Asbestos Fibrous Material: None Detected	100

Please refer to the Appendix of this report for further information regarding your analysis.

Date Received: 1/13/2023
Date Analyzed: 01/17/2023
Signature: 
Analyst: David Hayes

Approved By: 
Frank E. Ehrenfeld, III
Laboratory Director


CERTIFICATE OF ANALYSIS


Client: EHS Alaska Incorporated 11901 Business Blvd., Ste 208 Eagle River AK 99577	Report Date: 1/17/2023 Report No.: 676214 - PLM Project: DOTPF Haines M&O Bldg; 800 Haines Hwy Project No.: 8000-01
Client: EHS511	

PLM BULK SAMPLE ANALYSIS SUMMARY

Lab No.: 7553042 Client No.: HMO2301-A11	Analyst Observation: White Drywall Client Description: White GWB	Location: Bay #1, North Wall, Above Entrance to Tire Room - Photo P146 Facility: Percent Non-Fibrous Material:
Percent Asbestos: <i>None Detected</i>	Percent Non-Asbestos Fibrous Material: Trace Cellulose	100
Lab No.: 7553043 Client No.: HMO2301-A12	Analyst Observation: Off-White Joint Compound Client Description: Off-White Joint Compound	Location: Bay #1, North Wall, Above Entrance to Boiler Room - Photo P147 Facility: Percent Non-Fibrous Material:
Percent Asbestos: <i>None Detected</i>	Percent Non-Asbestos Fibrous Material: None Detected	100
Lab No.: 7553044 Client No.: HMO2301-A13	Analyst Observation: White Wrap Client Description: Off-White Thermal System Insulation	Location: Bay #1, Outside Boiler Room, Vertical Pipe Run - Photo P148 Facility: Percent Non-Fibrous Material:
Percent Asbestos: <i>None Detected</i>	Percent Non-Asbestos Fibrous Material: 75 Cellulose	25
Lab No.: 7553044(L2) Client No.: HMO2301-A13	Analyst Observation: White Insulation Client Description: Off-White Thermal System Insulation	Location: Bay #1, Outside Boiler Room, Vertical Pipe Run - Photo P148 Facility: Percent Non-Fibrous Material:
Percent Asbestos: <i>None Detected</i>	Percent Non-Asbestos Fibrous Material: 10 Cellulose	90
Lab No.: 7553045 Client No.: HMO2301-A14	Analyst Observation: White Insulation Client Description: Off-White Thermal System Insulation	Location: Bay #1, Above Office Entrance - Photo P151 Facility: Percent Non-Fibrous Material:
Percent Asbestos: <i>None Detected</i>	Percent Non-Asbestos Fibrous Material: 15 Cellulose	85
Lab No.: 7553046 Client No.: HMO2301-A15	Analyst Observation: Off-White Joint Compound Client Description: Off-White Joint Compound	Location: Bay #1, North Wall, Above Entrance to Office - Photo P152 Facility: Percent Non-Fibrous Material:
Percent Asbestos: <i>None Detected</i>	Percent Non-Asbestos Fibrous Material: None Detected	100

Please refer to the Appendix of this report for further information regarding your analysis.

Date Received: 1/13/2023
Date Analyzed: 01/17/2023
Signature: 
Analyst: David Hayes

Approved By: 
Frank E. Ehrenfeld, III
Laboratory Director

CERTIFICATE OF ANALYSIS

Client: EHS Alaska Incorporated 11901 Business Blvd., Ste 208 Eagle River AK 99577	Report Date: 1/17/2023 Report No.: 676214 - PLM Project: DOTPF Haines M&O Bldg; 800 Haines Hwy Project No.: 8000-01
Client: EHS511	

PLM BULK SAMPLE ANALYSIS SUMMARY

Lab No.: 7553047 Client No.: HMO2301-A16	Analyst Observation: Off-White Joint Compound Client Description: Off-White Joint Compound	Location: Boiler Room, SW Corner - Photo P153 Facility: Percent Non-Fibrous Material:
Percent Asbestos: <i>None Detected</i>	Percent Non-Asbestos Fibrous Material: None Detected	Percent Non-Fibrous Material: 100
Lab No.: 7553048 Client No.: HMO2301-A17	Analyst Observation: White Joint Compound Client Description: Off-White Joint Compound	Location: Boiler Room, Above Door - Photo P154 Facility: Percent Non-Fibrous Material:
Percent Asbestos: <i>None Detected</i>	Percent Non-Asbestos Fibrous Material: None Detected	Percent Non-Fibrous Material: 100
Lab No.: 7553049 Client No.: HMO2301-A18	Analyst Observation: White Insulation Client Description: Off-White Thermal System Insulation	Location: Boiler Room, Pipe Insulation at "T" Fitting - Photo P155 Facility: Percent Non-Fibrous Material:
Percent Asbestos: <i>15 Amosite PC 1 Chrysotile</i>	Percent Non-Asbestos Fibrous Material: None Detected	Percent Non-Fibrous Material: 84
Lab No.: 7553050 Client No.: HMO2301-A19	Analyst Observation: Green Gasket Client Description: Green Gasket	Location: Boiler Room, Flange, Top of Boiler - Photo P156 Facility: Percent Non-Fibrous Material:
Percent Asbestos: <i>None Detected</i>	Percent Non-Asbestos Fibrous Material: 3 Cellulose 2 Fibrous Glass	Percent Non-Fibrous Material: 95
Lab No.: 7553051 Client No.: HMO2301-A20	Analyst Observation: Grey Gasket Client Description: Grey Gasket	Location: Boiler Room, Steam Trap, Front of Boiler - Photo P157 Facility: Percent Non-Fibrous Material:
Percent Asbestos: <i>None Detected</i>	Percent Non-Asbestos Fibrous Material: 5 Cellulose 10 Synthetic 3 Fibrous Glass	Percent Non-Fibrous Material: 82

Please refer to the Appendix of this report for further information regarding your analysis.

Date Received: 1/13/2023
Date Analyzed: 01/17/2023
Signature: *David Hayes*
Analyst: David Hayes

Approved By: *Frank E. Ehrenfeld, III*
Frank E. Ehrenfeld, III
Laboratory Director

CERTIFICATE OF ANALYSIS

Client: EHS Alaska Incorporated
11901 Business Blvd., Ste 208
Eagle River AK 99577

Client: EHS511

Report Date: 1/17/2023
Report No.: 676214 - PLM
Project: DOTPF Haines M&O Bldg; 800 Haines Hwy
Project No.: 8000-01

PLM BULK SAMPLE ANALYSIS SUMMARY

Lab No.: 7553052
Client No.: HMO2301-A21

Analyst Observation: Brown Floor Tile
Client Description: Brown Peel and Stick Floor Tile

Location: Office, Raised Floor Area - Photo P161

Percent Asbestos:
None Detected

Percent Non-Asbestos Fibrous Material:
Trace Cellulose

Facility:
Percent Non-Fibrous Material:
100

Lab No.: 7553053
Client No.: HMO2301-A22

Analyst Observation: Off-White Joint Compound
Client Description: Off-White Joint Compound

Location: Bat #2, South Wall - Photo P163
Facility:

Percent Asbestos:
None Detected

Percent Non-Asbestos Fibrous Material:
None Detected

Percent Non-Fibrous Material:
100

Lab No.: 7553054
Client No.: HMO2301-A23

Analyst Observation: Lt Grey Insulation
Client Description: Off-White Thermal System Insulation


Location: Bat #2, South Wall, "Elbow" Pipe Fitting - Photo P165
Facility:


Percent Asbestos:
None Detected

Percent Non-Asbestos Fibrous Material:
15 Fibrous Glass
Trace Cellulose

Percent Non-Fibrous Material:
85

Please refer to the Appendix of this report for further information regarding your analysis.

Date Received: 1/13/2023
Date Analyzed: 01/17/2023
Signature: 
Analyst: David Hayes

Approved By: 
Frank E. Ehrenfeld, III
Laboratory Director

CERTIFICATE OF ANALYSIS

Client: EHS Alaska Incorporated
11901 Business Blvd., Ste 208
Eagle River AK 99577

Report Date: 1/17/2023
Report No.: 676214 - PLM
Project: DOTPF Haines M&O Bldg; 800 Haines Hwy
Project No.: 8000-01

Client: EHS511

Appendix to Analytical Report

Customer Contact: Cali Swatowski

Method: 40 CFR Appendix E to Subpart E of Part 763, interim method for the Determination of Asbestos in Bulk Insulation Samples, USEPA 600, R93-116 and NYSDOH ELAP 198.1 as needed.

This appendix seeks to promote greater understanding of any observations, exceptions, special instructions, or circumstances that the laboratory needs to communicate to the client concerning the above samples. The information below is used to help promote your ability to make the most informed decisions for you and your customers. Please note the following points of contact for any questions you may have.

iATL Customer Service: customerservice@iatl.com

iATL Office Manager: wchampion@iatl.com

iATL Account Representative: Semih Kocahasan

Sample Login Notes: See Batch Sheet Attached

Sample Matrix: Bulk Building Materials

Exceptions Noted: See Following Pages

General Terms, Warrants, Limits, Qualifiers:

General information about iATL capabilities and client/laboratory relationships and responsibilities are spelled out in iATL policies that are listed at www.iATL.com and in our Quality Assurance Manual per ISO 17025 standard requirements. The information therein is a representation of iATL definitions and policies for turnaround times, sample submittal, collection media, blank definitions, quantification issues and limit of detection, analytical methods and procedures, sub-contracting policies, results reporting options, fees, terms, and discounts, confidentiality, sample archival and disposal, and data interpretation.

iATL warrants the test results to be of a precision normal for the type and methodology employed for each sample submitted. iATL disclaims any other warrants, expressed or implied, including warranty of fitness for a particular purpose and warranty of merchantability. iATL accepts no legal responsibility for the purpose for which the client uses test results. Any analytical work performed must be governed by our Standard Terms and Conditions. Prices, methods and detection limits may be changed without notification. Please contact your Customer Service Representative for the most current information.

This confidential report relates only to those item(s) tested and does not represent an endorsement by NIST-NVLAP, AIHA LAP LLC, or any agency of local, state or province governments nor of any agency of the U.S. government.

This report shall not be reproduced except in full, without written approval of the laboratory.

Information Pertinent to this Report:

Analysis by US EPA 600 93-116: Determination of Asbestos in Bulk Building Materials by Polarized Light Microscopy (PLM).

Certifications:

- NIST-NVLAP No. 101165-0
- NYSDOH-ELAP No. 11021
- AIHA-LAP, LLC No. 100188

Quantification at <0.25% by volume is possible with this method. (PC) Indicates Stratified Point Count Method performed. (PC-Trace) means that asbestos was detected but is not quantifiable under the Point Counting regimen. PC Trace represents a <0.25% amount. Analysis includes all distinct separable layers in accordance with EPA 600 Method. If not reported or otherwise noted, layer is either not present or the client has specifically requested that it not be analyzed (ex. analyze until positive instructions). Small asbestos fibers may be missed by PLM due to resolution limitations of the optical microscope. Therefore, PLM is not consistently reliable in detecting asbestos in non-friable organically bound (NOB) materials. Quantitative transmission electron microscopy (TEM) is currently the only method that can pronounce materials as non-asbestos containing.

Analytical Methodology Alternatives: Your initial request for analysis may not have accounted for recent advances in regulatory requirements or advances in technology that are routinely used in similar situations for other qualified projects. You may have the option to explore additional analysis for further information. Below are a few options, listed as the matrix followed by the appropriate methodology. Also included are links to more information on our website.

Bulk Building Materials that are Non-Friable Organically Bound (NOB) by Gravimetric Reduction techniques employing PLM and TEM: ELAP 198.6 (PLM-NOB), ELAP 198.4 (TEM-NOB) See additional information at the end of this appendix.

CERTIFICATE OF ANALYSIS

Client: EHS Alaska Incorporated
11901 Business Blvd., Ste 208
Eagle River AK 99577

Report Date: 1/17/2023
Report No.: 676214 - PLM
Project: DOTPF Haines M&O Bldg; 800 Haines Hwy
Project No.: 8000-01

Client: EHS511

Loose Fill Vermiculite Insulation, Attic Insulation, Zonolite (copyright), etc.: US EPA 600 R-4/004 (multi-tiered analytical process)
Sprayed On Insulation/Fireproofing with Vermiculite (SOF-V): ELAP 198.8 (PLM-SOF-V)

Soil, sludge, sediment, aggregate, and like materials analyzed for asbestos or other elongated mineral particles (ex. erionite, etc.): ASTM D7521, CARB 435, and other options available

Asbestos in Surface Dust according to one of ASTM's Methods (very dependent on sampling collection technique – by TEM): ASTM D 5755, D5756, or D6480

Various other asbestos matrices (air, water, etc.) and analytical methods are available.

Disclaimers / Qualifiers:

There may be some samples in this project that have a "NOTE:" associated with a sample result. We use added disclaimers or qualifiers to inform the client about something that requires further explanation. Here is a list with highlighted disclaimers that may be pertinent to this project. For a full explanation of these and other disclaimers, please inquire at customerservice@iatl.com.

- 1) Note: No mastic provided for analysis.
- 2) Note: Insufficient mastic provided for analysis.
- 3) Note: Insufficient material provided for analysis.
- 4) Note: Insufficient sample provided for QC reanalysis.
- 5) Note: Different material than indicated on Sample Log / Description.
- 6) Note: Sample not submitted.
- 7) Note: Attached to asbestos containing material.
- 8) Note: Received wet.
- 9) Note: Possible surface contamination.
- 10) Note: Not building material. 1% threshold may not apply.
- 11) Note: Recommend TEM-NOB analysis as per EPA recommendations.
- 12) Note: Asbestos detected but not quantifiable.
- 13) Note: Multiple identical samples submitted, only one analyzed.
- 14) Note: Analyzed by EPA 600/R-93/116. Point Counting detection limit at 0.080%.
- 15) Note: Analyzed by EPA 600/R-93/116. Point Counting detection limit at 0.125%.
- 16) Note: This sample contains >10% vermiculite mineral. See Appendix for Recommendations for Vermiculite Analysis.

Recommendations for Vermiculite Analysis:

Several analytical protocols exist for the analysis of asbestos in vermiculite. These analytical approaches vary depending upon the nature of the vermiculite mineral being tested (e.g. un-processed gänge, homogeneous exfoliated books of mica, or mixed mineral composites). Please contact your client representative for pricing and turnaround time options available.

iATL recommends initial testing using the EPA 600/R-93/116 method. This method is specifically designed for the analysis of asbestos in bulk building materials. It provides an acceptable starting point for primary screening of vermiculite for possible asbestos.

Results from this testing may be inconclusive. EPA suggests proceeding to a multi-tiered analysis involving wet separation techniques in conjunction with PLM and TEM gravimetric analysis (EPA 600/R-04/004).

For New York State customers, NYSDOH requires disclaimers and qualifiers for various vermiculite containing samples that direct analysis via ELAP198.6 and ELAP198.8 for samples that contain >10% vermiculite mineral where ELAP198.6 may be used to evaluate the asbestos content of the material. However, any test result using ELAP198.6 will be reported with the following disclaimer: "ELAP198.6 method does not remove vermiculite and may underestimate the level of asbestos present in a sample containing >10% vermiculite."

Further information on this method and other vermiculite and asbestos issues can be found at the following: Agency for Toxic Substances and Disease Registry (ATSDR) www.atsdr.cdc.gov, United States Geological Survey (USGS) www.minerals.usgs.gov/minerals/, US EPA www.epa.gov/asbestos. The USEPA also has an informative brochure "Current Best Practices for Vermiculite Attic Insulation" EPA 747F03001 May 2003, that may assist the health and remediation professional. NYS customers please follow current NYSDOH ELAP requirements per policy on subject of surfacing and vermiculite, May 6, 2016, Testing Requirements for Surfacing Material Containing Vermiculite (https://www.wadsworth.org/sites/default/files/WebDoc/1198_8_02_2.pdf)

The following is a summary of the analytical process outlines in the EPA 600/R-04/004 Method:

- 1) **Analytical Step/Method:** Initial Screening by PLM, EPA 600R-93/116
Requirements/Comments: Minimum of 0.1 g of sample. ~0.25% for most samples.

CERTIFICATE OF ANALYSIS

Client: EHS Alaska Incorporated
11901 Business Blvd., Ste 208
Eagle River AK 99577

Report Date: 1/17/2023
Report No.: 676214 - PLM
Project: DOTPF Haines M&O Bldg; 800 Haines Hwy
Project No.: 8000-01

Client: EHS511

2)**Analytical Step/Method:** Wet Separation by PLM Gravimetric Technique, EPA R-04/004
Requirements/Comments: Minimum 50g** of dry sample. Analysis of "Sinks" only.

3)**Analytical Step/Method:** Wet Separation by PLM Gravimetric Technique, EPA R-04/004
Requirements/Comments: Minimum 50g** of dry sample. Analysis of "Floats" only.

4)**Analytical Step/Method:** Wet Separation by TEM Gravimetric Technique, EPA R-04/004
Requirements/Comments: Minimum 50g** of dry sample. Analysis of "Sinks" only.

5)**Analytical Step/Method:** Wet Separation by TEM Gravimetric Technique, EPA R-04/004
Requirements/Comments: Minimum 50g** of dry sample. Analysis of "Suspension" only.
*With advance notice and confirmation by the laboratory.

**Approximately 1 Liter of sample in double-bagged container (~9x6 inch bag of sample).

New York State Department of Health requires that samples originating from NYS that they categorize as Non-friable Organically Bound materials can only be confirmed as None Detected for asbestos by method 198.4. See the table below for a list of those materials. (ENVIRONMENTAL LABORATORY APPROVAL PROGRAM CERTIFICATION MANUAL - ITEM No. 198.1, Revision Date 5/6/16)

*Asphalt Shingles, Caulking, Ceiling Tiles with Cellulose, Duct Wrap, Glazing, Mastic, Paint Chips, Resilient Floor Tiles, Rubberized Asbestos Gaskets, Siding Shingles, Vinyl Asbestos Tile, NOB materials (other than SM-V) with <10% vermiculite, Any material (Friable or NOB other than SM-V) with >10% vermiculite.

Statistically derived uncertainty with any measure should be taken into consideration when reviewing and interpreting all reported data and results. A more comprehensive listing of accuracy, precision, and uncertainty as it impacts this method is available upon request.

APPENDIX B

Lead Analyzer Test Results

LEAD ANALYZER TEST RESULTS

Heuresis Pb200i, Serial No. 1770

NO.	SITE	INSPECTOR	FLOOR	ROOM	COMPONENT	SUBSTRATE	CONDITION	COLOR	DURATION	TIME	RESULTS		
											LBP	mg/cm ²	+/- ERROR
1	DOT&PF - HAINES	KLASWICK	-	-	CALIBRATION	WOOD	-	GREEN	5	1/05/23 11:50:17	POSITIVE	1	0.1
2	DOT&PF - HAINES	KLASWICK	-	-	CALIBRATION	WOOD	-	GREEN	5	1/05/23 11:50:31	POSITIVE	1	0.1
3	DOT&PF - HAINES	KLASWICK	-	-	CALIBRATION	WOOD	-	GREEN	5	1/05/23 11:50:45	POSITIVE	1	0.1
4	DOT&PF - HAINES	KLASWICK	FIRST	EXTERIOR	SIDING	METAL	INTACT	BLUE	2	1/05/23 11:52:37	NEGATIVE	0.3	0.2
5	DOT&PF - HAINES	KLASWICK	FIRST	EXTERIOR	WINDOW FRAME	METAL	INTACT	WHITE	2	1/05/23 11:53:14	NEGATIVE	0.1	0.2
6	DOT&PF - HAINES	KLASWICK	FIRST	EXTERIOR	DOOR	WOOD	INTACT	LIGHT BLUE	2	1/05/23 11:54:50	NEGATIVE	0.2	0.2
7	DOT&PF - HAINES	KLASWICK	FIRST	EXTERIOR	DOOR FRAME	WOOD	INTACT	WHITE	2	1/05/23 11:55:22	NEGATIVE	0.2	0.2
8	DOT&PF - HAINES	KLASWICK	FIRST	EXTERIOR	DOOR FRAME	METAL	INTACT	RED	1	1/05/23 11:55:58	POSITIVE	6	0.3
9	DOT&PF - HAINES	KLASWICK	FIRST	EXTERIOR	DOOR HINGE	METAL	INTACT	GRAY	5	1/05/23 11:58:00	NEGATIVE	0.8	0.1
10	DOT&PF - HAINES	KLASWICK	FIRST	EXTERIOR	DOOR	WOOD	INTACT	BLUE	2	1/05/23 11:59:11	POSITIVE	2.9	0.2
11	DOT&PF - HAINES	KLASWICK	FIRST	EXTERIOR	WINDOW CASING	WOOD	INTACT	WHITE	2	1/05/23 12:00:03	POSITIVE	2.2	0.2
12	DOT&PF - HAINES	KLASWICK	FIRST	EXTERIOR	SIDING	METAL	INTACT	BLUE	2	1/05/23 12:01:00	NEGATIVE	0.2	0.2
13	DOT&PF - HAINES	KLASWICK	FIRST	EXTERIOR	DOOR	WOOD	INTACT	BLUE	2	1/05/23 12:02:24	NEGATIVE	0.2	0.2
14	DOT&PF - HAINES	KLASWICK	FIRST	EXTERIOR	DOOR HINGE	METAL	INTACT	GRAY	2	1/05/23 12:03:01	NEGATIVE	0.5	0.3
15	DOT&PF - HAINES	KLASWICK	FIRST	EXTERIOR	DOOR FRAME	METAL	INTACT	RED	1	1/05/23 12:03:55	POSITIVE	2.4	0.3
16	DOT&PF - HAINES	KLASWICK	FIRST	EXTERIOR	PANEL	WOOD	INTACT	BLUE	2	1/05/23 12:05:23	NEGATIVE	0.2	0.2
17	DOT&PF - HAINES	KLASWICK	FIRST	WASH BAY	WALL	WOOD	INTACT	WHITE	2	1/05/23 12:07:50	POSITIVE	2.3	0.2
18	DOT&PF - HAINES	KLASWICK	FIRST	WASH BAY	WINDOW SILL	WOOD	INTACT	BLUE	2	1/05/23 12:08:38	NEGATIVE	0.2	0.2
19	DOT&PF - HAINES	KLASWICK	FIRST	WASH BAY	WINDOW TRIM	WOOD	INTACT	BLUE	2	1/05/23 12:08:58	NEGATIVE	0.1	0.2
20	DOT&PF - HAINES	KLASWICK	FIRST	WASH BAY	DOOR	WOOD	INTACT	WHITE	2	1/05/23 12:09:46	POSITIVE	1.6	0.2
21	DOT&PF - HAINES	KLASWICK	FIRST	WASH BAY	DOOR CASING	WOOD	INTACT	WHITE	2	1/05/23 12:10:40	POSITIVE	2.8	0.2
22	DOT&PF - HAINES	KLASWICK	FIRST	WASH BAY	DOOR TRIM	WOOD	INTACT	BLUE	2	1/05/23 12:11:18	POSITIVE	1.3	0.2
23	DOT&PF - HAINES	KLASWICK	FIRST	WASH BAY	DOOR	WOOD	INTACT	WHITE	5	1/05/23 12:11:56	POSITIVE	1.2	0.1
24	DOT&PF - HAINES	KLASWICK	FIRST	WASH BAY	PIPE	METAL	INTACT	WHITE	2	1/05/23 12:13:09	POSITIVE	5.1	0.2
25	DOT&PF - HAINES	KLASWICK	FIRST	MAINT. BAY	CABINET	METAL	INTACT	YELLOW	1	1/05/23 12:15:19	NEGATIVE	0.1	0.3
26	DOT&PF - HAINES	KLASWICK	FIRST	MAINT. BAY	COLUMN	METAL	INTACT	WHITE	1	1/05/23 12:23:35	POSITIVE	10.8	0.3
27	DOT&PF - HAINES	KLASWICK	FIRST	MAINT. BAY	BEAM	METAL	INTACT	WHITE	1	1/05/23 12:24:16	POSITIVE	12.7	0.3
28	DOT&PF - HAINES	KLASWICK	FIRST	MAINT. BAY	PIPE	METAL	INTACT	WHITE	1	1/05/23 12:25:02	POSITIVE	7.3	0.3
29	DOT&PF - HAINES	KLASWICK	FIRST	MAINT. BAY	CONDUIT	METAL	INTACT	WHITE	2	1/05/23 12:26:22	NEGATIVE	0.4	0.2
30	DOT&PF - HAINES	KLASWICK	FIRST	MAINT. BAY	DOOR	WOOD	INTACT	WHITE	2	1/05/23 12:27:04	POSITIVE	3.5	0.2
31	DOT&PF - HAINES	KLASWICK	FIRST	MAINT. BAY	DOOR HINGE	METAL	INTACT	WHITE	2	1/05/23 12:27:47	POSITIVE	6.2	0.2
32	DOT&PF - HAINES	KLASWICK	FIRST	STORAGE	FLOOR	CONCRETE	INTACT	GRAY	5	1/05/23 12:30:01	POSITIVE	1	0.1
33	DOT&PF - HAINES	KLASWICK	FIRST	STORAGE	HAND RAIL	WOOD	INTACT	WHITE	2	1/05/23 12:30:53	NEGATIVE	0.1	0.2
34	DOT&PF - HAINES	KLASWICK	FIRST	STORAGE	RISER	WOOD	INTACT	WHITE	2	1/05/23 12:31:18	NEGATIVE	0.1	0.2
35	DOT&PF - HAINES	KLASWICK	FIRST	STORAGE	WALL	WOOD	INTACT	WHITE	2	1/05/23 12:32:13	NEGATIVE	0.1	0.2
36	DOT&PF - HAINES	KLASWICK	FIRST	STORAGE	WALL	WOOD	INTACT	WHITE	2	1/05/23 12:32:31	POSITIVE	2.3	0.2
37	DOT&PF - HAINES	KLASWICK	FIRST	STORAGE	FLOOR	WOOD	INTACT	OFF-WHITE	2	1/05/23 12:33:46	NEGATIVE	0	0.2
38	DOT&PF - HAINES	KLASWICK	FIRST	STORAGE	CEILING	WOOD	INTACT	WHITE	2	1/05/23 12:34:26	POSITIVE	2.5	0.2
39	DOT&PF - HAINES	KLASWICK	FIRST	OFFICE	WALL	DRYWALL	INTACT	WHITE	2	1/05/23 12:36:22	NEGATIVE	0.2	0.2
40	DOT&PF - HAINES	KLASWICK	FIRST	OFFICE	FLOOR	CONCRETE	INTACT	GRAY	1	1/05/23 12:37:03	NEGATIVE	0.3	0.3
41	DOT&PF - HAINES	KLASWICK	FIRST	OFFICE	WALL	WOOD	INTACT	GRAY	2	1/05/23 12:37:54	NEGATIVE	0.2	0.2
42	DOT&PF - HAINES	KLASWICK	FIRST	OFFICE	CEILING	DRYWALL	INTACT	WHITE	2	1/05/23 12:38:33	NEGATIVE	0.2	0.2
43	DOT&PF - HAINES	KLASWICK	FIRST	OFFICE	DOOR	WOOD	INTACT	WHITE	2	1/05/23 12:38:56	POSITIVE	1.5	0.2

LEAD ANALYZER TEST RESULTS

NO.	SITE	INSPECTOR	FLOOR	ROOM	COMPONENT	SUBSTRATE	CONDITION	COLOR	DURATION	TIME	RESULTS		
											LBP	mg/cm ²	+/- ERROR
44	DOT&PF - HAINES	KLASWICK	FIRST	OFFICE	DOOR TRIM	WOOD	INTACT	BLUE	2	1/05/23 12:39:32	POSITIVE	1.9	0.2
45	DOT&PF - HAINES	KLASWICK	FIRST	OFFICE	DOOR CASING	WOOD	INTACT	WHITE	2	1/05/23 12:39:59	POSITIVE	2.2	0.2
46	DOT&PF - HAINES	KLASWICK	FIRST	MAINT. BAY	DUCT	METAL	INTACT	WHITE	2	1/05/23 12:40:41	NEGATIVE	0.1	0.2
47	DOT&PF - HAINES	KLASWICK	FIRST	BOILER ROOM	DOOR	METAL	INTACT	WHITE	2	1/05/23 12:41:59	NEGATIVE	0.1	0.2
48	DOT&PF - HAINES	KLASWICK	FIRST	BOILER ROOM	DOOR CASING	METAL	INTACT	WHITE	2	1/05/23 12:42:23	NEGATIVE	0	0.2
49	DOT&PF - HAINES	KLASWICK	FIRST	BOILER ROOM	DOOR TRIM	WOOD	INTACT	WHITE	2	1/05/23 12:42:55	NEGATIVE	0.1	0.2
50	DOT&PF - HAINES	KLASWICK	FIRST	BOILER ROOM	GUARD RAIL	METAL	INTACT	GREEN	2	1/05/23 12:44:48	POSITIVE	1.6	0.3
51	DOT&PF - HAINES	KLASWICK	FIRST	BOILER ROOM	WALL	DRYWALL	INTACT	WHITE	2	1/05/23 12:45:43	NEGATIVE	0.3	0.2
52	DOT&PF - HAINES	KLASWICK	FIRST	BOILER ROOM	BOILER	METAL	INTACT	GRAY	2	1/05/23 12:46:26	NEGATIVE	0	0.2
53	DOT&PF - HAINES	KLASWICK	FIRST	BOILER ROOM	TANK	METAL	INTACT	OFF-WHITE	2	1/05/23 12:47:18	NEGATIVE	0	0.2
54	DOT&PF - HAINES	KLASWICK	FIRST	STORAGE	FLOOR	CONCRETE	INTACT	GRAY	1	1/05/23 12:49:01	NEGATIVE	0.3	0.3
55	DOT&PF - HAINES	KLASWICK	FIRST	STORAGE	WALL	WOOD	INTACT	WHITE	2	1/05/23 12:50:01	POSITIVE	3.6	0.2
56	DOT&PF - HAINES	KLASWICK	FIRST	OFFICE	WALL	WOOD	INTACT	WHITE	2	1/05/23 12:50:56	POSITIVE	3.4	0.2
57	DOT&PF - HAINES	KLASWICK	FIRST	OFFICE	FLOOR	CONCRETE	INTACT	GRAY	1	1/05/23 12:51:41	NEGATIVE	0.1	0.3
58	DOT&PF - HAINES	KLASWICK	FIRST	OFFICE	DOOR	WOOD	INTACT	WHITE	2	1/05/23 12:52:54	POSITIVE	2.1	0.2
59	DOT&PF - HAINES	KLASWICK	FIRST	BATHROOM	DOOR	WOOD	INTACT	WHITE	2	1/05/23 12:53:36	POSITIVE	1.8	0.2
60	DOT&PF - HAINES	KLASWICK	FIRST	BATHROOM	URINAL	CERAMIC	INTACT	WHITE	1	1/05/23 12:54:20	NEGATIVE	0.5	0.3
61	DOT&PF - HAINES	KLASWICK	FIRST	BATHROOM	TOILET	CERAMIC	INTACT	WHITE	1	1/05/23 12:54:48	NEGATIVE	0.4	0.3
62	DOT&PF - HAINES	KLASWICK	FIRST	BATHROOM	SINK	CERAMIC	INTACT	WHITE	5	1/05/23 12:55:10	NEGATIVE	0.8	0.1
63	DOT&PF - HAINES	KLASWICK	FIRST	COLD SHED	SIDING	METAL	INTACT	WHITE	2	1/05/23 12:58:00	NEGATIVE	0.1	0.2
64	DOT&PF - HAINES	KLASWICK	FIRST	COLD SHED	SIDING	METAL	INTACT	BLUE	2	1/05/23 12:58:19	NEGATIVE	0.2	0.2
65	DOT&PF - HAINES	KLASWICK	FIRST	COLD SHED	DOOR	METAL	INTACT	BLUE	2	1/05/23 12:59:34	NEGATIVE	0.2	0.2
66	DOT&PF - HAINES	KLASWICK	FIRST	COLD SHED	DOOR	METAL	INTACT	WHITE	2	1/05/23 12:59:56	NEGATIVE	0.1	0.2
67	DOT&PF - HAINES	KLASWICK	FIRST	COLD SHED	COLUMN	METAL	INTACT	WHITE	2	1/05/23 13:00:27	NEGATIVE	0.2	0.3
68	DOT&PF - HAINES	KLASWICK	FIRST	COLD SHED	BEAM	METAL	INTACT	WHITE	1	1/05/23 13:01:36	NEGATIVE	0.1	0.3
69	DOT&PF - HAINES	KLASWICK	FIRST	COLD SHED	DOOR	METAL	INTACT	GRAY	2	1/05/23 13:03:18	NEGATIVE	0	0.2
70	DOT&PF - HAINES	KLASWICK	FIRST	COLD SHED	DOOR CASING	METAL	INTACT	WHITE	1	1/05/23 13:03:48	NEGATIVE	0.1	0.3
71	DOT&PF - HAINES	KLASWICK	FIRST	COLD SHED	CONDUIT	METAL	INTACT	WHITE	2	1/05/23 13:04:20	NEGATIVE	0.2	0.2
72	DOT&PF - HAINES	KLASWICK	FIRST	COLD SHED	DOOR	METAL	INTACT	WHITE	2	1/05/23 13:07:44	NEGATIVE	0.1	0.2
73	DOT&PF - HAINES	KLASWICK	-	-	CALIBRATION	WOOD	-	GREEN	5	1/05/23 13:10:37	POSITIVE	1	0.1
74	DOT&PF - HAINES	KLASWICK	-	-	CALIBRATION	WOOD	-	GREEN	5	1/05/23 13:10:50	POSITIVE	1.1	0.1
75	DOT&PF - HAINES	KLASWICK	-	-	CALIBRATION	WOOD	-	GREEN	5	1/05/23 13:11:03	POSITIVE	1.1	0.1

Table Heading Descriptions:

Duration: This is the nominal time in "source" seconds that each sample was analyzed.

LBP: Results are shown as positive (POS \geq 1.0 mg/cm²) or negative (NEG < 1.0 mg/cm²). Positive results are shown in bold print.

mg/cm²: This is the testing results produced by the Heuresis Pb200i instrument in milligrams of lead per square centimeter (mg/cm²). The EPA defines lead based paint as paint containing lead at 1.0 mg/cm² or greater. A negative number is a result of an internal computation made by the instrument and should be interpreted as zero. Even though paint may be termed negative (less than 1.0 mg/cm²) by EPA definition, disturbance of the paint may still be regulated by OSHA under 29 CFR 1926.62. Where lead is present at any level, appropriate engineering controls, work practices and personal protective equipment should be used until a negative exposure assessment can be determined. <LOD indicates that the lead present was less than the limits of detection of the instrument (very little or no lead present).

LEAD ANALYZER TEST RESULTS

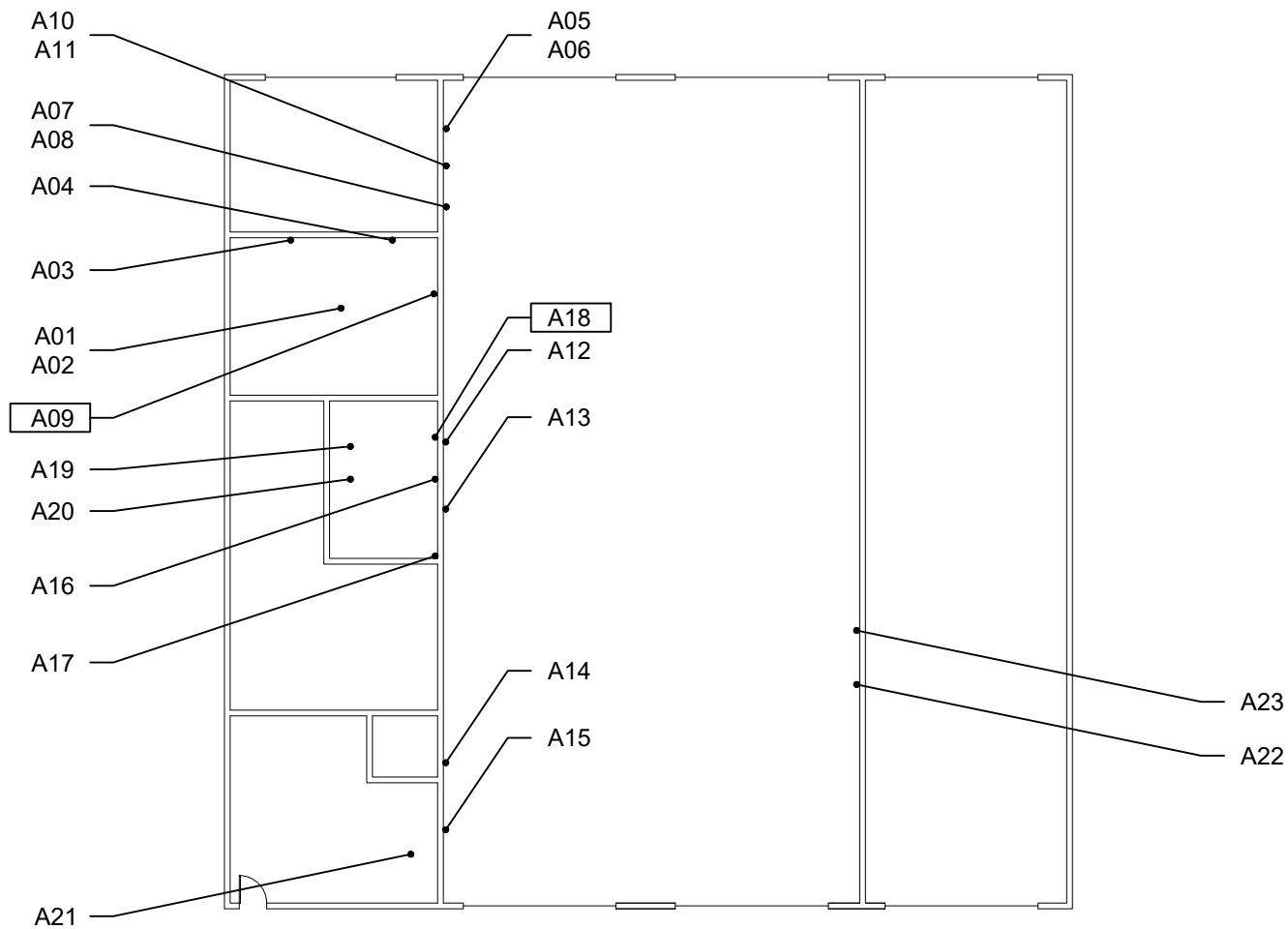
NO.	SITE	INSPECTOR	FLOOR	ROOM	COMPONENT	SUBSTRATE	CONDITION	COLOR	DURATION	TIME	RESULTS		
											LBP	mg/cm ²	+/- ERROR

VOID: This indicates that the test was intentionally terminated by the operator due to operator error (e.g. - operator moved analyzer while testing).

Substrate: Where ceramic is shown as a substrate, lead content is typically from the glazing on the tile unless the tile is painted.

APPENDIX C

Drawings of Sample Locations



1
C-1

STATION SHOP FLOOR PLAN NTS



LEGEND

- AXX ASBESTOS TEST LOCATION
- AXX LAB TEST RESULTS POSITIVE FOR ASBESTOS

REFER TO TESTING SUMMARY IN REPORT FOR FULL DETAILS. ALL SAMPLES HAVE HM&O2301- PREFIX.

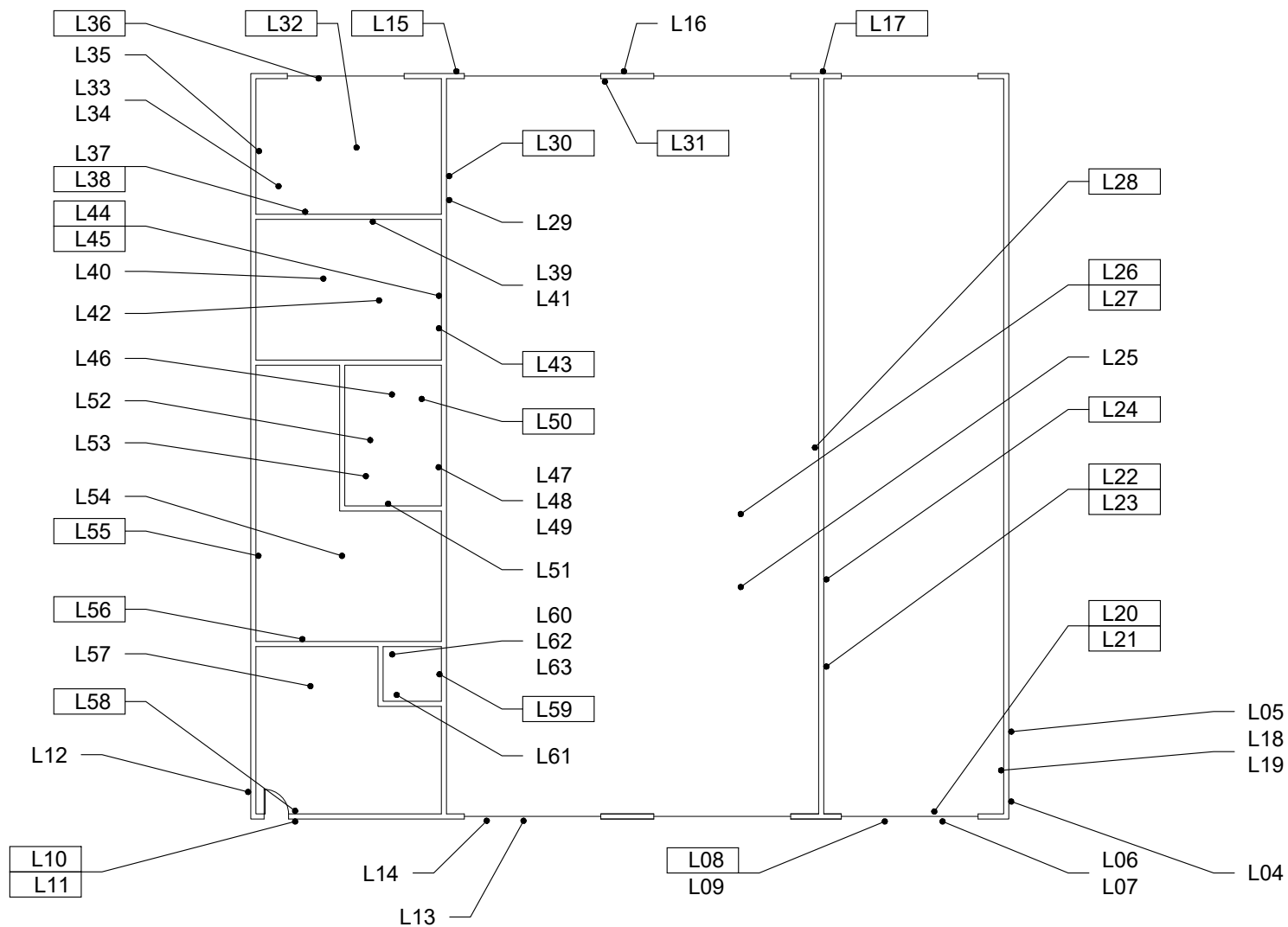
ALASKA DEPARTMENT
OF TRANSPORTATION &
PUBLIC FACILITIES

HAINES M&O STATION SHOP
HAINES, ALASKA
ASBESTOS SAMPLE LOCATIONS



DRAWN: JHL
CHECK: RAF
FILE #:
8000-SL

DATE:
01/05/2023
DWG.NO:
C-1



1
C-2

STATION SHOP FLOOR PLAN NTS



LEGEND

- LXX LEAD TEST LOCATION
 - LXX LEAD TEST CONTAINING ≥ 1.0 mg/cm² OF LEAD
- REFER TO TESTING SUMMARY IN REPORT FOR FULL DETAILS.

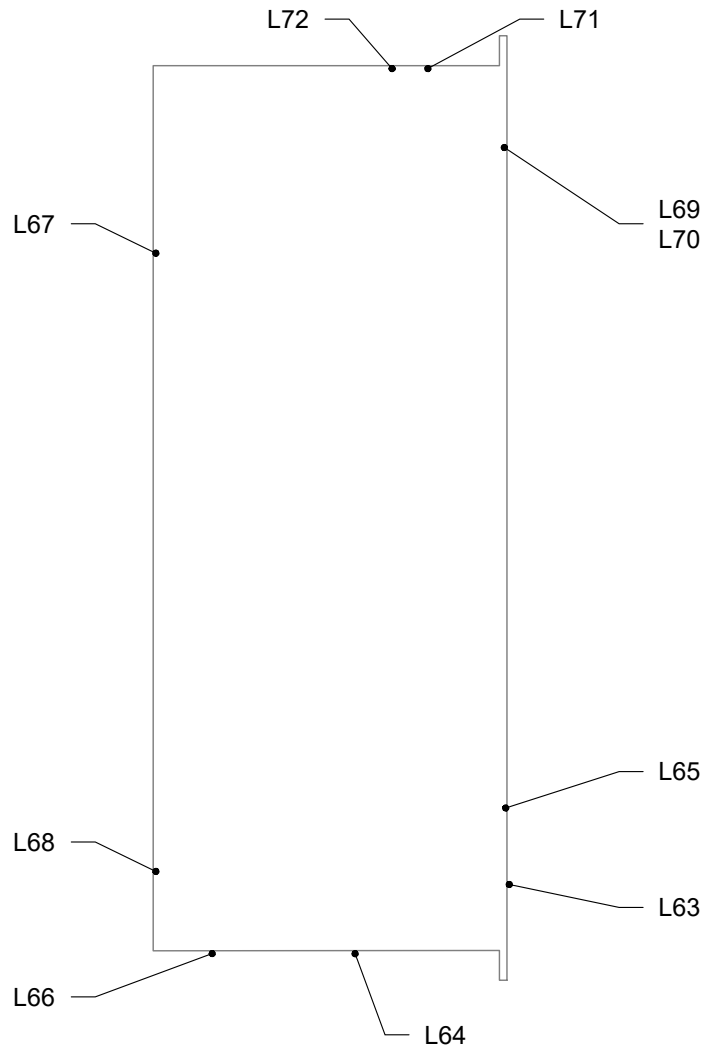
ALASKA DEPARTMENT
OF TRANSPORTATION &
PUBLIC FACILITIES

HAINES M&O STATION SHOP
HAINES, ALASKA
LEAD SAMPLE LOCATIONS



DRAWN: JHL
CHECK: RAF
FILE #:
8000-SL

DATE:
01/05/2023
DWG.NO:
C-2



1
C-3

COLD STORAGE FLOOR PLAN
NTS



LEGEND

- LXX LEAD TEST LOCATION
- LXX LEAD TEST CONTAINING ≥ 1.0 mg/cm² OF LEAD

REFER TO TESTING SUMMARY IN REPORT FOR FULL DETAILS.

ALASKA DEPARTMENT
OF TRANSPORTATION &
PUBLIC FACILITIES

HAINES M&O STATION SHOP
HAINES, ALASKA
LEAD SAMPLE LOCATIONS



DRAWN: JHL
CHECK: RAF

DATE:
01/05/2023

FILE #:
8000-SL

DWG.NO:
C-3

SECTION 02 41 00 - DEMOLITION

PART 1 - GENERAL

1.01 SUMMARY

- A. The Work includes the removal and disposal or salvage of a building, old pavements, abandoned utilities, aboveground storage tanks (ASTs), and any other obstructions and improvements connected to the Haines Maintenance & Operations Station building.
- B. The Work involves the abatement of all hazardous building materials present in accordance with Section 02 82 33, 02 83 33, and 02 84 18 specifications.
- C. The Work includes the backfill of resulting trenches, holes, and pits in accordance with Section 31 20 01 – Demolition Excavation and Fill.

1.02 RELATED SECTIONS

- A. Division 1 Specifications.
- B. Section 01 35 45 – Airborne Contaminant Control.
- C. Section 02 26 00 – Hazardous Materials Assessment.
- D. Section 02 82 33 – Removal and Disposal of Asbestos Containing Materials.
- E. Section 02 83 33 – Removal and Disposal of Materials Containing Lead.
- F. Section 02 84 18 – Removal and Disposal of Chemical Hazards.
- G. Section 31 20 01 Demolition Excavation and Fill

1.03 JOB SAFETY

- A. The Contractor is advised that they must comply with Occupational Safety and Health Administrations (OSHA) regulations relating to construction safety and health. The contractor is further advised that safety on the project is solely their responsibility.

1.04 REFERENCE STANDARDS

- A. 29 CFR 1910 – OSHA Standards.
- B. 29 CFR 1926 – Safety and Health Regulations for Construction.
- C. National Fire Protection Association (NFPA) 241 – Standard for Safeguarding Construction, Alteration, and Demolition Operations.
- D. Alaska Department of Environmental Conservation (DEC) 18 AAC 80 – Drinking Water.
- E. Alaska Department of Natural Resources (DNR) 11 AAC 93 – Water Management.
- F. Shannon & Wilson, Soil Management Plan (pending review)

1.05 SUBMITTALS

- A. Demolition Plan: Submit demolition plan as specified by OSHA and local authorities.
 - 1. Indicate extent of demolition, removal sequence, bracing and shoring, and location and construction of barricades and fences.
 - 2. Identify demolition firm and submit qualifications.
 - 3. Include a summary of safety procedures.
- B. Project Record Documents: Accurately record actual locations of utilities and subsurface construction.
- C. Landfill Records: Indicate receipt and acceptance of hazardous wastes, including hazardous building materials, by a landfill facility licensed to accept hazardous wastes.

1.06 QUALITY ASSURANCE

- A. Demolition Firm Qualifications: Company specializing in the type of work required.
 - 1. Minimum of two years of documented experience.

PART 2 - PRODUCTS

NOT USED

PART 3 - EXECUTION

3.01 SCOPE

- A. Raze, remove, and dispose of, or salvage the M & O Station building and concrete slab, as indicated on Sheet C10.
- B. Raze, remove, and dispose of, or salvage obstructions and improvements connected to the M & O building, any portion of which are within the property boundaries, except utilities and those for which other provisions have been made to remain.
- C. Fill cavities left by structures, improvements, and utility removal, to the level of the surrounding ground and compact backfill as specified in Section 31 20 01 – Excavation and Fill.
- D. The Work involves the abatement of all hazardous building materials present in accordance with Section 02 82 33, 02 83 33, and 02 84 18 specifications.

3.02 GENERAL PROCEDURES AND PROJECT CONDITIONS

- A. The Work shall meet the requirements of all local, state, and federal regulations including, but not limited to, that of the State of Alaska and the Federal Government.
- B. Comply with applicable codes and regulations for demolition operations and safety of adjacent structures and the public.
 - 1. Obtain required permits.
 - 2. Comply with applicable requirements of NFPA 241.
 - 3. Use of explosives is not permitted.

4. Take precautions to prevent catastrophic or uncontrolled collapse of structures to be removed; do not allow worker or public access within range of potential collapse of unstable structures.
 5. Provide, erect, and maintain temporary barriers and security devices.
 6. Use physical barriers to prevent access to areas that could be hazardous to workers or the public.
 7. Conduct operations to minimize effects on and interference with adjacent structures and occupants.
 8. Do not close or obstruct roadways without approval of the Department's Representative.
 9. Conduct operations to minimize obstruction of public and private entrances and exits; do not obstruct required exits at any time; protect persons using entrances and exits from removal operations.
 10. All operations and staging must remain within project limits.
- C. Provide the Engineer with copies of all permits, agreements with utility companies and written consent to access private and or government property before starting work.
- D. Minimize production of dust due to demolition operations; do not use water if that will result in ice, flooding, sedimentation of public waterways or storm sewers, runoff, or other pollution.
- E. No staging areas are provided. All work shall be limited to the project limits.
- F. Where traffic maintenance is required for activities on the local, state and federal roads, submit a Traffic Control Plan to the Department for review and receive approval before beginning related construction activity, coordinate with the Department. Activities including moving whole or partial structures will require a Traffic Control Plan.
- G. Hazardous building materials encountered during removal operations must be removed in accordance with Sections 02 82 33, 02 83 33, and 02 84 18 specifications.
- H. Provide temporary security fencing around the worksite before beginning demolition.
- I. Demolish and remove the complete structure, the roof, floors, walls; foundations; including foundation walls, footings, posts, piers, and pilings.) Remove concrete slabs, including floor slabs at finish grade (with surrounding foundation walls and footings).
- J. Backfill all trenches, holes and pits flush to the surrounding finish grade with Selected Material, Type C. Grade fills and disturbed areas to drain.
- K. Parcel boundaries have not been surveyed. If necessary, the limits of the work will be defined by staked/ surveyed property boundaries established by the Contractor.

3.03 EXISTING UTILITIES

- A. Coordinate work with utility companies and/or owner; notify before starting work and comply with their requirements; obtain required permits.
- B. Protect existing utilities to remain from damage.
- C. Locate and mark utilities to remain; mark using highly visible tags or flags, with identification of utility type; protect from damage due to subsequent construction, using substantial barricades if necessary.
- D. Remove exposed piping, valves, meters, equipment, supports, and mounts of disconnected and abandoned utilities as authorized by utility companies.

- E. Coordinate all utility disconnects with the utility companies and the Department's Representative. Disconnects for this project will be of a permanent type, including shut-off valves, caps, plugs, and other as required to stop the flow of materials (water, sewer, gas, power, telephone) in accordance with the governing codes and utility companies. All permits required for this work will be paid for by the Contractor.

3.04 DEBRIS AND WASTE REMOVAL

- A. Remove existing and new debris, junk, and trash from site. All demolished materials are the property of the Contractor unless noted otherwise. Handle and transport materials according to all applicable regulations. Store materials at a Contractor DEC approved site.
- B. Demolition materials not being used in the project, stored at a Contractor DEC approved site, or disposed of at a previously approved DEC disposal site require a DEC Solid Waste Disposal Permit.
- C. Disposal sites shall be outside the project limits unless directed otherwise, in writing, by the Engineer. Obtain written consent from the property owner. Dispose of solid waste materials (including handling, transporting, storing and disposing) according to the DEC Regulations. A DEC Permitting Officer in Anchorage may be contacted at (907) 269-7590.
- D. Leave site in clean condition, ready for subsequent work.

END OF SECTION

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SECTION 02 61 13 – EXCAVATION AND HANDLING OF CONTAMINATED SOIL

PART 1 - GENERAL

1.01 SUMMARY

- A. This item covers excavating, removing, hauling, handling, storage, transport, disposal and/or treatment of any contaminated soil encountered during the structure removal process.
- B. The Contractor shall follow the Scope of Work as detailed in the Shannon & Wilson's June 2024 *Soil Management Plan, Haines Maintenance & Operations Station, Haines, Alaska*. (Review Pending)

1.02 RELATED SECTIONS

- A. Section 02 41 00 – Demolition
- B. Section 31 00 00 - Earthwork
- C. Section 31 20 01 – Demolition Excavation and Fill.
- D. Section 31 23 16 – Excavation
- E. Section 31 23 23 - Fill

1.03 JOB SAFETY

- A. The Contractor is advised that they must comply with Occupational Safety and Health Administrations (OSHA) regulations relating to construction safety and health. The contractor is further advised that safety on the project is solely their responsibility.

1.04 REFERENCE STANDARDS

- A. ADEC 18 AAC 75 Oil and Other Hazardous Substances Pollution Control

PART 2 - PRODUCTS

NOT USED

PART 3 - EXECUTION

3.01 EXCAVATION AND FIELD SCREENING OF CONTAMINATED SOIL

- A. Field tasks will be performed and/or monitored by a qualified environmental professional (QEP), as defined in 18 AAC 75.333 and the Soil Management Plan. The QEP will be supplied by the Contractor.

3.02 CONFIRMATION SAMPLING OF SOIL STOCKPILES

- A. Should excavated soil with evidence of contamination be encountered, such materials shall be stockpiled on the site. The QEP shall collect samples of the stockpiled material for laboratory analysis in accordance with the Soil Management Plan.

3.03 CONTAMINATED SOIL MANAGEMENT

- A. Soil excavated during this project will be placed onto a minimum 10 mil liner for temporary storage. If soil is stored onsite for greater than 180 days, stockpiled soil must be placed on a 20-mil liner. Stockpiled soil shall be covered with a 6-mil liner to prevent precipitation runoff from the stockpiled soil.

- B. Stockpiles must be constructed in accordance with 18 AAC 75.370. Stockpiles must be placed 100 feet or more from surface water, private water systems, or fresh water supply systems. The Contractor will inspect and maintain the stockpile to ensure that the cover remains intact, and that soil and any liquid leachate is contained.

3.04 TRANSPORTATION AND DISPOSAL OF CONTAMINATED SOILS

- A. It will be the responsibility of the Contractor to determine appropriate disposal facility and coordinate disposal with the DOT&PF, the ADEC, and the appropriate disposal/treatment facilities.
- B. Contractor must complete an ADEC *Contaminated Media Transport and Treatment or Disposal Approval Form* and submit the form to the ADEC project manager. Soil transport and/or treatment will not be conducted without ADEC approval.

END OF SECTION

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SECTION 02 82 33 - REMOVAL AND DISPOSAL OF ASBESTOS CONTAINING MATERIALS

PART 1 - GENERAL

1.01 DESCRIPTION OF WORK

- A. The work requires the disturbance, demolition, removal, and disposal of the following asbestos-containing materials (ACM) from the Haines Maintenance & Operation Station Project as shown on the drawings and as specified herein. Bulk samples have been taken of suspect materials in this facility and the results are documented in Section 02 26 00, Hazardous Materials Assessment:

Maintenance & Operations Building

1. Hard and chalky pipe insulation on runs and fittings (confirmed asbestos).
2. Gaskets and valve packings at piping (assumed asbestos-containing).
3. Boiler and Oil burner stove gaskets and sealants (assumed asbestos-containing).
4. Metal roofing seam sealant (assumed asbestos-containing).
5. Metal siding seam sealant including at windows and doors (assumed asbestos-containing).
6. Metal fire door insulation (assumed asbestos-containing).
7. Refractory, including hand-packing at concrete chimney (assumed asbestos-containing).

The "Cold Shed" is not currently scheduled for demolition, but the following asbestos-containing materials are present.

1. Metal siding seam sealant (assumed asbestos-containing).
2. Metal roofing seam sealant (assumed asbestos-containing).

- B. Quantities of ACM and hazardous materials shown on drawings are based on a comprehensive survey of the building and take-offs from scale drawings. The Hazardous Material Assessment and quantities provided are considered a baseline for bid purposes. It is the contractor's responsibility to remove and dispose of all ACMs affected by the project from the site in accordance with applicable regulations. The contractor shall immediately notify the owner if other ACM or additional quantities are discovered. Quantities of materials removed shall be documented on a daily basis and shall include all materials removed and locations, in the units used on the drawings. Unit pricing shall be provided in the bid for all identified hazardous material in case additional quantities are discovered.
- C. Notification of Potential Hazards: Asbestos, lead and other potentially hazardous materials are present in the building that may impact the work of all trades. Regulated air contaminants, including asbestos and lead, are also present in settled and concealed dust in and on architectural, structural, mechanical and electrical components or systems throughout the building. All trades shall coordinate with other trades and conduct their work to prevent worker exposure or site contamination. Refer to Specification Divisions 0, 1 and 2 for specific information concerning disturbing, removing and disposing of these materials and the installation of new materials or components. This notification is provided in accordance with EPA and OSHA requirements.
- D. Asbestos-containing materials may have come loose and fallen onto or into, floors, ceilings, walls, chases, wall cavities or mechanical, electrical and structural system components. The Contractor shall immediately notify the Owner if and when they encounter worn, damaged, or deteriorated ACM as evidenced by dust or debris adjacent to ACM materials.
- E. Work may not occur while staff occupy the building.

- F. All work shall comply with Environmental Protection Agency (EPA) AHERA standard, 40 CFR 763. Clearance sampling using five (5) aggressive PCM clearance samples is only are required if the building being demolished will be entered by non-abatement workers prior to demolition, if they will not be entered by unprotected workers, no clearance samples are required.

1.02 RELATED WORK SPECIFIED ELSEWHERE

- A. Section 02 26 00 Hazardous Materials Assessment
- B. Section 01 35 45 Airborne Contaminant Control
- C. Section 02 83 33 Removal and Disposal of Materials Containing Lead
- D. Section 02 84 18 Removal and Disposal of Chemical Hazards

1.03 DEFINITIONS AND ABBREVIATIONS: Definitions and abbreviations are provided in the applicable publications listed in Paragraph 1.04 of this section.

1.04 APPLICABLE PUBLICATIONS: The publications listed below form a part of this specification to the extent referenced.

- A. General Requirements: All work shall be performed in compliance with the International Building, Fire, Fuel Gas, Mechanical, Residential, Energy Conservation and Administrative Code; Uniform Plumbing Code; the National Electrical Code; and the publications listed in this section that are in effect at the time of the bidding of this contract.
- B. Title 29 Codes of Federal Regulations (CFR), Department of Labor (USDOL)
Part 1910 General Occupational Safety and Health Standards
Part 1926 Safety and Health Regulations for Construction
- C. Title 40 CFR, Environmental Protection Agency (EPA)
Part 61 National Emission Standards for Hazardous Air Pollutants
Part 311 Worker Protection
Part 763 Asbestos
- D. Title 49 CFR, Department of Transportation (DOT)
Part 171 General Information, Regulations and Definitions
Part 172 Hazardous Materials Communication and Regulations
Part 173 General Requirements for Shipments and Packaging
Part 177 Carriage by Public Highway
Part 178 Specifications for Packaging
Part 382 Requirements for Drug Testing
Part 383 Commercial Driver's License Standards
- E. State of Alaska Administrative Codes (AAC)
8 AAC 61 Occupational Safety and Health Standards
18 AAC 60 Solid Waste Management
- F. State of Alaska Statutes
AS 18.31 Health and Safety - Asbestos
AS 45.50.477 Titles Relating to Industrial Hygiene
- G. Public Law 101-637
Asbestos School Hazard Abatement Reauthorization Act

- H. Federal Standards
313E Safety Data Sheets
- I. American National Standard Institute (ANSI)
 - Z9.2 Local Exhaust Systems
 - Z87.1 Eye and Face Protection
 - Z88.2 Practices for Respiratory Protection
- J. American Society for Testing and Materials (ASTM)
 - D-4397 Polyethylene Sheeting
- K. International Code Council
 - International Building (IBC), Fire, Fuel Gas, Mechanical, Residential, Energy Conservation and Administrative Codes Current Standards
- L. National Fire Protection Association (NFPA)
 - NFPA 701 Fire Tests for Flame Resistant Textiles and Films
- M. National Institute of Occupational Safety and Health (NIOSH)
 - Manual of Analytical Methods, Current Edition
- N. Underwriters Laboratories (UL)
 - UL 586 High-Efficiency, Particulate, Air (HEPA) Filter Units

1.05 QUALITY ASSURANCE

A. On-site Observation:

1. The safety and protection of the Contractor's employees, sub-contractor's employees, Owner's employees, the facility, and the public is the sole responsibility of the Contractor.
2. The Owner, the Owner's Representative or representatives of State or Federal agencies may make unannounced visits to the site during the work. The contractor shall make available two complete sets of clean, protective clothing for such visitor use. If the work requires the use of PAPR or Supplied Air Respirators, the contractor shall provide respirators to the visitor to ensure compatibility with fresh batteries or supplied air system. It is the visitor's responsibility to ensure medical qualification, training, and current "fit test" prior to using any respirator provided by the Contractor.
3. If the Owner or agency visitor determines that practices are in violation of applicable regulations, they will immediately notify the Contractor that operations must cease until corrective action is taken. Such notification will be followed by formal confirmation.
4. The Contractor shall stop work after receiving such notification. The work may not be restarted until the Contractor receives written authorization from the Owner.
5. All costs resulting from such a stop work order shall be borne by the Contractor and shall not be a basis for an increase in the contract amount or an extension of time.

B. Air Monitoring: Air monitoring during the work shall be performed as follows:

1. The Contractor shall hire Independent Testing Laboratories to collect and evaluate all air samples that are the responsibility of the Contractor. The Contractor shall direct its laboratories, in writing, to release air monitoring data, and all other pertinent data and records, to the Owner. A copy of this written direction shall be submitted to the Owner along with the information required by Paragraph 1.13 of this Specification.
2. The Contractor shall be responsible for monitoring its employees for potential exposure to airborne asbestos fibers as required by this specification and all applicable regulations.
3. The Contractor shall be responsible for work area monitoring and environmental monitoring outside the work area as required by this specification.

4. The Owner may perform air monitoring inside the building, inside the work areas, and on the Contractor's employees while asbestos work is underway and at any time during the work.
5. Final inspection and clearance air monitoring shall be conducted by the Contractor's Independent Testing Laboratory. The Independent Testing Laboratory may not be hired by the Abatement Subcontractor to perform final visual inspections and clearance air monitoring.
6. The Contractor shall have its Independent Testing Laboratories archive all air samples until the successful completion of the project.

C. Additional Sampling of Suspect Materials:

1. The Contractor and all Subcontractors shall be vigilant during demolition and construction in the event additional suspect asbestos or hazardous materials are encountered. If suspect asbestos or hazardous materials not previously identified are encountered, the contractor shall stop work that may be affected by this material and immediately notify the Owner. The Owner or the Owner's Representative will provide recommendations and additional testing if necessary. All sampling by the Contractor shall be at their own cost.
2. The Contractor and all Subcontractors shall notify the Owner prior to any bulk sampling of suspect asbestos-containing material or other hazardous materials to allow the Owner or Owner's Representative to be present during such sampling. All results of bulk sampling conducted by the Contractor or Subcontractors shall be submitted to the Owner.

1.06 PROTECTION OF EXISTING WORK TO REMAIN: Perform asbestos removal in the project work areas without contamination of adjacent work or the facility.

1.07 MEDICAL REQUIREMENTS

- A. Institute and maintain a medical surveillance program for employees in accordance with 29 CFR 1926.1101 and 29 CFR 1910.134.
- B. Institute and maintain a random drug testing program, as required by 49 CFR 382, for all drivers of vehicles transporting asbestos or hazardous materials.

1.08 TRAINING: Employ only workers who are trained and certified as required by 8 AAC 61.600, 29 CFR 1910, 29 CFR 1926, 40 CFR 763, and 49 CFR 383 to remove, encapsulate, barricade, transport, or dispose of asbestos.

1.09 PERMITS AND NOTIFICATIONS: Secure necessary permits for asbestos removal, hauling, and disposal and provide timely notification as required by federal, state, and local authorities.

1.10 SAFETY AND ENVIRONMENTAL COMPLIANCE: Comply with laws, ordinances, rules, and regulations of federal, state, and local authorities regarding handling, storing, transporting, and disposing of hazardous materials and all other construction activities.

1.11 RESPIRATOR PROGRAM: Establish a respirator program as required by ANSI Z88.2 and 29 CFR 1910.134.

1.12 HAZARD COMMUNICATION PROGRAM: Implement a hazard communication program in accordance with 29 CFR 1910.1200.

1.13 SUBMITTALS

- A. The Contractor shall submit the following documentation to the Owner for review, approval or rejection. Work shall not begin until submittals are approved.
 1. Shop drawings.
 2. Work plan.

3. Liability insurance policy and performance bond.
 4. Schedule.
 5. Testing laboratory and laboratory personnel.
 6. Disposal site designations and disposal authorizations.
 7. Waste transporter designation.
 8. Notifications and certifications.
 9. "Competent Person" designation and experience.
 10. Request for substitutions.
- B. Shop drawings shall show:
1. Boundaries of each regulated work area.
 2. Location and construction of decontamination areas.
 3. Location of temporary site storage facilities.
 4. Location of air monitoring stations, both in and outside of the work area.
 5. Emergency egress route(s).
 6. Location of negative pressure exhaust systems, if required.
- C. The work plan shall include procedures for:
1. Work area setup and protection.
 2. Worker protection and decontamination.
 3. Initial exposure assessment procedures.
 4. Asbestos removal procedures.
 5. Waste load-out, transport, and disposal procedures.
 6. Air monitoring procedures.
 - a. Air monitoring procedures shall include the number of daily samples and the target volumes of each type of sample.
 - b. Clearance air monitoring procedures and protocols for each work area.
 7. Determination by the Certified Project Designer of the estimated quantities of ACM and PACM to be removed, and determination of clearance requirements for each different type or phase of work.
 8. Emergency procedures.
 9. The Work Plan shall be prepared, signed and dated by an Environmental Protection Agency (EPA) Certified Project Designer.
- D. Insurance Policy and Bond: Submit copies of the Contractor's or Subcontractor's insurance policy and performance bond. Submittal requirement is only to ensure that the insurance certificate(s) show specific coverage for the potentially hazardous materials being handled by this project. The insurance and bond amounts and certificate holder requirements are addressed in other portions of the contract documents and are not covered as part of this submittal requirement.
- E. Schedule: Submit construction schedule by work area.
- F. Independent Testing Laboratories and Laboratory Personnel: Submit the name, location, and phone number of proposed independent testing laboratories, and the names and certifications of the industrial hygiene technicians. Include the laboratory's accreditation. Not all laboratories will require all accreditations.
1. The Independent Testing Laboratories shall be acceptable to Owner.
 2. The laboratories shall be proficient in the National Institute of Occupational Safety and Health (NIOSH) Proficiency in Analytical Testing (PAT) program and shall be accredited by the National Institute of Science and Technology (NIST) under their National Voluntary Laboratory Accreditation Program (NVLAP) for bulk asbestos analysis and airborne asbestos fibers as appropriate. NVLAP accreditation for bulk asbestos analysis may be waived if the

- microscopists are listed in the American Industrial Hygiene Association (AIHA) Asbestos Analyst Registry (AAR).
3. Provide a current list of their microscopists who have participated in the latest PAT and NVLAP programs and provide the names of microscopists and evidence that they have completed the NIOSH 582 course or equivalent. Provide latest AAR report of performance for microscopists.
 4. Provide name(s) and resume(s) of proposed on-site industrial hygiene technician(s) showing academic degrees and Alaska Abatement Certificate(s). If On-Site analysis will be done, the microscopists shall be listed in the American Industrial Hygiene Association (AIHA) Asbestos Analyst Registry (AAR), or equivalent.
- G. Disposal Site: Submit the name and location of the proposed Alaska Department of Environmental Conservation/ U.S. Environmental Protection Agency (DEC/EPA) permitted disposal site. Submit authorization to dispose of asbestos waste by the proposed disposal site operator.
- H. Waste Transporter: Submit the name and address of the proposed waste transporter.
- I. Representations: Submit a signed statement by the Contractor that records of employees' work assignments, certifications, respirator fit tests, and medical records are accurate, up-to-date, and available for inspection.
- J. Notifications and Certificates:
1. Submit a copy of the written "Notification of Demolition and Renovation" to the Environmental Protection Agency. (If required by NESHAP).
 2. Submit a State of Alaska Department of Labor (ADOL) approved copy of the written ADOL notification of proposed workers.
 3. Submit a copy of Project Designer's current certification.
- K. Competent Person: Submit the name and certifications of the Contractor's proposed Competent Person and a list of their previous projects. Certify by signed statement that the Competent Person has the knowledge and training to supervise the work in compliance with the publications listed in Paragraph 1.04 above.
- L. Substitutions: Submit requests for substitutions of materials, equipment and methods.
- M. Updated Project Information: Submit changes to the submitted project information at least 24 hours prior to the effective time of change for the following:
1. Updated schedules.
 2. Change in Competent Person.
 3. ADOL approval for additional workers.
 4. Changes to work plan.
 5. Revisions to the EPA notification.
- 1.14 TEST REPORTS: Contractor shall submit periodic test reports, daily logs, monitoring results as specified herein. Submit two (2) copies of the following information within twenty-four (24) hours after the end of a shift:
- A. Initial Exposure Assessment(s): Submit the results of the Contractor's initial exposure assessment(s).
 - B. Daily Air Monitoring: Submit daily, all results of Contractor's air monitoring (submit no later than 24 hours after the end of the shift). Submittal shall consist of negative air pressure recordings, daily monitoring report, field data sheets, the analytical laboratory's results, and sketch of sample locations. Submit all results of any sampling of bulk materials to Owner within 24 hours of receipt of results. Bulk sample submittal shall consist of daily monitoring report, field data sheets, and the analytical

laboratory's results, and sketch of sample locations, as well as the current certification of the asbestos Building Inspector who conducted the sampling.

- C. Project Daily Logs: Submit the previous day's Daily Logs. Logs shall include regulated area sign-in sheets and list of asbestos-containing materials removed including quantities and locations of those materials, in the units used on the drawings. Claims for additional quantities will not be addressed unless daily quantities are submitted.
- D. Air Monitoring: Submit draft results of Contractor's clearance air monitoring for each work area for Owner's review and approval prior to releasing the work area to unprotected workers. FAX or electronic submittals are acceptable. Submittal shall include the following:
 - 1. A signed and dated copy of the final visual inspection report (completed prior to clearance air monitoring) certifying that all dust and debris have been removed from the work area and that all ACM to be removed as required by the contract, were removed. Visual inspection reports are required for all removal, even if clearance air monitoring is not required.
 - 2. Documentation that clearance air sample collection complied with 40 CFR 763, contract specifications and the approved work plan.
 - 3. Drawings of the work area with sampling locations clearly marked. Work area drawings shall be clearly identified as to their location within the facility.
 - 4. Field data sheets for sampling including: sample locations, calibration device serial number, initial and final pump calibration readings, pump time on and off, initial and final sampling flow rate, pump type and serial number, and sample cassette identification.
 - 5. Laboratory results, signed and dated by the analyst.
 - 6. Data sheets and visual inspection sheets shall be signed and dated by the Industrial Hygiene Technician performing the work.

1.15 PROJECT COMPLIANCE DOCUMENTS: Prepare and submit the following records of compliance with hazardous materials regulations following each work area clearance. Submittals may contain segregated submittals for more than one (1) work area. Submittal shall be received by Owner within four (4) weeks following work area clearance. Compliance documents shall be signed and dated and shall include as a minimum:

- A. Waste transport records (40 CFR 61, Figure 4).
- B. Disposal site receipts.
- C. Contractor's "Start" and "Finish" dates for the work area(s).
- D. Daily logs, including regulated area sign in sheets, materials summary, etc. (if not previously submitted).
- E. Final work area inspection report(s) and inspector certifications (if not previously submitted).
- F. Final, signed, clean copies of all bulk and air sampling field data sheets, location drawings, negative air tapes and air monitoring log, including all clearance data.
- G. Final, signed, clear, legible copies of all analytical laboratory bulk and air monitoring test results, including all clearance data, and current laboratory certifications (if changed from previously submitted).
- H. Copies of Asbestos Worker Training certificates for workers performing work on this project and all approved Alaska DOL notifications for those workers, and any revisions to the EPA notification(s).

1.16 SANITARY FACILITIES: Provide adequate toilet and hygiene facilities.

- 1.17 MATERIAL STORAGE: Store all materials subject to damage off the ground and secure from damage, weather, or vandalism.
- 1.18 ON-SITE DOCUMENTATION: The Contractor shall maintain on the job site, at a location approved by the owner, copies of the following data for safety procedures, equipment, and supplies used for the work
- A. Equipment: Show the model, style, capacity and the operation and maintenance procedures for the following, as applicable:
 - 1. High-Efficiency, Particulate, Air (HEPA) Filtration units.
 - 2. HEPA Vacuum cleaners.
 - 3. Pressure differential recording equipment.
 - 4. Heat stress monitoring equipment.
 - B. Safety Data Sheets (SDS): Maintain SDSs for each encapsulant, surfactant, solvent, detergent, and other material proposed to be used.
 - C. Respiratory Protection Plan: The Contractor's and/or Subcontractor's written respirator program.

PART 2 - PRODUCTS

- 2.01 PERSONAL PROTECTIVE EQUIPMENT: Provide personal protective clothing as approved and selected by the IH.
- A. Respirators: Provide personally issued and marked respirators approved by the National Institute of Occupational Safety and Health (NIOSH). Provide sufficient replacements for respirators with disposable canisters. Use respirators equipped with dual cartridges whenever both asbestos hazards and other respiratory hazards exist in the work area.
 - B. Provide filter cartridges approved for each airborne contaminant which may be present. NIOSH approved filter cartridges shall be used. At no time shall the permissible exposure limit (PEL) for the contaminant exceed the PEL listed in 8 AAC 61.1100.
 - C. Whole Body Protection: Provide approved disposable fire retardant, full body coveralls and hoods fabricated from nonwoven fabric, gloves, eye protection, and hard-hats, and other protective clothing as required to meet applicable safety regulations to personnel potentially exposed to asbestos above the permissible exposure limits (PELs). Wear this protection properly. Full facepiece respirators shall meet the requirements of ANSI Z87.1.
 - D. Provide protective personal equipment and clothing at no cost to the workers.
- 2.02 DECONTAMINATION UNIT
- A. Provide a temporary three-stage decontamination unit, attached in a leak-tight manner to each negative pressure work area. Decontamination units shall consist of a clean room equipped with separate lockers for each worker, a shower room, and an equipment locker room equipped with separate lockers for each worker.
 - B. Shower specifications: Locate flow and temperature controls within the shower where adjustable by the user. Hot water service may be secured from the building hot water system if available, but only with back-flow protection installed by the Contractor at the point of connection, and with prior notification and approval by the Owner. Should sufficient hot water be unavailable, the Contractor shall provide a minimum 40-gallon electric hot water heater with a minimum recovery rate of 20 gallons per minute. Water from the shower room shall not be allowed to wet the floor in the clean room.

- 2.03 WASTE WATER FILTERS: Provide Water Filtration Units with filters of adequate capacity to treat decontamination water and shower flows. Water filtration unit effluent shall contain less than 7,000,000 asbestos fibers per liter prior to discharge to sanitary sewer or storm drains.
- 2.04 DANGER SIGNS AND TAPE: Post danger signs and tape signs to demarcate areas where asbestos waste is temporarily stored, and, in areas not accessible to the public, where asbestos-containing materials are left in place. Signs and labels shall be in accordance with applicable regulations and codes. The signs posted at work area entrances, exits, decontamination areas, emergency egress, and waste disposal areas shall comply with 29 CFR 1926.1101 and the International Fire Code.
- 2.05 WARNING LABELS: Affix warning labels to all components or containers containing asbestos wastes. Conform labeling to 29 CFR 1926.1101 and 49 CFR 172.
- 2.06 HEPA FILTRATION UNITS: (if required) shall conform to ANSI Z9.2, and HEPA filters shall be UL-586 labeled.
- 2.07 PRESSURE DIFFERENTIAL MONITORING EQUIPMENT: Provide continuous monitoring of the pressure differential with an automatic recording instrument for each negative pressure enclosure. Locate the instrument in a clean area where personnel have access to it without respiratory protection. The instrument shall be fitted with an alarm should the negative pressure drop below -0.02 inches of water column relative to the air outside containment.
- 2.08 CHEMICALS
- A. Adhesives: Adhesives shall be capable of sealing joints of adjacent sheets of polyethylene to finished or unfinished surfaces and of adhering under both dry and wet conditions.
 - B. Mastic Removal Solvents: Mastic removal solvents shall not contain halogenated compounds or compounds with flashpoints less than 60° C (140° F). Solvents shall be compatible with replacement materials.
 - C. Sealants and Encapsulants: Penetrating and bridging encapsulants for asbestos applications. Tint "Lock-Down" encapsulants used in non-finished areas for identification in a color that will not obscure residual asbestos. Encapsulants shall be compatible with replacement materials.
 - D. Surfactant: Use a surfactant specifically designed to effectively wet asbestos. Mix and apply the surfactant as recommended by the manufacturer.
- 2.09 SAFETY DATA SHEETS (SDSs): Provide SDSs for all chemical materials brought onto the work-site.
- 2.10 MATERIALS
- A. Disposal Containers: Use disposal containers to receive, retain, and dispose of asbestos-containing or contaminated materials. Label leak tight containers in accordance with the applicable regulations. Non-leak tight containers are not acceptable. Plastic bags shall be a minimum 6-mil polyethylene, pre-printed with approved warning labels. Plastic wrap shall be 6-mil polyethylene sheets, securely wrapped and taped. Disposal containers shall be labeled with "ASBESTOS NA 2212," Contractor's name and location, and a Class 9 label.
 - B. Glove Bags: The glove bags shall be a minimum of 6-mil polyethylene or polyvinylchloride plastic, and specially designed for removal of asbestos-containing materials, with two inward projecting long sleeves and rubber gloves, one inward projecting water wand sleeve, an internal tool pouch, and an attached, labeled receptacle for asbestos waste.

- C. Plastic Sheet: A minimum 6-mil thick flame resistant polyethylene (in accordance with NFPA 701) shall be used unless otherwise specified.
- D. Tape: Tape shall be capable of sealing joints of adjacent sheets of polyethylene, for attachment of polyethylene sheets to finished or unfinished surfaces and of adhering under both dry and wet conditions.

2.11 OTHER MATERIALS: The Contractor shall provide standard commercial quality of all other materials as required to prepare and complete the work.

2.12 TOOLS AND EQUIPMENT

- A. The Contractor shall provide tools and equipment as required to prepare and complete the work. Tools and equipment shall meet all applicable safety regulations.
- B. Transportation equipment shall be suitable for loading, temporary storage, transit, and unloading of contaminated waste without exposure to persons or property. All trucks or vans used to transport asbestos shall be enclosed and all containers sealed leaktight. Truck drivers shall have a commercial driver's license with hazardous material endorsement.

PART 3 - EXECUTION

3.01 WORK AREAS

- A. Regulated Work Areas: Establish regulated work areas in compliance with 29 CFR 1926.1101.
- B. Decontamination Area: Install decontamination areas in compliance with 29 CFR 1926.1101. Decontamination area shall meet fire-exiting requirements of the International Fire Code. Showers shall be provided with hot water and water filtration units.
- C. Negative Pressure Enclosure System: Construct Negative Pressure Enclosure Systems as required by 29 CFR 1926.1101, these specifications, and approved work plan. Signage shall conform to the International Fire Code and 29 CFR 1926.1101. Exhausts from HEPA Filtration Units shall terminate outside of the building.
- D. Notify applicable Fire Marshal as required by the International Fire Code.

3.02 PERSONNEL PROTECTION PROCEDURES

- A. Contractor's Competent Person shall strictly enforce personal protection procedures as required by the approved work plan and all applicable regulations.
- B. Post the decontamination, safety, and work procedures to be followed by workers.
- C. Provide continuous on-site supervision by the approved Competent Person.
- D. Maintain a daily log of all workers and visitors entering regulated work areas. Log shall contain the name of each individual, their organization, accurate time of entering and leaving, and purpose of visit.

3.03 ASBESTOS REMOVAL PROCEDURES: Remove asbestos in accordance with the Contractor's Approved Work Plan, applicable regulations and this specification. The Owner shall be notified 24-hours in advance of any asbestos disturbance taking place outside of a Negative Pressure Enclosure System.

3.04 AIR MONITORING

- A. Perform personal, work area, and environmental monitoring for airborne asbestos fibers by industrial hygiene technicians who are employees of (one of) the Contractor's Independent Testing Laboratories.
- B. Conduct air monitoring in accordance with 29 CFR 1926.1101, current EPA guidance, and as specified herein. Calibrate all sampling pumps on-site with a calibrated transfer standard before and after each sample. Built-in rotameters on pumps are not acceptable for calibration. Additional samples beyond the minimum numbers shown below may be necessary if samples are overloaded or require shorter sampling periods to achieve readable samples, due to size of the work force, or due to more than one 8-hour work shifts.
- C. Conduct daily work area and environmental air monitoring per shift as follows:
 - 1. Three (3) air samples within the work area.
 - 2. One (1) air sample located outside the entrance to the work area.
 - 3. One (1) air sample located at the exhaust(s) of the HEPA filtration unit(s) (if more than one unit is used, the sampling may be rotated between units, however, each unit must be sampled at least once every three days).
 - 4. Three (3) air samples located in adjacent occupied areas.
 - 5. Two (2) waste load-out samples for the full duration of the operation, one taken inside the wash-down station and one taken on the clean side of the wash-down station, in addition to the daily work area and environmental samples, (no samples are necessary if no load-out operation is performed).
- D. Clearance air monitoring shall be conducted by the Contractor's Independent Testing Laboratory subcontractor. The Independent Testing Laboratory may not be hired by the Abatement Subcontractor to perform visual inspections and clearance air monitoring. Owner approval is required before a work area is released to unprotected workers. The Contractor is responsible for all costs associated with clearance and scheduling of visual inspection and clearance air monitoring. If the building will be entered by non-abatement workers prior to demolition, the maximum acceptable level of airborne asbestos fibers for work area clearance is as published in 40 CFR 763 for PCM analysis. The Contractor has the option, at its expense and at no cost to the Owner, of re-cleaning the work area and repeating the clearance air monitoring procedures or of having failed phase contrast microscopy (PCM) sample media sent to an approved NVLAP accredited laboratory for TEM analysis by NIOSH Method 7402.
- E. Conduct personal air monitoring in accordance with 29 CFR 1926.1101 and as specified herein.
 - 1. Take personnel samples (excluding excursion samples) at least twice per eight-hour work shift at the rate of one sample for every six people performing that task in the same work area. Persons performing separate tasks or in separate work areas shall be sampled separately.
 - 2. Collect and analyze excursion samples as required by 29 CFR 1926.1101.
 - 3. Continuously monitor all workers disturbing asbestos outside of a Negative-Pressure Enclosure System if that work is conducted indoors.
- F. Daily personnel monitoring may be discontinued only after the Contractor's Independent Testing Laboratory certifies in writing that a Negative Exposure Assessment has been obtained and the Owner has reviewed and approved the negative exposure assessment data. Daily work area and environmental air sampling may not be discontinued following a Negative Exposure Assessment.
- G. Submit air monitoring results to the Owner as specified in Paragraphs 1.14 and 1.15.

3.05 DISPOSAL

- A. Dispose of asbestos wastes in an EPA/DEC permitted asbestos landfill.

- B. Comply with current waste disposal, handling, labeling, storage, and transportation requirements of the waste disposal facility, U.S. Department of Transportation, and EPA regulations.
- C. Workers handling waste shall wear protective clothing and canister type respirators.
- D. Drivers of the waste transport vehicles need not wear respirators while enroute.
- E. Workers shall wear respirators when handling asbestos material at the disposal site.

3.06 CLEANING OF WORK AREA

- A. Remove all asbestos material and debris upon completion of asbestos repair or removal within a work area. Wet clean or HEPA vacuum all surfaces within the work area.
- B. Notify the Owner and the Independent Testing Laboratory that asbestos work has been completed and the work area is ready for visual inspection. Visual inspections are required even if clearance air monitoring is not required. Include in the visual inspection report a statement that all asbestos in the work area has been removed, repaired and/or encapsulated as required by the contract, and that all debris has been removed.
- C. All required demolition (ACM and non-ACM) shall be completed in each work area prior to clearance air monitoring. Exceptions may be made with prior approval of the Owner.
- D. A lockdown encapsulant shall be applied to all surfaces within the abatement areas prior to performing clearance air monitoring.

3.07 CLEARANCE AIR MONITORING

- A. The Contractor and its Independent Testing Laboratory shall conduct and document a visual inspection to verify that all asbestos in the work area has been removed, repaired and/or encapsulated as required by the contract, and that all debris has been removed.
- B. Final clearance air monitoring tests shall not be performed until all areas and materials within the work area are fully clean and dry.
- C. Final clearance air monitoring shall be conducted by the Contractor's Independent Testing Laboratory in accordance with all applicable regulations and the Contractor's approved work plan after passing the visual inspection. The clearance criteria shall include a minimum of five clearance samples using "aggressive methods" collected and analyzed in accordance with 40 CFR 763. PCM analysis is allowed if the building will be accessed by non-abatement workers prior to demolition.
- D. If the final clearance air monitoring results show that the work area has failed to meet the clearance criteria, the Independent Testing Laboratory shall notify the Owner and the Contractor. The Contractor shall reclean the work area and request the Independent Testing Laboratory to conduct a follow-up inspection to be followed by another set of clearance air monitoring samples. All work specified in this paragraph shall be done at no additional expense to the Owner.
- E. If the clearance air monitoring results meet the clearance criteria of 40 CFR 763 and the specifications for the work and the Owner has reviewed and accepted the clearance results as required by 1.14 D, then the HEPA filtration units may be deactivated (if applicable) and all seals, barriers, barricades, and decontamination areas shall be dismantled and removed and the work area released to unprotected workers.
- F. Submit the final work area inspection report, clearance air monitoring field data sheets and the laboratory air monitoring report to the Owner as specified in Paragraph 1.15.

3.08 SUBSTANTIAL COMPLETION

- A. After the work area barriers and temporary construction and equipment have been removed, the Contractor shall inspect the work area to verify that no asbestos debris, contaminated water, or other residue remains. Any remaining residue shall be cleaned up using HEPA vacuum cleaners and wet wiping methods.
- B. The visual inspection following building demolition will include close inspection of the remaining soils within the area disturbed by the building demolition, to look for and remove any visible building debris. The Contractor shall certify that the work area has been cleaned of all asbestos in compliance with the contract.

END OF SECTION

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SECTION 02 83 33 - REMOVAL AND DISPOSAL OF MATERIALS CONTAINING LEAD

PART 1 - GENERAL

1.01 DESCRIPTION OF WORK

- A. The work may require the disturbance (including cleanup of existing loose paint), demolition, or removal, and disposal of lead painted and/or lead-containing materials related to the Haines Maintenance & Operation Station Project as shown on the drawings and as specified herein. Items to be disturbed may include, but are not limited to:
 - 1. Painted interior and exterior surfaces, including, but not limited to painted windows, doors and frames, painted mechanical and electrical equipment, painted structural and miscellaneous steel, etc.
 - 2. Metallic lead flashings at VTR's, roof drain bowl clamping rings, and other roof penetrations, etc.
 - 3. Metallic lead caulking in bell and spigot pipe joints.
 - 4. Metallic lead in pipe solder at copper pipe fittings.
 - 5. Lead-containing dust in and on architectural, structural, mechanical, and electrical components.
 - 6. Lead-acid batteries for exit and emergency lights, and other equipment.
- B. Notification of Potential Hazards: Asbestos, lead and other potentially hazardous materials are present in the building that may impact the work of all trades. Regulated air contaminants, including asbestos and lead, are also present in settled and concealed dust in and on architectural, structural, mechanical and electrical components or systems throughout the building. All trades shall coordinate with other trades and conduct their work to prevent worker exposure or site contamination. Refer to Specification Divisions 0, 1 and 2 for specific information concerning disturbing, removing and disposing of these materials and the installation of new materials or components. This notification is provided in accordance with EPA and OSHA requirements.
- C. The work includes all air monitoring, dust sampling, waste testing and disposal as specified herein. Materials listed are not necessarily hazardous waste or hazardous to handle. Lead-containing paints or materials identified for demolition and disposal shall be tested by the Toxicity Characteristics Leaching Procedure (TCLP) to determine if they are hazardous waste prior to disposal. Metal waste shall be recycled where practical.
- D. All work disturbing lead-containing materials shall comply with 29 CFR 1926.62, and other applicable regulations. OSHA regulations apply equally to lead-containing materials, lead-containing paints, and lead-based paints, and are referred herein as lead-containing materials.

1.02 RELATED WORK SPECIFIED ELSEWHERE

- A. Section 02 26 00 Hazardous Materials Assessment
- B. Section 01 35 45 Airborne Contaminant Control
- C. Section 02 82 33 Removal and Disposal of Asbestos Containing Materials
- D. Section 02 84 18 Removal and Disposal of Chemical Hazards

1.03 DEFINITIONS AND ABBREVIATIONS: Definitions and abbreviations are provided in the applicable publications listed in Paragraph 1.04 of this section.

1.04 APPLICABLE PUBLICATIONS: The publications listed below form a part of this specification to the extent referenced.

- A. General Requirements: All work shall be performed in compliance with the International Building (IBC), Fire, Fuel Gas, Mechanical, Residential, Energy Conservation and Administrative Code; Uniform Plumbing Code; the National Electrical Code; and the publications listed in this section that are in effect at the time of the bidding of this contract.
- B. Title 29 Code of Federal Regulations (CFR), Department of Labor (USDOL)
 - Part 1910 General Occupational Safety and Health Standards
 - Part 1926 Safety and Health Regulations for Construction
- C. Title 40 CFR, Environmental Protection Agency (EPA)
 - Part 260 Hazardous Waste Management System: General
 - Part 261 Identification and Listing of Hazardous Wastes
 - Part 262 Standards Applicable to Generators of Hazardous Waste
 - Part 263 Standards Applicable to Transporters of Hazardous Waste
 - Part 270 Hazardous Waste Permit Program
 - Part 273 Standards for Universal Waste Management
 - Part 311 Worker Protection
 - Part 745 Lead Based Paint Poisoning Prevention in Certain Residential Structures
- D. Title 49 CFR, Department of Transportation (DOT)
 - Part 171 General Information, Regulations and Definitions
 - Part 172 Hazardous Materials Communication and Regulations
 - Part 173 General Requirements for Shipments and Packaging
 - Part 176 Carriage by Vessel
 - Part 177 Carriage by Public Highway
 - Part 178 Specifications for Packaging
 - Part 382 Requirements for Drug Testing
 - Part 383 Commercial Driver's License Standards
- E. Alaska Administrative Codes (AAC)
 - 8 AAC 61 Occupational Safety and Health Standards
 - 18 AAC 60 Solid Waste Management
 - 18 AAC 62 Hazardous Waste Management
 - 18 AAC 70 Water Quality Standards
 - 18 AAC 75 Oil and Hazardous Substances Pollution Control
- F. Alaska Statutes (AS)
 - AS 45.50.477 Titles Relating to Industrial Hygiene
- G. Municipality of Anchorage
 - AMC 26.50.060 Specific Discharge Limitations
- H. Federal Standards
 - 313E Safety Data Sheets
- I. American National Standards Institute (ANSI)
 - Z9.2 Local Exhaust Systems
 - Z87.1 Eye and Face Protection
 - Z88.2 Practices for Respiratory Protection
- J. American Society For Testing and Materials (ASTM)
 - D 4397 Polyethylene Sheeting
 - E 1728 Standard Practice for Collection of Settled Dust Samples Using Wipe Sampling Methods for Subsequent Lead Determination

E 1792

Specification for Wipe Sampling Materials for Lead in Surface Dust

- K. International Code Council
International Building (IBC), Fire, Fuel Gas, Mechanical, Residential, Energy Conservation and
Administrative Code Current Standards
- L. National Fire Protection Association (NFPA)
NFPA 701 Fire Tests for Flame Resistant Textiles and Films
- M. National Institute of Occupational Safety and Health (NIOSH)
Manual of Analytical Methods, Current Edition
- N. Underwriters Laboratories (UL)
UL 586 High-Efficiency, Particulate, Air (HEPA) Filter Units

1.05 QUALITY ASSURANCE

- A. On-site Observation:
 - 1. The safety and protection of the Contractor's employees, Subcontractor's employees, Owner's employees, the facility, and the public is the sole responsibility of the Contractor.
 - 2. The Owner, the Owner's Representative, or representatives of State or Federal agencies may make unannounced visits to the site during the work. The Contractor shall make available two complete sets of clean, protective clothing for such visitor use. If the work requires the use of PAPR or Supplied Air Respirators, the contractor shall provide respirators to the visitor to ensure compatibility with fresh batteries or supplied air system. It is the visitor's responsibility to ensure medical qualification, training, and current "fit test" prior to using any respirator provided by the Contractor.
 - 3. If the Owner or agency visitor determines that practices are in violation of applicable regulations, they will immediately notify the Contractor that operations must cease until corrective action is taken. Such notification will be followed by formal confirmation.
 - 4. The Contractor shall stop work after receiving such notification. The work may not be restarted until the Contractor receives written authorization from the Owner.
 - 5. All costs resulting from such a stop work order shall be borne by the Contractor and shall not be a basis for an increase in the contract amount or an extension of time.
- B. Monitoring and Testing: Monitoring and testing during the work shall be performed as follows:
 - 1. The Contractor shall hire Independent Testing Laboratories to collect and evaluate all air, dust, bulk, and toxicity characteristic leaching procedure (TCLP) samples that are the responsibility of the Contractor. The Contractor shall direct its laboratories, in writing, to release monitoring and testing data, and all other pertinent data and records, to the Owner.
 - 2. The Contractor shall be responsible for monitoring its employees for potential exposure to airborne contaminants as required by this specification and all applicable regulations.
 - 3. The Contractor shall be responsible for work area monitoring and environmental monitoring outside the work area as required by this specification.
 - 4. The Owner may perform monitoring and testing inside the building, inside the work areas, and on the Contractor's employees while work is underway and at any time during the work.
 - 5. Final inspection and clearance testing shall be conducted by the Contractor.
 - 6. The Contractor shall have its Independent Testing Laboratories archive all samples until the successful completion of the project.
- C. Additional Sampling of Suspect Materials:
 - 1. The Contractor and all Subcontractors shall be vigilant during demolition and construction in the event additional suspect lead or hazardous materials are encountered. If suspect lead or hazardous materials not previously identified are encountered, the contractor shall stop work that may be affected by this material and immediately notify the Owner. The Owner or the

Owner's Representative will provide recommendations and additional testing if necessary. All sampling by the Contractor shall be at their own cost.

2. The Contractor and all Subcontractors shall notify the Owner prior to any bulk sampling of suspect lead-containing material or other hazardous materials to allow the Owner or Owner's Representative to be present during such sampling.

1.06 PROTECTION OF EXISTING WORK TO REMAIN: Perform lead removal in the project work areas without damage or contamination of adjacent work or the facility.

1.07 MEDICAL REQUIREMENTS

- A. Institute and maintain a surveillance program in accordance with 29 CFR 1926.62 and 29 CFR 1910.134.
- B. Institute and maintain a random drug testing program, as required by 49 CFR 382, for all drivers of vehicles transporting hazardous materials.

1.08 TRAINING: Employ only workers who are trained and certified as required by 29 CFR 1910, 29 CFR 1926, 40 CFR 311, 40 CFR 745 and 49 CFR 383 to remove, encapsulate, barricade, transport, or dispose of lead-containing materials.

1.09 PERMITS, IDENTIFICATION NUMBERS AND NOTIFICATIONS: Secure necessary permits for hazardous material removal, storage, transport and disposal and provide timely notification as required by federal, state, and local authorities.

1.10 SAFETY AND ENVIRONMENTAL COMPLIANCE: Comply with laws, ordinances, rules, and regulations of federal, state, and local authorities regarding handling, storing, transporting, and disposing of hazardous materials and all other construction activities.

1.11 RESPIRATOR PROGRAM: Establish a respirator program as required by ANSI Z88.2 and 29 CFR 1910.134.

1.12 HAZARD COMMUNICATION PROGRAM: Implement a hazard communication program in accordance with 29 CFR 1910.1200.

1.13 SUBMITTALS

- A. Submit the following documentation to the Owner for review, approval or rejection. Work shall not begin until submittals are approved.
 1. Shop drawings.
 2. Work plan.
 3. Liability insurance policy and performance bond.
 4. Schedule.
 5. Independent testing laboratory and laboratory personnel.
 6. Disposal site designations.
 7. Waste transporter designations.
 8. Representations.
 9. "Competent Person" designation and experience.
 10. Request for substitutions.
- B. Shop drawings shall show:
 1. Boundaries of each lead work area, if required.
 2. Location and construction of decontamination stations, if required.
 3. Location of temporary site storage facilities.
 4. Location of air monitoring stations, both in and outside of the work area.

5. Emergency egress route(s).
 6. Location of negative pressure exhaust systems, if required.
- C. The work plan shall include procedures for:
1. Work area set-up and protection.
 2. Worker protection and decontamination.
 3. Initial exposure determination(s).
 4. Lead removal procedures.
 5. Waste testing, transport, and disposal procedures.
 6. Monitoring and testing procedures (Sampling and Analysis Plan).
 7. Spill clean-up emergency procedures.
- D. Insurance Policy and Bond: Submit copies of the Contractor's or Subcontractor's insurance policy and performance bond. Submittal requirement is only to ensure that the insurance certificate(s) show specific coverage for the potentially hazardous materials being handled by this project. The insurance and bond amounts and certificate holder requirements are addressed in other portions of the contract documents and are not covered as part of this submittal requirement.
- E. Schedule: Submit construction schedule by work area.
- F. Independent Testing Laboratories and Laboratory Personnel: Submit the name, location, and phone number of proposed independent testing laboratories, and the names and certifications of the industrial hygiene technicians. Include the laboratory's accreditation. Not all laboratories will require all accreditations.
1. The Independent Testing Laboratories shall be acceptable to Owner.
 2. Submit evidence that the laboratory is currently judged proficient in lead analysis, as determined by the Environmental Lead Proficiency Analytical Testing (ELPAT) Program, of the American Industrial Hygiene Association (AIHA) Environmental Lead Laboratory Accreditation Program (ELLAP) for lead in paint chip, soil, and dust wipe samples.
 3. Submit evidence that the laboratory is currently certified by OSHA to perform blood lead analysis.
 4. Submit evidence that the laboratory has demonstrated proficiency as determined by ELPAT or ELLAP performance for NIOSH Method 7082 and/or NIOSH Method 7105 analytical method for the determination of lead in air.
 5. Submit evidence that the laboratory has demonstrated proficiency in performing analyses according to Method 1311 TCLP, corresponding to the current version of Test Methods for Evaluating Solid Wastes (Chemical Physical Methods), SW-846. Evidence may include successful participation in a recognized inter-laboratory quality control program such as a laboratory certified by the California Health and Welfare Agency, Department of Health Services, or a more informal inter-laboratory quality control program.
 6. Submit evidence that the laboratory is currently accredited by the American Industrial Hygiene Association (AIHA).
 7. Submit the name, address, telephone number, and résumé of the Contractor's Industrial Hygienist (IH) who prepared the Sampling and Analysis Plan and will oversee the on-site monitoring, visual inspections and clearance testing. Submit the names, addresses, and résumés of industrial hygiene technicians who may assist the IH for on-site tasks. Submit documentation that the IH has all the qualifications for the assigned duties as required by the Contractor's liability insurance policy.
 8. Submit copies of the Contractor's letter to each of the independent testing laboratories, directing each to release all the results for this project to the Owner, as these results become available and as specified herein.
- G. Disposal Site: Submit the name and location of the proposed Environmental Protection Agency (EPA) permitted disposal site.
- H. Waste Transporter: Submit the name and address of the proposed waste transporter.

- I. Representations: Submit statement by the Contractor that records of employees' work assignments, certifications, respirator fit tests, and medical records are accurate, up-to-date, and available for inspection.
 - J. Competent Person: Submit the name and certifications of the Contractor's proposed Competent Person and a list of their previous projects. Certify that the Competent Person has the knowledge and training to supervise the work in compliance with the publications listed in Paragraph 1.04 above.
 - K. Substitutions: Submit requests for substitutions of materials, equipment and methods.
 - L. Updated Project Information: Submit changes to the submitted project information at least 24 hours prior to the effective time of change for the following:
 - 1. Updated schedules for lead removal.
 - 2. Change in Competent Person.
 - 3. Changes to work plan.
- 1.14 TEST REPORTS: Submit the following documentation produced during the work as soon as received:
- A. Project Daily Logs: Submit the previous day's Daily Logs. Logs shall include regulated area sign-in sheets and list of lead-containing materials removed, including quantities and locations of those materials, in the units used on the drawings. Claims for additional quantities will not be addressed unless daily quantities are submitted.
 - B. Daily Monitoring: Submit daily, all results of Contractor's air, and dust monitoring (submit no later than 24 hours after the end of the shift). Submittal shall consist of daily monitoring report, field data sheets, the analytical laboratory's results, and sketch of sample locations. Submit all results of any TCLP sampling or testing of bulk materials to Owner within 24 hours of receipt of results. Bulk or TCLP sample submittal shall consist of daily monitoring report, field data sheets, the analytical laboratory's results, and sketch of sample locations (sketch not required for TCLP samples, but descriptions of materials included is required).
- 1.15 PROJECT COMPLIANCE DOCUMENTS: Submit the following documents to the Owner with application for final payment:
- A. Contractor's actual project "Start and Finish" dates.
 - B. Daily logs, including sign in sheets, etc. (if not previously submitted).
 - C. Waste testing results per Paragraph 3.05 (A).
 - D. Waste Shipment Records (Manifest EPA form 8700-22) if required.
 - E. Clearance sampling and soil sampling data sheets (if required) and laboratory reports.
 - F. Disposal site receipts, or certification of acceptance for recycling.
 - G. Final clearance submittals as outlined in 3.07 (if required).
 - H. Evidence that each employee who was engaged in lead disturbance/removal work or who was exposed to lead completed training on lead covering the requirements of 29 CFR 1926.62.
- 1.16 SANITARY FACILITIES: Provide adequate toilet and hygiene facilities.
- 1.17 MATERIAL STORAGE: Store all materials subject to damage off the ground and secure from damage, weather, or vandalism.

1.18 ON-SITE DOCUMENTATION: The Contractor shall maintain on the job site, at a location approved by the owner, copies of the following data for safety procedures, equipment, and supplies used for the work.

- A. Equipment: Show the model, style, capacity and the operation and maintenance procedures for the following, as applicable:
 - 1. High-Efficiency, Particulate, Air (HEPA) Filtration units.
 - 2. HEPA Vacuum cleaners.
 - 3. Pressure differential recording equipment.
 - 4. Heat stress monitoring equipment.
- B. Safety Data Sheets (SDSs): Maintain SDSs for each encapsulant, surfactant, solvent, detergent, and other material proposed to be used.
- C. Respiratory Protection Plan: The Contractor's written respirator program.

PART 2 - PRODUCTS

2.01 PERSONAL PROTECTIVE EQUIPMENT: Provide personal protective clothing as approved and selected by the IH.

- A. Respirators: Provide personally issued and marked respirators approved by the National Institute of Occupational Safety and Health (NIOSH). Provide sufficient replacements for respirators with disposable canisters. Use respirators equipped with dual cartridges whenever both lead hazards and other respiratory hazards exist in the work area.
- B. Provide filter cartridges approved for each airborne contaminant which may be present. NIOSH approved filter cartridges shall be used. At no time shall the permissible exposure limit (PEL) for the contaminant exceed the PEL listed in 8 AAC 61.1100.
- C. Whole Body Protection: Provide approved aprons, gloves, eye protection, and hard-hats, and other protective clothing as required to meet applicable safety regulations to personnel potentially exposed to lead dust or fumes above the permissible exposure limit (PEL). Wear this protection properly. Full facepiece respirators shall meet the requirements of ANSI Z87.1.
- D. Provide protective personal equipment and clothing at no cost to the workers.

2.02 DECONTAMINATION UNIT

- A. Provide a temporary three-stage decontamination unit, attached in a leak-tight manner to each Contained Work Area. Decontamination units shall consist of a clean room equipped with separate lockers for each worker, a shower room, and an equipment locker room equipped with separate lockers for each worker.
- B. Shower specifications: Locate flow and temperature controls within the shower and be adjustable by the user. Hot water service may be secured from the building hot water system if available, but only with back-flow protection installed by the Contractor at the point of connection, and with prior notification and approval by the Owner. Should sufficient hot water be unavailable, the Contractor shall provide a minimum 40 gallon electric hot water heater with a minimum recovery rate of 20 gallons per hour. Water from the shower room shall not be allowed to wet the floor in the clean room.

2.03 WASTE WATER FILTERS: Install the waste water filters in a series of stages with the final filtration stage sufficient to meet discharge standard of 18 AAC 70 and/or any local sewage system discharge limit for lead. Size the waste water pump for 1.25 times the shower head flow-rate. Dispose all filters as lead contaminated waste.

- 2.04 **WARNING SIGNS AND TAPE:** Post warning signs and tape at the boundaries and entrances to lead disturbance and removal work areas. Signs required by other statutes, regulations, or ordinances may be posted in addition to, or in combination with, this warning sign. Conform warning signs and tape to the requirements of 29 CFR 1926.62.
- 2.05 **WARNING LABELS:** Affix warning labels to all hazardous waste disposal containers as described in the Contractor's approved Solid Waste Disposal Plan. Conform labeling to 29 CFR 1926.62 and 49 CFR 100-199.
- 2.06 **NEGATIVE PRESSURE EXHAUST SYSTEM:** Use the negative pressure exhaust systems to exhaust each contained work area where the PEL will or is expected to be exceeded. Operate the negative pressure exhaust system continuously (24 hours a day) during lead work. Select the negative pressure exhaust system equipment to provide a minimum of 4 air changes per hour under load within the work area. The negative pressure exhaust system shall have a minimum of two stages of pre-filtration ahead of the HEPA filter: The HEPA filter shall bear the UL-586 label. In no case shall the building ventilation system be used as the local exhaust for the contained work area. Terminate the exhaust outside of the building. The exhaust ventilation system equipment shall be equipped with lock-out protection to prevent operation without a HEPA filter properly installed. The exhaust system equipment shall be equipped with the following instrumentation: a static pressure gauge with low flow alarm, an elapsed time indicator, automatic shutdown capability in the event of a major rupture in the HEPA filter or blocked air discharge and an automatic re-start when power is restored after a power failure.
- 2.07 **PRESSURE DIFFERENTIAL MONITORING EQUIPMENT:** Provide continuous monitoring of the pressure differential with an automatic recording instrument for each contained work area. Locate the instrument in a clean area where personnel have access to it without respiratory protection. The instrument shall be fitted with an alarm should the negative pressure drop below -0.02 inches of water column relative to the air outside containment.
- 2.08 **TOOLS:** Vacuum cleaners shall be equipped with HEPA filters. Use only approved power tools to remove lead-containing material. Do not use open-flame and electric element heat-gun type tools with temperatures in excess of 700° F to remove lead-containing material. Remove all residual lead contamination from reusable tools being removed from lead disturbance or removal work areas. Electrical tools and equipment shall be UL listed.
- 2.09 **AIR MONITORING EQUIPMENT:** The Contractor's IH shall select the air monitoring equipment to be used for the evaluation of airborne lead.
- 2.10 **EXPENDABLE SUPPLIES:** Provide flame resistant 6-mil thick polyethylene sheet plastic in widths necessary to minimize seams.
- 2.11 **SAFETY DATA SHEETS (SDSs):** Provide SDSs for all chemical materials brought onto the work-site.
- 2.12 **OTHER ITEMS:** Provide other items, such as consumable materials, disposable and/or reusable cleaning equipment and hand tools, or miscellaneous construction equipment and materials, in sufficient quantity as necessary to fulfill and complete the requirements of the contract. Electrical equipment and supplies shall be UL listed.
- 2.13 **ENCAPSULANTS:** Encapsulants shall contain no toxic or hazardous substances. Encapsulants shall be compatible with the products to which they are applied and be compatible with replacement products.

PART 3 - EXECUTION

3.01 WORK AREAS

- A. Lead Control Areas: A control area, structure or containment where lead-containing or contaminated materials are being disturbed. Critical barriers and/or physical boundaries shall be employed to isolate the lead control area and to prevent migration of lead contamination and unauthorized entry of personnel.
- B. Contained Lead Work Area Requirements: Construct contained lead work areas as described in the Contractor's approved work plan. A contained lead work area is required whenever airborne lead levels cannot be maintained below the OSHA action level at the boundary of a lead work area.
- C. Building Ventilation System: Shut down and isolate by air-tight seals all building ventilation systems supplying air into or returning air from a lead control area or contained lead work area.
- D. Building Electrical Systems: Verify that the electrical service is deactivated, disconnected and locked out where necessary for wet washing and/or removal. Provide temporary electrical service, equipped with ground fault protection, where needed.

3.02 PERSONNEL PROTECTION PROCEDURES

- A. Initial Determination: An initial determination is required in the absence of acceptable prior exposure data in accordance with 29 CFR 1926.62. Establish an initial lead work area for each material to be disturbed and each disturbance procedure if required. Isolate these lead work areas from the rest of the building. Personnel working in these areas shall wear respiratory protection and personal protective equipment as directed by the IH. Perform personal and work area air monitoring as directed by the IH. Operational decontamination facilities shall be available. Work performed shall be representative of the work to be done during the remainder of the project.
- B. Respirator Evaluation: Upgrading, downgrading, or not requiring respirators shall be recommended by the Contractor's IH based on the measured airborne lead-containing dust or fume concentrations. Immediately implement recommendations to upgrade the respiratory protection, followed by notification to the Owner. NOTE: Submit recommendations in writing to downgrade respirator type or not require respirators to the Owner for review and written approval prior to implementation.
- C. Decontamination Procedures: Worker and material decontamination procedures shall be as described in the Contractor's approved work plan. Worker decontamination shall be as directed by the Contractor's competent person.
- D. Work Stoppage: Stop work if the IH, the Owner, or a representative of a regulatory agency determines that the work is not in compliance with the Contractor's approved work plan, these specifications, or applicable laws and regulations. The Contractor shall stop work and notify the Owner whenever the measured concentrations of lead outside the lead control area equal or exceed $30 \mu\text{g}/\text{m}^3$ for airborne lead or $200 \mu\text{g}/\text{ft}^2$ for lead dust on surfaces that would normally be accessible by building occupants. When such work stoppage occurs, the cause of the contamination shall be corrected and the damaged or contaminated area shall be restored to its original decontaminated condition by the Contractor at no expense to the Owner. The Contractor is responsible for removing dusts and debris that were generated as a result of their work.
- E. The Contractor shall adhere to all applicable regulations regarding entry into confined spaces.

3.03 LEAD DISTURBANCE AND REMOVAL PROCEDURES:

- A. General: Perform lead disturbance or removal work in accordance with the Contractor's approved work plan, applicable regulations and this specification.
- B. Pre-Cleaning: Removal of existing loose paint chips is included in the scope of work. Pre-clean surfaces by HEPA vacuum and wet washing/wiping prior to the establishment of a work area.

- C. Perform waste battery storage and disposal in accordance with 40 CFR 261, 40 CFR 264, 40 CFR 265, 40 CFR 273 and 8 AAC.

3.04 MONITORING AND TESTING: Conduct daily sampling in accordance with the Contractor's accepted Sampling and Analysis Plan and this specification. The Owner may conduct air monitoring in the Contractor's work areas and on the Contractor's employees.

- A. Perform environmental air monitoring outside the lead work area for each lead work area without a negative initial determination. Take a minimum of two lead-in-air samples inside the work area, and two lead-in-air samples in adjacent areas.
- B. Perform dust wipe sampling for each lead work area without a negative initial determination. Include at least one sample immediately outside the entrance to the work area daily.
- C. Take personnel samples in accordance with 29 CFR 1926.62. Personal samples for an employee will include a minimum of two samples per 8 hour shift. Employees will be monitored at the rate of at least one employee for every eight people performing each task in each work area. Persons performing separate tasks or in separate lead work areas shall be sampled separately.
- D. Reduction of monitoring: For each operation for which the Negative Initial Determination established workers' exposure will be below the action level, the Contractor's IH may petition the Owner's Representative to recommend that the monitoring as required above be reduced for the specific task or operation. Daily environmental and dust sampling may not be discontinued following a Negative Initial Determination.

3.05 DISPOSAL

- A. Sampling of Waste Materials: The Contractor shall test waste materials according to 40 CFR 261 and the disposal site's permit to determine if they are hazardous waste and to dispose of them accordingly. Collect, package and transport to an EPA approved Hazardous Waste Disposal Site all bulk debris, loose paint chips, fines, dust from HEPA filters and vacuum bags, unfiltered waste water, water filter cartridges, disposable personal protective equipment (including respirator filters, poly, and tape) which do not have TCLP test results that classify the material as non-hazardous for lead (containing less than 5.0 mg/liter or 5.0 ppm of lead). Lead-acid batteries and other batteries are classified by the EPA as Universal Wastes. The EPA encourages that all Universal Wastes be recycled in accordance with 40 CFR 273, or in the case of lead-acid batteries, in accordance with 40 CFR 266, subpart G.
- B. Hazardous Waste Disposal: Dispose of hazardous project wastes as required by 40 CFR 260 and the Contractor's approved work plan.
- C. Construction (Non-Hazardous) Waste Disposal: Dispose of solid (non-hazardous) waste in a permitted waste facility, in accordance with applicable federal, state, and local laws and regulations. Burning of waste is prohibited.
- D. Salvageable Materials: The Contractor may salvage metallic lead, lead-acid batteries and other materials to keep such materials from entering the project waste stream. Sell or transfer salvage with a document of exempt status as provided by 40 CFR 261.
- E. Waste Storage: Temporarily store solid wastes as described in the approved work plan.

3.06 FINAL CLEANING AND VISUAL INSPECTION: Perform a final cleaning and visual inspection of each lead control area prior to release to unprotected workers in accordance with the Contractor's approved work plan. Clean the lead control area by vacuuming with a HEPA filtered vacuum cleaner, wet mopping or wet wiping. Do not dry sweep or use pressurized air to clean up the area. A final visual inspection report shall be provided verifying that all lead disturbance required by the contract has been completed and that all visible

dust and debris subject to disturbance by the planned work under this contract have been removed and the area HEPA vacuumed, wet mopped or wet wiped.

3.07 WORK AREA CLEARANCE TESTING: Work area clearance testing by the Contractor is required for each lead control area where the lead action level has been exceeded. Clearance testing shall be performed only after a visual inspection report by the Contractor's IH Technician has documented that the work area is clean and that all lead disturbance required by the contract has been completed. Clearance testing shall include the following:

- A. A visual inspection report by the Contractor's IH Technician verifying that all lead disturbance required by the contract has been completed and that all visible dust and debris subject to disturbance by the planned work under this contract have been removed. The visual inspection following building demolition will include close inspection of the remaining soils within the area disturbed by the building demolition, to look for and remove any visible building debris.
- B. Three (3) lead wipe and/or lead soil sample results from within the lead control area per the Contractor's approved work plan and in accordance with NIOSH method 9100. Clearance levels shall be 200 µg/ft² for wipes or 500 ppm in soil.
- C. The Owner may conduct concurrent clearance testing.
- D. Work area barriers or containments shall not be removed until clearance testing results are reviewed and approved by the Owner.

3.08 SUBSTANTIAL COMPLETION

- A. After the work area barriers and temporary construction and equipment have been removed, the Contractor shall inspect the work area to verify that no lead debris, contaminated water, or other residue remains. Any remaining residue shall be cleaned up using HEPA vacuum cleaners and wet wiping methods.
- B. The Contractor shall certify that the work area has been cleaned of all lead in compliance with the contract.

END OF SECTION

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SECTION 02 84 18 – REMOVAL AND DISPOSAL OF CHEMICAL HAZARDS

PART 1 - GENERAL

- 1.01 DESCRIPTION OF WORK: The work includes proper removal and disposal of electrical equipment and chemical hazards related to the Haines Maintenance & Operation Station Project as shown on the drawings and as specified herein. Items to be removed or disturbed may include, but are not limited to:
- A. Mercury and mercury compounds in electrical equipment and light fixtures, switches, etc.
 - B. PCB containing ballasts and light fixture components contaminated with PCB-containing oil.
 - C. Heat transfer fluids.
 - D. Radioactive components in smoke detectors and self-illuminating exit signs.
 - E. Stored common household chemicals, including construction materials, water treatment chlorine, paint thinners, fuels, new and used lubrication products. Contractor to coordinate, characterize and quantify stored materials required to be removed.
 - F. Ozone Depleting Substances (ODS) in refrigeration equipment.
 - G. Universal Waste batteries for exit and emergency lights, and other equipment.
 - H. Notification of Potential Hazards: Asbestos, lead and other potentially hazardous materials are present in the building that may impact the work of all trades. Regulated air contaminants, including asbestos and lead, are also present in settled and concealed dust in and on architectural, structural, mechanical and electrical components or systems throughout the building. All trades shall coordinate with other trades and conduct their work to prevent worker exposure or site contamination. Refer to Specification Divisions 0, 1 and 2 for specific information concerning disturbing, removing and disposing of these materials and the installation of new materials or components. This notification is provided in accordance with EPA and OSHA requirements.
- 1.02 RELATED WORK SPECIFIED ELSEWHERE
- A. Section 02 26 00 Hazardous Materials Assessment
 - B. Section 01 35 45 Airborne Contaminant Control
 - C. Section 02 82 33 Removal and Disposal of Asbestos Containing Materials
 - D. Section 02 83 33 Removal and Disposal of Materials Containing Lead
- 1.03 DEFINITIONS AND ABBREVIATIONS: Definitions and abbreviations are provided in the applicable publications listed in Paragraph 1.04 of this Section.
- 1.04 APPLICABLE PUBLICATIONS: The publications listed below form a part of this specification to the extent referenced.
- A. General Requirements: All work shall be performed in compliance with the International Building Code (IBC), Fire, Fuel Gas, Mechanical, Residential, Energy Conservation and Administrative Code; Uniform Plumbing Code; the National Electrical Code; and the publications listed in this section that are in effect at the time of the bidding of this contract.

- B. Title 10 Code of Federal Regulations (CFR), Nuclear Regulatory Commission
Part 20 Standard for Protection Against Radiation
- C. Title 29 CFR, Department of Labor (USDOL)
Part 1910 General Occupational Safety and Health Standards
Part 1926 Safety and Health Regulations for Construction
- D. Title 40 CFR, Environmental Protection Agency (EPA)
Part 61 National Emission Standards for Hazardous Air Pollutants
Part 260 Hazardous Waste Management System: General
Part 261 Identification and Listing of Hazardous Waste
Part 262 Standards Applicable to Generators of Hazardous Waste
Part 263 Standards Applicable to Transporters of Hazardous Waste
Part 270 The Hazardous Waste Permit Program
Part 273 Standards for Universal Waste Management
Part 311 Worker Protection
Part 761 Polychlorinated Biphenyls (PCBs)
- E. Title 49 CFR, Department of Transportation (DOT)
Part 171 General Information, Regulations and Definitions
Part 172 Hazardous Materials Communication and Regulations
Part 173 General Requirements for Shipments and Packaging
Part 177 Carriage by Public Highway
Part 178 Specifications for Packagings
Part 382 Requirements for Drug Testing
Part 383 Commercial Driver's License Standards
- F. State of Alaska Administrative Codes (AAC)
8 AAC 61 Occupational Safety and Health Standards
18 AAC 60 Solid Waste Management
18 AAC 62 Hazardous Wastes
18 AAC 75 Oil and Hazardous Substances Pollution Control
- G. State of Alaska Statutes (AS)
AS 45.50.477 Titles Relating to Industrial Hygiene
- H. Federal Standards
313E Safety Data Sheets
- I. American National Standard Institute (ANSI)
Z9.2 Local Exhaust Systems
Z87.1 Eye and Face Protection
Z88.2 Practices for Respiratory Protection
C78.LL 1256 Procedures for Fluorescent Lamp Sample Preparation and Toxicity
Characteristic Leaching Procedure.
- J. American Society for Testing and Materials (ASTM)
D-4397 Polyethylene Sheeting
- K. International Code Council
International Building (IBC), Fire, Fuel Gas, Mechanical, Residential, Energy Conservation and
Administrative Code Current IC Standards
- L. National Fire Protection Association (NFPA)
NFPA 701 Fire Tests for Flame Resistant Textiles and Films

- M. National Institute of Occupational Safety and Health (NIOSH)
Manual of Analytical Methods, Current Edition

1.05 QUALITY ASSURANCE

A. On-site Observation:

1. The safety and protection of the Contractor's employees, sub-contractor's employees, Owner's employees, the facility, and the public is the sole responsibility of the Contractor.
2. The Owner, the Owner's Representative, or representatives of State or Federal agencies may make unannounced visits to the site during the work. The contractor shall make available two complete sets of clean protective clothing for such visitor use. If the work requires the use of PAPR or Supplied Air Respirators, the contractor shall provide respirators to the visitor to ensure compatibility with fresh batteries or supplied air system. It is the visitor's responsibility to ensure medical qualification, training, and current "fit test" prior to using any respirator provided by the Contractor.
3. If the Owner or agency visitor determines that practices are in violation of applicable regulations, they will immediately notify the Contractor that operations must cease until corrective action is taken. Such notification will be followed by formal confirmation.
4. The Contractor shall stop work after receiving such notification. The work may not be restarted until the Contractor receives written authorization from the Owner.
5. All costs resulting from such a stop work order shall be borne by the Contractor and shall not be a basis for an increase in the contract amount or an extension of time.

B. Monitoring and Testing: Monitoring and testing during the work shall be performed as follows:

1. The Contractor shall hire Independent Testing Laboratories to collect and evaluate all air, bulk, and toxicity characteristic leaching procedure (TCLP) samples, which are the responsibility of the Contractor. The Contractor shall direct its laboratories, in writing, to release monitoring and testing data, and all other pertinent data and records, to the Owner.
2. The Contractor shall be responsible for monitoring its employees for potential exposure to airborne contaminants as required by specification 01 35 45 and all applicable regulations.
3. The Contractor shall be responsible for work area monitoring and environmental monitoring outside the work area as required by this specification. All sampling by the Contractor shall be at their own cost.
4. The Owner may perform monitoring and testing inside the building, inside the work areas, and on the Contractor's employees while work is underway and at any time during the work.
5. The Contractor shall have its Independent Testing Laboratories archive all samples until the successful completion of the project.
6. Final inspection and clearance testing shall be conducted by the Contractor.

1.06 PROTECTION OF EXISTING WORK TO REMAIN: Perform hazardous material removal work without damage or contamination of adjacent work or the site.

1.07 MEDICAL REQUIREMENTS

- A. Institute and maintain a medical surveillance program in accordance with 29 CFR 1910.134.
- B. Institute and maintain a random drug testing program, as required by 49 CFR 382, for all drivers of vehicles transporting hazardous materials.

- 1.08 TRAINING: Employ only workers who are trained and certified as required by 29 CFR 1910, 29 CFR 1926, 40 CFR 311, and 49 CFR 383 to remove, encapsulate, barricade, transport, or dispose of hazardous materials.
- 1.09 PERMITS AND NOTIFICATIONS: Secure necessary permits for hazardous material removal, storage, transport and disposal and provide timely notification as required by federal, state, and local authorities.
- 1.10 SAFETY AND ENVIRONMENTAL COMPLIANCE: Comply with laws, ordinances, rules, and regulations of federal, state, and local authorities regarding handling, storing, transporting, and disposing of hazardous materials and all other construction activities.
- 1.11 RESPIRATOR PROGRAM: Establish a respirator program as required by ANSI Z88.2 and 29 CFR 1910.134.
- 1.12 HAZARD COMMUNICATION PROGRAM: Implement a hazard communication program in accordance with 29 CFR 1910.1200.
- 1.13 SUBMITTALS
 - A. Approval: Submit the following documentation to the Owner for review, approval, or rejection. Work shall not begin until submittals are approved.
 1. Shop drawings.
 2. Hazardous material removal work plan.
 3. Liability insurance policy and performance bond.
 4. Schedule.
 5. Independent testing laboratories.
 6. Disposal site designations.
 7. Waste Transporter Designations.
 8. Notifications and certifications.
 9. Competent Person Designation Notifications and Certifications.
 10. Request for Substitutions.
 - B. Shop drawings shall show:
 1. Boundaries of all hazardous material removal areas.
 2. Location and construction of decontamination stations, if required.
 3. Location of temporary site storage facilities.
 4. Location of air monitoring stations, if required.
 5. Emergency egress route(s).
 - C. The work plan shall include procedures for:
 1. Work area set-up and protection.
 2. Worker protection and decontamination.
 3. PCB removal procedures.
 4. Mercury-containing lamp removal and packaging procedures.
 5. Mercury-containing material removal procedures.
 6. Monitoring and testing procedures (Sampling and Analysis Plan).
 7. Radioactive materials removal and tracking procedures.
 8. Waste handling, packaging, labeling, manifesting and disposal procedures.
 - D. Insurance Policy and Performance Bond: Submit copies of the Contractor's or Subcontractor's insurance policy and performance bond. Submittal requirement is only to ensure that the insurance certificate(s) show specific coverage for the potentially hazardous materials being handled by this project. The insurance and bond amounts and certificate holder requirements are

addressed in other portions of the contract documents and are not covered as part of this submittal requirement.

- E. Schedule: Submit construction schedule by work area.
- F. Independent Testing Laboratories and Laboratory Personnel: Submit the name, location, and phone number of proposed independent testing laboratories, and the names and certifications of industrial hygiene technicians. Include the laboratory's accreditation. Not all laboratories will require all accreditations.
 - 1. The Independent Testing Laboratories shall be acceptable to the Owner.
 - 2. Evidence that a laboratory has demonstrated proficiency in performing analyses according to Method 1311 TCLP, corresponding to the current version of Test Methods for Evaluating Solid Wastes (Chemical Physical Methods), SW-846. Evidence may include successful participation in a recognized inter-laboratory quality control program such as a laboratory certified by the California Health and Welfare Agency, Department of Health Services, or a more informal inter-laboratory quality control program.
 - 3. Submit the name, address, telephone number, and résumé of the Industrial Hygienist (IH) who prepared the Sampling and Analysis Plan and will oversee the on-site monitoring. Submit the names, addresses, and résumés of industrial hygiene technicians who may assist the IH for on-site tasks. The Contractor shall submit documentation that the IH has all the qualifications for the assigned duties as required by the Contractor's liability insurance policy.
 - 4. Submit copies of the Contractor's letters to the independent testing laboratories, directing each to release all the results for this project to the Owner, as these results become available and as specified herein.
- G. Disposal Site: Submit the name and location of the proposed Alaska Department of Environmental Conservation (DEC) or U.S. Environmental Protection Agency (EPA) permitted disposal sites.
- H. Waste Transporter: Submit the name, address and EPA Hazardous Waste Transporter identification number for the proposed waste transporters.
- I. Certifications, Permits, and Notifications: Obtain and submit copies of EPA Hazardous Waste Generator identification number for the purpose of accumulating hazardous waste in accordance with 40 CFR 262. Submit copies of refrigerant recovery technician's EPA certification and company name when refrigeration systems are being demolished or deactivated. If the site does not have an EPA ID number for hazardous wastes, the contractor will need to assist the Owner in obtaining the EPA ID number, but the Owner will be available to sign the application documents and shipment records prepared by the contractor.
- J. Representations: Submit statement by the Contractor that records of employees' work assignments, certifications, respirator fit tests, and medical records are accurate, up-to-date, and available for inspection.
- K. Competent Person: Submit the name and certifications of the Contractor's proposed Competent Person and a list of their previous projects. Certify that the Competent Person has the knowledge and training to supervise the work in compliance with the publications listed in Paragraph 1.04 above.
- L. Substitutions: Submit requests for substitutions of materials, equipment and methods.
- M. Updated Project Information: Submit changes to the submitted project information at least 24 hours prior to the effective time of change for the following:

1. Updated schedules for hazardous material removal.
2. Change in competent person.
3. Changes to work plan.

- 1.14 TEST REPORTS: Submit the following documentation produced during the work as received:
- A. Project Daily Logs: Submit the previous day's Daily Logs. Logs shall include regulated area sign-in sheets and list of chemical hazards removed including quantities and locations of those materials, in the units used on the drawings. Claims for additional quantities will not be addressed unless daily quantities are submitted.
 - B. Monitoring and testing data sheets and laboratory reports.
- 1.15 PROJECT COMPLIANCE DOCUMENTS: Submit the following documents with the application for final payment.
- A. Daily sign-in sheets.
 - B. Contractor's actual "start and finish" project dates.
 - C. All hazardous waste shipping manifests.
 - D. Disposal site receipts, including manufacturer name and serial numbers from each radioactive exit sign (if removed).
 - E. All final laboratory results.
 - F. Submit legible copies of each Worker's Hazardous Waste Operations and Emergency Response (HAZWOPR) cards and/or a copy of the refresher training certificate to show that all workers have received their initial training or an eight-hour refresher course within the past year.
- 1.16 SANITARY FACILITIES: Provide adequate toilet and hygiene facilities.
- 1.17 MATERIAL STORAGE: Store all materials subject to damage off the ground and secure from damage, weather, or vandalism.
- 1.18 ON-SITE DOCUMENTATION: The Contractor shall maintain on the job site, at a location approved by the owner, copies of the following data for safety procedures, equipment, and supplies used for the work.
- A. Equipment: Show the model, style, operations, and maintenance for the following, as applicable:
 1. Respirators, PAPR and canister types.
 2. Decontamination facilities.
 3. Specialized hazards handling equipment.
 - B. Expendable supplies: Maintain the manufacturer's safety data, and use the data for the following supplies:
 1. Coveralls and headgear.
 2. Boots, aprons, and gloves.
 3. Disposal containers.
 4. Solvents and degreasers.
 - C. Safety Data Sheets (SDS): Maintain SDSs for each encapsulant, surfactant, solvent, detergent, and other material proposed to be used.

- D. Respirator Program: The Contractor's written respirator program.

PART 2 - PRODUCTS

- 2.01 PERSONAL PROTECTIVE EQUIPMENT: Provide personal protective clothing as approved and selected by the IH.
- A. Respirators: Provide personally issued and marked respirators approved by the National Institute of Occupational Safety and Health (NIOSH). Provide sufficient replacements for respirators with disposable canisters.
- B. Provide filter cartridges approved for each airborne contaminant which may be present. NIOSH approved filter cartridges shall be used. At no time shall the permissible exposure limit (PEL) for the contaminant exceed the PEL listed in 8 AAC 61.1100.
- C. Whole Body Protection: Provide approved aprons, gloves, goggles, face shields, and hard-hats, and other protective clothing as required to meet applicable safety regulations to all workers engaged in hazardous materials removal. Full facepiece respirators shall meet the requirements of ANSI Z87.1.
- D. Provide protective personal equipment and clothing at no cost to the workers.
- 2.02 DECONTAMINATION UNIT: Provide a decontamination station in accordance with the Contractor's accepted work plan and applicable regulations.
- 2.03 WARNING SIGNS AND TAPE: Post warning signs and tape at the boundaries and entrances to chemical hazards removal areas. Signs required by other statutes, regulations, or ordinances may be posted in addition to, or in combination with, this warning sign.
- 2.04 WARNING LABELS: Affix warning labels to all hazardous waste disposal containers as described in the Contractor's approved Solid Waste Disposal Plan. Conform labeling to 49 CFR 100-199.
- 2.05 SPECIALIZED EQUIPMENT: Lamp crushers and other specialized equipment to consolidate, reduce or treat hazardous materials are classified as RCRA treatment and the EPA specifically prohibits the use of Drum Top Crushers for management of fluorescent lamps as universal waste unless an equivalency determination is made by the state.
- 2.06 EXPENDABLE SUPPLIES: Provide flame resistant 6-mil thick polyethylene sheet plastic in widths necessary to minimize seams.
- 2.07 SAFETY DATA SHEETS (SDSs): Provide SDSs for all chemical materials brought onto the work-site.
- 2.08 OTHER ITEMS: Provide other items, such as consumable materials, disposable and/or reusable cleaning equipment and hand tools, or miscellaneous construction equipment and materials, in sufficient quantity as necessary to fulfill and complete the requirements of the contract. Electrical equipment and supplies shall be UL listed.
- 2.09 ENCAPSULANTS: Encapsulants shall contain no toxic or hazardous substances. Encapsulants shall be compatible with the products to which they are applied and be compatible with any replacement products.

PART 3 - EXECUTION

- 3.01 WORK AREAS

- A. Electrical Power: Verify that the electrical power to the equipment being removed is deactivated, disconnected, and locked-out.
- B. Loaded Disposal Drums: The Contractor shall provide handling equipment to move disposal drums loaded with hazardous wastes.

3.02 PERSONNEL PROTECTION PROCEDURES

- A. All personnel entering the work area shall sign the daily log and put on clean protective clothing.
- B. Basic protective clothing shall consist of aprons, gloves, goggles, face shields, and hard hats--with the addition of approved full body coveralls, bib-type aprons, and respirators as conditions warrant.
- C. Make available a contaminated material disposal drum, 6-mil. plastic wrapping and tape, or appropriate bagging materials for leaking ballasts and/or oil-contaminated components.
- D. Decontamination Procedures: All personnel handling or removing hazardous materials will comply with the decontamination procedures as described in the approved work plan.

3.03 HAZARDOUS MATERIAL REMOVAL PROCEDURES: Conduct hazardous materials removal, handling, packaging, storage, transport and disposal in accordance with the Contractor's approved work plan, applicable regulations, and this specification.

- A. Perform PCB related work in accordance with 40 CFR 761, 8 AAC 61, 18 AAC 60 and 18 AAC 62.
- B. Perform mercury-containing lamps work in accordance with 40 CFR 261, 40 CFR 264, 40 CFR 265, 40 CFR 273 and 8 AAC.
- C. Perform waste battery work in accordance with 40 CFR 261, 40 CFR 264, 40 CFR 265, 40 CFR 273 and 8 AAC.
- D. Perform radioactive smoke detector and exit sign work in accordance with 10 CFR 20, 8 AAC 61, 18 AAC 60 and 18 AAC 62.
- E. Perform ozone depleting substances work in accordance with 40 CFR 82, 8 AAC 61, 18 AAC 60, and 18 AAC 62.
- F. Perform heat transfer fluid work in accordance with 40 CFR 261, 40 CFR 264, 40 CFR 265, 40 CFR 273 and 8 AAC.

3.04 MONITORING AND TESTING: Conduct daily sampling in accordance with the Contractor's accepted Sampling and Analysis Plan and this Specification. The Owner may conduct air monitoring in the Contractor's work areas and on the Contractor's employees.

- A. Personal, work area, and environmental monitoring for airborne contaminants shall be performed by industrial hygiene technicians who are employees of (one of) the Contractor's Independent Testing Laboratories.
- B. Perform air monitoring in accordance with 29 CFR 1926, current EPA guidance, and as specified herein. Calibrate all sampling pumps on-site with a calibrated transfer standard before and after each sample. Built-in rotameters on pumps are not acceptable for calibration.

- C. Monitor for all airborne contaminants listed in 29 CFR 1926.55 and 8 AAC 61.1100, which are produced by the Contractor's operations.
- D. Contractor shall test waste materials as required by 40 CFR 261, the disposal site's permit, and it's approved work plan. If performed, TCLP testing of fluorescent lamps shall comply with ANSI/NEMA Standard Procedure for Fluorescent Lamp Sample Preparation and Toxicity Characteristic Leaching Procedure, C78.LL 1256-2003 or latest version.

3.05 DISPOSAL

- A. Dispose of hazardous wastes in an EPA permitted hazardous waste disposal site as required by 40 CFR 260 and 40 CFR 761, the Contractor's approved plan, and the disposal site operator.
- B. Comply with current waste disposal, handling, labeling, storage, and transportation requirements of the waste disposal facility, U.S. Department of Transportation, and EPA regulations.
- C. Dispose of PCB Containing ballasts and/or other PCB Equipment in accordance with 40 CFR 761.
- D. Fluorescent, mercury vapor, metal halide and high pressure sodium lamps are classified by the EPA as hazardous mercury waste under the Universal Waste Rule under 40 CFR 273. Mercury and mercury-containing products are considered hazardous waste unless TCLP testing of the waste for mercury confirms the mercury content to be less than the EPA criteria of 0.2 mg/l. If mercury-containing lamps and thermostats are handled and disposed of in accordance with the Universal Waste Regulations, no TCLP test is required. If the Contractor chooses to perform a TCLP test of fluorescent lamps, the test shall be conducted in accordance with the requirements of ANSI/NEMA Standard Procedure for Fluorescent Lamp Sample Preparation and Toxicity Characteristic Leaching Procedure, C78.LL 1256-2003 or latest version.
- E. Dispose or recycle universal waste batteries as required by 40 CFR 273, the Contractor's approved plan, and the disposal/recycling site operator.
- F. Dispose of radioactive materials and equipment in accordance with the manufacturer's recommendations, the disposal site's requirements and 10 CFR 20, Subpart K. Provide list of manufacturer name and serial numbers for all removed radioactive exit signs to owner.
- G. Refrigerants in refrigeration and cooling systems in the building contain ODS components that must be recovered and recycled or disposed of in accordance with 40 CFR 82. Personnel decommissioning or removing ODS refrigerants shall hold appropriate EPA training and certificate for handling and recovering these materials.
- H. Waste heat transfer fluids (such as used heating/cooling system glycol or other circulating heating/cooling fluids) are a potentially hazardous waste and shall be drained and collected in appropriate waste containers for recycling or disposal. Fluids shall be TCLP tested prior to disposal to determine if the fluids are classified as hazardous or non-hazardous waste per the EPA's RCRA regulations governing hazardous wastes. Fluids that failed the TCLP test shall be packaged for disposal as hazardous waste.

3.06 CLEANING OF WORK AREA

- A. Remove all hazardous materials and debris within a work area. Wet clean all work area surfaces.
- B. Notify the Owner that hazardous materials removal has been completed and the work area is ready for visual inspection. Include a statement that all hazardous materials and debris in the work area have been removed as required by the contract.

END OF SECTION

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**SECTION 03 30 00
CAST-IN-PLACE CONCRETE**

PART 1 - GENERAL

1.01 RELATED DOCUMENTS

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

1.02 SUMMARY

- A. Section includes cast-in-place concrete, including formwork, reinforcement, concrete materials, accessories, mixture design, placement procedures, and finishes.
- B. Related Requirements:
 - 1. Section 05 31 00 - Steel Decking for composite steel deck for elevated slabs.
 - 2. Section 31 20 00 - Earth Moving for drainage fill under slabs-on-grade.

1.03 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. W/C Ratio: The ratio by weight of water to cementitious materials.

1.04 ACTION SUBMITTALS

- A. Product Data: For each type of product.
- B. Design Mixtures: For each concrete mixture. Submit alternate design mixtures when characteristics of materials, Project conditions, weather, test results, or other circumstances warrant adjustments.
 - 1. Indicate amounts of mixing water to be withheld for later addition at Project site.
 - 2. Include 7- and 28-day quality test reports by a third party for the proposed design mixture.
- C. Steel Reinforcement Shop Drawings: Placing Drawings that detail fabrication, bending, and placement. Include bar sizes, lengths, material, grade, bar schedules, stirrup spacing, bent bar diagrams, bar arrangement, splices and laps, mechanical connections, tie spacing, hoop spacing, and supports for concrete reinforcement.
- D. Construction Joint Layout: Indicate proposed construction joints required to construct the structure.
 - 1. Location of construction joints is subject to approval of the Department.

1.05 INFORMATIONAL SUBMITTALS

- A. Material Certificates: For each of the following, signed by manufacturers:
 - 1. Cementitious materials.
 - 2. Admixtures.
 - 3. Form materials and form-release agents.
 - 4. Steel reinforcement and accessories.

5. Waterstops.
 6. Curing compounds.
 7. Floor and slab treatments.
 8. Bonding agents.
 9. Adhesives.
 10. Vapor retarders.
 11. Rigid insulation.
 12. Semirigid joint filler.
 13. Joint-filler strips.
 14. Repair materials.
- B. Material Test Reports: For the following, from a qualified testing agency:
1. Aggregates.
- C. Floor surface flatness and levelness measurements indicating compliance with specified tolerances.
- D. Field quality-control reports.
- E. Minutes of preinstallation conference.

1.06 QUALITY ASSURANCE

- A. Installer Qualifications: A qualified installer who employs on Project personnel qualified as ACI-certified Flatwork Technician and Finisher and a supervisor who is an ACI-certified Concrete Flatwork Technician.
- B. Manufacturer Qualifications: A firm experienced in manufacturing ready-mixed concrete products and that complies with ASTM C 94/C 94M requirements for production facilities and equipment.
1. Manufacturer certified according to NRMCA's "Certification of Ready Mixed Concrete Production Facilities."
- C. Testing Agency Qualifications: An independent agency, qualified according to ASTM C 1077 and ASTM E 329 for testing indicated.
1. Personnel conducting field tests shall be qualified as ACI Concrete Field Testing Technician, Grade 1, according to ACI CP-1 or an equivalent certification program.
 2. Personnel performing laboratory tests shall be ACI-certified Concrete Strength Testing Technician and Concrete Laboratory Testing Technician, Grade I. Testing agency laboratory supervisor shall be an ACI-certified Concrete Laboratory Testing Technician, Grade II.
- D. Welding Qualifications: Qualify procedures and personnel according to AWS D1.4/D 1.4M.

1.07 DELIVERY, STORAGE, AND HANDLING

- A. Steel Reinforcement: Deliver, store, and handle steel reinforcement to prevent bending and damage. Protect stored steel reinforcing from rust.
- B. Waterstops: Store waterstops under cover to protect from moisture, sunlight, dirt, oil, and other contaminants.

1.08 FIELD CONDITIONS

- A. Cold-Weather Placement: Comply with ACI 306.1 and as follows. Protect concrete work from physical damage or reduced strength that could be caused by frost, freezing actions, or low temperatures.
 - 1. When average high and low temperature is expected to fall below 40 deg F for three successive days, maintain delivered concrete mixture temperature within the temperature range required by ACI 301.
 - 2. Do not use frozen materials or materials containing ice or snow. Do not place concrete on frozen subgrade or on subgrade containing frozen materials.
 - 3. Do not use calcium chloride, salt, or other materials containing antifreeze agents or chemical accelerators unless otherwise specified and approved in mixture designs.
- B. Hot-Weather Placement: Comply with ACI 301 and ACI 305.1, and as follows:
 - 1. Maintain concrete temperature below 90 deg F at time of placement. Chilled mixing water or chopped ice may be used to control temperature, provided water equivalent of ice is calculated to total amount of mixing water. Using liquid nitrogen to cool concrete is Contractor's option.
 - 2. Fog-spray forms, steel reinforcement, and subgrade just before placing concrete. Keep subgrade uniformly moist without standing water, soft spots, or dry areas.

PART 2 - PRODUCTS

2.01 CONCRETE, GENERAL

- A. ACI Publications: Comply with the following unless modified by requirements in the Contract Documents:
 - 1. ACI 301.
 - 2. ACI 117.

2.02 FORM-FACING MATERIALS

- A. Smooth-Formed Finished Concrete: Form-facing panels that provide continuous, true, and smooth concrete surfaces. Furnish in largest practicable sizes to minimize number of joints.
 - 1. Plywood, metal, or other approved panel materials.
 - 2. Exterior-grade plywood panels, suitable for concrete forms, complying with DOC PS 1, and as follows:
 - a. High-density overlay, Class 1 or better.
 - b. Medium-density overlay, Class 1 or better; mill-release-agent-treated and edge-sealed.
 - c. Structural 1, B-B or better; mill-oiled and edge-sealed.
 - d. B-B (Concrete Form), Class 1 or better; mill-oiled and edge-sealed.
- B. Rough-Formed Finished Concrete: Plywood, lumber, metal, or another approved material. Provide lumber dressed on at least two edges and one side for tight fit.
- C. Chamfer Strips: Wood, metal, PVC, or rubber strips, 3/4-by-3/4 inch, minimum.
- D. Form-Release Agent: Commercially formulated form-release agent that does not bond with, stain, or adversely affect concrete surfaces and does not impair subsequent treatments of concrete surfaces.
 - 1. Formulate form-release agent with rust inhibitor for steel form-facing materials.

- E. Form Ties: Factory-fabricated, removable or snap-off glass-fiber-reinforced plastic or metal form ties designed to resist lateral pressure of fresh concrete on forms and to prevent spalling of concrete on removal.
 - 1. Furnish units that leave no corrodible metal closer than 1 inch to the plane of exposed concrete surface.
 - 2. Furnish ties that, when removed, leave holes no larger than 1 inch in diameter in concrete surface.

2.03 STEEL REINFORCEMENT

- A. Reinforcing Bars: ASTM A 615/A 615M, Grade 60, deformed.
- B. Deformed-Steel Welded-Wire Reinforcement: ASTM A 1064/A 1064M, flat sheet.

2.04 REINFORCEMENT ACCESSORIES

- A. Joint Dowel Bars: ASTM A 615/A 615M, Grade 60, plain-steel bars, cut true to length with ends square and free of burrs.
- B. Bar Supports: Bolsters, chairs, spacers, and other devices for spacing, supporting, and fastening reinforcing bars and welded-wire reinforcement in place. Manufacture bar supports from steel wire, plastic, or precast concrete according to CRSI's "Manual of Standard Practice," of greater compressive strength than concrete and as follows:
 - 1. For concrete surfaces exposed to view, where legs of wire bar supports contact forms, use CRSI Class 1 plastic-protected steel wire or CRSI Class 2 stainless-steel bar supports.

2.05 CONCRETE MATERIALS

- A. Source Limitations: Obtain each type or class of cementitious material of the same brand from the same manufacturer's plant, obtain aggregate from single source, and obtain admixtures from single source from single manufacturer.
- B. Cementitious Materials:
 - 1. Portland Cement: ASTM C 150/C 150M, Type I/II.
 - 2. Fly Ash: ASTM C 618, Class F or C.
 - 3. Slag Cement: ASTM C 989/C 989M, Grade 100 or 120.
 - 4. Silica Fume: ASTM C 1240, amorphous silica.
- C. Normal-Weight Aggregates: ASTM C 33/C 33M, coarse aggregate or better, graded. Provide aggregates from a single source.
 - 1. Maximum Coarse-Aggregate Size: 3/4 inch nominal.
 - 2. Fine Aggregate: Free of materials with deleterious reactivity to alkali in cement.
- D. Air-Entraining Admixture: ASTM C 260/C 260M.
- E. Chemical Admixtures: Certified by manufacturer to be compatible with other admixtures and that do not contribute water-soluble chloride ions exceeding those permitted in hardened concrete. Do not use calcium chloride or admixtures containing calcium chloride.
 - 1. Water-Reducing Admixture: ASTM C 494/C 494M, Type A.
 - 2. Retarding Admixture: ASTM C 494/C 494M, Type B.
 - 3. Water-Reducing and Retarding Admixture: ASTM C 494/C 494M, Type D.

4. High-Range, Water-Reducing Admixture: ASTM C 494/C 494M, Type F.
 5. High-Range, Water-Reducing and Retarding Admixture: ASTM C 494/C 494M, Type G.
 6. Plasticizing and Retarding Admixture: ASTM C 1017/C 1017M, Type II.
- F. 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 C 494/C 494M, Type C.
- G. Non-Set-Accelerating Corrosion-Inhibiting Admixture: Commercially formulated, non-set-accelerating, anodic inhibitor or mixed cathodic and anodic inhibitor; capable of forming a protective barrier and minimizing chloride reactions with steel reinforcement in concrete.
- H. Water: ASTM C 94/C 94M and potable.

2.06 WATERSTOPS

- A. Flexible PVC Waterstops: CE CRD-C 572, for embedding in concrete to prevent passage of fluids through joints. Factory fabricate corners, intersections, and directional changes.
1. Profile: Flat or dumbbell with center bulb.
 2. Dimensions: 4 inches by 3/16 inch thick minimum, nontapered.

2.07 VAPOR RETARDERS

- A. Sheet Vapor Retarder: ASTM E 1745, 15 mil thickness minimum. Include manufacturer's recommended adhesive or pressure-sensitive tape.

2.08 RIGID INSULATION

- A. Extruded Polystyrene Rigid Insulation: ASTM C578 Type VII, AASHTO M230, ASTM D6817 XPS36.
1. Compressive Strength: 60 PSI minimum.
 2. Thermal Resistance: R-5.0 per inch of thickness.

2.09 LIQUID FLOOR TREATMENTS

- A. Penetrating Liquid Floor Treatment: Clear, chemically reactive, waterborne solution of inorganic silicate or silicate materials and proprietary components; odorless; that penetrates, hardens, and densifies concrete surfaces.

2.10 CURING MATERIALS

- A. Evaporation Retarder: Waterborne, monomolecular film forming, manufactured for application to fresh concrete.
- B. Absorptive Cover: AASHTO M 182, Class 2, burlap cloth made from jute or kenaf, weighing approximately 9 oz./sq. yd. when dry.
- C. Moisture-Retaining Cover: ASTM C 171, polyethylene film or white burlap-polyethylene sheet.
- D. Water: Potable.
- E. Clear, Waterborne, Membrane-Forming Curing Compound: ASTM C 309, Type 1, Class B, dissipating.

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

2.11 RELATED MATERIALS

- A. Expansion- and Isolation-Joint-Filler Strips: ASTM D 1751, asphalt-saturated cellulosic fiber.
- B. Semirigid Joint Filler: Two-component, semirigid, 100 percent solids, according to ASTM D 2240.
- C. Bonding Agent: ASTM C 1059/C 1059M, Type II, nonredispersible, acrylic emulsion or styrene butadiene.

2.12 REPAIR MATERIALS

- A. Repair Underlayment: Cement-based, polymer-modified, self-leveling product that can be applied in thicknesses from 1/8 inch and that can be feathered at edges to match adjacent floor elevations.
 - 1. Cement Binder: ASTM C 150/C 150M, portland cement or hydraulic or blended hydraulic cement as defined in ASTM C 219.
 - 2. Primer: Product of underlayment manufacturer recommended for substrate, conditions, and application.
 - 3. Aggregate: Well-graded, washed gravel, 1/8 to 1/4 inch or coarse sand as recommended by underlayment manufacturer.
 - 4. Compressive Strength: Not less than 4100 psi at 28 days when tested according to ASTM C 109/C 109M.
- B. Repair Overlayment: Cement-based, polymer-modified, self-leveling product that can be applied in thicknesses from 1/4 inch and that can be filled in over a scarified surface to match adjacent floor elevations.
 - 1. Cement Binder: ASTM C 150/C 150M, portland cement or hydraulic or blended hydraulic cement as defined in ASTM C 219.
 - 2. Primer: Product of topping manufacturer recommended for substrate, conditions, and application.
 - 3. Aggregate: Well-graded, washed gravel, 1/8 to 1/4 inch or coarse sand as recommended by topping manufacturer.
 - 4. Compressive Strength: Not less than 5000 psi at 28 days when tested according to ASTM C 109/C 109M.

2.13 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, according to ACI 301.
 - 1. Use a qualified independent 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: 25 percent.
 - 2. Combined Fly Ash and Pozzolan: 25 percent.
 - 3. Slag Cement: 50 percent.
 - 4. Combined Fly Ash or Pozzolan and Slag Cement: 50 percent portland cement minimum, with fly ash or pozzolan not exceeding 25 percent.
 - 5. Silica Fume: 10 percent.

6. Combined Fly Ash, Pozzolans, and Silica Fume: 35 percent with fly ash or pozzolans not exceeding 25 percent and silica fume not exceeding 10 percent.
 7. Combined Fly Ash or Pozzolans, Slag Cement, and Silica Fume: 50 percent with fly ash or pozzolans not exceeding 25 percent and silica fume not exceeding 10 percent.
- C. Admixtures: Use admixtures according to manufacturer's written instructions.
1. Use water-reducing, high-range water-reducing, or 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, concrete for vehicle bay slabs, concrete required to be watertight, and concrete with a w/c ratio below 0.50.
 4. Use corrosion-inhibiting admixture in concrete mixtures where indicated.

2.14 CONCRETE MIXTURES FOR BUILDING ELEMENTS

- A. First Floor and Topping Slabs: Normal-weight concrete.
1. Minimum Compressive Strength: 5000 psi at 28 days.
 2. Maximum W/C Ratio: 0.40.
 3. Slump Limit: 8 inches for concrete with verified slump of 2 to 4 inches before adding high-range water-reducing admixture or plasticizing admixture, plus or minus 1 inch.
 4. Air Content: 5 percent, plus or minus 1.5 percent at point of delivery for 3/4-inch nominal maximum aggregate size.
 5. Air Content: Do not allow air content of trowel-finished floors to exceed 3 percent.
- B. Mezzanine floor: Normal-weight concrete.
1. Minimum Compressive Strength: 4500 psi at 28 days.
 2. Maximum W/C Ratio: 0.50.
 3. Slump Limit: 8 inches for concrete with verified slump of 2 to 4 inches before adding high-range water-reducing admixture or plasticizing admixture, plus or minus 1 inch.
 4. Air Content: 5 percent, plus or minus 1.5 percent at point of delivery for 3/4-inch nominal maximum aggregate size.
 5. Air Content: Do not allow air content of trowel-finished floors to exceed 3 percent.
- C. Exterior Concrete: Normal-weight concrete.
1. Minimum Compressive Strength: 4500 psi at 28 days.
 2. Maximum W/C Ratio: 0.45.
 3. Slump Limit: 8 inches for concrete with verified slump of 2 to 4 inches before adding high-range water-reducing admixture or plasticizing admixture, plus or minus 1 inch.
 4. Air Content: 6 percent, plus or minus 1.5 percent at point of delivery for 3/4-inch nominal maximum aggregate size.
- D. Housekeeping Pads, Equipment Bases, and Steel Pan Stairs: Normal-weight concrete.
1. Minimum Compressive Strength: 3000 psi at 28 days.
 2. Maximum W/C Ratio: 0.60.
 3. Slump Limit: 8 inches for concrete with verified slump of 2 to 4 inches before adding high-range water-reducing admixture or plasticizing admixture, plus or minus 1 inch.
 4. Air Content: 5 percent, plus or minus 1.5 percent at point of delivery for 3/4-inch nominal maximum aggregate size.
 5. Air Content: Do not allow air content of trowel-finished floors to exceed 3 percent.

- E. Sand Storage Building Wall Concrete: Normal-weight concrete.
 - 1. Minimum Compressive Strength: 4500 psi at 28 days.
 - 2. Maximum W/C Ratio: 0.40.
 - 3. Slump Limit: 8 inches for concrete with verified slump of 2 to 4 inches before adding high-range water-reducing admixture or plasticizing admixture, plus or minus 1 inch.
 - 4. Air Content: 6 percent, plus or minus 1.5 percent at point of delivery for 3/4-inch nominal maximum aggregate size.

2.15 FABRICATING REINFORCEMENT

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

2.16 CONCRETE MIXING

- A. Ready-Mixed Concrete: Measure, batch, mix, and deliver concrete according to ASTM C 94/C 94M, and furnish batch ticket information.
 - 1. When air temperature is between 85 and 90 deg F, reduce mixing and delivery time from 1-1/2 hours to 75 minutes; when air temperature is above 90 deg F, reduce mixing and delivery time to 60 minutes.
- B. Project-Site Mixing: Measure, batch, and mix concrete materials and concrete according to ASTM C 94/C 94M. Mix concrete materials in appropriate drum-type batch machine mixer.
 - 1. For mixer capacity of 1 cu. yd. or smaller, continue mixing at least 1-1/2 minutes, but not more than 5 minutes after ingredients are in mixer, before any part of batch is released.
 - 2. For mixer capacity larger than 1 cu. yd., increase mixing time by 15 seconds for each additional 1 cu. yd.
 - 3. Provide batch ticket for each batch discharged and used in the Work, indicating Project identification name and number, date, mixture type, mixture time, quantity, and amount of water added. Record approximate location of final deposit in structure.

PART 3 - EXECUTION

3.01 FORMWORK INSTALLATION

- A. Design, erect, shore, brace, and maintain formwork, according to ACI 301, to support vertical, lateral, static, and dynamic loads, and construction loads that might be applied, until structure can support such loads.
- B. Construct formwork so concrete members and structures are of size, shape, alignment, elevation, and position indicated, within tolerance limits of ACI 117.
- C. Limit concrete surface irregularities, designated by ACI 347 as abrupt or gradual, as follows:
 - 1. Class A, 1/8 inch for smooth-formed finished surfaces.
 - 2. Class B, 1/4 inch for rough-formed finished surfaces.
- D. Construct forms tight enough to prevent loss of concrete mortar.
- E. Construct forms for easy removal without hammering or prying against concrete surfaces. Provide crush or wrecking plates where stripping may damage cast-concrete surfaces. Provide top forms for inclined surfaces steeper than 1.5 horizontal to 1 vertical.
 - 1. Install keyways, recesses, and the like, for easy removal.

2. Do not use rust-stained steel form-facing material.
- F. Set edge forms, bulkheads, and intermediate screed strips for slabs to achieve required elevations and slopes in finished concrete surfaces. Provide and secure units to support screed strips; use strike-off templates or compacting-type screeds.
 - G. Provide temporary openings for cleanouts and inspection ports where interior area of formwork is inaccessible. Close openings with panels tightly fitted to forms and securely braced to prevent loss of concrete mortar. Locate temporary openings in forms at inconspicuous locations.
 - H. Chamfer exterior corners and edges of permanently exposed concrete.
 - I. Form openings, chases, offsets, sinkages, keyways, reglets, blocking, screeds, and bulkheads required in the Work. Determine sizes and locations from trades providing such items.
 - J. Clean forms and adjacent surfaces to receive concrete. Remove chips, wood, sawdust, dirt, and other debris just before placing concrete.
 - K. Retighten forms and bracing before placing concrete, as required, to prevent mortar leaks and maintain proper alignment.
 - L. Coat contact surfaces of forms with form-release agent, according to manufacturer's written instructions, before placing reinforcement.

3.02 EMBEDDED ITEM INSTALLATION

- A. Place and secure anchorage devices and other embedded items required for adjoining work that is attached to or supported by cast-in-place concrete. Use setting drawings, templates, diagrams, instructions, and directions furnished with items to be embedded.
 1. Install anchor rods, accurately located, to elevations required and complying with tolerances in Section 7.5 of AISC 303.

3.03 REMOVING AND REUSING FORMS

- A. General: Formwork for sides of beams, walls, columns, and similar parts of the Work that does not support weight of concrete may be removed after cumulatively curing at not less than 50 deg F for 24 hours after placing concrete. Concrete has to be hard enough to not be damaged by form-removal operations, and curing and protection operations need to be maintained.
 1. Leave formwork for beam soffits, joists, slabs, and other structural elements that support weight of concrete in place until concrete has achieved at least 70 percent of its 28-day design compressive strength.
 2. Remove forms only if shores have been arranged to permit removal of forms without loosening or disturbing shores.
- B. Clean and repair surfaces of forms to be reused in the Work. Split, frayed, delaminated, or otherwise damaged form-facing material are not acceptable for exposed surfaces. Apply new form-release agent.
- C. When forms are reused, clean surfaces, remove fins and laitance, and tighten to close joints. Align and secure joints to avoid offsets. Do not use patched forms for exposed concrete surfaces unless approved by DEPARTMENT's Representative.

3.04 SHORING AND RESHORING INSTALLATION

- A. Comply with ACI 318 and ACI 301 for design, installation, and removal of shoring and reshoring.
 - 1. Do not remove shoring or reshoring until measurement of slab tolerances is complete.
- B. Plan sequence of removal of shores and reshore to avoid damage to concrete. Locate and provide adequate reshoring to support construction without excessive stress or deflection.

3.05 VAPOR-RETARDER INSTALLATION

- A. Sheet Vapor Retarders: Place, protect, and repair sheet vapor retarder according to ASTM E 1643 and manufacturer's written instructions.
 - 1. Place under entire slab-on-grade within the building footprint.
 - 2. Lap joints 6 inches and seal with manufacturer's recommended tape.

3.06 RIGID INSULATION INSTALLATION

- A. Place boards in the largest increment possible with staggered joints where applicable.
- B. Repair damage by replacing sections. Spray insulation may be used at small irregularities or holes, less than 0.5-sf.
- C. Place under entire slab-on-grade within the building footprint.
 - 1. Wrap grade beams, sand traps, and similar concrete components.

3.07 STEEL REINFORCEMENT INSTALLATION

- A. General: Comply with CRSI's "Manual of Standard Practice" for fabricating, placing, and supporting reinforcement.
 - 1. Do not cut or puncture vapor retarder. Repair damage and reseal vapor retarder before placing concrete.
- B. Clean reinforcement of loose rust and mill scale, earth, ice, and other foreign materials that reduce bond to concrete.
- C. Accurately position, support, and secure reinforcement against displacement. Locate and support reinforcement with bar supports to maintain minimum concrete cover. Do not tack weld crossing reinforcing bars.
 - 1. Weld reinforcing bars according to AWS D1.4/D 1.4M, where indicated.
- D. Set wire ties with ends directed into concrete, not toward exposed concrete surfaces.
- E. Install welded-wire reinforcement in longest practicable lengths on bar supports spaced to minimize sagging. Lap edges and ends of adjoining sheets at least one mesh spacing. Offset laps of adjoining sheet widths to prevent continuous laps in either direction. Lace overlaps with wire.

3.08 JOINTS

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

- B. Construction Joints: Install so strength and appearance of concrete are not impaired, at locations indicated or as approved by DEPARTMENT's Representative.
 - 1. Place joints perpendicular to main reinforcement. Continue reinforcement across construction joints unless otherwise indicated. Do not continue reinforcement through sides of strip placements of floors and slabs.
 - 2. Form keyed joints as indicated. Embed keys at least 1-1/2 inches into concrete.
 - 3. Use a bonding agent at locations where fresh concrete is placed against hardened or partially hardened concrete surfaces.
- C. Contraction Joints in Slabs-on-Grade: Form weakened-plane contraction joints, sectioning concrete into areas as indicated. Construct contraction joints for a depth equal to at least one-fourth of concrete thickness as follows:
 - 1. Grooved Joints: Form contraction joints after initial floating by grooving and finishing each edge of joint to a radius of 1/8 inch. Repeat grooving of contraction joints after applying surface finishes. Eliminate groover tool marks on concrete surfaces.
 - 2. Sawed Joints: Form contraction joints with power saws equipped with shatterproof abrasive or diamond-rimmed blades. Cut 1/8-inch-wide joints into concrete when cutting action does not tear, abrade, or otherwise damage surface and before concrete develops random contraction cracks.
- D. Isolation Joints in Slabs-on-Grade: After removing formwork, install joint-filler strips at slab junctions with vertical surfaces, such as column pedestals, foundation walls, grade beams, and other locations, as indicated.
 - 1. Extend joint-filler strips full width and depth of joint, terminating flush with finished concrete surface unless otherwise indicated.
 - 2. Terminate full-width joint-filler strips not less than 1/2 inch or more than 1 inch below finished concrete surface where joint sealants, specified in Section 07 92 00 - Joint Sealants, are indicated.
 - 3. Install joint-filler strips in lengths as long as practicable. Where more than one length is required, lace or clip sections together.
- E. Doweled Joints: Install dowel bars and support assemblies at joints where indicated. Lubricate or asphalt-coat one-half of dowel length to prevent concrete bonding to one side of joint.

3.09 WATERSTOP INSTALLATION

- A. Flexible Waterstops: Install in construction joints and at other joints indicated to form a continuous diaphragm. Install in longest lengths practicable. Support and protect exposed waterstops during progress of the Work. Field fabricate joints in waterstops according to manufacturer's written instructions.
- B. Self-Expanding Strip Waterstops: Install in construction joints and at other locations indicated, according to manufacturer's written instructions, adhesive bonding, mechanically fastening, and firmly pressing into place. Install in longest lengths practicable.

3.10 CONCRETE PLACEMENT

- A. Before placing concrete, verify that installation of formwork, reinforcement, and embedded items is complete and that required inspections are completed.
- B. Do not add water to concrete during delivery, at Project site, or during placement unless approved by DEPARTMENT's Representative.

- C. Before test sampling and placing concrete, water may be added at Project site, subject to limitations of ACI 301.
 - 1. Do not add water to concrete after adding high-range water-reducing admixtures to mixture.
- D. 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. If a section cannot be placed continuously, provide construction joints as indicated. Deposit concrete to avoid segregation.
 - 1. Deposit concrete in horizontal layers of depth not to exceed formwork design pressures and in a manner to avoid inclined construction joints.
 - 2. Consolidate placed concrete with mechanical vibrating equipment according to ACI 301.
 - 3. Do not use vibrators to transport concrete inside forms. Insert and withdraw vibrators vertically at uniformly spaced locations to rapidly penetrate placed layer and at least 6 inches into preceding layer. Do not insert vibrators into lower layers of concrete that have begun to lose plasticity. At each insertion, limit duration of vibration to time necessary to consolidate concrete and complete embedment of reinforcement and other embedded items without causing mixture constituents to segregate.
- E. Deposit and consolidate concrete for floors and slabs in a continuous operation, within limits of construction joints, until placement of a panel or section is complete.
 - 1. Consolidate concrete during placement operations, so concrete is thoroughly worked around reinforcement and other embedded items and into corners.
 - 2. Maintain reinforcement in position on chairs during concrete placement.
 - 3. Screed slab surfaces with a straightedge and strike off to correct elevations.
 - 4. Slope surfaces uniformly to drains where required.
 - 5. Begin initial floating using bull floats or darbies to form a uniform and open-textured surface plane, before excess bleedwater appears on the surface. Do not further disturb slab surfaces before starting finishing operations.
- F. Apply bonding agent to cold joints of continued concrete. Except not at specified joints and not between topping slab and substrate.

3.11 FINISHING FORMED SURFACES

- A. Rough-Formed Finish: As-cast concrete texture imparted by form-facing material with tie holes and defects repaired and patched. Remove fins and other projections that exceed specified limits on formed-surface irregularities.
 - 1. Apply to concrete surfaces not exposed to public view.
- B. Smooth-Formed Finish: As-cast concrete texture imparted by form-facing material, arranged in an orderly and symmetrical manner with a minimum of seams. Repair and patch tie holes and defects. Remove fins and other projections that exceed specified limits on formed-surface irregularities.
 - 1. Apply to concrete surfaces exposed to public view or to be covered with a coating or covering material applied directly to concrete.
- C. Related Unformed Surfaces: At tops of walls, horizontal offsets, and similar unformed surfaces adjacent to formed surfaces, strike off smooth and finish with a texture matching adjacent formed surfaces. Continue final surface treatment of formed surfaces uniformly across adjacent unformed surfaces unless otherwise indicated.

3.12 FINISHING FLOORS AND SLABS

- A. General: Comply with ACI 302.1R recommendations for screeding, restraighening, and finishing operations for concrete surfaces. Do not wet concrete surfaces.
- B. Float Finish: Consolidate surface with power-driven floats or by hand floating if area is small or inaccessible to power-driven floats. Restraighten, cut down high spots, and fill low spots. Repeat float passes and restraighening until surface is left with a uniform, smooth, granular texture.
 - 1. Apply float finish to surfaces to receive trowel finish.
- C. Trowel Finish: After applying float finish, apply first troweling and consolidate concrete by hand or power-driven trowel. Continue troweling passes and restraighten until surface is free of trowel marks and uniform in texture and appearance. Grind smooth any surface defects that would telegraph through applied coatings or floor coverings.
 - 1. Apply a trowel finish to surfaces exposed to view or to be covered with resilient flooring, carpet, ceramic or quarry tile set over a cleavage membrane, paint, or another thin-film-finish coating system.
 - 2. Finish surfaces to the following tolerances, according to ASTM E 1155, for a randomly trafficked floor surface:
 - a. Specified overall values of flatness, F(F) 35; and of levelness, F(L) 25; with minimum local values of flatness, F(F) 24; and of levelness, F(L) 17; for slabs-on-grade.
 - b. Specified overall values of flatness, F(F) 30; and of levelness, F(L) 20; with minimum local values of flatness, F(F) 24; and of levelness, F(L) 15; for suspended slabs.
 - 3. Finish and measure surface, so gap at any point between concrete surface and an unleveled, freestanding, 10-foot-long straightedge resting on two high spots and placed anywhere on the surface does not exceed 3/16 inch.
- D. Broom Finish: Apply a broom finish to exterior concrete platforms, steps, ramps, and elsewhere as indicated.
 - 1. Immediately after float finishing, slightly roughen trafficked surface by brooming with fiber-bristle broom perpendicular to main traffic route. Coordinate required final finish with DEPARTMENT's Representative before application.

3.13 MISCELLANEOUS CONCRETE ITEM INSTALLATION

- A. Filling In: Fill in holes and openings left in concrete structures after work of other trades is in place unless otherwise indicated. Mix, place, and cure concrete, as specified, to blend with in-place construction. 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.
- C. Equipment Bases and Foundations:
 - 1. Coordinate sizes and locations of concrete bases with actual equipment provided.
 - 2. Construct concrete bases a minimum of 3 inches deep unless otherwise indicated, and extend base not less than 6 inches in each direction beyond the maximum dimensions of supported equipment unless otherwise indicated or unless required for seismic anchor support.
 - 3. Install dowel rods to connect concrete base to concrete floor. Unless otherwise indicated, install dowel rods on 12-inch centers each way of concrete base.

4. For supported equipment, install epoxy-coated anchor bolts that extend through concrete base and anchor into structural concrete substrate.
 5. Prior to pouring concrete, place and secure anchorage devices. Use setting drawings, templates, diagrams, instructions, and directions furnished with items to be embedded.
 6. Cast anchor-bolt insert into bases. Install anchor bolts to elevations required for proper attachment to supported equipment.
- D. Steel Pan Stairs: Provide concrete fill for steel pan stair treads, landings, and associated items. Cast-in inserts and accessories as shown on Drawings. Screed, tamp, and trowel finish concrete surfaces.

3.14 CONCRETE PROTECTING AND CURING

- A. General: Protect freshly placed concrete from premature drying and excessive cold or hot temperatures. Comply with ACI 306.1 for cold-weather protection and ACI 305.1 hot-weather protection during curing.
- B. Evaporation Retarder: Apply evaporation retarder to unformed concrete surfaces if hot, dry, or windy conditions cause moisture loss approaching 0.2 lb/sq. ft. x h before and during finishing operations. Apply according to manufacturer's written instructions after placing, screeding, and bull floating or darbying concrete, but before float finishing.
- C. Formed Surfaces: Cure formed concrete surfaces, including underside of beams, supported slabs, and other similar surfaces. If forms remain during curing period, moist cure after loosening forms. If removing forms before end of curing period, continue curing for remainder of curing period.
- D. Unformed Surfaces: Begin curing immediately after finishing concrete. Cure unformed surfaces, including floors and slabs, concrete floor toppings, and other surfaces.
- E. Cure concrete according to ACI 308.1, by one or a combination of the following methods:
1. Moisture Curing: Keep surfaces continuously moist for not less than seven days with the following materials:
 - a. Water.
 - b. Continuous water-fog spray.
 - c. Absorptive cover, water saturated, and kept continuously wet. Cover concrete surfaces and edges with 12-inch lap over adjacent absorptive covers.
 2. Moisture-Retaining-Cover Curing: Cover concrete surfaces with moisture-retaining cover for curing concrete, placed in widest practicable width, with sides and ends lapped at least 12 inches, and sealed by waterproof tape or adhesive. Cure for not less than seven days. Immediately repair any holes or tears during curing period, using cover material and waterproof tape.
 - a. Moisture cure or use moisture-retaining covers to cure concrete surfaces to receive floor coverings.
 - b. Moisture cure or use moisture-retaining covers to cure concrete surfaces to receive penetrating liquid floor treatments.
 - c. Cure concrete surfaces to receive floor coverings with either a moisture-retaining cover or a curing compound that the manufacturer certifies does not interfere with bonding of floor covering used on Project.

3. Curing Compound: Apply uniformly in continuous operation by power spray or roller according to manufacturer's written instructions. Recoat areas subjected to heavy rainfall within three hours after initial application. Maintain continuity of coating and repair damage during curing period.
 - a. Removal: After curing period has elapsed, remove curing compound without damaging concrete surfaces by method recommended by curing compound manufacturer unless manufacturer certifies curing compound does not interfere with bonding of floor covering used on Project.
4. Curing and Sealing Compound: Apply uniformly to floors and slabs indicated in a continuous operation by power spray or roller according to manufacturer's written instructions. Recoat areas subjected to heavy rainfall within three hours after initial application. Repeat process 24 hours later and apply a second coat. Maintain continuity of coating and repair damage during curing period.

3.15 LIQUID FLOOR TREATMENT APPLICATION

- A. Penetrating Liquid Floor Treatment: Prepare, apply, and finish penetrating liquid floor treatment according to manufacturer's written instructions.
 1. Remove curing compounds, sealers, oil, dirt, laitance, and other contaminants and complete surface repairs.
 2. Do not apply to concrete that is less than seven days' old unless recommended by the manufacturer.
 3. Apply liquid until surface is saturated, scrubbing into surface until a gel forms; rewet; and repeat brooming or scrubbing. Rinse with water; remove excess material until surface is dry. Apply a second coat in a similar manner if surface is rough or porous.
- B. Sealing Coat: Uniformly apply a continuous sealing coat of curing and sealing compound to hardened concrete by power spray or roller according to manufacturer's written instructions.
- C. Apply to all slabs except where architectural floor finishes are not compatible with liquid floor treatment.

3.16 JOINT FILLING

- A. Prepare, clean, and install joint filler according to manufacturer's written instructions.
 1. Defer joint filling until concrete has aged at least one month(s). 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. Overfill joint and trim joint filler flush with top of joint after hardening.

3.17 CONCRETE SURFACE REPAIRS

- A. Defective Concrete: Repair and patch defective areas when approved by DEPARTMENT's Representative. Remove and replace concrete that cannot be repaired and patched to Department's approval.
- B. Patching Mortar: Mix dry-pack patching mortar, consisting of one part portland cement to 2-1/2 parts fine aggregate passing a No. 16 sieve, using only enough water for handling and placing.

- C. Repairing Formed Surfaces: Surface defects include color and texture irregularities, cracks, spalls, air bubbles, honeycombs, rock pockets, fins and other projections on the surface, and stains and other discolorations that cannot be removed by cleaning.
1. Immediately after form removal, cut out honeycombs, rock pockets, and voids more than 1/2 inch in any dimension to solid concrete. Limit cut depth to 3/4 inch. Make edges of cuts perpendicular to concrete surface. Clean, dampen with water, and brush-coat holes and voids with bonding agent. Fill and compact with patching mortar before bonding agent has dried. Fill form-tie voids with patching mortar or cone plugs secured in place with bonding agent.
 2. Repair defects on surfaces exposed to view by blending white portland cement and standard portland cement so that, when dry, patching mortar matches surrounding color. Patch a test area at inconspicuous locations to verify mixture and color match before proceeding with patching. Compact mortar in place and strike off slightly higher than surrounding surface.
 3. Repair defects on concealed formed surfaces that affect concrete's durability and structural performance as determined by DEPARTMENT's Representative.
- D. Repairing Unformed Surfaces: Test unformed surfaces, such as floors and slabs, for finish and verify surface tolerances specified for each surface. Correct low and high areas. Test surfaces sloped to drain for trueness of slope and smoothness; use a sloped template.
1. Repair finished surfaces containing defects. Surface defects include spalls, popouts, honeycombs, rock pockets, crazing and cracks in excess of 0.01 inch wide or that penetrate to reinforcement or completely through unreinforced sections regardless of width, and other objectionable conditions.
 2. After concrete has cured at least 14 days, correct high areas by grinding.
 3. Correct localized low areas during or immediately after completing surface finishing operations by cutting out low areas and replacing with patching mortar. Finish repaired areas to blend into adjacent concrete.
 4. Correct other low areas scheduled to receive floor coverings with a repair underlayment. Prepare, mix, and apply repair underlayment and primer according to manufacturer's written instructions to produce a smooth, uniform, plane, and level surface. Feather edges to match adjacent floor elevations.
 5. Correct other low areas scheduled to remain exposed with a repair topping. Cut out low areas to ensure a minimum repair topping depth of 1/4 inch to match adjacent floor elevations. Prepare, mix, and apply repair topping and primer according to manufacturer's written instructions to produce a smooth, uniform, plane, and level surface.
 6. Repair defective areas, except random cracks and single holes 1 inch or less in diameter, by cutting out and replacing with fresh concrete. Remove defective areas with clean, square cuts and expose steel reinforcement with at least a 3/4-inch clearance all around. Dampen concrete surfaces in contact with patching concrete and apply bonding agent. Mix patching concrete of same materials and mixture as original concrete, except without coarse aggregate. Place, compact, and finish to blend with adjacent finished concrete. Cure in same manner as adjacent concrete.
 7. Repair random cracks and single holes 1 inch or less in diameter with patching mortar. Groove top of cracks and cut out holes to sound concrete and clean off dust, dirt, and loose particles. Dampen cleaned concrete surfaces and apply bonding agent. Place patching mortar before bonding agent has dried. Compact patching mortar and finish to match adjacent concrete. Keep patched area continuously moist for at least 72 hours.
- E. Perform structural repairs of concrete, subject to DEPARTMENT's Representative's approval, using epoxy adhesive and patching mortar.
- F. Repair materials and installation not specified above may be used, subject to DEPARTMENT's Representative's approval.

3.18 FIELD QUALITY CONTROL

- A. Special Inspections: DEPARTMENT will engage a special inspector to perform inspections.
- B. Testing Agency: CONTRACTOR shall engage a qualified testing agency to perform tests and to submit reports.
- C. Inspections:
 - 1. Steel reinforcement placement.
 - 2. Headed bolts and studs.
 - 3. Verification of use of required design mixture.
 - 4. Concrete placement, including conveying and depositing.
 - 5. Curing procedures and maintenance of curing temperature.
 - 6. Verification of concrete strength before removal of shores and forms from beams and slabs.
- D. Concrete Tests by Contractor: Testing of composite samples of fresh concrete obtained according to ASTM C 172/C 172M shall be performed according to 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 shall be conducted from at least five randomly selected batches or from each batch if fewer than five are used.
 - 2. Slump: ASTM C 143/C 143M; 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. Perform additional tests when concrete consistency appears to change.
 - 3. Air Content: ASTM C 231/C 231M, pressure method, for normal-weight concrete; 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 C 1064/C 1064M; 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. Unit Weight: ASTM C 567/C 567M, fresh unit weight of structural lightweight concrete; one test for each composite sample, but not less than one test for each day's pour of each concrete mixture.
 - 6. Compression Test Specimens: ASTM C 31/C 31M.
 - a. Cast and laboratory cure two sets of two standard cylinder specimens for each composite sample.
 - b. Cast and field cure two sets of two standard cylinder specimens for each composite sample.
 - 7. Compressive-Strength Tests: ASTM C 39/C 39M
 - a. Test one set of two laboratory-cured specimens at 7 days and one set of two specimens at 28 days.
 - b. Test one set of two field-cured specimens at 7 days and one set of two specimens at 28 days.
 - c. A compressive-strength test shall be the average compressive strength from a set of two specimens obtained from same composite sample and tested at age indicated.
 - 8. When strength of field-cured cylinders is less than 85 percent of companion laboratory-cured cylinders, Contractor shall evaluate operations and provide corrective procedures for protecting and curing in-place concrete.

9. 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.
 10. Test results shall be reported in writing to DEPARTMENT's Representative, concrete manufacturer, and Contractor within 48 hours of testing. Reports of compressive-strength tests shall contain Project identification name and number, date of concrete placement, name of concrete testing and inspecting agency, location of concrete batch in Work, design compressive strength at 28 days, concrete mixture proportions and materials, compressive breaking strength, and type of break for both 7- and 28-day tests.
 11. Nondestructive Testing: Impact hammer, sonoscope, or other nondestructive device may be permitted by DEPARTMENT's Representative but will not be used as sole basis for approval or rejection of concrete.
 12. Additional Tests: Testing and inspecting agency shall make additional tests of concrete when test results indicate that slump, air entrainment, compressive strengths, or other requirements have not been met, as directed by DEPARTMENT's Representative. Testing and inspecting agency may conduct tests to determine adequacy of concrete by cored cylinders complying with ASTM C 42/C 42M or by other methods as directed by DEPARTMENT's Representative.
 13. Additional testing and inspecting, at Contractor's expense, will be performed to determine compliance of replaced or additional work with specified requirements.
 14. Correct deficiencies in the Work that test reports and inspections indicate do not comply with the Contract Documents.
- E. Contractor to measure floor and slab flatness and levelness according to ASTM E 1155 within 48 hours of finishing.

3.19 PROTECTION OF LIQUID FLOOR TREATMENTS

- A. Protect liquid floor treatment from damage and wear during the remainder of construction period. Use protective methods and materials, including temporary covering, recommended in writing by liquid floor treatments installer.

END OF SECTION

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SECTION 042613 - MASONRY VENEER

PART 1 GENERAL

2.1 SECTION INCLUDES

- A. Concrete block.
- B. Mortar and grout.
- C. Reinforcement and anchorage.
- D. Flashings.
- E. Accessories.

2.2 REFERENCE STANDARDS

- A. ASTM A153/A153M - Standard Specification for Zinc Coating (Hot-Dip) on Iron and Steel Hardware; 2023.
- B. ASTM A615/A615M - Standard Specification for Deformed and Plain Carbon-Steel Bars for Concrete Reinforcement; 2022.
- C. ASTM A641/A641M - Standard Specification for Zinc-Coated (Galvanized) Carbon Steel Wire; 2019.
- D. ASTM A666 - Standard Specification for Annealed or Cold-Worked Austenitic Stainless Steel Sheet, Strip, Plate, and Flat Bar; 2023.
- E. ASTM A951/A951M - Standard Specification for Steel Wire for Masonry Joint Reinforcement; 2022.
- F. ASTM A1064/A1064M - Standard Specification for Carbon-Steel Wire and Welded Wire Reinforcement, Plain and Deformed, for Concrete; 2022.
- G. ASTM B370 - Standard Specification for Copper Sheet and Strip for Building Construction; 2022.
- H. ASTM C91/C91M - Standard Specification for Masonry Cement; 2023.
- I. ASTM C129 - Standard Specification for Nonloadbearing Concrete Masonry Units; 2023.
- J. ASTM C144 - Standard Specification for Aggregate for Masonry Mortar; 2018.
- K. ASTM C150/C150M - Standard Specification for Portland Cement; 2022.
- L. ASTM C207 - Standard Specification for Hydrated Lime for Masonry Purposes; 2018.
- M. ASTM C270 - Standard Specification for Mortar for Unit Masonry; 2019a, with Editorial Revision.
- N. ASTM C404 - Standard Specification for Aggregates for Masonry Grout; 2024.
- O. ASTM C476 - Standard Specification for Grout for Masonry; 2023.
- P. ASTM C979/C979M - Standard Specification for Pigments for Integrally Colored Concrete; 2016.
- Q. ASTM D226/D226M - Standard Specification for Asphalt-Saturated Organic Felt Used in Roofing and Waterproofing; 2017 (Reapproved 2023).
- R. BIA Technical Notes No. 7 - Water Penetration Resistance – Design and Detailing; 2017.
- S. BIA Technical Notes No. 28B - Brick Veneer/Steel Stud Walls; 2005.
- T. BIA Technical Notes No. 46 - Maintenance of Brick Masonry; 2017.
- U. TMS 402/602 - Building Code Requirements and Specification for Masonry Structures; 2022, with Errata (2024).

2.3 ADMINISTRATIVE REQUIREMENTS

- A. Preinstallation Meeting: Convene one week before starting work of this section.

2.4 SUBMITTALS

- A. See Section 013300 - Administrative Requirements, for submittal procedures.

- B. Product Data: Provide data for masonry units, fabricated wire reinforcement, and mortar.
- C. Samples: Submit four samples of decorative block units to illustrate color, texture, and extremes of color range.
- D. Manufacturer's Certificate: Certify that masonry units meet or exceed specified requirements.

2.5 QUALITY ASSURANCE

- A. Comply with provisions of TMS 402/602, except where exceeded by requirements of Contract Documents.
 - 1. Maintain one copy of each document on project site.
- B. Manufacturer Qualifications: Company specializing in manufacturing the type of products specified in this section with minimum three years of documented experience.

2.6 DELIVERY, STORAGE, AND HANDLING

- A. Deliver, handle, and store masonry units by means that will prevent mechanical damage and contamination by other materials.
- B. Handle and store ceramic glazed masonry units in protective cartons or trays. Do not remove from protective packaging until ready for installation.

2.7 FIELD CONDITIONS

- A. Cold and Hot Weather Requirements: Comply with requirements of TMS 402/602 or applicable building code, whichever is more stringent.
- B. Maintain materials and surrounding air temperature to minimum 40 degrees F (5 degrees C) prior to, during, and 48 hours after completion of masonry work.
- C. Maintain materials and surrounding air temperature to maximum 90 degrees F (32 degrees C) prior to, during, and 48 hours after completion of masonry work.

PART 2 PRODUCTS

3.1 UNIT MASONRY - GENERAL

3.2 CONCRETE MASONRY UNITS

- A. Concrete Block: Comply with referenced standards and as follows:
 - 1. Size: Standard units with nominal face dimensions of 16 by 8 inches (400 by 200 mm) and nominal depth of 4 inches (100 mm).
 - 2. Non-Loadbearing Units: ASTM C129.
 - a. Lightweight.

3.3 MORTAR AND GROUT MATERIALS

- A. Masonry Cement: ASTM C91/C91M Type N.
 - 1. Colored Mortar: Premixed cement as required to match Architect's color sample.
- B. Portland Cement: ASTM C150/C150M, Type I; color as required to produce approved color sample.
- C. Hydrated Lime: ASTM C207, Type S.
- D. Mortar Aggregate: ASTM C144.
- E. Grout Aggregate: ASTM C404.
- F. Pigments for Colored Mortar: Pure, concentrated mineral pigments specifically intended for mixing into mortar and complying with ASTM C979/C979M.
 - 1. Color(s): As indicated on drawings.
 - 2. Manufacturers:
 - a. Davis Colors, a division of Venator Materials PLC; _____: www.daviscolors.com/#sle.
 - b. Interstar.
 - c. Substitutions: See Section 016000 - Product Requirements.
- G. Water: Clean and potable.
- H. Accelerating Admixture: Nonchloride type for use in cold weather.

- I. Moisture-Resistant Admixture: Water repellent compound designed to reduce capillarity.

3.4 REINFORCEMENT AND ANCHORAGE

- A. Reinforcing Steel: ASTM A615/A615M, Grade 40 (40,000 psi) (280 MPa) yield strength, deformed billet bars; galvanized.
- B. Joint Reinforcement Type: Use ladder type joint reinforcement where vertical reinforcement is involved and truss type elsewhere, unless otherwise indicated.
- C. Joint Reinforcement Standard: ASTM A951/A951M.
 - 1. Type: Truss or ladder.
 - 2. Material: ASTM A1064/A1064M steel wire, mill galvanized to ASTM A641/A641M Class 3.
 - 3. Size: 0.1483 inch (3.8 mm) side rods with 0.1483 inch (3.8 mm) cross rods; width as required to provide not less than 5/8 inch (16 mm) of mortar coverage on each exposure.
- D. Masonry Veneer Anchors: 2-piece anchors that permit differential movement between masonry veneer and structural backup, hot dip galvanized to ASTM A 153/A 153M, Class B.
 - 1. Anchor plates: Not less than 0.075 inch (1.91 mm) thick, designed for fastening to structural backup through sheathing by two fasteners; provide design with legs that penetrate sheathing and insulation to provide positive anchorage.
 - 2. Wire ties: Manufacturer's standard shape, 0.1875 inch (4.75 mm) thick.
 - 3. Vertical adjustment: Not less than 3-1/2 inches (89 mm).
- E. Strap Anchors: Bent steel shapes, 1-1/2-inch (38 mm) width, 0.105-inch (2.7 mm) thickness, 24-inch (610 mm) length; with 1-1/2 inches (38 mm) long, 90-degree bend at each end to form U or Z shape or with cross pins; hot-dip galvanized in accordance with ASTM A153/A153M Class B.
- F. Metal-to-Metal Fasteners: Self-drilling, self-tapping screws; corrosion resistant finish or hot dip galvanized to ASTM A153/A153M.

3.5 FLASHINGS

- A. Metal Flashing Materials:
 - 1. Copper Flashing: ASTM B370, 060 soft annealed; 20 oz/sq ft (0.7 mm) thick; natural finish.
 - 2. Stainless Steel Flashing: ASTM A666, Type 304, soft temper; 26 gauge, 0.0187 inch (0.48 mm) thick; finish 2B to 2D.
 - 3. Prefabricated Metal Flashing: Smooth fabricated 12 oz/sq ft (3.66 kg/sq m) copper flashing for surface mounted conditions.
- B. Factory-Fabricated Flashing Corners and Ends: Stainless steel.
- C. Flashing Sealant/Adhesives: Silicone, polyurethane, or silyl-terminated polyether/polyurethane, or other type required or recommended by flashing manufacturer; type capable of adhering to type of flashing used.
- D. Termination Bars: Stainless steel; compatible with membrane and adhesives.
- E. Drip Edge: Stainless steel; compatible with membrane and adhesives.
- F. Lap Sealants and Tapes: As recommended by flashing manufacturer; compatible with membrane and adhesives.

3.6 ACCESSORIES

- A. Preformed Control Joints: Rubber material. Provide with corner and tee accessories, fused joints.
- B. Joint Filler: Closed cell polyvinyl chloride; oversized 50 percent to joint width; self expanding; in maximum lengths available.
- C. Building Paper: ASTM D226/D226M, Type I ("No. 15") asphalt felt.
- D. Weeps:
 - 1. Type: Preformed aluminum vents with sloping louvers.
 - 2. Color(s): As selected by Architect from manufacturer's full range.
- E. Cavity Vents:
 - 1. Type: Polyester mesh.

- 2. Color(s): As selected by Architect from manufacturer's full range.
 - F. Drainage Fabric: Polyester mesh bonded to a water and vapor-permeable fabric.
 - G. Cavity Mortar Control: Semi-rigid polyethylene or polyester mesh panels, sized to thickness of wall cavity, and designed to prevent mortar droppings from clogging weeps and cavity vents and allow proper cavity drainage.
 - 1. Mortar Diverter: Panels installed at flashing locations.
 - H. Cleaning Solution: Non-acidic, not harmful to masonry work or adjacent materials.
- 3.7 MORTAR AND GROUT MIXING
- A. Mortar for Unit Masonry: ASTM C270, Proportion Specification.
 - 1. Masonry below grade and in contact with earth; Type S.
 - 2. Exterior, non-loadbearing masonry; Type N.
 - B. Colored Mortar: Proportion selected pigments and other ingredients to match Architect's sample, without exceeding manufacturer's recommended pigment-to-cement ratio.
 - C. Grout: ASTM C476; consistency as required to fill volumes completely for grouting; fine grout for spaces with smallest horizontal dimension of 2 inches (50 mm) or less; coarse grout for spaces with smallest horizontal dimension greater than 2 inches (50 mm).
 - D. Mixing: Use mechanical batch mixer and comply with referenced standards.

PART 3 EXECUTION

4.1 EXAMINATION

- A. Verify that field conditions are acceptable and are ready to receive masonry.
- B. Verify that related items provided under other sections are properly sized and located.
- C. Verify that built-in items are in proper location, and ready for roughing into masonry work.

4.2 COURSING

- A. Establish lines, levels, and coursing indicated. Protect from displacement.
- B. Maintain masonry courses to uniform dimension. Form vertical and horizontal joints of uniform thickness.
- C. Concrete Masonry Units:
 - 1. Bond: Running.
 - 2. Coursing: One unit and one mortar joint to equal 8 inches (200 mm).
 - 3. Mortar Joints: Concave.

4.3 PLACING AND BONDING

- A. Lay solid masonry units in full bed of mortar, with full head joints, uniformly jointed with other work.
- B. Lay hollow masonry units with face shell bedding on head and bed joints.
- C. Buttering corners of joints or excessive furrowing of mortar joints is not permitted.
- D. Remove excess mortar as work progresses.
- E. Interlock intersections and external corners, except for units laid in stack bond.
- F. Do not shift or tap masonry units after mortar has achieved initial set. Where adjustment must be made, remove mortar and replace.
- G. Perform job site cutting of masonry units with proper tools to provide straight, clean, unchipped edges. Prevent broken masonry unit corners or edges.

4.4 WEEPS/CAVITY VENTS

- A. Install weeps in veneer walls at 24 inches (600 mm) on center horizontally on top of through-wall flashing above shelf angles and lintels and at bottom of walls.
- B. Install cavity vents in veneer walls at 32 inches (800 mm) on center horizontally below shelf angles and lintels and at top of walls.

4.5 CAVITY MORTAR CONTROL

- A. Do not permit mortar to drop or accumulate into cavity air space or to plug weep/cavity vents.
- B. For cavity walls, build inner wythe ahead of outer wythe to accommodate accessories.
- C. Install cavity mortar diverter at base of cavity and at other flashing locations as recommended by manufacturer to prevent mortar droppings from blocking weep/cavity vents.

4.6 REINFORCEMENT AND ANCHORAGE - MASONRY VENEER

4.7 MASONRY FLASHINGS

- A. Whether or not specifically indicated, install masonry flashing to divert water to exterior at all locations where downward flow of water will be interrupted.
 - 1. Extend flashings full width at such interruptions and at least 6 inches (152 mm), minimum, into adjacent masonry or turn up at least 1 inch (25.4 mm), minimum, to form watertight pan at non-masonry construction.
 - 2. Remove or cover protrusions or sharp edges that could puncture flashings.
 - 3. Seal lapped ends and penetrations of flashing before covering with mortar.
- B. Terminate flashing up 8 inches (203 mm) minimum on vertical surface of backing:
 - 1. Install vertical leg of flashing behind water-resistive barrier sheet over backing.
 - 2. Install vertical leg of flashing over fluid-applied or self-adhered air/vapor barriers over backing or per manufacturer's directions.
 - 3. Terminate vertical leg of flashing into bed joint in masonry or reglet in concrete.
 - 4. Anchor vertical leg of flashing into backing with a termination bar and sealant.
 - 5. Apply cap bead of sealant on top edge of self-adhered flashing.
- C. Install flashing in accordance with manufacturer's instructions and BIA Technical Notes No. 7.
- D. Support flexible flashings across gaps and openings.
- E. Lap end joints of flashings at least 6 inches (152 mm), minimum, and seal watertight with flashing sealant/adhesive.

4.8 CONTROL AND EXPANSION JOINTS

- A. Do not continue horizontal joint reinforcement through control or expansion joints.
- B. Form control joint with a sheet building paper bond breaker fitted to one side of the hollow contour end of the block unit. Fill the resultant core with grout fill. Rake joint at exposed unit faces for placement of backer rod and sealant.
- C. Install preformed control joint device in continuous lengths. Seal butt and corner joints in accordance with manufacturer's instructions.
- D. Size control joints as indicated on drawings; if not indicated, 3/4 inch (19 mm) wide and deep.

4.9 TOLERANCES

- A. Install masonry within the site tolerances found in TMS 402/602.

4.10 CUTTING AND FITTING

- A. Cut and fit for pipes and conduit. Coordinate with other sections of work to provide correct size, shape, and location.
- B. Obtain approval prior to cutting or fitting masonry work not indicated or where appearance or strength of masonry work may be impaired.

4.11 CLEANING

- A. Remove excess mortar and mortar smears as work progresses.
- B. Replace defective mortar. Match adjacent work.
- C. Clean soiled surfaces with cleaning solution.
- D. Use non-metallic tools in cleaning operations.

4.12 PROTECTION

- A. Without damaging completed work, provide protective boards at exposed external corners that are subject to damage by construction activities.

END OF SECTION

SECTION 05 12 00
STRUCTURAL STEEL FRAMING

PART 1 GENERAL

1.01 SUMMARY

- A. Section Includes:
 - 1. Structural steel.
 - 2. Shear stud connectors.
 - 3. Shrinkage-resistant grout.
- B. Related Requirements:
 - 1. Section 05 31 00 "Steel Decking" for field installation of shear stud connectors through deck.
 - 2. Section 05 50 00 "Metal Fabrications" for miscellaneous steel fabrications and other steel items not defined as structural steel.
 - 3. Section 09 91 13 "Exterior Painting" and Section 09 91 23 "Interior Painting" and Section 09 96 00 "High-Performance Coatings" for painting requirements.

1.02 DEFINITIONS

- A. Structural Steel: Elements of the structural frame indicated on Drawings and as described in ANSI/AISC 303.
- B. Seismic-Load-Resisting System: Elements of structural-steel frame designated as "SLRS" or along grid lines designated as "SLRS" on Drawings, including columns, beams, and braces and their connections.
- C. Heavy Sections: Rolled and built-up sections as follows:
 - 1. Shapes included in ASTM A6/A6M with flanges thicker than 1-1/2 inches.
 - 2. Welded built-up members with plates thicker than 2 inches.
 - 3. Column base plates thicker than 2 inches.
- D. Protected Zone: Structural members or portions of structural members indicated as "protected zone" on Drawings. Connections of structural and nonstructural elements to protected zones are limited.
- E. Demand-Critical Welds: Those welds, the failure of which would result in significant degradation of the strength and stiffness of the seismic-load-resisting system and which are indicated as "demand critical", "DC", or "seismic critical" on Drawings.

1.03 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 anchorage items to be embedded in or attached to other construction without delaying the Work. Provide setting diagrams, sheet metal templates, instructions, and directions for installation.

1.04 PREINSTALLATION MEETINGS

- A. Preinstallation Conference: Conduct conference at the Project site.

1.05 ACTION SUBMITTALS

- A. Product Data:
 - 1. Structural-steel materials.
 - 2. High-strength, bolt-nut-washer assemblies.
 - 3. Shear stud connectors.
 - 4. Anchor rods.
 - 5. Threaded rods.
 - 6. Forged-steel hardware.
 - 7. Shop primer.
 - 8. Galvanized-steel primer.
 - 9. Etching cleaner.
 - 10. Galvanized repair paint.

11. Shrinkage-resistant grout.
- B. Shop Drawings: Show fabrication of structural-steel components.
 1. Include details of cuts, connections, splices, camber, holes, and other pertinent data.
 2. Include embedment Drawings.
 3. Indicate welds by standard AWS symbols, distinguishing between shop and field welds, and show size, length, and type of each weld. Show backing bars that are to be removed and supplemental fillet welds where backing bars are to remain.
 4. Indicate type, size, and length of bolts, distinguishing between shop and field bolts. Identify pretensioned and slip-critical, high-strength bolted connections.
 5. Identify members and connections of the seismic-load-resisting system.
 6. Indicate locations and dimensions of protected zones.
 7. Identify demand-critical welds.
 8. Identify members, or portions of members, not to be shop primed.
 9. Identify members that are to be galvanized.
 10. Identify locations of weep holes and vent holes for galvanized HSS members.
- C. Welding Procedure Specifications (WPSs) and Procedure Qualification Records (PQRs): Provide in accordance with AWS D1.1/D1.1M for each welded joint whether prequalified or qualified by testing or qualified by testing, including the following:
 1. Power source (constant current or constant voltage).
 2. Electrode manufacturer and trade name, for demand-critical welds.

1.06 INFORMATIONAL SUBMITTALS

- A. Qualification Data: For Installer, fabricator, shop-painting applicators and testing agency.
- B. Welding certificates.
- C. Paint Compatibility Certificates: From manufacturers of topcoats applied over shop primers, certifying that shop primers are compatible with topcoats.
- D. Mill test reports for structural-steel materials, including chemical and physical properties.
- E. Product Test Reports: For the following:
 1. Bolts, nuts, and washers, including mechanical properties and chemical analysis.
 2. Direct-tension indicators.
 3. Tension-control, high-strength, bolt-nut-washer assemblies.
 4. Shear stud connectors.
- F. Survey of existing conditions.
- G. Source quality-control reports.
- H. Field quality-control reports.

1.07 QUALITY ASSURANCE

- A. Fabricator Qualifications: A qualified fabricator that participates in the AISC Quality Certification Program and is designated an AISC-Certified Plant, Category BU or is accredited by the IAS Fabricator Inspection Program for Structural Steel (Acceptance Criteria 172). The fabricator may also employ a qualified third-party inspector to observe the shop fabricated structural steel in accordance with the International Building Code (IBC) 2018 requirements.
- B. Installer Qualifications: A qualified Installer who participates in the AISC Quality Certification Program and is designated an AISC-Certified Erector, Category CSE.
- C. Welding Qualifications: Qualify procedures and personnel in accordance with AWS D1.1/D1.1M.
 1. Welders and welding operators performing work on bottom-flange, demand-critical welds shall pass the supplemental welder qualification testing, as required by AWS D1.8/D1.8M. FCAW-S and FCAW-G shall be considered separate processes for welding personnel qualification.

1.08 DELIVERY, STORAGE, AND HANDLING

- A. Store materials to permit easy access for inspection and identification. Keep steel members off ground and spaced by using pallets, dunnage, or other supports and spacers. Protect steel members and packaged materials from corrosion and deterioration.
 - 1. Do not store materials on structure in a manner that might cause distortion, damage, or overload to members or supporting structures. Repair or replace damaged materials or structures as directed.
- B. Store fasteners in a protected place in sealed containers with manufacturer's labels intact.
 - 1. Fasteners may be repackaged provided Owner's testing and inspecting agency observes repackaging and seals containers.
 - 2. Clean and relubricate bolts and nuts that become dry or rusty before use.
 - 3. Comply with manufacturers' written recommendations for cleaning and lubricating ASTM F3125/F3125M, Grade F1852 bolt assemblies and for retesting bolt assemblies after lubrication.

PART 2 PRODUCTS

2.01 PERFORMANCE REQUIREMENTS

- A. Comply with applicable provisions of the following specifications and documents:
 - 1. ANSI/AISC 303.
 - 2. ANSI/AISC 341.
 - 3. ANSI/AISC 360.
 - 4. RCSC's "Specification for Structural Joints Using High-Strength Bolts."

2.02 STRUCTURAL-STEEL MATERIALS

- A. W-Shapes: As indicated.
- B. Channels, Angles, M-Shapes, S-Shapes: As indicated.
- C. Plate and Bar: As indicated.
- D. Cold-Formed Hollow Structural Sections: As indicated.
- E. Steel Pipe: As indicated.
 - 1. Weight Class: Standard.
 - 2. Finish: Black except where indicated to be galvanized.
- F. Steel Castings: ASTM A216/A216M, Grade WCB, with supplementary requirement S11.
- G. Steel Forgings: ASTM A668/A668M.
- H. Welding Electrodes: Comply with AWS requirements, and requirements indicated on plan.

2.03 BOLTS AND CONNECTORS

- A. High-Strength A325 Bolts, Nuts, and Washers: ASTM F3125/F3125M, Grade A325, Type 1, heavy-hex steel structural bolts; ASTM A563, Grade DH, heavy-hex carbon-steel nuts; and ASTM F436/F436M, Type 1, hardened carbon-steel washers; all with plain finish.
 - 1. Direct-Tension Indicators: ASTM F959/F959M, Type 325-1, compressible-washer type with plain finish.
- B. High-Strength A490 Bolts, Nuts, and Washers: ASTM F3125/F3125M, Grade A490, Type 1, heavy-hex steel structural bolts[or Grade F2280 tension-control, bolt-nut-washer assemblies with splined ends; ASTM A563, Grade DH, heavy-hex carbon-steel nuts; and ASTM F436/F436M, Type 1, hardened carbon-steel washers; all with plain finish.
 - 1. Direct-Tension Indicators: ASTM F959/F959M, Type 490-1, compressible-washer type with plain finish.
- C. Zinc-Coated High-Strength A325 Bolts, Nuts, and Washers: ASTM F3125/F3125M, Grade A325, Type 1, heavy-hex steel structural bolts; ASTM A563, Grade DH, heavy-hex carbon-steel nuts; and ASTM F436/F436M, Type 1, hardened carbon-steel washers.
 - 1. Finish: Hot-dip or mechanically deposited zinc coating.

2. Direct-Tension Indicators: ASTM F959/F959M, Type 325-1, compressible-washer type with mechanically deposited zinc coating, baked epoxy-coated finish.
- D. Tension-Control, High-Strength Bolt-Nut-Washer Assemblies: ASTM F3125/F3125M, Grade F1852, Type 1, heavy-hex or round head assemblies, consisting of steel structural bolts with splined ends; ASTM A563, Grade DH, heavy-hex carbon-steel nuts; and ASTM F436/F436M, Type 1, hardened carbon-steel washers.
 1. Finish: Plain or Mechanically deposited zinc coating as indicated.
- E. Shear Stud Connectors: ASTM A108, AISI C-1015 through C-1020, headed-stud type, cold-finished carbon steel; AWS D1.1/D1.1M, Type B.

2.04RODS

- A. Unheaded Anchor Rods: ASTM F1554, Grade 36, unless otherwise indicated.
 1. Configuration: Straight.
 2. Nuts: ASTM A563 heavy-hex carbon steel.
 3. Plate Washers: ASTM A36/A36M carbon steel.
 4. Washers: ASTM F436, Type 1, hardened carbon steel.
 5. Finish: Plain or Hot-dip zinc coating, ASTM A153/A153M, Class C as indicated.
- B. Headed Anchor Rods: ASTM F1554, Grade 36, unless otherwise indicated, straight.
 1. Nuts: ASTM A563 heavy-hex carbon steel.
 2. Plate Washers: ASTM A36/A36M carbon steel.
 3. Washers: ASTM F436, Type 1, hardened carbon steel.
 4. Finish: Plain or Hot-dip zinc coating, ASTM A153/A153M, Class C as indicated.
- C. Threaded Rods: ASTM A36/A36M, unless otherwise indicated.
 1. Nuts: ASTM A563 heavy-hex carbon steel.
 2. Plate Washers: ASTM A36/A36M carbon steel.
 3. Washers: ASTM F436, Type 1, hardened carbon steel.
 4. Finish: Plain or hot-dip zinc coating, ASTM A153/A153M, Class C as indicated.

2.05FORGED-STEEL STRUCTURAL HARDWARE

- A. Clevises and Turnbuckles: Made from cold-finished carbon-steel bars, ASTM A108, AISI C-1035.
- B. Eye Bolts and Nuts: Made from cold-finished carbon-steel bars, ASTM A108, AISI C-1030.
- C. Sleeve Nuts: Made from cold-finished carbon-steel bars, ASTM A108, AISI C-1018.

2.06PRIMER

- A. Steel Primer:
 1. Comply with Section 09 91 13 "Exterior Painting" and Section 09 91 23 "Interior Painting."
 2. SSPC-Paint 23, latex primer.
 3. Fabricator's standard lead- and chromate-free, nonasphaltic, rust-inhibiting primer complying with MPI#79 and compatible with topcoat.
- B. Galvanized-Steel Primer:
 1. Etching Cleaner: MPI#25, for galvanized steel.
 2. Galvanizing Repair Paint: SSPC-Paint 20, ASTM A780/A780M.

2.07SHRINKAGE-RESISTANT GROUT

- A. Metallic, Shrinkage-Resistant Grout: ASTM C1107/C1107M, factory-packaged, metallic aggregate grout, mixed with water to consistency suitable for application and a 30-minute working time.
- B. Nonmetallic, Shrinkage-Resistant Grout: ASTM C1107/C1107M, factory-packaged, nonmetallic aggregate grout, noncorrosive and nonstaining, mixed with water to consistency suitable for application and a 30-minute working time.
- C. Grout used below column base plates shall have a minimum design compressive strength of twice that of the foundation elements.

2.08 FABRICATION

- A. Structural Steel: Fabricate and assemble in shop to greatest extent possible. Fabricate in accordance with ANSI/AISC 303 and to ANSI/AISC 360.
 - 1. Camber structural-steel members where indicated.
 - 2. Fabricate beams with rolling camber up.
 - 3. Identify high-strength structural steel in accordance with ASTM A6/A6M and maintain markings until structural-steel framing has been erected.
 - 4. Mark and match-mark materials for field assembly.
 - 5. Complete structural-steel assemblies, including welding of units, before starting shop-priming operations.
- B. Thermal Cutting: Perform thermal cutting by machine to greatest extent possible.
 - 1. Plane thermally cut edges to be welded to comply with requirements in AWS D1.1/D1.1M.
- C. Bolt Holes: Cut, drill, or punch standard bolt holes perpendicular to metal surfaces.
- D. Finishing: Accurately finish ends of columns and other members transmitting bearing loads.
- E. Cleaning: Clean and prepare steel surfaces that are to remain unpainted in accordance with SSPC-SP 1.
- F. Shear Stud Connectors: Prepare steel surfaces as recommended by manufacturer of shear connectors. Weld using automatic end welding of headed-stud shear connectors in accordance with AWS D1.1/D1.1M and manufacturer's written instructions.
- G. Holes: Provide holes required for securing other work to structural steel and for other work to pass through steel members.
 - 1. Cut, drill, or punch holes perpendicular to steel surfaces. Do not thermally cut bolt holes or enlarge holes by burning.
 - 2. Baseplate Holes: Cut, drill, mechanically thermal cut, or punch holes perpendicular to steel surfaces.
 - 3. Weld threaded nuts to framing and other specialty items indicated to receive other work.

2.09 SHOP CONNECTIONS

- A. High-Strength Bolts: Shop install high-strength bolts in accordance with RCSC's "Specification for Structural Joints Using High-Strength Bolts" for type of bolt and type of joint specified.
- B. Weld Connections: Comply with AWS D1.1/D1.1M and AWS D1.8/D1.8M for tolerances, appearances, welding procedure specifications, weld quality, and methods used in correcting welding work.
 - 1. Assemble and weld built-up sections by methods that maintain true alignment of axes without exceeding tolerances in ANSI/AISC 303 for mill material.

2.10 GALVANIZING

- A. Hot-Dip Galvanized Finish: Apply zinc coating by the hot-dip process to structural steel in accordance with ASTM A123/A123M.
 - 1. Fill vent and drain holes that are exposed in the finished Work unless they function as weep holes, by plugging with zinc solder and filing off smooth.
 - 2. Galvanize lintels, shelf angles, and, welded door frames attached to structural-steel frame and located in exterior walls.
 - 3. All Exterior Steel and associated connectors shall be galvanized unless otherwise indicated.

2.11 SHOP PRIMING

- A. Shop prime steel surfaces, except the following:
 - 1. Surfaces embedded in concrete or mortar. Extend priming of partially embedded members to a depth of 2 inches.
 - 2. Surfaces to be field welded.
 - 3. Surfaces of high-strength bolted, slip-critical connections.
 - 4. Surfaces to receive sprayed fire-resistive materials (applied fireproofing).
 - 5. Galvanized surfaces unless indicated to be painted.
 - 6. Corrosion-resisting (weathering) steel surfaces.

7. Surfaces enclosed in interior construction.
- B. Surface Preparation of Steel: Clean surfaces to be painted. Remove loose rust and mill scale and spatter, slag, or flux deposits. Prepare surfaces in accordance with SSPC-SP 3 specifications and standards. Architecturally Exposed Structural Steel shall be prepared in accordance with Specification section 05 12 13.
- C. Surface Preparation of Galvanized Steel: Prepare galvanized-steel surfaces for shop priming by thoroughly cleaning steel of grease, dirt, oil, flux, and other foreign matter, and treating with etching cleaner.
- D. Priming: Immediately after surface preparation, apply primer in accordance with manufacturer's written instructions and at rate recommended by SSPC to provide a minimum dry film thickness of 1.5 mils. Use priming methods that result in full coverage of joints, corners, edges, and exposed surfaces.
 1. Apply two coats of shop paint to surfaces that are inaccessible after assembly or erection. Change color of second coat to distinguish it from first.

2.12SOURCE QUALITY CONTROL

- A. Testing Agency: Owner will engage a qualified testing agency to perform shop tests and inspections.
 1. Allow testing agency access to places where structural-steel work is being fabricated or produced to perform tests and inspections.
 2. Bolted Connections: Inspect and test shop-bolted connections in accordance with RCSC's "Specification for Structural Joints Using High-Strength Bolts."
 3. Welded Connections: Visually inspect shop-welded connections in accordance with AWS D1.1/D1.1M and the following inspection procedures, at testing agency's option:
 - a. Liquid Penetrant Inspection: ASTM E165/E165M.
 - b. Magnetic Particle Inspection: ASTM E709; performed on root pass and on finished weld. Cracks or zones of incomplete fusion or penetration are not accepted.
 - c. Ultrasonic Inspection: ASTM E164.
 - d. Radiographic Inspection: ASTM E94/E94M.
 4. In addition to visual inspection, test and inspect shop-welded shear stud connectors in accordance with requirements in AWS D1.1/D1.1M for stud welding and as follows:
 - a. Perform bend tests if visual inspections reveal either a less-than-continuous 360-degree flash or welding repairs to any shear stud connector.
 - b. Conduct tests in accordance with requirements in AWS D1.1/D1.1M on additional shear stud connectors if weld fracture occurs on shear stud connectors already tested.
 5. Prepare test and inspection reports.

PART 3 EXECUTION

3.01EXAMINATION

- A. Verify, with certified steel erector present, elevations of concrete- and masonry-bearing surfaces and locations of anchor rods, bearing plates, and other embedments for compliance with requirements.
 1. Prepare a certified survey of existing conditions. Include bearing surfaces, anchor rods, bearing plates, and other embedments showing dimensions, locations, angles, and elevations.
- B. Proceed with installation only after unsatisfactory conditions have been corrected.

3.02PREPARATION

- A. Provide temporary shores, guys, braces, and other supports during erection to keep structural steel secure, plumb, and in alignment against temporary construction loads and loads equal in intensity to design loads. Remove temporary supports when permanent structural steel, connections, and bracing are in place unless otherwise indicated on Drawings.
 1. Do not remove temporary shoring supporting composite deck construction and structural-steel framing until cast-in-place concrete has attained its design compressive strength.

3.03ERECTION

- A. Set structural steel accurately in locations and to elevations indicated and in accordance with ANSI/AISC 303 and ANSI/AISC 360.
- B. Baseplates Bearing Plates and Leveling Plates: Clean concrete- and masonry-bearing surfaces of bond-reducing materials, and roughen surfaces prior to setting plates. Clean bottom surface of plates.
 - 1. Set plates for structural members on wedges, shims, or setting nuts as required.
 - 2. Weld plate washers to top of baseplate.
 - 3. Snug-tighten, unless otherwise indicated as pretensioned, anchor rods after supported members have been positioned and plumbed. Do not remove wedges or shims but, if protruding, cut off flush with edge of plate before packing with grout.
 - 4. Promptly pack shrinkage-resistant grout solidly between bearing surfaces and plates, so no voids remain. Neatly finish exposed surfaces; protect grout and allow to cure. Comply with manufacturer's written installation instructions for grouting.
- C. Maintain erection tolerances of structural steel within ANSI/AISC 303.
- D. Align and adjust various members that form part of complete frame or structure before permanently fastening. Before assembly, clean bearing surfaces and other surfaces that are in permanent contact with members. Perform necessary adjustments to compensate for discrepancies in elevations and alignment.
 - 1. Level and plumb individual members of structure. Slope roof framing members to slopes indicated on Drawings.
 - 2. Make allowances for difference between temperature at time of erection and mean temperature when structure is completed and in service.
- E. Splice members only where indicated.
- F. Do not use thermal cutting during erection.
- G. Do not enlarge unfair holes in members by burning or using drift pins. Ream holes that must be enlarged to admit bolts.

3.04FIELD CONNECTIONS

- A. High-Strength Bolts: Install high-strength bolts in accordance with RCSC's "Specification for Structural Joints Using High-Strength Bolts" for bolt and joint type specified.
- B. Weld Connections: Comply with AWS D1.1/D1.1M and AWS D1.8/D1.8M for tolerances, appearances, welding procedure specifications, weld quality, and methods used in correcting welding work.
 - 1. Comply with ANSI/AISC 303 and ANSI/AISC 360 for bearing, alignment, adequacy of temporary connections, and removal of paint on surfaces adjacent to field welds.
 - 2. Remove backing bars or runoff tabs unless otherwise indicated, back gouge, and grind steel smooth.
 - 3. Assemble and weld built-up sections by methods that maintain true alignment of axes without exceeding tolerances in ANSI/AISC 303 for mill material.

3.05REPAIR

- A. Galvanized Surfaces: Clean areas where galvanizing is damaged or missing, and repair galvanizing to comply with ASTM A780/A780M.
- B. Touchup Painting:
 - 1. Immediately after erection, clean exposed areas where primer is damaged or missing, and paint with the same material as used for shop painting to comply with SSPC-PA 1 for touching up shop-painted surfaces.
 - a. Clean and prepare surfaces by SSPC-SP 2 hand-tool cleaning or SSPC-SP 3 power-tool cleaning.
 - 2. Cleaning and touchup painting are specified in Section 09 91 13 "Exterior Painting." Or Section 09 91 23 "Interior Painting."
- C. Touchup Priming: Cleaning and touchup priming are specified in Section 09 96 00 "High-Performance Coatings."

3.06 FIELD QUALITY ASSURANCE

- A. Special Inspections: Owner will engage a special inspector to perform the following special inspections:
 - 1. Verify structural-steel materials and inspect steel frame joint details.
 - 2. Verify weld materials and inspect welds.
 - 3. Verify connection materials and inspect high-strength bolted connections.
 - 4. Perform all special inspections as indicated on design drawings.
- B. Testing Agency: Owner will engage a qualified testing agency to perform tests and inspections.
 - 1. Bolted Connections: Inspect and test bolted connections in accordance with RCSC's "Specification for Structural Joints Using High-Strength Bolts."
 - 2. Welded Connections: Visually inspect field welds in accordance with AWS D1.1/D1.1M.
 - a. In addition to visual inspection, test and inspect field welds in accordance with AWS D1.1/D1.1M and the following inspection procedures, at testing agency's option:
 - 1) Liquid Penetrant Inspection: ASTM E165/E165M.
 - 2) Magnetic Particle Inspection: ASTM E709; performed on root pass and on finished weld. Cracks or zones of incomplete fusion or penetration are not accepted.
 - 3) Ultrasonic Inspection: ASTM E164.
 - 4) Radiographic Inspection: ASTM E94/E94M.

END OF SECTION

**SECTION 05 31 00
STEEL DECKING**

PART 1 - GENERAL

1.01 RELATED DOCUMENTS

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

1.02 SUMMARY

- A. Section Includes:
 - 1. Composite floor deck.
- B. Related Requirements:
 - 1. Section 03 30 00 - Cast-in-Place Concrete for normal-weight and lightweight structural concrete fill over steel deck.
 - 2. Section 05 50 00 - Metal Fabrications for framing deck openings with miscellaneous steel shapes.
 - 3. Section 05 51 13 - Metal Pan Stairs for stair framing and openings.
 - 4. Section 09 91 23 - Interior Painting for repair painting of primed deck and finish painting of deck.
 - 5. Section 13 34 19 - Metal Building Systems for structural support framing and slab on deck design.

1.03 ACTION SUBMITTALS

- A. Product Data: For each type of deck, accessory, and product indicated.
- B. Shop Drawings: Include layout and types of deck panels, anchorage details, reinforcing channels, pans, cut deck openings, special jointing, accessories, and attachments to other construction.

1.04 INFORMATIONAL SUBMITTALS

- A. Welding certificates.
- B. Product Certificates: For each type of steel deck.
- C. Product Test Reports: For tests performed by a qualified testing agency, indicating that each of the following complies with requirements:
- D. Evaluation Reports: For steel deck, from ICC-ES.
- E. Field quality-control reports.

1.05 QUALITY ASSURANCE

- A. Testing Agency Qualifications: Qualified according to ASTM E 329 for testing indicated.
- B. Welding Qualifications: Qualify procedures and personnel according to AWS D1.3/D1.3M, "Structural Welding Code - Sheet Steel."

1.06 DELIVERY, STORAGE, AND HANDLING

- A. Protect steel deck from corrosion, deformation, and other damage during delivery, storage, and handling.
- B. Stack steel deck on platforms or pallets and slope to provide drainage. Protect with a waterproof covering and ventilate to avoid condensation.
 - 1. Protect and ventilate acoustical cellular roof deck with factory-installed insulation to maintain insulation free of moisture.

PART 2 - PRODUCTS

2.01 PERFORMANCE REQUIREMENTS

- A. AISI Specifications: Comply with calculated structural characteristics of steel deck according to AISI's "North American Specification for the Design of Cold-Formed Steel Structural Members."
- B. Fire-Resistance Ratings: Comply with ASTM E 119; 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.

2.02 COMPOSITE FLOOR DECK

- A. Composite Floor Deck: Fabricate panels, with integrally embossed or raised pattern ribs and interlocking side laps, to comply with "SDI Specifications and Commentary for Composite Steel Floor Deck," in SDI Publication No. 31, with the minimum section properties indicated, and with the following:
 - 1. Galvanized-Steel Sheet: ASTM A 653/A 653M, Structural Steel (SS), Grade 33 or Grade 50, G60 zinc coating.
 - 2. Profile Depth: As indicated on the drawings, not less than 1-1/2 inches.
 - 3. Span Condition: Triple span or more.
 - 4. Design Thickness: 18-gauge minimum.

2.03 ACCESSORIES

- A. General: Provide manufacturer's standard accessory materials for deck that comply with requirements indicated.
- B. Mechanical Fasteners: Corrosion-resistant, low-velocity, power-actuated or pneumatically driven carbon-steel fasteners; or self-drilling, self-threading screws.
- C. Side-Lap Fasteners: Corrosion-resistant, hexagonal washer head; self-drilling, carbon-steel screws, No. 10 minimum diameter minimum.
- D. Flexible Closure Strips: Vulcanized, closed-cell, synthetic rubber.
- E. Miscellaneous Sheet Metal Deck Accessories: Steel sheet, minimum yield strength of 33,000 psi, not less than 0.0359-inch design uncoated thickness, of same material and finish as deck; of profile indicated or required for application.

- F. Pour Stops and Girder Fillers: Steel sheet, minimum yield strength of 33,000 psi, of same material and finish as deck, and of thickness and profile recommended by SDI Publication No. 31 for overhang and slab depth, or greater.
- G. Column Closures, End Closures, Z-Closures, and Cover Plates: Steel sheet, of same material, finish, and thickness as deck unless otherwise indicated.
- H. Piercing Hanger Tabs: Piercing steel sheet hanger attachment devices for use with floor deck.
- I. Galvanizing Repair Paint: ASTM A 780/A 780M or SSPC-Paint 20.
- J. Repair Paint: Manufacturer's standard rust-inhibitive primer of same color as primer.

PART 3 - EXECUTION

3.01 EXAMINATION

- A. Examine supporting frame and field conditions for compliance with requirements for installation tolerances and other conditions affecting performance of the Work.
- B. Proceed with installation only after unsatisfactory conditions have been corrected.

3.02 INSTALLATION, GENERAL

- A. Install deck panels and accessories according to applicable specifications and commentary in SDI Publication No. 31, manufacturer's written instructions, and requirements in this Section.
- B. Install temporary shoring before placing deck panels if required to meet deflection limitations.
- C. Locate deck bundles to prevent overloading of supporting members.
- D. Place deck panels on supporting frame and adjust to final position with ends accurately aligned and bearing on supporting frame before being permanently fastened. Do not stretch or contract side-lap interlocks.
 - 1. Align cellular deck panels over full length of cell runs and align cells at ends of abutting panels.
- E. Place deck panels flat and square and fasten to supporting frame without warp or deflection.
- F. Cut and neatly fit deck panels and accessories around openings and other work projecting through or adjacent to deck.
- G. Provide additional reinforcement and closure pieces at openings as required for strength, continuity of deck, and support of other work.
- H. Comply with AWS requirements and procedures for manual shielded metal arc welding, appearance and quality of welds, and methods used for correcting welding work.
- I. Mechanical fasteners may be used in lieu of welding to fasten deck. Locate mechanical fasteners and install according to deck manufacturer's written instructions.

3.03 FLOOR-DECK INSTALLATION

- A. Fasten floor-deck panels to steel supporting members by arc spot (puddle) welds of the surface as required by composite slab design.

- B. Side-Lap and Perimeter Edge Fastening: Fasten side laps and perimeter edges of panels between supports, at intervals as required by composite slab design.
- C. End Bearing: Install deck ends over supporting frame with a minimum end bearing of 1-1/2 inches, with end joints as follows:
 - 1. Butted at wide flange supports.
 - 2. Lapped at other supports.
- D. Pour Stops and Girder Fillers: Weld steel sheet pour stops and girder fillers to supporting structure according to SDI recommendations unless otherwise indicated.
- E. Floor-Deck Closures: Weld steel sheet column closures, cell closures, and Z-closures to deck, according to SDI recommendations, to provide tight-fitting closures at open ends of ribs and sides of deck.

3.04 FIELD QUALITY CONTROL

- A. Testing Agency: The Department will engage a qualified testing agency to perform tests and inspections.
- B. Field welds will be subject to inspection.
- C. Prepare test and inspection reports.

3.05 PROTECTION

- A. Galvanizing Repairs: Prepare and repair damaged galvanized coatings on both surfaces of deck with galvanized repair paint according to ASTM A 780/A 780M and manufacturer's written instructions.
- B. Repair Painting: Wire brushing, cleaning, and repair painting of rust spots, welds, and abraded areas of both deck surfaces are included in Section 09 91 23 - Interior Painting.

END OF SECTION

SECTION 054000 - COLD-FORMED METAL FRAMING

PART 1 - GENERAL

1.01 SUMMARY

A. Section Includes:

1. Load-bearing wall framing.
2. Exterior non-load-bearing wall framing.
3. Interior non-load-bearing wall framing.
4. Floor joist framing.
5. Roof rafter framing.
6. Ceiling joist framing.
7. Soffit framing.

B. Related Requirements:

1. Section 055000 "Metal Fabrications" for miscellaneous steel shapes, masonry shelf angles, and connections used with cold-formed metal framing.
2. Section 092116.23 "Gypsum Board Shaft Wall Assemblies" for interior non-load-bearing, metal-stud-framed, shaft-wall assemblies, with height limitations.
3. Section 092216 "Non-Structural Metal Framing" for standard, interior non-load-bearing, metal-stud framing, with height limitations and ceiling-suspension assemblies.

1.02 PREINSTALLATION MEETINGS

A. Preinstallation Conference: Conduct conference at Project site.

1. Contractor and other relevant parties.

1.03 ACTION SUBMITTALS

A. Product Data: For the following:

1. Cold-formed steel framing materials.
2. Exterior non-load-bearing wall framing.
3. Interior non-load-bearing wall framing.
4. Vertical deflection clips.
5. Single deflection track.
6. Double deflection track.
7. Drift clips.
8. Ceiling joist framing.
9. Soffit framing.
10. Post-installed anchors.
11. Power-actuated anchors.
12. Sill sealer gasket.
13. Sill sealer gasket/termite barrier.

B. Shop Drawings:

1. Include layout, spacings, sizes, thicknesses, and types of cold-formed steel framing; fabrication; and fastening and anchorage details, including mechanical fasteners.
 2. Indicate reinforcing channels, opening framing, supplemental framing, strapping, bracing, bridging, splices, accessories, connection details, and attachment to adjoining work.
- C. Delegated Design Submittal: For cold-formed steel framing.

1.04 INFORMATIONAL SUBMITTALS

- A. Qualification Data: For testing agency.
- B. Welding certificates.
- C. Product Certificates: For each type of code-compliance certification for studs and tracks.
- D. Product Test Reports: For each listed product, for tests performed by manufacturer and witnessed by a qualified testing agency.
1. Steel sheet.
 2. Expansion anchors.
 3. Power-actuated anchors.
 4. Mechanical fasteners.
 5. Vertical deflection clips.
 6. Horizontal drift deflection clips
 7. Miscellaneous structural clips and accessories.
- E. Research Reports:
1. For nonstandard cold-formed steel framing post-installed anchors and power-actuated fasteners, from ICC-ES or other qualified testing agency acceptable to authorities having jurisdiction.
 2. For sill sealer gasket/termite barrier, showing compliance with ICC-ES AC380.

1.05 QUALITY ASSURANCE

- A. Testing Agency Qualifications: Qualified according to ASTM E329 for testing indicated.
- B. Product Tests: Mill certificates or data from a qualified independent testing agency, or in-house testing with calibrated test equipment, indicating steel sheet complies with requirements, including base-metal thickness, yield strength, tensile strength, total elongation, chemical requirements, and metallic-coating thickness.
- C. Code-Compliance Certification of Studs and Tracks: Provide documentation that framing members are certified according to the product-certification program of the Certified Steel Stud Association, the Steel Framing Industry Association, the Steel Stud Manufacturers Association or the Supreme Steel Framing System Association.
- D. Welding Qualifications: Qualify procedures and personnel according to the following:
1. AWS D1.1/D1.1M, "Structural Welding Code - Steel."
 2. AWS D1.3/D1.3M, "Structural Welding Code - Sheet Steel."

1.06 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

1.01 MANUFACTURERS

- A. Manufacturers: Subject to compliance with requirements, available manufacturers offering products that may be incorporated into the Work include, but are not limited to, the following:
 - 1. ClarkDietrich.
 - 2. Marino\WARE.
 - 3. SCAFCO Steel Stud Company; Stone Group of Companies.

1.02 COLD-FORMED STEEL FRAMING MATERIALS

- A. Framing Members, General: Comply with AISI S240 for conditions indicated.
- B. Steel Sheet: ASTM A1003/A1003M, Structural Grade, Type H, metallic coated, of grade and coating designation as follows:
 - 1. Grade: ST50H or as required by structural performance.
 - 2. Coating: G60, A60, AZ50, or GF30.
- C. Steel Sheet for Vertical Deflection Clips: ASTM A653/A653M, structural steel, zinc coated, of grade and coating as follows:
 - 1. Grade: 50, Class 1.
 - 2. Coating: G60.

1.03 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: As indicated, 0.105" min.
 - 1. Flange Width: As indicated, 1-5/8" minimum.
 - 2. Section Properties: As indicated.
- B. Steel Track: Manufacturer's standard U-shaped steel track, of web depths indicated, unpunched, with unstiffened flanges, and as follows:
 - 1. Minimum Base-Metal Thickness: As indicated, but not less than steel studs.
 - 2. Flange Width: As indicated, 1-1/4 inches min.

1.04 INTERIOR 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: 0.0428 inch.
 2. Flange Width: 1-5/8 inches
 3. Section Properties: As Indicated.
- B. Steel Track: Manufacturer's standard U-shaped steel track, of web depths indicated, unpunched, with unstiffened flanges, and as follows:
1. Minimum Base-Metal Thickness: Matching steel studs.
 2. Flange Width: 1-1/4 inches, minimum.
- C. Vertical Deflection Clips, Interior: Manufacturer's standard **[bypass]** **[head]** clips, capable of accommodating upward and downward vertical displacement of primary structure through positive mechanical attachment to stud web.
1. [<Double click here to find, evaluate, and insert list of manufacturers and products.>](#)
- D. 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.
 2. Flange Width: 1 inch plus the design gap for one-story structures and 1 inch plus twice the design gap for other applications.
- E. Drift Clips: Manufacturer's standard bypass or head clips, capable of isolating wall stud from upward and downward vertical displacement and lateral drift of primary structure through positive mechanical attachment to stud web and structure.

1.05 CEILING JOIST FRAMING

- A. Steel Ceiling Joists: Manufacturer's standard C-shaped steel sections, of web depths indicated, **[unpunched,]** **[punched with standard holes,]** **[punched with enlarged service holes,]** with stiffened flanges, and as follows:
1. Minimum Base-Metal Thickness: **[0.0329 inch]** **[0.0428 inch]** **[0.0538 inch]** **[0.0677 inch]** **[0.0966 inch]** **<Insert dimension>**.
 2. Flange Width: **[1-5/8 inches]** **[2 inches]** **[2-1/2 inches]** **<Insert dimension>**, minimum.
 3. Section Properties: **<Insert minimum allowable calculated section modulus, moment of inertia, and allowable moment>**.

1.06 SOFFIT FRAMING

- A. Exterior Soffit Frame: Manufacturer's standard C-shaped steel sections, of web depths indicated, with stiffened flanges, and as follows:
1. Minimum Base-Metal Thickness: 0.0428 inch.
 2. Flange Width: 1-5/8 inches, minimum.
 3. Section Properties: As indicated.

1.07 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. Stud kickers and knee braces.
 - 8. Joist hangers and end closures.

1.08 ANCHORS, CLIPS, AND FASTENERS

- A. Steel Shapes and Clips: ASTM A36/A36M, zinc coated by hot-dip process according to ASTM A123/A123M.
- B. Anchor Bolts: ASTM F1554, Grade 36, threaded carbon-steel hex-headed bolts, carbon-steel nuts, and flat, hardened-steel washers; zinc coated by hot-dip process according to ASTM A153/A153M, Class C.
- C. Post-Installed Anchors: Fastener systems with bolts of same basic metal as fastened metal, if visible, unless otherwise indicated; 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 AC01, ICC-ES AC193, ICC-ES AC58, or ICC-ES AC308 as appropriate for the substrate.
 - 1. Uses: Securing cold-formed steel framing to structure.
 - 2. Type: As indicated.
 - 3. Material for Interior Locations: Carbon-steel components zinc plated to comply with ASTM B633 or ASTM F1941, Class Fe/Zn 5, unless otherwise indicated.
 - 4. Material for Exterior or Interior Locations and Where Stainless Steel Is Indicated: Alloy Group 1 stainless steel bolts, ASTM F593, and nuts, ASTM F594.
- D. Power-Actuated 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 AC70.
- E. Mechanical Fasteners: ASTM C1513, corrosion-resistant-coated, self-drilling, self-tapping, steel drill screws.
 - 1. Head Type: Low-profile head beneath sheathing; manufacturer's standard elsewhere.
- F. Welding Electrodes: Comply with AWS standards.

1.09 MISCELLANEOUS MATERIALS

- A. Galvanizing Repair Paint: ASTM A780/A780M.

- B. Cement Grout: Portland cement, ASTM C150/C150M, Type I; and clean, natural sand, ASTM C404. Mix at ratio of 1 part cement to 2-1/2 parts sand, by volume, with minimum water required for placement and hydration.
- C. Nonmetallic, Nonshrink Grout: Factory-packaged, nonmetallic, noncorrosive, nonstaining grout, complying with ASTM C1107/C1107M, and with a fluid consistency and 30-minute working time.
- D. Shims: Load-bearing, high-density, multimonomer, nonleaching plastic; or cold-formed steel of same grade and metallic coating as framing members supported by shims.
- E. Sill Sealer Gasket: Closed-cell neoprene foam, 1/4 inch thick, selected from manufacturer's standard widths to match width of bottom track or rim track members as required.
- F. Sill Sealer Gasket/Termite Barrier: Minimum 68-mil nominal thickness, self-adhering sheet consisting of 64 mils of rubberized asphalt laminated on one side to a 4-mil-thick, polyethylene-film reinforcement, and with release liner on adhesive side; formulated for application with primer or surface conditioner that complies with VOC limits of authorities having jurisdiction.
 - 1. [<Double click here to find, evaluate, and insert list of manufacturers and products.>](#)
 - 2. Physical Properties:
 - a. Peel Adhesion: 17.0 lb/in of width when tested in accordance with ASTM D412.
 - b. Low-Temperature Flexibility: Pass at minus 25 deg F when tested in accordance with ASTM D146/D146M.
 - c. Water Vapor Permeance: 0.05 perm maximum when tested in accordance with ASTM E96/E96M, Method B.
 - d. Resistance to Termite Penetration: Comply with ICC-ES AC380.

1.10 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

1.01 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.

1.02 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.

1.03 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 072100 "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.

1.04 INSTALLATION OF EXTERIOR NONLOADBEARING WALL FRAMING

- A. Install girts, sag rods, and associated hardware as indicated.

1.05 INSTALLATION OF INTERIOR 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" maximum, unless indicated otherwise on Drawings.
- 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 studs and anchor to building structure.
 4. Connect drift clips to cold-formed steel metal 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 96-inch centers, or as indicated.
- 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.

1.06 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.

1.07 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.

1.08 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 Architect.
- 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.

1.09 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.

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PROJECT NO. Z571830000

SECTION 54 40 00
COLD FORMED METAL FRAMING

END OF SECTION 054000

**SECTION 05 50 00
METAL FABRICATIONS**

PART 1 - GENERAL

1.01 RELATED DOCUMENTS

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

1.02 SUMMARY

- A. Section Includes:
 - 1. Steel framing and supports for mechanical and electrical equipment.
 - 2. Steel framing and supports for applications where framing and supports are not specified in other Sections.
 - 3. Metal bollards and bollard sleeves.
 - 4. Trench drains and sump covers.
 - 5. Loose bearing and leveling plates for applications where they are not specified in other Sections.
- 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.
- C. Related Requirements:
 - 1. Section 03 30 00 - Cast-in-Place Concrete for installing anchor bolts, steel pipe sleeves, slotted-channel inserts, wedge-type inserts, and other items cast into concrete.
 - 2. Section 13 34 19 - Metal Building Systems.

1.03 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 metal fabrications that are anchored to or that receive other work. 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.

1.04 ACTION SUBMITTALS

- A. Product Data: For each type of product indicated
- B. Shop Drawings: Show fabrication and installation details. Provide Shop Drawings for the following:
 - 1. Steel framing and supports for mechanical and electrical equipment.
 - 2. Steel framing and supports for applications where framing and supports are not specified in other Sections.
 - 3. Metal bollards.

4. Trench drains and sump covers.

1.05 INFORMATIONAL SUBMITTALS

- A. Mill Certificates: Signed by stainless-steel manufacturers, certifying that products furnished comply with requirements.
- B. Welding certificates.
- C. Paint Compatibility Certificates: From manufacturers of topcoats applied over shop primers, certifying that shop primers are compatible with topcoats.
- D. Research/Evaluation Reports: For post-installed anchors, from ICC-ES.

1.06 QUALITY ASSURANCE

- A. Welding Qualifications: Qualify procedures and personnel according to AWS D1.1/D1.1M, "Structural Welding Code - Steel."
- B. Welding Qualifications: Qualify procedures and personnel according to 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."

1.07 FIELD CONDITIONS

- A. Field Measurements: Verify actual locations of walls and other construction contiguous with metal fabrications by field measurements before fabrication.

PART 2 - PRODUCTS

2.01 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 A 36.
- C. Stainless-Steel Sheet, Strip, and Plate: ASTM A 240 or ASTM A 666, Type 316L.
- D. Stainless-Steel Bars and Shapes: ASTM A 276, Type 316L.
- E. Steel Tubing: ASTM A 500, cold-formed steel tubing.
- F. Steel Pipe: ASTM A 53/A 53M, Standard Weight (Schedule 40) unless otherwise indicated.
- G. Slotted Channel Framing: Cold-formed metal box channels (struts) complying with MFMA-4.
 1. Size of Channels: 1-5/8 by 1-5/8 inches minimum.
 2. Material: Galvanized steel, ASTM A 653, with G90 coating; 0.064-inch minimum nominal thickness.
- H. Cast Iron: Either gray iron, ASTM A 48, or malleable iron, ASTM A 47, unless otherwise indicated.

- I. Aluminum Plate and Sheet: ASTM B 209, Alloy 6061-T6.
- J. Aluminum Extrusions: ASTM B 221, Alloy 6063-T6.
- K. Aluminum-Alloy Rolled Tread Plate: ASTM B 632, Alloy 6061-T6.
- L. Aluminum Castings: ASTM B 26, Alloy 443.0-F.

2.02 FASTENERS

- A. General: Unless otherwise indicated, provide Type 316 stainless-steel fasteners for exterior use and zinc-plated fasteners with coating complying with ASTM B 633 or ASTM F 1941, Class Fe/Zn 5, at exterior walls. Select fasteners for type, grade, and class required.
 - 1. Provide stainless-steel fasteners for fastening aluminum.
 - 2. Provide stainless-steel fasteners for fastening stainless steel.
- B. Steel Bolts and Nuts: Regular hexagon-head bolts, ASTM A 307, Grade A; with hex nuts, ASTM A 563; and, where indicated, flat washers.
- C. Steel Bolts and Nuts: Regular hexagon-head bolts, ASTM A 325, Type 3; with hex nuts, ASTM A 563, Grade C3; and, where indicated, flat washers.
- D. Stainless-Steel Bolts and Nuts: Regular hexagon-head annealed stainless-steel bolts, ASTM F 593; with hex nuts, ASTM F 594; and, where indicated, flat washers; Alloy Group 2.
- E. Anchor Bolts: ASTM F 1554, Grade 36 or 55, of dimensions indicated; with nuts, ASTM A 563; and, where indicated, flat washers.
 - 1. Hot-dip galvanize or provide mechanically deposited, zinc coating where item being fastened is indicated to be galvanized.
- F. Anchors, General: Anchors 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 according to ASTM E 488/E 488M, conducted by a qualified independent testing agency.
- G. Cast-in-Place Anchors in Concrete: Either threaded type or wedge type unless otherwise indicated; galvanized ferrous castings, either ASTM A 47/A 47M malleable iron or ASTM A 27/A 27M cast steel. Provide bolts, washers, and shims as needed, all hot-dip galvanized per ASTM F 2329.
- H. Post-Installed Anchors:
 - 1. Material for Interior Locations: Carbon-steel components zinc plated to comply with ASTM B 633 or ASTM F 1941, Class Fe/Zn 5, unless otherwise indicated.
 - 2. Material for Exterior Locations and Where Stainless Steel Is Indicated: Alloy Group 2 stainless-steel bolts, ASTM F 593, and nuts, ASTM F 594.
- I. Slotted-Channel Inserts: Cold-formed, hot-dip galvanized-steel box channels (struts) complying with MFMA-4, 1-5/8 by 7/8 inches by length indicated with anchor straps or studs not less than 3 inches long at not more than 8 inches o.c. Provide with temporary filler and tee-head bolts, complete with washers and nuts, all zinc-plated to comply with ASTM B 633, Class Fe/Zn 5, as needed for fastening to inserts.

2.03 MISCELLANEOUS MATERIALS

- A. Universal Shop Primer: Fast-curing, lead- and chromate-free, universal modified-alkyd primer complying with MPI#79 and compatible with topcoat.
 - 1. Use primer containing pigments that make it easily distinguishable from zinc-rich primer.
- B. Epoxy Zinc-Rich Primer: Complying with MPI#20 and compatible with topcoat.
- C. Shop Primer for Galvanized Steel: Primer formulated for exterior use over zinc-coated metal and compatible with finish paint systems indicated.
- D. Galvanizing Repair Paint: High-zinc-dust-content paint complying with SSPC-Paint 20 and compatible with paints specified to be used over it.
- E. Concrete: Comply with requirements in Section 03 30 00 - Cast-in-Place Concrete for normal-weight, air-entrained, concrete with a minimum 28-day compressive strength of 3000 psi.

2.04 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. Cut, drill, and punch metals cleanly and accurately. Remove burrs and ease edges to a radius of approximately 1/32 inch unless otherwise indicated. Remove sharp or rough areas on exposed surfaces.
- C. Form bent-metal corners to smallest radius possible without causing grain separation or otherwise impairing work.
- D. Form exposed work with accurate angles and surfaces and straight edges.
- E. 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.
- F. Form exposed connections with hairline joints, flush and smooth, using concealed fasteners or welds where possible. Where exposed fasteners are required, use Phillips flat-head (countersunk) fasteners unless otherwise indicated. Locate joints where least conspicuous.
- G. Fabricate seams and other connections that are exposed to weather in a manner to exclude water. Provide weep holes where water may accumulate.
- H. Cut, reinforce, drill, and tap metal fabrications as indicated to receive finish hardware, screws, and similar items.
- I. 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.

2.05 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.
 - 2. Furnish inserts for units installed after concrete is placed.
- C. Galvanize miscellaneous framing and supports where indicated.
- D. Prime miscellaneous framing and supports with zinc-rich primer indicated.

2.06 METAL BOLLARDS

- A. Fabricate metal bollards from minimum Schedule 40 steel pipe.
- B. Prime bollards with zinc-rich primer.
- C. Bollard Sleeve: UV-stabilized HDPE bollard sleeve.
 - 1. Minimum 0.125-in thick.
 - 2. Color: Safety Yellow
 - 3. Integral reflective tape, minimum 1-in wide bands spaced not more than 10" apart with the top band 3 to 4 inches from the top of the sleeve.

2.07 LOOSE BEARING AND LEVELING PLATES

- A. Provide loose bearing and leveling plates for steel items bearing on concrete construction. Drill plates to receive anchor bolts and for grouting.
- B. Galvanize plates.

2.08 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.

2.09 CAST IRON GRATES AND TRENCHES

- A. Acceptable Manufacturers include, but are not limited to:
 - 1. Neenah Foundry, www.nfco.com.
 - 2. US Foundry, www.usfoundry.com.
 - 3. East Jordan, www.ejco.com.
- B. Heavy Duty Trench:
 - 1. Basis of Design: Neenah R-4990-CX with Type P grate opening.
 - 2. ADA-compliant lid opening type.
 - 3. ASTM-A48 Class 35-B for heavy-duty use.

- C. Heavy Duty Sump Grate:
 - 1. Basis of Design: Neenah R-4990-FX with Type P grate opening.
 - 2. ADA-compliant lid opening type.
 - 3. ASTM-A48 Class 35-B for heavy-duty use.

2.10 FINISHES, GENERAL

- 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.

2.11 STEEL AND IRON FINISHES

- A. Galvanizing: Hot-dip galvanize items as indicated to comply with ASTM A 153/A 153M for steel and iron hardware and with ASTM A 123/A 123M for other steel and iron products.
 - 1. Do not quench or apply post galvanizing treatments that might interfere with paint adhesion.
- B. Preparation for Shop Priming Galvanized Items: After galvanizing, thoroughly clean railings of grease, dirt, oil, flux, and other foreign matter, and treat with metallic phosphate process.
- C. Shop prime iron and steel items not indicated to be galvanized unless they are to be embedded in concrete, sprayed-on fireproofing, or masonry, or unless otherwise indicated.
 - 1. Shop prime with universal shop primer unless zinc-rich primer is indicated.
- D. Preparation for Shop Priming: Prepare surfaces to comply with requirements indicated below:
 - 1. Exterior Items: SSPC-SP 6/NACE No. 3, "Commercial Blast Cleaning."
 - 2. Items Indicated to Receive Zinc-Rich Primer: SSPC-SP 6/NACE No. 3, "Commercial Blast Cleaning."
 - 3. Other Items: SSPC-SP 3, "Power Tool Cleaning."
- E. Shop Priming: Apply shop primer to comply with SSPC-PA 1, "Paint Application Specification No. 1: Shop, Field, and Maintenance Painting of Steel," for shop painting.
 - 1. Stripe paint corners, crevices, bolts, welds, and sharp edges.

2.12 ALUMINUM FINISHES

- A. As-Fabricated Finish: AA-M12.
- B. Clear Anodic Finish: AAMA 611, Class I, AA-M12C22A41.

PART 3 - EXECUTION

3.01 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.

1. Weld connections that are not to be left as exposed joints but cannot be shop welded because of shipping size limitations.
 2. 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. Field Welding: Comply with the following requirements:
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. 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.
- E. Provide temporary bracing or anchors in formwork for items that are to be built into concrete, masonry, or similar construction.
- F. Corrosion Protection: Coat concealed surfaces of aluminum that come into contact with grout, concrete, masonry, wood, or dissimilar metals with the following:
1. Cast Aluminum: Heavy coat of bituminous paint.
 2. Extruded Aluminum: Two coats of clear lacquer.

3.02 INSTALLING 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 securely to, and rigidly brace from, building structure.
- C. 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.
- D. Install pipe columns on concrete footings with grouted baseplates. Position and grout column baseplates as specified in "Installing Bearing and Leveling Plates" Article.
1. Grout baseplates of columns supporting steel girders after girders are installed and leveled.

3.03 INSTALLING METAL BOLLARDS

- A. Anchor bollards in place with concrete footings. Center and align bollards in holes. Place concrete and vibrate or tamp for consolidation. Support and brace bollards in position until concrete has cured.
- B. Fill bollards solidly with concrete, mounding top surface to shed water.
- C. Cover with bollard sleeves.

3.04 INSTALLING 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 nonshrink grout. Pack grout solidly between bearing surfaces and plates to ensure that no voids remain.

3.05 ADJUSTING AND CLEANING

- A. Touchup Painting: Immediately after erection, clean field welds, bolted connections, and abraded areas. Paint uncoated and abraded areas with the same material as used for shop painting to comply with SSPC-PA 1 for touching up shop-painted surfaces.
 - 1. Apply by brush or spray to provide a minimum 2.0-mil dry film thickness.
- B. Touchup Painting: Cleaning and touchup painting of field welds, bolted connections, and abraded areas of shop paint are specified in Section 09 91 23 - Interior Painting.
- C. Galvanized Surfaces: Clean field welds, bolted connections, and abraded areas and repair galvanizing to comply with ASTM A 780/A 780M.

END OF SECTION

**SECTION 05 51 13
METAL PAN STAIRS**

PART 1 - GENERAL

1.01 RELATED DOCUMENTS

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

1.02 SUMMARY

- A. Section Includes:
 - 1. Preassembled steel stairs with concrete-filled treads.
 - 2. Steel railings attached to metal stairs.
 - 3. Steel handrails attached to walls adjacent to metal stairs.
- B. Related Requirements:
 - 1. Section 03 30 00 - Cast-in-Place Concrete.
 - 2. Section 05 52 13 - Pipe and Tube Railings.
 - 3. Section 13 34 19 - Metal Building Systems.

1.03 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.
- B. Coordinate stair design, layout, and attachment with Metal Building System design.
- C. Coordinate installation of anchorages for metal stairs and railings.
 - 1. Furnish setting drawings, templates, and directions for installing anchorages, including sleeves, concrete inserts, anchor bolts, blocking for attachment of wall-mounted handrails, and items with integral anchors, that are to be embedded in concrete or masonry.
 - 2. Deliver such items to Project site in time for installation.
- D. Coordinate locations of hanger rods and struts with other work so they do not encroach on required stair width and are within fire-resistance-rated stair enclosure.
- E. Schedule installation of railings so wall attachments are made only to completed walls.
 - 1. Do not support railings temporarily by any means that do not satisfy structural performance requirements.

1.04 ACTION SUBMITTALS

- A. Product Data: For metal pan stairs and the following:
 - 1. Woven-wire mesh.
 - 2. Welded-wire mesh.
 - 3. Abrasive nosings.
 - 4. Shop primer products.

5. Nonslip-aggregate concrete finish.
 6. Handrail wall brackets.
- B. Shop Drawings:
1. Include plans, elevations, sections, details, and attachments to other work.
 2. Indicate sizes of metal sections, thickness of metals, profiles, holes, and field joints.
 3. Include plan at each level.
 4. Indicate locations of anchors, weld plates, and blocking for attachment of wall-mounted handrails.
- C. Delegated-Design Submittal: For stairs, railings, and anchorage including analysis data signed and sealed by the qualified professional engineer responsible for their preparation, and coordinated with the Metal Building System framing and design.

1.05 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 State of Alaska.
- B. Welding certificates.
- C. Paint Compatibility Certificates: From manufacturers of topcoats applied over shop primers, certifying that shop primers are compatible with topcoats.

1.06 QUALITY ASSURANCE

- A. Installer Qualifications: Fabricator of products.
- B. Welding Qualifications: Qualify procedures and personnel according to the following:
1. AWS D1.1/D1.1M, "Structural Welding Code - Steel."
 2. AWS D1.3/D1.3M, "Structural Welding Code - Sheet Steel."

1.07 DELIVERY, STORAGE, AND HANDLING

- A. Store materials to permit easy access for inspection and identification.
1. Keep steel members off ground and spaced by using pallets, dunnage, or other supports and spacers.
 2. Protect steel members and packaged materials from corrosion and deterioration.
 3. Do not store materials on structure in a manner that might cause distortion, damage, or overload to members or supporting structures.
 - a. Repair or replace damaged materials or structures as directed.

PART 2 - PRODUCTS

2.01 PERFORMANCE REQUIREMENTS

- A. Delegated Design: Engage a qualified professional engineer, as defined in Section 01 45 00 – Quality Control, to design stairs and railings, including attachment to building construction.

- B. Structural Performance of Stairs: Metal stairs shall 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. Concentrated Load: 300 lbf applied on an area of 4 sq. in.
 - 3. Uniform and concentrated loads need not be assumed to act concurrently.
 - 4. Stair Framing: Capable of withstanding stresses resulting from railing loads in addition to loads specified above.
 - 5. Limit deflection of treads, platforms, and framing members to $L/360$ or $1/4$ inch, whichever is less.
- C. Structural Performance of Railings: Railings, including attachment to building construction, shall 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.
 - 3. Thermal Movements: Allow for thermal movements from ambient and surface temperature changes.
- D. Seismic Performance of Stairs: Metal stairs shall withstand the effects of earthquake motions determined according to ASCE/SEI 7-10.
 - 1. Component Importance Factor: 1.5.

2.02 METALS

- A. Metal Surfaces: Provide materials with smooth, flat surfaces unless otherwise indicated. For components 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 A 36/A 36M.
- C. Steel Tubing for Railings: ASTM A 500 (cold formed) ASTM A 513.
- D. Steel Pipe for Railings: ASTM A 53, Type F or Type S, Grade A, Standard Weight (Schedule 40), unless another grade and weight are required by structural loads.
- E. Uncoated, Cold-Rolled Steel Sheet: ASTM A 1008 structural steel, Grade 25, unless another grade is required by design loads; exposed.
- F. Uncoated, Hot-Rolled Steel Sheet: ASTM A 1011 structural steel, Grade 30, unless another grade is required by design loads.
- G. Galvanized-Steel Sheet: ASTM A 653, G90 coating, structural steel, Grade 33, unless another grade is required by design loads.

2.03 ABRASIVE NOSINGS

- A. Cast-Metal Units: Cast aluminum, with an integral abrasive, as-cast finish consisting of aluminum oxide, silicon carbide, or a combination of both. Fabricate units in lengths necessary to accurately fit openings or conditions.
 - 1. Configuration: Cross-hatched units, 3 inches wide without lip.
- B. Provide anchors for embedding units in concrete, either integral or applied to units, as standard with manufacturer.
- C. Apply bituminous paint to concealed surfaces of cast-metal units set into concrete.
- D. Apply clear lacquer to concealed surfaces of extruded units set into concrete.

2.04 FASTENERS

- A. General: Provide zinc-plated fasteners with coating complying with ASTM B 633 or ASTM F 1941, Class Fe/Zn 12.
 - 1. Select fasteners for type, grade, and class required.
- B. 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 indicated and capable of withstanding design loads.
- C. Bolts and Nuts: Regular hexagon-head bolts, ASTM A 307, Grade A; with hex nuts, ASTM A 563; and, where indicated, flat washers.
- D. Anchor Bolts: ASTM F 1554, Grade 36, of dimensions indicated; with nuts, ASTM A 563; and, where indicated, flat washers.
 - 1. Provide mechanically deposited or hot-dip, zinc-coated anchor bolts.
- E. Post-Installed Anchors: Capable of sustaining, without failure, a load equal four times the load imposed when installed in concrete, as determined by testing according to ASTM E 488/E 488M, conducted by a qualified independent testing agency.
 - 1. Material for Interior Locations: Carbon-steel components zinc plated to comply with ASTM B 633 or ASTM F 1941/F 1941M, Class Fe/Zn 5, unless otherwise indicated.

2.05 MISCELLANEOUS MATERIALS

- A. Welding Electrodes: Comply with AWS requirements.
- B. Shop Primers: Provide primers that comply with Section 09 91 23 - Interior Painting.
- C. Universal Shop Primer: Fast-curing, lead- and chromate-free, universal modified-alkyd primer complying with MPI#79 and compatible with topcoat.
 - 1. Use primer containing pigments that make it easily distinguishable from zinc-rich primer.
- D. Zinc-Rich Primer: Comply with SSPC-Paint 20, and compatible with topcoat.
- E. Shop Primer for Galvanized Steel: Primer formulated for exterior use over zinc-coated metal and compatible with finish system indicated.

- F. Galvanizing Repair Paint: High-zinc-dust-content paint complying with SSPC-Paint 20 or ASTM A 780/A 780M and compatible with paints specified to be used over it.
- G. Bituminous Paint: Cold-applied asphalt emulsion complying with ASTM D 1187/D 1187M.
- H. Nonmetallic, Shrinkage-Resistant Grout: ASTM C 1107/C 1107M, factory-packaged, nonmetallic aggregate grout; recommended by manufacturer for interior use; noncorrosive and nonstaining; mixed with water to consistency suitable for application and a 30-minute working time.
- I. Filled Concrete Treads and Landings:
 - 1. Concrete Materials and Properties: Comply with requirements in Section 03 30 00 - Cast-in-Place Concrete for normal-weight, air-entrained, ready-mix concrete with minimum 28-day compressive strength of 3000 psi and maximum aggregate size of 1/2 inch unless otherwise indicated.
 - 2. Nonslip-Aggregate Concrete Finish: Factory-packaged abrasive aggregate made from fused, aluminum-oxide grits or crushed emery; rustproof and nonglazing; unaffected by freezing, moisture, or cleaning materials.
 - 3. Plain Steel Welded-Wire Reinforcement: ASTM A 1064/A 10645M, steel, 6 by 6 inches, W1.4 by W1.4, unless otherwise indicated on Drawings.
 - 4. Reinforcement Supports: Bolsters, chairs, spacers, and other devices for spacing, supporting, and fastening welded-wire reinforcement in place.
 - a. Manufacture bar supports from steel wire, plastic, or precast concrete according to CRSI's "Manual of Standard Practice," of greater compressive strength than concrete.

2.06 FABRICATION, GENERAL

- A. Provide complete stair assemblies, including metal framing, hangers, struts, railings, clips, brackets, bearing plates, and other components necessary to support and anchor stairs and platforms on supporting structure.
 - 1. Join components by welding unless otherwise indicated.
 - 2. Use connections that maintain structural value of joined pieces.
- B. Assemble stairs and railings in shop to greatest extent possible.
 - 1. Disassemble units only as necessary for shipping and handling limitations.
 - 2. Clearly mark units for reassembly and coordinated installation.
- 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 bent-metal corners to smallest radius possible without causing grain separation or otherwise impairing work.
- E. Form exposed work with accurate angles and surfaces and straight edges.
- F. Weld connections 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. Weld exposed corners and seams continuously unless otherwise indicated.
 5. At exposed connections, finish exposed welds to comply with NOMMA's "Voluntary Joint Finish Standards" for Finish #2 - Completely sanded joint with some undercutting and pinholes okay.
- G. Form exposed connections with hairline joints, flush and smooth, using concealed fasteners where possible.
1. Where exposed fasteners are required, use Phillips flat-head (countersunk) screws or bolts unless otherwise indicated.
 2. Locate joints where least conspicuous.
 3. Fabricate joints that will be exposed to weather in a manner to exclude water.
 4. Provide weep holes where water may accumulate internally.

2.07 FABRICATION OF STEEL-FRAMED STAIRS

- A. NAAMM Stair Standard: Comply with NAAMM AMP 510, "Metal Stairs Manual," for Service Class, unless more stringent requirements are indicated.
- B. Stair Framing:
1. Fabricate stringers steel channels or steel rectangular tubes.
 - a. Stringer Size: As required to comply with "Performance Requirements".
 - b. Provide closures for exposed ends of channel and rectangular tube stringers.
 - c. Finish: Painted or Galvanized.
 2. Construct platforms of steel channel or rectangular tube headers and miscellaneous framing members as required to comply with "Performance Requirements."
 - a. Provide closures for exposed ends of channel and rectangular tube framing.
 - b. Finish: Painted or Galvanized.
 3. Weld or bolt stringers to headers; weld or bolt framing members to stringers and headers. If using bolts, fabricate and join so bolts are not exposed on finished surfaces.
 4. Where stairs are enclosed by gypsum board assemblies, provide hanger rods or struts to support landings from floor construction above or below.
 - a. Locate hanger rods and struts where they do not encroach on required stair width and are within the fire-resistance-rated stair enclosure.
 5. Where masonry walls support metal stairs, provide temporary supporting struts designed for erecting steel stair components before installing masonry.
- C. Metal Pan Stairs: Form risers, subreads pans, and subplatforms to configurations shown from steel sheet of thickness needed to comply with performance requirements, but not less than 0.067 inch.
1. Fabricate treads and landing subplatforms of exterior stairs so finished walking surfaces slope to drain.
 2. Steel Sheet: Uncoated, cold-rolled steel sheet.
 3. Directly weld metal pans to stringers; locate welds on top of subreads where they will be concealed by concrete fill. Do not weld risers to stringers.
 4. Attach risers and subreads to stringers with brackets made of steel angles or bars. Weld brackets to stringers and attach metal pans to brackets by welding, riveting, or bolting.
 5. Shape metal pans to include nosing integral with riser.
 6. Attach abrasive nosings to risers.

7. At CONTRACTOR's option, provide stair assemblies with metal pan subtreads filled with reinforced concrete during fabrication.
8. Provide epoxy-resin-filled treads, reinforced with glass fibers, with non-slip-concrete aggregate finish to tread surface.
9. Provide subplatforms of configuration indicated or, if not indicated, the same as subtreads. Weld subplatforms to platform framing.
 - a. Smooth Soffit Construction: Construct subplatforms with flat metal under surfaces to produce smooth soffits.

2.08 FABRICATION OF STAIR RAILINGS

- A. Fabricate railings to comply with requirements indicated for design, dimensions, details, finish, and member sizes, including wall thickness of member, post spacings, wall bracket spacing, and anchorage, but not less than that needed to withstand indicated loads and the following minimum requirements.
 1. Rails and Posts: 1-5/8-inch-diameter top and bottom rails and 1-1/2-inch-square posts.
 2. Picket Infill: 3/4-inch-square pickets spaced less than 4 inches clear.
 3. Expanded-Metal Infill: Expanded-metal panels edged with U-shaped channels made from steel sheet and not less than 0.043 inch thick. Orient expanded metal with long dimension of diamonds.
 4. Mesh Infill: Woven-wire mesh crimped into 1-by-1/2-by-1/8-inch steel channel frames. Orient wire mesh with wires perpendicular and parallel to top rail.
 5. Intermediate Rails Infill: 1-5/8-inch-diameter intermediate rails spaced less than 21 inches clear.
- B. Welded Connections: Fabricate railings with welded connections.
 1. Fabricate connections that are exposed to weather in a manner that excludes water.
 - a. Provide weep holes where water may accumulate internally.
 2. Cope components at connections to provide close fit, or use fittings designed for this purpose.
 3. Weld all around at connections, including at fittings.
 4. Use materials and methods that minimize distortion and develop strength and corrosion resistance of base metals.
 5. Obtain fusion without undercut or overlap.
 6. Remove flux immediately.
 7. Finish welds to comply with NOMMA's "Voluntary Joint Finish Standards" for Finish #2 - Completely sanded joint, some undercutting and pinholes are okay, as shown in NAAMM AMP 521.
- C. Form changes in direction of railings as follows:
 1. By bending.
- D. For changes in direction made by bending, use jigs to produce uniform curvature for each repetitive configuration required. Maintain cross section of member throughout entire bend without buckling, twisting, cracking, or otherwise deforming exposed surfaces of components.
- E. Close exposed ends of railing members with prefabricated end fittings.
- F. Provide wall returns at ends of wall-mounted handrails unless otherwise indicated.
 1. Close ends of returns unless clearance between end of rail and wall is 1/4 inch or less.
- G. Connect posts to stair framing by direct welding unless otherwise indicated.

- H. Brackets, Flanges, Fittings, and Anchors: Provide wall brackets, end closures, flanges, miscellaneous fittings, and anchors for interconnecting components and for attaching to other work.
 - 1. Furnish inserts and other anchorage devices for connecting to concrete or masonry work.
 - 2. For galvanized railings, provide galvanized fittings, brackets, fasteners, sleeves, and other ferrous-metal components.
 - 3. For nongalvanized railings, provide nongalvanized ferrous-metal fittings, brackets, fasteners, and sleeves, except galvanize anchors embedded in exterior masonry and concrete construction.
 - 4. Provide type of bracket predrilled hole for exposed bolt anchorage and that provides 1-1/2-inch clearance from inside face of handrail to finished wall surface.
- I. Fillers: Provide fillers made from steel plate, or other suitably crush-resistant material, where needed to transfer wall bracket loads through wall finishes to structural supports.
 - 1. Size fillers to suit wall finish thicknesses and to produce adequate bearing area to prevent bracket rotation and overstressing of substrate.

2.09 FINISHES

- A. Finish metal stairs after assembly.
- B. Galvanizing: Hot-dip galvanize items as indicated to comply with ASTM A 153/A 153M for steel and iron hardware and with ASTM A 123/A 123M for other steel and iron products.
 - 1. Do not quench or apply post-galvanizing treatments that might interfere with paint adhesion.
 - 2. 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.
- C. Preparation for Shop Priming: Prepare uncoated, ferrous-metal surfaces to comply with SSPC-SP 3, "Power Tool Cleaning."
- D. Apply shop primer to uncoated surfaces of metal stair components, except those with galvanized finishes and those to be embedded in concrete or masonry unless otherwise indicated. Comply with SSPC-PA 1, "Paint Application Specification No. 1: Shop, Field, and Maintenance Painting of Steel," for shop painting.

PART 3 - EXECUTION

3.01 EXAMINATION

- A. Verify elevations of floors, bearing surfaces and locations of bearing plates, and other embedments for compliance with requirements.
 - 1. For wall-mounted railings, verify locations of concealed reinforcement within gypsum board and plaster assemblies.
- B. Proceed with installation only after unsatisfactory conditions have been corrected.

3.02 INSTALLING METAL PAN STAIRS

- A. Fastening to In-Place Construction: Provide anchorage devices and fasteners where necessary for securing metal stairs to in-place construction.
 - 1. Include threaded fasteners for concrete and masonry inserts, through-bolts, lag bolts, and other connectors.

- B. Cutting, Fitting, and Placement: Perform cutting, drilling, and fitting required for installing metal stairs. Set units accurately in location, alignment, and elevation, measured from established lines and levels and free of rack.
- C. Install metal stairs by welding stair framing to steel structure or to weld plates cast into concrete unless otherwise indicated.
 - 1. Grouted Baseplates: Clean concrete- and masonry-bearing surfaces of bond-reducing materials, and roughen surfaces prior to setting plates.
 - a. Clean bottom surface of plates.
 - b. Set plates for structural members on wedges, shims, or setting nuts.
 - c. Tighten anchor bolts after supported members have been positioned and plumbed.
 - d. Do not remove wedges or shims but, if protruding, cut off flush with edge of plate before packing with grout.
 - e. Promptly pack grout solidly between bearing surfaces and plates so no voids remain.
 - 1) Neatly finish exposed surfaces; protect grout and allow to cure.
 - 2) Comply with manufacturer's written installation instructions for shrinkage-resistant grouts.
- D. Provide temporary bracing or anchors in formwork for items that are to be built into concrete, masonry, or similar construction.
- E. Fit exposed connections accurately together to form hairline joints.
 - 1. Weld connections that are not to be left as exposed joints but cannot be shop welded because of shipping size limitations.
 - 2. 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.
 - 3. Comply with requirements for welding in "Fabrication, General" Article.
- F. Place and finish concrete fill for treads and platforms to comply with Section 03 30 00 - Cast-in-Place Concrete.
 - 1. Install abrasive nosings with anchors fully embedded in concrete.
 - 2. Center nosings on tread width.

3.03 INSTALLING RAILINGS

- A. Adjust railing systems before anchoring to ensure matching alignment at abutting joints with tight, hairline joints.
 - 1. Space posts at spacing indicated or, if not indicated, as required by design loads.
 - 2. Plumb posts in each direction, within a tolerance of 1/16 inch in 3 feet.
 - 3. Align rails so variations from level for horizontal members and variations from parallel with rake of stairs for sloping members do not exceed 1/4 inch in 12 feet.
 - 4. Secure posts and rail ends to building construction as follows:
 - a. Anchor posts to steel by welding or bolting to steel supporting members.
 - b. Anchor handrail ends to concrete and masonry with steel round flanges welded to rail ends and anchored with post-installed anchors and bolts.
- B. 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.

- C. Attach handrails to wall with wall brackets.
 - 1. Locate brackets as indicated or, if not indicated, at spacing required to support structural loads.
 - 2. Secure wall brackets to building construction as required to comply with performance requirements.
 - a. For concrete and solid masonry anchorage, use drilled-in expansion shields and hanger or lag bolts.
 - b. For steel-framed partitions, use hanger or lag bolts set into wood backing between studs. Coordinate with stud installation to locate backing members.
 - c. For steel-framed partitions, use self-tapping screws fastened to steel framing or to concealed steel reinforcements.

3.04 REPAIR

- A. Touchup Painting: Immediately after erection, clean field welds, bolted connections, and abraded areas of shop paint, and paint exposed areas with same material as used for shop painting to comply with SSPC-PA 1 for touching up shop-painted surfaces.
 - 1. Apply by brush or spray to provide a minimum 2.0-mil dry film thickness.
- B. Touchup Painting: Cleaning and touchup painting of field welds, bolted connections, and abraded areas of shop paint are specified in Section 09 91 23 - Interior Painting.
- C. Galvanized Surfaces: Clean field welds, bolted connections, and abraded areas and repair galvanizing to comply with ASTM A 780/A 780M.

END OF SECTION

**SECTION 05 52 13
PIPE AND TUBE RAILINGS**

PART 1 - GENERAL

1.01 RELATED DOCUMENTS

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

1.02 SUMMARY

- A. Section Includes:
 - 1. Steel pipe and tube railings.
- B. Related Requirements:
 - 1. Section 05 50 00 - Metal Fabrications.
 - 2. Section 05 51 13 - Metal Pan Stairs.
 - 3. Section 13 34 19 - Metal Building Systems.

1.03 COORDINATION

- A. Coordinate design of railing systems with Metal Building System design.
- B. 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.
- C. Coordinate installation of anchorages for railings, attachments, and anchorage. 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.
- D. Schedule installation so wall attachments are made only to completed walls. Do not support railings temporarily by any means that do not satisfy structural performance requirements.

1.04 ACTION SUBMITTALS

- A. Product Data: For the following:
 - 1. Manufacturer's product lines of mechanically connected railings.
 - 2. Railing brackets.
 - 3. Grout, anchoring cement, and paint products.
- B. Shop Drawings: Include plans, elevations, sections, details, and attachments to other work.
- C. Delegated-Design Submittal: For railings, attachments, and anchorage including analysis data signed and sealed by the qualified professional engineer responsible for their preparation, and coordinated with the Metal Building System framing and design.

1.05 INFORMATIONAL SUBMITTALS

- A. Qualification Data: For testing agency.
- B. Welding certificates.
- C. Mill Certificates: Signed by manufacturers of stainless-steel products certifying that products furnished comply with requirements.
- D. Paint Compatibility Certificates: From manufacturers of topcoats applied over shop primers certifying that shop primers are compatible with topcoats.
- E. Product Test Reports: For pipe and tube railings, for tests performed by a qualified testing agency, according to ASTM E 894 and ASTM E 935.
- F. Evaluation Reports: For post-installed anchors, from ICC-ES.

1.06 QUALITY ASSURANCE

- A. Welding Qualifications: Qualify procedures and personnel according to the following:
 - 1. AWS D1.1/D1.1M, "Structural Welding Code - Steel."

1.07 DELIVERY, STORAGE, AND HANDLING

- A. Protect mechanical finishes on exposed surfaces from damage by applying a strippable, temporary protective covering before shipping.

1.08 FIELD CONDITIONS

- A. Field Measurements: Verify actual locations of walls and other construction contiguous with metal fabrications by field measurements before fabrication.

1.09 PERFORMANCE REQUIREMENTS

- A. Delegated Design: Engage a qualified professional engineer, as defined in Section 01 45 00 – Quality Control, to design railings, including attachment to building construction.
- B. Structural Performance: Railings, including attachment to building construction, shall 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:
 - 2. Uniform load of 50 lbf/ft. applied in any direction.
 - 3. Concentrated load of 200 lbf applied in any direction.
 - 4. Uniform and concentrated loads need not be assumed to act concurrently.
 - 5. Infill of Guards:
 - 6. Concentrated load of 50 lbf applied horizontally on an area of 1 sq. ft.
 - 7. Infill load and other loads need not be assumed to act concurrently.

PART 2 - PRODUCTS

2.01 METALS, GENERAL

- A. Metal Surfaces, General: Provide materials with smooth surfaces, without seam marks, roller marks, rolled trade names, stains, discolorations, or blemishes.
- B. Brackets, Flanges, and Anchors: Cast or formed metal of same type of material and finish as supported rails unless otherwise indicated.

2.02 STEEL AND IRON

- A. Tubing: ASTM A 500 (cold formed) or ASTM A 513.
- B. Pipe: ASTM A 53/A 53M, Type F or Type S, Grade A, Standard Weight (Schedule 40), unless another grade and weight are required by structural loads.
 - 1. Provide galvanized finish for exterior installations and where indicated.
- C. Plates, Shapes, and Bars: ASTM A 36.

2.03 FASTENERS

- A. General: Provide the following:
 - 1. Ungalvanized-Steel Railings: Plated steel fasteners complying with ASTM B 633 or ASTM F 1941, Class Fe/Zn 5 for zinc coating.
 - 2. Hot-Dip Galvanized Railings: Type 304 stainless-steel or hot-dip zinc-coated steel fasteners complying with ASTM A 153/A 153M or ASTM F 2329 for zinc coating.
 - 3. Provide exposed fasteners with finish matching appearance, including color and texture, of railings.
- B. 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 indicated and capable of withstanding design loads.
- C. Fasteners for Interconnecting Railing Components:
 - 1. Provide concealed fasteners for interconnecting railing components and for attaching them to other work, unless otherwise indicated.
 - 2. Provide concealed fasteners for interconnecting railing components and for attaching them to other work, unless exposed fasteners are unavoidable or are the standard fastening method for railings indicated.
 - 3. Provide flat-head machine screws for exposed fasteners unless otherwise indicated.
- D. Post-Installed Anchors: Capable of sustaining, without failure, a load equal to 4 times the load imposed when installed in concrete, as determined by testing according to ASTM E 488/E 488M, conducted by a qualified independent testing agency.
 - 1. Material for Interior Locations: Carbon-steel components zinc-plated to comply with ASTM B 633 or ASTM F 1941, Class Fe/Zn 5, unless otherwise indicated.
 - 2. Material for Exterior Locations and Where Stainless Steel Is Indicated: Alloy Group 2 stainless-steel bolts, ASTM F 593, and nuts, ASTM F 594.

2.04 MISCELLANEOUS MATERIALS

- A. Welding Rods and Bare Electrodes: Select according to AWS specifications for metal alloy welded.
- B. Etching Cleaner for Galvanized Metal: Complying with MPI#25.
- C. Galvanizing Repair Paint: High-zinc-dust-content paint complying with SSPC-Paint 20 and compatible with paints specified to be used over it.
- D. Shop Primers: Provide primers that comply with Section 09 91 23 - Interior Painting.
- E. Universal Shop Primer: Fast-curing, lead- and chromate-free, universal modified-alkyd primer complying with MPI#79 and compatible with topcoat.
 - 1. Use primer containing pigments that make it easily distinguishable from zinc-rich primer.
- F. Epoxy Zinc-Rich Primer: Complying with MPI#20 and compatible with topcoat.
- G. Shop Primer for Galvanized Steel: Primer formulated for exterior use over zinc-coated metal and compatible with finish paint systems indicated.
- H. Intermediate Coats and Topcoats: Provide products that comply with Section 09 91 23 - Interior Painting.
- I. Epoxy Intermediate Coat: Complying with MPI #77 and compatible with primer and topcoat.
- J. Polyurethane Topcoat: Complying with MPI #72 and compatible with undercoat.

2.05 SWING GATES

- A. Pipe: ASTM A 53/A 53M, Type F or Type S, Grade A, Standard Weight (Schedule 40), unless another grade and weight are required by structural loads.
 - 1. Gate Leaf Width: 36 inches.
 - 2. Framework Member Sizes and Strength: As required to meet performance requirements, but not less than adjacent guardrail.
- B. Frame Corner Construction: Welded.
- C. Finish: Match guardrails.
- D. Hardware:
 - 1. Hinges: 180-degree inward (into mezzanine).
 - 2. Latch: Permitting operation from both sides of gate with provision for padlock.
 - 3. Flush Bolt: Heavy duty steel cane bolt assembly. Minimum 5/8" diameter or 3/4" x 1/4" bar. Minimum 2" embed to concrete.
 - 4. Closer: Integral with hinge assembly.

2.06 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. Clearly mark units for

- reassembly and coordinated installation. Use connections that maintain structural value of joined pieces.
- C. Cut, drill, and punch metals cleanly and accurately. Remove burrs and ease edges to a radius of approximately 1/32 inch unless otherwise indicated. 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. Provide weep holes where water may accumulate.
 - 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. 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 surfaces smooth and blended so no roughness shows after finishing and welded surface matches contours of adjoining surfaces.
 - I. Form Changes in Direction as Follows:
 - 1. By bending.
 - J. For changes in direction made by bending, use jigs to produce uniform curvature for each repetitive configuration required. Maintain cross section of member throughout entire bend without buckling, twisting, cracking, or otherwise deforming exposed surfaces of components.
 - K. Close exposed ends of railing members with prefabricated end fittings.
 - L. 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.
 - M. 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.
 - N. Provide inserts and other anchorage devices for connecting railings to concrete or masonry work. Fabricate anchorage devices capable of withstanding loads imposed by railings. Coordinate anchorage devices with supporting structure.
 - O. For railing posts set in concrete, provide 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.
 - P. 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.

2.07 STEEL AND IRON FINISHES

- A. For nongalvanized-steel railings, provide nongalvanized ferrous-metal fittings, brackets, fasteners, and sleeves; however, galvanize anchors to be embedded in exterior concrete or masonry.
- B. Preparation for Shop Priming: Prepare uncoated ferrous-metal surfaces to comply with requirements indicated below:
 - 1. Exterior Railings: SSPC-SP 6/NACE No. 3, "Commercial Blast Cleaning."
 - 2. Railings Indicated to Receive Zinc-Rich Primer: SSPC-SP 6/NACE No. 3, "Commercial Blast Cleaning."
 - 3. Railings Indicated to Receive Primers Specified in Section 09 91 23 - Interior Painting: SSPC-SP 6/NACE No. 3, "Commercial Blast Cleaning."
 - 4. Other Railings: SSPC-SP 3, "Power Tool Cleaning."
- C. Primer Application: Apply shop primer to prepared surfaces of railings unless otherwise indicated. Comply with requirements in SSPC-PA 1, "Shop, Field, and Maintenance Painting of Steel," for shop painting. Primer need not be applied to surfaces to be embedded in concrete or masonry.
 - 1. Shop prime uncoated railings with Section 09 91 23 - Interior Painting unless zinc-rich primer is indicated.
 - 2. Do not apply primer to galvanized surfaces.
- D. High-Performance Coating: Apply epoxy intermediate and polyurethane topcoats to prime-coated surfaces. Comply with coating manufacturer's written instructions and with requirements in SSPC-PA 1, "Shop, Field, and Maintenance Painting of Steel," for shop painting. Apply at spreading rates recommended by coating manufacturer.
 - 1. Color: Safety Yellow or selected by DEPARTMENT's Representative from manufacturer's full range.

PART 3 - EXECUTION

3.01 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.

3.02 INSTALLATION, GENERAL

- A. Fit exposed connections together to form tight, hairline joints.
- B. Perform cutting, drilling, and fitting required for installing railings. Set railings accurately in location, alignment, and elevation; measured from established lines and levels and free of rack.
 - 1. 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.
 - 2. Set posts plumb within a tolerance of 1/16 inch in 3 feet.
 - 3. 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.

- C. Control of Corrosion: Prevent galvanic action and other forms of corrosion by insulating metals and other materials from direct contact with incompatible materials.
- D. Adjust railings before anchoring to ensure matching alignment at abutting joints.
- E. Fastening to In-Place Construction: Use anchorage devices and fasteners where necessary for securing railings and for properly transferring loads to in-place construction.

3.03 RAILING CONNECTIONS

- A. Nonwelded Connections: Use mechanical or adhesive joints for permanently connecting railing components. 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.

3.04 ANCHORING POSTS

- A. Use metal sleeves preset and anchored into concrete or welded to steel beams for installing posts. After posts are inserted into sleeves, fill annular space between post and sleeve with anchoring cement, mixed and placed to comply with anchoring material manufacturer's written instructions.
- B. Cover anchorage joint with flange of same metal as post, attached to post with set screws.
- C. Anchor posts to metal surfaces with oval flanges, angle type, or floor type as required by conditions, connected to posts and to metal supporting members as follows:
 - 1. For steel pipe railings, weld flanges to post and bolt to metal supporting surfaces.

3.05 ATTACHING RAILINGS

- A. Anchor railing ends at walls with round flanges anchored to wall construction and welded to railing ends.
- B. Anchor railing ends to metal surfaces with flanges bolted to metal surfaces and welded to railing ends.
- C. Attach railings to wall with wall brackets, except where end flanges are used. 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 wood stud partitions, use hanger or lag bolts set into studs or wood backing between studs. Coordinate with carpentry work to locate backing members.
 - 4. For steel-framed partitions, use hanger or lag bolts set into wood backing between studs. Coordinate with stud installation to locate backing members.
 - 5. For steel-framed partitions, use self-tapping screws fastened to steel framing or to concealed steel reinforcements.

6. For steel-framed partitions, use toggle bolts installed through flanges of steel framing or through concealed steel reinforcements.

3.06 ADJUSTING AND CLEANING

- A. Touchup Painting: Immediately after erection, clean field welds, bolted connections, and abraded areas of shop paint, and paint exposed areas with the same material as used for shop painting to comply with SSPC-PA 1 requirements for touching up shop-painted surfaces.
 1. Apply by brush or spray to provide a minimum 2.0-mil dry film thickness.
- B. Touchup Painting: Cleaning and touchup painting of field welds, bolted connections, and abraded areas of shop paint are specified in Section 09 91 23 - Interior Painting.
- C. Galvanized Surfaces: Clean field welds, bolted connections, and abraded areas, and repair galvanizing to comply with ASTM A 780/A 780M.

3.07 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.

END OF SECTION

SECTION 061000 - ROUGH CARPENTRY

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. Wood blocking, grounds and nailers.
 - 2. Plywood backing panels.
 - 3. Wood preservative treated lumber.
 - 4. Fire retardant-treated lumber.
- B. Related Requirements:
 - 1. Division 06 Section "Interior Architectural Casework" for fabrication requiring miscellaneous blocking, grounds and nailers.
 - 2. Division 06 Section "Miscellaneous Rough Carpentry" for plywood wainscot and trim at maintenance bays and interior hallways.
 - 3. Division 09 Section "Non-Structural Metal Framing"

1.3 DEFINITIONS

- A. Boards or Strips: Lumber of less than 2 inches nominal (38 mm actual) size in least dimension.
- B. Dimension Lumber: Lumber of 2 inches nominal (38 mm actual) size or greater but less than 5 inches nominal (114 mm actual) size in least dimension.

1.4 ACTION SUBMITTALS

- A. Product Data: For each type of process and factory-fabricated product. Indicate component materials and dimensions and include construction and application details.
 - 1. Include data for wood-preservative treatment from chemical treatment manufacturer and certification by treating plant that treated materials comply with requirements. Indicate type of preservative used and net amount of preservative retained.
 - 2. For products receiving a waterborne treatment, include statement that moisture content of treated materials was reduced to levels specified before shipment to Project site.

1.5 INFORMATIONAL SUBMITTALS

- A. Material Certificates: For dimension lumber specified to comply with minimum allowable unit stresses. Indicate species and grade selected for each use and design values approved by the ALSC Board of Review.

1.6 DELIVERY, STORAGE, AND HANDLING

- A. Stack wood products flat with spacers beneath and between each bundle to provide air circulation. Protect wood products from weather by covering with waterproof sheeting, securely anchored. Provide for air circulation around stacks and under coverings.

PART 2 - PRODUCTS

2.1 WOOD PRODUCTS, GENERAL

- A. Lumber: DOC PS 20 and applicable rules of grading agencies indicated. If no grading agency is indicated, comply with the applicable rules of any rules-writing agency certified by the ALSC Board of Review. Grade lumber by an agency certified by the ALSC Board of Review to inspect and grade lumber under the rules indicated.
 - 1. Factory mark each piece of lumber with grade stamp of grading agency.
 - 2. For exposed lumber indicated to receive a stained or natural finish, mark grade stamp on end or back of each piece.
 - 3. Dress lumber, S4S, unless otherwise indicated.
- B. Maximum Moisture Content of Lumber: 15 percent for 2-inch nominal (38-mm actual) thickness or less; 19 percent for more than 2-inch nominal (38-mm actual) thickness unless otherwise indicated.

2.2 WOOD-PRESERVATIVE-TREATED LUMBER

- A. Preservative Treatment by Pressure Process: AWP A U1; Use Category UC2.
 - 1. Preservative Chemicals: Acceptable to authorities having jurisdiction and containing no arsenic or chromium.
- B. Kiln-dry lumber after treatment to a maximum moisture content of 19 percent. Do not use material that is warped or that does not comply with requirements for untreated material.
- C. Mark lumber with treatment quality mark of an inspection agency approved by the ALSC Board of Review.
- D. Application: Treat items indicated on Drawings, and the following:
 - 1. Wood sills, sleepers, blocking, and similar concealed members in contact with masonry or concrete.

2.3 FIRE-RETARDANT-TREATED MATERIALS

- A. General: Where fire-retardant-treated materials are indicated, materials shall comply with requirements in this article, that are acceptable to authorities having jurisdiction, and with fire-test-response characteristics specified as determined by testing identical products per test method indicated by a qualified testing agency.
- B. Fire-Retardant-Treated Lumber and Plywood by Pressure Process: Products with a flame-spread index of 25 or less when tested according to ASTM E 84, and with no evidence of significant progressive combustion when the test is extended an additional 20 minutes, and with the flame front not extending more than 10.5 feet (3.2 m) beyond the centerline of the burners at any time during the test.
 - 1. Treatment shall not promote corrosion of metal fasteners.

- C. Kiln-dry lumber after treatment to maximum moisture content of 19 percent.
- D. Identify fire-retardant-treated wood with appropriate classification marking of qualified testing agency.
- E. Application: Treat items indicated on Drawings, and the following:
 - 1. Concealed blocking.
 - 2. Plywood backing panels.
 - 3. Plywood wainscot at maintenance bays.

2.4 MISCELLANEOUS LUMBER

- A. General: Provide miscellaneous lumber indicated and lumber for support or attachment of other construction, including the following:
 - 1. Blocking.
 - 2. Nailers.
 - 3. Grounds.
- B. Dimension Lumber Items: For items of dimension lumber size, provide Standard, Stud, or No. 3 grade lumber with 19 percent maximum moisture content of any species.
- C. For blocking not used for attachment of other construction, Utility, Stud, or No. 3 grade lumber of any species may be used provided that it is cut and selected to eliminate defects that will interfere with its attachment and purpose.
- D. For blocking and nailers used for attachment of other construction, select and cut lumber to eliminate knots and other defects that will interfere with attachment of other work.

2.5 PLYWOOD BACKING PANELS

- A. Equipment Backing Panels: Plywood, DOC PS 1, Exposure 1, C-D Plugged, fire-retardant treated, in thickness indicated or, if not indicated, not less than 1/2-inch (13-mm) nominal thickness.

2.6 FASTENERS

- A. General: Fasteners shall be of size and type indicated and shall comply with requirements specified in this article for material and manufacture.
 - 1. Where rough carpentry is exposed to weather, in ground contact, pressure-preservative treated, or in area of high relative humidity, provide fasteners with hot-dip zinc coating complying with ASTM A 153/A 153M.
- B. Nails, Brads, and Staples: ASTM F 1667.
- C. Wood Screws: ASME B18.6.1.
- D. Screws for Fastening to Cold-Formed Metal Framing: ASTM C 954, except with wafer heads and reamer wings, length as recommended by screw manufacturer for material being fastened.

PART 3 - EXECUTION

3.1 INSTALLATION, GENERAL

- A. Framing Standard: Comply with AF&PA's WCD 1, "Details for Conventional Wood Frame Construction," unless otherwise indicated.
- B. Set rough carpentry to required levels and lines, with members plumb, true to line, cut, and fitted. Fit rough carpentry accurately to other construction. Locate nailers, blocking, grounds, and similar supports to comply with requirements for attaching other construction.
- C. Install plywood backing panels by fastening to studs; coordinate locations with utilities requiring backing panels. Install fire-retardant-treated plywood backing panels with classification marking of testing agency exposed to view.
- D. Provide blocking and framing as indicated and as required to support facing materials, fixtures, specialty items, and trim.
 - 1. Provide metal clips for fastening gypsum board or lath at corners and intersections where framing or blocking does not provide a surface for fastening edges of panels. Space clips not more than 16 inches (406 mm) o.c.
- E. Sort and select lumber so that natural characteristics do not interfere with installation or with fastening other materials to lumber. Do not use materials with defects that interfere with function of member or pieces that are too small to use with minimum number of joints or optimum joint arrangement.
- F. Comply with AWP A M4 for applying field treatment to cut surfaces of preservative-treated lumber.
 - 1. Use inorganic boron for items that are continuously protected from liquid water.
 - 2. Use copper naphthenate for items not continuously protected from liquid water.
- G. Securely attach rough carpentry work to substrate by anchoring and fastening as indicated, complying with the following:
 - 1. Table 2304.9.1, "Fastening Schedule," in ICC's International Building Code (IBC).
 - 2. ICC-ES evaluation report for fastener.
- H. Use steel common nails unless otherwise indicated. Select fasteners of size that will not fully penetrate members where opposite side will be exposed to view or will receive finish materials. Make tight connections between members. Install fasteners without splitting wood. Drive nails snug but do not countersink nail heads unless otherwise indicated.

3.2 WOOD GROUND, BLOCKING, AND NAILER INSTALLATION

- A. Install where indicated and where required for attaching other work. Form to shapes indicated and cut as required for true line and level of attached work. Coordinate locations with other work involved.
- B. Attach items to substrates to support applied loading. Recess bolts and nuts flush with surfaces unless otherwise indicated.
- C. Provide permanent grounds of dressed, pressure-preservative-treated, key-beveled lumber not less than 1-1/2 inches (38 mm) wide and of thickness required to bring face of ground to exact thickness of finish material. Remove temporary grounds when no longer required.

3.3 PROTECTION

- A. Protect wood that has been treated with inorganic boron (SBX) from weather. If, despite protection, inorganic boron-treated wood becomes wet, apply EPA-registered borate treatment. Apply borate solution by spraying to comply with EPA-registered label.

END OF SECTION

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SECTION 06 10 53 - MISCELLANEOUS ROUGH CARPENTRY

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. Interior standing and running trim.
 - 2. Fire retardant-treated plywood for painted wood wainscot at maintenance bays
 - 3. Plywood wainscot at interior hallways with transparent finish.
- B. Related Requirements:
 - 1. Division 06 Section "Rough Carpentry" for wood furring, blocking, and shims required for installing wood trim and concealed within other construction before wood trim installation.

1.3 ACTION SUBMITTALS

- A. Product Data: For each type of product.
 - 1. Include data for fire-retardant treatment from chemical-treatment manufacturer and certification by treating plant that treated materials comply with requirements.
- B. Shop Drawings: Show location of each item, dimensioned plans and elevations, large-scale details, attachment devices, and other components.
 - 1. Show details full size.
- C. Samples for Verification:
 - 1. Lumber for transparent finish, not less than 5 inches (125 mm) wide by 12 inches (300 mm) long, for each species and cut, finished on one side and one edge.

1.4 INFORMATIONAL SUBMITTALS

- A. Evaluation Reports: For fire-retardant-treated materials, from ICC-ES.

1.5 DELIVERY, STORAGE, AND HANDLING

- A. Do not deliver wood trim until operations that could damage wood trim have been completed in installation areas. If wood trim must be stored in other than installation areas, store only in areas where environmental conditions comply with requirements specified in "Field Conditions" Article.

1.6 FIELD CONDITIONS

- A. Environmental Limitations for Interior Work: Do not deliver or install interior wood trim until building is enclosed, wet work is complete, and HVAC system is operating and maintaining temperature between 60 and 90 deg F (16 and 32 deg C) and relative humidity between 25 and 55 percent during the remainder of the construction period.

1.7 COORDINATION

- A. Coordinate sizes and locations of framing, blocking, furring, reinforcements, and other related units of Work specified in other Sections to ensure that wood trim can be supported and installed as indicated.

PART 2 - PRODUCTS

2.1 WOOD TRIM, GENERAL

- A. Quality Standard: Unless otherwise indicated, comply with the "Architectural Woodwork Standards" for grades of wood trim indicated for construction, finishes, installation, and other requirements.
 - 1. Provide labels and certificates from AWI certification program indicating that woodwork complies with requirements of grades specified.

2.2 INTERIOR STANDING AND RUNNING TRIM FOR TRANSPARENT FINISH

- A. Grade: Custom.
- B. Wood Species and Cut: Match species and cut indicated for other types of transparent-finished architectural woodwork located in same area of building unless otherwise indicated.

2.3 INTERIOR STANDING AND RUNNING TRIM FOR OPAQUE FINISH

- A. Grade: Custom.
- B. Wood Species: Any closed-grain hardwood.

2.4 PLYWOOD WAINSCOT PANELS FOR TRANSPARENT FINISH

- A. Wainscot Panels: Plywood, DOC PS 1, Exposure 1, A-C, in thickness indicated or, if not indicated, not less than 1/2-inch (13-mm) nominal thickness.
- B. Location: As indicated on the Drawings in the finish schedule.

2.5 PLYWOOD WAINSCOT PANELS FOR OPAQUE FINISH (MAINTENANCE BAYS)

- A. Wainscot Panels: Plywood, DOC PS 1, Exposure 1, C-D Plugged, fire-retardant treated, in thickness indicated or, if not indicated, not less than 1/2-inch (13-mm) nominal thickness.
- B. Location: As indicated on the Drawings in the finish schedule.

2.6 WOOD MATERIALS

- A. Wood Products: Provide materials that comply with requirements of referenced quality standard for each type of wood trim and quality grade specified unless otherwise indicated.
 - 1. Do not use plain-sawn softwood lumber with exposed, flat surfaces more than 3 inches (75 mm) wide.
 - 2. Wood Moisture Content for Interior Materials: 5 to 10 percent.
- B. Composite Wood and Agrifiber Products: Provide materials that comply with requirements of referenced quality standard for each type of wood trim and quality grade specified unless otherwise indicated.
 - 1. Veneer-Faced Panel Products (Hardwood Plywood): HPVA HP-1, made with adhesive containing no urea formaldehyde.

2.7 FIRE-RETARDANT-TREATED MATERIALS

- A. Fire-Retardant-Treated Materials, General: Where fire-retardant-treated materials are indicated, use materials complying with requirements in this article that are acceptable to authorities having jurisdiction and with fire-test-response characteristics specified as determined by testing identical products per test method indicated by a qualified testing agency.
 - 1. Use treated materials that comply with requirements of referenced woodworking standard. Do not use materials that are warped, discolored, or otherwise defective.
 - 2. Use fire-retardant-treatment formulations that do not bleed through or otherwise adversely affect finishes. Do not use colorants to distinguish treated materials from untreated materials.
 - 3. Identify fire-retardant-treated materials with appropriate classification marking of qualified testing agency in the form of removable paper label or imprint on surfaces that will be concealed from view after installation.
- B. Fire-Retardant-Treated Lumber: Products with a flame-spread index of 25 or less when tested according to ASTM E 84, with no evidence of significant progressive combustion when the test is extended an additional 20 minutes, and with the flame front not extending more than 10.5 feet (3.2 m) beyond the centerline of the burners at any time during the test.
 - 1. For exterior applications, use materials that comply with testing requirements after being subjected to accelerated weathering according to ASTM D 2898.
 - 2. Kiln dry lumber after treatment to a maximum moisture content of 19 percent.
 - 3. For items indicated to receive a stained or natural finish, use organic resin chemical formulation.
 - 4. Mill lumber after treatment within limits set for wood removal that do not affect listed fire-test-response characteristics, using a woodworking shop certified by testing and inspecting agency.
 - 5. Mill lumber before treatment and implement special procedures during treatment and drying processes that prevent lumber from warping and developing discolorations from drying sticks or other causes, marring, and other defects affecting appearance of treated woodwork.

2.8 MISCELLANEOUS MATERIALS

- A. Adhesives: Do not use adhesives that contain urea formaldehyde.

2.9 FABRICATION

- A. Sand fire-retardant-treated wood lightly to remove raised grain on exposed surfaces before fabrication.

- B. Fabricate wood trim to dimensions, profiles, and details indicated. Ease edges to radius indicated for the following:
 - 1. Edges of Solid-Wood (Lumber) Members: 1/16 inch (1.5 mm) unless otherwise indicated.
 - 2. Edges of Rails and Similar Members More Than 3/4 Inch (19 mm) Thick: 1/8 inch (3 mm).
- C. Backout or groove backs of flat trim members and kerf backs of other wide, flat members except for members with ends exposed in finished work.
- D. Assemble moldings in shop to maximum extent possible. Miter corners in shop and prepare for field assembly with bolted fittings designed to pull connections together.

PART 3 - EXECUTION

3.1 PREPARATION

- A. Before installation, condition wood trim to average prevailing humidity conditions in installation areas.

3.2 INSTALLATION

- A. Grade: Install wood trim to comply with same grade as item to be installed.
- B. Install wood trim level, plumb, true, and straight. Shim as required with concealed shims. Install level and plumb to a tolerance of 1/8 inch in 96 inches (3 mm in 2400 mm).
- C. Scribe and cut wood trim to fit adjoining work, refinish cut surfaces, and repair damaged finish at cuts.
- D. Fire-Retardant-Treated Wood: Handle, store, and install fire-retardant-treated wood to comply with chemical treatment manufacturer's written instructions, including those for adhesives used to install woodwork.
- E. Anchor wood trim to anchors or blocking built in or directly attached to substrates. Secure with countersunk, concealed fasteners and blind nailing. Use fine finishing nails or finishing screws for exposed fastening, countersunk and filled flush with woodwork.
- F. Standing and Running Trim: Install with minimum number of joints possible, using full-length pieces (from maximum length of lumber available) to greatest extent possible. Do not use pieces less than 36 inches (900 mm) long except where shorter single-length pieces are necessary.
 - 1. Install standing and running trim with no more variation from a straight line than 1/8 inch in 96 inches (3 mm in 2400 mm).
- G. Install plywood panels by fastening to studs or furring members. Install fire-retardant-treated plywood backing panels with classification marking of testing agency exposed to view.
- H. Touch up finishing work specified in this Section after installation of wood trim. Fill nail holes with matching filler where exposed.
- I. Refer to Division 09 Sections "Interior Painting" and "Staining and Transparent Finishing" for final finishing of installed wood trim.

3.3 ADJUSTING AND CLEANING

- A. Repair damaged and defective wood trim, where possible, to eliminate functional and visual defects; where not possible to repair, replace wood trim. Adjust joinery for uniform appearance.
- B. Clean wood trim on exposed and semiexposed surfaces. Touch up shop-applied finishes to restore damaged or soiled areas.

END OF SECTION

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SECTION 064116 - INTERIOR ARCHITECTURAL CASEWORK

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. Plastic-laminate-faced architectural cabinets.
 - 2. Solid-surface countertop and backsplash, window sills and wall caps.
 - 3. Wood furring, blocking, shims, and hanging strips for installing plastic-laminate-faced architectural cabinets unless concealed within other construction before cabinet installation.
- B. Related Requirements:
 - 1. Division 6 Section "Rough Carpentry" for wood furring, blocking, shims, and hanging strips required for installing cabinets and concealed within other construction before cabinet installation.

1.3 PREINSTALLATION MEETINGS

- A. Preinstallation Conference: Conduct conference at Project site.

1.4 ACTION SUBMITTALS

- A. Product Data: For each type of product, including high-pressure decorative laminate and cabinet hardware and accessories.
 - 1. Include data for fire-retardant treatment from chemical-treatment manufacturer and certification by treating plant that treated materials comply with requirements.
- B. Shop Drawings: Show location of each item, dimensioned plans and elevations, large-scale details, attachment devices, and other components.
 - 1. Show details full size.
 - 2. Show locations and sizes of furring, blocking, and hanging strips, including concealed blocking and reinforcement specified in other Sections.
 - 3. Show locations and sizes of cutouts and holes for electrical switches and outlets and other items installed in architectural plastic-laminate cabinets and countertops.
- C. Samples for Verification:
 - 1. Plastic laminates, 8 by 10 inches (200 by 250 mm), for each type, color, pattern, and surface finish.
 - 2. Exposed cabinet hardware and accessories, one unit for each type and finish.

1.5 INFORMATIONAL SUBMITTALS

- A. Qualification Data: For Installer.
- B. Product Certificates: For the following:
 - 1. High-pressure decorative laminate.
 - 2. Adhesives.

1.6 QUALITY ASSURANCE

- A. Fabricator Qualifications: Shop that employs skilled workers who custom fabricate products similar to those required for this Project and whose products have a record of successful in-service performance.
- B. Installer Qualifications: Approved in writing by the Fabricator.
- C. Testing Agency Qualifications: For testing agency providing classification marking for fire-retardant-treated material, an inspection agency acceptable to authorities having jurisdiction that periodically performs inspections to verify that the material bearing the classification marking is representative of the material tested.

1.7 DELIVERY, STORAGE, AND HANDLING

- A. Do not deliver cabinets until painting and similar operations that could damage woodwork have been completed in installation areas. If cabinets must be stored in other than installation areas, store only in areas where environmental conditions comply with requirements specified in "Field Conditions" Article.

1.8 FIELD CONDITIONS

- A. Environmental Limitations: Do not deliver or install cabinets until building is enclosed, wet work is complete, and HVAC system is operating and maintaining temperature between 60 and 90 deg F (16 and 32 deg C) and relative humidity between 17 and 50 percent during the remainder of the construction period.
- B. Field Measurements: Where cabinets are indicated to fit to other construction, verify dimensions of other construction by field measurements before fabrication, and indicate measurements on Shop Drawings. Coordinate fabrication schedule with construction progress to avoid delaying the Work.
 - 1. Locate concealed framing, blocking, and reinforcements that support cabinets by field measurements before being enclosed, and indicate measurements on Shop Drawings.
- C. Established Dimensions: Where cabinets are indicated to fit to other construction, establish dimensions for areas where cabinets are to fit. Provide allowance for trimming at site, and coordinate construction to ensure that actual dimensions correspond to established dimensions.

1.9 COORDINATION

- A. Coordinate sizes and locations of framing, blocking, furring, reinforcements, and other related units of Work specified in other Sections to ensure that cabinets can be supported and installed as indicated.
- B. Hardware Coordination: Distribute copies of approved hardware schedule specified in Section 087111 "Door Hardware (Descriptive Specification)" to fabricator of architectural woodwork; coordinate Shop Drawings and fabrication with hardware requirements.

PART 2 - PRODUCTS

- A. Quality Standard: Unless otherwise indicated, comply with the "Architectural Woodwork Standards" for grades of architectural plastic-laminate cabinets indicated for construction, finishes, installation, and other requirements.
 - 1. Provide labels from AWI or WI certification program indicating that woodwork, including installation, complies with requirements of grades specified.
 - 2. The Contract Documents contain selections chosen from options in the quality standard and additional requirements beyond those of the quality standard. Comply with those selections and requirements in addition to the quality standard.
- B. Grade: Custom.
- C. Type of Construction: Frameless.
- D. Cabinet, Door, and Drawer Front Interface Style: Flush overlay.
- E. Reveal Dimension: 1/2 inch (13 mm).
- F. High-Pressure Decorative Laminate: NEMA LD 3, grades as indicated or if not indicated, as required by woodwork quality standard.
 - 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. Abet Laminati Inc.
 - b. Formica Corporation.
 - c. Wilsonart LLC.
- G. Laminate Cladding for Exposed Surfaces:
 - 1. Horizontal Surfaces: Grade HGS.
 - 2. Postformed Surfaces: Grade HGP.
 - 3. Vertical Surfaces: Grade HGS.
 - 4. Edges: PVC edge banding, 0.12 inch (3 mm) thick, matching laminate in color, pattern, and finish.
 - 5. Pattern Direction: Vertically for drawer fronts, doors, and fixed panels.
- H. Materials for Semiexposed Surfaces:
 - 1. Surfaces Other Than Drawer Bodies: High-pressure decorative laminate, NEMA LD 3, Grade VGS.
 - a. Edges of Plastic-Laminate Shelves: PVC edge banding, 0.12 inch (3 mm) thick, matching laminate in color, pattern, and finish.
 - b. For semiexposed backs of panels with exposed plastic-laminate surfaces, provide surface of high-pressure decorative laminate, NEMA LD 3, Grade VGS.
 - 2. Drawer Sides and Backs: Thermoset decorative panels with PVC or polyester edge banding.
 - 3. Drawer Bottoms: Thermoset decorative panels.
- I. Solid Surface Material: Homogeneous solid sheets of filled plastic resin complying with ANSI SS1.
 - 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. Avonite Surfaces.
 - b. LG Chemical, Ltd.
 - c. Wilsonart LLC.
 - 2. Type: Provide Standard Type or Veneer Type made from material complying with requirements for Standard Type, as indicated unless Special Purpose Type is indicated.

- 3. Colors and Patterns: As indicated by manufacturer's designations on the Drawings in a finish schedule.
- J. Dust Panels: 1/4-inch (6.4-mm) plywood or tempered hardboard above compartments and drawers unless located directly under tops.
- K. Concealed Backs of Panels with Exposed Plastic-Laminate Surfaces: High-pressure decorative laminate, NEMA LD 3, Grade BKL.
- L. Drawer Construction: Fabricate with exposed fronts fastened to subfront with mounting screws from interior of body.
 - 1. Join subfronts, backs, and sides with glued rabbeted joints supplemented by mechanical fasteners or glued dovetail joints.
- M. Colors, Patterns, and Finishes: Provide materials and products that result in colors and textures of exposed laminate surfaces complying with the following requirements:
 - 1. As indicated by laminate manufacturer's designations in a finish schedule.

2.2 WOOD MATERIALS

- A. Wood Products: Provide materials that comply with requirements of referenced quality standard for each type of woodwork and quality grade specified unless otherwise indicated.
 - 1. Wood Moisture Content: 5 to 10 percent.
- B. Composite Wood and Agrifiber Products: Provide materials that comply with requirements of referenced quality standard for each type of woodwork and quality grade specified unless otherwise indicated.
 - 1. Medium-Density Fiberboard: ANSI A208.2, Grade 130, made with binder containing no urea formaldehyde.
 - 2. Particleboard: ANSI A208.1, Grade M-2-Exterior Glue.
 - 3. Softwood Plywood: DOC PS 1, medium-density overlay.
 - 4. Thermoset Decorative Panels: Particleboard or medium-density fiberboard finished with thermally fused, melamine-impregnated decorative paper and complying with requirements of NEMA LD 3, Grade VGL, for test methods 3.3, 3.4, 3.6, 3.8, and 3.10.

2.3 CABINET HARDWARE AND ACCESSORIES

- A. General: Provide cabinet hardware and accessory materials associated with architectural cabinets except for items specified in Section 087111 "Door Hardware (Descriptive Specification)."
- B. Frameless Concealed Hinges (European Type): BHMA A156.9, B01602, 100 degrees of opening, self-closing.
- C. Back-Mounted Pulls: BHMA A156.9, B02011.
- D. Wire Pulls: Back mounted, solid metal, 4 inches (100 mm) long, 5/16 inch (8 mm) in diameter.
- E. Catches: Magnetic catches, BHMA A156.9, B03141.
- F. Adjustable Shelf Standards and Supports: BHMA A156.9, B04071; with shelf rests, B04081.
- G. Shelf Rests: BHMA A156.9, B04013; metal.

- H. Drawer Slides: BHMA A156.9.
 - 1. Grade 1 and Grade 1HD-100: Side mounted and extending under bottom edge of drawer; full-extension type; epoxy-coated steel with polymer rollers.
 - 2. For drawers not more than 3 inches (75 mm) high and not more than 24 inches (600 mm) wide, provide Grade 1.
 - 3. For drawers more than 3 inches (75 mm) high provide Grade 1HD-100.
 - 4. For computer keyboard shelves, provide Grade 1HD-100.
- I. Door Locks: BHMA A156.11, E07121.
- J. Drawer Locks: BHMA A156.11, E07041.
- K. Door and Drawer Silencers: BHMA A156.16, L03011.
- L. Exposed Hardware Finishes: For exposed hardware, provide finish that complies with BHMA A156.18 for BHMA finish number indicated.
 - 1. Satin Stainless Steel: BHMA 630.
- M. For concealed hardware, provide manufacturer's standard finish that complies with product class requirements in BHMA A156.9.

2.4 SOLID-SURFACE-MATERIAL COUNTERTOPS

- A. Configuration: Provide countertops with the following front and backsplash style:
 - 1. Front: Straight, slightly eased at top 3/4-inch (19-mm) bullnose.
 - 2. Backsplash: Radius edge with 3/8-inch (9.5-mm) radius.
 - 3. Endsplash: Matching backsplash.
- B. Countertops: 1/4-inch- (6.4-mm-) thick, solid surface material laminated to 3/4-inch- (19-mm-) thick particleboard with exposed edges faced with 1/4-inch- (6.4-mm-) thick, solid surface material.
- C. Backsplashes: 1/2-inch- (12.7-mm-) thick, solid surface material.
- D. Fabrication: Fabricate tops in one piece with shop-applied edges unless otherwise indicated. Comply with solid-surface-material manufacturer's written instructions for adhesives, sealers, fabrication, and finishing.
 - 1. Fabricate with loose backsplashes for field assembly.

2.5 ACCESSORIES

- A. Grommets for Cable Passage through Countertops: 2-inch (51-mm) OD, molded-plastic grommets and matching plastic caps with slot for wire passage. Color as selected by architect from manufacturer's full range.

2.6 MISCELLANEOUS MATERIALS

- A. Furring, Blocking, Shims, and Hanging Strips: Softwood or hardwood lumber, kiln dried to less than 15 percent moisture content.
- B. Anchors: Select material, type, size, and finish required for each substrate for secure anchorage. Provide metal expansion sleeves or expansion bolts for post-installed anchors. Use nonferrous-metal or hot-dip galvanized anchors and inserts at inside face of exterior walls and at floors.

- C. Adhesives: Do not use adhesives that contain urea formaldehyde.

2.7 FABRICATION

- A. Sand fire-retardant-treated wood lightly to remove raised grain on exposed surfaces before fabrication.
- B. Fabricate cabinets to dimensions, profiles, and details indicated.
- C. Fabricate countertops to dimensions, profiles, and details indicated. Provide front and end overhang of 1 inch (25 mm) over base cabinets.:
- D. Complete fabrication, including assembly and hardware application, to maximum extent possible before shipment to Project site. Disassemble components only as necessary for shipment and installation. Where necessary for fitting at site, provide ample allowance for scribing, trimming, and fitting.
 - 1. Notify Architect seven days in advance of the dates and times woodwork fabrication will be complete.
 - 2. Trial fit assemblies at fabrication shop that cannot be shipped completely assembled. Install dowels, screws, bolted connectors, and other fastening devices that can be removed after trial fitting. Verify that various parts fit as intended and check measurements of assemblies against field measurements before disassembling for shipment.
- E. Shop-cut openings to maximum extent possible to receive hardware, appliances, electrical work, and similar items. Locate openings accurately and use templates or roughing-in diagrams to produce accurately sized and shaped openings. Sand edges of cutouts to remove splinters and burrs.

PART 3 - EXECUTION

3.1 PREPARATION

- A. Before installation, condition cabinets to average prevailing humidity conditions in installation areas.
- B. Before installing cabinets and countertops, examine shop-fabricated work for completion and complete work as required.

3.2 INSTALLATION

- A. Grade: Install cabinets and countertops to comply with same grade as item to be installed.
- B. Assemble cabinets and complete fabrication at Project site to the extent that it was not completed in the shop.
 - 1. Provide cutouts for appliances, plumbing fixtures, electrical work, and similar items.
 - 2. Seal edges of cutouts by saturating with varnish.
- C. Install cabinets and countertops level, plumb, true, and straight. Shim as required with concealed shims. Install level and plumb to a tolerance of 1/8 inch in 96 inches (3 mm in 2400 mm).
- D. Scribe and cut cabinets and countertops to fit adjoining work, refinish cut surfaces, and repair damaged finish at cuts.

- E. Anchor cabinets to anchors or blocking built in or directly attached to substrates. Secure with countersunk, concealed fasteners and blind nailing. Use fine finishing nails or finishing screws for exposed fastening, countersunk and filled flush with woodwork.
 - 1. Use filler matching finish of items being installed.
- F. Cabinets: Install without distortion so doors and drawers fit openings properly and are accurately aligned. Adjust hardware to center doors and drawers in openings and to provide unencumbered operation. Complete installation of hardware and accessory items as indicated.
 - 1. Install cabinets with no more than 1/8 inch in 96-inch (3 mm in 2400-mm) sag, bow, or other variation from a straight line.
 - 2. Fasten wall cabinets through back, near top and bottom, and at ends not more than 16 inches (400 mm) o.c. with No. 10 wafer-head sheet metal screws through metal backing or metal framing behind wall finish.
- G. Countertops: Anchor securely by screwing through corner blocks of base cabinets or other supports into underside of countertop.
 - 1. Install countertops with no more than 1/8 inch in 96-inch (3 mm in 2400-mm) sag, bow, or other variation from a straight line.
 - 2. Secure backsplashes to walls with adhesive. Install backsplashes and endsplashes to comply with manufacturer's written instructions for adhesives, sealers, fabrication and finishing.
 - 3. Seal junctures of tops, splashes, and walls with mildew-resistant silicone sealant or another permanently elastic sealing compound recommended by countertop material manufacturer.

3.3 ADJUSTING AND CLEANING

- A. Repair damaged and defective cabinets, where possible, to eliminate functional and visual defects; where not possible to repair, replace woodwork. Adjust joinery for uniform appearance.
- B. Clean, lubricate, and adjust hardware.
- C. Clean cabinets and countertops on exposed and semiexposed surfaces.

END OF SECTION

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SECTION 06 64 00 - PLASTIC PANELING

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. PVC water resistant sheet paneling for wash bay.
- B. Related Requirements:
 - 1. Division 09 Section "Non-structural Metal Framing" for metal stud framing for interior partition walls.

1.3 ACTION SUBMITTALS

- A. Product Data: For each type of product.
- B. Shop Drawings: Submit manufacturer's shop drawings, including plans, elevations, sections and details, indicating dimensions, tolerances, materials, components, fabrication, fasteners, finish, options and accessories.
- C. Samples: For plastic paneling and trim accessories, in manufacturer's standard sizes, minimum 6 inches by 6 inches.
- D. Sample warranty: Submit manufacturer's standard warranty.

1.4 QUALITY ASSURANCE

- A. Testing Agency: Acceptable to authorities having jurisdiction.
- B. Installer's Qualifications: An experienced installer regular engaged, for past 5 years, in installation of wall systems of similar type to that specified.

1.5 PROJECT CONDITIONS

- A. Environmental Limitations: Do not deliver or install plastic paneling until spaces are enclosed and weathertight and temporary HVAC system is operating and maintaining ambient temperature and humidity conditions at occupancy levels during the remainder of the construction period.

1.6 WARRANTY

- A. Special warranty: Manufacturer agrees to repair or replace PVC panels that fail in materials or workmanship within specified warranty period.
 - 1. Warranty Period: 10 years from date of Substantial Completion.

PART 2 - PRODUCTS

2.1 MANUFACTURERS

- A. Source Limitations: Obtain plastic paneling and trim accessories from single manufacturer.

2.2 PLASTIC SHEET PANELING

- A. PVC Paneling: Multi-chamber rigid polyvinyl chloride panels.
 - 1. Basis-of-Design Product: Subject to compliance with requirements, provide EPI9000 Series PVC panels as manufactured by Extrutech Plastics, Inc. or a comparable product by another manufacturer.
 - 2. Surface-Burning Characteristics: As follows when tested by a qualified testing agency according to ASTM E 84. Identify products with appropriate markings of applicable testing agency.
 - a. Flame-Spread Index: 25 or less.
 - b. Smoke-Developed Index: 450 or less.
 - 3. Nominal Panel Thickness: 1.75 inch.
 - 4. Panel Width: 36 inches.
 - 5. Surface Finish: Smooth.
 - 6. Fungus Resistance: ASTM D 3273, no mold or mildew growth.
 - 7. Color: White.

2.3 ACCESSORIES

- A. Trim Accessories: Manufacturer's standard one-piece vinyl extrusions designed to retain and cover edges of panels. Provide division bars, inside corners, outside corners, and caps as needed to conceal edges.
 - 1. Color: White.
- B. Exposed Fasteners: Flat Phillips head, stainless steel, self-drilling screws with washers according to manufacturer's recommendations for spacing and installation.
- C. Sealant: Mildew-resistant, single-component, neutral-curing or acid-curing silicone sealant recommended by plastic paneling manufacturer and complying with requirements in Division 07 Section "Joint Sealants."
 - 1. Sealant shall have a VOC content of 250 g/L or less.

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. Condition panels by unpacking and placing in installation space before installation according to manufacturer's written recommendations.
- B. Lay out paneling before installing. Locate panel joints to provide equal panels at ends of walls not less than half the width of full panels so that trimmed panels at corners are not less than 12 inches (300 mm) wide.
 - 1. Locate panel joints to allow clearance at panel edges according to manufacturer's written instructions.

3.3 INSTALLATION

- A. Install plastic paneling according to manufacturer's written instructions.
- B. Install trim accessories with adhesive and nails or staples. Do not fasten through panels.
- C. Maintain uniform space between adjacent panels and between panels and floors, ceilings, and fixtures. Fill space with sealant.
- D. Remove excess sealant and smears as paneling is installed. Clean with solvent recommended by sealant manufacturer and then wipe with clean dry cloths until no residue remains.

END OF SECTION

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SECTION 071113 - BITUMINOUS DAMPPROOFING

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. Cold-applied, emulsified-asphalt dampproofing.
- B. Related Requirements:
 - 1. Division 07 Section "Thermal Insulation".

1.3 ACTION SUBMITTALS

- A. Product Data: For each type of product.

1.4 FIELD CONDITIONS

- A. Weather Limitations: Proceed with application only when existing and forecasted weather conditions permit dampproofing to be performed according to manufacturers' written instructions.
- B. Ventilation: Provide adequate ventilation during application of dampproofing in enclosed spaces. Maintain ventilation until dampproofing has cured.

PART 2 - PRODUCTS

2.1 MATERIALS, GENERAL

- A. Source Limitations: Obtain primary dampproofing materials and primers from single source from single manufacturer. Provide auxiliary materials recommended in writing by manufacturer of primary materials.
- B. VOC Content: Products shall comply with VOC content limits of authorities having jurisdiction unless otherwise required.

2.2 COLD-APPLIED, EMULSIFIED-ASPHALT DAMPPROOFING

- 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. BASF Corporation; Construction Systems.
 - 2. Henry Company.
 - 3. W. R. Meadows, Inc.

- B. Trowel Coats: ASTM D 1227, Type II, Class 1.
- C. Fibered Brush and Spray Coats: ASTM D 1227, Type II, Class 1.
- D. Brush and Spray Coats: ASTM D 1227, Type III, Class 1.
- E. VOC Content: 30 g/L or less.

2.3 AUXILIARY MATERIALS

- A. General: Furnish auxiliary materials recommended in writing by dampproofing manufacturer for intended use and compatible with bituminous dampproofing.
- B. Emulsified-Asphalt Primer: ASTM D 1227, Type III, Class 1, except diluted with water as recommended in writing by manufacturer.
- C. Asphalt-Coated Glass Fabric: ASTM D 1668, Type I.
- D. Patching Compound: Asbestos-free fibered mastic of type recommended in writing by dampproofing manufacturer.
- E. Protection Course: Fan folded, with a core of extruded-polystyrene board insulation faced on one side or both sides with plastic film, nominal thickness 1/4 inch (6 mm), with a compressive strength of not less than 8 psi (55 kPa) per ASTM D 1621, and maximum water absorption by volume of 0.6 percent per ASTM C 272.

PART 3 - EXECUTION

3.1 EXAMINATION

- A. Examine substrates, areas, and conditions with Applicator present, for compliance with requirements for surface smoothness, surface moisture, and other conditions affecting performance of bituminous dampproofing work.
 - 1. Test for surface moisture according to ASTM D 4263.
- B. Proceed with application only after substrate construction and penetrating work have been completed and unsatisfactory conditions have been corrected.

3.2 PREPARATION

- A. Mask or otherwise protect adjoining exposed surfaces from being stained, spotted, or coated with dampproofing. Prevent dampproofing materials from entering and clogging weep holes and drains.
- B. Clean substrates of projections and substances detrimental to the dampproofing work; fill voids, seal joints, and remove bond breakers if any, as recommended in writing by prime material manufacturer.
- C. Apply patching compound to patch and fill tie holes, honeycombs, reveals, and other imperfections.

3.3 APPLICATION, GENERAL

- A. Comply with manufacturer's written instructions for dampproofing application, cure time between coats, and drying time before backfilling unless more stringent requirements are indicated.
 - 1. Apply dampproofing to provide continuous plane of protection.
 - 2. Apply additional coats if recommended in writing by manufacturer or to achieve a smooth surface and uninterrupted coverage.
- B. Where dampproofing footings and foundation walls, apply from finished-grade line to top of footing; extend over top of footing and down a minimum of 6 inches (150 mm) over outside face of footing.
 - 1. Extend dampproofing 12 inches (300 mm) onto intersecting walls and footings, but do not extend onto surfaces exposed to view when Project is completed.
 - 2. Install flashings and corner protection stripping at internal and external corners, changes in plane, construction joints, cracks, and where shown as "reinforced," by embedding an 8-inch- (200-mm-) wide strip of asphalt-coated glass fabric in a heavy coat of dampproofing. Dampproofing coat for embedding fabric is in addition to other coats required.

3.4 COLD-APPLIED, EMULSIFIED-ASPHALT DAMPPROOFING

- A. Concrete Foundations: Apply one fibered brush or spray coat at not less than 3 gal./100 sq. ft. (1.2 L/sq. m) or one trowel coat at not less than 4 gal./100 sq. ft. (1.6 L/sq. m).

3.5 INSTALLATION OF PROTECTION COURSE

- A. Where indicated, install protection course over completed-and-cured dampproofing. Comply with dampproofing-material and protection-course manufacturers' written instructions for attaching protection course.
 - 1. Support protection course over cured coating with spot application of adhesive type recommended in writing by protection-board manufacturer.
 - 2. Install protection course within 24 hours of installation of dampproofing (while coating is tacky) to ensure adhesion.

3.6 CLEANING

- A. Clean spillage and soiling from adjacent construction using cleaning agents and procedures recommended in writing by manufacturer of affected construction.

END OF SECTION

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SECTION 07 21 00 - THERMAL INSULATION

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. Extruded polystyrene foam-plastic board.
 - 2. Expanded polystyrene foam-plastic board.
 - 3. Glass-fiber blanket.
 - 4. Spray polyurethane foam insulation.
 - 5. Under slab vapor retarder at concrete floor slab.
- B. Related Requirements:
 - 1. Division 03 Section "Cast-in-Place Concrete" for concrete floor slabs.
 - 2. Division 07 Section "Ethylene-Propylene-Diene-Monomer (EPDM) Roofing" for insulation specified as part of roofing construction.
 - 3. Division 07 Section "Insulated Metal Wall Panels" for insulated exterior building shell.
 - 4. Division 09 Section "Gypsum Board" for sound attenuation blanket used as acoustic insulation.

1.3 ACTION SUBMITTALS

- A. Product Data: For each type of product.

1.4 INFORMATIONAL SUBMITTALS

- A. Product Test Reports: For each product, for tests performed by a qualified testing agency.
- B. Evaluation Reports: For foam-plastic insulation, from ICC-ES.

1.5 DELIVERY, STORAGE, AND HANDLING

- A. Protect insulation materials from physical damage and from deterioration due to moisture, soiling, and other sources. Store inside and in a dry location. Comply with manufacturer's written instructions for handling, storing, and protecting during installation.
- B. Protect foam-plastic board insulation as follows:
 - 1. Do not expose to sunlight except to necessary extent for period of installation and concealment.
 - 2. Protect against ignition at all times. Do not deliver foam-plastic board materials to Project site until just before installation time.
 - 3. Quickly complete installation and concealment of foam-plastic board insulation in each area of construction.

PART 2 - PRODUCTS

2.1 EXTRUDED POLYSTYRENE FOAM-PLASTIC BOARD

- A. Extruded polystyrene boards in this article are also called "XPS boards." Roman numeral designators in ASTM C 578 are assigned in a fixed random sequence, and their numeric order does not reflect increasing strength or other characteristics.
- B. Extruded Polystyrene Board, Type VII: ASTM C 578, Type VII, 60-psi (414-kPa) minimum compressive strength; maximum flame-spread and smoke-developed indexes of 25 and 450, respectively, per ASTM E 84.
 - 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:
 - 1. DiversiFoam Products.
 - 2. Dow Chemical Company (The).
 - 3. Owens Corning.
 - 2. Thickness: As indicated on the Drawings.
 - 3. Location: Below grade at concrete foundation wall, and horizontally over isolated footings.

2.2 EXPANDED POLYSTYRENE FOAM-PLASTIC BOARD

- A. Expanded Polystyrene Board, Type I: ASTM C 578, Type I, 10-psi (69-kPa) minimum compressive strength.
 - 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:
 - 1. DiversiFoam Products.
 - 2. Insulfoam LLC; a Carlisle company.
 - 2. Thickness: As indicated on the Drawings.
 - 3. Location: Above grade at door and window openings.
 - 4. Fire Resistant Characteristics: Flame spread 25 maximum , smoke development 450 maximum (ASTM E84).

2.3 GLASS-FIBER BLANKET

- A. Sustainability Requirements: Provide glass-fiber blanket insulation as follows:
 - 1. Free of Formaldehyde: Insulation manufactured with 100 percent acrylic binders and no formaldehyde.
- B. Glass-Fiber Blanket, Unfaced: ASTM C 665, Type I; with maximum flame-spread and smoke-developed indexes of 25 and 50, respectively, per ASTM E 84; passing ASTM E 136 for combustion characteristics.
 - 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:
 - 1) CertainTeed Corporation.
 - 2) Johns Manville; a Berkshire Hathaway company.
 - 3) Knauf Insulation.
 - 4) Owens Corning.
 - 2. Location: At interior acoustical partition walls.

2.4 UNDER SLAB VAPOR RETARDERS

- A. Polyethylene Vapor Retarders: Class A, ASTM E 1745, 15 mils (0.38 mm) thick, with maximum permeance rating of 0.13 perm (7.5 ng/Pa x s x sq. m).
- B. Vapor-Retarder Tape: Pressure-sensitive tape of type recommended by vapor-retarder manufacturer for sealing joints and penetrations in vapor retarder.

2.5 ACCESSORIES

- A. Insulation for Miscellaneous Voids:
 - 1. Spray Polyurethane Foam Insulation: ASTM C 1029, Type II, closed cell, with maximum flame-spread and smoke-developed indexes of 75 and 450, respectively, per ASTM E 84.
- B. Adhesive for Bonding Insulation: Product compatible with insulation and air and water barrier materials, and with demonstrated capability to bond insulation securely to substrates without damaging insulation and substrates.

PART 3 - EXECUTION

3.1 PREPARATION

- A. Clean substrates of substances that are harmful to insulation, including removing projections capable of puncturing insulation or vapor retarders, or that interfere with insulation attachment.

3.2 INSTALLATION, GENERAL

- A. Comply with insulation manufacturer's written instructions applicable to products and applications.
- B. Install insulation that is undamaged, dry, and unsoiled and that has not been left exposed to ice, rain, or snow at any time.
- C. Extend insulation to envelop entire area to be insulated. Fit tightly around obstructions and fill voids with insulation. Remove projections that interfere with placement.
- D. Provide sizes to fit applications and selected from manufacturer's standard thicknesses, widths, and lengths. Apply single layer of insulation units unless multiple layers are otherwise shown or required to make up total thickness or to achieve R-value.

3.3 INSTALLATION OF SLAB INSULATION

- A. On vertical slab edge and foundation surfaces, set insulation units using manufacturer's recommended adhesive according to manufacturer's written instructions.
 - 1. If not otherwise indicated, extend insulation a minimum of 36 inches (915 mm) below exterior grade line.
- B. On horizontal surfaces, loosely lay insulation units according to manufacturer's written instructions. Stagger end joints and tightly abut insulation units.
 - 1. If not otherwise indicated, extend insulation a minimum of 24 inches (610 mm) in from exterior walls.

3.4 INSTALLATION OF FOUNDATION WALL INSULATION

- A. Butt panels together for tight fit.
- B. Adhesive Installation: Install with adhesive or press into tacky waterproofing or dampproofing according to manufacturer's written instructions.

3.5 INSTALLATION OF CAVITY-WALL INSULATION

- A. Foam-Plastic Board Insulation: Install pads of adhesive spaced approximately 24 inches (610 mm) o.c. both ways on inside face and as recommended by manufacturer. Fit courses of insulation between wall ties and other obstructions, with edges butted tightly in both directions. Press units firmly against inside substrates.

3.6 INSTALLATION OF INSULATION IN FRAMED CONSTRUCTION

- A. Spray-Applied Cellulosic Insulation: Apply spray-applied insulation according to manufacturer's written instructions. Do not apply insulation until installation of pipes, ducts, conduits, wiring, and electrical outlets in walls is completed and windows, electrical boxes, and other items not indicated to receive insulation are masked. After insulation is applied, make flush with face of studs by using method recommended by insulation manufacturer.
- B. Blanket Insulation: Install in cavities formed by framing members according to the following requirements:
 - 1. Use insulation widths and lengths that fill the cavities formed by framing members. If more than one length is required to fill the cavities, provide lengths that will produce a snug fit between ends.
 - 2. Place insulation in cavities formed by framing members to produce a friction fit between edges of insulation and adjoining framing members.
 - 3. Maintain 3-inch (76-mm) clearance of insulation around recessed lighting fixtures not rated for or protected from contact with insulation.
 - 4. For metal-framed wall cavities where cavity heights exceed 96 inches (2438 mm), support unfaced blankets mechanically and support faced blankets by taping flanges of insulation to flanges of metal studs.

3.7 INSTALLATION OF VAPOR RETARDERS

- A. Place vapor retarders on side of construction indicated on Drawings. Extend vapor retarders to extremities of areas to protect from vapor transmission. Secure vapor retarders in place with adhesives or other anchorage system as indicated. Extend vapor retarders to cover miscellaneous voids in insulated substrates, including those filled with loose-fiber insulation.
- B. Seal joints caused by pipes, conduits, electrical boxes, and similar items penetrating vapor retarders with vapor-retarder tape to create an airtight seal between penetrating objects and vapor retarders.
- C. Repair tears or punctures in vapor retarders immediately before concealment by other work. Cover with vapor-retarder tape or another layer of vapor retarders. Seal vertical joints in vapor retarders over framing by lapping no fewer than two studs.
 - 1. Firmly attach vapor retarders to wood framing and solid substrates with vapor-retarder fasteners as recommended by vapor-retarder manufacturer.

3.8 PROTECTION

- A. Protect installed insulation from damage due to harmful weather exposures, physical abuse, and other causes. Provide temporary coverings or enclosures where insulation is subject to abuse and cannot be concealed and protected by permanent construction immediately after installation.

END OF SECTION 072100

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SECTION 07 41 13 - STANDING-SEAM METAL ROOF PANELS

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 standing-seam metal roof panels and accessory flashing for exterior canopies.
- B. Related Sections:
 - 1. Division 07 Section "Expansion Control".
 - 2. Division 07 Section "Sheet Metal Flashing and Trim".

1.3 ACTION SUBMITTALS

- A. Product Data: For each type of product.
 - 1. Include construction details, material descriptions, dimensions of individual components and profiles, and finishes for 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 Initial Selection: For each type of metal panel indicated with factory-applied color finishes.
 - 1. Include similar Samples of trim and accessories involving color selection.

1.4 CLOSEOUT SUBMITTALS

- A. Maintenance Data: For metal panels to include in maintenance manuals.

1.5 QUALITY ASSURANCE

- A. Installer Qualifications: An entity that employs installers and supervisors who are trained and approved by manufacturer.

1.6 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.

1.7 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.

1.8 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.

1.9 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 Hunter units when tested according to ASTM D 2244.
 - b. Chalking in excess of a No. 8 rating when tested according to ASTM D 4214.
 - 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. Structural Performance: Provide metal panel systems capable of withstanding the effects of the following loads, based on testing according to ASTM E 1592:
 - 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.

- B. Air Infiltration: Air leakage of not more than 0.06 cfm/sq. ft. when tested according to ASTM E 1680 or ASTM E 283 at the following test-pressure difference:
 - 1. Test-Pressure Difference: 1.57 lbf/sq. ft..
- C. Water Penetration under Static Pressure: No water penetration when tested according to ASTM E 1646 or ASTM E 331 at the following test-pressure difference:
 - 1. Test-Pressure Difference: 2.86 lbf/sq. ft..
- D. Hydrostatic-Head Resistance: No water penetration when tested according to ASTM E 2140.
- 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. 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. General: 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 E 1514.
- B. Vertical-Rib, Snap-Joint, Standing-Seam Metal Roof Panels: Formed with vertical ribs at panel edges and intermediate stiffening ribs symmetrically spaced 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. Basis of Design Product:
 - a. HR-36 standing seam metal roof panels as manufactured by AEP Span
 - b. or approved products by the following Available Manufacturers:
 - 1) Centria Architectural Systems.
 - 2) Metal Sales Manufacturing.
 - 3) VICWEST.
 - 2. Metallic-Coated Steel Sheet: Zinc-coated (galvanized) steel sheet complying with ASTM A 653/A 653M, G90 coating designation, or aluminum-zinc alloy-coated steel sheet complying with ASTM A 792/A 792M, Class AZ50 coating designation; structural quality. Prepainted by the coil-coating process to comply with ASTM A 755/A 755M.
 - a. Nominal Thickness: 22 gauge.
 - b. Exterior Finish: Two-coat fluoropolymer.
 - c. Color: As indicated on the Drawings in the finish schedule.
 - 3. Battens: 22 gauge
 - 4. Clips: One-piece fixed to accommodate thermal movement.
 - a. Material: 21 gauge nominal thickness, zinc-coated (galvanized) or aluminum-zinc alloy-coated steel sheet.
 - 5. Panel Coverage: 36 inches.
 - 6. Panel Height: 1-1/2 inches.

2.3 MISCELLANEOUS MATERIALS

- A. Miscellaneous Metal Subframing and Furring: ASTM C 645; cold-formed, metallic-coated steel sheet, ASTM A 653/A 653M, G90 coating designation or ASTM A 792/A 792M, Class AZ50 coating designation unless otherwise indicated. Provide manufacturer's standard sections as required for support and alignment of metal panel system.
- B. 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. 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.
- C. Flashing and Trim: Provide flashing and trim formed from same material as metal panels as required to seal against weather and to provide finished appearance. Locations include, but are not limited to, eaves, rakes, corners, bases, framed openings, ridges, fasciae, and fillers. Finish flashing and trim with same finish system as adjacent metal panels.
 - 1. Color: Match color of metal roof panel.
- D. Panel Fasteners: Self-tapping screws designed to withstand design loads.
- E. Panel Sealants: Provide sealant type recommended by manufacturer that are compatible with panel materials, are nonstaining, and do not damage panel finish.
 - 1. Sealant Tape: Pressure-sensitive, 100 percent solids, gray polyisobutylene compound sealant tape with release-paper backing. Provide permanently elastic, nonsag, nontoxic, nonstaining tape 1/2 inch wide and 1/8 inch thick.
 - 2. Joint Sealant: ASTM C 920; elastomeric polyurethane or silicone sealant; of type, grade, class, and use classifications required to seal joints in metal panels and remain weathertight; and as recommended in writing by metal panel manufacturer.
 - 3. Butyl-Rubber-Based, Solvent-Release Sealant: ASTM C 1311.

2.4 FABRICATION

- A. General: 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. Provide panel profile, including major ribs and intermediate stiffening ribs, if any, for full length of panel.
- C. Sheet Metal Flashing and Trim: Fabricate flashing and trim to comply with manufacturer's recommendations and recommendations in SMACNA's "Architectural 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 "Architectural Sheet Metal Manual" or metal panel manufacturer for application, but not less than thickness of metal being secured.

2.5 FINISHES

- A. Protect mechanical and painted finishes on exposed surfaces from damage by applying a strippable, temporary protective covering before shipping.
- B. Appearance of Finished Work: Variations in appearance of abutting or adjacent pieces are acceptable if they are within one-half of the range of approved Samples. Noticeable variations in same piece are unacceptable. Variations in appearance of other components are acceptable if they are within the range of approved Samples and are assembled or installed to minimize contrast.
- C. Steel Panels and Accessories:
 1. Two-Coat Fluoropolymer: AAMA 621. Fluoropolymer finish containing not less than 70 percent PVDF resin by weight in color coat. Prepare, pretreat, and apply coating to exposed metal surfaces to comply with coating and resin manufacturers' written instructions.
 2. Concealed Finish: Apply pretreatment and manufacturer's standard white or light-colored acrylic or polyester backer finish consisting of prime coat and wash coat with a minimum total dry film thickness of 0.5 mil.

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.
- 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 C 754 and metal panel manufacturer's written recommendations.

3.3 METAL PANEL INSTALLATION

- A. General: 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.
- 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. 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. Flashing and Trim: Comply with performance requirements, manufacturer's written installation instructions, and SMACNA's "Architectural Sheet Metal Manual." Provide concealed fasteners where possible, and set units true to line and level as indicated. Install work with laps, joints, and seams that will be permanently watertight and weather resistant.
1. Install exposed flashing and trim that is without buckling and tool marks, and that is true to line and levels indicated, with exposed edges folded back to form hems. Install sheet metal flashing and trim to fit substrates and achieve waterproof and weather-resistant performance.
 2. Expansion Provisions: Provide for thermal expansion of exposed flashing and trim. Space movement joints at a maximum of 10 feet with no joints allowed within 24 inches of corner or intersection. Where lapped expansion provisions cannot be used or would not be sufficiently weather resistant and waterproof, form expansion joints of intermeshing hooked flanges, not less than 1 inch deep, filled with mastic sealant (concealed within joints).

3.4 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.

3.5 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.

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SECTION 074213 - METAL WALL PANELS

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. Corrugated metal wall panels at exterior of sand storage building.

1.3 PREINSTALLATION MEETINGS

- A. Preinstallation Conference: Conduct conference at Project site.
 - 1. Meet with Owner, Architect, Owner's insurer if applicable, metal panel Installer, metal panel manufacturer's representative, structural-support Installer, and installers whose work interfaces with or affects metal panels, including installers of doors, windows, and louvers.
 - 2. Review and finalize construction schedule and verify availability of materials, Installer's personnel, equipment, and facilities needed to make progress and avoid delays.
 - 3. Review methods and procedures related to metal panel installation, including manufacturer's written instructions.
 - 4. Examine support conditions for compliance with requirements, including alignment between and attachment to structural members.
 - 5. Review flashings, special siding details, wall penetrations, openings, and condition of other construction that affect metal panels.
 - 6. Review governing regulations and requirements for insurance, certificates, and tests and inspections if applicable.
 - 7. Review temporary protection requirements for metal panel assembly during and after installation.
 - 8. Review procedures for repair of metal panels damaged after installation.
 - 9. Document proceedings, including corrective measures and actions required, and furnish copy of record to each participant.

1.4 ACTION SUBMITTALS

- A. Product Data: For each type of product.
 - 1. Include construction details, material descriptions, dimensions of individual components and profiles, and finishes for 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 assembly, trim, flashings, closures, and accessories; and special details.

2. Accessories: Include details of the flashing, trim, and anchorage, at a scale of not less than 1-1/2 inches per 12 inches (1:10).
 - C. Samples for Initial Selection: For each type of metal panel indicated with factory-applied color finishes.
 1. Include similar Samples of trim and accessories involving color selection.
 - D. Samples for Verification: For each type of exposed finish required, prepared on Samples of size indicated below.
 1. Metal Panels: 12 inches (305 mm) long by actual panel width. Include fasteners, closures, and other metal panel accessories.
- 1.5 INFORMATIONAL SUBMITTALS
- A. Qualification Data: For Installer.
 - B. Product Test Reports: For each product, tests performed by a qualified testing agency.
 - C. Field quality-control reports.
 - D. Sample Warranties: For special warranties.
- 1.6 CLOSEOUT SUBMITTALS
- A. Maintenance Data: For metal panels to include in maintenance manuals.
- 1.7 QUALITY ASSURANCE
- A. Installer Qualifications: An entity that employs installers and supervisors who are trained and approved by manufacturer.
- 1.8 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.

1.9 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.

1.10 COORDINATION

- A. 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.

1.11 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 Hunter units when tested according to ASTM D 2244.
 - b. Chalking in excess of a No. 8 rating when tested according to ASTM D 4214.
 - 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. Structural Performance: Provide metal panel systems capable of withstanding the effects of the following loads, based on testing according to ASTM E 330:
 - 1. Wind Loads: As indicated on Drawings.
 - 2. Other Design Loads: As indicated on Drawings.
 - 3. Deflection Limits: For wind loads, no greater than 1/180 of the span.
- B. Air Infiltration: Air leakage of not more than 0.06 cfm/sq. ft. (0.3 L/s per sq. m) when tested according to ASTM E 283 at the following test-pressure difference:
 - 1. Test-Pressure Difference: 1.57 lbf/sq. ft. (75 Pa).

- C. Water Penetration under Static Pressure: No water penetration when tested according to ASTM E 331 at the following test-pressure difference:
 - 1. Test-Pressure Difference: 2.86 lbf/sq. ft. (137 Pa).
- D. 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 (67 deg C), ambient; 180 deg F (100 deg C), material surfaces.

2.2 PANEL MATERIALS

- A. Metallic-Coated Steel Sheet: Restricted flatness steel sheet metallic coated by the hot-dip process and prepainted by the coil-coating process to comply with ASTM A 755/A 755M.
 - 1. Aluminum-Zinc Alloy-Coated Steel Sheet: ASTM A 792/A 792M, Class AZ55 coating designation.
 - 2. Surface: Smooth, flat finish.
 - 3. Exposed Coil-Coated Finish:
 - a. 2-Coat Fluoropolymer: AAMA 621. Fluoropolymer finish containing not less than 70 percent 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.
 - 4. Concealed Finish: Apply pretreatment and manufacturer's standard white or light-colored acrylic or polyester backer finish consisting of prime coat and wash coat with a minimum total dry film thickness of 0.5 mil.

2.3 EXPOSED-FASTENER, LAP-SEAM CORRUGATED METAL WALL PANELS

- A. General: Provide factory-formed, corrugated metal wall panels fabricated from single sheets of metal formed into profile for installation method indicated. Include attachment assembly components, and accessories required for weathertight system.
- B. Corrugated-Profile, Exposed-Fastener Metal Wall Panels: Formed with alternating curved ribs spaced at 2.67 inches on center across width of panel, and a panel depth of 7/8-inch.
 - 1. Basis-of-Design Product: Subject to compliance with requirements, provide 2.76" x 7/8" corrugated panel and related metal flashing and trim with Kynar finish as manufactured by Morin or comparable product by one of the following:
 - a. AEP-Span.
 - b. CENTRIA Architectural Systems.
 - c. Metal Sales Manufacturing Corporation
 - d. Industrial Building Panels.
 - 2. Color: As indicated on the Drawings.
 - 3. Material:
 - a. Aluminum-zinc alloy-coated steel sheet, 24 gauge nominal thickness.
 - b. Exterior finish: 2-coat fluoropolymer.
 - 4. Panel Coverage: 34 2/3-inches.
 - 5. Panel Height: 0.875 inch.

2.4 WEATHER BARRIER

- A. Building Wrap: ASTM E 1677, Type I air barrier; with flame-spread and smoke-developed indexes of less than 25 and 450, respectively, when tested according to ASTM E 84; UV stabilized; and acceptable to authorities having jurisdiction.
1. Basis of Design Product: Subject to compliance with requirements, provide DuPont Tyvek Commerical Wrap or a comparable product by one of the following:
 - a. Dow Chemical Company
 - b. Ludlow Coated Products,.
 - c. Pactiv, Inc.;
 - d. Raven Industries Inc,.
 - e. Reemay, Inc.
 2. Water-Vapor Permeance: Not less than 50 g through 1 sq. m of surface in 24 hours per ASTM E 96/E 96M, Desiccant Method (Procedure A).
- B. Building-Wrap Tape: Pressure-sensitive plastic tape recommended by building-wrap manufacturer for sealing joints and penetrations in building wrap.

2.5 PREFINISHED SHEET METAL FLASHING AND TRIM

- A. Sheet Metal:
1. General: Protect mechanical and other finishes on exposed surfaces from damage by applying a strippable, temporary protective film before shipping.
 2. Metallic-Coated Steel Sheet: Restricted flatness steel sheet metallic coated by the hot-dip process and prepainted by the coil-coating process to comply with ASTM A 755/A 755M
 - a. Aluminum-Zinc Alloy-Coated Steel Sheet: ASTM A 792/A 792M, Class AZ55 coating designation.
 - b. Surface: Smooth, flat finish.
 - c. Thickness: 0.028 inch thick.
 - d. Exterior finish: 2-coat fluoropolymer.
 - e. Color: To match metal wall panels.

2.6 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. Closure strips: Closed-cell, expanded, cellular, rubber or cross-linked, polyolefin-foam or closed-cell laminated polyethylene; minimum 1-inch-thick, flexible closure strips; cut or pre-molded to match metal wall panel profile. Provide closure strips where indicated or necessary to ensure weather-tight construction and minimize insect access.
- B. Flashing and Trim: Provide flashing and trim formed from same material as metal panels as required to seal against weather and to provide finished appearance. Locations include, but are not limited to, bases, drips, sills, jambs, corners, endwalls, framed openings, rakes, fasciae, parapet caps, reveals, and fillers. Finish flashing and trim with same finish system as adjacent metal panels.

- C. Panel Fasteners: Self-tapping screws designed to withstand design loads. Provide exposed fasteners with heads matching color of metal panels by means of plastic caps or factory-applied coating. Provide EPDM or PVC sealing washers for exposed fasteners.
- D. Panel Sealants:
 - 1. Sealant Tape: Pressure-sensitive, 100 percent solids, gray polyisobutylene compound sealant tape with release-paper backing. Provide permanently elastic, non-sag, nontoxic, non-staining tape 1/2 inch wide and 1/8 inch thick.
 - 2. Joint Sealant: ASTM C 920; elastomeric polyurethane or silicone sealant; of type, grade, class, and use classifications required to seal joints in metal panels and remain weathertight; and as recommended in writing by metal panel manufacturer. Provide sealant types that are compatible with panel materials, are nonstaining, and do not damage panel finish.
 - 3. Butyl-Rubber-Based, Solvent-Release Sealant: ASTM C1311.

2.7 FABRICATION

- A. General: 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. 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.
- C. Sheet Metal Flashing and Trim: Fabricate flashing and trim to comply with manufacturer's recommendations and recommendations in SMACNA's "Architectural 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 Other Than Aluminum: Fabricate nonmoving seams in accessories with flat-lock seams. Tin edges to be seamed, form seams, and solder.
 - 3. Sealed Joints: Form nonexpansion, but movable, joints in metal to accommodate sealant and to comply with SMACNA standards.
 - 4. Conceal fasteners and expansion provisions where possible. Exposed fasteners are not allowed on faces of accessories exposed to view.
 - 5. 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 "Architectural Sheet Metal Manual" or metal wall panel manufacturer for application but not less than thickness of metal being secured.

2.8 GENERAL FINISH REQUIREMENTS

- A. Protect mechanical and painted finishes on exposed surfaces from damage by applying a strippable, temporary protective covering before shipping.
- B. Appearance of Finished Work: Variations in appearance of abutting or adjacent pieces are acceptable if they are within one-half of the range of approved Samples. Noticeable variations in same piece are not acceptable. Variations in appearance of other components are acceptable if they are within the range of approved Samples and are assembled or installed to minimize contrast.

PART 3 - EXECUTION

3.1 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 wall framing to verify that girts, angles, channels, studs, and other structural panel support members and anchorage have been installed within alignment tolerances required by metal wall panel manufacturer.
 - 2. Examine wall sheathing to verify that sheathing joints are supported by framing or blocking and that installation is within flatness tolerances required by metal wall 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 C 754 and metal panel manufacturer's written recommendations.

3.3 WEATHER BARRIER INSTALLATION

- A. Cover exposed exterior surface of sheathing with weather-resistive barrier securely fastened to framing immediately after sheathing is installed.
- B. Cover sheathing with water-resistive barrier as follows:
 - 1. Apply barrier to cover vertical flashing with a minimum 4-inch overlap unless otherwise indicated.
- C. Weather Barrier Application: Comply with manufacturer's written instructions.
 - 1. Seal seams, edges, fasteners, and penetrations with tape.
 - 2. Extend into jambs of openings and seal corners with tape.

3.4 INSTALLATION

- A. General: 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 weather-tight escutcheons for pipe- and conduit-penetrating panels.
- B. Fasteners:
1. Steel Wall Panels: Use stainless-steel fasteners for surfaces exposed to the exterior; use galvanized-steel fasteners for surfaces exposed to the interior.
- C. Metal Protection: Where dissimilar metals contact each other or corrosive substrates, protect against galvanic action as recommended in writing by metal panel manufacturer.
- D. Attachment Assembly, General: Install attachment assembly required to support metal plate wall panels and to provide a complete weather-tight wall system, including wood blocking.
1. Include attachment to supports, panel-to-panel joinery, panel-to-dissimilar-material joinery, and panel-system joint seals.
- E. Joint Sealers: Install gaskets, joint fillers, and sealants where indicated and where required for weather-tight performance of metal wall panel assemblies. Provide types of gaskets, fillers, and sealants indicated or, if not indicated, types recommended by metal wall panel manufacturer.
1. Seal metal wall panel end laps with double beads of tape or sealant, full width of panel. Seal side joints where recommended by metal wall panel manufacturer.
 2. Prepare joints and apply sealant according to requirements specified in Section 07920 "Joint Sealants."
- F. Accessory Installation: Install accessories with positive anchorage to building and weather-tight 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 panel manufacturer; or, if not indicated, provide types recommended in writing by metal panel manufacturer.
- G. Flashing and Trim: Comply with performance requirements, manufacturer's written installation instructions, and SMACNA's "Architectural Sheet Metal Manual." Provide concealed fasteners where possible, and set units true to line and level as indicated. Install work with laps, joints, and seams that are permanently watertight.
1. Install exposed flashing and trim that is without buckling and tool marks and that is true to line and levels indicated, with exposed edges folded back to form hems. Install sheet metal flashing and trim to fit substrates and to result in waterproof performance.
 2. Expansion Provisions: Provide for thermal expansion of exposed flashing and trim. Space movement joints at a maximum of 10 feet (3 m) with no joints allowed within 24 inches (605 mm) of corner or intersection. Where lapped expansion provisions cannot be used or would not be sufficiently waterproof, form expansion joints of intermeshing hooked flanges, not less than 1 inch (25 mm) deep, filled with mastic sealant (concealed within joints).

- H. Lap-Seam Corrugated, Metal Wall Panels: Fasten metal wall panels to supports with fasteners at each lapped joint at location and spacing recommended by metal wall panel manufacturer.
1. Lap ribbed or fluted sheets one full rib corrugation. Apply panels and associated items for neat and weather-tight enclosure. Avoid "panel creep" or application not true to line.
 2. Provide metal-back washers under heads of exposed fasteners bearing on weather side of metal wall panels.
 3. Locate and space exposed fasteners in uniform vertical and horizontal alignment. Use proper tools to obtain controlled uniform compression for positive seal without rupture of washer.
 4. Install screw fasteners with power tools having controlled torque adjusted to compress washer tightly without damage to washer, screw threads, or panels. Install screws in predrilled holes.
 5. Provide sealant tape at lapped joints of metal wall panels and between panels and protruding equipment, vents and accessories.
 6. Apply a continuous ribbon of sealant tape to weather-side surface of fastenings on end laps; on side laps of nesting-type panels; on side laps of corrugated nesting-type, ribbed or fluted panels; and elsewhere as needed to make panels weather-tight.
 7. At panel splices, nest panels with minimum 6-inch end lap, sealed with butyl-rubber sealant and fastened together by interlocking clamping plates.

3.5 ERECTION TOLERANCES

- A. Installation Tolerances: Shim and align metal plate wall panel units within installed tolerance of 1/4 inch in 20 feet (6 mm in 6 m), non-accumulative, on level, plumb, and location lines as indicated, and within 1/8-inch (3-mm) offset of adjoining faces and of alignment of matching profiles.

3.6 FIELD QUALITY CONTROL

- A. Testing Agency: Owner reserves the right to engage a qualified independent testing agency to perform field tests and inspections.
- B. Remove and replace metal wall 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.

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. After metal panel installation, clear weep holes and drainage channels of obstructions, dirt, and sealant.
- C. Replace metal panels that have been damaged or have deteriorated beyond successful repair by finish touchup or similar minor repair procedures.

END OF SECTION

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SECTION 07 42 13.19 - INSULATED METAL WALL PANELS

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. Foamed-insulation-core metal wall panels.
 - 2. Accessories including carrier rails, hat channel, fasteners, flashings, and perimeter trim.
- B. Related Requirements:
 - 1. Division 07 Section "Sealants" for field-applied sealants not otherwise specified in this Section.
 - 2. Division 07 Section "Sheet Metal and Sheet Metal Flashing".
 - 3. Division 07 Section "Solid Phenolic Exterior Wall Panels" for rain-screen wainscot panels at exterior walls.
 - 4. Division 08 Sections "Hollow Metal Doors and Frames", "Sectional Doors," "Translucent Panels" and "Fiberglass Windows" for overhead sectional doors, hollow metal doors and other openings in insulated metal wall panel skin.

1.3 PREINSTALLATION MEETINGS

- A. Preinstallation Conference: Conduct conference at Project site.
 - 1. Meet with Owner, Architect, Owner's insurer if applicable, metal panel Installer, metal panel manufacturer's representative, structural-support Installer, and installers whose work interfaces with or affects metal panels, including installers of doors, windows, and louvers.
 - 2. Review and finalize construction schedule and verify availability of materials, Installer's personnel, equipment, and facilities needed to make progress and avoid delays.
 - 3. Review methods and procedures related to metal panel installation, including manufacturer's written instructions.
 - 4. Examine support conditions for compliance with requirements, including alignment between and attachment to structural members.
 - 5. Review flashings, special siding details, wall penetrations, openings, and condition of other construction that affect metal panels.
 - 6. Review governing regulations and requirements for insurance, certificates, and tests and inspections if applicable.
 - 7. Review temporary protection requirements for metal panel assembly during and after installation.
 - 8. Review procedures for repair of metal panels damaged after installation.
 - 9. Document proceedings, including corrective measures and actions required, and furnish copy of record to each participant.

1.4 ACTION SUBMITTALS

- A. Product Data: For each type of product.

1. Include construction details, material descriptions, dimensions of individual components and profiles, and finishes for 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, gauge of exterior and interior faces, 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 (1:10).
- C. Samples for Verification: For each type of exposed finish, prepared on Samples of size indicated below.
 1. Metal Panels: 12 inches (305 mm) long by 12 inches. Include fasteners, closures, and other metal panel accessories.

1.5 INFORMATIONAL SUBMITTALS

- A. Qualification Data: For Installer.
- B. Product Test Reports: For each product, tests performed by a qualified testing agency.
- C. Field quality-control reports.
- D. Sample Warranties: For special warranties.

1.6 CLOSEOUT SUBMITTALS

- A. Maintenance Data: For metal panels to include in maintenance manuals.

1.7 QUALITY ASSURANCE

- A. Installer Qualifications: An entity that employs installers and supervisors who are trained and approved by manufacturer.

1.8 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.

1.9 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.

1.10 COORDINATION

- A. 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.

1.11 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 Hunter units when tested according to ASTM D 2244.
 - b. Chalking in excess of a No. 8 rating when tested according to ASTM D 4214.
 - 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. Recycled Content of Steel Products: Postconsumer recycled content plus one-half of preconsumer recycled content not less than 25 percent.
- B. Structural Performance: Provide metal panel systems capable of withstanding the effects of the following loads, based on testing according to ASTM E 72:
 - 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. (0.3 L/s per sq. m) when tested according to ASTM E 283 at the following test-pressure difference:
 - 1. Test-Pressure Difference: 1.57 lbf/sq. ft. (75 Pa).

- D. Water Penetration under Static Pressure: No water penetration when tested according to ASTM E 331 at the following test-pressure difference:
 - 1. Test-Pressure Difference: 2.86 lbf/sq. ft. (137 Pa).
- E. 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 (67 deg C), ambient; 180 deg F (100 deg C), material surfaces.
- F. Fire-Test-Response Characteristics: Provide metal wall panels and system components with the following fire-test-response characteristics, as determined by testing identical panels and system components per test method indicated below by UL or another testing and inspecting agency acceptable to authorities having jurisdiction. Identify products with appropriate markings of applicable testing agency.
 - 1. Fire-Resistance Characteristics: Provide materials and construction tested for fire resistance per ASTM E 119.
 - 2. Intermediate-Scale Multistory Fire Test: Tested mockup, representative of completed multistory wall assembly of which wall panel is a part, complies with NFPA 285 for test method and required fire-test-response characteristics of exterior non-load-bearing wall panel assemblies.
 - 3. Radiant Heat Exposure: No ignition when tested according to NFPA 268.
 - 4. Potential Heat: Acceptable level when tested according to NFPA 259.
 - 5. Surface-Burning Characteristics: Provide wall panels with a flame-spread index of 25 or less and a smoke-developed index of 450 or less, per ASTM E 84.

2.2 FOAMED-INSULATION-CORE METAL WALL PANELS

- A. General: Provide factory-formed and -assembled metal wall panels fabricated from two metal facing sheets and insulation core foamed in place during fabrication, and with joints between panels designed to form weathertight seals. Include accessories required for weathertight installation.
 - 1. Insulation Core: Modified isocyanurate or polyurethane foam using a non-CFC blowing agent, with maximum flame-spread and smoke-developed indexes of 25 and 450, respectively.
 - a. Closed-Cell Content: 90 percent when tested according to ASTM D 6226.
 - b. Density: 2.0 to 2.6 lb/cu. ft. (32 to 42 kg/cu. m) when tested according to ASTM D 1622.
 - c. Compressive Strength: Minimum 20 psi (140 kPa) when tested according to ASTM D 1621.
 - d. Shear Strength: 26 psi (179 kPa) when tested according to ASTM C 273/C 273M.
- B. Concealed-Fastener, Foamed-Insulation-Core Metal Wall Panels (Horizontal): Formed with tongue-and-groove panel edges; designed for sequential installation by interlocking panel edges and mechanically attaching panels to supports using concealed clips or fasteners.
 - 1. Basis-of-Design Product: Subject to compliance with requirements, provide Kingspan Insulated Panels; 200 Inverted Rib Wall Panel or a comparable product by one of the following:
 - a. CENTRIA Architectural Systems.
 - b. Insulated Panel Systems (IPS).
 - c. Metl-Span.
 - 2. Metallic-Coated Steel Sheet: Facings of zinc-coated (galvanized) steel sheet complying with ASTM A 653/A 653M, G90 (Z275) coating designation, or aluminum-zinc alloy-coated steel sheet complying with ASTM A 792/A 792M, Class AZ50 (Class AZM150) coating designation; structural quality. Prepainted by the coil-coating process to comply with ASTM A 755/A 755M.
 - a. Exterior Finish: Two-coat fluoropolymer.
 - 1) Color: As indicated on the Drawings in the finish schedule.
 - b. Interior Finish: Siliconized polyester.
 - 1) Color: Manufacturer's standard white.

3. Panel Coverage: 42 inches nominal.
 4. Panel Thickness: 4.0 inches (102 mm).
 5. Thermal-Resistance Value (R-Value): R 33 according to ASTM C 1363.
 6. Panel Exterior Face Material Thickness: 22 Gage.
 7. Panel Interior Face Material Thickness: 26 Gage.
- C. Concealed-Fastener, Foamed-Insulation-Core Metal Wall Panels (Vertical): Formed with tongue-and-groove panel edges; designed for sequential installation by interlocking panel edges and mechanically attaching panels to supports using concealed clips or fasteners.
1. Basis-of-Design Product: Subject to compliance with requirements, provide Kingspan Insulated Panels; Micro-Rib Series Wall Panel or a comparable product by one of the following:
 - a. CENTRIA Architectural Systems.
 - b. Insulated Panel Systems (IPS).
 - c. Metl-Span.
 2. Metallic-Coated Steel Sheet: Facings of zinc-coated (galvanized) steel sheet complying with ASTM A 653/A 653M, G90 (Z275) coating designation, or aluminum-zinc alloy-coated steel sheet complying with ASTM A 792/A 792M, Class AZ50 (Class AZM150) coating designation; structural quality. Prepainted by the coil-coating process to comply with ASTM A 755/A 755M.
 - a. Exterior Finish: Two-coat fluoropolymer.
 - 1) Color: As indicated on the Drawings in the finish schedule.
 - b. Interior Finish: Siliconized polyester.
 - 1) Color: Manufacturer's standard white.
 3. Panel Coverage: 24 inches nominal.
 4. Panel Thickness: 4.0 inches (102 mm).
 5. Thermal-Resistance Value (R-Value): R 33 according to ASTM C 1363.
 6. Panel Exterior Face Material Thickness: 22 Gage.
 7. Panel Interior Face Material Thickness: 26 Gage.

2.3 MISCELLANEOUS MATERIALS

- A. Miscellaneous Metal Subframing and Furring: ASTM C 645, cold-formed, metallic-coated steel sheet, ASTM A 653/A 653M, G90 (Z275 hot-dip galvanized) coating designation or ASTM A 792/A 792M, Class AZ50 (Class AZM150) aluminum-zinc-alloy coating designation unless otherwise indicated. Provide manufacturer's standard sections as required for support and alignment of metal panel system.
- B. 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. Backing Plates: Provide metal backing plates at panel end splices, fabricated from material recommended by manufacturer.
 2. Closure Strips: Closed-cell, expanded, cellular, rubber or crosslinked, polyolefin-foam or closed-cell laminated polyethylene; minimum 1-inch- (25-mm-) thick, flexible closure strips; cut or premolded to match metal panel profile. Provide closure strips where indicated or necessary to ensure weathertight construction.
 3. Carrier Rails: Manufacturer's standard, ASTM A653 cold-formed, G90 hot-dip galvanized carrier rails. Basis-of-Design product is Karrier Rail metal support rail as manufactured by Kingspan.
- C. Flashing and Trim: Provide flashing and trim formed from same material as metal panels as required to seal against weather and to provide finished appearance. Locations include, but are not limited to, bases, drips, sills, jambs, corners, endwalls, framed openings, rakes, fasciae, parapet caps, soffits, reveals, and fillers. Finish flashing and trim with same finish system as adjacent metal panels.

- D. Panel Fasteners: Self-tapping screws designed to withstand design loads. Provide exposed fasteners with heads matching color of metal panels by means of plastic caps or factory-applied coating. Provide EPDM or PVC sealing washers for exposed fasteners.
- E. Panel Sealants: Provide sealant type recommended by manufacturer that are compatible with panel materials, are nonstaining, and do not damage panel finish.
 - 1. Sealant Tape: Pressure-sensitive, 100 percent solids, gray polyisobutylene compound sealant tape with release-paper backing. Provide permanently elastic, nonsag, nontoxic, nonstaining tape 1/2 inch (13 mm) wide and 1/8 inch (3 mm) thick.
 - 2. Joint Sealant: ASTM C 920; elastomeric polyurethane or silicone sealant; of type, grade, class, and use classifications required to seal joints in metal panels and remain weathertight; and as recommended in writing by metal panel manufacturer.
 - 3. Butyl-Rubber-Based, Solvent-Release Sealant: ASTM C 1311.

2.4 FABRICATION

- A. General: 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. Provide panel profile, including major ribs and intermediate stiffening ribs, if any, for full length of panel.
- C. 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.
- D. Sheet Metal Flashing and Trim: Fabricate flashing and trim to comply with manufacturer's recommendations and recommendations in SMACNA's "Architectural 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 Other Than Aluminum: Fabricate nonmoving seams in accessories with flat-lock seams. Tin edges to be seamed, form seams, and solder.
 - 3. Sealed Joints: Form nonexpansion, but movable, joints in metal to accommodate sealant and to comply with SMACNA standards.
 - 4. Conceal fasteners and expansion provisions where possible. Exposed fasteners are not allowed on faces of accessories exposed to view.
 - 5. 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 "Architectural Sheet Metal Manual" or metal wall panel manufacturer for application but not less than thickness of metal being secured.

2.5 FINISHES

- A. Protect mechanical and painted finishes on exposed surfaces from damage by applying a strippable, temporary protective covering before shipping.
- B. Appearance of Finished Work: Variations in appearance of abutting or adjacent pieces are acceptable if they are within one-half of the range of approved Samples. Noticeable variations in same piece are not acceptable. Variations in appearance of other components are acceptable if they are within the range of approved Samples and are assembled or installed to minimize contrast.
- C. Steel Panels and Accessories:

1. Two-Coat Fluoropolymer: AAMA 621. Fluoropolymer finish containing not less than 70 percent PVDF resin by weight in color coat. 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, for compliance with requirements for installation tolerances, metal panel supports, and other conditions affecting performance of the Work.
 1. Examine wall framing to verify that girts, angles, channels, studs, and other structural panel support members and anchorage have been installed within alignment tolerances required by metal wall panel manufacturer.
 2. Examine wall sheathing to verify that sheathing joints are supported by framing or blocking and that installation is within flatness tolerances required by metal wall 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 C 754 and metal panel manufacturer's written recommendations.

3.3 METAL PANEL INSTALLATION

- A. General: 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.

- C. Metal Protection: Where dissimilar metals contact each other or corrosive substrates, protect against galvanic action as recommended in writing by metal panel manufacturer.
- D. Joint Sealers: Install gaskets, joint fillers, and sealants where indicated and where required for weathertight performance of metal wall panel assemblies. Provide types of gaskets, fillers, and sealants indicated by metal panel manufacturer; or, if not indicated, provide types recommended by metal wall panel manufacturer.
 - 1. Seal metal wall panel end laps with double beads of tape or sealant, full width of panel. Seal side joints where recommended by metal wall panel manufacturer.
 - 2. Prepare joints and apply sealants to comply with requirements in Section 079200 "Joint Sealants."

3.4 INSULATED METAL WALL PANEL INSTALLATION

- A. General: Apply continuous ribbon of sealant to panel joint on concealed side of insulated metal wall panels as vapor seal; apply sealant to panel joint on exposed side of panels for weather seal.
 - 1. Fasten foamed-insulation-core metal wall panels to supports with fasteners at each lapped joint at location and spacing and with fasteners recommended by manufacturer.
 - 2. Apply panels and associated items true to line for neat and weathertight enclosure. Avoid "panel creep" or application not true to line.
 - 3. Provide sealant tape at lapped joints of insulated metal wall panels and between panels and protruding equipment, vents, and accessories.
 - 4. Apply a continuous ribbon of sealant tape to panel side laps and elsewhere as needed to make panels weathertight.
- B. Foamed-Insulation-Core Metal Wall Panels: Fasten metal wall panels to supports with concealed clips at each joint at location and spacing and with fasteners recommended by manufacturer. Fully engage tongue and groove of adjacent panels.
 - 1. Install clips to supports with self-tapping fasteners.
- C. 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 panel manufacturer; or, if not indicated, provide types recommended by metal panel manufacturer.
 - 2. In locations indicated on the Drawings, install manufacturer's standard carrier rails for support of exterior phenolic panels acting as a rainscreen system. Installation of rainscreen system is specified in Division 07 Section "Solid Phenolic Exterior Wall Panels".
- D. Flashing and Trim: Comply with performance requirements, manufacturer's written installation instructions, and SMACNA's "Architectural Sheet Metal Manual." Provide concealed fasteners where possible, and set units true to line and level. Install work with laps, joints, and seams that are permanently watertight.
 - 1. Install exposed flashing and trim that is without buckling and tool marks, and that is true to line and levels indicated, with exposed edges folded back to form hems. Install sheet metal flashing and trim to fit substrates and to achieve waterproof performance.
 - 2. Expansion Provisions: Provide for thermal expansion of exposed flashing and trim. Space movement joints at a maximum of 10 feet (3 m) with no joints allowed within 24 inches (610 mm) of corner or intersection. Where lapped expansion provisions cannot be used or would not be sufficiently waterproof, form expansion joints of intermeshing hooked flanges, not less than 1 inch (25 mm) deep, filled with mastic sealant (concealed within joints).

3.5 FIELD QUALITY CONTROL

- A. Testing Agency: Engage a qualified testing agency to perform tests and inspections.
- B. Water-Spray Test: After installation, test area of assembly as directed by Architect for water penetration according to AAMA 501.2.
- C. Manufacturer's Field Service: Engage a factory-authorized service representative to test and inspect completed metal wall panel installation, including accessories.
- D. Metal wall panels will be considered defective if they do not pass test and inspections.
- E. Additional tests and inspections, at Contractor's expense, are performed to determine compliance of replaced or additional work with specified requirements.
- F. Prepare test and inspection reports.

3.6 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. After metal panel installation, clear weep holes and drainage channels of obstructions, dirt, and sealant.
- C. Replace metal panels that have been damaged or have deteriorated beyond successful repair by finish touchup or similar minor repair procedures.

END OF SECTION

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SECTION 07 62 00 - SHEET METAL FLASHING AND TRIM

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. Manufactured through-wall flashing with snaplock receiver with counterflashing.
 - 2. Manufactured reglets with counterflashing.
 - 3. Formed roof-drainage sheet metal fabrications.
 - 4. Formed low-slope roof sheet metal fabrications.
 - 5. Formed wall sheet metal fabrications.
 - 6. Formed equipment support flashing.
- B. Related Requirements:
 - 1. Division 06 Section "Rough Carpentry" for wood nailers, curbs, and blocking.
 - 2. Division 07 Section "Standing Seam Metal Roof Panels" for materials and installation of sheet metal flashing and trim integral with roofing.
 - 3. Division 07 Section "Insulated Metal Wall Panels" for sheet metal flashing and trim integral with metal wall panels.
 - 4. Division 04 Section "Masonry Veneer" for wainscoting at exterior walls.
 - 5. Division 07 Section "Expansion Control" for manufactured expansion-joint covers.

1.3 COORDINATION

- 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 roofing and wall materials, joints, and seams to provide leakproof, secure, and noncorrosive installation.

1.4 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 special roof details, roof drainage, roof-penetration flashing, equipment curbs, and condition of other construction that affect sheet metal flashing and trim.
 - 3. Review requirements for insurance and certificates if applicable.
 - 4. Review sheet metal flashing observation and repair procedures after flashing installation.

1.5 ACTION SUBMITTALS

- A. Product Data: For each type of product.
 - 1. Include construction details, material descriptions, dimensions of individual components and profiles, and finishes for each manufactured product and accessory.
- 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, and counterflashings as applicable.
 - 10. Include details of special conditions.
 - 11. Include details of connections to adjoining work.
 - 12. Detail formed flashing and trim at scale of not less than 1-1/2 inches per 12 inches (1:10).

1.6 INFORMATIONAL SUBMITTALS

- A. Qualification Data: For fabricator.
- B. Product Test Reports: For each product, for tests performed by a qualified testing agency.
- C. Sample Warranty: For special warranty.

1.7 CLOSEOUT SUBMITTALS

- A. Maintenance Data: For sheet metal flashing and trim, and its accessories, to include in maintenance manuals.

1.8 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.

1.9 DELIVERY, STORAGE, AND HANDLING

- A. Do not store sheet metal flashing and trim materials in contact with other materials that might cause staining, denting, or other surface damage. Store sheet metal flashing and trim materials away from uncured concrete and masonry.

- B. Protect strippable protective covering on sheet metal flashing and trim from exposure to sunlight and high humidity, except to extent necessary for period of sheet metal flashing and trim installation.

1.10 WARRANTY

- A. Special Warranty on Finishes: Manufacturer agrees to repair finish or replace sheet metal flashing and trim that shows 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 Hunter units when tested according to ASTM D 2244.
 - b. Chalking in excess of a No. 8 rating when tested according to ASTM D 4214.
 - 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: Sheet metal flashing and trim assemblies 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 NRCA's "The NRCA Roofing Manual" and SMACNA's "Architectural Sheet Metal Manual" requirements for dimensions and profiles shown unless more stringent requirements are indicated.
- C. FM Approvals Listing: Manufacture and install copings that are listed in FM Approvals' "RoofNav" and approved for windstorm classification, Class 1-105. Identify materials with name of fabricator and design approved by FM Approvals.
- D. 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 (67 deg C), ambient; 180 deg F (100 deg C), material surfaces.

2.2 SHEET METALS

- A. General: Protect mechanical and other finishes on exposed surfaces from damage by applying strippable, temporary protective film before shipping.
 - 1. Exposed Coil-Coated Finish:
 - a. Three-Coat Fluoropolymer: AAMA 2605. Fluoropolymer finish containing not less than 70 percent 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.
 - 2. Color: As indicated on the Drawings in the finish schedule.
 - 3. Surface: Smooth, flat.
 - 4. 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 (0.013 mm).

- B. Metallic-Coated Steel Sheet: Provide aluminum-zinc alloy-coated steel sheet according to ASTM A 792/A 792M, Class AZ50 (Class AZM150) coating designation, Grade 40 (Grade 275); prepainted by coil-coating process to comply with ASTM A 755/A 755M.

2.3 UNDERLAYMENT MATERIALS

- A. Self-Adhering, High-Temperature Sheet: Minimum 30 mils (0.76 mm) 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 according to written recommendations of 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. Grace Construction Products; W.R. Grace & Co. -- Conn.
 - b. Henry Company.
 - c. Owens Corning.
 - 2. Thermal Stability: ASTM D 1970; stable after testing at 240 deg F (116 deg C) or higher.
 - 3. Low-Temperature Flexibility: ASTM D 1970; passes after testing at minus 20 deg F (29 deg C) or lower.

2.4 MISCELLANEOUS MATERIALS

- A. General: Provide materials and types of fasteners, solder, 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: Wood screws, annular threaded nails, self-tapping screws, self-locking rivets and bolts, and other suitable 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.
 - a. Exposed Fasteners: Heads matching color of sheet metal using plastic caps or factory-applied coating. Provide metal-backed EPDM or PVC sealing washers under heads of exposed fasteners bearing on weather side of metal.
 - b. Blind Fasteners: High-strength aluminum or stainless-steel rivets suitable for metal being fastened.
 - c. Spikes and Ferrules: Same material as gutter; with spike with ferrule matching internal gutter width.
 - 2. Fasteners for Aluminum-Zinc Alloy-Coated Steel Sheet: Series 300 stainless steel or hot-dip galvanized steel according to ASTM A 153/A 153M or ASTM F 2329.
- C. Solder:
 - 1. For Zinc-Coated (Galvanized) Steel: ASTM B 32, Grade Sn50, 50 percent tin and 50 percent lead or Grade Sn60, 60 percent tin and 40 percent lead with maximum lead content of 0.2 percent.
- D. 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 (13 mm) wide and 1/8 inch (3 mm) thick.
- E. Elastomeric Sealant: ASTM C 920, elastomeric polysulfide polymer sealant; of type, grade, class, and use classifications required to seal joints in sheet metal flashing and trim and remain watertight.
- F. Butyl Sealant: ASTM C 1311, single-component, solvent-release butyl rubber sealant; polyisobutylene plasticized; heavy bodied for hooked-type expansion joints with limited movement.

- G. Epoxy Seam Sealer: Two-part, noncorrosive, aluminum seam-cementing compound, recommended by aluminum manufacturer for exterior nonmoving joints, including riveted joints.
- H. Bituminous Coating: Cold-applied asphalt emulsion according to ASTM D 1187.
- I. Asphalt Roofing Cement: ASTM D 4586, asbestos free, of consistency required for application.

2.5 MANUFACTURED SHEET METAL FLASHING AND TRIM

- A. Reglets: Units of type, material, and profile required, formed to provide secure interlocking of separate reglet and counterflashing pieces, and compatible with flashing indicated with interlocking counterflashing on exterior face, of same metal as reglet.
 - 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. Cheney Flashing Company.
 - b. Fry Reglet Corporation.
 - c. Heckmann Building Products, Inc.
 - d. Hickman, W. P. Company.
 - e. Hohmann & Barnard, Inc.
 - f. Keystone Flashing Company, Inc.
 - g. National Sheet Metal Systems, Inc.
 - h. Sandell Manufacturing Co., Inc.
 - 2. Material: Galvanized steel, 0.022 inch (0.56 mm) thick.
 - 3. Surface-Mounted Type: Provide with slotted holes for fastening to substrate, with neoprene or other suitable weatherproofing washers, and with channel for sealant at top edge.
 - 4. Concrete Type: Provide temporary closure tape to keep reglet free of concrete materials, special fasteners for attaching reglet to concrete forms, and guides to ensure alignment of reglet section ends.
 - 5. Accessories:
 - a. Flexible-Flashing Retainer: Provide resilient plastic or rubber accessory to secure flexible flashing in reglet where clearance does not permit use of standard metal counterflashing or where Drawings show reglet without metal counterflashing.
 - b. Counterflashing Wind-Restraint Clips: Provide clips to be installed before counterflashing to prevent wind uplift of counterflashing's lower edge.
 - 6. Finish: With manufacturer's standard color coating.

2.6 FABRICATION, GENERAL

- A. General: Custom fabricate sheet metal flashing and trim to comply with details shown and recommendations in cited sheet metal standard that apply to design, dimensions, geometry, metal thickness, and other characteristics of item required. Fabricate sheet metal flashing and trim in shop to greatest extent possible.
 - 1. 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.
 - 2. Obtain field measurements for accurate fit before shop fabrication.
 - 3. 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.
 - 4. Conceal fasteners and expansion provisions where possible. Do not use exposed fasteners on faces exposed to view.

- B. Fabrication Tolerances: Fabricate sheet metal flashing and trim that is capable of installation to a tolerance of 1/4 inch in 20 feet (6 mm in 6 m) on slope and location lines indicated on Drawings and within 1/8-inch (3-mm) offset of adjoining faces and of alignment of matching profiles.
- 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 (25 mm) 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 to provide for proper installation of elastomeric sealant according to cited sheet metal standard.
- E. Fabricate cleats and attachment devices from same material as accessory being anchored or from compatible, noncorrosive metal.
- F. Seams: 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.
- G. Do not use graphite pencils to mark metal surfaces.

2.7 WALL SHEET METAL FABRICATIONS

- A. Opening Flashings in Frame Construction: Fabricate head, sill, jamb, and similar flashings to extend 4 inches (100 mm) beyond wall openings. Form head and sill flashing with 2-inch- (50-mm-) high, end dams. Fabricate from the following materials:
 - 1. Aluminum-Zinc Alloy-Coated Steel: 0.022 inch (0.56 mm) thick.
- B. Wall Expansion-Joint Cover: Fabricate from the following materials:
 - 1. Aluminum-Zinc Alloy-Coated Steel: 0.028 inch (0.71 mm) thick.

2.8 MISCELLANEOUS SHEET METAL FABRICATIONS

- A. Equipment Support Flashing: Fabricate from the following materials:
 - 1. Aluminum-Zinc Alloy-Coated Steel: 0.028 inch (0.71 mm) 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.
 - 3. Verify that air- or water-resistant barriers have been installed over sheathing or backing substrate to prevent air infiltration or water penetration.
- B. Proceed with installation only after unsatisfactory conditions have been corrected.

3.2 UNDERLAYMENT INSTALLATION

- A. Self-Adhering Sheet Underlayment: Install self-adhering sheet underlayment, wrinkle free. Prime substrate if recommended by underlayment manufacturer. Comply with temperature restrictions of underlayment manufacturer for installation; use primer for installing underlayment at low temperatures. Apply in shingle fashion to shed water, with end laps of not less than 6 inches (150 mm) staggered 24 inches (600 mm) between courses. Overlap side edges not less than 3-1/2 inches (90 mm). Roll laps and edges with roller. Cover underlayment within 14 days.

3.3 INSTALLATION, GENERAL

- A. General: Anchor sheet metal flashing and trim and other components of the Work securely in place, with provisions for thermal and structural movement. Use fasteners, solder, protective coatings, separators, sealants, and other miscellaneous items as required to complete sheet metal flashing and trim system.
1. Install sheet metal flashing and trim true to line, levels, and slopes. Provide uniform, neat seams with minimum exposure of solder, welds, and sealant.
 2. Install sheet metal flashing and trim to fit substrates and to result in watertight performance. Verify shapes and dimensions of surfaces to be covered before fabricating sheet metal.
 3. Space cleats not more than 12 inches (300 mm) apart. Attach each cleat with at least two fasteners. Bend tabs over fasteners.
 4. Install exposed sheet metal flashing and trim with limited oil canning, and free of buckling and tool marks.
 5. Torch cutting of sheet metal flashing and trim is not permitted.
 6. 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 sheet metal flashing and trim with bituminous coating where flashing and trim contact wood, ferrous metal, or cementitious construction.
 2. Underlayment: Where installing sheet metal flashing and trim directly on cementitious or wood substrates, install underlayment and cover with slip sheet.
- C. Expansion Provisions: Provide for thermal expansion of exposed flashing and trim. Space movement joints at maximum of 10 feet (3 m) with no joints within 24 inches (600 mm) of corner or intersection.
1. Form expansion joints of intermeshing hooked flanges, not less than 1 inch (25 mm) deep, filled with sealant concealed within joints.
 2. Use lapped expansion joints only where indicated on Drawings.
- D. Fasteners: Use fastener sizes that penetrate wood blocking or sheathing not less than 1-1/4 inches (32 mm) for nails and not less than 3/4 inch (19 mm) for wood screws.
- 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. Embed hooked flanges of joint members not less than 1 inch (25 mm) into sealant. Form joints to completely conceal sealant. When ambient temperature at time of installation is between 40 and 70 deg F (4 and 21 deg C), set joint members for 50 percent movement each way. Adjust setting proportionately for installation at higher ambient temperatures. Do not install sealant-type joints at temperatures below 40 deg F (4 deg C).
 2. Prepare joints and apply sealants to comply with requirements in Section 079200 "Joint Sealants."

- G. Soldered Joints: Clean surfaces to be soldered, removing oils and foreign matter. Pre-tin edges of sheets with solder to width of 1-1/2 inches (38 mm); however, reduce pre-tinning where pre-tinned surface would show in completed Work.
 - 1. Do not solder metallic-coated steel sheet.
 - 2. Do not use torches for soldering.
 - 3. Heat surfaces to receive solder, and flow solder into joint. Fill joint completely. Completely remove flux and spatter from exposed surfaces.

3.4 ROOF-DRAINAGE SYSTEM INSTALLATION

- A. General: Install sheet metal roof-drainage items to produce complete roof-drainage system according to cited sheet metal standard unless otherwise indicated. Coordinate installation of roof perimeter flashing with installation of roof-drainage system.
- B. Parapet Scuppers: Continuously support scupper, set to correct elevation, and seal flanges to interior wall face, over cants or tapered edge strips, and under roofing membrane.
 - 1. Anchor scupper closure trim flange to exterior wall and solder or seal with elastomeric sealant to scupper.
- C. Expansion-Joint Covers: Install expansion-joint covers at locations and of configuration indicated. Lap joints minimum of 4 inches (100 mm) in direction of water flow.

3.5 ROOF FLASHING INSTALLATION

- A. General: Install sheet metal flashing and trim to comply with performance requirements, sheet metal manufacturer's written installation instructions, and cited sheet metal standard. Provide concealed fasteners where possible, and set units true to line, levels, and slopes. Install work with laps, joints, and seams that are permanently watertight and weather resistant.
- B. Roof Edge Flashing: Anchor to resist uplift and outward forces according to recommendations in FM Global Property Loss Prevention Data Sheet 1-49 for FM Approvals' listing for required windstorm classification.
- C. Copings: Anchor to resist uplift and outward forces according to recommendations in cited sheet metal standard unless otherwise indicated.
 - 1. Interlock exterior bottom edge of coping with continuous cleat anchored to substrate at 24-inch (600-mm) centers.
 - 2. Anchor interior leg of coping with washers and screw fasteners through slotted holes at 24-inch (600-mm) centers.
- D. Pipe or Post Counterflashing: Install counterflashing umbrella with close-fitting collar with top edge flared for elastomeric sealant, extending minimum of 4 inches (100 mm) over base flashing. Install stainless-steel draw band and tighten.
- E. Counterflashing: Coordinate installation of counterflashing with installation of base flashing. Insert counterflashing in reglets or receivers and fit tightly to base flashing. Extend counterflashing 4 inches (100 mm) over base flashing. Lap counterflashing joints minimum of 4 inches (100 mm). Secure in waterproof manner by means of snap-in installation and sealant or lead wedges and sealant unless otherwise indicated.
- F. Roof-Penetration Flashing: Coordinate installation of roof-penetration flashing with installation of roofing and other items penetrating roof. Seal with elastomeric sealant and clamp flashing to pipes that penetrate roof.

3.6 WALL FLASHING INSTALLATION

- A. General: Install sheet metal wall flashing to intercept and exclude penetrating moisture according to cited sheet metal standard unless otherwise indicated. Coordinate installation of wall flashing with installation of wall-opening components such as windows, doors, and louvers.
- B. Reglets: Installation of reglets is specified in Division 03 "Cast-in-Place Concrete."
- C. Opening Flashings in Frame Construction: Install continuous head, sill, jamb, and similar flashings to extend 4 inches (100 mm) beyond wall openings.

3.7 MISCELLANEOUS FLASHING INSTALLATION

- A. Equipment Support Flashing: Coordinate installation of equipment support flashing with installation of roofing and equipment. Weld or seal flashing with elastomeric sealant to equipment support member.

3.8 ERECTION TOLERANCES

- A. Installation Tolerances: Shim and align sheet metal flashing and trim within installed tolerance of 1/4 inch in 20 feet (6 mm in 6 m) on slope and location lines indicated on Drawings and within 1/8-inch (3-mm) offset of adjoining faces and of alignment of matching profiles.
- B. Installation Tolerances: Shim and align sheet metal flashing and trim within installed tolerances specified in MCA's "Guide Specification for Residential Metal Roofing."

3.9 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.
- C. Clean off excess sealants.
- D. Remove temporary protective coverings and strippable films as sheet metal flashing and trim are installed unless otherwise indicated in manufacturer's written installation instructions. On completion of sheet metal flashing and trim installation, remove unused materials and clean finished surfaces as recommended by sheet metal flashing and trim manufacturer. Maintain sheet metal flashing and trim in clean condition during construction.
- E. 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.

END OF SECTION

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SECTION 07 84 13 - PENETRATION FIRESTOPPING

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. Penetrations in fire-resistance-rated walls.
 - 2. Penetrations in horizontal assemblies.
 - 3. Penetrations in smoke barriers.
- B. Related Sections:
 - 1. Division 20 through 28 Sections for mechanical and electrical equipment and accessories penetrating fire rated vertical or horizontal assemblies.

1.3 ACTION SUBMITTALS

- A. Product Data: For each type of product indicated.
- B. Product Schedule: For each penetration firestopping system. Include location and design designation of qualified testing and inspecting agency.
 - 1. Where Project conditions require modification to a qualified testing and inspecting agency's illustration for a particular penetration firestopping condition, submit illustration, with modifications marked, approved by penetration firestopping manufacturer's fire-protection engineer as an engineering judgment or equivalent fire-resistance-rated assembly.

1.4 INFORMATIONAL SUBMITTALS

- A. Qualification Data: For qualified Installer.
- B. Installer Certificates: From Installer indicating penetration firestopping has been installed in compliance with requirements and manufacturer's written recommendations.
- C. Product Test Reports: Based on evaluation of comprehensive tests performed by a qualified testing agency, for penetration firestopping.

1.5 QUALITY ASSURANCE

- A. Installer Qualifications: A firm experienced in installing penetration firestopping similar in material, design, and extent to that indicated for this Project, whose work has resulted in construction with a record of successful performance. Qualifications include having the necessary experience, staff, and training to install manufacturer's products per specified requirements. Manufacturer's willingness to sell its

penetration firestopping products to Contractor or to Installer engaged by Contractor does not in itself confer qualification on buyer.

- B. Fire-Test-Response Characteristics: Penetration firestopping shall comply with the following requirements:
 - 1. Penetration firestopping tests are performed by a qualified testing agency acceptable to authorities having jurisdiction.
 - 2. Penetration firestopping is identical to those tested per testing standard referenced in "Penetration Firestopping" Article. Provide rated systems complying with the following requirements:
 - a. Penetration firestopping products bear classification marking of qualified testing and inspecting agency.
 - b. Classification markings on penetration firestopping correspond to designations listed by the following:
 - 1) UL in its "Fire Resistance Directory."
- C. Preinstallation Conference: Conduct conference at Project site.

1.6 PROJECT CONDITIONS

- A. Environmental Limitations: Do not install penetration firestopping when ambient or substrate temperatures are outside limits permitted by penetration firestopping manufacturers or when substrates are wet because of rain, frost, condensation, or other causes.
- B. Install and cure penetration firestopping per manufacturer's written instructions using natural means of ventilations or, where this is inadequate, forced-air circulation.

1.7 COORDINATION

- A. Coordinate construction of openings and penetrating items to ensure that penetration firestopping is installed according to specified requirements.
- B. Coordinate sizing of sleeves, openings, core-drilled holes, or cut openings to accommodate penetration firestopping.

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. 3M Fire Protection Products.
 - 2. Hilti, Inc.
 - 3. NUCO Inc.
 - 4. United States Gypsum Company.

2.2 PENETRATION FIRESTOPPING

- A. Provide penetration firestopping that is produced and installed to resist spread of fire according to requirements indicated, resist passage of smoke and other gases, and maintain original fire-resistance

rating of construction penetrated. Penetration firestopping systems shall be compatible with one another, with the substrates forming openings, and with penetrating items if any.

- B. Penetrations in Fire-Resistance-Rated Walls: Provide penetration firestopping with ratings determined per ASTM E 814 or UL 1479, based on testing at a positive pressure differential of 0.01-inch wg (2.49 Pa).
 - 1. Fire-resistance-rated walls include fire-barrier walls smoke-barrier walls and fire partitions.
 - 2. F-Rating: Not less than the fire-resistance rating of constructions penetrated.
- C. Penetrations in Horizontal Assemblies: Provide penetration firestopping with ratings determined per ASTM E 814 or UL 1479, based on testing at a positive pressure differential of 0.01-inch wg (2.49 Pa).
 - 1. Horizontal assemblies include floor/ceiling assemblies.
 - 2. F-Rating: At least 1 hour, but not less than the fire-resistance rating of constructions penetrated.
 - 3. T-Rating: At least 1 hour, but not less than the fire-resistance rating of constructions penetrated except for floor penetrations within the cavity of a wall.
- D. Penetrations in Smoke Barriers: Provide penetration firestopping with ratings determined per UL 1479.
 - 1. L-Rating: Not exceeding 5.0 cfm/sq. ft. (0.025 cu. m/s per sq. m) of penetration opening at 0.30-inch wg (74.7 Pa) at both ambient and elevated temperatures.
- E. Exposed Penetration Firestopping: Provide products with flame-spread and smoke-developed indexes of less than 25 and 450, respectively, as determined per ASTM E 84.
- F. Accessories: Provide components for each penetration firestopping system that are needed to install fill materials and to maintain ratings required. Use only those components specified by penetration firestopping manufacturer and approved by qualified testing and inspecting agency for firestopping indicated.
 - 1. Permanent forming/damming/backing materials, including the following:
 - a. Slag-wool-fiber or rock-wool-fiber insulation.
 - b. Sealants used in combination with other forming/damming/backing materials to prevent leakage of fill materials in liquid state.
 - c. Fire-rated form board.
 - d. Fillers for sealants.
 - 2. Temporary forming materials.
 - 3. Substrate primers.
 - 4. Collars.
 - 5. Steel sleeves.

2.3 FILL MATERIALS

- A. Cast-in-Place Firestop Devices: Factory-assembled devices for use in cast-in-place concrete floors and consisting of an outer metallic sleeve lined with an intumescent strip, a radial extended flange attached to one end of the sleeve for fastening to concrete formwork, and a neoprene gasket.
- B. Latex Sealants: Single-component latex formulations that do not re-emulsify after cure during exposure to moisture.
- C. Firestop Devices: Factory-assembled collars formed from galvanized steel and lined with intumescent material sized to fit specific diameter of penetrant.
- D. Intumescent Composite Sheets: Rigid panels consisting of aluminum-foil-faced elastomeric sheet bonded to galvanized-steel sheet.

- E. Intumescent Putties: Nonhardening dielectric, water-resistant putties containing no solvents, inorganic fibers, or silicone compounds.
- F. Intumescent Wrap Strips: Single-component intumescent elastomeric sheets with aluminum foil on one side.
- G. Mortars: Prepackaged dry mixes consisting of a blend of inorganic binders, hydraulic cement, fillers, and lightweight aggregate formulated for mixing with water at Project site to form a nonshrinking, homogeneous mortar.
- H. Pillows/Bags: Reusable heat-expanding pillows/bags consisting of glass-fiber cloth cases filled with a combination of mineral-fiber, water-insoluble expansion agents, and fire-retardant additives. Where exposed, cover openings with steel-reinforcing wire mesh to protect pillows/bags from being easily removed.
- I. Silicone Foams: Multicomponent, silicone-based liquid elastomers that, when mixed, expand and cure in place to produce a flexible, nonshrinking foam.
- J. Silicone Sealants: Single-component, silicone-based, neutral-curing elastomeric sealants of grade indicated below:
 - 1. Grade: Pourable (self-leveling) formulation for openings in floors and other horizontal surfaces, and nonsag formulation for openings in vertical and sloped surfaces, unless indicated firestopping limits use of nonsag grade for both opening conditions.

2.4 MIXING

- A. For those products requiring mixing before application, comply with penetration firestopping manufacturer's written instructions for accurate proportioning of materials, water (if required), type of mixing equipment, selection of mixer speeds, mixing containers, mixing time, and other items or procedures needed to produce products of uniform quality with optimum performance characteristics for application indicated.

PART 3 - EXECUTION

3.1 EXAMINATION

- A. Examine substrates and conditions, with Installer present, for compliance with requirements for opening configurations, penetrating items, substrates, 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: Clean out openings immediately before installing penetration firestopping to comply with manufacturer's written instructions and with the following requirements:
 - 1. Remove from surfaces of opening substrates and from penetrating items foreign materials that could interfere with adhesion of penetration firestopping.
 - 2. Clean opening substrates and penetrating items to produce clean, sound surfaces capable of developing optimum bond with penetration firestopping. Remove loose particles remaining from cleaning operation.

- B. Priming: Prime substrates where recommended in writing by manufacturer using that manufacturer's recommended products and methods. Confine primers to areas of bond; do not allow spillage and migration onto exposed surfaces.
- C. Masking Tape: Use masking tape to prevent penetration firestopping from contacting adjoining surfaces that will remain exposed on completion of the Work and that would otherwise be permanently stained or damaged by such contact or by cleaning methods used to remove stains. Remove tape as soon as possible without disturbing firestopping's seal with substrates.

3.3 INSTALLATION

- A. General: Install penetration firestopping to comply with manufacturer's written installation instructions and published drawings for products and applications indicated.
- B. Install forming materials and other accessories of types required to support fill materials during their application and in the position needed to produce cross-sectional shapes and depths required to achieve fire ratings indicated.
 - 1. After installing fill materials and allowing them to fully cure, remove combustible forming materials and other accessories not indicated as permanent components of firestopping.
- C. Install fill materials for firestopping by proven techniques to produce the following results:
 - 1. Fill voids and cavities formed by openings, forming materials, accessories, and penetrating items as required to achieve fire-resistance ratings indicated.
 - 2. Apply materials so they contact and adhere to substrates formed by openings and penetrating items.
 - 3. For fill materials that will remain exposed after completing the Work, finish to produce smooth, uniform surfaces that are flush with adjoining finishes.

3.4 IDENTIFICATION

- A. Identify penetration firestopping with preprinted metal or plastic labels. Attach labels permanently to surfaces adjacent to and within 6 inches (150 mm) of firestopping edge so labels will be visible to anyone seeking to remove penetrating items or firestopping. Use mechanical fasteners or self-adhering-type labels with adhesives capable of permanently bonding labels to surfaces on which labels are placed. Include the following information on labels:
 - 1. The words "Warning - Penetration Firestopping - Do Not Disturb. Notify Building Management of Any Damage."
 - 2. Contractor's name, address, and phone number.
 - 3. Designation of applicable testing and inspecting agency.
 - 4. Date of installation.
 - 5. Manufacturer's name.
 - 6. Installer's name.

3.5 CLEANING AND PROTECTION

- A. Clean off excess fill materials adjacent to openings as the Work progresses by methods and with cleaning materials that are approved in writing by penetration firestopping manufacturers and that do not damage materials in which openings occur.
- B. Provide final protection and maintain conditions during and after installation that ensure that penetration firestopping is without damage or deterioration at time of Substantial Completion. If, despite such protection, damage or deterioration occurs, immediately cut out and remove damaged or deteriorated

penetration firestopping and install new materials to produce systems complying with specified requirements.

3.6 PENETRATION FIRESTOPPING SCHEDULE

- A. Firestopping with No Penetrating Items:
 - 1. F-Rating: 1 hour.
 - 2. T-Rating: 1 hour.
 - 3. Type of Fill Materials: As required to achieve rating.
- B. Firestopping for Metallic Pipes, Conduit, or Tubing:
 - 1. F-Rating: 1 hour.
 - 2. T-Rating: 1 hour.
 - 3. Type of Fill Materials: As required to achieve rating.
- C. Firestopping for Nonmetallic Pipe, Conduit, or Tubing:
 - 1. F-Rating: 1 hour.
 - 2. T-Rating: 1 hour.
 - 3. Type of Fill Materials: As required to achieve rating.
- D. Firestopping for Insulated Pipes:
 - 1. F-Rating: 1 hour.
 - 2. T-Rating: 1 hour.
 - 3. Type of Fill Materials: As required to achieve rating.
- E. Firestopping for Miscellaneous Electrical Penetrants:
 - 1. F-Rating: 1 hour.
 - 2. T-Rating: 1 hour.
 - 3. Type of Fill Materials: As required to achieve rating.
- F. Firestopping for Miscellaneous Mechanical Penetrants:
 - 1. F-Rating: 1 hour.
 - 2. T-Rating: 1 hour.
 - 3. Type of Fill Materials: As required to achieve rating.

END OF SECTION

SECTION 07 92 00 - JOINT SEALANTS

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. Silicone joint sealants.
 - 2. Urethane joint sealants.
 - 3. Mildew-resistant joint sealants.

1.3 ACTION SUBMITTALS

- A. Product Data: For each joint-sealant product.
- B. Samples for Initial Selection: Manufacturer's color charts consisting of strips of cured sealants showing the full range of colors available for each product exposed to view.

1.4 QUALITY ASSURANCE

- A. Installer Qualifications: An authorized representative who is trained and approved by manufacturer.
- B. Product Testing: Test joint sealants using a qualified testing agency.
 - 1. Testing Agency Qualifications: Qualified according to ASTM C 1021 to conduct the testing indicated.

1.5 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.

PART 2 - PRODUCTS

2.1 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 of Interior Sealants: Sealants and sealant primers used inside the weatherproofing system 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.
- C. Low-Emitting Interior Sealants: Sealants and sealant primers shall comply with the testing and product requirements of the California Department of Health's (formerly, the California Department of Health Services') "Standard Method for the Testing and Evaluation of Volatile Organic Chemical Emissions from Indoor Sources Using Environmental Chambers."
- D. Colors of Exposed Joint Sealants: As selected by Architect from manufacturer's full range.

2.2 SILICONE JOINT SEALANTS

- A. Silicone, S, NS, 100/50, NT: Single-component, nonsag, plus 100 percent and minus 50 percent movement capability, nontraffic-use, neutral-curing silicone joint sealant; ASTM C 920, Type S, Grade NS, Class 100/50, Use NT.
 - 1. Use for all interior locations except in toilet rooms, kitchens, and other wet areas.

2.3 URETHANE JOINT SEALANTS

- A. Urethane, S, NS, 100/50, T, NT: Single-component, nonsag, plus 100 percent and minus 50 percent movement capability, traffic- and nontraffic-use, urethane joint sealant; ASTM C 920, Type S, Grade NS, Class 100/50, Uses T and NT.
 - 1. Use at all exterior locations

2.4 MILDEW-RESISTANT JOINT SEALANTS

- A. Mildew-Resistant Joint Sealants: Formulated for prolonged exposure to humidity with fungicide to prevent mold and mildew growth.
- B. Silicone, Mildew Resistant, Acid Curing, S, NS, 25, NT: Mildew-resistant, single-component, nonsag, plus 25 percent and minus 25 percent movement capability, nontraffic-use, acid-curing silicone joint sealant; ASTM C 920, Type S, Grade NS, Class 25, Use NT.
 - 1. Use at all interior locations in toilet rooms, kitchens, and other wet areas.

2.5 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 C 1330, Type C (closed-cell material with a surface skin), and of size and density to control sealant depth and otherwise contribute to producing optimum sealant performance.
- C. Bond-Breaker Tape: Polyethylene tape or other plastic tape recommended by sealant manufacturer for preventing sealant from adhering to rigid, inflexible joint-filler materials or joint surfaces at back of joint. Provide self-adhesive tape where applicable.

2.6 MISCELLANEOUS MATERIALS

- A. Primer: Material recommended by joint-sealant manufacturer where required for adhesion of sealant to joint substrates indicated, as determined from preconstruction joint-sealant-substrate tests and field tests.
- B. Cleaners for Nonporous Surfaces: Chemical cleaners acceptable to manufacturers of sealants and sealant backing materials, free of oily residues or other substances capable of staining or harming joint substrates and adjacent nonporous surfaces in any way, and formulated to promote optimum adhesion of sealants to joint substrates.
- C. Masking Tape: Nonstaining, nonabsorbent material compatible with joint sealants and surfaces adjacent to joints.

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.
 - 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. 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 C 1193 for use of joint sealants as applicable to materials, applications, and conditions indicated.
- C. Install sealant backings of kind 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 per Figure 8A in ASTM C 1193 unless otherwise indicated.

3.4 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.

3.5 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

SECTION 07 95 00 - EXPANSION CONTROL

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. Exterior expansion control systems at joints between metal roof canopies and the exterior building wall.
- B. Related Requirements:
 - 1. Division 07 Section "Standing Seam Metal Roof Panels".
 - 2. Division 07 Section "Sheet Metal Flashing and Trim".

1.3 ACTION SUBMITTALS

- A. Product Schedule: Prepared by or under the supervision of the supplier. Include the following information in tabular form:
 - 1. Manufacturer and model number for each expansion control system.
 - 2. Expansion control system location cross-referenced to Drawings.
 - 3. Nominal joint width.
 - 4. Movement capability.
 - 5. Classification as thermal or seismic.
 - 6. Materials, colors, and finishes.

PART 2 - PRODUCTS

2.1 SYSTEM DESCRIPTION

- A. General: Provide expansion control systems of design, basic profile, materials, and operation indicated. Provide units with capability to accommodate variations in adjacent surfaces.
 - 1. Furnish units in longest practicable lengths to minimize field splicing.
- B. Coordination: Coordinate installation of exterior expansion control systems to ensure that wall transitions are watertight..

2.2 EXTERIOR WALL EXPANSION CONTROL SYSTEMS

- A. Basis-of-Design Product: Subject to compliance with requirements, provide Construction Specialties, Inc.; BRJW Series Roof-to-Wall Joint cover, Model BRJW-600, or a comparable product by one of the following:

1. Balco, Inc.
- B. Source Limitations: Obtain expansion control systems from single source from single manufacturer.
- C. Nominal Joint Width: As indicated on the Drawings.

2.3 ACCESSORIES

- A. Moisture Barriers: Manufacturer's standard moisture barrier consisting of a continuous, waterproof membrane within joint and attached to substrate on sides of joint below the primary cover.

2.4 MATERIALS

- A. Galvanized Steel: ASTM A 123/A 123M or ASTM A153/A153M.
- B. Moisture Barrier: Flexible elastomeric material, EPDM, minimum 45 mils thick.
 1. Color: Black.
- C. Accessories: Manufacturer's standard anchors, clips, fasteners, set screws, spacers, and other accessories compatible with material in contact, as indicated or required for complete installations.

2.5 GENERAL FINISH REQUIREMENTS

- A. Comply with NAAMM's "Metal Finishes Manual for Architectural and Metal Products" for recommendations for applying and designating finishes.
- B. Protect mechanical finishes on exposed surfaces from damage by applying a strippable, temporary protective covering before shipping.
- C. Appearance of Finished Work: Noticeable variations in same piece are not acceptable. Variations in appearance of adjoining components are acceptable if they are within the range of approved Samples and are assembled or installed to minimize contrast.

PART 3 - EXECUTION

3.1 EXAMINATION

- A. Examine surfaces where expansion control systems will be installed for installation tolerances and other conditions affecting performance of work.
 1. Proceed with installation only after unsatisfactory conditions have been corrected.

3.2 PREPARATION

- A. Prepare substrates according to expansion control system manufacturer's written instructions.
- B. Coordinate and furnish anchorages, setting drawings, and instructions for installing expansion control systems. Provide fasteners of metal, type, and size to suit type of construction indicated and to provide for secure attachment of expansion control systems.

3.3 INSTALLATION

- A. Comply with manufacturer's written instructions for storing, handling, and installing expansion control systems and materials unless more stringent requirements are indicated.
- B. Terminate exposed ends of expansion control systems with field- or factory-fabricated termination devices.
- C. Moisture Barrier: Provide at exterior joints and where indicated on Drawings.

3.4 PROTECTION

- A. Do not remove protective covering until finish work in adjacent areas is complete. When protective covering is removed, clean exposed metal surfaces to comply with manufacturer's written instructions.
- B. Protect the installation from damage by work of other Sections. Where necessary due to heavy construction traffic, remove and properly store cover plates or seals and install temporary protection over expansion control systems. Reinstall cover plates or seals prior to Substantial Completion of the Work.

END OF SECTION

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SECTION 08 11 13 - HOLLOW METAL DOORS AND FRAMES

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 hollow-metal work, including hollow metal doors and frames, and interior relites.
- B. Related Requirements:
 - 1. Division 06 Section "Miscellaneous Rough Carpentry" for plywood wainscot at maintenance bays and interior hallways.
 - 2. Division 07 Section "Plastic Panels" for PVC panels at washbay walls.
 - 3. Division 08 Section "Finish Hardware" for door hardware for hollow-metal doors.
 - 4. Division 09 Section "Gypsum Board" for typical finish at interior partition walls.
 - 5. Division 09 Sections "Exterior Painting" and "Interior Painting" for field finishing of hollow-metal doors and frames.

1.3 DEFINITIONS

- A. Minimum Thickness: Minimum thickness of base metal without coatings according to NAAMM-HMMA 803 or SDI A250.8.

1.4 COORDINATION

- A. Coordinate anchorage installation for hollow-metal frames. Furnish setting drawings, templates, and directions for installing anchorages, including sleeves, concrete inserts, anchor bolts, and items with integral anchors. Deliver such items to Project site in time for installation.

1.5 PREINSTALLATION MEETINGS

- A. Preinstallation Conference: Conduct conference at Project site.

1.6 ACTION SUBMITTALS

- A. Product Data: For each type of product.
 - 1. Include construction details, material descriptions, core descriptions, fire-resistance ratings, and finishes.
- B. Shop Drawings: Include the following:
 - 1. Elevations of each door type.
 - 2. Details of doors, including vertical- and horizontal-edge details and metal thicknesses.
 - 3. Frame details for each frame type, including dimensioned profiles and metal thicknesses.

4. Locations of reinforcement and preparations for hardware.
 5. Details of each different wall opening condition.
 6. Details of anchorages, joints, field splices, and connections.
 7. Details of accessories.
 8. Details of moldings, removable stops, and glazing.
 9. Details of conduit and preparations for power, signal, and control systems.
- C. Schedule: Provide a schedule of hollow-metal work prepared by or under the supervision of supplier, using same reference numbers for details and openings as those on Drawings. Coordinate with final Door Hardware Schedule.

1.7 INFORMATIONAL SUBMITTALS

- A. Product Test Reports: For each type of hollow-metal door and frame assembly, for tests performed by a qualified testing agency.
- B. Oversize Construction Certification: For assemblies required to be fire rated and exceeding limitations of labeled assemblies.

1.8 DELIVERY, STORAGE, AND HANDLING

- A. Deliver hollow-metal work palletized, packaged, or crated to provide protection during transit and Project-site storage. Do not use nonvented plastic.
1. Provide additional protection to prevent damage to factory-finished units.
- B. Deliver welded frames with two removable spreader bars across bottom of frames, tack welded to jambs and mullions.
- C. Store hollow-metal work vertically under cover at Project site with head up. Place on minimum 4-inch- (102-mm-) high wood blocking. Provide minimum 1/4-inch (6-mm) space between each stacked door to permit air circulation.

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. Amweld International, LLC.
 2. Ceco Door; ASSA ABLOY.
 3. Curries Company; ASSA ABLOY.
- B. Source Limitations: Obtain hollow-metal work from single source from single manufacturer.

2.2 REGULATORY REQUIREMENTS

- A. Fire-Rated Assemblies: Complying with NFPA 80 and listed and labeled by a qualified testing agency acceptable to authorities having jurisdiction for fire-protection ratings indicated, based on testing at positive pressure according to NFPA 252 or UL 10C.

1. Smoke- and Draft-Control Assemblies: Provide an assembly with gaskets listed and labeled for smoke and draft control by a qualified testing agency acceptable to authorities having jurisdiction, based on testing according to UL 1784 and installed in compliance with NFPA 105.

2.3 INTERIOR DOORS AND FRAMES

- A. Construct interior doors and frames to comply with the standards indicated for materials, fabrication, hardware locations, hardware reinforcement, tolerances, and clearances, and as specified.
- B. Heavy-Duty Doors and Frames: SDI A250.8, Level 2. At all interior door locations except where specifically noted otherwise.
 1. Physical Performance: Level B according to SDI A250.4.
 2. Doors:
 - a. Type: As indicated in the Door and Frame Schedule.
 - b. Thickness: 1-3/4 inches (44.5 mm).
 - c. Face: Uncoated, cold-rolled steel sheet, minimum thickness of 0.042 inch (1.0 mm).
 - d. Edge Construction: Model 2, Seamless.
 - e. Core: Manufacturer's standard kraft-paper honeycomb, polystyrene, polyurethane, polyisocyanurate, mineral-board, or vertical steel-stiffener core at manufacturer's discretion.
 3. Frames:
 - a. Materials: Uncoated steel sheet, minimum thickness of 0.053 inch (1.3 mm).
 - b. Construction: Full profile welded.
 4. Exposed Finish: Prime.
- C. Extra-Heavy-Duty Doors and Frames: SDI A250.8, Level 3. At interior partitions between maintenance bays and at doors leading from maintenance bays into central office/storage section of maintenance station.
 1. Physical Performance: Level A according to SDI A250.4.
 2. Doors:
 - a. Type: As indicated in the Door and Frame Schedule.
 - b. Thickness: 1-3/4 inches (44.5 mm).
 - c. Face: Uncoated, cold-rolled steel sheet, minimum thickness of 0.053 inch (1.3 mm).
 - d. Edge Construction: Model 2, Seamless.
 - e. Core: Manufacturer's standard kraft-paper honeycomb, polystyrene, polyurethane, polyisocyanurate, mineral-board, or vertical steel-stiffener core at manufacturer's discretion.
 3. Frames:
 - a. Materials: Uncoated, steel sheet, minimum thickness of 0.053 inch (1.3 mm).
 - b. Construction: Full profile welded.
 4. Exposed Finish: Prime.

2.4 EXTERIOR HOLLOW-METAL DOORS AND FRAMES

- A. Construct exterior doors and frames to comply with the standards indicated for materials, fabrication, hardware locations, hardware reinforcement, tolerances, and clearances, and as specified.
- B. Extra-Heavy-Duty Doors and Frames: SDI A250.8, Level 3. At locations indicated in the Door and Frame Schedule.
 1. Physical Performance: Level A according to SDI A250.4.
 2. Doors:
 - a. Type: As indicated in the Door and Frame Schedule.
 - b. Thickness: 1-3/4 inches (44.5 mm.)

- c. Face: Metallic-coated steel sheet, minimum thickness of 0.053 inch (1.3 mm), with minimum A40 (ZF120) coating.
- d. Edge Construction: Model 2, Seamless.
- e. Core: Manufacturer's standard kraft-paper honeycomb, polystyrene, polyurethane, polyisocyanurate, mineral-board, or vertical steel-stiffener core at manufacturer's discretion.
- 3. Frames:
 - a. Materials: Metallic-coated steel sheet, minimum thickness of 0.053 inch (1.3 mm), with minimum A40 (ZF120) coating.
 - b. Construction: Full profile welded.
- 4. Exposed Finish: Prime.

2.5 FRAME ANCHORS

- A. Jamb Anchors:
 - 1. Stud-Wall Type: Designed to engage stud, welded to back of frames; not less than 0.042 inch (1.0 mm) thick.
 - 2. Compression Type for Drywall Slip-on Frames: Adjustable compression anchors.
 - 3. Postinstalled Expansion Type for In-Place Concrete or Masonry: Minimum 3/8-inch- (9.5-mm-) diameter bolts with expansion shields or inserts. Provide pipe spacer from frame to wall, with throat reinforcement plate, welded to frame at each anchor location.
- B. Floor Anchors: Formed from same material as frames, minimum thickness of 0.042 inch (1.0 mm), and as follows:
 - 1. Monolithic Concrete Slabs: Clip-type anchors, with two holes to receive fasteners.

2.6 INTERIOR RELITE FRAMES

- A. Construct interior frames to comply with the standards indicated for materials, fabrication, hardware locations, hardware reinforcement, tolerances, and clearances, and as specified.
- B. Heavy-Duty Frames: SDI A250.8, Level 2. At locations indicated on the Drawings.
 - 1. Physical Performance: Level B according to SDI A250.4.
 - 2. Materials: Uncoated steel sheet, minimum thickness of 0.053 inch (1.3 mm).
 - 3. Frames: Fabricated from same thickness material as adjacent door frame.
 - 4. Construction: Full profile welded.
 - 5. Exposed Finish: Prime.

2.7 MATERIALS

- A. Recycled Content of Steel Products: Postconsumer recycled content plus one-half of preconsumer recycled content not less than 25 percent.
- B. Cold-Rolled Steel Sheet: ASTM A 1008/A 1008M, Commercial Steel (CS), Type B; suitable for exposed applications.
- C. Hot-Rolled Steel Sheet: ASTM A 1011/A 1011M, Commercial Steel (CS), Type B; free of scale, pitting, or surface defects; pickled and oiled.
- D. Metallic-Coated Steel Sheet: ASTM A 653/A 653M, Commercial Steel (CS), Type B.

- E. Frame Anchors: ASTM A 879/A 879M, Commercial Steel (CS), 04Z (12G) coating designation; mill phosphatized.
 - 1. For anchors built into exterior walls, steel sheet complying with ASTM A 1008/A 1008M or ASTM A 1011/A 1011M, hot-dip galvanized according to ASTM A 153/A 153M, Class B.
- F. Inserts, Bolts, and Fasteners: Hot-dip galvanized according to ASTM A 153/A 153M.
- G. Power-Actuated Fasteners in Concrete: Fastener system of type suitable for application indicated, fabricated from corrosion-resistant materials, with clips or other accessory devices for attaching hollow-metal frames of type indicated.
- H. Grout: ASTM C 476, except with a maximum slump of 4 inches (102 mm), as measured according to ASTM C 143/C 143M.
- I. Mineral-Fiber Insulation: ASTM C 665, Type I (blankets without membrane facing); consisting of fibers manufactured from slag or rock wool; with maximum flame-spread and smoke-developed indexes of 25 and 50, respectively; passing ASTM E 136 for combustion characteristics.
- J. Glazing: Comply with requirements in Division 08 Section "Glazing."
- K. Bituminous Coating: Cold-applied asphalt mastic, compounded for 15-mil (0.4-mm) dry film thickness per coat. Provide inert-type noncorrosive compound free of asbestos fibers, sulfur components, and other deleterious impurities.

2.8 FABRICATION

- A. Fabricate hollow-metal work to be rigid and free of defects, warp, or buckle. Accurately form metal to required sizes and profiles, with minimum radius for metal thickness. Where practical, fit and assemble units in manufacturer's plant. To ensure proper assembly at Project site, clearly identify work that cannot be permanently factory assembled before shipment.
- B. Hollow-Metal Doors:
 - 1. Steel-Stiffened Door Cores: Provide minimum thickness 0.026 inch (0.66 mm), steel vertical stiffeners of same material as face sheets extending full-door height, with vertical webs spaced not more than 6 inches (152 mm) apart. Spot weld to face sheets no more than 5 inches (127 mm) o.c. Fill spaces between stiffeners with glass- or mineral-fiber insulation.
 - 2. Fire Door Cores: As required to provide fire-protection ratings indicated.
 - 3. Vertical Edges for Single-Acting Doors: Bevel edges 1/8 inch in 2 inches (3.2 mm in 51 mm).
 - 4. Top Edge Closures: Close top edges of doors with flush closures of same material as face sheets.
 - 5. Bottom Edge Closures: Close bottom edges of doors with end closures or channels of same material as face sheets.
 - 6. Exterior Doors: Provide weep-hole openings in bottoms of exterior doors to permit moisture to escape. Seal joints in top edges of doors against water penetration.
 - 7. Astragals: Provide overlapping astragal on one leaf of pairs of doors where required by NFPA 80 for fire-performance rating or where indicated. Extend minimum 3/4 inch (19 mm) beyond edge of door on which astragal is mounted or as required to comply with published listing of qualified testing agency.
- C. Hollow-Metal Frames: Where frames are fabricated in sections due to shipping or handling limitations, provide alignment plates or angles at each joint, fabricated of same thickness metal as frames.
 - 1. Provide countersunk, flat- or oval-head exposed screws and bolts for exposed fasteners unless otherwise indicated.
 - 2. Grout Guards: Weld guards to frame at back of hardware mortises in frames to be grouted.

3. Floor Anchors: Weld anchors to bottoms of jambs with at least four spot welds per anchor; however, for slip-on drywall frames, provide anchor clips or countersunk holes at bottoms of jambs.
 4. Jamb Anchors: Provide number and spacing of anchors as follows:
 - a. Stud-Wall Type: Locate anchors not more than 18 inches (457 mm) from top and bottom of frame. Space anchors not more than 32 inches (813 mm) o.c. and as follows:
 - 1) Three anchors per jamb up to 60 inches (1524 mm) high.
 - 2) Four anchors per jamb from 60 to 90 inches (1524 to 2286 mm) high.
 - 3) Five anchors per jamb from 90 to 96 inches (2286 to 2438 mm) high.
 - 4) Five anchors per jamb plus one additional anchor per jamb for each 24 inches (610 mm) or fraction thereof above 96 inches (2438 mm) high.
 - b. Compression Type: Not less than two anchors in each frame.
 - c. Postinstalled Expansion Type: Locate anchors not more than 6 inches (152 mm) from top and bottom of frame. Space anchors not more than 26 inches (660 mm) o.c.
 5. Head Anchors: Two anchors per head for frames more than 42 inches (1067 mm) wide and mounted in metal-stud partitions.
 6. Door Silencers: Except on weather-stripped frames, drill stops to receive door silencers as follows. Keep holes clear during construction.
 - a. Single-Door Frames: Drill stop in strike jamb to receive three door silencers.
 - b. Double-Door Frames: Drill stop in head jamb to receive two door silencers.
- D. Fabricate concealed stiffeners and edge channels from either cold- or hot-rolled steel sheet.
- E. Hardware Preparation: Factory prepare hollow-metal work to receive templated mortised hardware; include cutouts, reinforcement, mortising, drilling, and tapping according to SDI A250.6, the Door Hardware Schedule, and templates.
1. Reinforce doors and frames to receive nontemplated, mortised, and surface-mounted door hardware.
 2. Comply with applicable requirements in SDI A250.6 and BHMA A156.115 for preparation of hollow-metal work for hardware.
- F. Stops and Moldings: Provide stops and moldings around glazed lites and louvers where indicated. Form corners of stops and moldings with butted hairline joints.
1. Single Glazed Lites: Provide fixed stops and moldings welded on secure side of hollow-metal work.
 2. Provide fixed frame moldings on outside of exterior and on secure side of interior doors and frames.
 3. Provide loose stops and moldings on inside of hollow-metal work.
 4. Coordinate rabbet width between fixed and removable stops with glazing and installation types indicated.

2.9 STEEL FINISHES

- A. Prime Finish: Clean, pretreat, and apply manufacturer's standard primer.
1. Shop Primer: Manufacturer's standard, fast-curing, lead- and chromate-free primer complying with SDI A250.10; recommended by primer manufacturer for substrate; compatible with substrate and field-applied coatings despite prolonged exposure.

2.10 ACCESSORIES

- A. Mullions and Transom Bars: Join to adjacent members by welding or rigid mechanical anchors.

- B. Grout Guards: Formed from same material as frames, not less than 0.016 inch (0.4 mm) thick.

PART 3 - EXECUTION

3.1 EXAMINATION

- A. Examine substrates, areas, and conditions, with Installer present, for compliance with requirements for installation tolerances and other conditions affecting performance of the Work.
- B. Examine roughing-in for embedded and built-in anchors to verify actual locations before frame installation.
- C. Prepare written report, endorsed by Installer, listing conditions detrimental to performance of the Work.
- D. Proceed with installation only after unsatisfactory conditions have been corrected.

3.2 PREPARATION

- A. Remove welded-in shipping spreaders installed at factory. Restore exposed finish by grinding, filling, and dressing, as required to make repaired area smooth, flush, and invisible on exposed faces.
- B. Drill and tap doors and frames to receive nontemplated, mortised, and surface-mounted door hardware.

3.3 INSTALLATION

- A. General: Install hollow-metal work plumb, rigid, properly aligned, and securely fastened in place. Comply with Drawings and manufacturer's written instructions.
- B. Hollow-Metal Frames: Install hollow-metal frames for doors and interior relites of size and profile indicated. Comply with SDI A250.11 or NAAMM-HMMA 840 as required by standards specified.
 - 1. Set frames accurately in position; plumbed, aligned, and braced securely until permanent anchors are set. After wall construction is complete, remove temporary braces, leaving surfaces smooth and undamaged.
 - a. At fire-rated openings, install frames according to NFPA 80.
 - b. Where frames are fabricated in sections because of shipping or handling limitations, field splice at approved locations by welding face joint continuously; grind, fill, dress, and make splice smooth, flush, and invisible on exposed faces.
 - c. Install frames with removable stops located on secure side of opening.
 - d. Install door silencers in frames before grouting.
 - e. Remove temporary braces necessary for installation only after frames have been properly set and secured.
 - f. Check plumb, square, and twist of frames as walls are constructed. Shim as necessary to comply with installation tolerances.
 - g. Field apply bituminous coating to backs of frames that will be filled with grout containing antifreezing agents.
 - 2. Floor Anchors: Provide floor anchors for each jamb and mullion that extends to floor, and secure with postinstalled expansion anchors.
 - a. Floor anchors may be set with power-actuated fasteners instead of postinstalled expansion anchors if so indicated and approved on Shop Drawings.

3. Metal-Stud Partitions: Solidly pack mineral-fiber insulation inside frames.
 4. Concrete Walls: Solidly fill space between frames and concrete with mineral-fiber insulation.
 5. In-Place Concrete or Masonry Construction: Secure frames in place with postinstalled expansion anchors. Countersink anchors, and fill and make smooth, flush, and invisible on exposed faces.
 6. In-Place Metal-Stud Partitions: Secure slip-on drywall frames in place according to manufacturer's written instructions.
 7. Installation Tolerances: Adjust hollow-metal door frames for squareness, alignment, twist, and plumb to the following tolerances:
 - a. Squareness: Plus or minus 1/16 inch (1.6 mm), measured at door rabbet on a line 90 degrees from jamb perpendicular to frame head.
 - b. Alignment: Plus or minus 1/16 inch (1.6 mm), measured at jambs on a horizontal line parallel to plane of wall.
 - c. Twist: Plus or minus 1/16 inch (1.6 mm), measured at opposite face corners of jambs on parallel lines, and perpendicular to plane of wall.
 - d. Plumbness: Plus or minus 1/16 inch (1.6 mm), measured at jambs at floor.
- C. Hollow-Metal Doors: Fit hollow-metal doors accurately in frames, within clearances specified below. Shim as necessary.
1. Non-Fire-Rated Steel Doors:
 - a. Between Door and Frame Jambs and Head: 1/8 inch (3.2 mm) plus or minus 1/32 inch (0.8 mm).
 - b. Between Edges of Pairs of Doors: 1/8 inch (3.2 mm) to 1/4 inch (6.3 mm) plus or minus 1/32 inch (0.8 mm).
 - c. At Bottom of Door: 3/4 inch (19.1 mm) plus or minus 1/32 inch (0.8 mm).
 - d. Between Door Face and Stop: 1/16 inch (1.6 mm) to 1/8 inch (3.2 mm) plus or minus 1/32 inch (0.8 mm).
 2. Fire-Rated Doors: Install doors with clearances according to NFPA 80.
 3. Smoke-Control Doors: Install doors and gaskets according to NFPA 105.
- D. Glazing: Comply with installation requirements in Division 08 Section "Glazing" and with hollow-metal manufacturer's written instructions.
1. Secure stops with countersunk flat- or oval-head machine screws spaced uniformly not more than 9 inches (230 mm) o.c. and not more than 2 inches (51 mm) o.c. from each corner.

3.4 ADJUSTING AND CLEANING

- A. Final Adjustments: Check and readjust operating hardware items immediately before final inspection. Leave work in complete and proper operating condition. Remove and replace defective work, including hollow-metal work that is warped, bowed, or otherwise unacceptable.
- B. Remove grout and other bonding material from hollow-metal work immediately after installation.
- C. Prime-Coat Touchup: Immediately after erection, sand smooth rusted or damaged areas of prime coat and apply touchup of compatible air-drying, rust-inhibitive primer.
- D. Touchup Painting: Cleaning and touchup painting of abraded areas of paint are specified in painting Sections.

END OF SECTION

SECTION 08 31 13 - ACCESS DOORS AND FRAMES

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. Access doors and frames for walls to access plumbing.
- B. Related Requirements:
 - 1. Division 08 Section "Hollow Metal Doors."
 - 2. Division 08 Section "Finish Hardware" for door hardware, including locks.
 - 3. Division 09 Section "Gypsum Board" for typical interior wall finish material.
 - 4. Division 22 Sections for plumbing fixtures at restrooms.

1.3 ALLOWANCES

- A. Access doors and frames are part of an access door and frame allowance.

1.4 ACTION SUBMITTALS

- A. Product Data: For each type of product.
 - 1. Include construction details, materials, individual components and profiles, and finishes.
- B. Shop Drawings:
 - 1. Include plans, elevations, sections, details, and attachments to other work.
 - 2. Detail fabrication and installation of access doors and frames for each type of substrate.
- C. Product Schedule: Provide complete access door and frame schedule, including types, locations, sizes, latching or locking provisions, and other data pertinent to installation.

PART 2 - PRODUCTS

2.1 ACCESS DOORS AND FRAMES FOR WALLS AND CEILINGS

- 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. Babcock-Davis.
 - 2. JL Industries, Inc.; a division of the Activar Construction Products Group.
 - 3. Nystrom, Inc.

- B. Source Limitations: Obtain each type of access door and frame from single source from single manufacturer.
- C. Flush Access Doors with Exposed Flanges:
 - 1. Basis-of-Design Product: Architectural flush access door Model BNT-M as manufactured by Babcock-Davis or a comparable product from another manufacturer.
 - 2. Assembly Description: Fabricate door to fit flush to frame. Provide manufacturer's standard-width exposed flange, proportional to door size.
 - 3. Locations: Wall.
 - 4. Door Size: 24 inches by 24 inches.
 - 5. Uncoated Steel Sheet for Door: Nominal 0.060 inch (1.52 mm), 16 gage.
 - a. Finish: Factory prime.
 - 6. Frame Material: Same material, thickness, and finish as door.
 - 7. Hinges: Manufacturer's standard.
 - 8. Hardware: Lock.
- D. Hardware:
 - 1. Lock: Mortise cylinder.
 - a. Lock Preparation: Prepare door panel to accept cylinder specified in Division 08 Section "Finish Hardware."

2.2 MATERIALS

- A. Steel Plates, Shapes, and Bars: ASTM A 36/A 36M.
- B. Steel Sheet: Uncoated or electrolytic zinc coated, ASTM A 879/A 879M, with cold-rolled steel sheet substrate complying with ASTM A 1008/A 1008M, Commercial Steel (CS), exposed.
- C. Frame Anchors: Same type as door face.
- D. Inserts, Bolts, and Anchor Fasteners: Hot-dip galvanized steel according to ASTM A 153/A 153M or ASTM F 2329.

2.3 FABRICATION

- A. General: Provide access door and frame assemblies manufactured as integral units ready for installation.
- B. Metal Surfaces: For metal surfaces exposed to view in the completed Work, provide materials with smooth, flat surfaces without blemishes. Do not use materials with exposed pitting, seam marks, roller marks, rolled trade names, or roughness.
- C. Doors and Frames: Grind exposed welds smooth and flush with adjacent surfaces. Furnish attachment devices and fasteners of type required to secure access doors to types of supports indicated.
 - 1. Provide mounting holes in frames for attachment of units to metal or wood framing.
- D. Latching Mechanisms: Furnish number required to hold doors in flush, smooth plane when closed.
 - 1. For cylinder locks, furnish two keys per lock and key all locks alike.

2.4 FINISHES

- A. Comply with NAAMM's "Metal Finishes Manual for Architectural and Metal Products" for recommendations for applying and designating finishes.

- B. Protect mechanical finishes on exposed surfaces from damage by applying a strippable, temporary protective covering before shipping.
- C. Appearance of Finished Work: Noticeable variations in same piece are not acceptable. Variations in appearance of adjoining components are acceptable if they are within the range of approved Samples and are assembled or installed to minimize contrast.
- D. Steel and Metallic-Coated-Steel Finishes:
 - 1. Factory Prime: Apply manufacturer's standard, fast-curing, lead- and chromate-free, universal primer immediately after surface preparation and pretreatment.

PART 3 - EXECUTION

3.1 EXAMINATION

- A. Examine substrates 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 INSTALLATION

- A. Comply with manufacturer's written instructions for installing access doors and frames.
- B. Install doors flush with adjacent finish surfaces or recessed to receive finish material.

3.3 ADJUSTING

- A. Adjust doors and hardware, after installation, for proper operation.
- B. Remove and replace doors and frames that are warped, bowed, or otherwise damaged.

END OF SECTION

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SECTION 08 36 13 - SECTIONAL DOORS

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 electrically operated sectional doors.
- B. Related Requirements:
 - 1. Division 05 Section "Metal Fabrications" for miscellaneous steel supports.
 - 2. Division 07 Section "Sheet Metal Flashing and Trim" for flashing at openings not otherwise specified in this Section.
 - 3. Division 07 Section "Insulated Metal Wall Panels" for typical exterior wall finish adjacent to overhead sectional door openings.
 - 4. Division 08 Section "Insulated Translucent Wall Panels" for daylight openings located above overhead sectional doors.

1.3 ACTION SUBMITTALS

- A. Product Data: For each type and size of sectional door and accessory.
 - 1. Include construction details, material descriptions, dimensions of individual components, profile door sections, and finishes.
 - 2. Include rated capacities, operating characteristics, electrical characteristics, and furnished accessories.
- B. Shop Drawings: For each installation and for special components not dimensioned or detailed in manufacturer's product data.
 - 1. Include plans, elevations, sections, and mounting details.
 - 2. Include details of equipment assemblies. Indicate dimensions, required clearances, method of field assembly, components, and location and size of each field connection.
 - 3. Include points of attachment and their corresponding static and dynamic loads imposed on structure.
 - 4. Include diagrams for power, signal, and control wiring.

1.4 INFORMATIONAL SUBMITTALS

- A. Qualification Data: For Installer.
- B. Sample Warranties: For special warranties.

1.5 CLOSEOUT SUBMITTALS

- A. Maintenance Data: For sectional doors 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 for both installation and maintenance of units required for this Project.
- B. Regulatory Requirements: Comply with applicable provisions in the U.S. Architectural & Transportation Barriers Compliance Board's ADA-ABA Accessibility Guidelines and ICC A117.1.

1.7 WARRANTY

- A. Special Warranty: Manufacturer agrees to repair or replace components of sectional doors that fail in materials or workmanship within specified warranty period.
 - 1. Failures include, but are not limited to, the following:
 - a. Structural failures including, but not limited to, excessive deflection.
 - b. Failure of components or operators before reaching required number of operation cycles.
 - c. Faulty operation of hardware.
 - d. Deterioration of metals, metal finishes, and other materials beyond normal weathering and use; rust through.
 - e. Delamination of exterior or interior facing materials.
 - 2. Warranty Period: Two years from date of Substantial Completion.
- B. Special Finish Warranty: Manufacturer agrees to repair or replace components that show evidence of deterioration of factory-applied finishes within specified warranty period.
 - 1. Warranty Period: 10 years from date of Substantial Completion.

PART 2 - PRODUCTS

2.1 MANUFACTURERS, GENERAL

- A. Source Limitations: Obtain sectional doors from single source from single manufacturer.
 - 1. Obtain operators and controls from sectional door manufacturer.

2.2 PERFORMANCE REQUIREMENTS

- A. General Performance: Sectional doors shall comply with performance requirements specified without failure due to defective manufacture, fabrication, installation, or other defects in construction and without requiring temporary installation of reinforcing components.
- B. Structural Performance, Exterior Doors: Capable of withstanding the design wind loads.
 - 1. Design Wind Load: As indicated on Drawings.
 - 2. Testing: According to ASTM E 330.
 - 3. Deflection Limits: Design sectional doors to withstand design wind loads without evidencing permanent deformation or disengagement of door components.
 - a. Deflection of door sections in horizontal position (open) shall not exceed 1/120 of the door width.
 - b. Deflection of horizontal track assembly shall not exceed 1/240 of the door height.
 - 4. Operability under Wind Load: Design overhead coiling doors to remain operable under design wind load, acting inward and outward.

- C. Windborne-Debris Impact Resistance: Provide sectional doors that pass missile-impact and cyclic-pressure tests according to ASTM E 1996 for Wind Zone 1.
 - 1. Large Missile Test: For overhead coiling doors located within 30 feet (9.144 m) of grade.
- D. Seismic Performance: Sectional doors shall withstand the effects of earthquake motions determined according to ASCE/SEI 7.
 - 1. Component Importance Factor: 1.0.

2.3 DOOR ASSEMBLY

- A. Steel Sectional Door: Sectional door formed with hinged sections and fabricated according to DASMA 102 unless otherwise indicated.
 - 1. Basis-of-Design Product: Subject to compliance with requirements, provide Overhead Door Corporation; Thermocore AP sectional overhead door or a comparable product by one of the following:
 - a. C.H.I. Overhead Doors, Inc.
 - b. Raynor.
 - c. Wayne-Dalton Corp.
 - d. Windsor Door.
- B. Operation Cycles: Door components and operators capable of operating for not less than 20,000. One operation cycle is complete when a door is opened from the closed position to the fully open position and returned to the closed position.
- C. Air Infiltration: Maximum rate of 0.08 cfm/sq. ft. (0.406 L/s per sq. m) at 15 and 25 mph (24.1 and 40.2 km/h) when tested according to ASTM E 283 or DASMA 105.
- D. Installed R-Value: 17.5 deg F x h x sq. ft./Btu (3.082 K x sq. m/W).
- E. Steel Sections: Zinc-coated (galvanized) steel sheet with G90 (Z275) zinc coating.
 - 1. Section Thickness: 3 inches (76.2 mm).
 - 2. Exterior-Face, Steel Sheet Thickness: .015 inches (.38 mm) nominal coated thickness.
 - a. Surface: Manufacturer's standard, textured.
 - 3. Insulation: Board.
 - 4. Interior Facing Material: Zinc-coated (galvanized) steel sheet with a nominal coated thickness of .015 inches (.38 mm).
- F. Track Configuration: High-lift track.
- G. Weatherseals: Fitted to bottom and top and around entire perimeter of door. Provide combination bottom weatherseal and sensor edge.
- H. Windows: Approximately 25 by 13 inches, with square corners, and spaced apart the approximate distance as indicated on Drawings; in one row(s) at height indicated on Drawings; installed with glazing of the following type:
 - 1. Insulating Glass: Manufacturer's standard.
- I. Roller-Tire Material: Manufacturer's standard.
- J. Locking Devices: Equip door with locking device assembly.
 - 1. Locking Device Assembly: Cremone type, both jamb sides, locking bars, operable from inside and outside, with cylinders.
- K. Counterbalance Type: Torsion spring.

- L. Electric Door Operator:
 - 1. Usage Classification: Heavy duty, 25 or more cycles per hour and more than 90 cycles per day.
 - 2. Operator Type: Manufacturer's standard for door requirements.
 - 3. Safety: Listed according to UL 325 by a qualified testing agency for commercial or industrial use; moving parts of operator enclosed or guarded if exposed and mounted at 8 feet (2.4 m) or lower.
 - 4. Motor Exposure: Interior, clean, and dry.
 - 5. Emergency Manual Operation: Chain type.
 - 6. Obstruction-Detection Device: Automatic pneumatic sensor edge on bottom section.
 - a. Sensor Edge Bulb Color: Black.
 - 7. Control Station: Interior-side mounted.
 - 8. Other Equipment: Audible and visual signals.
- M. Door Finish:
 - 1. Baked-Enamel or Powder-Coat Finish: Color and gloss as selected by Architect from manufacturer's full range.
 - 2. Finish of Interior Facing Material: Match finish of exterior section face.

2.4 MATERIALS, GENERAL

- A. Electrical Components, Devices, and Accessories: Listed and labeled as defined in NFPA 70, by a qualified testing agency, and marked for intended location and application.

2.5 STEEL DOOR SECTIONS

- A. Exterior Section Faces and Frames: Zinc-coated (galvanized), cold-rolled, commercial steel (CS) sheet, complying with ASTM A 653/A 653M, with indicated zinc coating and thickness.
 - 1. Fabricate section faces from single sheets to provide sections not more than 24 inches (610 mm) high and of indicated thickness. Roll horizontal meeting edges to a continuous, interlocking, keyed, rabbeted, shiplap, or tongue-in-groove weather-resistant seal, with a reinforcing flange return.
 - 2. For insulated doors, provide sections with continuous thermal-break construction, separating the exterior and interior faces of door.
- B. Section Ends and Intermediate Stiles: Enclose open ends of sections with channel end stiles formed from galvanized-steel sheet not less than 0.064-inch- (1.63-mm-) nominal coated thickness and welded to door section. Provide intermediate stiles formed from not less than 0.064-inch- (1.63-mm-) thick galvanized-steel sheet, cut to door section profile, and welded in place. Space stiles not more than 48 inches (1219 mm) apart.
- C. Reinforce bottom section with a continuous channel or angle conforming to bottom-section profile.
- D. Reinforce sections with continuous horizontal and diagonal reinforcement, as required to stiffen door and for wind loading. Provide galvanized-steel bars, struts, trusses, or strip steel, formed to depth and bolted or welded in place. Ensure that reinforcement does not obstruct vision lites.
- E. Provide reinforcement for hardware attachment.
- F. Board Thermal Insulation: Insulate interior of steel sections with door manufacturer's standard CFC-free polystyrene or polyurethane board insulation, with maximum flame-spread and smoke-developed indexes of 75 and 450, respectively, according to ASTM E 84; or with glass-fiber-board insulation. Secure insulation to exterior face sheet. Enclose insulation completely within steel sections and the interior facing material, with no exposed insulation.

- G. Interior Facing Material: Zinc-coated (galvanized), cold-rolled, commercial steel (CS) sheet, complying with ASTM A 653/A 653M, with indicated thickness.
- H. Interior Facing Material: manufacturer's standard material complying with the acceptance criteria of DASMA 107, with indicated thickness.
- I. Fabricate sections so finished door assembly is rigid and aligned, with tight hairline joints and free of warp, twist, and deformation.

2.6 TRACKS, SUPPORTS, AND ACCESSORIES

- A. Tracks: Manufacturer's standard, galvanized-steel track system of configuration indicated, sized for door size and weight, designed for lift type indicated and clearances indicated on Drawings, Provide complete system including brackets, bracing, and reinforcement to ensure rigid support of ball-bearing roller guides for required door type, size, weight, and loading.
 - 1. Galvanized Steel: ASTM A 653/A 653M, minimum G60 (Z180) zinc coating.
 - 2. Slope tracks at an angle from vertical or design tracks to ensure tight closure at jambs when door unit is closed.
 - 3. Track Reinforcement and Supports: Galvanized-steel members to support track without sag, sway, and vibration during opening and closing of doors. Slot vertical sections of track spaced 2 inches (51 mm) apart for door-drop safety device.
 - a. For Vertical Track: Intermittent, jamb brackets attached to track and attached to wall.
 - b. For Horizontal Track: Continuous reinforcing angle from curve in track to end of track, attached to track and supported at points by laterally braced attachments to overhead structural members.
- B. Weatherseals: Replaceable, adjustable, continuous, compressible weather-stripping gaskets of flexible vinyl, rubber, or neoprene fitted to bottom and top of sectional door unless otherwise indicated.
- C. Windows: Manufacturer's standard window units of type, size, and in arrangement indicated. Set glazing in vinyl, rubber, or neoprene glazing channel for metal-framed doors and elastic glazing compound for wood doors, as required. Provide removable stops of same material as door-section frames.

2.7 HARDWARE

- A. General: Heavy-duty, corrosion-resistant hardware, with hot-dip galvanized, stainless-steel, or other corrosion-resistant fasteners, to suit door type.
- B. Hinges: Heavy-duty, galvanized-steel hinges of not less than 0.079-inch- (2.01-mm-) nominal coated thickness at each end stile and at each intermediate stile, according to manufacturer's written recommendations for door size. Attach hinges to door sections through stiles and rails with bolts and lock nuts or lock washers and nuts. Use rivets or self-tapping fasteners where access to nuts is impossible. Provide double-end hinges where required, for doors more than 16 feet (4.88 m) wide unless otherwise recommended by door manufacturer.
- C. Rollers: Heavy-duty rollers with steel ball-bearings in case-hardened steel races, mounted with varying projections to suit slope of track. Extend roller shaft through both hinges where double hinges are required. Provide 3-inch- (76-mm-) diameter roller tires for 3-inch- (76-mm-) wide track and 2-inch- (51-mm-) diameter roller tires for 2-inch- (51-mm-) wide track.
- D. Push/Pull Handles: Equip each push-up operated or emergency-operated door with galvanized-steel lifting handles on each side of door, finished to match door.

2.8 LOCKING DEVICES

- A. Locking Device Assembly: Fabricate with cylinder lock, spring-loaded deadbolt, operating handle, cam plate, and adjustable locking bars to engage through slots in tracks.
 - 1. Lock Cylinders: Cylinders specified in Section 087100 "Door Hardware" standard with manufacturer and keyed to building keying system.
 - 2. Keys: Three for each cylinder.
- B. Chain Lock Keeper: Suitable for padlock.
- C. Safety Interlock Switch: Equip power-operated doors with safety interlock switch to disengage power supply when door is locked.

2.9 COUNTERBALANCE MECHANISM

- A. Torsion Spring: Counterbalance mechanism consisting of adjustable-tension torsion springs fabricated from steel-spring wire complying with ASTM A 229/A 229M, mounted on torsion shaft made of steel tube or solid steel. Provide springs designed for number of operation cycles indicated.
- B. Cable Drums and Shaft for Doors: Cast-aluminum or gray-iron casting cable drums mounted on torsion shaft and grooved to receive door-lifting cables as door is raised. Mount counterbalance mechanism with manufacturer's standard ball-bearing brackets at each end of torsion shaft. Provide one additional midpoint bracket for shafts up to 16 feet (4.88 m) long and two additional brackets at one-third points to support shafts more than 16 feet (4.88 m) long unless closer spacing is recommended by door manufacturer.
- C. Cables: Galvanized-steel, multistrand, lifting cables with cable safety factor of at least 5 to 1.
- D. Bracket: Provide anchor support bracket as required to connect stationary end of spring to the wall and to level the shaft and prevent sag.
- E. Bumper: Provide spring bumper at each horizontal track to cushion door at end of opening operation.

2.10 ELECTRIC DOOR OPERATORS

- A. General: Electric door operator assembly of size and capacity recommended and provided by door manufacturer for door and "operation cycles" requirement specified, with electric motor and factory-prewired motor controls, starter, gear-reduction unit, solenoid-operated brake, clutch, control stations, control devices, integral gearing for locking door, and accessories required for proper operation.
 - 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. Chamberlain Group, Inc. (The).
 - b. Overhead Door, Inc.
 - 2. Comply with NFPA 70.
 - 3. Control equipment complying with NEMA ICS 1, NEMA ICS 2, and NEMA ICS 6; with NFPA 70, Class 2 control circuit, maximum 24-V ac or dc.
- B. Usage Classification: Electric operator and components capable of operating for not less than number of cycles per hour indicated for each door.

- C. Door-Operator Type: Unit consisting of electric motor, gears, pulleys, belts, sprockets, chains, and controls needed to operate door and meet required usage classification.
 - 1. Jackshaft, Side Mounted: Jackshaft operator mounted on the inside front wall on right or left side of door and connected to torsion shaft with an adjustable coupling or drive chain.
- D. Motors: Reversible-type motor with controller (disconnect switch) for motor exposure indicated.
 - 1. Electrical Characteristics:
 - a. Phase: Polyphase.
 - b. Volts: 208 V.
 - c. Hertz: 60.
 - 2. Motor Size: 3/4 Hp or large enough to start, accelerate, and operate door in either direction from any position, at a speed not less than 8 in./sec. (203 mm/s) and not more than 12 in./sec. (305 mm/s), without exceeding nameplate ratings or service factor.
 - 3. Operating Controls, Controllers (Disconnect Switches), Wiring Devices, and Wiring: Manufacturer's standard unless otherwise indicated.
 - 4. Coordinate wiring requirements and electrical characteristics of motors and other electrical devices with building electrical system and each location where installed.
 - 5. Use adjustable motor-mounting bases for belt-driven operators.
- E. Limit Switches: Equip motorized door with adjustable switches interlocked with motor controls and set to automatically stop door at fully opened and fully closed positions.
- F. Obstruction Detection Device: External entrapment protection consisting of indicated automatic safety sensor capable of protecting full width of door opening. Activation of device immediately stops and reverses downward door travel.
 - 1. Photoelectric Sensor: Manufacturer's standard system designed to detect an obstruction in door opening without contact between door and obstruction.
 - a. Self-Monitoring Type: Designed to interface with door operator control circuit to detect damage to or disconnection of sensing device. When self-monitoring feature is activated, door closes only with sustained pressure on close button.
 - 2. Pneumatic Sensor Edge: Automatic safety sensor edge, located within astragal or weather stripping mounted to bottom bar. Contact with sensor activates device.
- G. Control Station: Three-button control station in fixed location with momentary-contact push-button controls labeled "Open" and "Stop" and sustained- or constant-pressure, push-button control labeled "Close."
 - 1. Interior-Mounted Units: Full-guarded, surface-mounted, heavy-duty type, with general-purpose NEMA ICS 6, Type 1 enclosure.
- H. Emergency Manual Operation: Equip electrically powered door with capability for emergency manual operation. Design manual mechanism so required force for door operation does not exceed 25 lbf (111 N).
- I. Emergency Operation Disconnect Device: Equip operator with hand-operated disconnect mechanism for automatically engaging manual operator and releasing brake for emergency manual operation while disconnecting motor without affecting timing of limit switch. Mount mechanism so it is accessible from floor level. Include interlock device to automatically prevent motor from operating when emergency operator is engaged.
- J. Motor Removal: Design operator so motor may be removed without disturbing limit-switch adjustment and without affecting emergency manual operation.
- K. Audible and Visual Signals: Audible alarm and visual indicator lights in compliance with regulatory requirements for accessibility.

- L. Portable, Radio-Control System: Consisting of two of the following:
 - 1. Three-channel universal coaxial receiver to open, close, and stop door.
 - 2. Portable control device to open and stop door may be momentary-contact type; control to close door shall be sustained- or constant-pressure type.

2.11 GENERAL FINISH REQUIREMENTS

- A. Comply with NAAMM/NOMMA's "Metal Finishes Manual for Architectural and Metal Products (AMP 500-06)" 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.

2.12 STEEL AND GALVANIZED-STEEL FINISHES

- A. Baked-Enamel or Powder-Coat Finish: Manufacturer's standard baked-on finish consisting of prime coat and thermosetting topcoat. Comply with coating manufacturer's written instructions for cleaning, pretreatment, application, and minimum dry film thickness.

PART 3 - EXECUTION

3.1 EXAMINATION

- A. Examine substrates, areas, and conditions, with Installer present, for compliance with requirements for substrate construction and other conditions affecting performance of the Work.
- B. Examine locations of electrical connections.
- C. Proceed with installation only after unsatisfactory conditions have been corrected.

3.2 INSTALLATION

- A. Install sectional doors and operating equipment complete with necessary hardware, anchors, inserts, hangers, and equipment supports; according to manufacturer's written instructions and as specified.
- B. Tracks:
 - 1. Fasten vertical track assembly to opening jambs and framing, spaced not more than 24 inches (610 mm) apart.
 - 2. Hang horizontal track assembly from structural overhead framing with angles or channel hangers attached to framing by welding or bolting, or both. Provide sway bracing, diagonal bracing, and reinforcement as required for rigid installation of track and door-operating equipment.
- C. Accessibility: Install sectional doors, switches, and controls along accessible routes in compliance with regulatory requirements for accessibility.
- D. Power-Operated Doors: Install according to UL 325.

3.3 STARTUP SERVICES

- A. Engage a factory-authorized service representative to perform startup service.
 - 1. Complete installation and startup checks according to manufacturer's written instructions.
 - 2. Test and adjust controls and safety devices. Replace damaged and malfunctioning controls and equipment.

3.4 ADJUSTING

- A. Adjust hardware and moving parts to function smoothly so that doors operate easily, free of warp, twist, or distortion.
- B. Lubricate bearings and sliding parts as recommended by manufacturer.
- C. Adjust doors and seals to provide weather-resistant fit around entire perimeter.
- D. Touch-up Painting: Immediately after welding galvanized materials, clean welds and abraded galvanized surfaces and repair galvanizing to comply with ASTM A 780/A 780M.

3.5 DEMONSTRATION

- A. Engage a factory-authorized service representative to train Owner's maintenance personnel to adjust, operate, and maintain sectional doors.

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SECTION 08 45 23 - INSULATED TRANSLUCENT WALL PANELS

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 aluminum-framed assemblies incorporating fiberglass-sandwich panels as follows:
 - 1. Translucent wall panels at maintenance bays.
- B. Related Sections:
 - 1. Division 07 Section "Sheet Metal Flashing" for flashings at exterior openings not otherwise specified in this Section.
 - 2. Division 07 Section "Insulated Metal Wall Panels" for typical exterior wall finish adjacent to translucent panel openings.
 - 3. Division 07 Section "Joint Sealant" for sealing of exterior openings.

1.3 ACTION SUBMITTALS

- A. Product Data: For each type of product indicated. Include construction details, material descriptions, dimensions of individual components and profiles, and finishes for aluminum components of panel assemblies.
- B. Shop Drawings: For panel assemblies. Include plans, elevations, sections, details, and attachments to other work.
 - 1. Include details of provisions for assembly expansion and contraction and for draining moisture within the assembly to the exterior.
- C. Samples for Verification: For each type of exposed finish required, in manufacturer's standard sizes.
- D. Fabrication Samples: Of each framing system intersection and adjacent panels, made from 12-inch (305-mm) lengths of full-size framing members and showing details of the following:
 - 1. Joinery.
 - 2. Anchorage.
 - 3. Expansion provisions.
 - 4. Fiberglass-sandwich panels.
 - 5. Flashing and drainage.
- E. Delegated-Design Submittal: For panel assemblies indicated to comply with performance requirements and design criteria, including analysis data signed and sealed by the qualified professional engineer responsible for their preparation.

1.4 INFORMATIONAL SUBMITTALS

- A. Qualification Data: For qualified Installer.

- B. Product Test Reports: Based on evaluation of comprehensive tests performed by a qualified testing agency, for panel assemblies.
- C. Field quality-control reports.
- D. Warranties: Sample of special warranties.

1.5 CLOSEOUT SUBMITTALS

- A. Maintenance Data: For panel assemblies to include in maintenance manuals.

1.6 QUALITY ASSURANCE

- A. Manufacturer Qualifications: For fiberglass-sandwich panels, a qualified manufacturer whose facilities, processes, and products are monitored by an independent, accredited quality-control agency for compliance with applicable requirements in ICC-ES AC04, "Sandwich Panels," or ICC-ES AC177, "Translucent Fiberglass Reinforced Plastic (FRP) Faced Panel Wall, Roof and Skylight Systems."
- B. Installer Qualifications: Manufacturer's authorized representative who is trained and approved for installation of panel assemblies required for this Project.
- C. Testing Agency Qualifications: Qualified according to ASTM E 699 for testing indicated.
- D. Product Options: Information on Drawings and in Specifications establishes requirements for panel assemblies' aesthetic effects and performance characteristics. Aesthetic effects are indicated by dimensions, arrangements, alignment, and profiles of components and assemblies as they relate to sightlines, to one another, and to adjoining construction. Performance characteristics are indicated by criteria subject to verification by one or more methods including testing conducted by an independent testing agency and in-service performance.
 - 1. Do not modify intended aesthetic effects, as judged solely by Architect, except with Architect's approval. If modifications are proposed, submit comprehensive explanatory data to Architect for review.
- E. Preconstruction Testing: Provide panel assemblies that comply with test-performance requirements indicated, as evidenced by reports of tests performed on manufacturer's standard panel assemblies by a qualified independent testing agency.
- F. Preinstallation Conference: Conduct conference at Project site.

1.7 WARRANTY

- A. Special Warranty: Manufacturer's standard form in which manufacturer agrees to repair or replace components of panel assemblies that fail in materials or workmanship within specified warranty period.
 - 1. Failures include, but are not limited to, the following:
 - a. Structural failures including, but not limited to, excessive deflection.
 - b. Deterioration of metals, metal finishes, and other materials beyond normal weathering.
 - c. Water leakage.
 - 2. Warranty Period: Five years from date of Substantial Completion.

- B. Special Fiberglass-Sandwich-Panel Warranty: Manufacturer's standard form in which manufacturer agrees to replace panels that exhibit defects in materials or workmanship.
 - 1. Defects include, but are not limited to, the following:
 - a. Fiberbloom.
 - b. Delamination of coating, if any, from exterior face sheet.
 - c. Color change exceeding requirements.
 - d. Delamination of panel face sheets from panel cores.
 - 2. Warranty Period: 10 years from date of Substantial Completion.
- C. Special Aluminum-Finish Warranty: Manufacturer's standard form in which manufacturer agrees to repair or replace components on which finishes fail within specified warranty period. Warranty does not include normal weathering.
 - 1. Failures include, but are not limited to, checking, crazing, peeling, chalking, and fading of finishes.
 - 2. Warranty Period: 10 years from date of Substantial Completion.

PART 2 - PRODUCTS

2.1 MANUFACTURERS

- A. Basis of Design: Subject to compliance with requirements, provide Guardian 275 Wall System as manufactured by Major Industries, or a comparable product by the following:
 - 1. Kalwall Corporation.

2.2 PERFORMANCE REQUIREMENTS

- A. General Performance: Fiberglass-sandwich-panel assemblies shall withstand the effects of the following forces without failure due to defective manufacture, fabrication, installation, or other defects in construction:
 - 1. Structural loads.
 - 2. Thermal movements.
 - 3. Movements of supporting structure.
 - 4. Dimensional tolerances of building frame and other adjacent construction.
 - 5. Failure includes, but is not limited to, the following:
 - a. Deflection exceeding specified limits.
 - b. Water leakage.
 - c. Thermal stresses transferred to building structure.
 - d. Noise or vibration created by wind, thermal, or structural movements.
 - e. Loosening or weakening of fasteners, attachments, and other components.
- B. Structural Loads:
 - 1. Seismic Loads: As indicated on Drawings.
 - 2. Wind Loads: As indicated on Drawings.
- C. Deflection Limits:
 - 1. Vertical Panel Assemblies: Limited to 1/90 of clear span for each assembly component.
- D. Structural-Test Performance: Provide panel assemblies tested according to ASTM E 330, as follows:
 - 1. When tested at positive and negative wind-load design pressures, assemblies do not show evidence of deflection exceeding specified limits.

2. When tested at 150 percent of positive and negative wind-load design pressures, assemblies, including anchorage, do not show evidence of material failures, structural distress, and permanent deformation of main framing members exceeding 0.2 percent of span.
 3. Test Durations: As required by design wind velocity, but not less than 10 seconds.
- E. Water Penetration under Static Pressure: Provide panel assemblies that do not evidence water penetration through fixed glazing and framing areas when tested according to ASTM E 331 at a minimum static-air-pressure difference of 20 percent of positive wind-load design pressure, but not less than 6.24 lbf/sq. ft. (300 Pa).
1. Maximum Water Leakage: According to AAMA 501.1 No uncontrolled water penetrating aluminum-framed systems or water appearing on systems' normally exposed interior surfaces from sources other than condensation. Water leakage does not include water that is controlled by flashing and gutters and drained to the exterior, or water that cannot damage adjacent materials or finishes.
- F. Thermal Movements: Allow for thermal movements from ambient- and surface-temperature changes. 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 (67 deg C), ambient; 180 deg F (100 deg C), material surfaces.
- G. Energy Performance: Provide panel assemblies with performance properties specified, as indicated in manufacturer's published test data, based on procedures indicated below and certified and labeled according to NFRC:
1. Thermal Transmittance (U-Factor): Fixed glazing and framing areas shall have U-factor of not more than 0.65 Btu/sq. ft. x h x deg F (3.69 W/sq. m x K) as determined according to NFRC 100.
 2. Solar-Heat-Gain Coefficient: Fixed glazing and framing areas shall have a solar heat gain coefficient of no greater than 0.7 as determined according to NFRC 200.
 3. Air Infiltration: Maximum air leakage through fixed glazing and framing areas of 0.30 cfm/sq. ft. (1.50 L/s per sq. m) of fixed wall area as determined according to ASTM E 283 at a minimum static-air-pressure differential of 1.57 lbf/sq. ft. (75 Pa).

2.3 ALUMINUM FRAMING SYSTEMS

- A. Components: Manufacturer's standard extruded-aluminum members of thickness required and reinforced as required to support imposed loads.
1. Construction: Thermally broken, extruded aluminum.
- B. Aluminum: Alloy and temper recommended in writing by manufacturer for type of use and finish indicated.
1. Sheet and Plate: ASTM B 209 (ASTM B 209M).
 2. Extruded Bars, Rods, Profiles, and Tubes: ASTM B 221 (ASTM B 221M).
 3. Extruded Structural Pipe and Tubes: ASTM B 429/B 429M.
 4. Structural Profiles: ASTM B 308/B 308M.
- C. Brackets and Reinforcements: Manufacturer's standard high-strength aluminum with nonstaining, nonferrous shims for aligning skylight components.
- D. Fasteners and Accessories: Manufacturer's standard, corrosion-resistant, nonstaining, and nonbleeding fasteners and accessories; compatible with adjacent materials.
1. At closures, retaining caps, or battens, use ASTM A 193/A 193M, 300 series stainless-steel screws.
 2. Use self-locking devices where fasteners are subject to loosening or turning out from thermal and structural movements, wind loads, or vibration.
 3. At movement joints, use slip-joint linings, spacers, and sleeves of material and type recommended in writing by manufacturer.

- E. Anchor Bolts: ASTM A 307, Grade A (ASTM F 568M, Property Class 4.6), galvanized steel.
- F. Concealed Flashing: Corrosion-resistant, nonstaining, nonbleeding flashing compatible with adjacent materials.
- G. Exposed Flashing and Closures: Aluminum sheet not less than 0.040 inch (1.02 mm) thick, finished to match framing.
- H. Framing Gaskets: Manufacturer's standard.
- I. Frame-System Sealants: As recommended in writing by manufacturer.
- J. Corrosion-Resistant Coating: Cold-applied asphalt mastic, compounded for 15-mil (0.4-mm) dry film thickness per coat. Provide inert-type noncorrosive compound free of asbestos fibers, sulfur components, and other deleterious impurities.

2.4 FIBERGLASS-SANDWICH PANELS

- A. Description: Assembly of uniformly colored, translucent, thermoset, fiberglass-reinforced-polymer face sheets bonded to both sides of a grid core.
 - 1. Self-Ignition Temperature: 650 deg F (343 deg C) or more per ASTM D 1929.
 - 2. Smoke-Developed Index: 450 or less per ASTM E 84, or 75 or less per ASTM D 2843.
 - 3. Flame-Spread Index: Not more than 25 per ASTM E 84.
 - 4. Combustibility Classification: Class CC1 per ASTM D 635.
 - 5. Interior Finish Classification: Class A per ASTM E 84.
- B. Panel Thickness: 2-3/4 inches (70 mm).
- C. Panel Strength Characteristics:
 - 1. Maximum Panel Deflection: 3-1/2 inches (89 mm) when a 4-by-12-foot (1.2-by-3.6-m) panel is tested according to ASTM E 72 at 34 lbf/sq. ft. (1.6 kPa), with a maximum 0.090-inch (2.3-mm) set deflection after five minutes.
 - 2. Panel Support Strength: Capable of supporting, without failure, a 300-lbf (1334-N) concentrated load when applied to a 3-inch- (76-mm-) diameter disk according to ASTM E 661.
- D. Grid Core: Mechanically interlocked, extruded-aluminum I-beams, with a minimum flange width of 7/16 inch (11.1 mm).
 - 1. Extruded Aluminum: ASTM B 221 (ASTM B 221M), in alloy and temper recommended in writing by manufacturer.
 - 2. I-Beam Construction: Thermally broken, extruded aluminum.
 - 3. Grid Pattern: As indicated on Drawings.
- E. Exterior Face Sheet:
 - 1. Thickness: 0.070 inches (1.78 mm).
 - 2. Color: Crystal.
 - 3. Color Change: Not more than 3.0 units Delta E when measured according to ASTM D 2244, after outdoor weathering in southern Florida compliant with procedures in ASTM D 1435, with panels mounted facing south and as follows:
 - a. Panel Mounting Angle: Not more than 5 degrees from horizontal.
 - b. Exposure Period: 60 months.
 - 4. Erosion Protection: Manufacturer's standard Surface-applied, polyvinyl-fluoride film not less than 1.0 mils (0.03 mm) thick.
 - 5. Impact Resistance: No fracture or tear at impact of 60 ft. x lbf (81 J) by a 3-1/4-inch- (83-mm-) diameter, 5-lb (2.3-kg) freefalling ball according to UL 972 test procedure.

- F. Interior Face Sheet:
 - 1. Thickness: 0.045 inch (1.14 mm).
 - 2. Color: Crystal.
- G. Fiberglass-Sandwich-Panel Adhesive: ASTM D 2559.
 - 1. Compatible with facing and core materials.
 - 2. Tensile and shear bond strength of aged adhesive ensures permanent adhesion of facings to cores, as evidenced by testing tensile strength according to ASTM C 297 and shear bond strength according ASTM D 1002. Use accelerated aging procedures that comply with aging requirements for adhesives with high resistance to moisture in ICC-ES AC05, "Sandwich Panel Adhesives."

2.5 FABRICATION

- A. Frame System Fabrication:
 - 1. Fabricate components before finishing.
 - 2. Fabricate components that, when assembled, have the following characteristics:
 - a. Profiles that are sharp, straight, and free of defects or deformations.
 - b. Accurately fitted joints with ends coped or mitered.
 - c. Internal guttering systems or other means to drain water passing through joints, condensation occurring within components, and moisture migrating within assembly to exterior.
 - 3. Fabricate sill closures with weep holes and for installation as continuous component.
 - 4. Reinforce components as required to receive fastener threads.
- B. Panel Fabrication: Factory assemble and seal panels.
 - 1. Laminate face sheets to grid core under a controlled process using heat and pressure to produce straight adhesive bonding lines that cover width of core members and that have sharp edges.
 - a. White spots indicating lack of bond at intersections of grid-core members are limited in number to four for every 40 sq. ft. (3.7 sq. m) of panel and limited in diameter to 3/64 inch (1.2 mm).
 - 2. Fabricate with grid pattern that is symmetrical about centerlines of each panel.
 - 3. Fabricate panel to allow condensation within panel to escape.
 - 4. Reinforce panel corners.

2.6 ALUMINUM FINISHES

- A. Clear Anodic Finish: AAMA 611, AA-M12C22A31, Class II, 0.010 mm or thicker.

PART 3 - EXECUTION

3.1 EXAMINATION

- A. Examine areas 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 INSTALLATION

- A. General:

1. Comply with manufacturer's written instructions.
 2. Do not install damaged components.
 3. Fit joints between aluminum components to produce hairline joints free of burrs and distortion.
 4. Rigidly secure nonmovement joints.
 5. Install anchors with separators and isolators to prevent metal corrosion, electrolytic deterioration, and immobilization of moving joints.
 6. Seal joints watertight unless otherwise indicated.
- B. Metal Protection: Where aluminum components will contact dissimilar materials, protect against galvanic action by painting contact surfaces with corrosion-resistant coating or by installing nonconductive spacers as recommended in writing by manufacturer for this purpose.
- C. Install continuous aluminum sill closures with weatherproof expansion joints and locked and sealed corners. Locate weep holes at rafters.
- D. Install components to drain water passing through joints, condensation occurring within aluminum members and panels, and moisture migrating within assembly to exterior.
- E. Install components plumb and true in alignment with established lines and elevations.
- F. Erection Tolerances: Install panel assemblies to comply with the following maximum tolerances:
1. Alignment: Limit offset from true alignment to 1/32 inch (0.8 mm) where surfaces abut in line, edge to edge, at corners, or where a reveal or protruding element separates aligned surfaces by less than 3 inches (76 mm); otherwise, limit offset to 1/8 inch (3.2 mm).
 2. Location and Plane: Limit variation from true location and plane to 1/8 inch in 12 feet (3.2 mm in 3.7 m), but no greater than 1/2 inch (13 mm) over total length.

3.3 FIELD QUALITY CONTROL

- A. Testing Agency: Engage a qualified testing agency to perform tests and inspections.
1. Water-Spray Test: Before installation of interior finishes has begun, panel assemblies shall be tested according to AAMA 501.2 and shall not show evidence of water penetration.
- B. Repair or remove work where test results and inspections indicate that it does not comply with specified requirements.
- C. Additional testing and inspecting, at Contractor's expense, will be performed to determine compliance of replaced or additional work with specified requirements.
- D. Prepare test and inspection reports.

END OF SECTION

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SECTION 08 54 13 - FIBERGLASS WINDOWS

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 fiberglass-framed windows.

1.3 PREINSTALLATION MEETINGS

- A. Preinstallation Conference: Conduct conference at Project site.
 - 1. Review and finalize construction schedule and verify availability of materials, Installer's personnel, equipment, and facilities needed to make progress and avoid delays.
 - 2. Review, discuss, and coordinate the interrelationship of fiberglass windows with other exterior wall components. Include provisions for anchoring, flashing, weeping, sealing perimeters, and protecting finishes.
 - 3. Review and discuss the sequence of work required to construct a watertight and weathertight exterior building envelope.
 - 4. Inspect and discuss the condition of substrate and other preparatory work performed by other trades.

1.4 ACTION SUBMITTALS

- A. Product Data: For each type of product.
 - 1. Include construction details, material descriptions, glazing and fabrication methods, dimensions of individual components and profiles, hardware, and finishes for fiberglass windows.
- B. Shop Drawings: Include plans, elevations, sections, hardware, accessories, insect screens, operational clearances, and details of installation, including anchor, flashing, and sealant installation.
- C. Samples for Verification: For fiberglass windows and components required, prepared on Samples of size indicated below:
 - 1. Exposed Finishes: 2 by 4 inches (50 by 100 mm).
 - 2. Exposed Hardware: Full-size units.
- D. Product Schedule: For fiberglass windows. Use same designations indicated on Drawings.

1.5 INFORMATIONAL SUBMITTALS

- A. Qualification Data: For manufacturer and Installer.
- B. Product Test Reports: For each type of fiberglass window, for tests performed by a qualified testing agency.

- C. Field quality-control reports.
- D. Sample Warranties: For manufacturer's warranties.

1.6 QUALITY ASSURANCE

- A. Manufacturer Qualifications: A manufacturer capable of fabricating fiberglass windows that meet or exceed performance requirements indicated and of documenting this performance by test reports and calculations.
- B. Installer Qualifications: An installer acceptable to fiberglass window manufacturer for installation of units required for this Project.

1.7 WARRANTY

- A. Manufacturer's Warranty: Manufacturer agrees to repair or replace fiberglass windows that fail in materials or workmanship within specified warranty period.
 - 1. Failures include, but are not limited to, the following:
 - a. Failure to meet performance requirements.
 - b. Structural failures including excessive deflection, water leakage, and air infiltration.
 - c. Faulty operation of movable sash and hardware.
 - d. Deterioration of materials and finishes beyond normal weathering.
 - e. Failure of insulating glass.
 - 2. Warranty Period:
 - a. Window: 10 years from date of Substantial Completion.
 - b. Glazing Units: 10 years from date of Substantial Completion.

PART 2 - PRODUCTS

2.1 MANUFACTURERS

- A. Basis-of-Design Product: Subject to compliance with requirements, provide Impervia series fiberglass windows as manufactured by Pella Corporation or a comparable product by one of the following:
 - 1. Alpen High Performance Products.
 - 2. Fibertec Window and Door Manufacturing.
 - 3. Milgard Manufacturing, Inc.
- B. Source Limitations: Obtain fiberglass windows from single source from single manufacturer.

2.2 WINDOW PERFORMANCE REQUIREMENTS

- A. Product Standard: Comply with AAMA/WDMA/CSA 101/I.S.2/A440 for definitions and minimum standards of performance, materials, components, accessories, and fabrication unless more stringent requirements are indicated.
 - 1. Window Certification: WDMA certified with label attached to each window.
- B. Performance Class and Grade: AAMA/WDMA/CSA 101/I.S.2/A440 as follows:
 - 1. Minimum Performance Class: CW.

2. Minimum Performance Grade: 30.
- C. Thermal Transmittance: NFRC 100 maximum whole-window U-factor of 0.32 Btu/sq. ft. x h x deg F (1.83 W/sq. m x K).
- D. Solar Heat-Gain Coefficient (SHGC): NFRC 200 maximum whole-window SHGC of 0.30.

2.3 FIBERGLASS WINDOWS

- A. Operating Types: Provide the following operating types in locations indicated on Drawings:
 1. Casement: Project out.
 2. Fixed.
- B. Frames and Sashes: Pultruded fiberglass complying with AAMA/WDMA/CSA 101/I.S.2/A440 and with exposed exterior fiberglass surfaces finished with manufacturer's standard enamel coating complying with AAMA 613.
 1. Exterior Color: Color selected by Architect from manufacturer's full range.
 2. Interior Finish: Matching exterior color and finish.
- C. Insulating-Glass Units: ASTM E 2190.
 1. Glass: ASTM C 1036, Type 1, Class 1, q3.
 - a. Tint: Clear.
 - b. Kind: Fully tempered.
 2. Lites: Two.
 3. Filling: Fill space between glass lites with argon.
 4. Low-E Coating: Sputtered on second or third surface.
- D. Glazing System: Manufacturer's standard factory-glazing system that produces weathertight seal.
- E. Hardware, General: Provide manufacturer's standard hardware fabricated from aluminum, stainless steel, carbon steel complying with AAMA 907, or other corrosion-resistant material compatible with adjacent materials; designed to smoothly operate, tightly close, and securely lock fiberglass windows, and sized to accommodate sash weight and dimensions.
 1. Exposed Hardware Color and Finish: As selected by Architect from manufacturer's full range.
- F. Projected Window Hardware:
 1. Gear-Type Rotary Operators: Complying with AAMA 901 when tested according to ASTM E 405, Method A. Provide operators that function without requiring the removal of interior screens or using screen wickets.
 - a. Type and Style: As selected by Architect from manufacturer's full range of types and styles.
 2. Hinges: Manufacturer's standard type for sash weight and size indicated.
 3. Single-Handle Locking System: Operates positive-acting arms that pull sash into locked position. Provide one arm on sashes up to 27-1/2 inches (700 mm) tall and two arms on taller sashes.
- G. Weather Stripping: Provide full-perimeter weather stripping for each operable sash unless otherwise indicated.
- H. Fasteners: Noncorrosive and compatible with window members, trim, hardware, anchors, and other components.
 1. Exposed Fasteners: Do not use exposed fasteners to the greatest extent possible. For application of hardware, use fasteners that match finish hardware being fastened.

2.4 INSECT SCREENS

- A. General: Fabricate insect screens to integrate with window frame. Provide screen for each operable exterior sash. Screen wickets are not permitted.
 - 1. Type and Location: Full, inside for project-out sashes.
- B. Aluminum Frames: Manufacturer's standard aluminum alloy complying with SMA 1004 or SMA 1201. Fabricate frames with mitered or coped joints or corner extrusions, concealed fasteners, and removable PVC spline/anchor concealing edge of frame.
 - 1. Tubular Framing Sections and Cross Braces: Roll formed from aluminum sheet.
 - 2. Finish for Interior Screens: Baked-on organic coating in color selected by Architect from manufacturer's full range.
- C. Glass-Fiber Mesh Fabric: 18-by-14 (1.1-by-1.4-mm) or 18-by-16 (1.0-by-1.1-mm) mesh of PVC-coated, glass-fiber threads; woven and fused to form a fabric mesh resistant to corrosion, shrinkage, stretch, impact damage, and weather deterioration. Comply with ASTM D 3656.
 - 1. Mesh Color: Manufacturer's standard.

2.5 FABRICATION

- A. Fabricate fiberglass windows in sizes indicated. Include a complete system for installing and anchoring windows.
- B. Glaze fiberglass windows in the factory.
- C. Weather strip each operable sash to provide weathertight installation.
- D. Complete fabrication, assembly, finishing, hardware application, and other work in the factory to greatest extent possible. Disassemble components only as necessary for shipment and installation. Allow for scribing, trimming, and fitting at Project site.

PART 3 - EXECUTION

3.1 EXAMINATION

- A. Examine openings, substrates, structural support, anchorage, and conditions, with Installer present, for compliance with requirements for installation tolerances and other conditions affecting performance of the Work.
- B. Verify rough opening dimensions, levelness of sill plate, and operational clearances.
- C. Examine wall flashings, vapor retarders, water and weather barriers, and other built-in components to ensure weathertight window installation.
- D. Proceed with installation only after unsatisfactory conditions have been corrected.

3.2 INSTALLATION

- A. Comply with manufacturer's written instructions for installing windows, hardware, accessories, and other components. For installation procedures and requirements not addressed in manufacturer's written instructions, comply with installation requirements in ASTM E 2112.

- B. Install windows level, plumb, square, true to line, without distortion, anchored securely in place to structural support, and in proper relation to wall flashing and other adjacent construction to produce weathertight construction.

3.3 FIELD QUALITY CONTROL

- A. Testing Agency: Engage a qualified testing agency to perform tests and inspections.
 - 1. Testing and inspecting agency will interpret tests and state in each report whether tested work complies with or deviates from requirements.
- B. Testing Services: Testing and inspecting of installed windows shall take place as follows:
 - 1. Testing Methodology: Testing of windows for air infiltration and water resistance shall be performed according to AAMA 502.
 - 2. Air-Infiltration Testing:
 - a. Test Pressure: That required to determine compliance with AAMA/WDMA/CSA 101/I.S.2/A440 performance class indicated.
 - b. Allowable Air-Leakage Rate: 1.5 times the applicable AAMA/WDMA/CSA 101/I.S.2/A440 rate for product type and performance class rounded down to one decimal place.
 - 3. Water-Resistance Testing:
 - a. Test Pressure: Two-thirds times test pressure required to determine compliance with AAMA/WDMA/CSA 101/I.S.2/A440 performance grade indicated.
 - b. Allowable Water Infiltration: No water penetration.
 - 4. Testing Extent: Three windows of each type as selected by Architect and a qualified independent testing and inspecting agency. Windows shall be tested after perimeter sealants have cured.
 - 5. Test Reports: Prepared according to AAMA 502.
- C. Remove and replace noncomplying windows and retest as specified above.
- D. Additional testing and inspecting, at Contractor's expense, will be performed to determine compliance of replaced or additional work with specified requirements.
- E. Prepare test and inspection reports.

3.4 ADJUSTING, CLEANING, AND PROTECTION

- A. Adjust operating sashes and hardware for a tight fit at contact points and weather stripping for smooth operation and weathertight closure.
- B. Clean exposed surfaces immediately after installing windows. Remove excess sealants, glazing materials, dirt, and other substances.
 - 1. Keep protective films and coverings in place until final cleaning.
- C. Remove and replace sashes if glass has been broken, chipped, cracked, abraded, or damaged during construction period.
- D. Protect window surfaces from contact with contaminating substances resulting from construction operations. If contaminating substances do contact window surfaces, remove contaminants immediately according to manufacturer's written instructions.

HAINES MAINTENANCE AND OPERATIONS STATION
PROJECT NO. Z571830000

SECTION 08 54 13
FIBERGLASS WINDOWS

END OF SECTION

SECTION 087100 – DOOR HARDWARE

PART 1 – GENERAL

1.01 SUMMARY

- A. Work under this section includes the complete finish hardware requirements for the project. Quantities listed are for the contractor's convenience only and are not guaranteed. Items not specifically mentioned, but necessary to complete the work shall be furnished, matching the items specified in quality and finish.
- B. Related Sections:
 - 1. Section 08 Hollow Metal Doors and Frames
 - 2. Section 08 Wood Doors
 - 3. Section 08 Aluminum Entrances and Storefronts
 - 4. Section 28 Electronic Security and Safety

1.02 QUALITY ASSURANCE

- A. Product Qualification:
 - 1. To assure a uniform high quality of materials for the project, it is intended that only specified items be furnished. Comparable products may be accepted upon prior approval of architect.
 - 2. Hardware to be new, free of defects, blemishes and excessive play. Obtain each kind of hardware (Mechanical latch and locksets, exit devices, hinges and closers) from one manufacturer except where specified.
 - 3. Fire-Rated opening in compliance with NFPA80. Hardware UL10C/UBC-7-2 (positive pressure) compliant for given type/size opening and degree of label. Provide proper latching hardware, non-flaming door closers, approved bearing hinges and smoke seal. Furnish openings complete.
- B. Supplier Qualifications:
 - 1. Hardware supplier will be a direct factory contract supplier who employs a certified Architectural Hardware Consultant (AHC) available at all reasonable times during the work for project hardware consultation to owner, architect and contractor.
 - 2. Supplier will be responsible for detailing, scheduling and ordering of finish hardware.
 - 3. Conduct pre-installation conference at jobsite. Initiate and conduct with supplier, installer and related trades. Coordinate materials and techniques and sequence complex hardware items and systems installation.
 - 4. Key Conference shall be initiated and conducted with owner to determine system, keyway(s) and structure.
- C. Installer Qualifications:
 - 1. Installer to have not less than 3 years' experience specializing in installation of work in this section. Company must maintain qualified personnel trained and experienced in installing hardware.

1.03 REFERENCES

- A. IBC – International Building Code
- B. NFPA80 – Fire Doors and Windows
- C. NFPA101 – Life Safety Code
- D. NFPA105 – Smoke and Draft Control Door Assemblies
- E. ANSI A117.1 - Accessible and Usable Buildings and Facilities
- F. BHMA – Builders Hardware Manufacturers Association

G. DHI – Door Hardware Institute

1.04 SUBMITTALS

- A. Hardware schedule: Submit digital copies of schedule. Organize vertically formatted schedule into Hardware Sets with index of doors and headings, indicate complete designations of every item required for each door or opening. Include the following:
 - 1. Type, style, function, size, quantity and finish of hardware items.
 - 2. Name, part number and manufacture of each item.
 - 3. Fastenings and other pertinent information.
 - 4. Explanation of abbreviations, symbols and codes contained in schedule.
 - 5. Door and frame sizes, materials and degrees of swing.
- B. Product Data: Submit digital copies for each product indicated.
- C. Templates: Obtain and distribute templates for doors, frames, and other works specified to be prepared for installing door hardware.
- D. Wiring/Riser diagrams: As required for electric hardware indicated.
- E. Maintenance Data: For each type of door hardware to include in maintenance manuals specified in Division 1.
- F. Keying Schedule: Prepared by or under the supervision of supplier, after receipt of the approved finish hardware schedule, detailing Owner's final keying instructions for locks.
- G. Samples: Upon request submit material samples.

1.05 DELIVERY, STORAGE, AND HANDLING

- A. Deliver, store, handle and protect products to project site under provisions of Division 1 and as specified herein.
- B. Tag each item or package separately, with identification related to the final Door Hardware Schedule, and include basic installation instructions with each item or package.
- C. Deliver keys to Owner by registered mail.

1.06 WARRANTY

- A. Special Warranty: Manufacturer's standard form in which manufacturer agrees to repair or replace components of door hardware that fail in materials or workmanship within specified warranty period.
 - 1. Warranty Period: Years from date of Substantial Completion, for durations indicated.

a. Closers:	Thirty years
b. Automatic operators:	Two years
c. Exit Devices, Electrical:	Three years
d. Exit Devices, Mechanical:	Ten years
e. Locksets, Electrical:	Three years
f. Locksets, Mechanical, Cylindrical:	Ten years
g. Locksets, Mechanical, Mortise:	Ten years

1.07 MAINTENANCE

- A. Maintenance tools:
 - 1. Furnish complete set of special tools required for maintenance and adjustment of hardware, including changing of cylinders.

PRODUCTS

1.08 MATERIAL AND FABRICATION

- A. Provide all door hardware for complete work, in accordance with the drawings and as specified herein.
- B. Provide items and quantities not specifically mentioned to ensure a proper and complete operational installation.

1.09 MANUFACTURERS

- A. Approval of products from manufacturers indicated as "Acceptable Manufacturer" is contingent upon those products providing all functions and features and meeting all requirements of scheduled manufacturer's product.

Item	Scheduled Manufacturer	Acceptable Manufacturer
Hinges	Ives (IVE)	Hager, Stanley
Flush Bolts & Coordinators	Ives (IVE)	Burns, Rockwood
Locksets & Deadlocks	Schlage (SCH)	Sargent
Exit Devices & Mullions	Von Duprin (VON)	Sargent
Electric Strikes	Von Duprin (VON)	HES, Folger Adam
Power Supplies	Von Duprin (VON)	Sargent
Cylinders & Keying	Schlage (SCH)	No Substitution
Door Closers	LCN (LCN)	Norton, Sargent
Door Trim	Ives (IVE)	Burns, Rockwood
Protection Plates	Ives (IVE)	Burns, Rockwood
Overhead Stops	Glynn-Johnson (GLY)	Rixson, Sargent
Thresholds & Weatherstrip	NGP	Approval Required

1.10 HANGING

- A. Conventional Hinges: Hinge open width minimum, but of sufficient throw to permit maximum door swing. Steel or stainless-steel pins:
 1. Three hinges per leaf to 7 feet, 6-inch height. Add one for each additional 30 inches in height or any fraction thereof.
 2. Provide standard-weight 4 ½ x 4 ½ for 1 ¾" thick doors up to 3'5". Provide heavy-weight 5 x 4 ½ on doors 36" and over.
 3. Exterior outswing doors to have non removable (NRP) pins.
 4. Pin tips, flat button, finish to match leaves.
 5. Interior doors over 36" – Heavy weight.
 6. Interior doors up to 36" – Standard weight.

1.11 LOCKSETS, LATCHSETS, DEADBOLTS

- A. Heavy Duty Mortise Locks and Latches: Schlage L9000 Series
 1. Provide mortise locks certified as ANSI A156.13, Grade 1 Operational, Grade 1 Security.
 2. Provide lock case that is multi-function and field reversible for handing without opening case, and manufactured from heavy gauge steel, containing components of steel with a zinc dichromate plating for corrosion resistance.
 3. Provide locks with standard 2-3/4 inches (70 mm) backset with full 3/4 inch (19 mm) throw stainless steel mechanical anti-friction latchbolt. Provide deadbolt with full 1 inch (25 mm) throw, constructed of stainless steel.
 4. Provide standard ASA strikes unless extended lip strikes are necessary to protect trim.
 5. Provide electrified options as scheduled in the hardware sets.

6. Lever Trim: Solid brass, bronze, or stainless steel, cast or forged in design specified, with wrought roses and external lever spring cages. Provide thru-bolted levers with 2-piece spindles.
 - a. Lever Design: Schlage 06A

1.12 KEYS, KEYING, AND KEY CONTROL

- A. See Keying Requirements in this section

1.13 CLOSERS

- A. Surface Closers: LCN 4010/4110 Series
 1. Provide door closers conforming to ANSI/BHMA A156.4 Grade 1 requirements by BHMA certified independent testing laboratory. ISO 9000 certify closers. Stamp units with date of manufacture code.
 2. Provide door closers with fully hydraulic, full rack and pinion action with cast aluminum cylinder.
 3. Closer Body: 1-1/2 inch (38 mm) diameter with 11/16 inch (17 mm) diameter heat-treated pinion journal and full complement bearings.
 4. Hydraulic Fluid: Fireproof, passing requirements of UL10C, and all weather requiring no seasonal closer adjustment for temperatures ranging from 120 degrees F to -30 degrees F.
 5. Spring Power: Continuously adjustable over full range of closer sizes, and providing reduced opening force as required by accessibility codes and standards.
 6. Hydraulic Regulation: By tamper-proof, non-critical valves, with separate adjustment for latch speed, general speed, and back check.
 7. Pressure Relief Valve (PRV) Technology: Not permitted.
 8. Provide stick on templates, special templates, drop plates, mounting brackets, or adapters for arms as required for details, overhead stops, and other door hardware items interfering with closer mounting.

1.14 OTHER HARDWARE

- A. Door stops: Provide stops to protect walls, casework or other hardware.
 1. Except as otherwise indicated, provide stops (wall, floor or overhead) at each leaf of every swinging door leaf.
 2. Where wall or floor stops are not appropriate, provide overhead holders.
- B. Weatherstrip and Gasket
 1. Provide continuous weather-strip gasketing on exterior doors and provide smoke, light, or sound gasketing on interior doors where indicated or scheduled.
 2. Provide non-corrosive fasteners as recommended by the manufacturer for application indicated.
- C. Thresholds
 1. Except as otherwise indicated, provide standard metal threshold unit of type, size and profile as detailed or scheduled.
- D. Silencers
 1. Interior hollow metal frames, 3 for single doors, 2 for pairs of doors.
- E. Kickplates
 1. Four beveled edges, .050 inches minimum thickness, height and width as scheduled. Sheet-metal screws of bronze or stainless steel to match other hardware.

1.15 HARDWARE FINISH

- A. Provide the following finishes unless noted differently in hardware groups:

Hinges	630 Stainless Steel Exterior, 652 Dull Chrome Interior
Locksets	626 Dull Chrome
Exit Devices	626 Dull Chrome
Closers	689 Aluminum
Kickplates	630 Stainless Steel
Other Hardware	626 Dull Chrome

Thresholds	Aluminum
Weatherstrip/Sweeps	Aluminum

1.16 KEYING REQUIREMENTS

- A. All keyed cylinders shall be subject to a new Schlage Masterkey system.
- B. Provide a factory registered keying system, complying with guidelines in ANSI/BHMA A156.28, incorporating decisions made at keying conference.
- C. Cylinders to be furnished with visual key control with key code. Stamped on the face of the keys and marked on the back or side of the cylinders.
- D. Initiate and conduct key conference with Owner to determine correct keyway(s) and structure. Owners written approval required prior to ordering product.
- E. Key Quantities
 - 6 EA Master Keys
 - 4 EA Control Keys
 - 2 EA Construction Control Keys
 - 10 EA Construction Keys
 - 3 EA Change Keys per keyed alike group

EXECUTION

1.17 PREPARATION

- A. Ensure that walls and frames are square and plumb before hardware installation.
- B. Locate hardware per SDI-100 and applicable building, fire, life-safety, accessibility, and security codes. Notify Architect of any code conflicts before ordering materials.

1.18 INSTALLATION

- A. Do not install surface mounted items until finishes have been completed on substrate. Set units level, plumb and true to line and location. Adjust and reinforce attachment substrate for proper installation and operation.
- B. Locate floor stops not more than 4 inches from the wall.
- C. Drill pilot holes for fasteners in wood doors and/or frames.

1.19 ADJUSTING

- A. Initial Adjustment: Adjust and check each operating item of door hardware and each door to ensure proper operation or function of every unit. Replace units that cannot be adjusted to operate as intended. Adjust door control devices to compensate for final operation of heating and ventilating equipment and to comply with referenced accessibility requirements.
- B. Occupancy Adjustment: Approximately three to six months after date of Substantial Completion, Installer's Architectural Hardware Consultant must examine and readjust each item of door hardware, including adjusting operating forces, as necessary to ensure function of doors and door hardware.

1.20 DEMONSTRATION

- A. Demonstrate electrical, electronic and pneumatic hardware system including adjustment and maintenance procedures.

1.21 PROTECTION/CLEANING


- A. Cover installed hardware, protect from paint, cleaning agents, weathering, carts/barrows, etc. Remove covering materials and clean hardware just prior to substantial completion. Clean adjacent wall, frame and door surfaces soiled from installation/reinstallation process.

1.22 DOOR HARDWARE SCHEDULE









- A. The intent of the hardware specification is to specify the hardware for interior and exterior doors, and to establish a type, continuity, and standard of quality. However, it is the door hardware supplier's responsibility to thoroughly review existing conditions, schedules, specifications, drawings, and other Contract Documents to verify the suitability of the hardware specified.
- B. Discrepancies, conflicting hardware, and missing items are to be brought to the attention of the architect with corrections made prior to the bidding process. Omitted items not included in a hardware set should be scheduled with the appropriate additional hardware required for proper application.
- C. Hardware items are referenced in the following hardware schedule. Refer to the above specifications for special features, options, cylinders/keying, and other requirements.

1.23 HARDWARE SETS:









HW SET: 00

1	EA	PADLOCK L/CYL-FSIC	KS43F3200 IF REQ'D		606	SCH
1	EA	FSIC CORE	23-030 NO 087100 SCOPE		626	SCH







HW SET: 01

3	EA	HINGE	5BB1 4.5 X 4.5 NRP		630	IVE
1	EA	STOREROOM LOCK	L9080R 06A		626	SCH
1	EA	SURFACE CLOSER	4111 SCUSH ST-1586		689	LCN
1	EA	KICK PLATE	8400 10" X 2" LDW B-CS BAA		630	IVE
1	EA	DRIP CAP	16A BAA		AL	NGP
1	SET	SEALS	706A BAA		AL	NGP
1	EA	DOOR SWEEP	C627A BAA		AL	NGP
1	EA	THERMAL BREAK THRESHOLD	8425A BAA		AL	NGP

HW SET: 01A


























3	EA	HINGE	5BB1 4.5 X 4.5 NRP		630	IVE
1	EA	STOREROOM LOCK	L9080R 06A		626	SCH
1	EA	SURFACE CLOSER	4111 SCUSH SRI ST-1586		689	LCN
1	EA	KICK PLATE	8400 10" X 2" LDW B-CS BAA		630	IVE
1	EA	DRIP CAP	16A BAA		AL	NGP
1	SET	SEALS	706A BAA		AL	NGP
1	EA	DOOR SWEEP	C627A BAA		AL	NGP
1	EA	THERMAL BREAK THRESHOLD	8425A BAA		AL	NGP

HW SET: 02

3	EA	HINGE	5BB1 4.5 X 4.5		652	IVE
1	EA	PRIVACY INDICATOR LOCK	L9056R 06A 09-544 L283-722		626	SCH
1	EA	SURFACE CLOSER	4011		689	LCN
1	EA	KICK PLATE	8400 10" X 2" LDW B-CS BAA		630	IVE
1	EA	MOP PLATE	8400 4" X 1" LDW B-CS BAA		630	IVE
1	EA	WALL STOP	WS406/407CCV TAIWAN		630	IVE






HAINES MAINTENANCE AND OPERATIONS STATION
PROJECT NO. Z571830000

SECTION 08 71 00
DOOR HARDWARE







1	EA	GASKETING	5050C BAA		BK	NGP
HW SET: 03A						
6	EA	HINGE	5BB1HW 5 X 4.5		652	IVE
1	SET	CONST LATCHING BOLT	FB51P BAA		630	IVE
1	EA	DUST PROOF STRIKE	DP2 TAIWAN		626	IVE
1	EA	STOREROOM LOCK	L9080R 06A		626	SCH
1	EA	COORDINATOR	COR X FL BAA		628	IVE
2	EA	OH STOP	100S BAA		630	GLY
2	EA	SURFACE CLOSER	4011 ST-1544 X 4020-18		689	LCN
2	EA	PROTECTION PLATE	8400 10" X 1" LDW B-CS BAA		630	IVE
1	EA	GASKETING	5050C BAA		BK	NGP
HW SET: 03W						
6	EA	HINGE	5BB1HW 5 X 4.5		652	IVE
1	SET	CONST LATCHING BOLT	FB51P BAA		630	IVE
1	EA	DUST PROOF STRIKE	DP2 TAIWAN		626	IVE
1	EA	STOREROOM LOCK	L9080R 06A		626	SCH
1	EA	COORDINATOR	COR X FL BAA		628	IVE
1	EA	OH STOP	100S BAA		630	GLY
1	EA	SURFACE CLOSER	4011		689	LCN
1	EA	SURFACE CLOSER	4011 ST-1544 X 4020-18		689	LCN
2	EA	PROTECTION PLATE	8400 10" X 1" LDW B-CS BAA		630	IVE
1	EA	WALL STOP	WS406/407CCV TAIWAN		630	IVE
1	EA	GASKETING	5050C BAA		BK	NGP
HW SET: 04						
3	EA	HINGE	5BB1 4.5 X 4.5		652	IVE
1	EA	OFFICE/ENTRY LOCK	L9050R 06A 09-544		626	SCH
1	EA	WALL STOP	WS406/407CCV TAIWAN		630	IVE
1	EA	GASKETING	5050C BAA		BK	NGP
HW SET: 05A						

HAINES MAINTENANCE AND OPERATIONS STATION
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SECTION 08 71 00
DOOR HARDWARE

3	EA	HINGE	5BB1HW 5 X 4.5		652	IVE
1	EA	STOREROOM LOCK	L9080R 06A		626	SCH
1	EA	SURFACE CLOSER	4111 SCUSH		689	LCN
1	EA	KICK PLATE	8400 10" X 2" LDW B-CS BAA		630	IVE
1	EA	GASKETING	5050C BAA		BK	NGP







HW SET: 05W

3	EA	HINGE	5BB1HW 5 X 4.5		652	IVE
1	EA	STOREROOM LOCK	L9080R 06A		626	SCH
1	EA	SURFACE CLOSER	4011		689	LCN
1	EA	KICK PLATE	8400 10" X 2" LDW B-CS BAA		630	IVE
1	EA	WALL STOP	WS406/407CCV TAIWAN		630	IVE
1	EA	GASKETING	5050C BAA		BK	NGP




HW SET: 06

3	EA	HINGE	5BB1 4.5 X 4.5 NRP		630	IVE
1	EA	CLASSROOM LOCK	L9070R 06A		626	SCH
1	EA	SURFACE CLOSER	4111 SCUSH		689	LCN
1	EA	KICK PLATE	8400 10" X 2" LDW B-CS BAA		630	IVE
1	EA	GASKETING	5050C BAA		BK	NGP
1	EA	THRESHOLD	513 BAA		AL	NGP

HW SET: 07

3	EA	HINGE	5BB1 4.5 X 4.5		652	IVE
1	EA	PASSAGE SET	L9010 06A		626	SCH
1	EA	SURFACE CLOSER	4011		689	LCN
1	EA	KICK PLATE	8400 10" X 2" LDW B-CS BAA		630	IVE
1	EA	WALL STOP	WS406/407CCV TAIWAN		630	IVE
1	EA	GASKETING	5050C BAA		BK	NGP

HW SET: 07A

3	EA	HINGE	5BB1 4.5 X 4.5		652	IVE
1	EA	PASSAGE SET	L9010 06A		626	SCH
1	EA	WALL STOP	WS406/407CCV TAIWAN		630	IVE

HAINES MAINTENANCE AND OPERATIONS STATION
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SECTION 08 71 00
DOOR HARDWARE

1	EA	GASKETING	5050C BAA		BK	NGP
HW SET: 08						
6	EA	HINGE	5BB1 4.5 X 4.5 NRP		652	IVE
1	SET	AUTO FLUSH BOLT	FB31P		630	IVE
1	EA	DUST PROOF STRIKE	DP2 TAIWAN		626	IVE
1	EA	CLASSROOM LOCK	L9070R 06A		626	SCH
1	EA	COORDINATOR	COR X FL BAA		628	IVE
2	EA	MOUNTING BRACKET	MB TAIWAN		689	IVE
2	EA	SURFACE CLOSER	4111 SCUSH ST-1496		689	LCN
2	EA	PROTECTION PLATE	8400 10" X 1" LDW B-CS BAA		630	IVE
1	EA	GASKETING	5050C BAA		BK	NGP

END OF SECTION

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SECTION 08 80 00 - GLAZING

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. Glass for windows, doors, interior borrowed lites.
 - 2. Glazing sealants and accessories.
- B. Related Requirements:
 - 1. Division 07 Section "Joint Sealants" for sealants at openings not specified in this Section.
 - 2. Division 08 Section "Mirrors."
 - 3. Division 08 Section "Fiberglass Windows".
 - 4. Division 08 Section "Hollow Metal Doors and Frames".
 - 5. Division 08 Section "Sectional Doors" for lites in sectional doors.

1.3 DEFINITIONS

- A. Glass Manufacturers: Firms that produce primary glass, fabricated glass, or both, as defined in referenced glazing publications.
- B. Glass Thicknesses: Indicated by thickness designations in millimeters according to ASTM C 1036.
- C. IBC: International Building Code.
- D. Interspace: Space between lites of an insulating-glass unit.

1.4 COORDINATION

- A. Coordinate glazing channel dimensions to provide necessary bite on glass, minimum edge and face clearances, and adequate sealant thicknesses, with reasonable tolerances.

1.5 PREINSTALLATION MEETINGS

- A. Preinstallation Conference: Conduct conference at Project site.
 - 1. Review and finalize construction schedule and verify availability of materials, Installer's personnel, equipment, and facilities needed to make progress and avoid delays.
 - 2. Review temporary protection requirements for glazing during and after installation.

1.6 ACTION SUBMITTALS

- A. Product Data: For each type of product.
- B. Glass Samples: For each type of the following products; 12 inches (300 mm) square.
 - 1. Insulating glass.
 - 2. Fully tempered safety glass.
- C. Glazing Accessory Samples: For sealants, in 12-inch (300-mm) lengths.
- D. Glazing Schedule: List glass types and thicknesses for each size opening and location. Use same designations indicated on Drawings.
- E. Delegated-Design Submittal: For glass indicated to comply with performance requirements and design criteria, including analysis data signed and sealed by the qualified professional engineer responsible for their preparation.

1.7 INFORMATIONAL SUBMITTALS

- A. Qualification Data: For Installer.
- B. Product Certificates: For glass.
- C. Product Test Reports: For insulating glass and glazing sealants, for tests performed by a qualified testing agency.
- D. Preconstruction adhesion and compatibility test report.
- E. Sample Warranties: For special warranties.

1.8 QUALITY ASSURANCE

- A. Manufacturer Qualifications for Insulating-Glass Units with Sputter-Coated, Low-E Coatings: A qualified insulating-glass manufacturer who is approved by coated-glass manufacturer.
- B. Installer Qualifications: A qualified installer who employs glass installers for this Project who are certified under the National Glass Association's Certified Glass Installer Program.
- C. Glass Testing Agency Qualifications: A qualified independent testing agency accredited according to the NFRC CAP 1 Certification Agency Program.
- D. Sealant Testing Agency Qualifications: An independent testing agency qualified according to ASTM C 1021 to conduct the testing indicated.

1.9 DELIVERY, STORAGE, AND HANDLING

- A. Protect glazing materials according to manufacturer's written instructions. Prevent damage to glass and glazing materials from condensation, temperature changes, direct exposure to sun, or other causes.
- B. Comply with insulating-glass manufacturer's written instructions for venting and sealing units to avoid hermetic seal ruptures due to altitude change.

1.10 FIELD CONDITIONS

- A. Environmental Limitations: Do not proceed with glazing when ambient and substrate temperature conditions are outside limits permitted by glazing material manufacturers and when glazing channel substrates are wet from rain, frost, condensation, or other causes.
 - 1. Do not install glazing sealants when ambient and substrate temperature conditions are outside limits permitted by sealant manufacturer or are below 40 deg F (4.4 deg C).

1.11 WARRANTY

- A. Manufacturer's Special Warranty for Insulating Glass: Manufacturer agrees to replace insulating-glass units that deteriorate within specified warranty period. Deterioration of insulating glass is defined as failure of hermetic seal under normal use that is not attributed to glass breakage or to maintaining and cleaning insulating glass contrary to manufacturer's written instructions. Evidence of failure is the obstruction of vision by dust, moisture, or film on interior surfaces of glass.
 - 1. Warranty Period: 10 years from date of Substantial Completion.

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. Hartung Glass Industries;
 - 2. Oldcastle BuildingEnvelope™;
 - 3. PPG Industries, Inc.;
- B. Source Limitations for Glass: Obtain from single source from single manufacturer for each glass type.
- C. Source Limitations for Glazing Accessories: Obtain from single source from single manufacturer for each product and installation method.

2.2 PERFORMANCE REQUIREMENTS

- A. General: Installed glazing systems shall withstand normal thermal movement and wind and impact loads (where applicable) without failure, including loss or glass breakage attributable to the following: defective manufacture, fabrication, or installation; failure of sealants or gaskets to remain watertight and airtight; deterioration of glazing materials; or other defects in construction.
- B. Delegated Design: Engage a qualified professional engineer, as defined in Section 014000 "Quality Requirements," to design glazing.
- C. Structural Performance: Glazing shall withstand the following design loads within limits and under conditions indicated determined according to the IBC and ASTM E 1300.
 - 1. Design Wind Pressures: As indicated on Drawings.
 - 2. Design Snow Loads: As indicated on Drawings.
 - 3. Thickness of Patterned Glass: Base design of patterned glass on thickness at thinnest part of the glass.
 - 4. Maximum Lateral Deflection: For glass supported on all four edges, limit center-of-glass deflection at design wind pressure to not more than 1/50 times the short-side length or 1 inch (25 mm), whichever is less.

5. Differential Shading: Design glass to resist thermal stresses induced by differential shading within individual glass lites.
- D. Safety Glazing: Where safety glazing is indicated, provide glazing that complies with 16 CFR 1201, Category II.
 1. Safety glazing shall be provided in locations designated as hazardous under Section 2406 of the International Building Code, including glazing in swinging doors and fixed or operable panels adjacent to a door where the nearest exposed edge of the glazing is within a 24-inch arc of either vertical edge of the door in a closed position and where the bottom exposed edge of the glazing is less than 60 inches above the walking surface..
- E. Thermal and Optical Performance Properties: Provide glass with performance properties specified, as indicated in manufacturer's published test data, based on procedures indicated below:
 1. For monolithic-glass lites, properties are based on units with lites 6 mm thick.
 2. For insulating-glass units, properties are based on units of thickness indicated for overall unit and for each lite.
 3. U-Factors: Center-of-glazing values, according to NFRC 100 and based on LBL's WINDOW 5.2 computer program, expressed as Btu/sq. ft. x h x deg F (W/sq. m x K).
 4. Solar Heat-Gain Coefficient and Visible Transmittance: Center-of-glazing values, according to NFRC 200 and based on LBL's WINDOW 5.2 computer program.
 5. Visible Reflectance: Center-of-glazing values, according to NFRC 300.

2.3 GLASS PRODUCTS, GENERAL

- A. Glazing Publications: Comply with published recommendations of glass product manufacturers and organizations below unless more stringent requirements are indicated. See these publications for glazing terms not otherwise defined in this Section or in referenced standards.
 1. IGMA Publication for Insulating Glass: SIGMA TM-3000, "North American Glazing Guidelines for Sealed Insulating Glass Units for Commercial and Residential Use."
- B. Safety Glazing Labeling: Where safety glazing is indicated, permanently mark glazing with certification label of the SGCC or another certification agency acceptable to authorities having jurisdiction. Label shall indicate manufacturer's name, type of glass, thickness, and safety glazing standard with which glass complies.
- C. Insulating-Glass Certification Program: Permanently marked either on spacers or on at least one component lite of units with appropriate certification label of IGCC.
- D. Thickness: Where glass thickness is indicated, it is a minimum. Provide glass that complies with performance requirements and is not less than the thickness indicated.
 1. Minimum Glass Thickness for Exterior Lites: 6 mm.
- E. Strength: Where annealed float glass is indicated, provide annealed float glass, heat-strengthened float glass, or fully tempered float glass as needed to comply with "Performance Requirements" Article. Where heat-strengthened float glass is indicated, provide heat-strengthened float glass or fully tempered float glass as needed to comply with "Performance Requirements" Article. Where fully tempered float glass is indicated, provide fully tempered float glass.

2.4 GLASS PRODUCTS

- A. Clear Annealed Float Glass: ASTM C 1036, Type I, Class 1 (clear), Quality-Q3.

- B. Fully Tempered Float Glass: ASTM C 1048, Kind FT (fully tempered), Condition A (uncoated) unless otherwise indicated, Type I, Class 1 (clear) Quality-Q3.

2.5 INSULATING GLASS

- A. Insulating-Glass Units: Factory-assembled units consisting of sealed lites of glass separated by a dehydrated interspace, qualified according to ASTM E 2190.
 - 1. Sealing System: Dual seal, with manufacturer's standard polyisobutylene and polysulfide primary and secondary sealants.
 - 2. Spacer: Manufacturer's standard spacer material and construction.
 - 3. Desiccant: Molecular sieve or silica gel, or a blend of both.

2.6 GLAZING SEALANTS

- A. General:
 - 1. Compatibility: Compatible with one another and with other materials they contact, including glass products, seals of insulating-glass units, and glazing channel substrates, under conditions of service and application, as demonstrated by sealant manufacturer based on testing and field experience.
 - 2. Suitability: Comply with sealant and glass manufacturers' written instructions for selecting glazing sealants suitable for applications indicated and for conditions existing at time of installation.
 - 3. Field-applied sealants shall have a VOC content of not more than 250 g/L.
 - 4. Sealants shall comply with the testing and product requirements of the California Department of Public Health's (formerly, the California Department of Health Services) "Standard Method for the Testing and Evaluation of Volatile Organic Chemical Emissions from Indoor Sources Using Environmental Chambers."
 - 5. Colors of Exposed Glazing Sealants: As selected by Architect from manufacturer's full range.
- B. Glazing Sealant: Neutral-curing silicone glazing sealant complying with ASTM C 920, Type S, Grade NS, Class 100/50, Use NT.
 - 1. Products: Subject to compliance with requirements, available products that may be incorporated into the Work include, but are not limited to the following:
 - a. Dow Corning Corporation;
 - b. GE Construction Sealants; Momentive Performance Materials Inc.;
 - c. Pecora Corporation;
 - d. Sika Corporation;
 - 2. Applications: At exterior windows, typical.

2.7 GLAZING TAPES

- A. Back-Bedding Mastic Glazing Tapes: Preformed, butyl-based, 100 percent solids elastomeric tape; nonstaining and nonmigrating in contact with nonporous surfaces; with or without spacer rod as recommended in writing by tape and glass manufacturers for application indicated; and complying with ASTM C 1281 and AAMA 800 for products indicated below:
 - 1. AAMA 804.3 tape, where indicated.
 - 2. AAMA 806.3 tape, for glazing applications in which tape is subject to continuous pressure.
 - 3. AAMA 807.3 tape, for glazing applications in which tape is not subject to continuous pressure.
- B. Expanded Cellular Glazing Tapes: Closed-cell, PVC foam tapes; factory coated with adhesive on both surfaces; and complying with AAMA 800 for the following types:

1. AAMA 810.1, Type 1, for glazing applications in which tape acts as the primary sealant.
2. AAMA 810.1, Type 2, for glazing applications in which tape is used in combination with a full bead of liquid sealant.

2.8 MISCELLANEOUS GLAZING MATERIALS

- A. General: Provide products of material, size, and shape complying with referenced glazing standard, with requirements of manufacturers of glass and other glazing materials for application indicated, and with a proven record of compatibility with surfaces contacted in installation.
- B. Cleaners, Primers, and Sealers: Types recommended by sealant or gasket manufacturer.
- C. Setting Blocks: Elastomeric material with a Shore, Type A durometer hardness of 85, plus or minus 5.
- D. Spacers: Elastomeric blocks or continuous extrusions of hardness required by glass manufacturer to maintain glass lites in place for installation indicated.
- E. Edge Blocks: Elastomeric material of hardness needed to limit glass lateral movement (side walking).
- F. Cylindrical Glazing Sealant Backing: ASTM C 1330, Type O (open-cell material), of size and density to control glazing sealant depth and otherwise produce optimum glazing sealant performance.

2.9 FABRICATION OF GLAZING UNITS

- A. Fabricate glazing units in sizes required to fit openings indicated for Project, with edge and face clearances, edge and surface conditions, and bite complying with written instructions of product manufacturer and referenced glazing publications, to comply with system performance requirements.
 1. Allow for thermal movements from ambient and surface temperature changes acting on glass framing members and glazing components.
 - a. Temperature Change: 120 deg F (67 deg C), ambient; 180 deg F (100 deg C), material surfaces.
- B. Clean-cut or flat-grind vertical edges of butt-glazed monolithic lites to produce square edges with slight chamfers at junctions of edges and faces.
- C. Grind smooth and polish exposed glass edges and corners.

PART 3 - EXECUTION

3.1 EXAMINATION

- A. Examine framing, glazing channels, and stops, with Installer present, for compliance with the following:
 1. Manufacturing and installation tolerances, including those for size, squareness, and offsets at corners.
 2. Presence and functioning of weep systems.
 3. Minimum required face and edge clearances.
 4. Effective sealing between joints of glass-framing members.
- B. Proceed with installation only after unsatisfactory conditions have been corrected.

3.2 PREPARATION

- A. Clean glazing channels and other framing members receiving glass immediately before glazing. Remove coatings not firmly bonded to substrates.
- B. Examine glazing units to locate exterior and interior surfaces. Label or mark units as needed so that exterior and interior surfaces are readily identifiable. Do not use materials that leave visible marks in the completed Work.

3.3 GLAZING, GENERAL

- A. Comply with combined written instructions of manufacturers of glass, sealants, gaskets, and other glazing materials, unless more stringent requirements are indicated, including those in referenced glazing publications.
- B. Protect glass edges from damage during handling and installation. Remove damaged glass from Project site and legally dispose of off Project site. Damaged glass includes glass with edge damage or other imperfections that, when installed, could weaken glass, impair performance, or impair appearance.
- C. Apply primers to joint surfaces where required for adhesion of sealants, as determined by preconstruction testing.
- D. Install setting blocks in sill rabbets, sized and located to comply with referenced glazing publications, unless otherwise required by glass manufacturer. Set blocks in thin course of compatible sealant suitable for heel bead.
- E. Do not exceed edge pressures stipulated by glass manufacturers for installing glass lites.
- F. Provide spacers for glass lites where length plus width is larger than 50 inches (1270 mm).
 - 1. Locate spacers directly opposite each other on both inside and outside faces of glass. Install correct size and spacing to preserve required face clearances, unless gaskets and glazing tapes are used that have demonstrated ability to maintain required face clearances and to comply with system performance requirements.
 - 2. Provide 1/8-inch (3-mm) minimum bite of spacers on glass and use thickness equal to sealant width. With glazing tape, use thickness slightly less than final compressed thickness of tape.
- G. Provide edge blocking where indicated or needed to prevent glass lites from moving sideways in glazing channel, as recommended in writing by glass manufacturer and according to requirements in referenced glazing publications.
- H. Set glass lites in each series with uniform pattern, draw, bow, and similar characteristics.
- I. Set glass lites with proper orientation so that coatings face exterior or interior as specified.
- J. Where wedge-shaped gaskets are driven into one side of channel to pressurize sealant or gasket on opposite side, provide adequate anchorage so gasket cannot walk out when installation is subjected to movement.
- K. Square cut wedge-shaped gaskets at corners and install gaskets in a manner recommended by gasket manufacturer to prevent corners from pulling away; seal corner joints and butt joints with sealant recommended by gasket manufacturer.

3.4 TAPE GLAZING

- A. Position tapes on fixed stops so that, when compressed by glass, their exposed edges are flush with or protrude slightly above sightline of stops.
- B. Install tapes continuously, but not necessarily in one continuous length. Do not stretch tapes to make them fit opening.
- C. Cover vertical framing joints by applying tapes to heads and sills first, then to jambs. Cover horizontal framing joints by applying tapes to jambs, then to heads and sills.
- D. Place joints in tapes at corners of opening with adjoining lengths butted together, not lapped. Seal joints in tapes with compatible sealant approved by tape manufacturer.
- E. Do not remove release paper from tape until right before each glazing unit is installed.
- F. Apply heel bead of elastomeric sealant.
- G. Center glass lites in openings on setting blocks, and press firmly against tape by inserting dense compression gaskets formed and installed to lock in place against faces of removable stops. Start gasket applications at corners and work toward centers of openings.
- H. Apply cap bead of elastomeric sealant over exposed edge of tape.

3.5 GASKET GLAZING (DRY)

- A. Cut compression gaskets to lengths recommended by gasket manufacturer to fit openings exactly, with allowance for stretch during installation.
- B. Insert soft compression gasket between glass and frame or fixed stop so it is securely in place with joints miter cut and bonded together at corners.
- C. Installation with Drive-in Wedge Gaskets: Center glass lites in openings on setting blocks, and press firmly against soft compression gasket by inserting dense compression gaskets formed and installed to lock in place against faces of removable stops. Start gasket applications at corners and work toward centers of openings. Compress gaskets to produce a weathertight seal without developing bending stresses in glass. Seal gasket joints with sealant recommended by gasket manufacturer.
- D. Installation with Pressure-Glazing Stops: Center glass lites in openings on setting blocks, and press firmly against soft compression gasket. Install dense compression gaskets and pressure-glazing stops, applying pressure uniformly to compression gaskets. Compress gaskets to produce a weathertight seal without developing bending stresses in glass. Seal gasket joints with sealant recommended by gasket manufacturer.
- E. Install gaskets so they protrude past face of glazing stops.

3.6 SEALANT GLAZING (WET)

- A. Install continuous spacers, or spacers combined with cylindrical sealant backing, between glass lites and glazing stops to maintain glass face clearances and to prevent sealant from extruding into glass channel and blocking weep systems until sealants cure. Secure spacers or spacers and backings in place and in position to control depth of installed sealant relative to edge clearance for optimum sealant performance.

- B. Force sealants into glazing channels to eliminate voids and to ensure complete wetting or bond of sealant to glass and channel surfaces.
- C. Tool exposed surfaces of sealants to provide a substantial wash away from glass.

3.7 CLEANING AND PROTECTION

- A. Immediately after installation remove nonpermanent labels and clean surfaces.
- B. Protect glass from contact with contaminating substances resulting from construction operations. Examine glass surfaces adjacent to or below exterior concrete and other masonry surfaces at frequent intervals during construction, but not less than once a month, for buildup of dirt, scum, alkaline deposits, or stains.
 - 1. If, despite such protection, contaminating substances do come into contact with glass, remove substances immediately as recommended in writing by glass manufacturer. Remove and replace glass that cannot be cleaned without damage to coatings.
- C. Remove and replace glass that is damaged during construction period.
- D. Wash glass on both exposed surfaces not more than four days before date scheduled for inspections that establish date of Substantial Completion. Wash glass as recommended in writing by glass manufacturer.

3.8 MONOLITHIC GLASS SCHEDULE

- A. Glass Type GL1: Clear fully tempered float glass.
 - 1. Minimum Thickness: 6 mm.
 - 2. Safety glazing required.

3.9 INSULATING GLASS SCHEDULE

- A. Glass Type GL-2: Low-E-coated, clear insulating glass.
 - 1. Overall Unit Thickness: 1 inch (25 mm).
 - 2. Minimum Thickness of Each Glass Lite: 3 mm.
 - 3. Outdoor Lite: Annealed float glass.
 - 4. Interspace Content: Argon.
 - 5. Indoor Lite: Annealed float glass.
 - 6. Low-E Coating: Pyrolytic or sputtered on second or third surface.

END OF SECTION

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SECTION 08 83 00 - MIRRORS

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 the following types of silvered flat glass mirrors:
 - 1. Annealed monolithic glass mirrors.
- B. Related Requirements:
 - 1. Division 08 Section "Glazing" for glass used for vision lites.
 - 2. Division 10 Section "Toilet, Bath, and Laundry Accessories" for other restroom accessories.

1.3 ACTION SUBMITTALS

- A. Product Data: For each type of product.
 - 1. Mirrors. Include description of materials and process used to produce each type of silvered flat glass mirror specified that indicates sources of glass, glass coating components, edge sealer, and quality-control provisions.
- B. Shop Drawings: Include mirror elevations, edge details, mirror hardware, and attachment details.
- C. Samples: For each type of the following:
 - 1. Mirrors: 12 inches (300 mm) square, including edge treatment on two adjoining edges.
 - 2. Mirror Clips: Full size.

1.4 INFORMATIONAL SUBMITTALS

- A. Qualification Data: For Installer.
- B. Product Certificates: For each type of mirror and mirror mastic.
- C. Preconstruction Test Reports: From mirror manufacturer indicating that mirror mastic was tested for compatibility and adhesion with mirror backing and substrates on which mirrors are installed.
- D. Sample Warranty: For special warranty.

1.5 CLOSEOUT SUBMITTALS

- A. Maintenance Data: For mirrors to include in maintenance manuals.

1.6 QUALITY ASSURANCE

- A. Installer Qualifications: A qualified installer who employs glass installers for this Project who are certified under the National Glass Association's Certified Glass Installer Program.

1.7 PRECONSTRUCTION TESTING

- A. Preconstruction Mirror Mastic Compatibility Test: Submit mirror mastic products to mirror manufacturer for testing to determine compatibility of mastic with mirror backing.
 - 1. Testing is not required if data are submitted based on previous testing of mirror mastic products and mirror backing matching those submitted.

1.8 DELIVERY, STORAGE, AND HANDLING

- A. Protect mirrors according to mirror manufacturer's written instructions and as needed to prevent damage to mirrors from moisture, condensation, temperature changes, direct exposure to sun, or other causes.
- B. Comply with mirror manufacturer's written instructions for shipping, storing, and handling mirrors as needed to prevent deterioration of silvering, damage to edges, and abrasion of glass surfaces and applied coatings. Store indoors.

1.9 FIELD CONDITIONS

- A. Environmental Limitations: Do not install mirrors until ambient temperature and humidity conditions are maintained at levels indicated for final occupancy.

1.10 WARRANTY

- A. Special Warranty: Manufacturer agrees to replace mirrors that deteriorate within specified warranty period. Deterioration of mirrors is defined as defects developed from normal use that are not attributed to mirror breakage or to maintaining and cleaning mirrors contrary to manufacturer's written instructions. Defects include discoloration, black spots, and clouding of the silver film.
 - 1. Warranty Period: Five years from date of Substantial Completion.

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. Avalon Glass and Mirror Company.
 - 2. D & W Incorporated.
 - 3. Guardian Industries Corp.; SunGuard.
- B. Source Limitations for Mirrors: Obtain mirrors from single source from single manufacturer.
- C. Source Limitations for Mirror Accessories: Obtain mirror glazing accessories from single source.

2.2 SILVERED FLAT GLASS MIRRORS

- A. Mirrors, General: ASTM C 1503; manufactured using copper-free, low-lead mirror coating process.
- B. Annealed Monolithic Glass Mirrors: Mirror Select Quality, ultraclear (low-iron) float glass with a minimum 91 percent visible light transmission.
 - 1. Nominal Thickness: 6.0 mm.
- C. Mirror Unit Sizes: As indicated on the Drawings.

2.3 MISCELLANEOUS MATERIALS

- A. Setting Blocks: Elastomeric material with a Shore, Type A durometer hardness of 85, plus or minus 5.
- B. Edge Sealer: Coating compatible with glass coating and approved by mirror manufacturer for use in protecting against silver deterioration at mirrored glass edges.
- C. Mirror Mastic: An adhesive setting compound, asbestos-free, produced specifically for setting mirrors and certified by both mirror and mastic manufacturer as compatible with glass coating and substrates on which mirrors will be installed.
 - 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. Franklin International.
 - b. Laurence, C. R. Co., Inc.
 - c. Liquid Nails Adhesive.
 - d. Pecora Corporation.
 - 2. Adhesive shall have a VOC content of 70 g/L or less.

2.4 MIRROR HARDWARE

- A. Top and Bottom Aluminum J-Channels: Aluminum extrusions with a return deep enough to produce a glazing channel to accommodate mirrors of thickness indicated and in lengths required to cover edges of mirrors in a single piece.
 - 1. Bottom and Side Trim: J-channels formed with front leg and back leg not less than 3/8 and 7/8 inch (9.5 and 22 mm) in height, respectively, and a thickness of not less than 0.04 inch (1.0 mm).
 - 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) Andscot Company, Inc.
 - 2) Laurence, C. R. Co., Inc.
 - 3) Stylmark, Inc.
 - 2. Top Trim: J-channels formed with front leg and back leg not less than 5/8 and 1 inch (16 and 25 mm) in height, respectively, and a thickness of not less than 0.04 inch (1.0 mm).
 - 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) Andscot Company, Inc.
- 2) Laurence, C. R. Co., Inc.
- 3) Stylmark, Inc.

3. Finish: Clear bright anodized.

- B. Fasteners: Fabricated of same basic metal and alloy as fastened metal and matching it in finished color and texture where fasteners are exposed.
- C. Anchors and Inserts: Provide devices as required for mirror hardware installation. Provide toothed or lead-shield, expansion-bolt devices for drilled-in-place anchors. Provide galvanized anchors and inserts for applications on inside face of exterior walls and where indicated.

2.5 FABRICATION

- A. Fabricate mirrors in the shop to greatest extent possible.
- B. Fabricate cutouts for notches and holes in mirrors without marring visible surfaces. Locate and size cutouts so they fit closely around penetrations in mirrors.

PART 3 - EXECUTION

3.1 EXAMINATION

- A. Examine substrates, over which mirrors are to be mounted, with Installer present, for compliance with installation tolerances, substrate preparation, and other conditions affecting performance of the Work.
- B. Verify compatibility with and suitability of substrates, including compatibility of existing finishes or primers with mirror mastic.
- C. Proceed with installation only after unsatisfactory conditions have been corrected and surfaces are dry.

3.2 PREPARATION

- A. Comply with mastic manufacturer's written installation instructions for preparation of substrates, including coating substrates with mastic manufacturer's special bond coating where applicable.

3.3 INSTALLATION

- A. General: Install mirrors to comply with mirror manufacturer's written instructions and with referenced GANA publications. Mount mirrors accurately in place in a manner that avoids distorting reflected images.
- B. Provide a minimum airspace of 1/8 inch (3 mm) between back of mirrors and mounting surface for air circulation between back of mirrors and face of mounting surface.
- C. Install mirrors with mastic and mirror hardware. Attach mirror hardware securely to mounting surfaces with mechanical fasteners installed with anchors or inserts as applicable. Install fasteners so heads do not impose point loads on backs of mirrors.

1. Aluminum J-Channels: Provide setting blocks 1/8 inch (3 mm) thick by 4 inches (100 mm) long at quarter points. To prevent trapping water, provide, between setting blocks, two slotted weeps not less than 1/4 inch (6.4 mm) wide by 3/8 inch (9.5 mm) long at bottom channel.
2. Install mastic as follows:
 - a. Apply barrier coat to mirror backing where approved in writing by manufacturers of mirrors and backing material.
 - b. Apply mastic to comply with mastic manufacturer's written instructions for coverage and to allow air circulation between back of mirrors and face of mounting surface.
 - c. After mastic is applied, align mirrors and press into place while maintaining a minimum airspace of 1/8 inch (3 mm) between back of mirrors and mounting surface.

3.4 CLEANING AND PROTECTION

- A. Protect mirrors from breakage and contaminating substances resulting from construction operations.
- B. Do not permit edges of mirrors to be exposed to standing water.
- C. Maintain environmental conditions that prevent mirrors from being exposed to moisture from condensation or other sources for continuous periods of time.
- D. Clean exposed surface of mirrors not more than four days before date scheduled for inspections that establish date of Substantial Completion. Clean mirrors as recommended in writing by mirror manufacturer.

END OF SECTION

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SECTION 088813 - FIRE-RATED GLAZING

PART 1 - GENERAL

1.01 SECTION INCLUDES

- A. Fire-rated glazing units.
- B. Glazing compounds.

1.02 RELATED REQUIREMENTS

- A. Section 079200 - Joint Sealants: Sealants for other than glazing purposes.
- B. Section 081113 - Hollow Metal Doors and Frames: Glazed lites in doors, borrowed lites, and transoms.
- C. Section 081213 - Hollow Metal Frames: Glazed borrowed lites.

1.03 REFERENCE STANDARDS

- A. 16 CFR 1201 - Safety Standard for Architectural Glazing Materials; Current Edition.
- B. ANSI Z97.1 - American National Standard for Safety Glazing Materials Used in Buildings - Safety Performance Specifications and Methods of Test; 2015 (Reaffirmed 2020).
- C. ASCE 7 - Minimum Design Loads and Associated Criteria for Buildings and Other Structures; Most Recent Edition Cited by Referring Code or Reference Standard.
- D. ASTM C864 - Standard Specification for Dense Elastomeric Compression Seal Gaskets, Setting Blocks, and Spacers; 2005 (Reapproved 2019).
- E. ASTM C920 - Standard Specification for Elastomeric Joint Sealants; 2018.
- F. ASTM C1172 - Standard Specification for Laminated Architectural Flat Glass; 2019.
- G. ASTM C1193 - Standard Guide for Use of Joint Sealants; 2016 (Reapproved 2023).
- H. ASTM E1300 - Standard Practice for Determining Load Resistance of Glass in Buildings; 2016.
- I. GANA (SM) - GANA Sealant Manual; 2008.
- J. ICC (IBC) - International Building Code; Most Recent Edition Adopted by Authority Having Jurisdiction, Including All Applicable Amendments and Supplements.
- K. NFPA 252 - Standard Methods of Fire Tests of Door Assemblies; 2022.
- L. NFPA 257 - Standard on Fire Test for Window and Glass Block Assemblies; 2022.
- M. NFRC 100 - Procedure for Determining Fenestration Product U-factors; 2023.
- N. NFRC 200 - Procedure for Determining Fenestration Product Solar Heat Gain Coefficient and Visible Transmittance at Normal Incidence; 2023.
- O. NFRC 300 - Test Method for Determining the Solar Optical Properties of Glazing Materials and Systems; 2023.
- P. UL (DIR) - Online Certifications Directory; Current Edition.
- Q. UL 9 - Standard for Fire Tests of Window Assemblies; Current Edition, Including All Revisions.
- R. UL 10B - Standard for Fire Tests of Door Assemblies; Current Edition, Including All Revisions.
- S. UL 10C - Standard for Positive Pressure Fire Tests of Door Assemblies; Current Edition, Including All Revisions.
- T. UL 263 - Standard for Fire Tests of Building Construction and Materials; Current Edition, Including All Revisions.

1.04 SUBMITTALS

- A. See Section 013000 - Administrative Requirements for submittal procedures.
- B. Product Data on Glazing Unit Glazing Types: Provide structural, physical, and environmental characteristics, size limitations, special handling and installation requirements.

- C. Product Data on Glazing Compounds and Accessories: Provide chemical, functional, and environmental characteristics, limitations, special application requirements, and identify available colors.
- D. Certificate: Certify that products of this section meet or exceed specified requirements.
- E. Manufacturer's qualification statement.
- F. Installer's qualification statement.
- G. Specimen warranty.
- H. Maintenance Materials: Furnish the following for Owner's use in maintenance of project.
 - 1. See Section 016000 - Product Requirements for additional provisions.
 - 2. Extra Insulating Glass Units: One of each glass size and each glass type.

1.05 QUALITY ASSURANCE

- A. Manufacturer Qualifications: Company specializing in manufacturing the products specified in this section with minimum three years of documented experience.
 - 1. Provide certified glass products through ANSI accredited certifications that include plant audits and independent laboratory performance testing.
 - a. Insulating Glass Certification Council (IGCC).
 - b. Safety Glazing Certification Council (SGCC).
- B. Installer Qualifications: Company specializing in performing work of type specified and with at least three years of documented experience and approved by manufacturer.
 - 1. Provide company, field supervisors, and installers that hold active ANSI accredited certifications in appropriate categories for work specified.
 - a. North American Contractor Certification (NACC) for glazing contractors.
 - b. Equivalent independent third-party ANSI accredited certification.
- C. Testing Agency Qualifications: Independent firm specializing in performing testing and inspections of type specified in this section.

1.06 FIELD CONDITIONS

- A. Ambient Conditions: Do not install glazing when ambient temperature is less than 40 degrees F (4 degrees C).
- B. Maintain minimum ambient temperature before, during, and 24 hours after installation of glazing compounds.

1.07 WARRANTY

- A. See Section 017800 - Closeout Submittals for additional warranty requirements.
- B. Manufacturer Warranty for Insulating Glass Units: Provide 5-year manufacturer warranty coverage for seal failure, interpane dusting or misting, including providing products to replace failed units, and commencing on the Date of Substantial Completion. Complete forms in Owner's name and register with manufacturer.
- C. Manufacturer Warranty for Laminated Glass: Provide 5-year manufacturer warranty coverage for delamination, including providing products to replace failed units, and commencing on the Date of Substantial Completion. Complete forms in Owner's name and register with manufacturer.
- D. Manufacturer Warranty for Heat Soaked Tempered Glass: Provide 5-year manufacturer warranty coverage for spontaneous breakage of fully tempered glass caused by nickel sulfide (NiS) inclusions, and commencing on the Date of Substantial Completion. Complete forms in Owner's name and register with manufacturer.

PART 2 PRODUCTS

2.01 MANUFACTURERS

- A. Glass Fabricators:
 - 1. GGI - General Glass International: www.generalglass.com/#sle.
 - 2. Standard Bent Glass Corp: www.standardbent.com/#sle.
 - 3. Trulite Glass & Aluminum Solutions, LLC: www.trulite.com/#sle.

4. Viracon, Inc: www.viracon.com/#sle.
- B. Fire-Protection-Rated Glass:
 1. Fabricators:
 - a. GGI - General Glass International: www.generalglass.com/#sle.
 - b. McGrory Glass, Inc: www.mcgrory.com/#sle.
 - c. Technical Glass Products: www.fireglass.com/#sle.
 2. Manufacturers:
 - a. McGrory Glass, Inc: www.mcgrory.com/#sle.
 - b. SAFTIFIRST, a division of O'Keeffe's Inc; SuperClear 45-HS: www.safti.com/#sle.
 - c. SCHOTT North America Inc; PYRAN Platinum: www.us.schott.com/#sle.
 - d. Vetrotech North America; Keralite/Select: www.vetrotechusa.com/#sle.

2.02 PERFORMANCE REQUIREMENTS

- A. Provide type and thickness of exterior glazing assemblies to support assembly dead loads and withstand live loads caused by positive and negative wind pressure acting normal to plane of glass.
 1. Design Pressure: Calculated in accordance with ASCE 7.
 2. Comply with ASTM E1300 for design load resistance of glass type, thickness, dimensions, and maximum lateral deflection of supported glass.
 3. Seismic Loads: Design and size glazing components to withstand seismic loads and sway displacement in accordance with requirements of ASCE 7
 4. Provide glass edge support system sufficiently stiff to limit lateral deflection of supported glass edges to less than 1/175 of their lengths under specified design load.
 5. Glass thicknesses listed are minimum.
- B. Vapor Retarder and Air Barrier Seals: Provide completed assemblies that maintain building enclosure vapor retarder and air barrier continuity.
- C. Thermal and Optical Performance: Provide exterior glazing products with performance properties as indicated, in accordance with manufacturer's published data as determined with the following procedures or test methods:
 1. Center of Glass U-Value: Comply with NFRC 100 using Lawrence Berkeley National Laboratory (LBNL) WINDOW software.
 2. Center of Glass Solar Heat Gain Coefficient (SHGC): Comply with NFRC 200 using Lawrence Berkeley National Laboratory (LBNL) WINDOW software.
 3. Solar Optical Properties: Comply with NFRC 300 test method.

2.03 GLASS MATERIALS

- A. Laminated Glass: Float glass laminated in accordance with ASTM C1172.
 1. Laminated Safety Glass: Comply with ANSI Z97.1 - Class B or 16 CFR 1201 - Category I impact test requirements.
 2. Polyvinyl Butyral (PVB) Interlayer: 0.030 inch (0.762 mm) thick, minimum.
 3. Ionoplast Interlayer: 0.035 inch (0.889 mm) thick, minimum.

2.04 GLAZING UNITS

- A. Type GL3 - Fire-Protection-Rated Glazing: Type, thickness, and configuration of glazing that contains flame, smoke, and does not block radiant heat, as required to achieve indicated fire rating period as indicated on drawings.
 1. Applications:
 - a. Glazing in fire-resistance-rated door assembly.
 2. Glass Type: Specialty tempered float glass.
 3. Provide products listed by UL (DIR) and approved by authorities having jurisdiction.
 4. Safety Glazing Certification: 16 CFR 1201 Category II.
 5. Glazing Method: As required for fire rating.
 6. Glazing Series: As indicated on drawings.
 7. Fire-Rating Period: As indicated on drawings.

8. Markings for Fire-Protection-Rated Glazing Assemblies: Provide permanent markings on fire-protection-rated glazing in compliance with ICC (IBC), local building code, and authorities having jurisdiction
 - a. "D" - meets fire door assembly criteria of NFPA 252, UL 10B, or UL 10C fire test standards.
 - b. "OH" - meets fire window assembly criteria, including hose stream test of NFPA 257 or UL 9 fire test standards.
 - c. "H" - meets fire door assembly hose stream test of NFPA 252, UL 10B, or UL 10C fire tests standards.
 - d. "XXX" - placeholder that represents fire-rating period, in minutes.
9. Products:
 - a. GGI - General Glass International: www.generalglass.com/#sle.
 - b. McGrory Glass, Inc; FireDefend Series ____: www.mcgrory.com/#sle.
 - c. McGrory Glass, Inc; PYRAN Platinum Series ____: www.mcgrory.com/#sle.
 - d. SAFTIFIRST, a division of O'Keeffe's Inc; SuperLite I: www.safti.com/#sle.
 - e. SAFTIFIRST, a division of O'Keeffe's Inc; SuperLite I-XL: www.safti.com/#sle.
 - f. SAFTIFIRST, a division of O'Keeffe's Inc; SuperLite I-XL IGU: www.safti.com/#sle.
 - g. SAFTIFIRST, a division of O'Keeffe's Inc; SuperLite X-45: www.safti.com/#sle.
 - h. SAFTIFIRST, a division of O'Keeffe's Inc; SuperClear 45-HS: www.safti.com/#sle.
 - i. SCHOTT North America Inc; PYRAN Platinum: www.us.schott.com/#sle.
 - j. SCHOTT North America Inc; PYRAN Platinum F (Surface-Applied Safety Film): www.us.schott.com/#sle.
 - k. SCHOTT North America Inc; PYRAN Platinum L (Laminated Safety Glass): www.us.schott.com/#sle.
 - l. Technical Glass Products; Fireglass20: www.fireglass.com/#sle.
 - m. Technical Glass Products; Firelite: www.fireglass.com/#sle.
 - n. Technical Glass Products; Firelite Plus: www.fireglass.com/#sle.
 - o. Technical Glass Products; Firelite NT: www.fireglass.com/#sle.
 - p. Technical Glass Products; Firelite IGU: www.fireglass.com/#sle.
 - q. Vetrotech North America; Keralite/Select: www.vetrotechusa.com/#sle.
 - r. Vetrotech North America; Keralite/Select Filmed: www.vetrotechusa.com/#sle.
 - s. Vetrotech North America; Keralite/Select Laminated: www.vetrotechusa.com/#sle.
 - t. Vetrotech North America; Pyroswiss 20: www.vetrotechusa.com/#sle.
 - u. Vetrotech North America; Pyroswiss 45: www.vetrotechusa.com/#sle.

2.05 GLAZING COMPOUNDS

- A. Type GC-1 - Silicone Sealant: Single component; neutral curing; capable of water immersion without loss of properties; nonbleeding, nonstaining; ASTM C920 Type S, Grade NS, Class 25, Uses M, A, and G; with cured Shore A hardness range of 15 to 25; color as selected.
 1. Manufacturers:
 - a. BASF Corporation: www.basf.com/#sle.
 - b. Bostik Inc: www.bostik-us.com/#sle.
 - c. Dow Corning Corporation: www.dowcorning.com/construction/#sle.
 - d. Momentive Performance Materials, Inc: www.momentive.com/#sle.
 - e. Pecora Corporation: www.pecora.com/#sle.
 - f. Tremco Commercial Sealants & Waterproofing: www.tremcosealants.com/#sle.

2.06 ACCESSORIES

- A. Setting Blocks: Aluminum silicate, with 80 to 90 Shore A durometer hardness; ASTM C864 Option II. Length of 0.1 inch for each square foot (25 mm for each square meter) of glazing or minimum 4 inch (100 mm) by width of glazing rabbet space minus 1/16 inch (1.5 mm) by height to suit glazing method and pane weight and area.
- B. Setting Blocks: Hardwood.
- C. Spacer Shims: Neoprene, 50 to 60 Shore A durometer hardness; ASTM C864 Option II. Continuous by one half the height of glazing stop by thickness to suit application, self adhesive on one face.

- D. Glazing Tape: Closed-cell polyvinyl chloride (PVC) foam, coiled on release paper over adhesive on two sides, maximum water absorption by volume of 2 percent, designed for compression of 25 percent to affect air barrier and vapor retarder seal; _____ by _____ size.
 - 1. Manufacturers:
 - a. Pecora Corporation: www.pecora.com/#sle.
 - b. Saint-Gobain Performance Plastics: www.plastics.saint-gobain.com/#sle.
- E. Glazing Tape: Flexible tape made from spun calcium-magnesium-silica fibers in binder; designed to remain stable at temperatures up to 2,012 degrees F (1,100 degrees C).
 - 1. Thickness: As recommended by framing manufacturer for glazing application.
- F. Glazing Gaskets: Flexible intumescent seals.
 - 1. Material: Co-extruded intercalated graphite combined with thermoplastic lip.
- G. Glazing Splines: Resilient silicone extruded shape to suit glazing channel retaining slot; ASTM C864 Option II; color black.
- H. Smoke Removal Window/Glazing Unit Markings: Adhesive backed markings affixed to manually operable or fixed windows of high-rise buildings to identify units intended for post-fire smoke removal in compliance with ICC (IBC) and authorities having jurisdiction.

2.07 SOURCE QUALITY CONTROL

- A. See Section 014000 - Quality Requirements for additional requirements.
- B. Provide shop inspection and testing for Type _____ glass.

PART 3 EXECUTION

3.01 EXAMINATION

- A. Verify that openings for glazing are correctly sized and within tolerances, including those for size, squareness, and offsets at corners.
- B. Verify that minimum required face and edge clearances are provided.
- C. Verify that surfaces of glazing channels or recesses are clean, free of obstructions that may impede moisture movement, weeps are clear, and support framing is ready to receive glazing system.
- D. Proceed with glazing system installation only after unsatisfactory conditions have been corrected.

3.02 PREPARATION

- A. Clean contact surfaces with appropriate solvent and wipe dry within maximum of 24 hours before glazing. Remove coatings that are not tightly bonded to substrates.
- B. Seal porous glazing channels or recesses with substrate compatible primer or sealer.
- C. Prime surfaces scheduled to receive sealant where required for proper sealant adhesion.

3.03 INSTALLATION - GENERAL

- A. Install glazing in compliance with written instructions of glass, gaskets, and other glazing material manufacturers unless more stringent requirements are indicated, including those in referenced glazing standards.
- B. Install glazing sealants in accordance with ASTM C1193, GANA (SM), and manufacturer's instructions.
- C. Do not exceed edge pressures around perimeter of glass lites as stipulated by glass manufacturer.
- D. Set glass lites of system with uniform pattern, draw, bow, and similar characteristics.
- E. Set glass lites in proper orientation so that coatings face exterior or interior as indicated.
- F. Prevent glass from contact with contaminating substances that may result from construction operations including, but not limited to weld spatter, fire-safing, plastering, mortar droppings, etc.

3.04 INSTALLATION - WET/DRY GLAZING METHOD (TAPE AND SEALANT)

- A. Application - Interior Glazed: Set glazing infills from interior of building.

- B. Cut glazing tape to length and install against permanent stops, projecting 1/16 inch (1.6 mm) above sightline.
- C. Place setting blocks at 1/4 points with edge block no more than 6 inches (152 mm) from corners.
- D. Rest glazing on setting blocks and push against tape to ensure full contact at perimeter of pane or unit.
- E. Install removable stops, spacer shims inserted between glazing and applied stops at 24-inch (610 mm) intervals, 1/4 inch (6 mm) below sight line.
- F. Fill gaps between pane and applied stop with _____ type sealant to depth equal to bite on glazing, to uniform and level line.
- G. Carefully trim protruding tape with knife.

3.05 FIELD QUALITY CONTROL

- A. See Section 014000 - Quality Requirements for additional requirements.
- B. Glass and Glazing product manufacturers to provide field surveillance of the installation of their products.
- C. Manufacturer Services: Provide services of glass and glazing manufacturer's field representative to observe installation of their products.

3.06 CLEANING

- A. See Section 017000 - Execution and Closeout Requirements for additional requirements.
- B. Remove excess glazing materials from finish surfaces immediately after application using solvents or cleaners recommended by manufacturers.
- C. Remove nonpermanent labels immediately after glazing installation is complete.
- D. Clean glass and adjacent surfaces after sealants are fully cured.
- E. Clean glass on both exposed surfaces not more than four days prior to Date of Substantial Completion in accordance with glass manufacturer's written recommendations.

3.07 PROTECTION

- A. After installation, mark pane with 'X' by using removable plastic tape or paste; do not mark heat-absorbing or reflective glass units.
- B. Remove and replace glass that is damaged during construction period prior to Date of Substantial Completion.

END OF SECTION