

PROJECT MANUAL FOR

Government Camp Fire Station

Renovation - Rebid

HFD Project No. 2019-01

Hoodland Fire District #74
Welches, Oregon

December 12, 2018



Prepared by:

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PROJECT

Government Camp Fire Station
Renovation
Government Camp, Oregon

OWNER

Hoodland Fire District
69634 E. Highway 26
Welches, Oregon 97067

ARCHITECT

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STRUCTURAL ENGINEER

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GENERAL CONDITIONS

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The American Institute of Architects' "General Conditions of the Contract for Construction," A.I.A. Document "A201 – 2017" edition, are hereby fully incorporated as part of these Specifications as though bound herein. Copies of the A.I.A. A201 – 2017 are available online at www.aiacontracts.org/contractdocuments/25131-general-conditions-of-the-contract-for-construction.

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GENERAL

- A. The following supplements modify, change, delete from or add to the “General Conditions”. These supplements are part of the Contract Documents and apply to all work, taking precedence over conflicting provisions in the General Conditions. Where any Article of the General Conditions is modified or deleted by these supplements, the unaltered provisions of that Article, this Paragraph, Subparagraph of Clause shall remain in effect.

- B. Should any discrepancy arise between elements of the Contract Documents, precedence shall be given in the following order: (1) The Agreement, (2) The General and Supplementary General Conditions, (3) The Specifications, (4) The Details, (5) The General Drawings.

ARTICLE 1 – GENERAL PROVISIONS

1.1 BASIC DEFINITIONS

Add the following:

- 1.1.7 PROJECT MANUAL
The term “Project Manual” as used herein these Supplementary Conditions is the volume which includes the bidding requirements, conditions of the Contract and the Specifications.

- 1.1.8 OWNER
References to the “Owner” means Hoodland Fire District.

- 1.1.9 ARCHITECT
References to the “Architect” means Keystone Architecture Planning and Project Management, LLC.

- 1.1.10 PROVIDE
The term “Provide” includes furnishing and installation.

- 1.1.11 PRODUCE
The term “Produce” as used herein these Supplementary Conditions includes materials, systems, equipment and all necessary appurtenances.

1.2 EXECUTION, CORRELATION AND INTENT

- 1.2.2 Add the following paragraph:

Execute work as per Contract Documents, make no changes there from without having first received written authorization. Where detailed information is lacking, before proceeding with work, refer matter to Architect for information.

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1.2.3 Add the following paragraph:

“General Conditions” apply with equal force to Contractor’s work, Subcontractor’s work, extra work and the like that may be specified herein or performed on site under this Contract.

1.2.4 The delegation of work responsibility is the decision and duties of the General Contractor. No opinion of work responsibility shall be rendered by the Architect.

1.3 OWNERSHIP AND USE OF DOCUMENTS (copies furnished)

1.3.1 Add the following paragraph:

The General Conditions shall be modified as follows: After Contract Award, Drawings and Specifications will be furnished without charge as follows:

The Contractor shall distribute documents to his subcontractors. Additional copies of Drawings and Specifications will be furnished by Architect when requested, upon receipt of payment for full reproduction cost.

ARTICLE 2 – OWNER

2.2 INFORMATION AND SERVICES REQUIRED BY THE OWNER

2.2.3 Add the following paragraph:

Unless otherwise noted in Specifications or Drawings.

ARTICLE 3 – CONTRACTOR

3.4 LABOR AND MATERIALS

3.4.1 Add the following paragraphs:

Products are generally specified by ASTM or other reference Standard, and/or by Manufacturer’s name or trade name and model number. When specified only by reference Standard, the Contractor or Subcontractor may select any product meeting this Standard, by any Manufacturer. When several products or Manufacturers are specified as being equally acceptable, the Contractor or Subcontractor has the option of using any product and Manufacturer combination listed.

“APPROVED CLAUSE”

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Whenever the name of a Manufacturer or vendor is used with the term "approved" it is for the purpose of establishing a standard. "Approved" shall be construed to mean approved by the Architect and Owner.

3.6 TAXES

3.6.2 Add the following paragraph:

Contractor shall pay all contributions or amounts due the Industrial Accident Fund of the State of Oregon by such Contractor in the performance of the Contract and shall pay to the Oregon Department of Revenue all sums withheld from its employees pursuant to Section 25 of the Personal Income Tax Act of 1969.

3.7 PERMITS, FEES AND NOTICES

3.7.1 Change to read:

The Owner will only be responsible for securing and paying for the General Building Permit Plan check fee, HVA Plan Review Fee (not HVAC Permit Fee), the Electrical Plan Review Fee (not Electrical Permit) and all service connection fees.

The General Contractor and subcontractors shall obtain and pay for all other permits, licenses, charges and certificates as required to complete his respective part of the work.

The General Contractor shall provide the Architect with documentation of all permit approvals (including permit number) prior to any work and within one (1) working day of issued permit.

3.15 CLEANING UP

3.15.1 Modified as follows:

During the progress of work, each trade on the job shall be responsible for maintaining the premises and the site in clean condition, free from accumulations of scrap, litter and debris resulting from operations under jurisdiction of that trade.

Interior work spaces which are not completely protected from occupied spaces shall be continuously cleaned as work progresses. All other interior space shall be cleaned at least once each day. Exterior spaces shall be cleaned at least once each week. Scrap, litter and debris shall be deposited at a designated location on the site, from which point the General Contractor shall remove and legally dispose of same away from the premises.

Upon completion or when directed, the General Contractor shall thoroughly clean all surfaces of work under this Contract, including the washing of glass, the

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Mechanical Subcontractor shall clean all plumbing fixtures, fittings and equipment, and the Electrical Subcontractor shall clean all light fixtures, wall plates and equipment. Other Contractors and Subcontractors shall clean surfaces of accessories and equipment for which they are responsible and as specified in the various trade section.

The final cleaning shall include polishing and all affected areas and surfaces shall be left broom clean and in perfect condition.

ARTICLE 4 – ADMINISTRATION OF THIS CONTRACT

4.3.7 CLAIMS FOR ADDITIONAL COST

Add the following paragraph:

All changes in work negotiated on a cost plus basis shall be reviewed weekly. Submit a complete report including number of men, amount of material and percent of completion, weekly prior to project meetings.

ARTICLE 5 – SUBCONTRACTORS

5.3 SUBCONTRACTUAL RELATIONS

Add the following paragraph:

- 5.3.1 Obligate each Subcontractor to make payments promptly when due to all persons supplying the Subcontractor labor or materials for this Contract. Also make all contributions or amounts each Contractor is required to pay the Oregon Industrial in performance of this Contract. Obligate the Subcontractor to pay to the Oregon Department of Revenue all sums withheld from its employees pursuant to section 25 of the Personal Income Tax Act of 1969. Obligate the Subcontractor not to permit any lien or claim to be filed or prosecuted against the Owner on account of any labor or materials furnished to the Subcontractor for this project.

ARTICLE 7 – CHANGE IN WORK

7.3 CONSTRUCTION CHANGE DIRECTIVE

7.3.4 CLARIFICATION

If there are any additions, deletions, changes and/or clarifications that do not change the Contract Price or Project Completion Date, action shall be taken immediately. If there is a change in the Contract Price and/or Project Completion Date, inform the Architect of this change immediately and follow up in writing.

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7.3.6 Add the following paragraph:

6. When the General Contractor has obtained the scope of work for a change, and if it involves a delay of project with additional costs due to the delay, then the General Contractor must notify the Owner of these additional possible costs within 24 hours of learning of the change. The Owner must be made aware of these costs when making a decision regarding a change. Additional costs associated with a change may therefore occur only during the change order process and not as an added cost later in the project.

ARTICLE 9 - PAYMENTS AND COMPLETION

9.2 SCHEDULES OF VALUES

9.2.1 Add the following paragraph:

The schedule of values shall be prepared in such a manner that each major item of work and each subcontracted item of work is shown as a single line item. Submit sample of proposed schedule of values for Architect's approval.

9.3 APPLICATION FOR PAYMENT

9.3 Add the following paragraph:

Neither the final certificate, nor payment in full, nor any provision in the Contract Documents, shall relieve the Contractor of responsibility for faulty materials and workmanship and he shall promptly correct all such defects resulting therefrom at no additional cost to the Owner for a period of not less than one year from the date of final completion. Longer guarantee periods as specified for various parts of the work shall govern.

9.4 CERTIFICATES FOR PAYMENT

9.4.1 Add the following paragraph:

Before certificates of payment will be issued, Architect to receive on not later than the first day of the month, a written application for payments, together with Contractor's signed itemized list for labor and materials incorporated in work. Forms Type: A.I.A. Document G702 and G702A. Contractor shall also submit at that time or by no later than the 5th of the month, the prevailing wage weekly Certified Payroll Reports (BOLI Form WH-38 or equivalent) for the preceding month for Contractor and subcontractors.

9.4.2 Revise the following paragraph:

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Based upon Applications for payments submitted to the Architect by the Contractor and Certificates for Payment issued by the Architect, the Owner shall make progress payments on account of the Contract price to the Contractor as follows:

On or about the tenth (10th) day of each month, ninety-five (95) percent of the proportion of the Contract price properly allocable to labor, materials and equipment incorporated in the work and ninety-five (95) percent of the portion of the Contract price properly allocable to materials and equipment suitably stored at the site or at some other location agreed upon in writing by the parties, up to the thirtieth (30th) day of that month, less the aggregate of previous payments in each case; and upon final acceptance of the entire work, a sum sufficient to increase the total payment to one hundred (100) percent of the Contract price, less such retainages as the Architect shall determine for all incomplete work and unsettled claims, but such retainage shall not be less than two hundred (200) percent of the value of incomplete work and unsettled claims.

“Retainage” means the difference between the amount earned by the Contractor on the Contract and the amount paid on the Contract by the Owner.

ARTICLE 11 – INSURANCE

11.1 CONTRACTOR’S LIABILITY INSURANCE

11.1.1 Add the following:

The liability insurance purchased by Contractor shall be maintained up to the limits and for the coverages described below, to insure against claims that may arise from the Contractor’s operations or completed operations under the Contract and for which the Contractor may be legally liable, and to be maintained without interruption from the date of commencement of the Work until the date of final payment and termination of any coverage required to be maintained after final payment, and, with respect to Contractor’s completed operations coverage, it shall be continued for two years following final approval of the work.

- | | | |
|----|---------------------------------|--|
| A. | 1. Workmen’s Compensation | Statutory |
| | 2. Employer’s Liability | \$1,000,000.00 |
| B. | Comprehensive General Liability | |
| | 1. Bodily Injury | \$1,000,000.00 Each Person
\$1,000,000.00 Each Occurrence |
| | 2. Personal Injury | \$1,000,000.00 Each Person
\$1,000,000.00 Aggregate
\$1,000,000.00 General Aggregate |

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- | | | |
|---|----------------------------|--|
| 3. | Property Damage | \$1,000,000.00 Each Occurrence
\$1,000,000.00 Aggregate |
| C. Automobile Liability | | |
| 1. | Bodily Injury | \$500,000.00 Each Person
\$1,000,000.00 Each Occurrence |
| 2. | Property Damage | \$1,000,000.00 Each Occurrence |
| 3. | (or) Combined Single Limit | \$1,000,000.00 |
| D. Independent Contractors or Subcontractors – same limits as above. | | |
| E. Products and completed operations – same limits as above for two (2) years, commencing with issuance of final approval. | | |
| F. Contractual Liability – same limits as above. | | |
| G. \$1,000,000.00 umbrella liability policy. | | |
| 11.1.3 The Contractor shall file certified copies of policies and certificates of coverage for the above liability insurance coverages with the Owner and Architect prior to commencement of work. These shall include endorsements for named additional insureds as required by Section 11.1.1 of the General Conditions and also a provision that the coverages afforded by the policies will not be cancelled or allowed to expire without at least thirty (30) days prior written notice to Owner and Architect. If the Owner is damaged by the failure of the Contractor to maintain such insurance and to so notify the Owner, then the Contractor shall bear all reasonable costs properly attributable thereto. | | |

11.2 OWNER'S PROPERTY INSURANCE

Article 11.2 of the General Conditions shall be modified by the addition of the following:

- 11.2.1 The Owner will purchase and maintain Course of Construction ("COC") insurance for the duration of the Work, as an addition to Owner's existing property insurance. It shall be for not less than the amount of the Contract Sum, plus the value of subsequent contract modifications, comprising total value for the entire project on a replacement cost basis. In the event deductibles are required, then the Owner shall pay the costs not covered thereby for a covered claim. The insurance shall include the interests of the Owner, the Contractor, and Subcontractors at all tiers at the project.

Such property insurance shall insure against the perils of fire insurance with extended coverage (and including wind, third-party theft and malicious mischief coverage), and including coverage of work in or adjacent to the insured structure

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(but excluding portable tools and other equipment and expendable accessories that will not become an integral part of the work under this Contract, which items shall be insured separately by the contractor responsible for same).

In waiving the rights of recovery under the terms of this Subparagraph, the term "Owner" shall be deemed to include his employees and the Architect and his employees as the Owner's representative, as provided in the Contract Documents.

- 11.2.4 If the Owner finds it necessary to occupy or use a portion or portions of the work prior to Substantial Completion, such occupancy shall not commence prior to a time mutually agreed to by the Owner and Contractor and concurred with by the insurance company or companies. This insurance shall not be cancelled or lapsed on account of such partial occupancy.

ARTICLE 12 – UNCOVERING AND CORRECTION OF WORK

12.2 CORRECTION OF WORK

Add the following paragraph:

Partial occupancy of incompleting structure by Owner shall not alter warranty period as defined. All questions arising under this article shall be decided by the Architect subject to arbitration, notwithstanding final payment.

ARTICLE 13 – MISCELLANEOUS PROVISIONS

13.1 GOVERNING LAW

- 13.1.2 Add the following paragraph:

General Contractor, each Subcontractor to comply with all Federal and State Laws pertaining to Social Security, Unemployment Insurance and Tax Regulations. Make prompt payment to designated agencies.

13.4 TESTS AND INSPECTIONS

- 13.4.7 Add the following paragraph:

The specific situations in which the contractor is relieved of bearing the costs of inspections, tests and approvals are noted in the individual divisions or parts of work.

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13.6 WORKER PAY

- 13.6.1 All applicable provisions of ORS chapters 187 and 279A, 279B, and 279C and all other terms and conditions necessary to be inserted into public contracts in the State of Oregon, are hereby incorporated as if such provisions were a part of these supplemental conditions. Specifically, it is a condition of this project that Contractor and all employers working under this Agreement are subject employers that will comply with ORS 656.017 as required by 1989 Oregon Laws, Chapter 684.
- 13.6.2 The Contractor and each subcontractor shall pay workers not less than the Specified minimum hourly rate of wage in accordance with Section 7 of 2005 Oregon Laws Chapter 360. Owner shall pay an administrative fee as provided in ORS 279C.825(1) to the Bureau of Labor and Industries pursuant to the administrative rules established by the Commissioner of Labor and Industries. Contractor must promptly pay, as due, all persons supplying to such contractor labor or material used in this contract. If the Contractor or any first-tier subcontractor fails, neglects, or refuses to make payment to a person furnishing labor or materials in connection with the public contract for a public improvement within 30 days after receipt of payment from the public contracting agency or a contractor, the Contractor or first-tier subcontractor shall owe the person the amount due plus shall pay interest in accordance with ORS 279C.515; further, the unpaid person may file a complaint with the Construction Contractors Board, unless payment is subject to a good faith dispute as defined in ORS 279C.580.

ARTICLE 16 – EQUAL OPPORTUNITY

16.1 The Contractor shall maintain policies of employment as follows:

- 16.1.1 The Contractor and all Subcontractors shall not discriminate against any employee or applicant for employment because of race, religion, color, sex or national origin. The Contractor shall take affirmative action to insure that applicants are employed and that employees are treated during employment without regard to their race, religion, color, sex or national origin. Such action shall include, but not be limited to the following:

Employment, upgrading, demotion or transfer; recruitment or recruitment advertising; lay off or termination; rates of pay or other forms of compensation; and selection for training, including apprenticeship. The Contractor agrees to post in conspicuous places, available to employees and applicants for employment, notices setting forth the policies of non-discrimination.

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- 16.1.2 The Contractor and all Subcontractors shall, in all solicitations or advertisements for employees placed by them on their behalf, state that all qualified applicants shall receive consideration for employment without regard to race, religion, color, sex or national origin.

END OF SECTION

OREGON PREVAILING WAGE RATE COMPLIANCE

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GENERAL

The Government Camp Station Renovation Project (hereafter the "Project") is a prevailing wage public works project subject to ORS 279C.800 through 279C.870, and the Contractor and Subcontractors are required to pay prevailing wage rates to their workers.

The prevailing wage rates that are applicable to the Project are set forth in the Oregon Bureau of Labor and Industries (hereafter "BOLI") publication titled "Prevailing Wage Rates for Public Works Contracts in Oregon, Effective January 1, 2019" (hereafter the "publication"). The Project is located in Clackamas County. All of such applicable prevailing wage rates in the publication are hereby fully incorporated into the Project specifications by this reference as though bound herein. Copies of the publication are available online for viewing and printing at <https://www.oregon.gov/boli/WHD/PWR/docs/January%201%2c%202019%20PWR%20Rate%20Book.pdf>, and a complimentary hard copy is available upon request by emailing BOLI at pwremail@boli.stat.or.us or calling 971-673-0838 (additional copies may be purchased from the BOLI Prevailing Wage Rate Unit at cost plus postage).

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- 1010 Summary of Work
- 1011 Contractors Review of Site
- 1012 Future Work
- 1013 Work Sequence
- 1014 Contractor Use of Premises
- 1015 Occupancy
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SECTION 1010 – SUMMARY OF WORK

A. INTENT

1. These Requirements, General Conditions, the Instructions to Bidders, Supplementary Conditions and all other preceding documents shall form a part of the Specifications, which, together with the accompanying Drawings, are intended to provide for all labor, materials, equipment, services, etc., required for the project named on this title page.
2. The Division applies to the job as a whole and is intended to include items which are not part of any other subdivision of this specification.

B. Separation of these specifications into Divisions and Sections is for convenience only and is not intended to establish limits of work.

C. Specification for products, materials or systems shown on the drawings, but not included in these specifications, shall be included in this contract as though specified herein.

D. WORK COVERED BY CONTRACT DOCUMENTS

1. The General provisions of the Contract and General Requirements (Division 1) of the Specifications apply to Work specified in this section and in each section of Project Manual Specifications. Contractor shall instruct each of Contractor's subcontractors to become fully familiar with all these documents.
2. Work of this contract comprises the site preparation and construction at Hoodland Fire District's Government Camp Fire Station, Government Camp, Oregon.
3. Division 15 Mechanical, and Division 16 Electrical are Design Build. Refer to the drawings and these areas for descriptions of the work. See also Section 1061 Design Build Requirements.

E. RECORD EXISTING CONDITIONS

Not required.

F. WORK PROVIDED BY OWNER

1. Installation of furniture and moveable appliances.
2. Other items specified in Drawings or other section of the Specifications.

G. SCHEDULING OF WORK/CONTRACT TIME

1. Contractor shall coordinate with owner and tenants.

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H. WORKING HOURS

8:00 am to 5:00 pm Monday through Friday.

I. CONTRACT TIME

As determined by the General Contractor.

SECTION 1011 – CONTRACTORS REVIEW OF SITE

- A. Contractor and subcontractors shall visit site, ascertain for themselves all conditions affecting the Contract. Make allowance for existing conditions. Be responsible for same after bid date.

SECTION 1014 – CONTRACTOR USE OF PREMISES

- A. See General Conditions, **Section 0700**, “Owner’s Right to Occupancy”.
- B. Contractor shall, at Job Site, clearly mark Work limit and any storage and staging areas, if provided, as shown on Drawings. Contractor shall make Contractor’s workers and subcontractors familiar with these areas; Use of any areas not specifically marked on Drawings for use by Contractor, will not be allowed. Access to other spaces required to execute Work shall be arranged and scheduled with Owner’s Representative.
- C. Not applicable.
- D. Keep all equipment and delivery trucks inside working boundaries.
- E. Allocate storage and working areas to trades and Subcontractors. Arrange storage spaces in approximate order of use to eliminate re handling. Maintain clear access at all times. Restrict work including storage of material and equipment to space allotted on plot plan for this contract unless specifically approved otherwise by Architect.
- F. Driveway shall be kept clear at all times for use of others.
- G. Storage and Protection of Materials.
 - 1. Storage of materials or equipment in corridors reserved for simultaneous use by public is not permitted. All storage must be confined to areas indicated on Drawings.
 - 2. Do not store materials or equipment in any location that will impair or interfere with exiting or access to any building, public access, traffic or parking areas, except those in areas designated by Drawings and enclosed by proper fencing or barricades. Materials and equipment shall be stored in areas in manner preventing overloading or damage to supporting structure. No storage of materials allowed in public right-of-way.

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3. Contractor shall obtain and pay for additional off-site storage as required to execute Work and store materials.
4. When workers are not present in building area shall be secured by locked windows and doors or any other method required to control access by unauthorized persons.
5. Lock automotive vehicles, such as passenger cars, trucks and other motorized construction equipment, when parked and unattended, so as to prevent unauthorized use. Do not leave vehicles or equipment unattended with motor running or ignition key in place.
6. In accordance with generally accepted construction practices, Contractor shall be solely and completely responsible for condition of Project Site, including safety of all persons and property during execution of Work. This requirement applies continuously throughout duration of project, 24 hours a day, 7 days a week.
7. Responsibility of Owner's representative is to conduct construction reviews of Contractor's performance and does not include review of Contractor's safety measures or practices on or around Construction Site.
8. Debris and dirt produced through execution of Work shall be removed daily from Construction Site at end of each working shift or working day. Contractor is responsible for complete lawful removal of all such debris relative to Project. Unless specific arrangements are otherwise made, Contractor shall coordinate and pay for removal of debris off-site.
9. Contractors and subcontractors are required to follow all Owner's Building policies regarding smoking in and around building. Open fires will not be permitted at any times.

SECTION 1015 – OCCUPANCY DURING CONSTRUCTION

Occupancy during construction will occur. Owner will make reasonable accommodations of Contractor's needs during construction. When conflicts exist, Owner's operation takes precedence over Contractor's operation.

SECTION 1016 – OWNER FURNISHED PRODUCTS

1. Products and equipment furnished and paid for by Owner for installation in this Contract for Construction include, but may not be limited to the following:
 - A. Refer to Section 1070 – Abbreviations and Symbols.
OFOI – Owner Furnished Owner Installed
OFCI – Owner Furnished Contractor Installed
CFCI – Contractor Furnished Contractor Installed

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2. Owner's Responsibilities for Owner Furnished Equipment:
 - A. Arrange for and deliver required Shop Drawings, Product Data, and Samples, to Contractor, through Architect.
 - B. Arrange and pay for product delivery to Site, in accordance with Construction Schedule.
 - C. Submit any claims required for transportation damage.
 - D. Arrange for warranties, inspections, service, etc., as required.
3. Contractor's Responsibilities for Owner Furnished Equipment:
 - A. Designate delivery dates for each product in Construction Schedule in coordination with anticipated installation dates.
 - B. Review Shop Drawings, Product Data, and Samples. Return to Architect notification of any discrepancies or problems anticipated in use of each product. This material shall be reviewed and submitted to Architect prior to ordering dates.
 - C. Receive and unload products and equipment at Site.
 - D. Promptly inspect products jointly with Owner. Record shortages and/or damaged or defective items.
 - E. Handle products at Site, including uncrating and storage to designated, sure area.
 - F. Remove to Contractor's trash facilities all packing materials.
 - G. Protect products from exposure to elements and damage.
 - H. Install, connect and finish products.
 - I. Repair or replace items damaged by Contractor.
 - J. Remove and reinstall O.F.C.I. items. Refer to **Section 0800**.

SECTION 1017 – PERMITS AND FEES

- A. The Owner shall only be responsible for paying for:
 1. Plan review fee.
- B. The Contractor shall be responsible for securing and paying for:
 1. General Building Permit

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2. Plumbing Permit
3. Electrical Permit
4. Mechanical Permit
5. All other Permits, Licenses, Fees, Bond, Certificates Inspection, Engineering Inspections, Engineering Costs and Charges as required to complete this project.

C. The General Contractor shall provide the Architect with documentation of all permit approvals (including permit number) prior to any work and within one (1) working day of issued permit.

SECTION 1027 – SCHEDULE OF VALUES

A. General:

1. Prepare Schedule of Values as required by GENERAL CONDITIONS in coordination with preparation of Construction Schedule.
2. Correlate line items with other administrative schedules and forms required for Work, including Construction Schedule, Payment Request Form, listing Subcontractors, Schedule of Allowances, Schedule of Alternates, listing of products and principals, suppliers, fabricators, and Schedule of Submittals.
3. Provide breakdown of Contract Sum in sufficient detail to facilitate continued evaluation of payment requests and progress reports. Breakdown principal subcontractor amounts into several line items. Round off to nearest whole dollar, but the total equal to Contract Sum.
4. Within 10 days following award of Contract, assist Owner in preparing separate Schedule of Values for portions of project which are wholly or partially funded by Federal grants. Schedule of Values shall include all direct and indirect costs related to their construction. These areas will be specifically identified for the contractor.
5. Provide cash flow summary showing project values of work for each month of work. Coordinate cash flow amounts with and derive from approved Construction Schedule specified in **Section 1310** of these specifications.

B. Material/Fabrication Values: For each unit of Work where payment requests will be made on account of materials or equipment purchased, fabricated or delivered, but not yet installed, show “initial value” for payment request and “value added” for subsequent stage or stages of completion on that unit of Work.

C. Time Coordination: In coordination of initial submittals and other administrative “start-up” activities, submit Schedule of Values to Architect at earliest feasible date, but in no case later than 7 days before initial Request for Payment is to be submitted.

D. Listing: Arrange Schedule of Values with columns to indicate generic name of item, related Specification sections, Subcontractor, supplier, manufacturer or fabricator,

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change order (numbers) which have affected value, dollar value of item, and percentage of Contract Sum to nearest one-hundredth percent and adjusted to total 100 percent. List items in order of related specification number.

- E. Margins of Cost: Show line items of indirect costs, and margins on actual costs, only to extent such items will be individually listed in Request for Payment. In general, each item in Schedule of Values and in Request for Payment shall be established to complete with its total expenses and proportionate share of general overhead and profit margin. Except as otherwise indicated, those major cost items that are not directly cost of actual work-in-lace, such as distinct temporary facilities, may be either shown as line items in Schedule of Values or may be distributed as general overhead expense, at Contractor's Option.
- F. Schedule Updating: Update and resubmit Schedule of Values when change orders affect listing and when actual performance of Work involved necessary change of substance to values previously listed.

SECTION 1028 – APPLICATIONS FOR PAYMENT

- A. Prepare application for payment as required by GENERAL CONDITIONS.
- B. General: Except as otherwise indicated, progress payment cycle is to be regular. Each application must be consistent with previous applications and payments. Certain application for payment, such as initial application, application at Substantial Completion and final payment application involve additional requirements.
- C. Payment Application Forms: AIA Document G702 and Continuation Sheets; available from "www.aiacontracts.org/contract-documents/19661-application-and-certificate-for-payment" (also available at most local AIA chapter offices). Computer generated listing showing required data in format acceptable to Architect and Owner may be used for continuation sheets.
- D. Application Preparation: Except as otherwise indicated, complete every entry provided for on form, including notarization and execution by authorized persons. Incomplete applications will be returned by Architect without action. Entries must match current data of Schedule of Values and Progress Schedule and report. Listing "period of construction" covered by application.
- E. Initial Payment Application: Principal administrative actions and submittals which must precede or coincide with submittal of Contractor's first payment application include, but are not limited to following:
 - 1. Listing of Subcontractors and principal suppliers and fabricators.
 - 2. Schedule of Values.

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3. Schedule of agreed upon lump sum and unit costs for change orders.
 4. Construction Schedule.
 5. Schedule of principal products.
 6. Schedule of submittals.
 7. Listing of Contractor's staff assignments and principal consultants.
 8. Copies of acquired building permits and similar authorizations and licenses from governing authorities for current performance of Work.
 9. Evidence satisfactory to Owner that Contractor's insurance coverage has been secured.
 10. Data needed to acquire Owner's insurance coverages.
 11. Initial progress reports, including report of Pre-Construction Meeting.
 12. Record Drawings
 13. Prevailing wage certified payroll reports.
- F. Application at Time of Owner's Acceptance of Work: Following issuance of Architect's "Certificate of Substantial Completion", and also in part as applicable to prior certificates on portions of completed work as designated, "special" payment application may be prepared and submitted by Contractor. Principal administrative actions and submittals which must precede or coincide with such special applications include, but are not limited to following:
1. Certifications by governing authorities and franchised services, assuring Owner's full access to and use of completed Work. Certificate of Occupancy.
 2. Test/adjust/balance records, maintenance instructions, meter readings, start-up performance reports, and similar change-over information germane to Owner's occupancy, use, operation and maintenance of completed Work.
 3. Final cleaning of Work.
 4. Application of reduction (if any) of retainage, and consent of surety.
 5. Advice of Owner on coordination of shifting insurance coverages, including proof of extended coverages as required.
 6. Final progress photographs, and final record photographs.

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7. Listing of Contractor's incomplete work, recognized as exceptions to Architect's Certificate of Substantial Completion.
 8. Record drawings.
- G. Final Payment Application: Administrative actions and submittals which must precede or coincide with submittal of Contractor's final payment application include, but are not limited to following:
1. Completion of Project Close-out requirements. Refer also to **Section 1700** of these Specifications.
 2. Completion of items specified for completion beyond time of Substantial Completion (regardless of whether special payment application was previously made).
 3. Assurance, satisfactory to Owner, that unsettled claims will be settled and that Work not actually completed and accepted will be completed without undue delay.
 4. Transmittal of required project construction records to Owner.
 5. Certified property survey, locating building or building addition.
 6. Warranties (guarantees), maintenance agreements and similar provisions of Contract Documents.
 7. Removal of temporary facilities, services, surplus materials, rubbish and similar elements.
 8. Change over of door locks and other Contractor's access provisions to Owner's property.
 9. Consent of surety for final payment.
- H. Application Transmittal: Submit four (4) executed copies of each payment application, one copy of which is completed with waivers of lien and similar attachments. Transmit each copy with transmittal form listing those attachments and recording appropriate information related to application in manner acceptable to Architect. Transmit to Architect by means ensuring receipt within 24 hours.

SECTION 1029 – CHANGE ORDER PROCEDURES

- A. See General Conditions, **Section 0700**, "Claims and Demands".
- B. SUBMITTALS:
 1. Request for Information (RFI): Owner's Standard form is available from the Architect.

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2. Construction Change Authorization/Proposal Request: Owner's Standard CCA form is available from the Architect.
3. Change Order Forms: Standard AIA Document G701 is available at "www.aiacontracts.org/contract-documents/155036-change-order?tab=library".

C. DOCUMENTATION OF CHANGE IN CONTRACT SUM & CONTRACT TIME:

1. Maintain detailed records of work done on a time and material basis. Provide full information required for evaluation of proposed changes, and to substantiate cost of changes in Work.
2. Document each quotation for change in cost or time with sufficient data to allow evaluation of quotation.
3. On request, provide additional data to support computations:
 - a. Quantities of products, labor and equipment.
 - b. Taxes, insurance and bonds.
 - c. Overhead and profit.
 - d. Justification for any change in Contract Time.
 - e. Credit for deletions from Contract, similarly documented.
4. Support each claim for additional costs and for work done on time and material basis, with additional information:
 - a. Origin and date of claim.
 - b. Dates and times work was performed, and by whom.
 - c. Time records and wage rates paid.
 - d. Invoices and receipts of products, equipment and subcontracts, similarly documented.

D. CHANGE PROCEDURES:

1. The Architect will advise of minor changes in the Work not involving an adjustment to Contract Sum or Contract Time as authorized by issuing supplemental instructions.
2. The Architect may issue a Proposal Request, in form of letter, which includes description of proposed change with supplementary or revised Drawings and Specifications. Proposal Request (P.R.) is not an authorization to proceed with Change. Contractor shall promptly respond with information regarding

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anticipated effects, if any, to Contract Sum and Time, as well as coordination or submittals concerns proposed changes may generate.

3. Contractor may propose a change by submitting Proposal Request to Architect:
 - a. Describe proposed change and its full effect on Work.
 - b. Describe reason for change, and effect on Contract Sum and Contract Time.
 - c. Provide full documentation and statement describing effect on separate Work by other contractors.
 - d. Document any requested substitutions in accordance with **Section 1600** – Material and Equipment.

E. CONSTRUCTION CHANGE AUTHORIZATION (CCA):

1. Owner may issue CCA, instructing Contractor to proceed with change in Work, for subsequent inclusion in Change Order.
2. CCA will describe changes in Work and will designate method of determining any change in Contract Sum or Contract Time.

F. Stipulated Sum Change Order: Based on Construction Change Authorization and Contractor's fixed price quotation.

G. UNIT PRICE CHANGE ORDER:

1. For pre-determined unit prices and quantities, Change Order will be executed on fixed unit price basis.
2. For unit costs or quantities of units of work which are not pre-determined, execute Work under Construction Change Authorization.

H. Execution of Change Orders: Architect/Owner will issue Change Orders for signature of parties as provided in GENERAL CONDITIONS.

I. CORRELATION OF CONTRACTOR'S SUBMITTALS:

1. Promptly revise Schedule of Values and Application for Payment forms to record each authorized Change Order as separate line item and adjust Contract Sum.
2. Promptly revise construction schedules to reflect any change in Contract Time, revise sub-schedules to adjust time for other items of work affected by change and resubmit.
3. Promptly enter changes in Project Record Documents.

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SECTION 1040 – PROJECT COORDINATION

- A. Coordinate scheduling, submittals, and Work of various Sections of Specifications to assure efficient and orderly sequence of installation of interdependent construction elements, with provisions for accommodating items installed later.
- B. Verify that utility requirement characteristics of operating equipment are compatible with building utilities. Coordinate work of various sections having interdependent responsibilities for installing, connecting to, and placing in service, such equipment.
- C. Coordinate space requirements and installation of mechanical and electrical work which are indicated diagrammatically on Drawings. Follow routing shown for pipes, ducts, and conduit, as closely as practicable; place runs parallel with line of building. Utilize spaces efficiently to maximize accessibility for other installations, for maintenance, and for repairs.
- D. See Mechanical Basic Materials and Methods, **Section 15010** for requirements for coordination drawings.
- E. In finished areas, except as otherwise indicated, conceal pipes, ducts, and wiring within construction. Coordinate locations of fixtures and outlets with finish elements.
- F. Coordinate completion and cleanup of Work of separate Sections in preparation for Substantial Completion and for portions of work designated for Owner's partial occupancy.
- G. After Owner occupancy of premises, coordinate access to site for correction of defective Work and Work not in accordance with Contract Documents, to minimize disruption of Owner's activities.

SECTION 1041 – COORDINATION AND LAYOUT OF WORK

- A. Verify conditions of existing project site. Purpose of survey is to record existing conditions prior to construction of comparison with Contract Documents. Report all conflicts to Architect. Architect will provide revisions to Contract Documents or issue instruction to deal with conflicts. Contractor shall be responsible for remedying conflicts which could have been prevented by timely review of existing conditions. All remedies, which vary from Contract Documents shall be approved by Architect and Owner's Representative.
- B. Be responsible for properly laying out Work, and for all lines and measurements for all Work executed under Contract Documents. Verify dimensions shown on Shop Drawings and report errors or inaccuracies in writing to Architect before commencing work.
- C. Be responsible for coordination and installation of all architectural, structural, mechanical and electrical work. Owner will not entertain requests for delays, time expansion or additional costs due to lack of coordination of Work by Contractor.

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- D. Mechanical and electrical trades shall be responsible for layout of ductwork, piping and conduit.
 - 1. Investigate structural and finish conditions affecting Work and arrange Work accordingly.
 - 2. Provide fittings and accessories as required to fit job conditions.
- E. Prepare detail layout drawings to a larger scale than Contract Documents in areas where Work is of sufficient complexity to warrant additional detailing. This shall apply to Mechanical and Electrical Rooms if applicable, and typical and complex duct and piping areas, wiring at switchboards and motor control centers, panel board cabinets in electrical closets, and sprinkler piping layouts. Prepare drawings on tracings of same size as Contract Drawings and submit with each set of Owner's Record Drawings. Submit layout drawings for approval before commencing shop fabrication or field erection, only when so directed by Architect.
- F. Coordinate rough-in, plumbing and wiring requirements for equipment with equipment suppliers. Provide adequate clearance between architectural, structural, mechanical, electrical systems. Verify physical dimensions of equipment with its available space. Check access routes through concealed space.
- G. General Contractor is responsible to review design drawings prior to rough-in. Contractor is responsible for verification that equipment will fit in spaces provided.
- H. Install additional offsets, bends and pull boxes in the systems where required by field conditions. Where exposed to view, conform to design intent. Verify with Architect prior to installation if design intent is not clearly understood.
 - 1. Generally, all exposed piping or conduits are parallel to or perpendicular to structure or to light fixtures. Diagonal runs are not acceptable.
 - 2. Generally, all unexposed piping or conduits are parallel to or perpendicular to structure or to light fixtures. Diagonal runs shall be kept to a minimum.
 - 3. The Architect and Owner's Representative may make minor adjustments in fixture, outlet, grille, sprinkler heads or piping prior to rough-in at no additional cost to the Owner.
- I. Slots, chases and openings through floors, walls, ceilings and roofs and specified in new construction shall be provided by various trades.
- J. Anchor bolts, sleeves, inserts and supports that are required shall be furnished and installed under same Section of Specifications as respective items to be anchored, with locations as directed by trade requiring them.

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- K. Sprinkler Heads and Other Devices: Automatic sprinklers shall be installed generally throughout all areas. Check locations for all sprinkler heads to prevent conflicts between trades. In cases where electric outlet or light fixture and sprinkler head occupy same position, Architect will decide which shall be shifted. Exposed sprinkler piping in finished areas will not be allowed without Architect's consent.
- L. Provide clearance and headroom. Utilize spaces efficiently so that adequate accessibility is retained for future maintenance, repairs, modifications and additions.
- M. Relocate installed work which does not provide adequate accessibility.
- N. Changes required in Work of Contractor, caused by Contractor's neglect to coordinate Work with others, shall be made at Contractor's own expense.
- O. Do all necessary Work to receive or join with Work of all trades.
- P. Coordinate Work to provide adequate clearances for installation and maintenance of equipment.
- Q. Installation and Arrangement: Install Work to permit removal of parts requiring periodic replacement or maintenance.
 - 1. Arrange pipes, ducts, raceways and equipment to permit ready access to valves, cocks, traps, starters, motors, and control components.
 - 2. Arrange raceways, wiring and equipment to permit ready access to switches, motors and control components. Doors and access panels shall be kept clear.
 - 3. Right-of-Way: Lines which pitch shall have right-of-way over conduit and EMT raceways whose elevations can be changed.
 - 4. Offsets, and changes in direction of pipes, ducts and raceways shall be made as required to maintain proper headroom and clearances whether or not indicated on Drawings. Provide all traps, vents, fittings, junction boxes, connectors, etc., as required to effect these offsets and change in direction.
- R. Drawings and Specifications are arranged for convenience only and do not necessarily determine which trades perform various portions of Work.
- S. Transmit to trades doing Work of other Divisions all information required for Work to be provided under their respective Sections (such as foundations, electric wiring, access door locations, etc.) in ample time for their installation.
- T. Consult with trades doing Work of other Divisions to that:
 - 1. Required related Work and information is received from them in ample time for installation.

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2. Whenever possible motor controls, pumps, valves, etc., are of same manufacturer.

SECTION 1043 – ADMINISTRATIVE AND SUPPORT PERSONNEL

- A. See General Conditions, **Section 0700**, “Materials, Employees and Workmanship”.
- B. In addition to General Superintendent and other administrative and support personnel required for performance of Work, provide Project Coordinator experienced in administration and supervision of building construction, including mechanical and electrical work. Project Coordinator is required to act as a general coordinator of interfaces between units of Work. For purposes of this provision, “interface” is defined as including scheduling and sequencing of Work, sharing of access to work spaces, installations, protection of work, cutting, patching, tolerances, cleaning, selections for compatibility, preparation of coordination drawings, inspections, tests and temporary facilities and services.
 1. Owner reserves right to review qualifications and experience of General Superintendent and Project Coordinator and to accept or reject Contractor’s proposal for staff members filling these positions.
- C. Contractor shall submit to Owner and Architect, within **five** days of Notice to Proceed, proposed listing of all principal staff members and their assignments, consultants, and subcontractors. List shall include business hour phone numbers and addresses as well as emergency phone numbers for off-hour contact on 24-hour basis in event of emergency.
- D. Maintain a construction force at site, including supervisors, mechanics, craftsmen and laborers, sufficient to expedite work to completion date indicated in contract documents.
- E. Maintain construction equipment at site, of proper size and type, in good condition as necessary to expedite and perform work.
- F. Each subcontractor shall cooperate and coordinate with each other. Each of these parties shall correlate his work and activities with the work of others and in case of any disagreements as to proper procedure, sequence of work, use of space, responsibility for damage, etc., the interested parties shall abide by the Architect’s decision as to the procedure to be followed.
- G. The work will be conducted in a functioning occupied building. The Contractor shall instruct all construction personnel to conduct themselves in a courteous manner and avoid the use of objectionable language. No broadcast radios or animals are allowed on site. See **Section 1140**.

SECTION 1045 – CUTTING AND PATCHING

- A. EXTENT OF WORK

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1. See Demolition, **Section 02200 and 02411.**
2. Not applicable.
3. Perform all cutting, fitting and patching, including excavation and backfill, required to complete work or to make work fit properly together.
4. Remove and replace defective work and work not conforming to Contract Documents.
5. Provide openings through non-structural surfaces for Mechanical and Electrical work.

B. SUBMITTALS

1. Submit written request 48 hours in advance of cutting or altering elements which effects:
 - a. Structural integrity of element.
 - b. Integrity of weather-exposed or moisture-resistant elements.
 - c. Efficiency, maintenance, or safety of element.
 - d. Visual Qualities of sight-exposed elements.
 - e. Work of Owner or separate Contractor.
 - f. Utilities.

C. ASBESTOS

Products with asbestos are not allowed in this project.

D. PRODUCTS

1. Materials:
 - a. Unless otherwise indicated or as directed by the Architect, use materials for cutting and patching that are identical to existing materials. If identical materials are not available or cannot be used, use materials that match adjacent surfaces to the fullest extent possible with regard to visual effect and structural integrity. Use cutting and patching materials and techniques that will result in equal-or-better performance characteristics.

E. EXECUTION

1. Inspection:
 - a. Before cutting, examine the surfaces to be cut and patched and the conditions under which the work is to be performed. If unsafe or otherwise unsatisfactory conditions are encountered, take corrective action before proceeding with the work.

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- b. Before starting the work, convene at the site all parties involved with cutting and patching, including mechanical and electrical trades. Review areas of potential interference and conflict between the various trades. Coordinate layout and scheduling of the work and resolve potential conflicts before proceeding.
 2. Provide adequate temporary support and bracing prior to the cutting of any work.
 - a. Properly protect other work during cutting and patching to prevent damage. Protect from adverse weather conditions for that part of the project that may be exposed during cutting and patching operations. Avoid interference with use of adjoining areas or interruption of free passage to adjoining areas through proper coordination with ongoing building use.
 - b. Take precautions to avoid the cutting of existing pipe, conduit or ductwork, serving any existing area. Schedule reallocations or by-passes as required to alleviate any interruptions of service. Schedule minor or major shutdowns in accordance with Owner's procedure, as outlined in these Specifications.
 3. After uncovering work, inspect conditions affecting product's installation or performance. Report unsatisfactory and questionable conditions to Architect in writing; do not proceed with work until Architect provides further instructions.

F. PERFORMANCE

1. Employ only skilled people to perform cutting and patching work. Unless otherwise approved, engage in cutting and patching work as soon as possible and perform as quickly as possible.
2. Cut the work using methods that are least likely to damage work to be retained or adjoining work. Where possible, review proposed procedures with original installer and comply with recommendations.
3. Use small hand or power tools designed for sawing and grinding, rather than hammering or chopping. When cutting through asphalt concrete, concrete or masonry, use a cutting machine such as a carborundum saw or core drill to provide a neat hole. Cut holes and slots neatly to size required with minimum disturbance to adjacent work. To avoid marring of existing finished surfaces, cut or drill from the exposed or finished side into concealed surfaces. Temporarily cover openings when not in use.
4. Comply with the requirements of applicable sections of Division 2 where cutting and patching requires excavation and backfilling.

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5. By-pass utility services such as pipe and conduit before cutting where such utilities are shown or required to be removed, related or abandoned. After by-pass and cutting, cap, valve or plug and seal tight the remaining portion of pipe to prevent entrance of moisture or other foreign matter.
6. Patch with seams which are durable and as invisible as possible. Comply with specified tolerances for the work. Where possible, inspect and test patched area to demonstrate integrity of seam. Restore exposed finishes of patched area as and where necessary extend finish restoration into retained adjoining work in a manner which will eliminate evidence of patching and refinishing. Thoroughly clean areas and spaces where work is performed or used as access to work. Restore damaged material to its original condition.

G. EXISTING UTILITIES AND SHUT DOWNS

Not applicable.

H. STRUCTURAL INTEGRITY

1. Maintain adequate temporary support necessary to assure structural integrity of affected work.
2. Cutting of structural framing not permitted unless with written approval of Architect and Structural Engineer.

I. PERFORMANCE

1. Replace cut or removed work with new like products to provide work complete in accordance with Contract Documents.
2. Fit work tight to pipes, sleeves, ducts, conduits and other surface penetrations.
3. Where patching occurs, refinish entire surface to provide even finish to match adjacent work.
4. All openings or reduction in size of existing materials and structures shall be first cut or drilled with power operated tools for clean finished cuts and surfaces prior to demolishing existing areas.
 - a. All cuts shall be made with no over cuts unless otherwise specified by this Contract.

SECTION 1050 – FIELD ENGINEERING

1. Verify all lines, levels and dimensions shown on Drawings. Report any error or discrepancies to Architect before proceeding with work.

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2. Locate partitions, door openings, windows and other features for use of all trades.

SECTION 1060 – REGULATORY REQUIREMENTS

A. REFERENCES

1. References to known standards, codes and regulations mean and intend latest edition of such material adopted, published at date of invitation to submit proposal.
2. The Contractor shall have on job site all applicable regulatory codes for Contractor's reference.
3. The applicable portions of the latest adopted published standards of the following organization (whether or not specifically mentioned) shall be included as minimum approved standards, throughout the various divisions of these specifications.

AA	Aluminum Association
AAMA	Architectural Aluminum Manufacturer's Association
AASSHTO	American Association of State Highway Transportation Officials
AATCC	American Association of Textile Chemists and Colorists
CI	American Concrete Institute
AGC	The Associated General Contractors of America, Inc.
AIA	American Institute of Architects
AIA	American Insurance Association (Formerly National Board of Fire Underwriters)
AIEE	American Institute of Electrical Engineers
AIMA	Acoustical and Insulating Materials Association
AISC	American Institute of Steel Construction
AISI	American Iron and Steel Institute
AITC	American Institute of Timber Construction
ANSI	American National Standards Institute (Formerly USASI)
APA	American Plywood Association
ASHRAE	American Society of Heating Refrigeration and Air Conditioning Engineers
ASME	American Society of Mechanical Engineers
ASSE	American Society of Sanitary Engineering
ASTM	American Society of Testing and Materials
AWI	American Woodwork Institute
AWPA	American Wood Preservers Institute
AWPB	American Wood Preservers Bureau
AWS	American Welding Society
BHMA	Builders Hardware Manufacturers Association
CBM	Certified Ballast Manufacturers
CISPI	Cast Iron Soil Pipe Institute
CLFMI	Chain Link Fence Manufacturers Institute

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CRSI	Concrete Reinforcing Steel Institute
CS	Commercial Standard of National Bureau of Standards
CSI	Construction Specifications Institute
ETL	Electrical Testing Laboratories
FGMA	Flat Glass Marketing Association
FM	Factory Mutual Engineering Corporation
FS	Federal Specification of General Services Administration
HPMA	Hardwood Plywood Manufacturers Association
IBC	International Building Code as modified and amended by the State of Oregon
ICBO	International Conference of Building Officials
IEE	Institute of Electrical & Electronics Engineering
IES	Illuminating Engineering Society
MIL	Military Specification on U.S. Dept. of Defense Commanding Officer
MIL/SFA	Metal Lath/Steel Framing Association
MLA	Metal Lath Association
NAAMM	The National Association of Architectural Metal
NBHA	National Builders' Hardware Association
NBS	National Bureau of Standards, U.S. Dept. of Corrections
NEC	National Electric Code by NFPA (NSI C1)
NECA	National Electrical Contractors Association
NEMA	National Electrical Manufacturers Association
NFPA	National Fire Protection Association 13,70,72,99,101,220
NRCA	National Roofing Contractors Association
NWMA	National Woodworking Manufacturers Association
OSHA	Occupational Safety and Health Administration
PCA	Portland Cement Association
PCI	Prestressed Concrete Institute
PEI	Porcelain Enamel Institute, Inc.
PGJA	Plat Glass Jobbers Association
PS	Product Standard of National Bureau of Standards
SCPI	Structural Clay Products Institute
SCR	Structural Clay Research
SDI	Steel Door Institute
SDI	Steel Deck Institute
SIGMA	Sealed Insulating Glass Manufacturers Association
SJI	Steel Joist Institute
SMACNA	Sheet Metal and Air Conditioning Contractors National Association, Inc.
SPR	Simplified Practice Recommendation of National Bureau of Standards
SSPC	Steel Structures Painting Counsel
TCA	Tile Council of America, Inc.
TECO	Timber Engineering Company
UL	Underwriters Laboratories, Inc., East Ohio Street, Chicago, IL 60611
UFC	Uniform Fire Code

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UMC	Uniform Mechanical Code
UPC	Uniform Plumbing Code
WCLA	West Coast Lumbermen's Association
WCLIB	West Coast Lumber Inspection Bureau (Grading Rules)
WWPA	Western Wood Products Association (Grading Rules) 700 Yeon Building, Portland, OR 97204
	International Building Code, 2003 Edition, with Oregon Amendments

SECTION 1061 – DESIGN/BUILD REQUIREMENTS

A. Description

1. Work included: Certain components of the work under this project are design/build. It is the builder's responsibility to coordinate and assume or assign to subcontractors the complete responsibility for the design, calculations, submittals, fabrication, transportation and installation of the design/build portions or components as required in this section. The applicant is responsible to submit all design/building documents to the AHJ required for the separate approval for each design/build item. There are **NO EXCEPTIONS**. Design/build components of this work are defined as complete, operations system, provided for their intended use.
2. The Architect or Engineer of Record's review of design/build submittals shall be for design intent and shall not lessen or shift the responsibility from the applicant or assigned subcontractor, to the Owner nor to the design professional. The Owner shall not be responsible to pay for any delays, additional products, additional hours of work or overtime, restocking or rework required due to failure by the applicant or the subcontractor to coordinate their work with the work of other trades on the project or to provide the design/build portion or component in a timely manner to meet the schedule of the project.
3. AHJ Requirements: Follow the AHJ requirements current at the time of submission. The applicant is responsible to coordinate and submit all material required by the AHJ, so the AHJ's review will not adversely affect the construction schedule. At or near time of application, the applicant shall meet with City to identify design/build components and how they are to be submitted and processed.

B. Related Work

1. Summary of Work, **Section 1010**.

C. Design/Build Components of the Work

1. Design/build components known at this time requiring AHJ review:
2. See each section below for additional requirements.

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3. Design/build submittals are required to show complete criteria, design assumptions, details, calculations, submittals, instructions for fabrication, assembly, installation and interface with other trades, unless noted otherwise in the specific Specification section.
4. Complete submittals shall be submitted with the design/build engineer's seal and calculations for that portion of work. Submittals without required calculations, without the design/build engineer's seal and which have not been reviewed by the General Contractor will not be reviewed by the Architect or Engineer of Record.

D. AHJ Design/Build Requirements

1. The AHJ has set policies regarding design/build components of building projects.
2. Design/build components of a project are those which will be subject to lateral and/or vertical loads not designed by the Architect or Engineer of Record. These components will have to be designed by the design/build engineer who received the subcontract for that component of the project.
3. AHJ requirements to allow a plan's examination for these components to proceed are:
 - a. Three sets of design drawings clearly and legibly showing all members, dimensions, connections, materials used and indicating how the part is attached to the main structure.
 - (1) Drawings shall be prepared, designed and sealed by an engineer licensed by the **State of Oregon** to practice as such.
 - (2) Drawings shall be signed indicating general design conformance by Architect or Engineer of Record.
 - (3) Shop drawings or erection drawings are not acceptable as design/build drawings.
 - b. Submit one set of calculations including criteria, design assumptions, substantiating computations and such additional data sufficient to show the correctness of the plans and compliance with the structural provisions of the applicable Oregon code.
 - (1) Calculations shall be prepared and sealed by the design/build engineer who prepared and sealed the drawings.
 - (2) Calculations shall be signed by the Architect or Engineer of Record indicating acceptance of design concepts, loading criteria and compatibility of designs.
4. Before work is allowed to proceed on these components, the following must occur:

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- a. Submit complete legible documents (that will also be legible under microfilming).
 - b. These documents must be examined by the AHJ to verify codes compliance.
 - c. These documents must be approved by the AHJ.
5. If design/build documents are not completed prior to issuance of the building permit, they must be prior to fabrication. The General Contractor must complete and submit a Contractor Design Summary Sheet (blank forms supplied by AHJ, no later than 14 days after award of bid listing design/build subcontractors and their registered Engineer's name and phone number prior to main permit issuance.
6. The Engineer of Record is to contact each design build engineer and verify that the correct design criteria is being used and that the design/build engineer's **Oregon** seal will appear on his drawings and calculations.

E. Specific Requirements

1. Some design/build components are shown in the Contract Document for design intent. The purpose is to have the Builder responsible to design, provide, coordinate and install the design/build component.
2. Design/build components attached to the structural frame or supplemental to the structural frame shall be designed for the anticipated loads as outlined in the Contract Documents. These design/build components shall be coordinated with the appropriate subcontractors.
3. Load reactions at the interface between the design/build components and the structural frame shall be clearly defined to allow for a review by the Architect or Engineer of Record.

SECTION 1070 – ABBREVIATIONS AND SYMBOLS

ABV	ABOVE	APPROX	APPROXIMATE
AFF	ABOVE FINISHED FLOOR	ARCH	ARCHITECTURAL
ADD	ADDENDUM	AC	ASPHALT CONCRETE
ADJ	ADJACENT	@	AT
AGGR	AGGREGATE	AUTO	AUTOMATIC
AIR COND	AIR CONDITIONING		
ALT	ALTERNATE	BSMT	BASEMENT
ALUM	ALUMINUM	BM OR BMS	BEAM
ANCH	ANCHOR	BR	BEDROOM
AB	ANCHOR BOLT	BTW	BETWEEN
&	AND	BLK	BLOCK
	ANGLE	BLKG	BLOCKING

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BD	BOARD	EXIST	EXISTING
BOT	BOTTOM	EXP. JT	EXPANSION JOINT
BLDG	BUILDING	EXP	EXPOSED
		EXT	EXTERIOR
CAB	CABINET		
CI	CAST IRON	FAB	FABRICATE
CB	CATCH BASIN	F	FACE
CLKG	CAULKING	FF	FACTORY FINISH
CLG	CEILING	FO	FIELD ORDER
CT	CERAMIC TILE	FIN	FINISH (ED)
CLR	CLEAR (CLEARANCE)	FE	FIRE EXTINGUISHER
CO	CHANGE ORDER	FEC	FIRE EXTINGUISHER CABINET
COL	COLUMN		
CONC	CONCRETE	FH	FIRE HYDRANT
CMU	CONCRETE MASONRY UNIT	FLSHG	FLASHING
CONST	CONSTRUCTION	FB	FLAT BAR
CONT	CONTINUOUS	FLR	FLOOR
CONTR	CONTRACTOR	FD	FLOOR DRAIN
CG	CORNER GUARD	FLUOR	FLUORESCENT
CORR	CORRUGATED CENTERLINE	FTG	FOOTING
		FDN	FOUNDATION
		FV	FIELD VERIFY
CFCI	CONTRACTOR FURNISHED CONTRACTOR INSTALLED	GALV	GALVANIZED
CFOI	CONTRACTOR FURNISHED OWNER INSTALLED	GA	GAUGE
		GL	GLASS, GLAZING
CFVI	CONTRACTOR FURNISHED VENDOR INSTALLED	GB	GRAB BAR
		GR	GRADE
		GWB	GYPSUM WALL BOARD
		GYP BD	GYPSUM BOARD
DTL	DETAIL		
DIM	DIMENSION	HB	HOSE BIB
DW	DISHWASHER	HDW	HARDWARE
DIS	DISPENSOR	HD	HEADER
DBL	DOUBLE	HT	HEIGHT
DF	DOUGLAS FIR	HC	HOLLOW CORE
DN	DOWN	HM	HOLLOW METAL
DWG	DRAWING	HOR	HORIZONTAL
DR	DRESSING ROOM	HVAC	HEATING VENTILATING & AIR CONDITIONING
DF	DRINKING FOUNTAIN		
Ø	DIAMETER		
		IBC	INTERNATIONAL BUILDING CODE
EA	EACH		
ELEC	ELECTRIC (AL)	ICBO	INTERNATIONAL CONFERENCE OF BUILDING OFFICIALS
ELEV	ELEVATION		
ENT	ENTRANCE		
EQ	EQUAL	INCL	INCLUDE (D), (ING)
EQUIP	EQUIPMENT	ID	INSIDE DIAMETER
		INSUL	INSULATION

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INT	INTERIOR	PT	POINT
		PVC	POLYVINYL CHLORIDE
JAN	JANITOR	PLWD	PLYWOOD
JT	JOINT	PREFAB	PREFABRICATED
		PJF	PREMODELED JOINT FILLER
LAM	LAMINATE		
LAV	LAVORATORY	QT	QUARRY TILE
MB	MACHINE BOLT	RB	RUBBER BASE
MH	MANHOLE	REF	REFRIGERATOR
MFR	MANUFACTURER	REINF	REINFORCE (D), (ING)
MO	MASONRY OPENING	REQ	REQUIRE (MENT), (MENTS)
MAT	MATERIAL (S)	REV	REVISION
MECH	MECHANIC (AL)	RO	ROUGH OPENING
MED	MEDIUM	ROW	RIGHT OF WAY
M	MEN	RD	ROOF DRAIN
MTL	METAL	RM	ROOM
MIN	MINIMUM		
MISC	MISCELLANEOUS	SCH	SCHEDULE
		SHTG	SHEATHING
NIC	NOT IN CONTRACT	SHT	SHEET
NTS	NOT TO SCALE	SH	SHOWER
NO	NUMBER	SIM	SIMILAR
		SC	SOLID CORE
O/C	ON CENTER (S)	SPEC	SPECIFICATION (S)
OC	ON CENTER (S)	SQ	SQUARE
OPG	OPENING	SS	STAINLESS STEEL
OPP	OPPOSITE	ST STL	STAINLESS STEEL
OS	OUTSIDE	STD	STANDARD
OD	OVERFLOW DRAIN	STL	STEEL
OD	OUTSIDE DIAMETER	STRUCT	STRUCTURAL (RE)
OHD	OVERHEAD DOOR	SUSP	SUSPENDED
OFCI	OWNER FURNISHED		
	CONTRACTOR INSTALLED	TEL	TELEPHONE
OFOI	OWNER FURNISHED	TV	TELEVISION
	OWNER INSTALLED	TEMP	TEMPERED
OFVI	OWNER FURNISHED	THK	THICK (NESS)
	VENDOR INSTALLED	TPD	TOILET PAPER DISPENSER
		T & G	TONGUE & GROOVE
PR	PAIR	T	TOP
PNL	PANEL	TR	TREAD
PT	PAPER TOWEL	TYP	TYPICAL
PTN	PARTITION		
d	PENNY (NAIL SIZE)	UL	UNDERWRITERS LABORATORY
PLAST	PLASTER		
PL	PLATE		
P. LAM	PLASTIC LAMINATE	VCT	VINYL COMPOSITION TILE
PLMB	PLUMBING	VENT	VENTILATION

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VFY	VERIFY	WH	WATER HEATER
VG	VERTICAL GRAIN	WP	WATERPROOFING
VAT	VINYL ASBESTOS TILE	W/R	WATER RESISTANT
VFCI	VENDOR FURNISHED CONTRACTOR INSTALLED	WWM	WELDED WIRE MESH
VFOI	VENDOR FURNISHED OWNER INSTALLED	WF	WIDE FLANGE
VFVI	VENDOR FURNISHED VENDOR INSTALLED	WDW	WINDOW
		W/	WITH
		W/O	WITHOUT
		W	WOMEN
		WD	WOOD
WC	WATER CLOSET		

SECTION 1140 – SPECIAL PROJECT PROCEDURES for OCCUPIED BUILDING

A. EXISTING UTILITIES

1. Where existing utility lines (water, gas, telephone, power, etc.) are intersected by proposed Work, the Contractor shall give a minimum of forty-eight (48) hours notice to the owners of such utilities to permit them to locate their lines prior to construction. The Utility Notification Center shall be contacted at least forty-eight (48) hours prior to start of excavation. Utilities, which are not members of the Utility Notification Center, shall be contacted individually by the Contractor.

B. REPAIRS - WORK SCHEDULE AND EMERGENCY RESPONSE TIME

1. Emergency response by the Contractor will be required within one hour of notice by telephone of required repair. The arrival of a repair crew will be required within one hour of the Contractor's assessment of the emergency situation.

SECTION 1210 – PRECONSTRUCTION CONFERENCE

A. Owner and Architect/Engineer will arrange, prior to commencement of Work, Preconstruction Conference to cover following agenda:

1. Introduction.
 - a. Hoodland Fire District's project goal.
2. Explain:
 - a. Execution of Owner-Contractor Agreement.
 - b. Submission of certificates of insurance
 - c. Distribution of Contract Documents.
 - d. List of subcontractors, products and Schedule of Values.

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- e. Responsibility of each Participant.
 - f. Inspection Procedures.
 - g. Progress Schedules.
 - h. Progress Payment Procedures.
 - i. Submittals and Approvals.
 - j. Routing of Correspondence.
 - k. Change Order Procedures.
 - l. Final Inspection Procedures.
3. Review:
- a. Project identification/temporary signs.
 - b. System for daily collection and disposal of waste materials from site.
 - c. Special Coordination Problems.
 - d. Ingress and egress to site, traffic and parking rules.
 - e. Demolition Procedures.
 - f. Not Applicable.
 - g. Any Special Requirements such as Wage Rate and Equal Employment Opportunity.
 - h. Certifications.
 - i. Safety, Fire and Security.
 - j. Insurance Responsibilities.
 - k. Hazardous Materials.
4. Confirm:
- a. Critical Layout Situations.
 - b. Not applicable.

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- c. Sources of temporary utilities.
5. Determine:
 - a. Contractor's Plan of Operations.
 - b. Line of Authority in Contractor's Organization.
 - c. Off-Hour Contact in case of emergency.
 - d. Safety and Security Arrangement contemplated by Contractor(s).
 - e. Address and telephone numbers of Architect, Contractor and Subcontractors.
6. Architectural Inspections and Approvals: The following applicable stages of work are to be inspected by the Owner's Representative and written approval obtained before proceeding with subsequent work. The Owner's Representative is to be notified at a minimum of 48 hours prior to the desired time of inspection.
 - a. Framing and Furring completed.
 - b. Sound insulation installed.
 - c. Electrical Work rough-in.
 - d. Mechanical Work rough-in.
 - e. GWB Work completed.
 - f. Painting – completion of each coat.
 - g. Completion of work.

SECTION 1220 – PROGRESS MEETINGS AND NOTIFICATIONS

A. SITE MOBILIZATION CONFERENCE

1. Architect will schedule conference at Project Site prior to Contractor occupancy. If deemed appropriate by Architect, Site Mobilization Conference agenda may be combined with Pre-Construction Conference.
2. Attendance Required: Owner, Architect/Engineer, Special Consultants, Contractor and major Subcontractors.
3. Agenda:
 - a. Site area delineation.
 - b. Schedules.

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- c. Procedures for testing.
- d. Procedures for maintaining record documents.
- e. Requirements for start-up of equipment.
- f. Inspection and acceptance of equipment put into service during construction period.

B. SPECIAL INSPECTION CONFERENCE

1. Within five days of Notice to Proceed, Architect, together with AHJ representative, shall arrange meeting to clarify requirements and conditions for Special Inspections which may be required by AHJ and Oregon Structural Specialty Code and Fire and Life Safety Regulations.
2. Special Inspection Meeting shall be attended by Contractor and Project Coordinator, representatives of inspection laboratory, AHJ representative, Architect and Consulting Engineers and Owner's Representative.

C. PROGRESS MEETINGS

1. Contractor shall attend weekly coordination meeting arranged by Architect at regularly scheduled times. Additional specific meetings may also be held for other purposes. Contractor and other persons involved in coordination and planning for Work, such as prime Subcontractors, shall attend as appropriate. Meetings, which may also be attended by Architect, Owner's Representative, Project Inspector and other appropriate persons, shall be conducted utilizing following agenda:
 - a. Comments or revisions to previous meeting notes.
 - b. Review accidents or unusual events.
 - c. Construction progress summary.
 - d. Discussions/information issues, old and new.
 - e. Construction schedule review. Present 5 week schedule and define schedule in relation to project approved schedule.
 - f. Submittal status.
 - g. RFI status.
 - h. ASI status.
 - i. Special inspection status.
 - j. Special issues status.
2. Contractor, who will be responsible for documentation of meetings, will distribute copies of Progress Meeting notes to attendees and appropriate parties, so they are received no later than three business days prior to next regularly scheduled meeting.

D. PREINSTALLATION CONFERENCES

1. Contractor shall schedule and hold Pre-Installation Conferences at Site well before installation of each unit work that requires coordination with other.

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Installers and representative of manufacturers and fabricators and who are involved in or affected by each unit of work shall attend. Advise Architect and Owner's Representative of schedule of meeting, dates, subject, and if consulting engineer is required. At each meeting, review progress of other work and preparations of particular work under consideration, including specific requirements for following issues:

- a. Contract Documents.
 - b. Options.
 - c. Related Change Orders.
 - d. Purchases.
 - e. Deliveries.
 - f. Shop Drawings, Product Data and Quality Control Samples.
 - g. Compatibility and possible conflicts.
 - h. Time schedules.
 - i. Weather limitations.
 - j. Manufacturer's recommendations.
 - k. Acceptability of substrates.
 - l. Temporary facilities.
 - m. Space and access.
 - n. Governing regulations.
 - o. Safety.
 - p. Inspection, testing and maintenance requirements.
 - q. Required performance.
 - r. Recording requirements.
 - s. Protection.
2. Record discussions of each conference. Distribute meeting minutes promptly to all involved, including Architect and Owner' Representative.
 3. Do not proceed with Work if pre-installation is not successfully concluded. Initiate action necessary to resolve issues and re-convene conference as soon as possible. Failure on part of Contractor to resolve issues which may delay project will not be considered as ground for approval of Change Orders requesting additional Contract Time or compensation.
 4. Require installer of each major unit of Work to inspect substrate to receive Work and conditions under which Work is to be performed. Installer shall report unsatisfactory conditions promptly in writing to Contractor. Remedy condition to installer's satisfaction immediately.
 5. Where installations include manufactured products, comply with recommendations and instructions of manufacturer, to extent that requirements are more stringent than indicated on Construction Documents.
 6. Inspect each item of materials or equipment prior to installation. Reject damaged or defective items.

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7. Provide attachment and connection devices and methods for securing Work. Secure Work true to line and level, and within recognized industry tolerances. Allow for expansion and building movement. Provide uniform joint width in exposed Work and arrange to provide best visual effect. Refer questionable visual effect choices to Architect.
8. Recheck measurements and dimensions of Work as integral step of starting each installation.
9. Schedule installation of each unit of Work to result in best overall compatibility to coordination of entire project. Isolate each unit of Work from incompatible work as necessary to prevent deterioration or damage. Coordinate enclosure of Work with required inspections and test to minimize uncovering of Work for that purpose.
10. Where mounting heights are not indicated, refer questions to Architect prior to installation.

E. MISCELLANEOUS CONFERENCES

1. The Contractor's Representative may be required to attend project meetings for adjacent projects and coordinate with other projects to avoid impacts to schedules of either or both projects.

SECTION 1221 – SHUTDOWN REQUEST, PERMITS, RFI'S

A. SHUTDOWN REQUESTS

All utility shutdowns shall be coordinated with the owner. The contractor shall provide ten working days' notice to the Owner's Representative prior to any utility shut down. This notice shall include a description of the need for the shutdown and a schedule indicating the start and finish times for the shutdown.

B. HOT WORK PERMITS

Not applicable.

C. REQUEST FOR INFORMATION (RFI)

1. General: When contractor requires a clarification or information regarding work, this shall be initiated by submittal of Request for Information. RFI is designed to deal with on-site concerns that for whatever reason, are not adequately clarified in Contract Documents and cannot be easily resolved at Site with assistance from Architect or Inspector.
2. Form: RFI form is to be submitted to Architect, with top section filled out by Contractor. Include required response date to establish when project may be adversely impacted. This date may be no less than 7 calendar days from

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initiation date. Incomplete forms may be returned by Architect. Improper or unclear or incomplete information from the Contractor on any submission which adds to the processing time will be considered an avoidable delay caused by the Contractor and will not be the basis for contract time extension or additional compensation. Use additional forms, diagrams or marked-up drawings where necessary. Method of transmittal to Architect should reflect urgency of response.

3. The RFI will define all cost or time impacts to the Contract.
4. General Contractor shall submit all RFI's. No RFI's will be accepted from subcontractors, suppliers or others, unless first submitted to General Contractor. (Refer also to article on Change Order Procedures, **Section 1029**).
5. General Contractor shall thoroughly review, date and sign all submitted RFI's. General Contractor shall thoroughly review RFI's with respect to Construction Documents prior to submitting RFI's to Architect and notify affected parties of any potential cost or schedule impact.
6. Architect will receive only properly prepared and submitted RFI's. Architect will stamp for date received, review with Documents and Owner for decision and process within 7 working days.

SECTION 1230 - BID ALTERNATIVE PROCEDURES

A. RELATED DOCUMENTS

1. Construction Drawings, Technical Specifications, Addenda, and general provisions of the Contract, including Contract General Conditions and Supplementary General Conditions and other Division 1 Specification Sections, apply to this Section.

B. SECTION INCLUDES

1. Requirements and descriptions for products and scopes of Work identified as Bid Alternative in the Drawings and Specifications and listed as " Additive Alternate " on the Bid Form.

C. RELATED DOCUMENTS AND SECTIONS

1. Division 2 through Division 16: Refer to product Specification Sections indicated in Bid Alternative descriptions and as may be affected by alternate products and scope descriptions.

D. GENERAL REQUIREMENTS FOR ALTERNATIVES

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1. To enable Owner to compare total costs where alternative materials and methods might be used or where scope of Work might be altered, Bid Alternative Work items have been established as described in this Section.
 - A. Unless otherwise specifically provided, the work described in Alternatives shall be completed with no increase in Contract Time.
2. Contract Amount included in Base Bid and as stated in executed Agreement shall include all costs for Work described in Contract Documents.
3. Contract Amount shall include all necessary provisions for Work described in alternatives, whether or not Alternatives are accepted. Base Bid specifications shall govern Work of alternatives unless otherwise specified.
4. Bid Form for submission of proposed cost of Work shall include line items for each Alternative described in this Section. No Alternatives other than as described in this Section shall be submitted.
5. Each Alternative is identified herein by letter. This identification shall be used whenever referring to Work described in Alternative and when submitting cost proposals and payment requests.
6. Alternative construction described in Alternatives shall be performed only when such Alternative is made a part of the Work by specific provision in the Owner-Contractor Agreement, if selected by Owner prior to execution of the Agreement, or by Change Order or Change Directive if selected subsequent to execution of the Agreement.
7. Costs for Alternatives shall be valid for no less than 30 calendar days from date of Agreement, and the Owner may select any or all Alternatives during that time. Once an Alternative is selected and the Contract modified for Work as described in the Alternative, changes to return to original scope of Work will be made only by Change Order or Change Directive in accordance with provisions of the Contract General Conditions for changes.

E. PRODUCTS AND EXECUTION

1. If the Owner elects to proceed on the basis of one or more of the described Alternatives, Contractor shall make all modifications to Work as required to provide products complete, in place and fully functional, including all labor, equipment, services and incidental consumables necessary to apply, install and finish Work described in Alternative in accordance with requirements specified in related product Sections of these Specifications.

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2. Cost for Alternatives shall be complete and include all net increases and decreases in Contract Amount for Work described in Alternative and for all changes in related Work. No claims for additional costs to Owner will be honored other than as stated in cost proposal for each Alternative.

F. ALTERNATIVES

1. Additive Alternative "A" - Automatic transfer switches.
 - A. Base Bid condition: No work.
 - B. Alternate Bid condition: Install two 600V Generac GTS Series automatic transfer switches to control existing generator / main panel operation when utility supplied power is lost. Tie operation of generator room motorized louver to operation of generator.
2. Additive Alternate "B" - New metal roofing.
 - A. Base Bid condition: No work. Roof remains as is.
 - B. Alternative Bid condition: Remove existing roofing and substrate on top of roof sheathing. Install new moisture membrane and new metal roofing. See Section 07610.
3. Additive Alternate "C" - Flooring in Sleeping Rooms 101 and 102.
 - A. Base Bid condition - No work.
 - B. Alternate Bid condition - Install new flooring as described in Room Finish Schedule.
4. Additive Alternate "D" - Apparatus bay walls fans.
 - A. Base Bid condition: No work.
 - B. Alternative Bid condition - Install fans as described in Section 16010.
4. Additive Alternative "E" - Exterior painting.
 - A. Base Bid condition: No work. Siding, trim, soffits, and roof fascias remain as is.
 - B. Alternative Bid condition: Prep siding for application of wood primer (at bare wood areas) and two coats of new paint. All exterior walls.

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SECTION 1310 – PROGRESS SCHEDULES

A. CONSTRUCTION SCHEDULE

1. General: Within ten (10) days of Notice to Proceed, submit comprehensive resource loaded computer-generated Construction Schedule. Schedule shall indicate major and minor construction activities, showing percentage of completion, ongoing activities, critical path items, float items, etc. Maximum length of each event shall be ten (10) working days. Schedule shall allow phased portions of project to be sorted independently. Schedule shall be able to generate two-week schedule from overall schedule. In addition, indicate on Schedule the following elements:
 - a. Order and delivery dates for major materials and equipment.
 - b. Not applicable.
 - c. Submittal review dates for major elements.
 - d. Fabrication release dates, delivery dates and required dates for rough-in.
 - e. Systems start-up.
 - f. Substantial Completion/Final Acceptance for each stage.
 - g. Resource loading for all major trade groups.
 - h. Temporary and permanent Utility use.
 - i. Designate delivery and installation dates of Owner furnished equipment. See **Section 1016**.
 - j. Owner's work for this project: Schedule shall identify sequencing of all work by Owner to coordinate with general construction. Adequate time periods shall be provided such that all work by Owner shall be 100% complete at time of substantial completion.
 - k. All events and their relationships one to another.
 - l. Provide Owner and Architect with Contractor's charted printout.
2. Computer-generated Construction Schedules: Schedule programs that have been Architect approved include the following:
 - a. Contractor's option. Submit schedules to Architect and Owner's Representative in pdf format.
3. Implementation: Prepare and maintain schedule on series of sheets to show required data clearly for entire duration of project. Prepare Schedule on sheets of stable transparency or other reproducible stock to permit reproduction for distribution.
4. Distribution
 - a. Following initial submittal to and approval response by Owner, print and distribute Construction Schedule to Architect (2 copies), Owner (3 copies), separate contractors, principal Subcontractors and suppliers or

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- fabricators and others with need-to-know schedule-compliance requirements.
 - b. Post copies in temporary Field Office.
 - c. When revisions are made, distribute updated issues to same entities and post updated issues in same locations.
 - d. Delete entities from distribution when they have completed assigned work and are no longer involved in performance of scheduled work.
5. If Contractor fails to deliver schedule on time or to properly update schedule, Architect may withhold progress payment approval until such time as Contractor complies with these requirements.
6. If, in Architect's or Owner's opinion, work progress falls behind approved schedule, Contractor shall take necessary action to regain lost time. Contractor shall increase work amount or number of shifts or establish overtime operations or all three and submit for review schedule revisions in which progress rate will be regained, all without additional cost to the Owner.
7. Contractor's failure to comply with these requirements shall be grounds for determination that Contractor is not prosecuting work with such diligence as will insure project completion within the specified time. Upon such determination Owner may terminate Contractor's right to proceed with work or any separable part thereof, in accordance with General Conditions.
8. The Contractor and all subcontractors, suppliers and manufacturers shall schedule material deliveries and installation to conform with the schedule and provisions to this effect shall be included in all subcontracts.

B. TWO-WEEK SCHEDULE

1. General: For each regularly scheduled weekly project meeting, contractor shall prepare and distribute two-week construction schedule detail indicating activities projected for following two weeks. Schedule shall also show activities of prior week. Schedule shall include:
- a. Contractors and Subcontractors and activities they are engaged in.
 - b. Dates and duration of scheduled activities.
 - c. Listing of shutdowns.
 - d. Large deliveries.
 - e. Other events that affect coordination of project.
2. Implementation: Submit proposed form to Architect for approval.
- a. Generate two-week schedule from computer-aided schedule described in this Section.

SECTION 1320 – PROGRESS REPORTS

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A. CONTRACTOR'S DAILY REPORT, INCLUDE AS MINIMUM:

1. Trades on job.
2. Number of personnel by trade.
3. Areas of work for each trade.
4. Comments.
5. Schedule impacts "Critical path items which were not started, worked on or finished on the current date".
6. Weather conditions including morning, noon and afternoon temperature, daily high and low temperature from recording thermometer.
7. Equipment – list major equipment on site and note if equipment is in use or idle and note any equipment worn time.
8. Visitor log.
9. Accidents and lost time injuries.

B. DAILY REPORTS

1. Shall be placed on file in Contractor's office with one copy each sent to Owner's Representative and to Architect if requested.

SECTION 1340 – SHOP DRAWINGS

A. SUBMITTALS SCHEDULE

1. General: Within five (5) days after development and acceptance of fully developed Construction Schedule, prepare complete schedule of work-related submittals. Submit this Submittals Schedule, correlated with listing of principal Subcontractors, and listing of products as specified in **Section 1630** and elsewhere in Contract Documents. Schedule shall be prepared jointly with Architect and Owner.
2. Form: Prepare Submittals Schedule in chronological order of submittals. Indicate following:
 - a. Category of submittal.
 - b. Name of Subcontractor.
 - c. Generic description of work covered.
 - d. Related Section numbers.
 - e. Activity or event number on Construction Schedule.
 - f. Scheduled date for first submittal.
 - g. Re-submittal and final release or approval by Architect.

B. PROPOSED PRODUCTS LIST

1. Within ten (10) days after date of Notice to Proceed, submit complete list of major products proposed for use, with name of manufacturer, trade name and model number of each product.

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2. For products specified only by reference standards, give manufacturer, trade name, model or catalog designation and reference standards.

C. SUBMITTAL PROCEDURES

1. Transmit each submittal with sequentially numbered transmittal forms. Re-submittals shall have original number with alphabetic suffix.
2. Identify project, contractor, subcontractor or supplier; pertinent Drawing sheet and detail number(s) and Specification Section number, as appropriate.
3. Apply Contractor's stamp, signed or initialed, certifying that review, verification of products required, field dimensions, adjacent construction work and coordination of information, is in accordance with the requirements of the Work and Contract Documents.
4. Schedule submittals to expedite project and deliver to Architect/Engineer and Owner. Coordinate submission of related items. Any delays due to re-submittals or additional reviews will not constitute grounds for time extension.
5. Identify variations from Contract Documents and Product or system limitations which may be detrimental to successful performance of complete work.
6. Provide space for Contractor and Architect/Engineer review stamps.
7. Revise and resubmit submittals as required, identify all changes made since previous submittal.
8. Distribute copies of reviewed submittals to concerned parties. Instruct parties to promptly report any inability to comply with provisions.

D. SHOP DRAWINGS, PRODUCT DATE AND SAMPLES:

1. Requirements
 - a. Provide manufacturer's instructions and specifications for installation of all products, systems and assemblies so that the Owner's Representative will have ample time to review prior to installation and have at hand during construction.
 - b. Submittals for materials which have not been approved will result in rejection. Delay claims resulting from improper submittals will not be considered, see **Section 1630**.
 - c. For Product Options and Submittals see **Section 1630**.
 - d. Critical shop drawing review, fabrication or MFR and delivery times shall be shown on all submitted critical path schedules.

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- e. All Shop Drawings and product literature submitted shall be **edited for this specific project.**
- f. Contractor shall thoroughly review all Shop Drawings and shall not submit them to Architect until Shop Drawings are, to the best of the Contractor's knowledge and ability to verify, complete and accurate. The submittals will be returned to the Contractor without Architect's review if the Contractor has not reviewed them.
- g. Contractor shall anticipate that some submittals will be rejected as incomplete or incorrect and that some submittals will require revisions and resubmittal. Time required for resubmittals shall be included or accommodated in the Contractor's schedule.
- h. Reference shop drawings to drawing sheet, detail schedule or room number shown on drawings.
- i. Mark product data to clearly identify subject products its performance characteristics or capacities. Provide dimensions and required clearances. Show controls and wiring and piping diagrams.
- j. Submit samples to Architect, see respective sections of this specification for size and quantity.
- k. All shop drawings resubmitted to Architect for additional review shall have all changes or revisions clearly marked and clouded with revision date.
- l. Correction modifications or comments made on submittals by the Architect or Consultants shall not constitute a change to the Contract. The Contractor shall inform the Architect of any change to the Contract price prior to any materials being ordered or work started. Contractor to immediately notify Owner's Representative and Architect in writing if they feel that any notes, comments or corrections on any returned shop drawings are considered as a change in the scope of work.
- m. Submittals:
 - (1) Submittals submitted by Facsimile Transmissions (FAX) shall not be accepted.
 - (2) Submit six (6) copies of Manufacturer's descriptive data, including catalog sheets for materials, equipment and fixtures, showing dimensions, performance characteristics and capacities, wiring diagrams and controls, schedules and other pertinent information as required. Where printed materials describe more than one product or model, clearly identify which is to be furnished.

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- (3) Three sets of Fire Marshal stamped Fire Protection Sprinkler shop drawings shall be delivered to the Architect, one for the Owner and two for the Architect.
- (4) The Architect will keep three copies of all processed submittals which includes copy for the Owner's Representative and consultant. Where more than one consultant is required for submittal review additional copies will be withheld by Architect.
- (5) Architects and consultants review and return submittals within a normal review time of 7 to 10 days. Normal review time does not begin until the date received by Architect.

E. REQUIRED MAUFACTURER'S INSTRUCTIONS

1. Where job specifications require products to be stored, mixed, handled, conditioned, applied, installed or cleaned in accordance with Manufacturer's instructions and when job specifications do not cover all recommendations and instructions covered by Manufacturer's printed product instructions or are contrary to them, the Contractor shall submit four (4) copies of these product instructions and recommendations to Architect a minimum of 21 days prior to product use. Indicate name of project and specification section number to which product relates.

F. ARCHITECT'S REVIEWS

1. Satisfactory shop drawings and equipment brochures will be so identified by Architect and copies returned to Contractor.

G. REQUIRED SHOP DRAWING (S), MOCK-UP (M), SAMPLE (SP), and LITERATURE (L). See **Section 1061** for Design/Build requirements:

Miscellaneous Metal (S&L)
Millwork (S&L)
Cabinetry & Hardware (S&L)
Solid Surfacing Material (S,L & M)
Sheet Metal Work (S&L)
Insulation (L)
Metal Doors and Frames (S&L)
Hollow Metal Doors and Window Frames (S&L)
Wood Doors – Plastic Laminated (S&L)
Finish Hardware List (S&L)
Autodoor Operators (S&L)
Flooring, Seam Layout & Misc. Products (S, SP & L)
Carpet & Seam Layout (S, SP & L)
Paint Materials List & Draw Downs (L)
Misc. Specialties (L)

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H. In addition to drawings and items listed above, see sections in division 2 through 14, division 15, mechanical and division 16, electrical, for additional drawings and lists required for architect's "shop drawing" approval.

I. SAMPLES

1. Submit samples to illustrate functional and aesthetic characteristics of the product with integral parts and attachment devices. Coordinate sample submittals for interfacing work.
2. Submit samples of finishes from full range of manufacturer's standard colors, textures and patterns for Architect/Engineer's selection.
3. Include identification on each sample, with full project information.
4. Submit number of samples specified in individual Specification Sections; one of which will be retained by Architect/Engineer.
5. Review samples which may be used in work indicated in individual Specification Sections.

J. MOCK-UPS

1. Mock-ups shall be approved before any work shall begin.
2. Locate mock-ups on job site at location approved by Owner's Representative.
3. Remove and dispose of mock-ups when approved by Owner's Representative.

K. MANUFACTURER'S CERTIFICATES

1. When specified in individual Specification Sections, submit manufacturer's certificate to Architect/Engineer for review, in quantities specified for product data.
2. Indicate material or product conforms to or exceeds specified requirements. Submit supporting reference data, affidavits and certifications as appropriate.
3. Certificates may be recent or previous test results on material or product, but must be acceptable to Architect/Engineer.

SECTION 1410 – TESTING LABORATORY SERVICES

A. REQUIREMENTS SPECIFIED ELSEWHERE

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1. Inspections and testing required by laws, ordinances, rules, and orders of AHJ. Product Certification; see respective Specification Sections. Equipment testing, adjusting and balancing; see respective Specification Section.
2. General Conditions, **Section 0700**.

B. REFERENCES

1. ANSI/ASTM D3740 – Practice of Evaluation of Agencies Engaged in Testing and/or Inspection of Soil and Rock as Used in Engineering Design and Construction.
2. ANSI/ASTM E329 – Recommended Practice for Inspection and Testing Agencies for Concrete, Steel and Bituminous Materials as Used on Construction.

C. COSTS

1. Paid by Owner:
 - a. Testing Laboratory services as specified in this section and for special inspections of Concrete, Reinforcing Steel Placement, Masonry, High-Strength Bolting and Welding required by Building Code.
2. Paid by Contractor:
 - a. Inspections and testing required by laws, ordinances, regulations and orders of AHJ, but not specified in this section and for reinspections and retesting of work required because of defective work or ill-timed notices.
 - b. Employment of testing laboratory shall in no way relieve Contractor of obligation to perform work in accordance with requirements of Contract Documents.

D. LABORATORY QUALIFICATIONS

1. “Independent Laboratory as approved by Architect and meeting Qualification,” latest edition, published by American Council of Independent Laboratories, 1725 K Street NW, Washington, D.C. 20036. Also meeting ASTM E-329 latest edition, “Standards of Recommended Practice for Inspection and Testing Agencies for Concrete and Steel”.

E. LABORATORY’S DUTIES

1. Test samples of mixes submitted by Contractor.
2. Provide qualified personnel at site. Cooperate with Architect/Engineer and Contractor in performance of services.
3. Perform specified inspection, sampling and testing of products in accordance with specified standards.

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4. Ascertain compliance of materials and mixes with requirements of Contract Documents.
5. Promptly notify Architect/Engineer and Contractor of observed irregularities or non-conformance of work products.
6. Perform additional inspections and tests required by Architect/Engineer.
7. Attend preconstruction conferences and progress meetings as directed by Architect/Engineer or Owner.
8. Testing Equipment: Calibrated at reasonable intervals with devices of accuracy traceable to either National Bureau of Standards (NBS) standards or accepted values of natural physical constants.
9. Comply with and coordinate requirements of AHJ Special Inspection requirements.
10. Submit final reports to Owner and Architect and, as required, to AHJ.
11. Submit written inspection and test reports to Architect, Structural Engineer, Building Official and Contractor. Provide the following on test reports:
 - a. Date issued
 - b. Project title and location
 - c. Testing Laboratory name and address
 - d. Inspector's name
 - e. Date of inspection or sampling
 - f. Record of temperature and weather
 - g. Date of test
 - h. Clear Identification of Product tested and location of product by grid lines or other known reference points
 - i. Type of inspection or test
 - j. Observations regarding compliance with Contract Documents
12. Laboratory shall not:
 - a. Release, revoke, alter or enlarge on Contract Document requirements.
 - b. Approve or accept any portion of work.
 - c. Perform any duties for the Contractor.

F. CONTRACTOR'S RESPONSIBILITIES:

1. Notify and cooperate with Laboratory Personnel, provide same with access to work and to Manufacturer's operations.
2. Provide to Laboratory, representative samples of materials to be tested, in required quantities.
3. Furnish laboratory with copies of Mill Test Report.
4. Furnish casual labor and facilities to laboratory as follows:
 - a. Access to work to be tested
 - b. To obtain and handle test samples at site
 - c. To facilitate inspections and tests
 - d. For Laboratory's exclusive use, provide space for storage and curing of test samples until removed to laboratory.

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5. Notify Laboratory at least 24 hours in advance of required test to allow personnel assignments and test.
6. Repair test holes to match original conditions.

G. LIABILITY

1. Laboratory service is provided for assurance of quality control and in no way relieves Contractor's responsibility to comply with Contract Documents.

H. DETAILED REQUIREMENTS

1. Special Inspections: as required by the AHJ and OSSC.
 - a. The testing agency and contractor shall coordinate for these specifications procedures and requirements.
 - b. The testing agency shall follow to the specific procedures and coordinate with the Architect and Engineer.

SECTION 1440 – CONTRACTOR'S QUALITY CONTROL

A. GENERAL

1. Monitor quality control over subcontractors, suppliers, manufacturers, products, services, site conditions and workmanship, to produce work of specified quality.
2. Comply fully with manufacturer's instructions, including each step in sequence.
3. Should manufacturer's instruction conflict with Contract Documents, request clarification from Architect/Engineer before proceeding.
4. Comply with specified standards as minimum quality for work except when more stringent tolerances, codes or specified requirements indicate higher standards or more precise workmanship.
5. Perform work by persons qualified to produce workmanship of specified quality.
6. Secure products in place with positive anchorage devices designed and sized to withstand stresses, vibration, physical distortion or disfigurement.

B. REFERENCES

1. Refer to the following sections:
Project Coordination, **Section 1040**
Coordination and Layout of Work, **Section 1041**
Preinstallation conference in Progress Meetings and Notifications,
Section 1220
2. Conform to reference standard by date of issue current on date of Contract Documents.
3. Should specified reference standards conflict with Contract Documents, request clarification from Architect/Engineer before proceeding.

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4. Contractual relationship of parties to contract shall not be altered from Contract Documents by mention or inference otherwise in any reference document.

C. FIELD SAMPLES

1. Install field samples at site as required by individual specifications sections for review.
2. Acceptable samples represent quality level for work.
3. Where field sample is specified in individual sections to be removed, clear area after field sample has been accepted by Architect/Engineer.

D. MOCK-UPS

1. Specific requirements for specific mock-ups are specified in individual sections of these Specifications.
2. Tests will be performed under provisions identified in **Section 1410**.
3. Assemble and erect specified items, with specified attachment and anchorage devices, flashings, seals and finishes.
4. Where mock-up is specified in individual sections to be removed, clear area after mock-up has been accepted by Architect/Engineer.

E. MANUFACTURER'S FIELD SERVICES AND REPORTS

1. Submit qualifications of observer to Architect/Engineer 30 days in advance of required observations. Observer subject to approval of Architect/Engineer and Owner.
2. When specified in individual specification sections, require material or product suppliers or manufacturers to provide qualified staff personnel to observe site conditions, conditions of surfaces and installation, quality of workmanship, start-up of equipment, testing, adjusting and balancing of equipment as applicable and to initiate instructions when necessary.
3. Individuals to report observations and site decisions or instructions given to applicators or installers that are supplemental or contrary to manufacturer's written instructions and that equipment or system has been properly installed and is functioning correctly.
4. Submit report in duplicate within 5 days of observation to Architect/Engineer for review.

SECTION 1500 – CONSTRUCTIONS FACILITIES AND TEMPORARY CONTROLS

A. GENERAL REQUIREMENTS

1. See General Requirements, **Section 0700**.

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2. This section specifies administrative and procedural requirements for temporary services and facilities, including such items as temporary utility services, temporary construction and support facilities, temporary controls, traffic regulations, project security and protection.
3. Inspect and test each service before placing temporary utilities in use. Arrange for required inspections and tests by governing authorities and obtain required certifications and permits for use.
4. During progress of work, submit copies of reports and permits required by governing authorities or necessary for installation and efficient operation of temporary services and facilities.
5. Provide each temporary service and facility ready for use at each location when service or facility is first needed to avoid delay in performance of work. Maintain or expand as required and modify temporary services and facilities as needed throughout progress of work. Do not remove until services or facilities are no longer needed or are replaced by authorized use of completed permanent facilities.
6. With establishment of Construction Schedule, establish schedule for implementation and termination of service for each temporary utility. At earliest feasible time and when acceptable to Owner and Architect, change over from use of temporary utility service to use of permanent service to enable removal of temporary utility and to eliminate possible interference with completion of work.
7. Operate temporary services and facilities in safe and efficient manner. Do not overload temporary services or facilities and do not permit them to interfere with progress of work. Should services of independent engineer be required to survey existing or temporary utilities, it shall be at no cost to Owner. Do not allow unsanitary conditions, public nuisances or hazardous conditions to develop or persist at site. Do not allow contaminated runoff to enter property surrounding the site. Surrounding property is owned by the Federal Government and is governed by very strict regulations that when violated are punishable by law.
8. Do not permit freezing of pipes, flooding or contamination of water sources.
9. Maintain temporary facilities in such a manner as to prevent discomfort to users. Take necessary fire protection measures. Maintain temporary support facilities in sanitary manner so as to avoid health problems and other deleterious effects.
10. Maintain site security and protection measures in safe, lawful and publicly acceptable manner. Take necessary measures to prevent erosion of site. At no time is site to be without protective fence enclosure(s) and barriers, as required to protect general public and the surrounding environment.
11. Provide perimeter protection plan for submittal to and approval by the United States Forest Service.

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B. TEMPORARY UTILITIES

1. Temporary utility services required for use at project site include but are not limited to the following:
 - a. Contractor shall provide toilet facilities and use of Owner's toilet facilities is strictly prohibited.
2. See **Section 1510**.

C. TEMPORARY CONSTRUCTION AND SUPPORT FACILITIES

1. Temporary construction and support facilities required for project include but are not limited to the following:
 - a. Waste disposal service.
 - b. Construction aids and miscellaneous general services and facilities.
 - c. Temporary enclosures.
 - d. Project identification, bulletin boards and signs.
 - e. Field offices and storage sheds.
2. Temporary Utilities, see **Section 1510**.

D. SECURITY

1. Security and protection facilities and services required for project include but are not limited to the following:
 - a. Temporary fire protection.
 - b. Barricades, warning signs and lights.
 - c. Environmental protection.
2. Security, see **Section 1540**.

E. REGULATORY REQUIREMENTS

1. Comply with requirements of local laws and regulations as well as Owner's requirements governing construction and local industry standards, in installation and maintenance of temporary services and facilities, including but not limited to the following:
 - a. Building codes, including local requirements for permits, testing and inspection.
 - b. Health and safety regulations.
 - c. Utility company regulations and recommendations for temporary services.
 - d. Police and Fire Department rules and recommendations.

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- e. United States Forest Service and the Environmental Protection Agency regulations and requirements.
 - f. Hazardous Materials Safety Regulations.
 - g. All temporary construction access ways shall comply with all accessible requirements per ADA and OSSC.
2. Comply with requirements of NFPA Code 241, "Standards for Safeguarding Building Construction and Demolition Operations" and ANSI – A 10 Series standards for "Safety Requirement for Construction and Demolition" and AGC/ASA/ASC Joint Guideline #5, "Temporary Job Utility and Services". Refer to "Guidelines for Bid Conditions for Temporary Job Utilities and Services", as prepared jointly by AGC and ASC for industry recommendations.

F. SAFETY

1. See General Conditions, **Section 0700**.
2. In accordance with generally accepted construction practices the Contractor will be solely and completely responsible for conditions of the job site, including safety of all persons and property during performance of work. This requirement will apply continuously and not be limited to normal working hours.
3. Comply with all rules and regulations of the City, State and County authorities regarding the closing of public streets or highways to use of public traffic. No road shall be closed to the public except by express permission of the Owner. Conduct the work so as to assure the least possible obstruction to traffic and normal commercial pursuits. Protect all Obstructions within traveled roadways by approved signs, barricades and lights where necessary for the safety of the public. The convenience of the general public and residents adjacent to the project and the protection of persons and property are of prime importance and shall be provided for in an adequate and satisfactory manner.
4. The General Contractor shall insure that all scaffolding, staging, temporary floors, runways and similar devices furnished by himself or his subcontractors for the installation of any work be built and maintained to safely support required loads.
5. Insure that all cranes, hoists, and other lifting equipment necessary for the movement and erection of materials have operators trained and experienced in the equipment being used and are properly equipped with guys, bracing and safety devices as required by applicable codes.
6. The duty of the Owner's Representative is to conduct construction review of the Contractor's performance and NOT intended to include review of the adequacy of the Contractor's safety measures in, on or near the construction site. The Contractor shall comply with the applicable local safety codes and specifically the Occupational Safety and Health Act for the construction industry.
7. Emergency Procedures

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- a. Contractor shall call 911 for all fire or injury related emergencies.

SECTION 1510 – TEMPORARY UTILITIES

A. GENERAL

1. See General Conditions, **Section 0700** "Temporary Structures and Services".
2. Engage local utility companies to install temporary service to project or to make connections to existing service.

B. TEMPORARY ELECTRICAL

1. Use existing building system as recommended by electrical sub-contractor.

C. TEMPORARY LIGHTING

1. Provide local switching or temporary lighting, space to allow lighting to be turned off in patterns to conserve energy and retain light suitable for work in progress, access traffic, security check and project lock-up.
2. Illuminate all hazardous areas. Keep safety lights burning from dusk to dawn.
3. Provide and maintain lighting for construction operations to achieve minimum lighting level of 2 watt/sq. ft.
4. NA.
5. Provide and maintain 0.25 watt/sq. ft. lighting to interior work areas after dark for security purposes.
6. Provide branch wiring from power source to distribution boxes with lighting conductors, pigtails and lamps as required.
7. Maintain lighting and provide routine repairs.
8. Permanent/current building lighting may be utilized during construction in occupied building areas.

D. TEMPORARY HEAT AND VENTILATION

1. Provide temporary heat where indicated or needed for performance of work, curing or drying of recently installed work or protection of work in place from adverse effects of low temperatures or high humidity. Select facilities known to be safe and without deleterious effects upon work in place or being installed. Coordinate with ventilation requirements to provide indicated ambient condition required and to minimize consumption of fuel or energy.

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2. Do not operate permanent heating/ventilating system without mechanical sub-contractor's engineer's authorization that equipment is ready for use and filters are installed. Replace construction filters with new filters and restore system to clean condition before balancing and turning project over to Owner.
3. Ventilate enclosed areas to assist cure of materials, to dissipate humidity and to prevent accumulation of dust, fumes, vapors or gasses.

E. ENVIRONMENTAL CONDITIONS

1. Provide heat and ventilation in interior space prior to, during and after work is performed as follows: (Temperatures indicated are Fahrenheit degrees. Temperatures in table indicate minimum ambient air temperature anywhere in space.) Product manufacturer's instructions may require more restrictive requirements which shall be followed.

Environmental Conditions prior, during and after installation	Environmental Conditions to Completion
---	--

Prior & During	After 4 days
----------------	--------------

Section Title or Material	Days Prior	Temp.	Humi*	Temp.	Humi*	Min. Temp.	Humi*
Gypsum Drywall Finishing	2	55-85	B	55	B	55	D
Ceramic Tile	2	50-80	C	50	A	50	D
Acoustical Ceiling Systems	1	60-90	D	60	D	55	D
Resilient Tile & Sheet Flooring	2	70-85	A	70	D	55	D
Case Work	1	70-85 35-80%	E	70	D	55	D

* Humidity and Moisture Conditions:

- A = No visible condensation on anything in work or materials storage space.
- B = Visible condensation, but not running on anything in space.
- C = No visible condensation, but floor may be wet.
- D = Normal conditions expected to exist when occupied by Owner.
- E = Relative humidity range given in percent, minimum to maximum

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2. Minimum temperatures of spaces in which the above materials are to be stored shall be 40 degrees F, except resilient tile and sheet flooring to be 70 degrees F, and casework 70 degrees F. Humidity conditions for storage of materials shall be per Symbol "A" above, except casework shall be per Symbol "E".
3. See specific sections for additional requirements for above and other materials and where other sections are more restrictive, other section shall govern.

F. TELEPHONE AND EMAIL

1. Provide and pay for telephone and email within offices for duration of contract (use of smart phone(s) is acceptable).
2. NA
3. Provide directory and listing of all job related persons and companies with their respective telephone numbers.
4. Provide telephone number list for Fire Department, Ambulance, Police and Owner's Representative.

G. TEMPORARY SANITARY FACILITIES

1. Temporary sanitary facilities also includes temporary toilets, wash facilities and drinking water fixtures. Comply with governing regulation including safety and health codes for type, number, location, operation and maintenance of fixtures and facilities; provide not less than specified requirements. Install in locations that will best serve project's needs.
2. Supply and maintain toilet tissue, paper towels, paper cups and similar disposable materials as appropriate for each facility. Provide covered waste receptacle.
3. Provide pit-type privies at building exterior. Use of existing toilets or wash facilities in building is not permitted.
4. Install potable-water supplied wash facilities at locations convenient to construction activity and personnel involved in handling of compounds or materials where wash-up is necessary to maintain healthy and sanitary conditions. Drain and dispose of drainage properly. Supply soap and other cleaning products appropriate for each condition. Where recommended or required by governing authorities and regulations or recognized standards, provide shower baths, safety showers, eye-wash fountains, and similar facilities for convenience, safety and sanitation of construction personnel.

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5. Provide drinking water fountains where and when piped potable water is reasonably accessible from permanent or temporary lines. Otherwise, provide container tap-dispenser bottled water units, complete with paper cups.

H. TEMPORARY FIRE PROTECTION AND DETECTION

1. The contractor shall comply with NFPA 241 Building Construction Operations, NFPA 99 and NFPA 101.
2. Coordinate with Owner' Representative for documentation of **INTERIM LIFE SAFETY MEASURES** for each phase of work.
3. The existing standpipe, hose cabinets and/or portable fire extinguishers shall remain in service and be maintained and kept accessible during construction.
4. Except for utilization of existing fire protection facilities, do not change over from use of temporary fire and security facilities to use of permanent facilities until Substantial Completion or as directed by Architect to Owner.
5. Until fire protection needs may be fulfilled by permanent facilities, install and maintain temporary fire protection facilities of types needed to adequately protect against reasonably predictable and controllable fire losses.
 - a. Comply with applicable recommendations of NFPA Standard 10 "Standard for Portable Fire Extinguishers."
 - b. Locate fire extinguishers where they are most convenient, visible and effective for their intended purpose, but provide no less than one extinguisher on each floor or in each general work area, at or near each usable stairwell.
 - c. Store combustible materials in containers in recognized fire-safe areas.
6. Develop and supervise overall fire prevention and first-aid fire protection program for personnel at project site.
 - a. Review needs with local fire department officials and establish procedures to be followed.
 - b. Post warning and information and enforce strict discipline.
 - c. Maintain unobstructed access to fire extinguishers, fire hydrants, temporary fire protection facilities, stairways and other access routes for fighting fires.
 - d. Prohibit smoking in building interiors except in designated areas.
 - e. Provide supervision of welding operations, combustion type temporary heating units and similar sources of ignition for fire.
 - f. Contractor shall ensure that contractor's employees are familiar with Hoodland Fire District's fire procedures and location of fire hydrants and extinguishers in adjacent parts of building or areas near construction area.

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7. All tarpaulins shall be flame resistant treated. Gasoline shall not be used as fuel for temporary space heaters. Flammable materials shall not be stored within the building.
8. Oily or paint soaked rags shall be kept in tightly covered metal containers which shall not be allowed on the premises overnight.
9. After interior finish work has started, acetylene torches or arc welders shall be used only in the presence of a man equipped with a portable fire extinguisher. This man's only assignment shall be to act as a fire watcher at all times that acetylene torches or arc welders are used.

SECTION 1525 – CONSTRUCTION AIDS

A. General

1. See General Conditions, **Section 0700**.
2. Design, construct and maintain construction aids and miscellaneous general services facilities as needed to accommodate performance of work. Construction aids and miscellaneous general services and facilities include, but are not limited to the following:
 - a. Temporary stairs and ladders.
 - b. Guardrails and barriers.
 - c. Walkways.
 - d. Cranes.
 - e. Hoists.
 - f. Chutes.
3. Provide temporary stairs where ladders are not adequate for proper, safe or efficient performance of work.
4. Install and maintain temporary walkways around work and to field offices, toilets and similar areas. Construct walkways of gravel or duckboard units.
5. All concrete pads and other supports for cranes, hoists, walkways, etc., shall be designed by engineers and provided by the contractor. All such support shall be removed from the job site when no longer needed. All areas shall be repaired to new condition.

SECTION 1530 – BARRIERS AND ENCLOSURES

A. ENCLOSURES

1. It is the Contractor's responsibility to review all areas of work and determine where construction barriers are needed to be installed to protect against the

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construction work. The Contractor shall coordinate with the Architect for any barriers indicated on the drawings. The Contractor shall coordinate all barriers with the Owner and Architect.

2. Comply with recognized standards and code requirements for erection of substantially adequate barriers where needed to prevent accidents and losses. Paint with appropriate colors, graphics and warning signs to inform construction personnel and public of hazard of concern. Provide lighting and flashing signals as required.
3. Provide barriers to prevent unauthorized entry to construction areas, to allow for Owner's use of site, and to protect existing facilities and adjacent properties from damage from construction operations and demolition.

B. PROTECTION OF INSTALLED WORK

1. Protect installed work and provide special protection where specified in individual Specification Sections.
2. Provide temporary and removable protection for installed products. Control activity in immediate work area to minimize damage.
3. Provide protective coverings at walls, projections, jambs, sills and soffits of openings.
4. Protect finished floors, stairs and other surfaces from traffic, dirt, wear, damage or movement of heavy objects, by protecting with durable sheet materials.
5. Prohibit traffic or storage upon waterproofed or roofed surfaces. If traffic or activity is necessary, obtain recommendations for protection from waterproofing or roofing material manufacturer.
6. Prohibit traffic from landscaped areas.

SECTION 1540 –SECURITY

A. GENERAL

1. See General Conditions, **Section 0700**.
2. Provide security and facilities to protect work, existing facilities and Owner's operations from unauthorized entry, vandalism or theft.
3. Coordinate with Owner's security program.
4. Maintain security program continuously throughout project, until Owner occupancy or Owner acceptance precludes need for security program. Provide control of all persons or vehicles leaving and entering project site. Owner will

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provide control and coordination of vehicles related to Owner's existing operations.

B. PROTECTION OF PROPERTY

1. The Contractor shall be responsible for protection of all new and existing surfaces, finishes and structures. Any damaged property shall be replaced by Contractor to match existing property and shall comply with code requirements.

SECTION 1560 – TEMPORARY CONTROLS

A. CONSTRUCTION PROGRESS CLEANING

1. Location of dumpsters is limited to the Contractor's work area limits and outside of public right-of-way.
2. Dirt and debris of all nature caused by the execution of work shall be removed from the job site at the end of each work day. The Contractor will be responsible for the disposal of all scraps and materials that are relevant to this project. Provide a covered dropbox.
3. Execute cleaning and trash removal during work progress and at work completion; as required by General Conditions and as specified herein.
4. See individual sections for cleaning specific products or work.
5. Comply with governing codes, regulations, ordinances and anti-pollution requirements.
6. Use only materials which will not create hazards to health or property and which will not damage surfaces and/or as recommended by manufacturer of surface to be cleaned.
7. Clean all spilled dirt, gravel or other foreign material caused by the construction operations from all streets and roads at the conclusion of each day's operation. Cleaning shall be by washing with water, power brushing and hand labor. Hose all paved areas staged with construction material and generally prepare area of work for occupancy with no further clean-up by Owner required.
8. Remove debris and rubbish from pipe chases, plenums, attics, crawl spaces and other closed or remote spaces, prior to enclosing spaces.
9. Final Cleaning: See **Section 1700**.

B. TEMPORARY CONTROLS

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1. Construction Hazards.
 - a. Ensuring exits provide free and unobstructed egress. Personnel shall receive training of alternative exits. Buildings or areas under construction must maintain escape facilities for construction workers at all times. Means of egress in construction areas must be inspected daily.
 - b. Ensuring free and unobstructed access to emergency services and for emergency forces.
 - c. Ensuring fire alarm, detection, and suppression systems are not impaired. A temporary, but equivalent system, shall be provided when any fire system is impaired.
 - d. Ensuring temporary construction partitions are smoke tight and built of noncombustible materials that will not contribute to the development or spread of fire.
 - e. Providing additional fire-fighting equipment and use training for personnel.
 - f. Prohibiting smoking in or adjacent to construction areas.
 - g. Developing and enforcing storage, housekeeping, and debris removal practices that reduce the flammable and combustible fire load of the building to the lowest level necessary for daily operations.
2. Noise Control.
 - a. Contractor shall provide and maintain adequate and effective mufflers, sound barriers and controls for all construction equipment so that noise from this equipment can be controlled.
3. Pest Control.
4. Rodent Control.
5. Pollution Control.
 - a. Provide general protection facilities, operate temporary facilities, conduct construction activities and enforce strict discipline for personnel on site by methods which comply with environmental regulations and that minimize possibility that air, water and subsoil may be contaminated or polluted or that other undesirable effects may occur from performance of work.
 - b. Comply with Clackamas County, State of Oregon Environmental, and US Forest Service rules for construction sites as the apply.

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- c. Contractor shall provide or pay others to perform any clean-up operation or damages sustained due to failure to provide or coordinate requirements of this article. Obtain and pay for permits as required for pollution control activities.

C. TRAFFIC CONTROL AND PARKING

1. Reference Summary of Work, **Section 1010**, and Occupancy, **Section 1015**, for clarifications regarding use of roadways.
2. Contractor to coordinate parking for contractor's vehicles.
3. Reference Construction Drawings for additional information.
4. No parking or off-loading will be permitted outside Contractor's area of work limits.
5. Comply with all rules and regulations of Owner and State authorities regarding closing of public streets to use by public traffic, including pedestrians. No road shall be closed to public except by express permission by Owner and State. Control obstructions and hazards with approved signs, barricades and lights where necessary to protect safety of public. Convenience of general public adjacent to project, protection of persons and property, and access of emergency vehicles are of prime importance and shall be provided for in satisfactory manner.
8. Flagging Services.
 - a. Contractor shall provide trained flaggers and barricade hazardous operations during construction activities in street. Equip flaggers and guards on duty with approved red work apparel and stop/slow paddle kept clean and in good condition.
 - b. Utilize traffic control cones, drums, flares and lights which are approved by local jurisdiction. Use flares and lights during hours of low visibility to delineate traffic lanes and to guide traffic.

D. FIELD OFFICE

1. General Contractor to locate temporary office.
2. Temperature Transmission Resistance of Floors, Walls and Ceilings: Compatible with occupancy and storage requirements.
3. Exterior Materials (if located outside building): Weather resistant, finished.

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4. Interior Materials in Offices: Sheet type materials for walls and ceilings, prefinished or painted, resilient floors and bases.
5. Lighting for Offices: 50 ft. candles at desk-top height, exterior lighting at entrance doors.
6. Fire extinguishers: Appropriate type fire extinguisher at each office and each storage area.
7. Interior materials in Storage Sheds: As required to provide specified conditions for storage of products, including temperature and humidity control.
8. Storage and sheds shall be located to allow access and orderly provision for maintenance and inspection of products.
9. Maintain approach walks free of mud, water or snow.
10. At completion of work, remove buildings, foundations, utility service and debris. Restore area to prior condition.
11. Provide and maintain contractor's office (Owner's Representative may have access) available for weekly construction meetings.
 - a. Minimum office requirements as determined by the General Contractor.
 - b. Provide on file for reference by Contractor, Owner's Representative and Architect:
 1. As built prints
 2. Construction Documents
 3. Addendums
 4. R.F.I.'s
 5. Change Orders
 6. Construction Change Authorization
 7. Shop Drawings
 8. Design Clarifications
 9. Field Orders

SECTION 1600 – MATERIALS AND EQUIPMENT

A. Reference the following sections:

1. Project Coordination, **Section 1040**.
2. Coordination and Layout of Work, **Section 1041**.
3. Progress Meetings and Notification, **Section 1220,D**.

B. INAPPROPRIATE PRODUCTS AND METHODS

1. If Contractor believes that any specified product, method or system is inappropriate for the intended use, he shall notify Architect at least 5 working

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days prior to Bid Opening, or if not possible, such notice shall be given before performing work in question. If notice of objection is not received within the specified time limits, it will be assumed that the Contractor agrees that specified products, methods and systems are appropriate for use. See Product Options and Substitutions, **Section 1630**.

C. GENERAL

1. Materials and equipment incorporated into work shall conform to applicable specifications and standards and comply with size, make, capacity, type and quantity specified, unless otherwise approved in writing.
2. Compliance with Standards, Codes and Regulations: Where specifications require compliance with imposed standard, code or regulation, Contractor has option of selecting product that complies with specifications requirements, including standards, codes and regulations.
3. Visual Matching: Where matching established sample is required, final judgment of whether product proposed by Contractor matches sample satisfactorily will be determined by Architect. Where there is no product available within specified product category that matches sample satisfactorily and also complies with other specified requirements, comply with provisions of contract documents concerning "substitutions" and "change orders" for selection of matching products in another product category or for non-compliance with specified requirements.
4. Visual Selection: Except as otherwise indicated, where specified product requirements include phrase "as selected from manufacturer's standard colors, patterns, textures" or similar phrases, Contractor has option of selecting product and manufacturer, provided selection complies with other specified requirements. Architect is subsequently responsible for selecting color, pattern and texture from product line selected by Contractor.
5. Manufactured and fabricated products of like parts of duplicate units shall be standard size and gauges and to be interchangeable. Two or more items of same kind shall be identical and by same manufacturer. Materials or equipment other than that designed or specified shall not be used without prior approval.

D. GENERAL PRODUCT REQUIREMENTS

1. Provide products that comply with requirements of contract documents and that are undamaged and, unless otherwise indicated, unused at time of installation. Provide products that are complete with all accessories, trim, finish, safety guards and other devices and details needed for complete installation and for intended use and effect.
2. Where they are available, provide standard products of types that have been produced and used successfully in similar situations on other projects.

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3. Where, because of nature of its application, Owner is likely to need replacement or additional amounts of product at a later date, either for maintenance or repair or replacement, provide standard, domestically produced products for which manufacturer has published assurances that products and parts are likely to be available to Owner at later date.
4. Locate required product labels and stamps on concealed surface or, where required for observation after installation, on accessible surface which, in occupied spaces, is not conspicuous.
5. Provide permanent engraved metal or laminate nameplate on each item of service-connected, power-operated equipment or electrical outlet. Locate nameplate on easily accessible. Nameplate shall contain following information and other essential operating data:
 - a. Name of manufacturer.
 - b. Name of product.
 - c. Model number.
 - d. Serial number.
 - e. Capacity.
 - f. Speed.
 - g. Rating.
6. For power outlets, verify information with Owner's Representative.

E. ANCHORS, INSERTS, PREPARATIONS

1. Each contractor or subcontractor shall furnish anchorage devices, sleeves and insert items required to complete his work.
2. Anchors and inserts shall be promptly furnished, together with adequate setting information, in ample time to permit building into the work of other trades where required.

F. QUALITY ASSURANCE

1. Source Limitations:
 - a. To fullest extent possible, provide products of same generic kind, from single source, for each unit of work.
 - b. If it is discovered that specified products are available only from sources that do not or cannot produce adequate quantity to complete project requirements in a timely manner, consult with Architect for determination of what product qualities are most important before proceeding. Architect will designate those qualities, such as visual, structural, durability or compatibility that are most important. When Architect's determination has

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been made, select products from those sources that possess most important qualities to fullest extent possible.

2. Compatibility Options:
 - a. Compatibility of products is basic requirement of product selection. When contractor is given option of selecting between two or more products for use on project, product selected must be compatible with other products previously selected, even if products previously selected were also contractor options. Complete compatibility between various choices available to contractor is not assumed by various requirements of contract documents, but must be provided by contractor.

G. INSTALLATION OF PRODUCTS

1. Except as otherwise indicated in individual sections of these Specifications, comply with manufacturer's instructions and recommendations for installation of products in applications indicated.
2. Anchor each product securely in place, accurately located and aligned with other work.
3. Clean exposed surfaces and protect surfaces as necessary to ensure freedom from damage and deterioration at time of acceptance.

SECTION 1610 – TRANSPORTATION AND HANDLING

A. GENERAL

1. Follow manufacturer's instructions for storage; maintain product identity labels legible and intact.
2. Store products subject to weather damage in weather tight enclosures and maintain storage room temperature and humidity within ranges required by manufacturer's instructions.
3. Deliver, handle and store products in accordance with manufacturer's recommendations, using means and methods that will prevent damage, deterioration and loss, including theft. Control delivery schedules to minimize long-term storage at site to prevent overcrowding of construction areas. In particular, coordinate delivery and installation to ensure minimum holding or storage times for items known or recognized to be flammable, hazardous, easily damaged, valuable or sensitive to theft, deterioration or other source of loss.
4. Promptly inspect shipments to assure that products comply with requirements, quantities are correct and products are undamaged.

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5. Provide equipment and personnel to handle products by methods to prevent soiling, disfigurement or damage.

B. STORAGE OF MATERIALS

1. There is no exterior staging area available. All storage must be confined to the limits of work area.
2. NA
3. Stack gypsum board products and other materials in small pallets to avoid overloading floor when not on a concrete slab.
4. Store and protect products in accordance with manufacturer's instructions, with seals and labels intact and legible. Store sensitive products in weather-tight, climate controlled enclosures.
5. For exterior storage of fabricated products, place on sloped supports, above ground.
6. Provide off-site storage and protection when site does not permit on-site storage or protection.
7. Store heavy materials in manner that will not endanger supporting structure.
8. Cover products subject to deterioration with impervious sheet covering. Provide ventilation to avoid condensation.
9. Store loose granular materials on solid flat surfaces in well-drained area. Provide mixing with foreign matter.
10. Provide equipment and personnel to store products by methods to prevent soiling, disfigurement or damage.
11. Arrange storage of products to permit access for inspection. Periodically inspect to assure products are undamaged and are maintained under specified conditions.

C. EXTERIOR STORAGE

1. Store fabricated products above ground, on blocking or skids to prevent damage and discoloration.
2. Cover products subject to deterioration with weather proof covering; provide adequate ventilation to prevent condensation.

D. PROTECTION AFTER INSTALLATION

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1. Provide coverings as necessary to protect installed Products against damage and discoloration. Remove covering when no longer needed.

E. GLASS DAMAGE

1. Exercise precaution for the protection of the glass after it has been permanently installed and be responsible for all breakage or other damage to glass up to the time the building is turned over to the Owner.
2. Breakage or other damage is paid for by the Subcontractor or other Contractor responsible for the breakage or damage.

SECTION 1630 – PRODUCT OPTIONS AND SUBSTITUTIONS

A. CONTRACTOR'S OPTIONS

1. When products specified only by Referenced Standard, Contractor may use any products meeting standard.
2. When products specified by naming several products, any one complying with specifications may be used.
3. When products specified by naming one or more products and “or approved”, use any specified product or submit request for substitution as specified in **Subsection B “PRODUCT SUBSTITUTIONS”**.

B. PRODUCT SUBSTITUTIONS DURING BIDDING

1. During bidding, Architect will consider written requests for substitutions received no later than **(ten (10) days prior to bid date)**; requests received after that time will not be considered.
 - a. Also Instructions to Bidders.
2. Product approvals during bidding will only be by listing in an Addendum.

C. PRODUCT SUBSTITUTIONS AFTER BID

1. After date of Contract, Architect may, optionally, consider normal requests from Contractor for substitution of products in place of those specified when submitted in accord with the requirements of this section. One or more of the following conditions must also be documented:
 - a. The substitution must be required for compliance with final interpretations of Code requirements or insurance regulations.
 - b. The substitution must be due to the unavailability or discontinuation of the specified products, through no fault of the Contractor.

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- c. The substitution may be requested when subsequent information discloses the inability of the specified products to perform properly or to fit in the designated places.
- d. The substitution may be due to the manufacturer's or fabricator's refusal to certify or guarantee performance of the specified product as required.
- e. The substitution may be due to the specified product not complying with governing codes or regulations.
- f. The substitution may be requested when it is clearly seen, in the judgment of the Owner, that a substitution would be subsequently to the Owner's best interest in terms of cost, time or other considerations.

D. PRODUCT SUBSTITUTION PROCESSES (During Bid and After Bid)

- 1. Submit two copies of "CSI Request for Substitution" forms. Include in request:
 - a. Complete data substantiating compliance of proposed substitution with Contract Documents.
 - (1) Product identification, including manufacturer's name and address.
 - (2) Manufacturer's literature:
 - Product Description
 - Performance and Test Data
 - Reference Standards
 - (3) Samples
 - (4) Name and address of similar projects on which product was used and date of installation.
 - (a) Itemized comparison of proposed substitution with product or method specified.
 - (b) Data relating to changes in construction schedule.
 - (c) For request submitted after Bids are received, accurate cost data on proposed substitution in comparison with product or method specified.
- 2. In making request for substitution, Manufacturer/Contractor represents:
 - a. He or she has personally investigated proposed product and determined that it is equal or superior in all respects to that specified.
 - b. He or she will provide the same guarantee for substitution as for product specified.
 - c. He or she will coordinate installation of accepted substitution into work making such changes as may be required for work to be complete in all respects.
 - d. He or she waives all claims for additional costs related to substitution which consequently become apparent.

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- e. The contractor agrees that there is no additional cost to the Owner.
 - f. Cost data is complete and includes all related costs under this Contract but excludes:
 - (1) Costs under separate contract.
 - (2) Owner redesign, including constant's fees.
 - (3) Substitutions will not be considered if:
 - (a) They are indicated or implied on shop drawings or products data submittals without request submitted in accord with this Section.
 - (b) Acceptance will require substantial revision of Contract Documents.
 - (c) Specifications list only one product with no "approval equal" or "equal" clause. Specified product is required to match Owner's existing systems.
3. Substitution requests submitted by Facsimile Transmissions (FAX) will not be accepted. Email is acceptable if images are legible on 8.5" x 11" paper.

SECTION 1650 – SYSTEM START-UP REQUIREMENTS

A. Reference the following section:

- 1. Progress Schedules, **Section 1310**.

B. GENERAL

- 1. All testing and procedures for all building systems.
- 2. Coordinate schedule for start-up of various equipment and systems.
- 3. Notify Architect/Engineer and Owner seven days prior to start-up of each item.
- 4. Verify that each piece of equipment or system has been checked for proper lubrication, drive rotation, belt tension, control sequence or other conditions which may cause damage.
- 5. Verify that tests, meter readings and specified electrical characteristics agree with those required by equipment or system manufacturer.
- 6. Verify wiring and support components for equipment are complete and tested.
- 7. Execute start-up under supervision of responsible manufacturer's representative and contractor's personnel in accordance with manufacturer's instructions.
- 8. When specified in individual Specification Sections, require manufacturer to provide authorized representative to be present at site to inspect, check and approve equipment or system installation prior to start-up and to supervise placing equipment or system in operation.

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9. Submit written report in accordance with Section 1440 – Quality Control, that equipment or system has been properly installed and is functioning correctly.

C. TESTING

1. Operating equipment and systems shall be tested in presence of Owner's Representative, Engineer who designed system (Div 15 and 16) and Architect to demonstrate compliance with specified requirements.
 - a. Notify Owner, in writing, seven (7) days prior to tests scheduled under requirements of this section.
 - b. Testing shall be conducted under specified design operating conditions as recommended or approved by Owner and design Engineer.
 - c. Provide copies of all test reports and records to Architect.
2. All elements of systems shall be tested to demonstrate that total systems satisfy all requirements of these Specifications. Testing shall be accomplished on hierarchical basis. Test each piece of equipment for proper operation, followed by each subsystem, followed by entire system, followed by interties to other major systems.
3. All special testing materials and equipment shall be provided by Contractor.
4. Architect and Owner – Witnessed Contractor's Tests
 - a. System shall be checked for proper installation, shall be adjusted and shall be calibrated to verify that it is ready to function as specified.
 - b. All system elements shall be checked to verify that they have been installed properly and that all connections have been made correctly.
 - c. All discrete elements and sub-systems shall be adjusted and shall be checked for proper operation.
 - d. Operational Tests shall be complete prior to starting Functional Acceptance Tests.
 - e. Provide copies of all test reports and records to Architect.
5. Architect and Owner-Witnessed Functional Tests
 - a. Objective of these tests is to demonstrate that system is operating and complying with specified performance requirements.
 - b. Architect, design Engineer and Owner-witnessed Functional Acceptance Test shall be performed on complete system. Each function shall be demonstrated to satisfaction of Engineer and Owner on paragraph-by-paragraph basis of Contractor's written test procedure, developed to demonstrate conformance to requirements of Contract Specifications.

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- c. Functional acceptance test shall be witnessed and signed off by Owner and Engineer upon satisfactory completion.
 - d. Actual testing program shall be conducted in accordance with prior approved procedures and shall be documented as required hereinafter.
 - e. Notify design Engineer, Architect, and Owner at least three weeks prior to date of Functional Acceptance Test.
6. Performance Period.
 - a. Upon successful completion of Architect and Owner-Witnessed Functional Test, Performance Period (30 consecutive calendar days) shall commence on first day following performance test. In event of failure to meet standard of performance during any initiated performance period, it is not required that one 30-day calendar period expire in order for another performance period to begin.
 - b. If equipment or system operates so as to demonstrate continuing compliance with specified requirements for period of 30 consecutive calendar days from commencement date of performance period, it shall be deemed to have met standard of performance. Satisfactory completion of performance period does not constitute acceptance by Owner, nor does it relieve Contractor of Contractor's Warranty responsibilities. In addition, equipment or systems shall operate in conformance with all Contract Specifications and with Contractor's bid and published Specifications in effect on date Contract is executed, provided such specifications are equal to or better than specifications submitted with Contractor's bid.
 - c. Equipment shall not be accepted by Owner and final payment shall not be made by Owner, until standard of performance is met.
7. Test Procedure Development and Test Documentation.
 - a. Within one (1) month after award of Contract, Contractor shall prepare and submit to Architect, and to Owner for review, detailed descriptions of test procedures which Contractor proposes to perform to demonstrate conformance of completed systems of instrumentation and controls to these Specifications.
 - b. Decision of Architect upon acceptability of test procedures shall be final.
 - c. Equipment shall not be accepted by Owner and final payments shall not be made by Owner until standard of performance is met.
 - d. Fit closeout schedule into original CPM schedule according to requirements of Section 1300. Include Owner's resource loading for testing and acceptance training.
8. Operational Tests

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- a. Contractor shall prepare check-off sheet(s) for each system. These check-off and data sheets shall form basis for these operational tests and this documentation.
- b. Each check-off sheet shall cite following information and shall provide spaces for sign-off on individual items and on completed systems by Owner and Engineer.
 1. Project name.
 2. For each element: tag number, description, manufacturer and model number, installation bulletin and specification sheet number.
- c. Each instrument calibration sheet shall provide adequate information and space for sign-off on individual items and on completed units by Contractor.

D. TRAINING

1. Contractor shall provide, at site, training for Owner's personnel in operation and maintenance of all systems, sub-systems and items of equipment. Refer also to individual specifications sections. Verify with Owner amount of training required for various systems, sub-systems and items of equipment. Owner may choose to video-tape training sessions; therefore, presentations shall be prepared and delivered in a professional manner.
 - a. Contractor training shall be provided by EXPERIENCED, FACTORY-TRAINED personnel.
 - b. Contractor shall submit, for Owner's approval, resumes of proposed training staff.
 - c. Satisfactory completion of plant training shall be determined by Owner.
 - d. Contractor shall provide CPM schedule as sub-schedule of overall Construction Schedule for entire closeout procedure and testing and training process. Refer also to **Section 1310**.
2. Use approved operation and maintenance manuals as basis for instruction. Review contents of manual with personnel in detail to explain all aspects of operation and maintenance.

E. ADJUSTING AND BALANCING

1. Adjusting and balancing shall be performed as element of preparation for testing procedures. Adjusting and balancing shall be completed prior to start of Performance Period.
2. Adjusting and balancing is included in Contract. Refer to Division 15.

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3. Submit to system design Engineer, Architect and to Owner reports indicating observations and results of tests and compliance or non-compliance with specified requirements and with requirements of Contract Documents.

F. OPERATION AND MAINTENANCE DATA

1. Materials and workmanship shall be guaranteed for minimum of one year period after Final Acceptance of Work by Owner, in accordance with **Section 1740, Project Closeout**. Contractor shall repair any failures due to inferior workmanship and/or materials, without additional expense to Owner. Contractor shall promptly repair any damage to existing materials, surfaces or equipment caused during execution of work.
2. Materials, products or systems provided with guarantees longer than one year shall remain valid and not be diminished by requirements of this section.

SECTION 1700 – CONTRACT CLOSEOUT

A. Description of Requirements

1. Definitions: Project Closeout is the term used to describe certain collective project requirements, indicating completion of the Work that are to be fulfilled near the end of the Contract time in preparation for Final Acceptance and occupancy of the Work by the Owner, as well as final payment to the Contractor and the normal termination of the Contract.
2. Special requirements for individual units of work are included in the appropriate sections in Divisions 2 through 16.
3. Time of Contract Closeout is directly related to “Substantial Completion” (as defined by Article 8.1.3 in the General Conditions), therefore, the time of closeout may be either a single time period for the entire Work or a series of time periods for individual elements of the Work that have been certified as substantially complete at different dates. This time variation, if any, shall be applicable to the other provisions of this section.

B. Prerequisites

1. General: Complete the following before requesting the Architect’s inspection for the certification of Substantial Completion, either for the entire Work or for portions of the Work. List known exceptions in the request.
 - a. In the progress payment request that coincides with, or is the first request following, the date of Substantial Completion is claimed, show either 100% completion for the portion of the Work claimed as “substantially complete” or list incomplete items, the value of incomplete work and the reason for the work being incomplete.

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- b. Include supporting documentation for completion as indicated in these Contract Documents.
 - c. Submit a statement showing an accounting of changes to the Contract Sum.
 - d. Submit specific warranties, workmanship/maintenance bonds, maintenance agreements, final certifications and similar documents.
 - e. Deliver tools, spare parts, extra stock of material and similar physical items to the Owner.
 - f. Complete start-up testing of systems and instruction of the Owner's operating and maintenance personnel. Discontinue or change over and remove temporary facilities and services from the project site, along with construction tools and facilities, mock-ups and similar events.
 - g. Complete final cleanup requirements, including touch-up painting of blemished surfaces.
 - h. Test fire and life safety equipment in the presence of the Owner's representative, Architect and City officials.
 - i. AHJ Certificate of Occupancy. Inspection procedure: Upon receipt of the Contractor's request for inspection, the Architect will either proceed with inspection or advise the Contractor of unfulfilled prerequisites.
2. Following the initial inspection, the Architect will either prepare the Certificate of Substantial Completion or will advise the Contractor of work which must be performed before the Certificate will be issued. The Architect will repeat the inspection when requested and when assured that the Work has been substantially completed. Should Architect determine that work is not substantially complete, Architect will promptly notify Contractor in writing. Contractor shall remedy work deficiencies and send second notice of substantial completion to Architect. When Architect concurs that work is substantially complete, they will issue a Certificate of Substantial Completion using AIA Form G704, accompanied with a punch list of items to be completed or corrected.
 3. Results of the completed inspection will form the initial "punch list" for final acceptance.

C. Final Inspection

1. When contractor considers work complete, he shall submit written certification that the Contract Documents have been reviewed and the Contractor has inspected work for compliance with Contract Documents. Contractor will certify equipment and systems have been tested in presence of Owner's Representative and are operational and that work is complete and ready for final inspection.
2. Architect will inspect work to verify completion status as soon as possible after receipt of Contractor's Certification. Should Architect consider incomplete or defective he will promptly notify Contractor in writing, listing incomplete or defective work. Contractor shall then immediately remedy deficiencies and send

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second written certification to Architect that work is complete and Architect will reinspect work.

3. When Architect finds work acceptable under Contract Documents, they shall request Contractor to make closeout submittals.
4. Reinspection fees: Should Architect be required to make more than **two** final inspections due to Contractor's failure to correct specified deficiencies:
 - a. Owner will compensate Architect for such additional services.
 - b. Owner will deduct Architect's compensation amount from Contractor's final payment as follows:
 - (1) Architect's time at \$100 per hour (3 hour minimum)
 - (2) Architect's employee's time at 2 1/2 times the direct personnel expense.
 - (3) Others at 2 1/2 times the direct cost incurred.
 - (4) Charges will be made for necessary travel time, commercial airfare, auto expense computed at .51 cents per mile, room and board and all other expenses incurred in making inspections.

D. Prerequisites to Final Acceptance

1. General: Complete the following before requesting the Architect's final inspection for certification of final acceptance and final payment as required by the General Conditions. List known exceptions, if any, in the request.
2. Submit the final payment request with final releases and supporting documentation not previously submitted and accepted. Include certificates of insurance for products and completed operations where required.
3. Submit an updated final statement, accounting for final additional charges to the Contract Sum.
4. Submit a certified copy of the Architect's final punch list of itemized work to be completed or corrected, stating that each item has been completed or otherwise resolved for acceptance and has been endorsed and dated by the Architect.
5. Contractor shall submit the Affidavit of Payment of Debts and Claims, AIA Document G706 and Affidavit of Release of Liens, AIA Document C705A including the following:
 - a. Consent of Contractor's Surety to Final Payment, AIA Document G707.
 - b. Contractor's release or waiver of liens.
6. Submit a final liquidated damages settlement statement, acceptable to the Owner.

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7. Submit evidence of final, continuing insurance coverage complying with insurance requirements.
8. Reinspection procedure: The Architect will reinspect the Work upon receipt of the Contractor's notice that the work, including punch-list items whose completion has been delayed because of circumstances that are acceptable to the Architect.
9. Upon completion of the reinspection, the Architect will either prepare a Certificate of Final Acceptance or will advise the Contractor of work that is incomplete or of obligations that have not been fulfilled, but are required for Final Acceptance. If necessary, the reinspection procedure will be repeated.
10. Final Adjustment of Contract Amount.
 - a. Submit final statement of accounting to Architect, including the total contract sum as adjusted showing previous payments and remaining sum due.
 - b. Architect will prepare and issue final change order, reflecting approved adjustments to contract assume not previously made by change orders.
11. Final Application for Payment
 - a. Submit final application for payment in accordance with procedures specified in Supplementary Conditions.

E. Record Document Submittals

1. General: Specific requirements for record documents are indicated in the individual sections of these Specifications. Other requirements are indicated in the General Conditions. General submittal requirements are indicated in the various "submittals" sections.
2. Do not use the record documents for construction purposes. Protect from deterioration and loss in a secure, fire-resistive location. Provide access to record documents for the Architect's reference during normal working hours. Record drawings: Maintain a record set of blue or black line prints of Contract Drawings and shop drawings in a clean, undamaged condition. Mark-up the set of record documents to show the actual installation where the installed work varies substantially from the work as originally shown. Mark whichever drawing is most capable of showing the actual "field" condition fully and accurately. Where shop drawings are used for mark-up, record a cross-reference at the corresponding location on the working drawings and a notation describing the purpose of the change or other method of reference. Give particular attention to concealed work that would be difficult to measure and record at a later date.
 - a. Record depths of foundations elements in relation to floor elevation.

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- b. Horizontal and vertical locations of underground utilities and appurtenances, referenced to permanent surface improvements.
 - c. Location of internal utilities and appurtenances concealed in construction, referenced to visible and accessible features of structure.
 - d. Record bench mark locations with horizontal and vertical dimensions.
 - e. Record field changes of dimensions, changes made by change order or field order, and details not shown on original contract drawings.
3. Mark record sets with red erasable pencil and where feasible, use other colors to distinguish between variations in separate categories of work.
4. Mark-up new information which is known to be important to the Owner, but for some reason was not shown on either Contract Documents or shop drawings.
5. Note related change order numbers where applicable.
6. Organize record drawing sheets into manageable sets, bind with a durable cover sheet and print suitable titles, dates and other identification on the cover of each set.
7. Record Specifications: Maintain one complete copy of the Project Manual, including Specifications and Addenda and one copy of other written Construction Documents such as change orders, supplemental instructions and similar modifications issued in printed form during construction. Mark these documents to show substantial variations in the actual work performed in comparison with the text of the Specifications and the modifications issued. Give particular attention to substitutions, selection of options and similar information on work where it is concealed or cannot otherwise be readily discerned at a later date by direct observation. Note related record drawing information and product data, where applicable.
8. Upon completion of the Work, submit record Specifications to the Architect for the Owner's records.
9. Record product data: Maintain one copy of each product data submittal. Mark these documents to show significant variations in the actual work performed in comparison with the submitted information. Include both variations in the products as delivered to the site and variations from the manufacturer's instructions and recommendations for installation. Give particular attention to concealed products and portions of the Work which cannot otherwise be readily discerned at later date by direct observation. Note related change orders and mark-up of record drawings and Specifications.
10. Upon completion of the mark-up, submit a complete set of record product data to the Architect for the Owner's records.
11. Record Sample submittal: Immediately prior to the date or dates of Substantial Completion, the Contractor will meet at the site with the Architect and the

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Owner's representative to determine which, if any, of the submitted samples that have been maintained by the Contractor during progress of the Work, are to be submitted to the Owner for record purposes. Comply with delivery to the Owner's designated location.

12. Miscellaneous Record submittals: Refer to other sections of these Specifications for requirements of miscellaneous record-keeping and submittals in connection with the actual performance of the Work. Immediately prior to the date or dates of Substantial Completion, complete miscellaneous records and place in good order, properly identified and bound or filed, ready for continued use and reference. Submit to the Architect for the Owner's records.
13. Maintenance Manuals: Submit as specified in **Section 1730** operations and maintenance manuals.

F. Closeout procedures

1. General Operating and Maintenance Instructions: Arrange for each installer of operating equipment and other work that requires regular or continuing maintenance, to meet at the site with the Owner's personnel to provide necessary basic instruction in the proper operation and maintenance of the entire Work. Where installers are not experienced in the required procedures, include instruction by the manufacturer's representatives. These instructions shall include a detailed review of the following items:
 - a. Maintenance manuals
 - b. Record documents
 - c. Spare parts and materials
 - d. Tools
 - e. Lubricants
 - f. Fuels
 - g. Identification systems
 - h. Control sequences
 - i. Hazards
 - j. Cleaning
 - k. Warranties, bonds, maintenance agreements, and similar continuing commitments.

G. Final Cleaning

1. General: Special cleaning requirements for specific units of Work are included in the appropriate sections of Divisions 2 through 16. General cleaning during the regular progress of the Work is required by the General Conditions and is included under Temporary Facilities, **Section 1560**.
2. Cleaning: Provide final cleaning of the Work at the time indicated. Employ experienced workers or professional cleaners for final cleaning. Clean each

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surface or unit of work to the condition expected from a normal commercial building cleaning and maintenance program.

3. Comply with the manufacturer's instructions for operations. Complete the following cleaning operations before requesting the Architect's inspection for Certification of Substantial Completion.
 - a. Clean interior and exterior glass, glazing, mirrors and surfaces exposed to view; remove temporary labels, stains and foreign substances, polish transparent and glossy surfaces, vacuum carpeted and soft surfaces.
 - b. Clean equipment and fixtures to a sanitary condition.
 - c. Clean or replace filters of operating equipment.
 - d. Clean debris from roofs, gutters, downspouts and drainage systems.
 - e. Clean project site, including landscape development area, of rubbish, litter and other foreign substances. Sweep paved areas to broom clean condition. Remove stains, spills and other foreign deposits. Rake grounds that are neither paved nor planted, to smooth, even-textured surface.
 - f. Clean mechanical and electrical equipment and spaces, including tops of pipes, ducts, equipment, etc.
 - g. Ventilating System (see Mechanical Division):
 - (1) Clean permanent filters and replace disposable filters if units were operated during construction.
 - (2) Clean ducts, blowers and coils if units were operated without effective filters during construction.
 - h. Re-clean areas or equipment, after final inspection, if dirtied as result of Contractor's work in preparing for final inspection or completion of punch list.
4. Removal of protection: Except as otherwise indicated or requested by the Architect, remove temporary protection devices and facilities which were installed during the course of the work to protect previously completed work during the remainder of the construction period or to protect the public.
5. Compliance: Comply with safety standards and governing regulations for cleaning operations. Do not burn waste materials at the site. Do not bury debris or excess materials on the Owner's property. Do not discharge volatile or other harmful or dangerous materials into drainage systems. Remove waste materials from the site and dispose of in a lawful manner.
6. Where extra materials of value remaining after completion of associated work have become the Owner's property, dispose of these materials to the Owner's best advantage, as directed.

SECTION 1720 – PROJECT RECORD DOCUMENTS

A. GENERAL

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1. Maintain at project site for Owner one record copy of contract drawings and specifications, addenda, change orders, field orders and other written instructions or contract modifications, approved shop drawings, product data, samples and field test reports.
2. Store documents in Contractor's field office apart from documents used for construction.
3. Do not use record documents for construction purposes.

B. DRAFTING QUALITY

1. Draftsman must be competent and skilled in drafting technique.

C. REQUIRED DRAWINGS

1. Maintain one black-line print of Contract Documents as "work set", using marking devices as required to record all contract changes.
2. Prior to submittal, transfer recorded information to one additional black-line print. Contractor may retain "work set" for his/her records.
3. Label each document "Project Record" in neat, large, printed letters. Use red ink.
4. Record information concurrently with construction progress. Do not conceal any work until required information is recorded.
5. Record depths of foundation elements in relation to floor elevation, horizontal and vertical locations of underground utilities and appurtenances, referenced to permanent surface improvements. Location of internal utilities and appurtenances concealed in construction, referenced to visible and accessible features of structure.
6. Record bench mark locations with horizontal and vertical dimensions.
7. Record field changes of dimensions, changes made by change order or field order and details not shown on original contract drawings.
8. Specifications and addenda; mark legibly to record manufacturer, trade name, catalog number and supplier of each product actually installed and changes made by change order or field order.
9. List on drawings all permit numbers.
11. All additional prints required for record documents shall be purchased by the Contractor.

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12. Fire Alarm As-Builts: All device address numbers shall be compatible with the existing system, if there is one. The Contractor shall field verify the numbering systems.

SECTION 1730 – OPERATING AND MAINTENANCE DATA

A. GENERAL

1. Catalog product data and specification information appropriate for Owner's maintenance and operation of products furnished under contract. Prepare as specified herein and in other specification sections. Instruct Owner's personnel in maintenance of products and in operation of equipment and systems.
2. For requirements of demonstrating Mechanical and Electrical equipment, Divisions 15 and 16 respectively.

B. QUALITY ASSURANCE

1. Data preparation shall be done by personnel, trained and experienced in maintenance and operation, completely familiar with requirements of this section and sufficiently skilled as technical writer and draftsman to communicate essential data.

C. FORM OF SUBMITTALS

1. Prepare data as typical instructional manual for use by Owner's personnel. Manual shall be 8-1/2 x 11 inch, use 20 lb. minimum white paper.
2. Provide manufacturer's printed data or neatly typed as text. Drawings shall have reinforced edges against tear-out. Bind-in with text, fold larger drawings to match size of text pages.
3. Provide fly-leaf for each separate product and identify each fly-leaf with labeled tabs.
4. Cover shall identify each volume with typed or printed title "Operating and Maintenance Instructions", and list project title and identity of general subject matter contained in manual.

D. BINDERS

1. Commercial quality three-ring type with durable and cleanable plastic covers. Maximum size, 1 1/2 inch. When multiple binders are used, correlate data into related consistent groupings.

E. MANUAL CONTENT, GENERAL

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1. Neatly typewritten table of contents for each volume, arranged in systematic order listing:
 - a. Contractor, name of responsible principal, address and telephone number.
 - b. Each product including name, address and telephone number of: Subcontractor or Installer, Recommended Maintenance Contractor, local source for replacement parts.
2. Product data shall include only those sheets which are pertinent to specific product, clearly identify specific product or part installed, and clearly identify data applicable to installation.
3. Supplement product data with drawings where necessary to clearly illustrate relations of component parts and control and flow diagrams. Do not use Project Record Documents as Maintenance Drawings.
4. Provide where necessary to supplement product data and drawings.
5. Organize in consistent format under separate headings for different procedures and provide logical sequence of instructions for each procedure.
6. Warranties, Bonds and Maintenance Contracts; provide one copy of each. Include the following: Proper procedures in event of a failure or instances which might affect validity of Warranties, Bonds or Contracts.
7. Copy of Certificate of Substantial Completion.

F. ARCHITECTURAL MATERIALS AND FINISH MANUALS

1. Include Manufacturer's catalog number, size, composition, color and texture designations. Provide required reordering information and recommended cleaning materials and methods.
2. Submit specified information for the following:
 - a. Wood Doors, Section 8200.
 - b. Automatic Door Operators, Section not used.
 - c. Finish Hardware, Section 8710.
 - d. Ceramic Tile, Section, Section not used.
 - e. Resilient Flooring, Section 9651.
 - (1) Recommended cleaning instructions shall include recommendations for different types of soil removal.

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- f. Carpet, Section 9680.
 - (1) Recommended cleaning instructions shall include recommendations for different types of soil removal.
- g. Painting and Finishing, Section 9911 and 9912.
 - (1) Recommended cleaning instructions shall include recommendations for different types of soil removal.
- h. Toilet Accessories, Section 10280.
- i. Misc. Specialties, Section 10900.
- j. Fire Extinguishers, Section not used.

G. Not applicable.

H. MECHANICAL EQUIPMENT AND SYSTEMS MANUALS

- 1. Include description of unit and component parts including:
 - a. Function, normal operating characteristics and limiting conditions.
 - b. Performance curves, engineering data and tests.
 - c. Complete nomenclature and commercial number of replaceable parts.
- 2. Include operating procedure including:
 - a. Start-up, break-in, routine and normal operating instructions.
 - b. Regulation, control, stopping, shut-down and emergency instructions.
 - c. Summer and winter operating instructions.
 - d. Special operating instructions.
- 3. Include maintenance procedures including:
 - a. Routine operations.
 - b. Trouble-shooting guide.
 - c. Disassembly, repair and reassemble.
 - d. Alignment, adjusting and checking.
 - e. Servicing and lubricating schedule, including recommended lubricants.
- 4. Include manufacturer's printed operating and maintenance instructions.
- 5. Include control system operating sequences.
- 6. Include parts list, illustrations, assembly drawings and diagrams necessary for maintenance, including:

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- a. Life expectancy of parts subject to wear.
 - b. Items recommended to be stocked as spare parts.
7. Provide as-installed control system diagrams with color-coded legend, if any.
 8. Provide valve tag number chart, with location and function of each valve. This chart shall be submitted to the Architect before substantial completion for Architect's and Owner's Representative's field review.
 9. Submit specify information for mechanical equipment specified in Divisions 10 and 15 (Design-Build).

I. ELECTRICAL EQUIPMENT AND SYSTEMS MANUALS

1. Include manufacturer's description of unit and component parts including:
 - a. Function, normal operating characteristics and limiting conditions.
 - b. Performance curve, engineering data and tests.
 - c. Complete nomenclature and commercial number of replaceable parts.
2. Provide panelboard circuit directories indicating electrical service, controls and communications, if any.
3. Provide as-installed wiring color-coded legend, if any.
4. Provide operating procedures, including:
 - a. Routine and normal operating instructions.
 - b. Sequences required.
 - c. Special operating instructions.
5. Include maintenance procedures for:
 - a. Routine operations.
 - b. Trouble-shooting guide.
 - c. Disassembly, repair and reassembly.
 - d. Adjustment and checking.
6. Provide manufacturer's printed operating and maintenance instructions complete with parts list, including current prices and recommended spare parts to be maintained in storage.
7. Submit specified information for Electrical Equipment specified in Divisions 15 and 16 (Design-Build).

J. SUBMITTAL PROCEDURE

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1. Preliminary submittal:
 - a. Submit one (1) copy of proposed operating and maintenance manuals. Architect will review and return with comments.
2. Final Submittal:
 - a. Submit three (3) copies, in approved final form, within 10 days of final inspection.
 - b. See System Start-up Requirements, **Section 1650**, for submitting Operating and Maintenance manuals.

K. INSTRUCTION OF OWNER'S PERSONNEL

1. Prior to final acceptance, instruct Owner's personnel in necessary operation, adjustment and maintenance of products, equipment and systems. Basis of instruction shall be the Operating and Maintenance Manuals. Review manual contents with Owner's personnel in detail to explain all aspects of operations and maintenance.

SECTION 1740 – GUARANTEES, AFFIDAVITS, CERTIFICATES AND RECEIPTS

A. GENERAL

1. See General Conditions, **Section 0700**.
2. Materials and workmanship to be guaranteed for a minimum one year period, unless a longer period is listed in material specification section, after acceptance of the work by the Owner. The Contractor will repair any failures due to inferior workmanship and/or materials without additional expense to the Owner.
3. The Contractor will repair any damage to existing materials, surfaces or equipment caused during the execution of the work.
4. Deliver to Architect required Documents listed below, accompanied by Contractor signed letter of transmittal with or before application for final payment.
5. Execute guarantee in writing and in favor of Owner.
6. AIA Forms where Specifications indicate such are to be used, may be procured from the American Institute of Architects, Portland Chapter or online.

B. List of Required Guarantees, Affidavits, Certificates and Receipts. Verify additional requirements as to type, quantity, guarantees, certificates and receipts from other portions of Contract Documents.

1. Contractor's Affidavit of Release of Liens (AIA G706A) and Payment of Debts and Claims (AIA G706).

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2. General Sheet Metal Guarantee per Division 7 – Thermal & Moisture Protection; two year guarantee.
 3. Wood Doors Guarantee; five year guarantee.
 4. Carpet Guarantee.
 5. Master Key and Grand Master Key signed delivery receipts, when required by Finish Hardware Specs.
 6. State Plumbing Certificate of Approval and Sanitary Authority Approval.
 7. Plumbing Guarantee; one year guarantee from date of beneficial use.
 8. Heating and Ventilating Guarantee; one year guarantee from date of beneficial use.
 9. State Electrical Certificate of Approval.
 10. Electrical Guarantee, one year from Substantial Completion Guarantee; Lamp Guarantee for time periods per Division 16, Electrical.
 11. Guarantees for periods greater than one year when normally offered by equipment and furnishings manufacturers on products used on the project, including such items as electrical devices, lighting fixture ballasts, etc.
- C. Quantity – provide four (3) bound sets of each guarantee, affidavit, certificate and receipt.
- D. Form for Submittal:
1. Bind all items in new loose-leaf hard cover binders, each item in separate transparent protective cover.
 2. Index each binder by providing index page.
 3. Bind items in order.

END OF DIVISION

ABBREVIATIONS AND SYMBOLS

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1.1 ABBREVIATIONS AND SYMBOLS

A Following are listed abbreviations and symbols commonly used within this project manual. See also Section 01001:

ACI	American Concrete Institute
AHJ	Authority Having Jurisdiction
AITC	American Institute of Timber Construction
ANSI	American National Standards Institute
APA	American Plywood Association
ASTM	American Society for Testing and Materials
ASHRAE	American Society of Heating, Refrigeration and Air Conditioning Engineers, Inc.
AWS	American Welding Society
AWPA	American Wood Preservers Association
AWI	Architectural Woodwork Institute
CONT	Continuous
CS	Commercial Standard (U.S. Department of Commerce)
CRSI	Concrete Reinforcing Steel Institute
ICBO	International Conference of Building Officials
NEMA	National Electrical Manufacturer's Association
NFPA	National Fire Protection Association
NWMA	National Woodwork Manufacturer's Association
PCA	Portland Cement Association
PCI	Prestressed Concrete Institute
SDI	Steel Door Institute
TCA	Tile Council of America
UBC	Uniform Building Code
UL	Underwriters Laboratories
WCLIB	West Coast Lumber Inspection Bureau
WRCLA	West Coast Red Cedar Lumber Association
WWPA	Western Wood Products Association

B. Following are listed abbreviations commonly used on drawings:

AB	Anchor Bolt
AC	Access Panel
ACOUS	Acoustical
ADJ	Adjustable
ADJAC	Adjacent
AFF	Above Finish Floor
ALT	Alternate
ALUM	Aluminum
AC	Asphaltic Concrete or Air Conditioning
APPROX	Approximately
ARCH	Architect/Architecture
BD	Board
BM	Beam or Bench Mark

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BLKG	Blocking
BO	By Owner, Bottom of
BOT	Bottom
CAB	Cabinet
CB	Catch Basin
CEM	Cement
CJ	Control Joint
CLG	Ceiling
CMU	Concrete Masonry Unit
CLR	Clear
COL	Column
CONC	Concrete
CONN	Connection
CT	Ceramic Tile
CONT	Continuous
C/L	Centerline
DTL	Detail
DIM	Dimension
DISP	Dispenser
DF	Drinking Fountain
DFIR	Douglas Fir
DP	Dampproofing
DS	Downspout
DSO	Downspout Outlet
DTL	Detail
DWG	Drawing
EJ	Expansion Joint
EWC	Electrical Water Cooler
EA	Each
EXT	Exterior
EQ	Equal
(E)/EXIST	Existing
EL/ELEV	Elevation
ELEC	Electrical
EXP	Exposed, Expansion
EW	Each Way
FD	Floor Drain
FDN	Foundation
FEC	Fire Extinguisher Cabinet
FF	Finish Floor
FIN	Finish
FLR	Floor
FTG	Footing
FOF	Face of Finish
FOS	Face of Stud
FTG	Footing
GA	Gage or Gauge
GYP BD	Gypsum Board

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GB	Grab Bars
GALV	Galvanized
HC	Handicap
HORIZ	Horizontal
INT	Interior
ID	Inside Diameter
INSUL	Insulation, Insulated
LAV	Lavatory
LT	Light
MAT	Material
MAX	Maximum
MECH	Mechanical
MFG, MFR	Manufacturer
MIN	Minimum
MTL	Metal
NIC	Not in Contract
OC	On Center
OD	Outside Diameter
OPG	Opening
OFCI	Owner Furnished Contractor Installed
OFOI	Owner Furnished Owner Installed
P.LAM	Plastic Laminate
PL	Plate, Property Line
PLAS	Plaster
PNL	Panel
PNT	Paint
PART	Partition
PLYWD	Plywood
QT	Quarry Tile
R	Riser, Radius
RD	Roof Drain
REINF	Reinforced
RM	Room
RSC	Raised Scupper
SAB	Student Activities Building
SATC	Suspended Acoustical Tile Ceiling
SC	Scupper
SECT	Section
SOG	Slab On Grade
SS	Stainless Steel or Service Sink
STL	Steel
SHT	Sheet
SIM	Similar
SPEC	Specification
STRUCT	Structural
TEMP	Temporary, Tempered
T&B	Top and Bottom
T&G	Tongue and Groove

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T	Tread
TO	Top Off
TOD	Top of Deck
TOM	Top of Masonry
TP	Toilet Paper
TYP	Typical
UNO	Unless Noted Otherwise
VCT	Vinyl Composition Tile
VERT	Vertical
VP	Veneer Plaster
VG	Vertical Grain
WC	Water Closet
WD	Wood
WG	Wire Glass
W/	With
W/O	Without
WP	Waterproof
WR	Water or Weather Resistant
@	At
&	And
O	Round
<	Angle
P/L	Plate
C/L	Center Line

END OF SECTION

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PART 1 - GENERAL

1.1 SUMMARY

A. Section Includes:

1. Wrecking and demolition required for completion of work shown on drawings including disconnecting and rerouting existing utilities and removal of debris and salvage.

B. Related Sections:

01500 Temporary Facilities and Controls

1.2 OPERATIONS

A. Safety Precautions and Regulations:

1. Conduct operations with minimum interference with streets, driveways, sidewalks and facilities. Maintain noise level at a minimum.
2. Maintain safety precautions and regulations in accordance with City, State and Owner's requirements.
3. Provide fire and public protection required by law and codes including requirements for cutting and welding metals.
4. Protect from damage portions of existing building, adjacent areas and areas not in contract. Protect walks, driveways, planting and exitways. If damaged, repair or replace at no cost to Owner.
5. Take special care to protect existing trees and plants to prevent damage to limbs, trunks and roots.
 - a. Provide approved temporary fencing, barricades or guards as required to protect trees and other plants, which are to remain, from above and below grade damage. Erect fences in areas directed by Owner's arborist prior to commencement of demolition and remove at completion of project construction.
 - b. Protect root system from damage. Do not store construction materials, debris of excavated material within drip line. Do not permit vehicle traffic, vehicle parking or pedestrian circulation within drip line.
 - c. Protect all plant growth, including root systems of trees and plants, from the dumping of refuse of chemically injurious material or liquids and continual puddling or running water.
 - d. Where cutting seems necessary, review conditions with Owner's arborist before proceeding. If approved, cut branches and roots with sharp pruning instruments following good horticultural practices. Breaking or chopping will not be tolerated.
 - e. Identify and field stake proposed improvements, which impact the protected root zone. Notify Architect of these conditions. Do not proceed until situation has been evaluated and a course of action determined by Architect.
 - f. Provide alternative construction details for bridging, tunneling and construction of aeration vents for use by the contractor.
 - g. Do not allow filling or excavation within the protected area during

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- construction.
- h. Provide care and maintenance during the construction phase, which maintains water availability to the root zone, controls traffic within the designated root zone and provide good horticulture practice in pruning, root aeration, fertilization or other required operation. All pruning must be approved by Owner's arborist.
- i. Utilize combinations of paving materials which emphasizes minimal changes to grades and maximizes the root zone preservation.
- j. Utilize trees on the perimeter of tree groups to be preserved as additional buffer. Fences located adjacent to these trees may be located within the root zone as necessary, for purposes of providing further protection of trees on the interior of the grouping. Perimeter trees can be removed in the final stages of construction as necessary. Coordinate with Architect and verify.
- k. Excavate within drip line of trees only where approved by Owner's arborist.
- l. Where trenching for new construction or utilities is required within drip lines, tunnel under or around roots by hand digging or boring. Do not cut main lateral roots or tap roots; cut smaller roots, which interfere with installation of new work. Cut roots with sharp pruning instruments; do not break or chop. All proposed utility routes must be staked and have Architects written approval prior to excavation.
- m. Do not allow exposed roots to dry out before permanent backfill is placed; provide temporary earth cover, or pack with peat moss and wrap with burlap. Water and maintain in moist condition and temporarily support and protect from damage until permanently relocated and covered with backfill.
- n. Prune branches as suggested by Owner's arborist to balance loss to root system caused by damage or cutting of root system.
- o. Maintain existing grade within drip line of trees unless otherwise indicated.
- p. Contractor will be charged a \$5,000.00 penalty for removing (or critically damaging) any tree without prior written approval by architect.
- q. Do not obstruct required fire exits and driveways, coordinate with fencing.
- r. Provide temporary barriers at existing building as needed to maintain dust free condition within building.
- s. Keep work areas clean at all times.
- t. Remove all debris and salvage from site as soon as possible.

B. Utilities:

1. Keep utilities intact and in first class condition.
2. Repair or replace any damaged utilities caused by construction activities.
3. Notify Owner not less than 24 hours in advance of any utility shutdown and receive written consent from Owner prior to shutdown.

1.3 SALVAGE

A. General:

1. Remove from site all rubble, debris and items not suitable for reuse by Owner.
2. Coordinate with Owner all usable items of salvage.

END OF SECTION

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PART 1 - GENERAL

1.1 DESCRIPTION

- A. This section describes the following:
 - 1. Demolition and removal of selected interior portions of building or structure.
 - 2. Salvage of existing items to be reused.

1.2 REFERENCES

- A. ANSI: American National Standards Institute/ ASSE: American Society of Safety Engineers
 - 1. ANSI/ASSE A10.6-2006: Safety Requirements for Demolition Operations
- B. NFPA: National Fire Protection Association
 - 1. NFPA 241-00: Safeguarding Construction, Alteration and Demolition Operations
- C. RFCI: Resilient Floor Covering Institute

1.3 SUBMITTALS

- A. Schedule of Selective Demolition Activities: Indicate the following:
 - 1. Detailed sequence of selective demolition and removal work, with starting and ending dates for each activity.
 - 2. Interruption of utility services. Indicate how long utility services will be interrupted.
 - 3. Coordination for shutoff, capping, and continuation of utility services.
 - 4. Use of elevator and stairs.
 - 5. Locations of proposed dust- and noise-control temporary partitions and means of egress.
 - 6. Coordination of continuing occupancy of portions of existing building and of partial occupancy of completed work so that operations continue uninterrupted.
 - 7. Means of protection for items to remain and items in path of waste removal from building.
- B. Inventory: After selective demolition is complete, submit a list of items that have been removed and salvaged.
- C. Pre-Demolition Photographs or Video: Show existing conditions of adjoining construction and site improvements, including finish surfaces, that might be misconstrued as damage caused by selective demolition operations. Submit before work begins.

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1.4 QUALITY ASSURANCE

- A. Demolition Firm Qualifications: An experienced firm that has specialized in demolition work similar in material and extent to that indicated for this project.
- B. Refrigerant Recovery Technician Qualifications: Certified by an EPA-approved certification program.
- C. Regulatory Requirements: Comply with governing EPA notification regulations before beginning selective demolition. Comply with hauling and disposal regulations of authorities having jurisdiction.
- D. Standards: Comply with ANSI A10.6 and NFPA 241.
- E. Pre-Demolition Meeting: Conduct meeting at project site to review methods and procedures related to selective demolition including, but not limited to, the following:
 - 1. Inspect and discuss condition of construction to be selectively demolished.
 - 2. Review structural load limitations of existing structure.
 - 3. Review and finalize selective demolition schedule and verify availability of materials, demolition personnel, equipment, and facilities needed to make progress and avoid delays.
 - 4. Review requirements of work performed by other trades that rely on substrates exposed by selective demolition operations.
 - 5. Review areas where existing construction is to remain and requires protection.

1.5 PROJECT CONDITIONS

- A. The areas of selective demolition are within an existing building with ongoing occupant activities. Conduct selective demolition so ongoing operations will not be disrupted.
- B. Conditions existing at time of inspection for bidding purpose will be maintained by the building occupants as far as practical.
 - 1. Before selective demolition, the Owner will remove the following items:
 - a. Wall mounted signs and notices of workplace nature.
- C. Provide notification of discrepancies between existing conditions and drawings before proceeding with selective demolition.
- D. Hazardous Materials: It is not expected that hazardous materials will be encountered in the work.
 - 1. Hazardous materials will be removed by the Owner before start of the work.
 - 2. If materials suspected of containing hazardous materials are encountered, do not disturb; immediately notify the Architect and Owner. The Owner will remove hazardous materials under a separate contract.
- E. Storage or sale of removed items or materials on-site is not permitted.

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- F. Utility Service: Maintain existing utilities indicated to remain in service and protect them against damage during selective demolition operations.

1.6 PROTECTION OF EXISTING WARRANTIES

- A. Remove, replace, patch, and repair materials and surfaces cut or damaged during selective demolition, by methods and with materials so as not to void existing warranties.

PART 2 - PRODUCTS

Not Used.

PART 3 - EXECUTION

3.1 EXAMINATION

- A. Verify that utilities have been disconnected and capped.
- B. Survey existing conditions and correlate with requirements indicated to determine extent of selective demolition required.
- C. Inventory and record the condition of items to be removed and reinstalled and items to be removed and salvaged.
- D. When unanticipated mechanical, electrical, or structural elements that conflict with intended function or design are encountered, investigate and measure the nature and extent of conflict. Promptly submit a written report.
- E. Engage a professional engineer to survey condition of building to determine whether removing any element might result in structural deficiency or unplanned collapse of any portion of structure or adjacent structures during selective demolition operations.
- F. Perform surveys as the work progresses to detect hazards resulting from selective demolition activities.

3.2 UTILITY SERVICES AND MECHANICAL/ELECTRICAL SYSTEMS

- A. Existing Services/Systems: Maintain services/systems indicated to remain and protect them against damage during selective demolition operations.
- B. Service/System Requirements: Locate, identify, disconnect, and seal or cap off indicated utility services and mechanical/electrical systems serving areas to be selectively demolished.

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1. The Owner will arrange to shut off indicated services/systems when requested by the Contractor.
2. Arrange to shut off indicated utilities with utility companies.
3. If services/systems are required to be removed, relocated, or abandoned, before proceeding with selective demolition provide temporary services/systems that bypass area of selective demolition and that maintain continuity of services/systems to other parts of building.
4. Cut off pipe or conduit in walls or partitions to be removed. Cap, valve, or plug and seal remaining portion of pipe or conduit after bypassing.
 - a. Where entire wall is to be removed, existing services/systems may be removed with removal of the wall.

3.3 PREPARATION

- A. Temporary Facilities: Provide temporary barricades and other protection required to prevent injury to people and damage to adjacent areas to remain.
 1. Provide protection to ensure safe passage of people around selective demolition area and to and from occupied portions of building.
 2. Provide temporary weather protection, during interval between selective demolition of existing construction on exterior surfaces and new construction, to prevent water leakage and damage to structure and interior areas.
 3. Protect walls, ceilings, floors, and other existing finish work that are to remain or that are exposed during selective demolition operations.
 4. Cover and protect furniture, furnishings, and equipment that have not been removed.
 5. Comply with requirements for temporary enclosures, dust control, heating, and cooling specified elsewhere.
- B. Temporary Shoring: Provide and maintain shoring, bracing, and structural supports as required to preserve stability and prevent movement, settlement, or collapse of construction and finishes to remain, and to prevent unexpected or uncontrolled movement or collapse of construction being demolished.
 1. Strengthen or add new supports when required during progress of selective demolition.

3.4 GENERAL SELECTIVE DEMOLITION

- A. Demolish and remove existing construction only to the extent required by new construction and as indicated. Use methods required to complete the work within limitations of governing regulations and as follows:
 1. Proceed with selective demolition systematically, from higher to lower level. Complete selective demolition operations above each floor or tier before disturbing supporting members on the next lower level.
 2. Neatly cut openings and holes plumb, square, and true to dimensions required. Use cutting methods least likely to damage construction to remain or adjoining construction. Use hand tools or small power tools designed for sawing or

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- grinding, not hammering and chopping, to minimize disturbance of adjacent surfaces. Temporarily cover openings to remain.
 3. Cut or drill from the exposed or finished side into concealed surfaces to avoid marring existing finished surfaces.
 4. Do not use cutting torches until work area is cleared of flammable materials. At concealed spaces, such as duct and pipe interiors, verify condition and contents of hidden space before starting flame-cutting operations. See Division 1 for fire suppression requirements and for welding, cutting, and burning permit.
 5. Maintain adequate ventilation when using cutting torches.
 6. Remove decayed, vermin-infested, or otherwise dangerous or unsuitable materials and promptly dispose of off-site.
 7. Remove structural framing members and lower to ground by method suitable to avoid free fall and to prevent ground impact or dust generation.
 8. Locate selective demolition equipment and remove debris and materials so as not to impose excessive loads on supporting walls, floors, or framing.
 9. Dispose of demolished items and materials promptly. Comply with requirements in Division 1 regarding solid waste management and construction waste management.
- B. Reuse of Building Elements: Do not demolish building elements beyond what is indicated on drawings without approval.
- C. Removed and Salvaged Items:
1. Clean salvaged items.
 2. Pack or crate items after cleaning. Identify contents of containers.
 3. Store items in a secure area until delivery to the Owner.
 4. Transport items to the Owner's storage area.
 5. Protect items from damage during transport and storage.
- D. Removed and Reinstalled Items:
1. Clean and repair items to functional condition adequate for intended reuse. Paint equipment to match new equipment.
 2. Pack or crate items after cleaning and repairing. Identify contents of containers.
 3. Protect items from damage during transport and storage.
 4. Reinstall items in locations indicated. Comply with installation requirements for new materials and equipment. Provide connections, supports, and miscellaneous materials necessary to make item functional for use indicated.
- E. Existing Items to Remain: Protect construction indicated to remain against damage and soiling during selective demolition. When permitted, items may be removed to a suitable, protected storage location during selective demolition, cleaned, and reinstalled in their original locations after selective demolition operations are complete.
- ### 3.5 SELECTIVE DEMOLITION PROCEDURES FOR SPECIFIC MATERIALS
- A. Concrete: Demolish in sections. Cut concrete full depth at junctures with construction to remain and at regular intervals, using power-driven saw, then remove concrete between saw cuts.

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- B. Masonry (if any): Demolish in small sections. Cut masonry at junctures with construction to remain, using power-driven saw, then remove masonry between saw cuts.
- C. Concrete Slabs-on-Grade: Saw-cut perimeter of area to be demolished, then break up and remove.
- D. Resilient Floor Coverings: Remove floor coverings and adhesive according to recommendations in RFCI-WP and its Addendum.
 - 1. Remove residual adhesive and prepare substrate for new floor coverings by one of the methods recommended by RFCI.
- E. Air-Conditioning Equipment (if any): Remove equipment without releasing refrigerants.

3.6 DISPOSAL OF DEMOLISHED MATERIALS

- A. Except for items or materials indicated to be recycled, reused, salvaged, or reinstalled, remove demolished materials from project site and legally dispose of them in an EPA-approved landfill.
 - 1. Do not allow demolished materials to accumulate on-site.
 - 2. Remove and transport debris in a manner that will prevent spillage on adjacent surfaces and areas.
 - 3. Remove debris from elevated portions of building by chute, hoist, or other device that will convey debris to grade level in a controlled descent.

3.7 CLEANING

- A. Clean adjacent structures and improvements of dust, dirt, and debris caused by selective demolition operations. Return adjacent areas to condition existing before selective demolition operations began.

END OF SECTION

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PART 1 – GENERAL

1.1 CONTRACT REQUIREMENTS

- A. The General Conditions, Supplementary Conditions, and Division I bound herewith apply in addition to this Specification and accompanying drawings.
- B. Specification for products, materials or systems shown on the drawings, but not included in these specifications, shall be included in this contract as though specified herein. Contractor and subcontractors shall be responsible for reviewing all contract documents for their scope of work.

1.2 RELATED WORK SPECIFIED ELSEWHERE

- A. Resilient Flooring, Section 9650.
- B. Carpet, Section 9680.

1.3 EXTENT OF WORK

- A. Fill all cracks, holes, joints and depressions in floor surface to receive finish materials.
- B. Grind all edges, ridges and joints in floor surface to receive floor finish materials.
- C. Prepare all floor surfaces within area of work.

1.4 SUBMITTALS

- A. Submit product literature in accordance with the General Requirements Section.

1.5 COORDINATION

- A. Coordinate with all floor covering manufacturers that all fill materials are compatible with their adhesive products.
- B. Coordinate with all floor covering installers the proper concrete finish for receiving floor coverings.

1.6 DELIVERY AND STORAGE

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- A. Prevent damage to or contamination of grouting materials during delivery, handling and storage.
- B. Store all grouting materials in undamaged condition with seals and labels intact as packaged by the manufacturer.

PART 2 – PRODUCTS

2.1 MATERIALS

- A. Fill all control joints and other cracks in concrete 1/8" wide or less with Vi-Tex or approved.
- B. Fill all control joints and other cracks in concrete over 8" wide with EUCO 700 (3,000 psi) flexible floor sealant or approved.
- C. Portland Cement grout all holes in floor:
 - 1. Portland Cement: ATSM C150, Type 1.
 - 2. Sand: ASTM C33, Fine Aggregate.
 - 3. Water: Potable.
 - 4. Pea Gravel: ASTM C33. Course aggregate, graded to that at least 90 percent passes 3/8 inch sieve and 90 percent is retained by a number 4 sieve.
 - 5. Mixes:
 - a. For less than 2-inch clearance, or where size or shape of space makes grouting difficult, grout mix shall consist of grout material and water.
 - b. For greater than 2-inch clearances where course aggregate will not obstruct free passage of the grout, extend grout by adding 50 pounds of pea gravel per 100 pounds grout material.
 - c. Use the minimum amount of water necessary to produce a flow-able grout without causing either segregation or bleeding.
 - 6. Mixing:
 - a. Mix non-shrink grouting materials and water in a mechanical mixer for no less than 3 minutes.
 - b. Mix grout: Minimum amount of water to produce 2500 psi compressive strength at 28 days and to provide pouring consistency without aggregate segregation.
 - c. Mix grout as close to the work area as possible and transport the mixture quickly and in a manner that does not permit segregation of materials.
 - d. After the grout has been mixed, do not add more water for any reason.
- D. Troweled Underlayment Grout:
 - 1. Latex concrete, Raeco "R-25" or approved.

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2. For leveling depressions in floors.

PART 3 – EXECUTION

3.1 PROCEDURES

- A. Install per manufacturer's instruction and recommendations.

3.2 NOTICES

- A. Notify testing lab at least 24 hours before intended grout placement.
- B. Place no grout until formwork and reinforcement have been inspected.
- C. Notify Architect 24 hours prior to intended grout placement.

3.3 SURFACE PREPARATION

- A. Remove foreign matter from surfaces and areas to receive grout.
- B. Sprinkle porous surfaces with water to eliminate suction.
- C. Under slab membrane, repair holes, tears or other damage.
- D. Follow manufacturer's instructions and recommendations.

3.4 CONCRETE BOND

- A. Coat bonding agent on existing concrete surfaces to be joined with new concrete.
- B. Follow manufacturer's directions.
- C. Cement washes less than 1-1/2 inches thick, coat surfaces to be covered, with bonding agent and incorporate bonding agent into wash mix in accordance with manufacturer's directions.

3.5 MIXING

- A. Mix to achieve uniform distribution; discharge mixer completely before recharging. Mix and deliver ready mixed concrete per ASTM C94.

3.6 FINISHING OF FLATWORK SURFACES

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- A. Unless otherwise shown, scheduled or specified hereinafter, finish all interior slabs with troweled finish.
- B. Patch and fill all cracks on interior slabs.

3.7 CURING AND PROTECTION.

- A. Protect all freshly placed concrete from premature drying and excessive hot or cold temperature extremes. Maintain curing procedures used to seven days at temperatures of 50 F; if mean daily temperature drops below 40 F during this period, extend curing period an equal number of days or provide temporary heat or additional protection to maintain specified minimum temperature of air in contact with concrete. Protect all concrete during curing period from all damaging mechanical disturbances, especially wad-induced load stresses, heavy shock and vibration.
 - 1. Protect all finished surfaces from damage.
 - 2. Do not load self-supporting structures in manner to overstress the concrete.
 - 3. Start curing procedures on slabs immediately after finishing operation.
 - 4. Keep concrete continuously moist or spray on an approved curing compound while the fresh concrete is still moist.
 - 5. Do not use liquid membrane-forming curing compounds on surfaces to receive additional concrete or cementitious finishing materials or for surfaces to receive hardeners.
- B. Interior Slabs:
 - 1. Spray with Polymer resin solvent base curing agent conforming to ASTM C309, slow sprayed, 250-250 sq. ft. per gallon, one coat.

3.8 CLEANING AND REPAIRING

- A. Remove debris from project site upon work completion or sooner, if directed.
- B. Including work of other section, clean, repair and touch-up, or replace when directed, products which have been soiled discolored or damaged by work of this section.
- C. Protective coverings shall remain in place until floors have completely cured or until partitions are installed.

END OF SECTION

FINISH CARPENTRY

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PART 1 – GENERAL

1.1 CONTRACT REQUIREMENTS

- A. The General Conditions, Supplementary Conditions, and Division I bound herewith apply in addition to this Specification and accompanying drawings.
- B. Specification for products, materials or systems shown on the drawings, but not included in these specifications, shall be included in this contract as though specified herein. Contractor and subcontractors shall be responsible for reviewing all contract documents for their scope of work.

1.2 SUMMARY

- A. Section includes interior millwork:
 - 1. Trim

1.3 RELATED WORK SPECIFIED ELSEWHERE

- A. Plastic Laminate, Section 6240.
- B. Joint Sealants, Section 7920.
- C. Gypsum Board, Section 9250.
- D. Interior Painting, Section 9912.

1.4 SUBMITTALS

- A. Submit in accordance with Division 1.
- B. Shop Drawings: Submit plan, elevations, sections and details for each condition. Indicate materials, surface graining elevations of sheet paneling, fastening methods, joining methods, and interruptions to other work.
- C. Samples: Submit two samples 6 inch by 12 inch illustrating wood grain and specified finish.

1.5 QUALITY ASSURANCE

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- A. Unless otherwise modified herein, materials and workmanship quality grades shall be determined by the Associations listed below. Standards may be obtained from Association.
 - 1. Plywood, Fir Lumber, Hardwood Lumber and Workmanship: Quality Standards of American Woodwork Institute hereinafter referred to as AWI.
- B. Fabricator: Company specializing in fabricating the products specified in this section with minimum three years of documented experience.

1.6 DELIVERY, STORAGE AND HANDLING

- A. Do not deliver products to job site until building is fully enclosed and interior temperature and humidity are in accordance with recommendations of AWI Quality Standards Illustrated.
- B. Protect work from moisture damage.

1.7 TEMPERATURE

- A. Maintain 50 degrees F minimum in interior spaces where finish carpentry materials are located.
- B. Installer shall advise contractor of temperature and humidity requirements for finish carpentry installation areas. Do not install finish carpentry until required temperature and relative humidity have been stabilized and will be maintained in installation areas. Environmental conditions: Obtain and comply with Woodwork Manufacturer's and Installer's coordinated advice for optimum temperature and humidity conditions for woodwork during its storage and installation. Do not install woodwork until these conditions have been attained and stabilized so that woodwork is within plus or minus 1.0 percent of optimum moisture content from date of installation through remainder of construction period.

1.8 PROTECTION

- A. Protect other surfaces against damage or discoloration caused by work of this section.

1.9 COORDINATION

- A. Coordinate with other trades affecting or affected by work of this section.

1.10 PROJECT CONDITIONS

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- A. Verify that field measurements are as indicated.

PART 2 – PRODUCTS

2.1 MATERIALS

- A. Softwood Lumber: PS 20; Graded in accordance with AWI/AWMAC Quality Standards Illustrated, Custom Quality; Douglas Fir species, quarter sawn, maximum moisture content of 6 percent; with vertical grain, of quality suitable for transparent finish.
- B. Softwood Plywood: PS 1 Grade A-C; Graded in accordance with AWI/AWMAC Quality Standards Illustrated, Custom quality; veneer core; Douglas Fir face species, quarter cut; of grain quality suitable for transparent finish.
- C. Particleboard: Complying with ANSI A208.1 and AWI/AWMAC Quality Standards Illustrated, composed of wood chips, medium density, made with waterproof resin binders; of grade to suit application; sanded faces.

2.2 TRIM MATERIAL BY LOCATION

- A. Interior: WCLB, C&Btr., KD, VG, Douglas Fir
 - 1. Lumber shall be Plain Sawn, Premium Grade per AWI Standards, smooth surface S4S. Match existing finish.
- B. Exterior: Select Tight knot, KD, Western Red Cedar, Rough sawn.
- C. Minimum Lengths of trim:
 - 1. Opening Trim: 1 piece, single length.
 - 2. Standing Trim: No less than full story height.
 - 3. Running Trim: Joints no closer than 14 ft. apart.

2.3 PLYWOOD

- A. Backing for plastic laminate surfaces.
- B. Douglas Fir, US Product Standard 11074, exterior type.
- C. Rotary cut, AWI premium grade.

2.4 PLASTIC LAMINATE FACING

- A. High pressure type conforming to NEMA LD-1, facing, Section 6240.

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1. Thickness: 0.050 inch.
2. Color and Pattern: See Room Finish Products, Section 9000.

2.5 ADHESIVES AND FASTENERS

- A. Adhesives: Type suitable for intended purpose, complying with applicable air quality regulations.
- B. Fasteners: Of size and type to suit application; galvanized or chrome plated finish in concealed locations and stainless steel in exposed locations.
 1. Panel Clip System: Aluminum 6065A, heat treated to hardness of T5 two-part hanging hardware by Brooklyn Hardware Manufacturing or approved.

2.6 FABRICATION

- A. Fabricate to AWI/AWMAC Quality Standards Illustrated Premium quality, of Flush design.
- B. Fabricate panels with book matching between adjacent leaves.
- C. At panels more than one leaf high, fabricate with architectural end matching.
- D. Shop prepare and identify panels for grain matching during site erection.
- E. Prepare panels for delivery to site, permitting passage through building openings.
- F. Finish exposed edges of panels as specified by grade requirements.
- G. When necessary to cut and fit on site, provide materials with ample allowance for cutting and scribing.
- H. Sand work smooth, ready for finishing.
- I. Finish work in accordance with AWI/AWMAC Architectural Woodwork Quality Standards Illustrated.

PART 3 – EXECUTION

3.1 EXAMINATION

- A. Verify adequacy of backing support framing.
- B. Verify mechanical, electrical, and building items affecting work of this section are placed and ready to receive this work.

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3.2 INSTALLATION

- A. Install work in accordance with requirements of AWI/AWMAC Quality Standards Illustrated for specified grade.
- B. Do not begin installation until wood materials have been fully acclimated to interior conditions as recommended by AWI/AWMAC Quality Standards Illustrated.
- C. Set and secure materials and components in place, plumb and level, using concealed fasteners wherever possible.
- D. Where necessary to cut and fit on site, scribe work abutting other components. Do not use additional overlay trim to conceal gaps.
- E. Set exposed fasteners, fill with wood filler, and finish to match panel finish.
- F. Touch up damaged finish to match original, using materials provided by fabricator; replace components that cannot be refinished like new.

3.3 PRODUCT CLEANING AND REPAIRING

- A. Including work of other sections, clean, repair and touch-up or replace when directed, products which have been soiled discolored or damaged by work of this section.
- B. Leave surfaces ready for Finishing specified in Room Finish Products, Section 09000, and Painting & Finishing, Section 09911 and 09912.
- C. Remove debris from project site upon work completion or sooner, if directed.

END OF SECTION

PLASTIC LAMINATE

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PART 1 – GENERAL

1.1 CONTRACT REQUIREMENTS

- A. Specification for products, materials or systems shown on the drawings, but not included in these specifications, shall be included in this contract as though specified herein. Contractor and subcontractors shall be responsible for reviewing all contract documents for their scope of work.

1.2 RELATED WORK SPECIFIED ELSEWHERE

- A. Finish Carpentry, Section 6220.

1.3 PRODUCT DELIVERY, STORAGE AND HANDLING

- A. Protect against damage and discoloration.

1.4 WORK SPACE TEMPERATURES

- A. 60 degrees F. minimum shall be maintained during installation.

1.5 WORK SPACE RELATIVE HUMIDITY

- A. 35% minimum, 80% maximum shall be maintained during installation.

1.6 WORK SPACE ILLUMINATION

- A. Maintain 30 foot candles minimum measured 3 feet above floor during covering installation.

1.7 PROTECTION

- A. Protect other surfaces against damage and discoloration caused by work of this section.

1.8 COORDINATION

- A. Coordinate with other trades affecting or affected by work of this section.

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PART 2 – PRODUCTS

2.1 PLASTIC LAMINATE

- A. Wilsonart, Formica, Nevamar, Laminart or approved.
- B. Color: Verify with Architect.

2.2 METAL TRIM FOR WALL INSTALLATION

- A. B & T Metals “Chromedge”, Colortrym mouldings or approved.
- B. Types and sizes to suit conditions, as indicated or approved.
- C. Coltrym Cap No. 7104 or approved.

2.3 PRIMERS, SEALERS, AND ADHESIVES

- A. Water-resistant type, made or recommended by plastic laminate manufacturer.

2.4 JOINT SEALANT

- A. Clean, translucent silicone sealant; Dow, G.E. or approved.

PART 3 – EXECUTION

3.1 EXISTING CONDITIONS

- A. Verify that surfaces to receive covering are dry, clean, smooth, sound, well secured, free from conditions that would damage covering or impair adhesive bond and otherwise properly prepared.
- B. Prior to starting work, notify General Contractor of defects requiring correction.
- C. Do not start work until conditions are satisfactory.

3.2 INSTALLATION

- A. Follow manufacturer’s directions.
- B. Apply plastic laminate finish and decorative surface material in full, uninterrupted sheets consistent with manufactured sizes. Make corners and joints hairline (nearly invisible). Slightly bevel arises.

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- C. Fit shelves, doors and exposed edges with plastic laminate edging. Use full-length pieces only.

3.3 VERTICAL SURFACES

- A. Longitudinal seams not permitted; vertical seams minimum 6 ft. apart.

3.4 METAL TRIM

- A. Secure trim in accordance with manufacturer's directions, level, plumb and true, neatly mitered corners.
- B. Provide at any exposed plastic laminated edges.

3.5 PRODUCT CLEANING AND REPAIRING

- A. Including work of other sections, clean, repair and touch-up or replace when directed, products which have been soiled, discolored or damaged by work of this section.
- B. Remove debris from project site upon work completion or sooner, if directed.

END OF SECTION

THERMAL INSULATION

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PART 1 - GENERAL

1.1 SUMMARY

- A. This Section includes the following:
 - 1. Concealed building insulation.
 - 2. Vapor retarders.

1.2 SUBMITTALS

- A. Product Data: For each type of product indicated.
- B. Product Test Reports: Based on evaluation of comprehensive tests performed by a qualified testing agency for insulation products.
- C. Research/Evaluation Reports: For foam-plastic insulation.

1.3 QUALITY ASSURANCE

- A. Source Limitations: Obtain each type of building insulation through one source from a single manufacturer.
- B. Fire-Test-Response Characteristics: Provide insulation and related materials with the fire-test-response characteristics indicated, as determined by testing identical products per test method indicated below by UL or another testing and inspecting agency acceptable to authorities having jurisdiction. Identify materials with appropriate markings of applicable testing and inspecting agency.
 - 1. Surface-Burning Characteristics: ASTM E 84.

1.4 DELIVERY, STORAGE, AND HANDLING

- A. Protect insulation materials from physical damage and from deterioration by 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.

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PART 2 - PRODUCTS

2.1 MANUFACTURERS

- A. In other Part 2 articles where titles below introduce lists, the following requirements apply to product selection:
 - 1. Available Manufacturers: Subject to compliance with requirements, manufacturers offering products that may be incorporated into the Work include, but are not limited to, manufacturers specified.

2.2 GLASS-FIBER BLANKET INSULATION

- A. Available Manufacturers:
 - 1. CertainTeed Corporation.
 - 2. Guardian Fiberglass, Inc.
 - 3. Johns Manville.
 - 4. Knauf Fiber Glass.
 - 5. Owens Corning.
- B. Glass-Fiber Blanket Insulation: ASTM C 665, consisting of fibers; with maximum flame-spread and smoke-developed indexes of 25 and 50, respectively; passing ASTM E 136 for combustion characteristics.
 - 1. New Walls: Unfaced 5-1/2 inches thick with a thermal resistance of 21deg F x h x sq. ft./Btu at 75 deg F.
 - 2. Existing Walls infill: Kraft faced 5-1/2 inches thick with a thermal resistance of 21deg F x h x sq. ft./Btu at 75 deg F.
 - 3. Ceiling: Kraft faced, 14 inches thick with a thermal resistance of 49 deg F x h x sq. ft./Btu at 75 deg F. See alternates.

2.3 VAPOR RETARDERS

- A. Polyethylene Vapor Retarders: ASTM D 4397, 10 mils thick, with maximum permeance rating of 0.13 perm.
- B. Vapor-Retarder Tape: Pressure-sensitive tape of type recommended by vapor-retarder manufacturer for sealing joints and penetrations in vapor retarder.

2.4 AUXILIARY INSULATING MATERIALS

- A. Adhesive for Bonding Insulation: Product with demonstrated capability to bond insulation securely to substrates indicated without damaging insulation and substrates.

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2.6 MINERAL WOOL BLANKET INSULATION

- A. Thermafiber SAFB 5-1/2" thick.

PART 3 - EXECUTION

3.1 EXAMINATION

- A. Examine substrates and conditions, with Installer present, for compliance with requirements of Sections in which substrates and related work are specified and for other conditions affecting performance.
 - 1. Proceed with installation only after unsatisfactory conditions have been corrected.

3.2 PREPARATION

- A. Clean substrates of substances harmful to insulation or vapor retarders, including removing projections capable of puncturing vapor retarders or of interfering with insulation attachment.

3.3 INSTALLATION, GENERAL

- A. Comply with insulation manufacturer's written instructions applicable to products and application indicated.
- B. Install insulation that is undamaged, dry, and unsoiled and that has not been left exposed at any time to ice, rain, and snow.
- C. Extend insulation in thickness indicated to envelop entire area to be insulated. Cut and fit tightly around obstructions and fill voids with insulation. Remove projections that interfere with placement.
- D. Water-Piping Coordination: If water piping is located within insulated exterior walls, coordinate location of piping to ensure that it is placed on warm side of insulation and insulation encapsulates piping.
- E. For preformed insulating units, provide sizes to fit applications indicated and selected from manufacturer's standard thicknesses, widths, and lengths. Apply single layer of insulation units to produce thickness indicated unless multiple layers are otherwise shown or required to make up total thickness.

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3.4 INSTALLATION OF GENERAL BUILDING INSULATION

- A. Install mineral-fiber insulation 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 cavity, 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. For metal-framed wall cavities where cavity heights exceed 96 inches, support unfaced blankets mechanically and support faced blankets by taping stapling flanges to flanges of metal studs.

3.5 INSTALLATION OF VAPOR RETARDERS

- A. General: Extend vapor retarder to extremities of areas to be protected from vapor transmission. Secure in place with adhesives or other anchorage system as indicated. Extend vapor retarder to cover miscellaneous voids in insulated substrates, including those filled with loose-fiber insulation.
- B. Seal vertical joints in vapor retarders over framing by lapping not less than two wall studs. Fasten vapor retarders to wood framing at top, end, and bottom edges; at perimeter of wall openings; and at lap joints. Space fasteners 16 inches o.c.
- C. 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 retarder.
- D. Repair tears or punctures in vapor retarders immediately before concealment by other work. Cover with vapor-retarder tape or another layer of vapor retarder.

3.6 PROTECTION

- A. Protect installed insulation and vapor retarders 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

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PART 1 GENERAL

1.1 SECTION INCLUDES

- A. Metal roofing, including flashing and accessories.

1.2 RELATED SECTIONS

- A. Section 07620 - Sheet Metal Flashing and Trim.
- B. Section 07900 - Joint Sealants.

1.3 REFERENCES

- A. ASTM A 653/A 653M - Standard Specification for Steel Sheet, Zinc-Coated (Galvanized) or Zinc-Iron Alloy-Coated (Galvannealed) by the Hot-Dip Process; 2001a.
- B. ASTM E 408/C - 1371: "Standard Test Method for Total Normal Emittance of Surfaces Using inspection - Meter Techniques.
- C. ASTM E 903/C - 1549: Standard Test Method for Solar Absorbance, using Integrating Spheres.
- D. ASTM E 1646 - Standard Test Method for Water Penetration of Exterior Metal Roof Panel Systems by Uniform Static Air Pressure Difference; 1995.
- E. ASTM E 1680 - Standard Test Method for Rate of Air Leakage Through Exterior Metal Roof Panel Systems; 1995.
- F. FM - Tests Requirements for Class 1 Panel roofs, Factory Mutual Research Corporation.
- G. UL 580 - Standard for Tests for Uplift Resistance of Roof Assemblies; 1994.
- H. UL2218: Class 4 Impact Resistance Rating.
- I. SMACNA (ASMM) - Architectural Sheet Metal Manual; Sheet Metal and Air Conditioning Contractors National Association; 1993.

1.4 SUBMITTALS

- A. Submit under provisions of Section 01300.
- B. Product Data: Manufacturer's data sheets on each product to be used, including:
 - 1. Preparation instructions and recommendations.
 - 2. Storage and handling requirements and recommendations.
 - 3. Installation methods.
- C. Shop Drawings: Submit shop drawings showing layout, profiles and product components, including anchorage, accessories, finish colors and textures.
- D. Selection Samples: For each finish product specified, two complete sets of color chips representing manufacturer's full range of available colors and patterns.
- E. Verification Samples: For each finish product specified, two samples, minimum size

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6 inches square, representing actual product, color, and patterns.

- F. Manufacturer's Certificates: Certify products meet or exceed specified requirements.
- G. Operation and Maintenance Data: Include methods for maintaining installed products and precautions relating to cleaning materials and methods that might be detrimental to finishes and performance.
- H. Close Out: Warranty documents specified herein.

1.5 QUALITY ASSURANCE

- A. Installer Qualifications: Installer with documented experience in performing work of this section who has specialized in the installation of work similar to that required for this project.
- B. Pre-Installation Meeting: Conduct pre-installation meeting to acquaint installers of roofing and related work with project requirements, substrate conditions, manufacturer's installation instructions and manufacturer's warranty requirements.

1.6 DELIVERY, STORAGE, AND HANDLING

- A. Store products in manufacturer's unopened packaging with identification labels intact until ready for installation.
- B. Store materials protected from exposure to harmful conditions. Store material in dry, above ground location.
 - 1. Stack pre-finished material to prevent twisting, bending, abrasion, scratching and denting. Elevate one end of each skid to allow for moisture to run off.
 - 2. Prevent contact with material that may cause corrosion, discoloration or staining.
 - 3. Do not expose to direct sunlight or extreme heat trim material with factory applied strippable film.

1.7 PROJECT CONDITIONS

- A. Maintain environmental conditions (temperature, humidity, and ventilation) within limits recommended by manufacturer for optimum results. Do not install products under environmental conditions outside manufacturer's absolute limits.

1.8 WARRANTY

- A. Manufacturer's Warranty: Provide manufacturer's standard warranty document executed by authorized company official covering finish, including color, fade, chalking and film integrity.
- B. Warranty Period: 20 years commencing on Date of Substantial Completion.

PART 2 PRODUCTS

2.1 MANUFACTURERS

- A. Acceptable Manufacturer: Metallion Industries, Estacada, Oregon.
- B. Requests for substitutions will be considered in accordance with provisions of Section 01600.

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2.2 SHEET METAL ROOFING

- A. General: Factory fabricated panels; panels fabricated on site using portable roll former are prohibited.
1. Performance Requirements: Provide sheet metal roofing that has been manufactured, fabricated and installed to achieve the following performance without defects, damage, failure or infiltration of water.
 - a. Wind Uplift: Provide UL 580 Class 90 rated assembly.
 - b. FM: Test Requirements for Class 1 panel roofs.
 - c. Static Air Infiltration: 0.06 cu ft/min/sq ft at 6.24 lb/sq ft air pressure differential, maximum, when tested in accordance with ASTM E 283 or ASTM E 1680.
 - d. Water Infiltration: No evidence of water penetration at inward static air pressure differential of 12.0 lb/sq ft, when tested in accordance with ASTM E 331 or ASTM E 1646.
 - e. Thermal Movement: Accommodate movement expected due to ambient and surface temperature ranges likely to occur at project site.
 2. Panel Lengths: As indicated on drawings; panels 55 feet and less fabricated in one continuous length.
 3. Texture: Smooth texture, dull matte specular gloss 25 to 35 percent at 60 degrees F.
 4. Texture: Smooth.
 5. Finish: Factory applied PAC-CLAD finish:
 - a. Topside: Full-strength fluoropolymer, 70 percent Kynar 500 or Hylar resin, 1.0 mil total dry film thickness.
 - b. Underside: Wash coat of 0.3 to 0.4 mil dry film thickness.
 - c. Color: As selected by Architect from manufacturer's standard colors.
 - d. Color: Verify with Architect.
 6. Panel Fasteners: Non-penetrating type, as required to achieve wind uplift rating and snow retainage device horizontal thrust requirements for the specified snow load, or otherwise as recommended by manufacturer.
- B. Roof Panels: Metallion Industries Clip Loc Panels; tension-leveled panels 1.875" high mechanically crimped standing seams.
1. Seam Style: Clip Loc.
 2. Material: 24 gage, 0.024 inch ASTM A 653/A 653M G90 hot-dipped galvanized steel, structural quality.
 3. Panel Width: 12 inch, center to center.
 4. Eave Notching: Factory produced eave notching for trimmed eave panels.
 5. Sealant Bead: Factory applied sealant bead.
- C. Flashing and Trim: Manufacturer's standard flashing and trim profiles, factory formed; fabricated as recommended in SMACNA Architectural Sheet Metal Manual.
1. Material: Same as roof panels.
 2. Finish: To match roof panels.
 3. Color: To match roof panels.

2.3 ACCESSORY MATERIALS

- A. Underlayment: Grace Ice and Water Shield HT or approved.
- B. Plywood Deck: 3/4 inch nominal thickness; as specified in Structural General Notes.
- C. Sealant: Elastomeric.

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- D. Touch-Up Paint: Approved by panel manufacturer.

PART 3 EXECUTION

3.1 EXAMINATION

- A. Verify that substrates are acceptable for roofing installation in accordance with manufacturer's instructions.
- B. Do not begin installation until substrates have been properly prepared.
- C. If substrate preparation is the responsibility of another installer, notify Architect of unsatisfactory preparation before proceeding.

3.2 INSTALLATION

- A. Install in accordance with manufacturer's instructions.
- B. Coordinate metal roofing with other work, including but not limited to drainage, flashing and trim, deck substrates, parapets, copings, walls, and other adjoining work.
- C. Install metal roofing panels to profiles, patterns and drainage indicated, in accordance with manufacturer's instructions, and as necessary to achieve specified performance and a leak-free Installation. Allow for structural and thermal movement.
- D. Separate dissimilar metals using bituminous coating to prevent galvanic action.
- E. Use fasteners recommended by panel manufacturer; conceal fasteners wherever possible; cover and seal exposed fasteners.
- F. Provide uniform, neat seams; provide sealant-type joint where indicated and form joints to conceal sealant.

3.3 FIELD QUALITY CONTROL

- A. Post Installation Testing: Owner reserves right to perform post installation testing of installed sheet metal roofing.
- B. Manufacturer's Field Services: Upon Owner's request, provide manufacturer's field service consisting of product use recommendations and periodic site visit for inspection of product installation in accordance with manufacturer's instructions.

3.4 CLEANING

- A. Remove temporary coverings and protection of adjacent work areas.
- B. Touch-up, repair or replace damaged products.
- C. Clean in accordance with manufacturer's instructions prior to Substantial Completion.
- D. Remove construction debris from project site and legally dispose of debris.

3.5 PROTECTION

- A. Protect installed products until completion of project.

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- B. Touch-up, repair or replace damaged products before Substantial Completion.

END OF SECTION

SHEET METAL FLASHING AND TRIM

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PART 1 - GENERAL

1.1 DESCRIPTION

- A. This section describes complete systems using proven details to exclude water from the building at copings, base flashings, parapet wall liners and other locations commonly closed by sheet metal.

1.2 REFERENCES

- A. FM: FM Global
 - 1. FM Data Sheet 1-49: Roof Perimeter Flashing
- B. SMACNA: Sheet Metal and Air Conditioning Contractors' National Association, Inc.

1.3 SYSTEM DESCRIPTION

- A. Allow for field adjustments for proper anchoring or joining to other items.
- B. The requirements shown by the details are intended to establish basic dimensions, profiles and sightlines. Within these limitations, the Contractor will be responsible for the design of the sheet metal flashing and trim assemblies and may make whatever modifications of and additions to the details as may be required to prevent water and air penetration. Maintain the visual design concept as shown, including member sizes, profiles and alignment of components.
- C. Conform to criteria described in FM data sheets 1-49.

1.4 SUBMITTALS

- A. Submit the following.
 - 1. Product Data: Submit metal manufacturer's specifications, installation instructions and general recommendations for flashing and trim applications, with complete list of materials proposed for use.
 - 2. Shop Drawings:
 - a. Show the manner of forming, jointing and securing the metal to form flashings and trim. Show waterproof connections to adjoining work and at obstructions and penetrations. Identify adjoining materials.
 - b. Clearly identify design modifications recommended under System Description article above.

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1.5 PROJECT CONDITIONS

- A. Scheduling: Promptly cover exposed edges of completed roofing.

1.6 WARRANTIES

- A. Extend the warranty for one year beyond the one-year warranty period.
- B. Submit written statement agreeing to above terms and conditions, signed by installer and Contractor.

PART 2 - PRODUCTS

2.1 MATERIALS

- A. Sheet metal exposed flashings: 26 gage minimum.
 - 1. Prefinish with silicone modified polyester color coating to match adjacent material.
- B. Galvalume or Zinalume: 24 gage minimum.
 - 1. Prefinish with silicone modified polyester color coating to match adjacent material.
- C. Fasteners:
 - 1. Nails: 4d shank, 1/4 inch diameter flat head, annular thread, diamond point, long enough to penetrate backing by at least 1 inch.
 - 2. Screws: #12 type A sheeting screws with hex heads and neoprene washers at least 3/4-inch diameter, 20 gage minimum, where exposed to weather.

2.2 FABRICATION

- A. Shop fabricate sheet metal flashing and trim as indicated.
- B. Hem exposed edges 1/2 inch on unexposed side, or as indicated.

PART 3 - EXECUTION

3.1 INSPECTION

- A. Verify that substrates are smooth and clean to extent needed for sheet metal work.

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- B. Verify that reglets, nailers, cants, and blocking, to receive sheet metal are installed and free of concrete and soil.
- C. Start sheet metal work only after conditions are satisfactory.

3.2 INSTALLATION

- A. General:
 - 1. SMACNA Details: Comply with applicable recommendations and details of SMACNA's "Architectural Sheet Metal Manual."
 - 2. Manufacturer's Recommendations: Comply with the recommendations and instructions of the manufacturer of the sheet metal being installed.
 - 3. Separate dissimilar metals as required to prevent electrolysis.
 - 4. Provide for thermal expansion of running trim, flashing, and other items exposed for more than 15'-0" continuous length.
 - 5. Install work with lines and corners of exposed units true and accurate, free of waves, warps, buckles, fastening stresses or distortion, allowing for expansion and contraction. Provide uniform, neat seams with minimum exposure of solder. Fold back the sheet metal to form a hem on the concealed side of exposed edges.
 - 6. Conceal fasteners and expansion provisions wherever possible in exposed work, and locate so as to minimize the possibility of leakage. Cover and seal work as required for a watertight installation. Provide cleat-type anchorages for metal flashing and trim wherever practical, arrange to relieve stresses from building movement and thermal expansion.
 - 7. On vertical surfaces, lap flashings a minimum of 3 inches.
- B. Flash other trades' work extending through sheet metal work.
- C. Provide other required sheet metal flashing and trim.

3.3 PROTECTION

- A. Protect completed flashing and trim. Maintain such protection during installation of other work, and also for the remainder of the construction period.

END OF SECTION

FIBERGLASS REINFORCED PANELS

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PART 1 - GENERAL

1.1 SUMMARY

- A. Section Includes: Prefinished polyester glass reinforced plastic sheets and adhered to unfinished gypsum wallboard.
 - 1. [Aluminum] [PVC] trim.

- B. Products Not Furnished or Installed under This Section:
 - 1. Gypsum substrate board.
 - 2. Resilient Base.

1.2 RELATED SECTIONS

- A. Section 9250 – Gypsum Board

- B. Section 9650 - Resilient Flooring

1.3 REFERENCES

- A. American Society for Testing and Materials: Standard Specifications (ASTM)
 - 1. ASTM D 256 - Izod Impact Strengths (ft #/in)
 - 2. ASTM D 570 - Water Absorption (%)
 - 3. ASTM D 638 - Tensile Strengths (psi) & Tensile Modulus (psi)
 - 4. ASTM D 790 - Flexural Strengths (psi) & Flexural Modulus (psi)
 - 5. ASTM D 2583- Barcol Hardness
 - 6. ASTM D 5319 - Standard Specification for Glass-Fiber Reinforced Polyester Wall and Ceiling Panels.
 - 7. ASTM E 84 - Standard Test Method for Surface Burning Characteristics of Building Materials.

1.4 SUBMITTALS

- A. Product Data: Submit sufficient manufacturer's data to indicate compliance with these specifications, including:
 - 1. Preparation instructions and recommendations.
 - 2. Storage and handling requirements and recommendations.
 - 3. Installation methods.

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- B. Shop Drawings: Submit elevations of each wall showing location of paneling and trim members with respect to all discontinuities in the wall elevation.
- C. Selection Samples: Submit manufacturer's standard color pattern selection samples representing manufacturer's full range of available colors and patterns.
- D. Samples for Verification: Submit appropriate section of panel for each finish selected indicating the color, texture, and pattern required.
 - 1. Submit complete with specified applied finish.
 - 2. For selected patterns show complete pattern repeat.
 - 3. Exposed Molding and Trim: Provide samples of each type, finish, and color.
- E. Manufacturers Material Safety Data Sheets (MSDS) for adhesives, sealants and other pertinent materials prior to their delivery to the site.

1.5 QUALITY ASSURANCE

- A. Conform to building code requirements for interior finish for smoke and flame spread requirements as tested in accordance with:
 - 1. ASTM E 84 (Method of test for surface burning characteristics of building Materials)
 - a. Wall Required Rating – Class [A] [C].
- B. Sanitary Standards: System components and finishes to comply with:
 - 1. United States Department of Agriculture (USDA) requirements for food preparation facilities, incidental contact.
 - 2. Food and Drug Administration (FDA) 1999 Food Code 6-101.11.
 - 3. Canadian Food Inspection Agency (CFIA) requirements.

1.6 DELIVERY, STORAGE AND HANDLING

- A. Deliver materials factory packaged on strong pallets.
- B. Store panels and trim lying flat, under cover and protected from the elements. Allow panels to acclimate to room temperature (range of 60 to 75°F) for 48 hours prior to installation.

1.7 PROJECT CONDITIONS

- A. Environmental Limitations: Building are to be fully enclosed prior to installation with sufficient heat (70°) and ventilation consistent with good working conditions for finish work

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- B. During installation and for not less than 48 hours before, maintain an ambient temperature and relative humidity within limits required by type of adhesive used and recommendation of adhesive manufacturer.
 - 1. Provide ventilation to disperse fumes during application of adhesive as recommended by the adhesive manufacturer.

1.8 WARRANTY

- A. Furnish one year guarantee against defects in material and workmanship.

PART 2 - PRODUCTS

2.1 ACCEPTABLE MANUFACTURER

- A. Marlite; 1 Marlite Drive, Dover, OH 44622. 800-377-1221 FAX (330) 343-4668
- B. Product:
 - 1. Symmetrix with Sani-Coat

2.2 PANELS

- A. Fiberglass reinforced thermosetting polyester resin panel sheets complying with ASTM D 5319.
 - 1. Coating: Multi-layer print, primer and finish coats or applied over-layer.
 - 2. Dimensions:
 - a. Thickness – 0.090 “nominal
 - b. Width - 4'-0” nominal
 - c. Length – 10'-0” nominal
 - 3. Tolerance:
 - a. Length and Width: +/-1/8 “
 - b. Square - Not to exceed 1/8 “ for 8 foot panels or 5/32 “ for 10 foot panels
- B. Properties: Resistant to rot, corrosion, staining, denting, peeling, and splintering.
 - 1. Flexural Strength - 1.0×10^4 psi per ASTM D 790.
 - 2. Flexural Modulus - 3.1×10^5 psi per ASTM D 790.
 - 3. Tensile Strength - 7.0×10^3 psi per ASTM D 638.
 - 4. Tensile Modulus - 1.6×10^5 psi per ASTM D 638.
 - 5. Water Absorption - 0.72% per ASTM D 570.
 - 6. Barcol Hardness (scratch resistance) of 35 55 as per ASTM D 2583.
 - 7. Izod Impact Strength of 72 ft. lbs./in ASTM D 256
- C. Back Surface: Smooth. Imperfections which do not affect functional properties are not cause for rejection.

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- D. Front Finish: In accordance with pre-approved sample.
 - a. Color: From manufacturers standard selection.
 - b. Surface: Smooth.
 - c. Fire Rating: Not required.
 - d. Size: 48" width by required length.

2.3 MOLDINGS

- A. PVC Trim: Thin-wall semi-rigid extruded PVC.
 - 1. M 350 Inside Corner
 - 2. M 360 Outside Corner
 - 3. M 365 Division
 - 4. M 370 Edge
 - 5. Color: Verify.

2.4 ACCESSORIES

- A. Adhesive: Either of the following construction adhesives complying with ASTM C 557.
 - 1. Marlite C-551 FRP Adhesive - Water- resistant, non-flammable adhesive.
 - 2. Marlite C-915 Construction Adhesive - Flexible, water-resistant, solvent based adhesive, formulated for fast, easy application.
 - 3. Titebond Advanced Polymer Panel Adhesive – VOC compliant, non-flammable, environmentally safe adhesive.
- B. Sealant:
 - 1. Marlite Brand - Color Match Sealant.

PART 3 - EXECUTION

3.1 PREPARATION

- A. Examine backup surfaces to determine that corners are plumb and straight, surfaces are smooth, uniform, clean and free from foreign matter, nails countersunk, joints and cracks filled flush and smooth with the adjoining surface.
 - 1. Verify that stud spacing does not exceed 24" on-center.
- B. Repair defects prior to installation.
 - 1. Level wall surfaces to panel manufacturer's requirements. Remove protrusions and fill indentations.

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3.2 INSTALLATION

- A. Comply with manufacturer's recommended procedures and installation sequence.
- B. Cut sheets to meet supports allowing 1/8" clearance for every 8 foot) of panel.
 - 1. Cut and drill with carbide tipped saw blades or drill bits, or cut with shears.
- C. Apply panels to board substrate, above base, vertically oriented with seams plumb and pattern aligned with adjoining panels.
 - 1. Install panels with manufacturer's recommended gap for panel field and corner joints.
 - a. Adhesive trowel and application method to conform to adhesive manufacturer's recommendations.
- D. Apply panel moldings to all panel edges using silicone sealant providing for required clearances.
 - 1. All moldings must provide for a minimum 1/8 "of panel expansion at joints and edges, to insure proper installation.
 - 2. Apply sealant to all moldings, channels and joints between the system and different materials to assure watertight installation.

3.3 CLEANING

- A. Remove excess sealant from panels and moldings. Wipe panel down using a damp cloth and mild soap solution or cleaner.
- B. Refer to manufacturer's specific cleaning recommendations Do not use abrasive cleaners.

END OF

JOINT SEALANTS

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PART 1 - GENERAL

1.1 DESCRIPTION

- A. This section describes sealant at exterior joints in vertical surfaces and non-traffic horizontal surfaces; exterior joints in horizontal traffic surfaces; and interior joints in vertical and horizontal surfaces.

1.2 REFERENCES

- A. ASTM: American Society of Testing and Materials
 - 1. ASTM C834: Latex Sealants
 - 2. ASTM C920: Elastomeric Joint Sealants
- B. FM: FM Global
- C. FS: Federal Standard
 - 1. FS TT-S-001543: Sealing Compound, Silicone Rubber Base (For Caulking and Sealing)
 - 2. FS TT-S-00227: Sealing Compound, Elastomeric Type, Multi-Component (For Caulking and Sealing)

1.3 SYSTEM PERFORMANCE

- A. Provide joint sealers that have been produced and installed to establish and maintain watertight and airtight continuous seals.

1.4 SUBMITTALS

- A. Sealants: Submit package clearly identifying where each material is proposed for use.
- B. Submit the following.
 - 1. Product data from manufacturers for each joint sealer product required with color cards, including instructions for joint preparation and joint sealer application.
 - 2. Samples for Initial Selection Purposes: Manufacturer's standard bead samples consisting of strips of actual products showing full range of colors available, for each product exposed to view.
 - 3. Samples for verification purposes of each type and color of joint sealer required. Install joint sealer samples in 1/2 inch wide joints formed between two 6 inch long strips of material matching the appearance of exposed surfaces adjacent to joint sealers.

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- C. Certificates from manufacturers of joint sealers attesting that their products comply with specification requirements and are suitable for the use indicated.
- D. Qualification data complying with requirements specified in "Quality Assurance" section.
- E. For sealants other than specified, submit compatibility and adhesion test reports from elastomeric sealant manufacturer indicating that materials forming joint substrates and joint sealant backings have been tested for compatibility and adhesion with joint sealants. Include sealant manufacturer's interpretation of test results relative to sealant performance and recommendations for primers and substrate preparation needed to obtain adhesion.
- F. Product test reports for each type of joint sealers indicated, evidencing compliance with requirements specified.

1.5 QUALITY ASSURANCE

- A. Installer Qualifications: Engage an installer who has successfully completed within the last 3 years at least 3 joint sealer applications similar in type and size to this project.

1.6 PRODUCT DELIVERY, STORAGE AND HANDLING

- A. Deliver materials to project site in original unopened containers or bundles with labels containing information about manufacturer, product name and designation, color, expiration period for use, pot life, curing time and mixing instructions for multi-component materials.
- B. Store and handle materials in compliance with manufacturer's recommendations to prevent their deterioration or damage due to moisture, high or low temperatures, contaminants, or other causes.

1.7 PROJECT CONDITIONS

- A. Conditions of Other Work:
 - 1. Examine the joint surfaces, backing, and anchorage of units forming sealant rabbet, and the conditions under which the sealant work is to be performed. Correct conditions detrimental to the proper and timely completion of the work and performance of the sealants.
 - 2. Do not proceed with the sealant work until unsatisfactory conditions have been corrected.
- B. Weather Conditions:
 - 1. Do not proceed with installation of sealants under adverse weather conditions, or when temperatures are below or above manufacturer's recommended limitations for installation.

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2. Proceed with the work only when forecasted weather conditions are favorable for proper cure and development of high early bond strength.
3. Wherever joint width is affected by ambient temperature variations, install elastomeric sealants only when temperatures are in the lower third of manufacturer's recommended installation temperature range, so that sealant will not be subjected to excessive elongation and bond stress at subsequent low temperatures.
4. Coordinate time schedule to avoid delay of project.

1.8 WARRANTY

- A. Extend period during which installer of work of this section is required to return to job to make corrections for four additional years beyond the one-year warranty period.
- B. Repair or replace sealants which fail to perform as air-tight and water-tight joints; or fail in joint adhesion, cohesion or abrasion resistance, weather resistance, extrusion resistance, migration resistance, stain resistance, or general durability; or appear to deteriorate in another manner not clearly specified by submitted manufacturer's data as an inherent quality of the material for the exposure indicated.

PART 2 - MATERIALS

2.1 MATERIALS, GENERAL

- A. Colors: For exposed materials, provide color as indicated, or if not indicated, as selected by the Architect from manufacturer's standard colors. For concealed materials, provide the natural color which has the best overall performance characteristics.
- B. Hardness: As recommended by manufacturer for application shown, unless otherwise indicated.
- C. Modulus of Elasticity: Provide the lowest available modulus of elasticity which is consistent with exposure to weathering, indentation, vandalism, abrasion, support of loading, and other requirements.
- D. Compatibility: Before purchase of each required material, confirm its compatibility with each other material it will be exposed to in the joint system.
- E. Size and Shape: As shown or, if not shown, as recommended by the manufacturer for the type and condition of joint, and for the indicated joint performance or movement.
- F. Grade of Sealant: For each application, provide the grade of sealant (non-sag, self-leveling, no-track, knife grade, preformed, etc.) as recommended by the manufacturer for the particular condition of installation (locations, joint shape, ambient temperature,

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and similar conditions), to achieve the best possible overall performance. Grades specified herein are for normal conditions for installation.

2.2 SEALANT AND CALKING MATERIALS

- A. Elastomeric Sealant: Provide at joints in the exterior of the building.
- B. Provide silicone rubber based, one-part, non-sag, elastomeric sealant, complying with FS TT-S-001543, Class A and ASTM C920 Type S, Grade NS, Class 40, uses NT, M, G, A and O; recommended by manufacturer (also tested for compatibility and materials warranted for 20 years by manufacturer) for exterior joint surfaces shown.
 - 1. Acceptable Products and Manufacturers:
 - a. Silicone Building Sealant 795 manufactured by Dow Corning Corp.
 - b. Silglaze / Silpruf Construction Sealant manufactured by General Electric Co.
 - c. Proglaze Construction Sealant manufactured by Tremco, Inc.
 - d. Or approved.
- C. Acrylic Latex Joint Sealants: Provide where calking is indicated at interior locations.
 - 1. Provide one-part, non-sag, mildew-resistant, sealant complying with ASTM C834, formulated to be paintable and recommended for exposed interior applications involving joint movement of not more than 7.5 percent from installed dimension.
 - 2. Acceptable Manufacturers and Products:
 - a. Chem-Calk 600 manufactured by Bostik.
 - b. Tremco Acrylic Latex Calk manufactured by Tremco.
 - c. Sonolac manufactured by Sonneborn.
 - d. Or approved.

2.3 MISCELLANEOUS MATERIALS

- A. Joint Cleaner: Provide the type of joint cleaning compound recommended by the sealant or caulking compound manufacturer, for the joint surfaces to be cleaned.
- B. Joint Primer/Sealer: Provide the type of joint primer/sealer recommended by the sealant manufacturer, for the joint surfaces to be primed or sealed.
- C. Bond Breaker Tape: Polyethylene tape or other plastic tape as recommended by the sealant manufacturer, to be applied to sealant-contact surfaces where bond to the substrate or joint filler must be avoided for proper performance of sealant. Provide self-adhesive tape wherever applicable.
- D. Sealant Back-Up Rod: Compressible rod stock of polyethylene foam, polyethylene jacketed polyurethane foam, butyl rubber foam, neoprene foam or other flexible, permanent, durable non-absorptive material as recommended for compatibility with sealant by the sealant manufacturer. Provide size and shape of rod which will control the joint depth for sealant placement, break bond of sealant at bottom of joint, from

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optimum shape of sealant bead on back side, and provide a highly compressible backing to minimize the possibility of sealant extrusion when joint is compressed.

PART 3 - EXECUTION

3.1 PREPARATION

- A. Clean joint surfaces immediately before installation of sealant or calking compound. Remove dirt, insecure coatings, moisture and other substances which would interfere with bond of sealant or calking compound.
- B. For elastomeric sealants, do not proceed with installation of sealant over joint surfaces which have been painted, lacquered, waterproofed or treated with water repellent or other treatment or coating unless a laboratory test for durability (adhesion), in compliance with Paragraph 4.3.9 of FS TT-S-00227 has successfully demonstrated that sealant bond is not impaired by coating or treatment. If laboratory test has not been performed, or shows bond interference, remove coating or treatment from joint surfaces before installing sealant.
- C. Etch masonry and stonework joint surfaces to remove excess alkalinity, unless sealant manufacturer's printed instructions indicate that alkalinity does not interfere with sealant bond and performance. Etch with 5 percent solution of muriatic acid; neutralize with dilute ammonia solution, rinse thoroughly with water and allow to dry before sealant installation.
- D. Roughen joint surfaces on vitreous coated and similar non-porous materials, where sealant manufacturer's data indicates lower bond strength than for porous surfaces. Rub with fine abrasive to produce a dull sheen.

3.2 INSTALLATION

- A. Comply with sealant manufacturer's printed instructions except where more stringent requirements are shown or specified and except where manufacturer's technical representative directs otherwise.
- B. Prime or seal the joint surfaces wherever shown or recommended by the sealant manufacturer. Do not allow primer/sealer to spill or migrate onto adjoining surfaces.
- C. Install sealant backup rod for elastomeric sealants, except where shown to be omitted or recommended to be omitted by sealant manufacturer for the application shown.
- D. Clean joint surfaces as recommended by sealant manufacturer. Provide bond-breaker or separator between sealant and joint filler, wherever recommended by manufacturer and wherever sealant is not compatible with joint filler.

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- E. Install bond breaker tape where shown and where required by manufacturer's recommendations to ensure that elastomeric sealants will perform properly.
- F. Employ only proven installation techniques which will ensure that sealants will be deposited in uniform, continuous ribbons without gaps or air pockets, with complete "wetting" of joint bond surfaces equally on opposite sides.
 - 1. Except as otherwise indicated, fill sealant rabbet to a slightly concave surface, slightly below adjoining surfaces.
 - 2. Where horizontal joints are between a horizontal surface and a vertical surface, fill joint to form a slight cove, so that joint will not trap moisture and dirt.
- G. Install sealants to depths as shown or, if not shown, as recommended by sealant manufacturer but within the following general limitations, measured at center (thin) section of bead.
 - 1. For normal moving joints sealed with elastomeric sealants, but not subject to traffic, fill joints to a depth equal to 50 percent of joint width, but neither more than 1/2 inch deep nor less than 1/4 inch deep.
 - 2. For joints sealed with non-elastomeric sealants and calking compounds, fill joints to a depth in the range of 75 percent to 125 percent of joint width.
- H. Spillage:
 - 1. Do not allow sealants or compounds to overflow or spill onto adjoining surfaces, or to migrate into voids of adjoining surfaces including exposed aggregate panels and similar rough textures. Use masking tape or other precautionary devices to prevent staining of adjoining surfaces, by either primer/sealer or the sealant/calcing compound.
 - 2. Remove excess and spillage of compounds promptly as work progresses. Clean the adjoining surfaces by whatever means may be necessary to eliminate evidence of spillage.
- I. Where exposed, install with surface profile within plus or minus 1/16 inch from dimension shown except over 8 feet above floor plus or minus 1/8 inch, with surface uniformly smooth and free of wrinkles.

3.3 CURE AND PROTECTION

- A. Cure sealants and calking compounds in compliance with manufacturer's instructions and recommendations, to obtain high early bond strength, internal cohesive strength and surface durability. Do not cure in a manner which would significantly alter material's modulus of elasticity or other characteristics.
- B. Follow manufacturer's procedures required for curing and protection of sealants and calking compounds during construction period, so that they will be without deterioration or damage (other than normal wear and weathering) at time of completion.

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3.4 TESTS FOR PERFORMANCE

- A. After nominal cure of exterior joint sealants which are exposed to weather, test for water leaks. Flood joint exposure with water directed from a 3/4 inch garden hose held perpendicular to wall face, 2'-0" from joint, connected to a water system with 30 psi minimum static water pressure at the nozzle. Move stream of water along joint at an approximate rate of 20 feet per minute.
- B. Test approximately 5 percent of total joint system in locations which are typical of every joint condition, and which can be inspected easily for leakage on opposite face. Conduct test in presence of the Architect who will determine actual percentage of joints to be tested and actual period of exposure to water from hose, based upon extent of observed leakage, or lack thereof. Repair sealant installation at leaks or, if leakage is excessive, replace sealant installation as directed.
- C. Where nature of observed leakage indicates possibility of inadequate joint bond strength, the Architect will direct that additional testing be performed at a time when joints have been fully cured, followed by natural exposure through both extreme temperatures, and returned to lowest range of temperature in which it is feasible to conduct testing. Repair or replace work as required. Perform testing at a reasonable time within 24 months of installation date, as directed.

END OF SECTION

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PART 1 - GENERAL

1.1 ISSUES

- A. All public and personnel doors shall be a minimum of 36" wide to provide barrier free access for mobility aid users.

1.2 SUMMARY

- A. This Section includes the following:
 - 1. Standard hollow-metal steel doors.
 - 2. Standard hollow-metal steel frames.
- B. Related Sections include the following:
 - 1. Division 07 Section JOINT SEALANTS for sealants used in hollow metal frame installation.
 - 2. Division 08 Section GLAZING for glazed lites in standard steel doors.
 - 3. Division 08 Section HARDWARE for door hardware for standard steel doors.
 - 4. Division 09 Section INTERIOR and EXTERIOR PAINTING for field painting standard steel doors and frames.

1.3 DEFINITIONS

- A. Minimum Thickness: Minimum thickness of base metal without coatings.

1.4 SUBMITTALS

- A. Product Data: Include construction details, material descriptions, core descriptions, label compliance, fire resistance rating and finishes for each type of steel door and frame specified.
- B. Oversize Construction Certification: For standard steel door assemblies required to be fire rated and exceeding limitations of labeled assemblies; include statement that doors comply with requirements of design, materials, and construction but have not been subjected to fire test.
- C. Qualification Data: For Installer.
- D. Product Test Reports: Based on evaluation of comprehensive fire tests performed by a qualified testing agency, for each type of standard steel door and frame.

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1.5 QUALITY ASSURANCE

- A. Installer Qualifications: An employer of workers trained and approved by manufacturer.
- B. Testing Agency Qualifications: An independent agency qualified according to ASTM E 329 for testing indicated, as documented according to ASTM E 548.
- C. Source Limitations: Obtain standard steel doors and frames through one source from a single manufacturer.
- D. Fire-Rated Door Frame Assemblies: Assemblies complying with NFPA 80 that are listed and labeled by a testing and inspecting agency acceptable to authorities having jurisdiction, for fire-protection ratings indicated.

1.6 DELIVERY, STORAGE, AND HANDLING

- A. Deliver doors and frames palletized, wrapped, or crated to provide protection during transit and Project-site storage. Do not use nonvented plastic.
 - 1. Provide additional protection to prevent damage to finish of factory-finished doors and frames.
- B. Deliver welded frames with two removable spreader bars across bottom of frames, tack welded to jambs and mullions.
- C. Store doors and frames under cover at Project site. Place units in a vertical position with heads up, spaced by blocking, on minimum 4-inch- high wood blocking. Avoid using nonvented plastic or canvas shelters that could create a humidity chamber.
 - 1. If wrappers on doors become wet, remove cartons immediately. Provide minimum 1/4-inch space between each stacked door to permit air circulation.

1.7 COORDINATION

- A. Coordinate installation of anchorages for standard steel frames. 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.

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PART 2 - PRODUCTS

2.1 MANUFACTURERS

- A. Available Manufacturers: Subject to compliance with requirements, manufacturers offering products that may be incorporated into the Work include, but are not limited to, the following:
1. Amweld Building Products, LLC.
 2. Ceco Door Products; an ASSA ABLOY Group Company.
 3. CURRIES Company; an ASSA ABLOY Group Company.
 4. Fleming Door Products Ltd.; an ASSA ABLOY Group Company.
 5. Pioneer Industries, Inc.
 6. Republic Doors and Frames; a Windsor Republic Door Company
 7. Steelcraft; an Ingersoll-Rand Company.

2.2 MATERIALS

- A. Cold-Rolled Steel Sheet: ASTM A 1008/A 1008M, Commercial Steel (CS), Type B; suitable for exposed applications.
- B. Hot-Rolled Steel Sheet: ASTM A 1011/A 1011M, Commercial Steel (CS), Type B; free of scale, pitting, or surface defects; pickled and oiled.
- C. Metallic-Coated Steel Sheet: ASTM A 653/A 653M, Commercial Steel (CS), Type B; with minimum A40 zinc-iron-alloy (galvannealed) coating designation.
- D. Supports and Anchors: After fabricating, galvanize units to be built into exterior walls according to ASTM A 153/A 153M, Class B.
- E. Inserts, Bolts, and Fasteners: Provide items to be built into exterior walls, hot-dip galvanized according to ASTM A 153/A 153M.
- F. Powder-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 standard steel door frames of type indicated.
- G. Grout: Comply with ASTM C 476, with a slump of 4 inches for standard steel door frames built into concrete or masonry, as measured according to ASTM C 143/C 143M.
- H. Glazing: Comply with requirements in Division 8 Section "Glazing."
- I. Bituminous Coating: Cold-applied asphalt mastic, SSPC-Paint 12, compounded for 15-mil dry film thickness per coat. Provide inert-type noncorrosive compound free of asbestos fibers, sulfur components, and other deleterious impurities.

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2.3 STANDARD STEEL DOORS

- A. General: Provide doors of design indicated, not less than thickness indicated; fabricated with smooth surfaces, without visible joints or seams on exposed faces, unless otherwise indicated. Comply with ANSI A250.8.
1. Design: Flush panel.
 2. Core Construction: Manufacturer's standard kraft-paper honeycomb, polystyrene, polyurethane, mineral-board, or vertical steel-stiffener core that produces doors complying with ANSI A250.8.
 - a. Fire Door Core: As required to provide fire-protection ratings indicated.
 3. Vertical Edges for Single-Acting Doors: Beveled edge.
 - a. Beveled Edge: 1/8 inch in 2 inches.
 4. Top and Bottom Edges: Closed with flush or inverted 0.042-inch- thick end closures or channels of same material as face sheets.
 5. Tolerances: Comply with SDI 117, "Manufacturing Tolerances for Standard Steel Doors and Frames."
- B. Exterior Doors: Face sheets fabricated from metallic-coated steel sheet. Provide doors complying with requirements indicated below by referencing ANSI A250.8 for level and model and ANSI A250.4 for physical-endurance level:
1. Level 2 and Physical Performance Level B (Heavy Duty), Model 2-Seamless for standard size doors not subject to heavy abuse.
 2. Level 3 and Physical Performance Level A (Extra Heavy Duty), Model 2-(Seamless) for large doors (greater than 48") or doors subject to heavy abuse.
- C. Interior Doors: Face sheets fabricated from cold-rolled steel sheet, unless otherwise indicated to comply with exterior door requirements. Provide doors complying with requirements indicated below by referencing ANSI A250.8 for level and model and ANSI A250.4 for physical-endurance level:
1. Level 2 and Physical Performance Level B (Heavy Duty), Model 2 (Seamless) for standard size doors not subject to heavy abuse.
 2. Level 3 and Physical Performance Level A (Extra Heavy Duty), Model 2 (Seamless) for large doors (greater than 48") or doors subject to heavy abuse.
- D. Hardware Reinforcement: Fabricate reinforcement plates from same material as door face sheets to comply with the following minimum sizes:
1. Hinges: Minimum 0.123 inch thick by 1-1/2 inches wide by 6 inches longer than hinge, secured by not less than 6 spot welds.
 2. Lock Face Closers, and Concealed Holders: Minimum 0.067 inch thick.
 3. All Other Surface-Mounted Hardware: Minimum 0.067 inch thick.

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- E. Fabricate concealed stiffeners and hardware reinforcement from either cold- or hot-rolled steel sheet.

2.4 STANDARD STEEL FRAMES

- A. General: Comply with ANSI A250.8 and with details indicated for type and profile.
- B. Exterior Frames: Fabricated from metallic-coated steel sheet.
 - 1. Fabricate frames with mitered or coped and welded face corners.
 - 2. Frames for Level 2 Steel Doors: 0.053-inch- thick steel sheet.
 - 3. Frames for Level 3 Steel Doors: 0.067-inch- thick steel sheet.
- C. Interior Frames: Fabricated from cold-rolled steel sheet, unless otherwise indicated to comply with exterior frame requirements.
 - 1. Fabricate frames with mitered or coped and welded face corners.
 - 2. Frames for Level 2 Steel Doors and for flush wood doors 0.053-inch- thick steel sheet.
 - 3. Frames for Level 3 Steel Doors: 0.067-inch-thick steel sheet.
- D. Hardware Reinforcement: Fabricate reinforcement plates from same material as frames to comply with the following minimum sizes:
 - 1. Hinges: Minimum 0.123 inches thick by 1-1/2 inches wide by 6 inches longer than hinge, secured by not less than 6 spot welds.
 - 2. Lock Face Closers, and Concealed Holders: Minimum 0.067 inch thick.
 - 3. All Other Surface-Mounted Hardware: Minimum 0.067 inch thick.
- E. Supports and Anchors: Fabricated from electrolytic zinc-coated or metallic-coated steel sheet.
- F. Jamb Anchors:
 - 1. Masonry Type: Adjustable strap-and-stirrup or T-shaped anchors to suit frame size, not less than 0.042 inch thick, with corrugated or perforated straps not less than 2 inches wide by 10 inches long; or wire anchors not less than 0.177 inch thick.
 - 2. Stud-Wall Type: Designed to engage stud, welded to back of frames; not less than 0.042 inch thick.
 - 3. Postinstalled Expansion Type for In-Place Concrete or Masonry: Minimum 3/8-inch- 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.
- G. Floor Anchors: Formed from same material as frames, not less than 0.042 inch thick, and as follows:

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1. Monolithic Concrete Slabs: Clip-type anchors, with two holes to receive fasteners.
 2. Separate Topping Concrete Slabs: Adjustable-type anchors with extension clips, allowing not less than 2-inch height adjustment. Terminate bottom of frames at finish floor surface.
- H. Fabricate concealed stiffeners and hardware reinforcement from either cold- or hot-rolled steel sheet.

2.5 STOPS AND MOLDINGS

- A. Moldings for Glazed Lites in Doors: Minimum 0.032 inch thick, fabricated from same material as door face sheet in which they are installed.
- B. Fixed Frame Moldings: Formed integral with standard steel frames, minimum 5/8 inch high, unless otherwise indicated.
- C. Loose Stops for Glazed Lites in Frames: Minimum 0.032 inch thick, fabricated from same material as frames in which they are installed.

2.6 FABRICATION

- A. General: Fabricate standard steel doors and frames to be rigid and free of defects, warp, or buckle. Accurately form metal to required sizes and profiles, with minimum radius for thickness of metal. 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. Standard Steel Doors:
 1. Exterior Doors: Provide weep-hole openings in bottom of exterior doors to permit moisture to escape. Seal joints in top edges of doors against water penetration.
 2. Glazed Lites: Factory cut openings in doors.
- C. Standard Steel 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. Welded Frames: Weld flush face joints continuously; grind, fill, dress, and make smooth, flush, and invisible.
 2. Provide countersunk, flat- or oval-head exposed screws and bolts for exposed fasteners, unless otherwise indicated.
 3. Plaster Guards: Weld guards to frame at back of hardware mortises in frames installed in concrete, masonry or plastered walls.
 4. Where installed in masonry, leave vertical mullions in frames open at top for grouting.

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5. Floor Anchors: Weld anchors to bottom of jambs and mullions with at least four spot welds per anchor.
 6. Jamb Anchors: Provide number and spacing of anchors as follows:
 - a. Masonry Type: Locate anchors not more than 18 inches from top and bottom of frame. Space anchors not more than 32 inches o.c. and as follows:
 - 1) Two anchors per jamb up to 60 inches in height.
 - 2) Three anchors per jamb from 60 to 90 inches in height.
 - 3) Four anchors per jamb from 90 to 120 inches in height.
 - 4) Four anchors per jamb plus 1 additional anchor per jamb for each 24 inches or fraction thereof more than 120 inches in height.
 - b. Stud-Wall Type: Locate anchors not more than 18 inches from top and bottom of frame. Space anchors not more than 32 inches o.c. and as follows:
 - 1) Three anchors per jamb up to 60 inches in height.
 - 2) Four anchors per jamb from 60 to 90 inches in height.
 - 3) Five anchors per jamb from 90 to 96 inches in height.
 - 4) Five anchors per jamb plus 1 additional anchor per jamb for each 24 inches or fraction thereof more than 96 inches in height.
 - 5) Two anchors per head for frames more than 42 inches wide and mounted in metal-stud partitions.
 - c. Compression Type: Not less than two anchors in each jamb.
 - d. Postinstalled Expansion Type: Locate anchors not more than 6 inches from top and bottom of frame. Space anchors not more than 26 inches o.c.
 7. Door Silencers: Except on weather-stripped doors, drill stops to receive door silencers as follows. Provide plastic plugs to 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. Hardware Preparation: Factory prepare standard steel doors and frames to receive templated mortised hardware; include cutouts, reinforcement, mortising, drilling, and tapping, according to the Door Hardware Schedule and templates furnished as specified in Division 8 Section DOOR HARDWARE.
1. Reinforce doors and frames to receive non-templated mortised and surface-mounted door hardware.
 2. Comply with applicable requirements in ANSI A250.6 and ANSI/DHI A115 Series specifications for door and frame preparation for hardware. Locate hardware as indicated on Shop Drawings or, if not indicated, according to ANSI A250.8.

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- E. Stops and Moldings: Provide stops and moldings around glazed lites where indicated. Form corners of stops and moldings with butted or mitered hairline joints.
 - 1. Single Glazed Lites: Provide fixed stops and moldings welded on secure side of door or frame.
 - 2. Multiple Glazed Lites: Provide fixed and removable stops and moldings such that each glazed lite is capable of being removed independently.
 - 3. Provide fixed frame moldings on outside of exterior and on secure side of interior doors and frames.
 - 4. Provide loose stops and moldings on inside of doors and frames.
 - 5. Coordinate rabbet width between fixed and removable stops with type of glazing and type of installation indicated.

2.7 STEEL FINISHES

- A. General: Comply with NAAMM's "Metal Finishes Manual for Architectural and Metal Products" for recommendations for applying and designating finishes.
 - 1. Finish standard steel door and frames after assembly.
- B. Metallic-Coated Steel Surface Preparation: Clean surfaces with non-petroleum solvent so surfaces are free of oil and other contaminants. After cleaning, apply a conversion coating suited to the organic coating to be applied over it. Clean welds, mechanical connections, and abraded areas, and apply galvanizing repair paint specified below to comply with ASTM A 780.
 - 1. Galvanizing Repair Paint: High-zinc-dust-content paint for regalvanizing welds in steel on galvanized doors and frames, complying with SSPC-Paint 20.
- C. Steel Surface Preparation: Clean surfaces to comply with SSPC-SP 1, "Solvent Cleaning"; remove dirt, oil, grease, or other contaminants that could impair paint bond. Remove mill scale and rust, if present, from uncoated steel; comply with SSPC-SP 3, "Power Tool Cleaning," or SSPC-SP 6/NACE No. 3, "Commercial Blast Cleaning."
- D. Factory Priming for Field-Painted Finish: Apply shop primer specified below immediately after surface preparation and pretreatment. Apply a smooth coat of even consistency to provide a uniform dry film thickness of not less than 0.7 mils.
 - 1. Shop Primer: Manufacturer's standard, fast-curing, lead- and chromate-free primer complying with ANSI A250.10 acceptance criteria; recommended by primer manufacturer for substrate; compatible with substrate and field-applied finish paint system indicated; and providing a sound foundation for field-applied topcoats despite prolonged exposure.

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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 standard steel doors and frames.
 - 1. Examine roughing-in for embedded and built-in anchors to verify actual locations of standard steel frame connections before frame installation.
 - 2. Proceed with installation only after unsatisfactory conditions have been corrected.

3.2 PREPARATION

- A. Remove welded-in shipping spreaders installed at factory.
- B. Prior to installation and with installation spreaders in place, adjust and securely brace standard steel door frames for squareness, alignment, twist, and plumb to the following tolerances:
 - 1. Squareness: Plus or minus 1/16 inch, measured at door rabbet on a line 90 degrees from jamb perpendicular to frame head.
 - 2. Alignment: Plus or minus 1/16 inch, measured at jambs on a horizontal line parallel to plane of wall.
 - 3. Twist: Plus or minus 1/16 inch, measured at opposite face corners of jambs on parallel lines, and perpendicular to plane of wall.
 - 4. Plumbness: Plus or minus 1/16 inch, measured at jambs on a perpendicular line from head to floor.
- C. Drill and tap doors and frames to receive nontemplated mortised and surface-mounted door hardware.

3.3 INSTALLATION

- A. General: Provide doors and frames of sizes, thicknesses, and designs indicated. Install standard steel doors and frames plumb, rigid, properly aligned, and securely fastened in place; comply with Drawings and manufacturer's written instructions.
- B. Standard Steel Frames: Install standard steel frames for doors and other openings, of size and profile indicated. Comply with SDI 105.
 - 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.

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- a. At fire-protection-rated openings, install frames according to NFPA 80.
 - b. Where frames are fabricated in sections due to 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 glazing 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, squareness, and twist of frames as walls are constructed. Shim as necessary to comply with installation tolerances.
 - g. Apply bituminous coating to backs of all exterior frames and those that are filled with mortar, grout, and plaster containing anti freezing 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 powder-actuated fasteners instead of postinstalled expansion anchors if so indicated and approved on Shop Drawings.
 3. Masonry Walls: Coordinate installation of frames to allow for solidly filling space between frames and masonry with mortar as specified in Division 4 Section "Unit Masonry Assemblies."
 4. Concrete Walls: Solidly fill space between frames and concrete with grout. Install grout in lifts and take precautions, including bracing frames, to ensure that frames are not deformed or damaged by grout forces.
 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 Gypsum Board Partitions: Secure frames in place with postinstalled expansion anchors through floor anchors at each jamb. Countersink anchors, and fill and make smooth, flush, and invisible on exposed faces.
 7. Ceiling Struts: Extend struts vertically from top of frame at each jamb to supporting construction above, unless frame is anchored to masonry or to other structural support at each jamb. Bend top of struts to provide flush contact for securing to supporting construction above. Provide adjustable wedged or bolted anchorage to frame jamb members.
 8. Installation Tolerances: Adjust standard steel door frames for squareness, alignment, twist, and plumb to the following tolerances:
 - a. Squareness: Plus or minus 1/16 inch, measured at door rabbet on a line 90 degrees from jamb perpendicular to frame head.
 - b. Alignment: Plus or minus 1/16 inch, measured at jambs on a horizontal line parallel to plane of wall.
 - c. Twist: Plus or minus 1/16 inch, measured at opposite face corners of jambs on parallel lines, and perpendicular to plane of wall.

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- d. Plumbness: Plus or minus 1/16 inch, measured at jambs at floor.
- C. Standard Steel Doors: Fit hollow-metal doors accurately in frames, within clearances specified below. Shim as necessary.
 - 1. Non-Fire-Rated Standard Steel Doors:
 - a. Jambs and Head: 1/8 inch plus or minus 1/16 inch.
 - b. Between Edges of Pairs of Doors: 1/8 inch plus or minus 1/16 inch.
 - c. Between Bottom of Door and Top of Threshold: Maximum 3/8 inch.
 - d. Between Bottom of Door and Top of Finish Floor (No Threshold): Maximum 3/4 inch.
 - 2. Fire-Rated Doors: Install doors with clearances according to NFPA 80.
- D. Glazing: Comply with installation requirements in Division 8 Section "Glazing" and with standard steel door and frame manufacturer's written instructions.
 - 1. Secure stops with countersunk flat- or oval-head machine screws spaced uniformly not more than 9 inches o.c., and not more than 2 inches o.c. from each corner.

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 standard steel doors or frames that are warped, bowed, or otherwise unacceptable.
- B. Clean grout and other bonding material off standard steel doors and frames 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 primer.
- D. Galvannealed Surfaces: Clean abraded areas and repair with galvanizing repair paint according to manufacturer's written instructions.

END OF SECTION

WOOD DOORS AND FRAMES

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PART 1 - GENERAL

1.1 SUMMARY

- A. This Section includes the following:
 - 1. Solid-core doors with pre-hung wood frame.
- B. Related Sections include the following:
 - 1. Section 08 DOOR HARDWARE.
 - 2. Section 8310 - STEEL DOORS AND FRAMES.

1.2 SUBMITTALS

- A. Product Data: For each type of door, include details of core and edge construction, louvers, and trim for openings. Include factory-finishing specifications.
- B. Samples for Initial Selection: Color charts consisting of actual materials in small sections for the following:
 - 1. Faces of Factory-Finished Doors: Clear sealer.
- C. Samples for Verification:
 - 1. Factory finishes applied to actual door face materials, approximately 8 by 10 inches, for each material and finish. For each wood species and transparent finish, provide set of three samples showing typical range of color and grain to be expected in the finished work.
 - 2. Corner sections of doors, approximately 8 by 10 inches, with door faces and edgings representing typical range of color and grain for each species of veneer and solid lumber required. Finish sample with same materials proposed for factory-finished doors.
 - 3. Louver blade and frame sections, 6 inches long, for each material and finish specified. (If applicable.)
 - 4. Frames for light openings, 6 inches long, for each material, type, and finish required. (If applicable.)

1.3 QUALITY ASSURANCE

- A. Source Limitations: Obtain flush wood doors through one source from a single manufacturer.
- B. Quality Standard: Comply with AWI's "Architectural Woodwork Quality Standards Illustrated."

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1. Provide AWI Quality Certification Labels or an AWI letter of licensing for Project indicating that doors comply with requirements of grades specified.

1.4 DELIVERY, STORAGE, AND HANDLING

- A. Comply with requirements of referenced standard and manufacturer's written instructions.
- B. Package doors and associated frame individually in plastic bags or cardboard cartons.
- C. Mark each door on top and bottom rail with Project Number and opening number used on Shop Drawings.

1.5 PROJECT CONDITIONS

- A. Environmental Limitations: Do not deliver or install doors until building is enclosed, wet work is complete, and HVAC system is operating and will maintain temperature and relative humidity at occupancy levels during the remainder of the construction period.

PART 2 - PRODUCTS

2.1 MANUFACTURERS

- A. Available Manufacturers: Subject to compliance with requirements, manufacturers offering products that may be incorporated into the Work include, but are not limited to, the following:

1. Flush Wood Doors:
 - a. Algoma Hardwoods Inc.
 - b. B-J Door
 - c. GRAHAM Manufacturing Corp.
 - d. Weyerhaeuser
 - e. Vancouver Door
 - f. Hanley

2.2 SOLID-CORE DOORS

- A. Interior Veneer-Faced Doors:
 1. Core: Glued block or structural composite lumber.
 2. Construction: Five or seven plies with stiles and rails bonded to core, then entire unit abrasive planed before veneering.
 3. Frame profile to match existing wood door frames.

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2.3 FABRICATION

- A. Fabricate doors in sizes indicated for Project-site fitting.
- B. Factory fit doors to suit frame-opening sizes indicated, with the following uniform clearances and bevels, unless otherwise indicated:
 - 1. Comply with clearance requirements of referenced quality standard for fitting. Comply with requirements in NFPA 80 for fire-rated doors.
- C. Factory machine doors for hardware that is not surface applied.
 - 1. Coordinate measurements of hardware mortises in metal frames to verify dimensions and alignment before factory machining.
 - 2. Metal Astragals: Premachine astragals and formed-steel edges for hardware for pairs of fire-rated doors.
- D. Transom and Side Panels: Fabricate matching panels with same construction, exposed surfaces, and finish as specified for associated doors. Finish bottom edges of transoms and top edges of rabbeted doors same as door stiles.
 - 1. Fabricate door and transom panels with full-width, solid-lumber meeting rails. Provide factory-installed spring bolts for concealed attachment into jambs of metal doorframes.
- E. Openings: Cut and trim openings through doors to comply with applicable requirements of referenced standards for kind(s) of door(s) required.
 - 1. Light Openings: Trim openings with moldings of material and profile indicated.

2.4 FACTORY FINISHING

- A. General: Comply with AWI's "Architectural Woodwork Quality Standards Illustrated" for factory finishing.

PART 3 - EXECUTION

2.5 EXAMINATION

- A. Examine doors and installed door frames before hanging doors.
 - 1. Verify that frames comply with indicated requirements for type, size, location, and swing characteristics and have been installed with level heads and plumb jambs.
 - 2. Reject doors with defects.
- B. Proceed with installation only after unsatisfactory conditions have been corrected.

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2.6 INSTALLATION

- A. Hardware: For installation, see Division 8 Section "Door Hardware."
- B. Manufacturer's Written Instructions: Install doors to comply with manufacturer's written instructions, referenced quality standard, and as indicated.
- C. Job-Fitted Doors: Align and fit doors in frames with uniform clearances and bevels as indicated below; do not trim stiles and rails in excess of limits set by manufacturer or permitted for fire-rated doors. Machine doors for hardware. Seal cut surfaces after fitting and machining.
 - 1. Clearances: Provide 1/8 inch at heads, jambs, and between pairs of doors. Provide 1/8 inch from bottom of door to top of decorative floor finish or covering. Where threshold is shown or scheduled, provide 1/4 inch from bottom of door to top of threshold.
 - a. Comply with NFPA 80 for fire-rated doors.
 - 2. Bevel non-fire-rated doors 1/8 inch in 2 inches at lock and hinge edges.
- D. Factory-Fitted Doors: Align in frames for uniform clearance at each edge.
- E. Factory-Finished Doors: Restore finish before installation if fitting or machining is required at Project site.
- F. Field-Finished Doors: Refer to the following for finishing requirements:
 - 1. Division 09 Sections EXTERIOR PAINTING and INTERIOR PAINTING

2.7 ADJUSTING

- A. Operation: Rehang or replace doors that do not swing or operate freely.
- B. Finished Doors: Replace doors that are damaged or do not comply with requirements. Doors may be repaired or refinished if work complies with requirements and shows no evidence of repair or refinishing.

END OF SECTION

FINISH HARDWARE

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PART 1 – GENERAL

1.1 SUMMARY

A. SECTION INCLUDES

1. The work in this section includes furnishing all items of finish hardware as hereinafter specified or obviously necessary for all swinging, sliding, folding and other doors. Except items, which are specifically excluded from this section of the specification or of unique hardware, specified in the same sections as the doors and frames on which they are installed.

B. RELATED SECTIONS

1. Finish Carpentry, Section 6220.
2. Wood Doors, Section 8200.
3. Hollow Metal Door and Frames, Section 8310

1.2 REFERENCES

A. STANDARDS

1. ANSI A156.1 – Butts and Hinges
2. ANSI A156.2 – Cored Locks and Latches
3. ANSI A156.3 – Exit Devices
4. ANSI A156.4 – Door Controls – Door Closers
5. ANSI A156.5 – Auxiliary Locks and Associated Products
6. ANSI A156.6 – Architectural Door Trim
7. ANSI A156.7 – Template Hinge Dimensions
8. ANSI A156.8 – Door Controls – Overhead Holders
9. ANSI A156.13 – Mortise Locks and Latches
10. ANSI A156.15 – Closer Holder Release Devices
11. ANSI A156.16 – Auxiliary Hardware
12. ANSI A156.18 – Material and Finishes
13. ANSI A156.19 – Low Powered Automatic Door Operators
14. NFPA 80 – Fire Door and Windows
15. UL10C – Positive Pressure Fire Tests of Door Assemblies
16. AIA A201 1997 – General Conditions of the Contract

B. CODES

1. NFPA 101 – Life Safety Code
2. IBC 2003 – International Building Code
3. ANSI A117.1 – Accessible and Usable Buildings and Facilities
4. ADA – Americans with Disabilities Act

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1.3 SUBMITTALS

A. GENERAL REQUIREMENTS

1. Submit copies of finish hardware schedule in accordance with Division 1, General Requirements.

B. SCHEDULES AND PRODUCT DATA

1. Schedules to be in vertical format, listing each door opening, and organized into "hardware sets" indicating complete designations of every item required for each door opening to function as intended. Hardware schedule shall be submitted within two (2) weeks from date the purchase order is received by the finish hardware supplier. Furnish four (4) copies of revised schedules after approval for field and file use. Note any special mounting instructions or requirements with the hardware schedule. Schedules to include the following information:
 - a. Location of each hardware set cross-referenced to indications on drawing, both on floor plans and in door and frame schedule.
 - b. Handing and degree of wing of each door.
 - c. Door and frame sizes and materials.
 - d. Keying information.
 - e. Type, style, function, size, and finish of each hardware item.
 - f. Elevation drawings and operational descriptions for all electronic openings.
 - g. Name and manufacturer of each hardware item.
 - h. Fastenings and other pertinent information.
 - i. Explanation of all abbreviations, symbols and codes contained in schedule.
 - j. Mounting locations for hardware when varies from standard.
 - k. Detail Hardware Schedule Submittal with hardware sets that include electrified hardware in form that is easily recognized by related trades. E.G. (All electrified hardware sets grouped at beginning of submittal).
2. Submit catalog cuts and/or product data sheets for all scheduled finish hardware.
3. Submit separate detailed keying schedule for approval indicating clearly how the owner's final instructions on keying of locks has been fulfilled.

C. SAMPLES

1. Upon request, samples of each type of hardware in finish indicated shall be submitted. Samples are to remain undamaged and in working condition through submittal and review process. Items will be returned to

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the supplier or incorporated into the work within limitations of keying coordination requirements.

D. TEMPLATES

1. Furnish a complete list and suitable templates, together with finish hardware schedule to contractor, for distribution to necessary trades supplying materials to be prepped for finish hardware.
2. Owner will furnish templates for lock sets they install.

E. OPERATIONS AND MAINTENANCE MANUALS

1. Upon completion of construction and building turnover, furnish two (2) complete maintenance manuals to the owner. Manuals to include the following items:
 - a. Approved hardware schedule, catalog cuts and keying schedule.
 - b. Hardware installation and adjustment instructions.
 - c. Manufacturer's written warranty information.
 - d. Wiring diagrams, elevation drawings and operational descriptions for all electronic openings.

1.4 QUALITY ASSURANCE

A. SUBSTITUTIONS

1. All substitution requests must be submitted before bidding and within the procedures and time frame as outlined in Division 1, General Requirements. Approval of products is at the discretion of the Architect and his hardware consultant.

B. SUPPLIER QUALIFICATIONS

1. A recognized architectural door hardware supplier who has maintained an office and has been furnishing hardware in the project's vicinity for a period of at least two (2) years.
2. Hardware supplier shall have office and warehouse facilities to accommodate this project.
3. Hardware supplier shall have in his employment at least one (1) Architectural Hardware Consultant (AHC) who is available at reasonable times during business hours for consultation about the project's hardware and requirements to the owner, architect and contractor.

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4. Hardware supplier must be an authorized factory distributor of all products specified herein.

1.5 DELIVERY, STORAGE AND HANDLING

A. MARKING AND PACKAGING

1. Properly package and mark items according to the approved hardware schedule, complete with necessary screws and accessories, instructions and installation templates for spotting mortising tools. Contractor shall check deliveries against accepted list and provide receipt for them, after which he is responsible for storage and care. Any shortage or damaged good shall be made without cost to the owner.
2. Packaging of door hardware is the responsibility of the supplier. As hardware supplier receives material from various manufacturers, sort and repackage in containers clearly marked with appropriate hardware set and door numbers to match the approved hardware schedule. Two or more identical sets may be packed in same container.

B. DELIVERY

1. The supplier shall deliver all hardware to the project site; direct factory shipments are not allowed unless agreed on beforehand. Hardware supplier shall coordinate delivery times and schedules with the contractor. Inventory door hardware jointly with representatives of hardware supplier and hardware installer/contractor until each is satisfied that count is correct.
2. No keys, other than construction master keys and/or temporary keys are to be packed in boxes with the locks.

C. STORAGE

1. Provide secure lock-up for door hardware delivered to the Project, but not yet installed. Control handling and installation of hardware items that are not immediately replaceable so that completion of work will not be delayed by hardware losses both before and after installation.

1.6 WARRANTY

- A. All items, except as noted below, shall be warranted in writing by the manufacturer against failure due to defective materials and workmanship for a minimum period of one (1) year commencing on the date of final completion and acceptance. In the event of product failure, promptly repair or replace item with no additional cost to the owner.

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1. Mortise locksets: Five (5) years
2. Exit Devices: Five (5) years
3. Door closers: Ten (10) years

PART 2 – PRODUCTS

2.1 MANUFACTURERS

- A. Only manufacturers as listed below shall be accepted. Obtain each type of finish hardware (hinges, latch and locksets, exit devices, door closers, etc.) from a single manufacturer.

2.2 MATERIALS

A. SCREWS AND FASTENERS

1. All required screws shall be supplied as necessary for securing finish hardware in the appropriate manner. Thru-bolts shall be supplied for exit devices and door closers where required by code and the appropriate blocking or reinforcing is not present in the door to preclude their use.

B. HANGING DEVICES

1. HINGES

- a. Hinges shall conform to ANSI A156.1 and have the number of knuckles as specified, oil-impregnated bearings as specified with NRP (non-removable pin) feature, at all exterior reverse bevel doors. Match existing exam room door hinge size and placement.

(1) Specified Manufacturer: McKinney

C. CYLINDERS AND KEYING

1. KEYING

- a. Owner will provide all cylinders and keys and will install all cylinders.

E. LOCKING DEVICES

1. LOCKSETS

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- a. All locksets shall be ANSI 156.13 Series 1000, Grade 1 Certified. All functions shall be manufactured in a single sized case formed from 12 gauge steel minimum. The lockset shall have a field-adjustable, beveled armored front, with a .125" minimum thickness and shall be reversible without opening the lock body. The lockset shall be 2 3/4" backset with a one-piece 3/4" anti-friction stainless steel latchbolt. All strikes shall be non-handed with a curved lip. Match existing.

(1) Specified Manufacturer: Schlage

- b. Owner will provide and install all new locksets.

F. DOOR CLOSERS

1. Von Duprin 4040XP Series.

G. DOOR TRIM AND PROTECTIVE PLATES

1. Kick plates shall be .050 gauges and shall be full door width less two (2) inches or as specified. Push plates, pull plates, door pulls and miscellaneous door trim shall be as shown in the hardware schedule. Match existing.

a. Specified Manufacturer: Tice

H. DOOR STOPS AND HOLDERS

1. WALL MOUNTED DOOR STOPS

- a. Where a door is indicated on the plans to strike flush against a wall, wall bumpers shall be provided.

(1) Specified Manufacturer: H.B. Ives/Rixson

I. SILENCERS

1. Furnish rubber door silencers all hollow metal frames; two (2) per pair and three (3) per single door frame.

2.3 FINISHES

- A. The designations used in schedules and elsewhere to indicate hardware finishes are those listed in ANSI/BHMA A156.18 or traditional U.S. finishes shown by certain manufacturers for their products.

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- B. Provide quality of finish, including thickness of plating or coating (if any), composition, hardness, and other qualities complying with manufacturer's standards, but in no case less than specified by referenced standards for the applicable units of hardware.
- C. Where specified hardware shall have an antimicrobial coating which permanently suppresses the growth of bacteria, algae, fungus, mold and mildew applied. The finish shall control the spread and growth of bacteria, mold and mildew and shall be FDA listed for use in medical and food preparation equipment.
- D. Finish: 626.

PART 3 – EXECUTION

3.1 EXAMINATION

- A. Contractor shall ensure that the building is secured and free from weather elements prior to installing interior door hardware. Examine hardware before installation to ensure it is free of defects.

3.2 INSTALLATION

- A. Mount hardware units at heights matching existing. Follow applicable publications, except as specifically indicated or required to comply with the governing regulations.
 - 1. "Recommended Locations for Builders Hardware for Standard Steel Doors and Frames" by the Door and Hardware Institute (DHI).
 - 2. NWWDA Industry Standard I.S.1.7, "Hardware Locations for Wood Flush Doors."
- B. All hardware shall be applied and installed in accordance with best trade practice by an experienced hardware installer. Care shall be exercised not to mar or damage adjacent work.
- C. Install each hardware item in compliance with the manufacturer's instructions and recommendations. Where cutting and fitting is required to install hardware onto or into surfaces that are later to be painted or finished in another way, coordinate removal, storage, and reinstallation or application of surface protection with finishing work specified in the Division 9 Sections. Do not install surface-mounted items until finishes have been completed on the substrates involved.
- D. Provide a secure lock up for hardware delivered to the project but not yet installed. Control the handling and installation of hardware items so that the

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completion of the work will not be delayed by hardware losses before and after installation.

- E. Owner will provide Contractor boring templates. Contractor will bore all new and existing doors to receive new lock sets. Contractor to repair/prepare existing doors as required to create new holes.

3.3 FIELD QUALITY CONTROL

- A. Prior to the installation of hardware, manufacturer's representatives for locksets, closers, and exit devices shall arrange and hold a jobsite meeting to instruct the installing contractor's personnel on the proper installation of their respective products. A letter of compliance, indicating when this meeting is held and who is in attendance, shall be sent to the Architect and Owner.
- C. The hardware supplier shall do a final inspection prior to building completion to ensure that all hardware was correctly installed and is in proper working order.
- D. The manufacturer's representative shall do a final inspection prior to building completion to ensure that all hardware was correctly installed and is in proper working order.

3.4 ADJUSTING, CLEANING, AND DEMONSTRATING

- A. Adjust and check each operating item of hardware and each door to ensure proper operation or function of every unit. Replace units that cannot be adjusted to operate freely and smoothly or as intended for the application made.
- B. Where door hardware is installed more than one month prior to acceptance or occupancy of a space or area, return to the installation during the week prior to acceptance or occupancy and make final check and adjustment of all hardware items in such space or area. Clean operating items as necessary to restore to proper function and finish of hardware and doors. Adjust door control devices to compensate for final operation of heating and ventilating equipment.
- C. Instruct owner's personnel in the proper adjustment and maintenance of door hardware and hardware finishes and usage of any electronic devices.

3.5 PROTECTION

- A. Contractor shall protect all hardware, as it is stored on construction site in a covered and dry place. Protect exposed hardware installed on doors during the construction phase. Install any and all hardware at the latest possible time frame.

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3.6 HARDWARE SCHEDULE

- A. The following schedule is furnished for whatever assistance it may afford the Contractor; do not consider it as entirely inclusive. Should any particular door or item be omitted in any scheduled hardware heading, provide door or item with hardware same as required for similar purposes. Hardware supplier is responsible for handling and sizing all products as listed in the hardware heading. Quantities listed are for each pair of doors, or for each single door.
- B. Manufacturer's Abbreviations:
1. CR – Corbin Russwin
 2. HS – HES
 3. MC – McKinney
 4. NO – Norton
 5. RO – Rockwood
 6. RX – Rixson
 7. SN – Securitron
 8. AD – Adams Rite
 9. AL – Alarm Lock
 10. SC – Schlage
 11. HB – H.B. Ives
 12. TI – Tice
 13. LC - LCN

END OF SECTION

ROOM FINISH SCHEDULE

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Rm. No.	Room Name	Floor			Walls				Ceiling		Window	Notes
		Material	Base	Height	North	East	South	West	Material	Finish	Coverings	

GROUND FLOOR

101	SLEEP. RM. 1	CAR	CB	4	E GB	E GB	E GB	E GB	E GB		Y	1
102	SLEEP RM. 2	CAR	CB	4	E GB	E GB	E GB	E GB	E GB			1
103	SLEEP RM. 3	CAR	CB	4	E GB	E GB	E GB	E GB	E GB		Y	1
104	HALL	SV	SC	6	E GB	E GB	E GB	E GB	E GB			1
105	TOILET RM. 2	SV	SC	6	N GB	N GB	N GB	N GB	N GB			5, 6
106	WATER HTR.	E	E		E GB	E GB	E GB	E GB	E GB			1, 3
107	SHOWER	UNIT		NA	N GB	N GB	N GB	N GB	N GB			6
108	JANITOR	E	E		E GB	E GB	E GB	E GB	E GB			1,3
109	TOILET RM. 1	E	E		E GB	E GB	E GB	E GB	E GB			1
110	STORAGE	E	E		E GB	E GB	E GB	E GB	E GB			1
111	HALL	E	E		E GB	E GB	E GB	E GB	E GB			1
112	OFFICE	E	E		E GB	E GB	E GB	E GB	E GB		Y	1
113	DAYROOM	CAR	CB	4	E GB	E GB	-	E GB	E ACT		Y	1, 7
114	KITCHEN	SV	SC	6	-	E GB	E GB	E GB	E ACT			1, 7
115	FOYER	CONC	WD	5.5	E WD	E WD	E WD	E WD	E WD			2

GYPSUM BOARD

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PART I GENERAL

1.1 SUMMARY

A. Section Includes:

1. Gypsum board interior and exterior including soffit board over metal studs detailed on drawings including metal framing members, fasteners, beads, grouting of steel door frames, sealer and other accessories required for a complete installation.
2. Sound insulated walls where shown on drawings.
3. Infill panels where shown on drawings.

B. Related Sections:

07210 Thermal Insulation
09912 Interior Painting

1.2 QUALITY ASSURANCE

- ##### A.
- Conform to American National Standard Institute of Specifications for Application and Finishing of Gypsum Wallboard, A97 latest edition as modified herein and IBC Code.

1.3 PROJECT/SITE CONDITIONS

A. Environmental Conditions:

1. Do no taping of surfaces if moisture content of substrate exceeds 15%. Check with moisture meter.
2. Maintain constant temperature of at least 45 degrees F. not less than 24 hours prior to, during and 72 hours after completion or until all coats of taping and finishing compounds are dried.

PART 2 PRODUCTS

2.1 MATERIALS

A. Wood Studs Exterior:

1. 2x6's @ 16" on center unless shown otherwise on structural drawings. Use Advanced Framing Method.

B. Wood Studs Interior:

1. Partition walls: 2x4's @ 16" on center unless shown otherwise on structural drawings. Use Advanced Framing Method.

C. Gypsum Board:

1. Interior locations: 5/8" Type X meeting ASTM C36. Use appropriate gypsum products in

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damp/wet locations.

D. Metal Furring:

1. Meet requirements of tested assembly shown on drawings.

E. Joint Treatment:

1. Comply with ASTM C475. Use type appropriate to location and base product.

F. Metal Corner Trim:

1. USG Dura-Bead #101. Beadx also acceptable.

G. Metal Stop Trim:

1. USG #200 series or Milcor #66. Beadx also acceptable.

H. Plastic Corner and Stop Trim: (Acceptable in lieu of metal)

1. High impact PVC plastic meeting ASTM D3678.

I. Screws:

1. Self-drilling, self tapping, bugle head for use with power driven tool. Type for wallboard to wood studs.

J. Acoustical Sealant:

1. Pecora BA-98 or PTI 808.

K. Fast Setting Plaster: (For steel door frames)

1. Grout consists of one part hardwall plaster to not more than 2-1/2 parts sand.

PART 3 EXECUTION

3.1 INSPECTION

A. Condition of Surfaces:

1. When completed, request Architect for an inspection of surfaces.
2. Completed surfaces must be free of defects and errors and acceptable to Architect to receive paint.

3.2 INSTALLATION

A. Wood Studs:

1. Install studs 16" O.C. at locations shown on drawings unless shown otherwise.

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2. Install two studs nested together at each jamb of door and reight openings unless shown otherwise. Extend these studs to top channel plate and anchor with not less than 2 toenails each side.

B. Gypsum Board, General:

1. Install maximum lengths to minimize end joints. Install with power driven drywall screws in adequate amounts.
2. Do not locate wallboard joints in line with door frames.
3. Install corner beads at external corners. At edges where wallboard abuts other material or joint is otherwise exposed, install metal specified.

C. Gypsum Board, Finishes:

1. Light Texture Finish:

- a. Tape and fill joints and screw locations and other imperfections with joint compound recommended by manufacturer.
- b. Apply two separate coats of joint compound over all joints, angles, fastener heads and accessories.
- c. Apply to entire surface USG's "First Coat" in accordance with manufacturer's instructions.
- d. Provide level 4 finish typical.
- e. Use texture and tape products appropriate to location and base material.

D. Sound Insulated Walls:

1. Place gypsum board at both sides of stud into a bead of specified sealant around entire perimeter junctions.
2. Place gypsum board only one side of studs at areas scheduled for sound insulation by others.
3. **Coordinate work with sound insulation installer. Do not close up both sides of walls until insulation has been accepted by Architect Owner.**

E. Steel Door Frames:

1. Grout all steel door frames with specified fast setting plaster mix.

END OF SECTION

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PART 1 - GENERAL

1.1 RELATED DOCUMENTS

Drawings and general conditions of Contract, including General and Supplementary Conditions and Divisions-1 Specification sections apply to work of this section.

1.2 SUMMARY

A. Section Includes:

1. Acoustical ceiling panels.
2. Exposed grid suspension system.
3. Wire hangers, fasteners, main runners, cross tees, and wall angle moldings.

B. Related Sections:

1. Division 15 Sections - Mechanical Work
2. Division 16 Sections - Electrical Work

1.3 REFERENCES

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

1. ASTM A 1008 Standard Specification for Steel, Sheet, Cold Rolled, Carbon, Structural, High-Strength Low-Alloy and High-Strength Low-Alloy with Improved Formability.
2. ASTM A 641 Standard Specification for Zinc-Coated (Galvanized) Carbon Steel Wire.
3. ASTM A 653 Standard Specification for Steel Sheet, Zinc-Coated (Galvanized) by the Hot-Dip Process.
4. ASTM C 423 Sound Absorption and Sound Absorption Coefficients by the Reverberation Room Method.
5. ASTM C 635 Standard Specification for Metal Suspension Systems for Acoustical Tile and Lay-in Panel Ceilings.
6. ASTM C 636 Recommended Practice for Installation of Metal Ceiling Suspension Systems for Acoustical Tile and Lay-in Panels.
7. ASTM E 84 Standard Test Method for Surface Burning Characteristics of Building Materials.
8. ASTM E 1414 Standard Test Method for Airborne Sound Attenuation Between Rooms Sharing a Common Ceiling Plenum.
9. ASTM E 1111 Standard Test Method for Measuring the Interzone Attenuation of Ceilings Systems.
10. ASTM E 1264 Classification for Acoustical Ceiling Products.

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11. ASTM E 1477 Standard Test Method for Luminous Reflectance Factor of Acoustical Materials by Use of Integrating-Sphere Reflectometers.
 12. ASTM D 3273 Standard Test Method for Resistance to Growth of Mold on the Surface of Interior Coatings in an Environmental Chamber.
 13. ASTM E 119 Standard Test Methods for Fire Tests of Building Construction and Material.
- B. ASHRAE Standard 62.1-2004, "Ventilation for Acceptable Indoor Air Quality"

1.4 SUBMITTALS

- A. Certifications: Manufacturer's certifications that products comply with specified requirements, including laboratory reports showing compliance with specified tests and standards. For acoustical performance, each carton of material must carry an approved independent laboratory classification of NRC, CAC, and AC.
- B. If the material supplied by the acoustical subcontractor does not have an Underwriter's Laboratory classification of acoustical performance on every carton, subcontractor shall be required to send material from every production run appearing on the job to an independent or NVLAP approved laboratory for testing, at the architect's or owner's discretion. All products not conforming to manufacturer's current published values must be removed, disposed of and replaced with complying product at the expense of the Contractor performing the work.

1.5 QUALITY ASSURANCE

- A. Single-Source Responsibility: Provide acoustical panel units and grid components by a single manufacturer.
- B. Fire Performance Characteristics: Identify acoustical ceiling components with appropriate markings of applicable testing and inspecting organization.
 1. Surface Burning Characteristics: As follows, tested per ASTM E 84 and complying with ASTM E 1264 for Class A products.
 - a. Flame Spread: 25 or less
 - b. Smoke Developed: 50 or less

1.6 DELIVERY, STORAGE, AND HANDLING

- A. Deliver acoustical ceiling units to project site in original, unopened packages and store them in a fully enclosed space where they will be protected against damage from moisture, direct sunlight, surface contamination, and other causes.
- B. Before installing acoustical ceiling units, permit them to reach room temperature and a stabilized moisture content.
- C. Handle acoustical ceiling units carefully to avoid chipping edges or damaged units in any way.

1.7 PROJECT CONDITIONS

- A. Space Enclosure:

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All ceiling products and suspension systems must be installed and maintained in accordance with Armstrong written installation instructions for that product in effect at the time of installation and best industry practice. Prior to installation, the ceiling product must be kept clean and dry, in an environment that is between 32 deg F and 120 deg F and not subject to Abnormal Conditions.

Abnormal conditions include exposure to chemical fumes, vibrations, moisture from conditions such as building leaks or condensation, excessive humidity, or excessive dirt or dust buildup.

1.8 WARRANTY

- A. Acoustical Panel: Submit a written warranty executed by the manufacturer, agreeing to repair or replace acoustical panels that fail within the warranty period. Failures include, but are not limited to:
 - 1. Acoustical Panels: Sagging and warping as a result of defects in materials or factory workmanship.
 - 2. Grid System: Rusting and manufacturer's defects
- B. The Warranty shall not deprive the Owner of other rights the Owner may have under other provisions of the Contract Documents and will be in addition to and run concurrent with other warranties made by the Contractor under the requirements of the Contract Documents.

1.9 MAINTENANCE

- A. Extra Materials: Deliver extra materials to Owner. Furnish extra materials described below that match products installed. Packaged with protective covering for storage and identified with appropriate labels.
 - 1. Acoustical Ceiling Units: Furnish quality of full-size units equal to 5.0 percent of amount installed.

Part 2-PRODUCTS

2.1 MANUFACTURERS

A. Ceiling Panels:

- 1. Armstrong World Industries, Inc.

2.2.0 ACOUSTICAL CEILING UNITS

A. Acoustical Panels Type ACT-1:

- 1. Surface Texture: Medium
- 2. Composition: Mineral Fiber
- 3. Color: White
- 4. Size: 24in X 24in X 5/8in

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5. Edge Profile: Angled Tegular for interface with Prelude XL 15/16" Exposed Tee.
6. Noise Reduction Coefficient (NRC): ASTM C 423; Classified with UL label on product carton, 0.55.
7. Emissions Testing: Section 01350 Protocol, < 13.5 ppb of formaldehyde when used under typical conditions required by ASHRAE Standard 62.1-2004, "Ventilation for Acceptable Indoor Air Quality"
8. Flame Spread: ASTM E 1264; Class A (UL)
9. Light Reflectance (LR): ASTM E 1477; White Panel: Light Reflectance: 0.81.
10. Acceptable Product: Designer, 734 as manufactured by Armstrong World Industries.

2.3.0 SUSPENSION SYSTEMS

- A. Components: Match existing.
- B. Attachment Devices: Size for five times design load indicated in ASTM C 635, Table 1, Direct Hung unless otherwise indicated.
- C. Wire for Hangers and Ties: ASTM A 641, Class 1 zinc coating, soft temper, pre-stretched, with a yield stress load of at least three times design load, but not less than 12 gauge.
- D. Edge Moldings and Trim: Match existing.

PART 3 - EXECUTION

3.1 EXAMINATION

- A. Do not proceed with installation until all wet work such as concrete, terrazzo, plastering and painting has been completed and thoroughly dried out, unless expressly permitted by manufacturer's printed recommendations. (Exception: HumiGuard Max Ceilings)

3.2 PREPARATION

- A. Measure each ceiling area and establish layout of acoustical units to balance border widths at opposite edges of each ceiling. Avoid use of less than half width units at borders, and comply with reflected ceiling plans. Coordinate panel layout with mechanical and electrical fixtures.
- B. Coordination: Furnish layouts for preset inserts, clips, and other ceiling anchors whose installation is specified in other sections.
 1. Furnish concrete inserts and similar devices to other trades for installation well in advance of time needed for coordination of other work.

3.3 INSTALLATION

- A. Install suspension system and panels in accordance with the manufacturer's instructions, and in compliance with ASTM C 636 and with the authorities having jurisdiction.

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- B. Suspend main beam from overhead construction with hanger wires spaced 4'-0" on center along the length of the main runner. Install hanger wires plumb and straight.
- C. Install wall moldings at intersection of suspended ceiling and vertical surfaces. Miter corners where wall moldings intersect or install corner caps.
- D. For reveal edge panels: Cut and reveal or rabbet edges of ceiling panels at border areas and vertical surfaces.
- E. Install acoustical panels in coordination with suspended system, with edges resting on flanges of main runner and cross tees. Cut and fit panels neatly against abutting surfaces. Support edges by wall moldings.

3.4 ADJUSTING AND CLEANING

- A. Replace damaged and broken panels.
- B. Clean exposed surfaces of acoustical ceilings, including trim, edge moldings, and suspension members. Comply with manufacturer's instructions for cleaning and touch up of minor finish damage. Remove and replace work that cannot be successfully cleaned and repaired to permanently eliminate evidence of damage.

END OF SECTION

RESILIENT FLOORING

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PART 1 GENERAL

1.1 SUMMARY

A. Section Includes:

1. Sheet flooring.

B. Related Sections:

09651 Resilient Tile Flooring
09680 Carpet

1.2 SUBMITTALS

A. Samples:

1. Submit samples to Architect upon request.

B. Additional Stock:

1. None required.

1.3 QUALITY ASSURANCE

A. Standards:

1. Comply with requirements of Resilient Floor Covering Institute.

1.4 PROJECT/SITE CONDITIONS

A. Environmental Requirements:

1. Maintain constant temperature of at least 60 degrees F. 48 hours prior to during and 48 hours after installation.

PART 2 PRODUCTS

2.1 SHEET FLOORING

Manufacturer: Armstrong DecorArt Corlon.

2.2 ADHESIVES

A. Types:

1. Sheet flooring as recommended by manufacturer and compatible with concrete slab sealer.

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2.3 ACCESSORIES

- A. Standard metal edge strips and stops where shown or required.

2.6 SUBSTRATE PATCH

- A. Patch wood and concrete floors with product 345 manufactured by Henry, or approved by manufacturer of sheet flooring.

PART 3 EXECUTION

3.1 GENERAL

- A. Inspect surfaces requiring covering for excessive moisture content or unevenness. Do not proceed with installation until defects are corrected.

3.2 APPLICATION OF ADHESIVES

- A. Provide safety precautions during application. Apply uniformly over surfaces.

3.3 SHEET FLOORING

- A. Install where shown on drawings and in accordance with manufacturer's instructions. Lay in a straight pattern.
- B. Install 6" integrated cove base in all rooms where sheet flooring is installed.

END OF SECTION

CARPET

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PART 1 GENERAL

1.1 SUMMARY

A. Section Includes:

1. Carpet (roll type).

1.2 SUBMITTALS

A. Submit samples to Architect for approval.

B. Provide manual on care and maintenance of installed products.

1.3 DELIVERY, STORAGE AND HANDLING

A. Deliver wrapped rolls to job site with mill's registration numbers warranting carpet meets specifications.

1.4 PROJECT/SITE CONDITIONS

A. Environmental Requirements:

1. Maintain constant temperature not less than 50 degrees F. 48 hours prior to, during and 48 hours after installation of carpeting.

PART 2 PRODUCTS

2.1 MANUFACTURER

A. Carpet:

1. Philadelphia Commercial Carpet, Be Present, or Be Real, 26 oz. tufted weight, gauge 1/10. Verify color with Architect.
2. Philadelphia Commercial Carpet, Sound Advice, 22 oz. tufted weight, gauge 1/10. Verify color with Architect.

2.2 CARPET ADHESIVES

A. Per carpet manufacturer's recommendations.

2.3. SUBSTRATE PATCH

A. Patch wood and concrete floors with product 345 manufactured by Henry, or approved.

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PART 3 EXECUTION

3.1 CARPET - GENERAL

A. Carpet Inspection:

1. Inspect carpet prior to installation for streaking, shading, spots, dirt or soil, frayed or pulled yarns or other defects. Install only acceptable carpet material free of defects.
2. Inspect floor surfaces to receive carpet. Do not proceed with work until any defects in floor which affect this work are corrected.

B. Carpet Installation:

1. Installer certified by manufacturer with five (5) years experience (Journeyman) installing approved carpet. One Apprentices for every two Journeyman.
1. Install carpet where shown on Finish Schedule.
2. Carpet within an architecturally-defined area must consist of manufacturer's "run" number and same dye lot.
3. Install carpet and pad in strict accordance with best trade practices and manufacturer's instructions. Set in adhesive as specified.
4. Install carpet in continuous lengths without end seams in traffic lanes with edges trued and treated in accordance with manufacturer's seaming techniques.
5. Install carpet stops where no wall exists. Center under doors in carpet stop.
6. Retain carpet "fall off" of usable sizes and store where directed.
7. Vacuum clean installed carpet and clean any soiled areas.
8. Provide protection of carpet using heavy kraft paper sealed or taped at joints or other means acceptable to Architect until accepted by Owner.

C. Maintenance Materials:

1. Deliver to Owner at Project site the following quantities of items in size and color distribution as directed. Store in location directed in unopened containers and in manner recommended by manufacturer.
 - a. Unused carpet and large scraps.

END OF SECTION

EXTERIOR PAINTING

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PART 1 - GENERAL

1.1 ISSUES

- A. Painting is not required on pre-finished items, finished metal surfaces, concealed surfaces, operating parts, and labels.
 - 1. Finished metal surfaces NOT to be painted include:
 - a. Anodized aluminum
 - b. Stainless steel
 - c. Chromium plate
 - d. Copper
 - e. Bronze
 - f. Brass
 - g. Galvanized steel (unless specifically designated to be painted)
 - 2. Do not paint over Underwriter's Laboratories, Factory Mutual or other code-required labels or equipment name, identification, performance rating or nomenclature plates.
- B. Painting includes field painting exposed bare and covered pipes and ducts (including color coding), hangers, exposed steel and ironwork, and primed metal surfaces of mechanical and electrical equipment, in interior finished spaces only. Access panel covers must be painted separately, according to the following code: Electrical – orange, Communications – blue, Alarms – red.
- C. Paint exposed surfaces whether or not colors are designated in paint schedules, except where a specific designation indicates the surface or material is not to be painted or is to remain natural. Where an item or surface is not specifically mentioned, paint the same as similar adjacent materials or surfaces. If color or finish is not designated, the Owner's project representative will select from standard colors or finishes available.

1.2 SUMMARY

- A. This Section includes surface preparation and the application of paint systems on the following exterior substrates:
 - 1. Concrete.
 - 2. Concrete masonry units (CMU).
 - 3. Steel.
 - 4. Galvanized metal.
 - 5. Aluminum (not anodized or otherwise coated).
 - 6. Wood.

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7. Fiber cement siding.
- B. Unless otherwise indicated, surface preparation, priming and finish coats specified in this section are in addition to shop priming and surface treatment specified under other sections.
- C. Related Sections include the following:
1. Division 05 Sections for shop priming of metal substrates with primers specified in this Section.
 2. Division 08 Sections for factory priming windows and doors with primers specified in this Section.
 3. Division 09 Section INTERIOR PAINTING for surface preparation and the application of paint systems on interior substrates.

1.3 SUBMITTALS

- A. Product Data: For each type of product indicated, submitted to the M.S.U. Project Representative prior to project inception. List each material by the manufacturer's catalog number and general classification. The University retains the right to approve or disapprove any proposed equivalent paint products.
- B. Samples for initial color selection: in the form of manufacturer's color charts. After color selection, the Owner's project representative will furnish color chips for surfaces to be coated. It is the contractor's responsibility to provide the Owner's project representative with three draw downs of each product and color combination to be used for final approval.
- C. Samples for Verification, when requested: For each type of paint system and each color and gloss of topcoat indicated.
1. Submit Samples on rigid backing, 8 inches square.
 2. Step coats on Samples to show each coat required for system.
 3. Label each coat of each Sample.
 4. Label each Sample for location and application area.
- D. An actual color sample, 4' X 4', shall be painted on one wall of the jobsite for verification of actual wall color prior to any other painting. Actual color samples of other selected paints shall be painted on appropriate surfaces for verification as directed by the Owner's project representative.
- E. Product List: For each product indicated, include the following:
1. Cross-reference to paint system and locations of application areas. Use same designations indicated on Drawings and in schedules.

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1.4 DELIVERY, STORAGE, AND HANDLING

- A. Deliver materials to the job site in the manufacturer's original, unopened packages and containers bearing manufacturer's name and label and the following information:
 - 1. Product name or title of material.
 - 2. Product description (generic classification or binder type).
 - 3. Federal Specification number, if applicable
 - 4. Manufacturer's stock number and date of manufacture.
 - 5. Thinning instructions.
 - 6. Application instructions.
 - 7. Color name and number.

- B. Store materials not in use in tightly covered containers in well-ventilated areas with ambient temperature continuously maintained at not less than 45 deg F.
 - 1. Maintain containers in clean condition, free of foreign materials and residue.
 - 2. Keep storage area neat and orderly. Remove rags and waste from storage areas daily. Take necessary measures to ensure that workers and work areas are protected from fire and health hazards from handling, mixing and application.
 - 3. Paint/varnish removers shall be non-flammable.

1.5 PROJECT CONDITIONS

- A. Apply water based paints only when temperature of surfaces to be painted and ambient air temperatures are between 50 and 90 deg F.

- B. Apply solvent-thinned paints only when temperature of surfaces to be painted and ambient air temperatures are between 45 and 95 deg F.

- C. Do not apply paints in snow, rain, fog, or mist; when relative humidity exceeds 85 percent; at temperatures less than 5 deg F above the dew point; or to damp or wet surfaces. Painting may continue during inclement weather if surfaces and areas to be painted are enclosed and heated within temperature limits specified by the manufacturer during application and drying periods.

PART 2 - PRODUCTS

2.1 MANUFACTURERS

- A. Available Manufacturers: Subject to compliance with requirements, manufacturers offering products that may be incorporated into the Work include, but are not limited to, the following:
 - 1. Miller (verify)
 - 2. Sherwin-Williams Company (The).

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3. Benjamin Moore & Co.

If products by manufacturers not listed above are recommended, they must be approved by M.S.U. at least 2 weeks prior to bidding.

2.2 PAINT, GENERAL

A. Material Compatibility:

1. Provide materials for use within each paint system that are compatible with one another and substrates indicated, under conditions of service and application as demonstrated by manufacturer, based on testing and field experience.
2. For each coat in a paint system, provide products recommended in writing by manufacturers of topcoat for use in paint system and on substrate indicated.

2.3 BLOCK FILLERS

A. Heavy-duty latex block filler: Used for filling open textured interior and exterior concrete block, above grade, before application of topcoats. This material should not be used in areas that are subject to continuous high moisture conditions such as daily washing, etc.

1. Miller (verify)
2. Sherwin-Williams Company (The): Heavy Duty Block Filler B42W46 G
3. Benjamin Moore & Co.: M88 Industrial Block Filler G

2.4 METAL PRIMERS

A. Ext., Rust-Inhibiting Acrylic Primer: Quick drying, rust-inhibiting primer for priming galvanized and ferrous and non-ferrous metals under acrylic and alkyd topcoats.

1. Miller (verify)
2. Sherwin-Williams Company (The): Procryl B66W310 G
3. Benjamin Moore & Co.: M04 Acrylic Metal Primer G

2.5 WOOD PRIMERS

A. Exterior Acrylic Wood Primer: Exterior 100% acrylic wood primer used for priming both wood and cement surfaces under both acrylic and oil base exterior finishes.

1. Miller (verify)
2. Sherwin-Williams Company (The): B42W41 G
3. Benjamin Moore & Co.: (023) Fresh Start Acrylic Primer Seal G

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2.6 EXTERIOR LATEX PAINTS

- A. Exterior Acrylic Emulsion: Quick-drying, flat, 100% acrylic paint for use on the exterior over concrete, stucco, masonry (including concrete masonry block), mineral-fiber reinforced cement-panel surfaces, properly primed wood surfaces, and factory primed Masonite siding. New, primed Masonite siding should receive two full coats of finish.
1. ICI Paints: 2200 Masonry and House Paint G
 2. O'Leary Paints: 2105 Sungard Acrylic Latex Flat House Paint G
 3. Sherwin-Williams Company (The): Super Paint A80W151 Acrylic Latex Flat Exterior G
 4. Benjamin Moore & Co.: (N096) MoorGlo Acrylic House & Trim Paint G
- B. Exterior Satin Semi-Gloss Acrylic Emulsion: Quick-drying, satin, 100% acrylic paint for use on the exterior over concrete, stucco, masonry (including concrete masonry block), mineral-fiber reinforced cement-panel surfaces, properly primed wood surfaces, and factory primed Masonite siding. New, primed Masonite siding should receive two full coats of finish.
1. Miller (verify)
 2. Sherwin-Williams Company (The): A89 Super Paint G A89W1151G
 3. Benjamin Moore & Co.: (N103) MooreGard Acrylic Low-Lustre House Paint G
- C. Exterior Gloss Acrylic Emulsion: Quick-drying, gloss, 100% acrylic paint for use on the exterior over concrete, stucco, masonry (including concrete masonry block), mineral-fiber reinforced cement-panel surfaces, properly primed wood surfaces, and factory primed Masonite siding. New, primed Masonite siding should receive two full coats of finish.
1. Miller (verify)
 2. Sherwin-Williams Company (The): A84 Super Paint G
 3. Benjamin Moore & Co.: (M28) Acrylic Gloss Enamel G
- D. Interior/Exterior Acrylic Machinery Enamel Gloss: Premium quality gloss 100% acrylic enamel for use on interior and exterior metal and concrete surfaces where abrasion is a problem. This product shall have excellent adhesion characteristics even to existing alkyd finish coats and provide a smooth brush-mark free surface. TO BE USED ON METAL DOORS AND FRAMES.
1. Miller (verify)
 2. Sherwin-Williams Company (The): DTM B66 W611G
 3. Benjamin Moore & co.: (M28) Acrylic Gloss Enamel G
- E. Interior/Exterior Acrylic Machinery Enamel Semi-Gloss: Premium quality semi-gloss 100% acrylic enamel for use on interior and exterior metal and concrete surfaces where abrasion is a problem. This product shall have excellent adhesion characteristics even to existing alkyd finish coats and provide a smooth brush-mark free surface. TO BE USED ON METAL DOORS AND FRAMES.

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1. Miller (verify)
2. Sherwin-Williams Company (The): DTM B66 W 651 G
3. Benjamin Moore & Co.: (M29) Acrylic Semi-Gloss Enamel G

F. Acrylic DTM Semi-Gloss: Weather resistant, int./ext. acrylic semi-gloss for use on metal ducts, galvanized and ferrous and non-ferrous metals.

1. Miller (verify)
2. Sherwin-Williams Company (The): DTM Acrylic Semi-Gloss B66W651 G
3. Benjamin Moore & Co.: (M29) Acrylic Semi-Gloss Enamel G

G. Acrylic Solid Color Stain, Wood Shakes and Rough Siding: Thin-bodied acrylic latex paint for use on the exterior for a flat finish on wood shakes and rough siding.

1. Miller (verify)
2. Sherwin-Williams Company (The): B22 Solid Color Acrylic Stain A 15 W51 G
3. Benjamin Moore & Co.: (N089) Acrylic Solid Exterior Stain G

2.7 EXTERIOR ALKYD/OIL BASED PAINTS

A. Alkyd-Oil Paint for Wood Shakes and Rough Siding: Thin bodied alkyd-oil paint for use on the exterior for a flat finish on wood shakes and rough wood siding.

1. Miller (verify)
2. Sherwin-Williams Company (The): Exterior Solid Stain A-14 Series G
3. Benjamin Moore & Co.: (C080) Alkyd Solid Exterior Stain G

B. Exterior Semi-Transparent Oil Stain: Semi-transparent oil based exterior wood stain.

1. Miller (verify)
2. Sherwin-Williams Company (The): Exterior Semi-Transparent Stain A-14 Series G
3. Benjamin Moore & Co.: (328) Alkyd Semi-transparent Exterior Stain G

C. Tung Oil-Phenolic Marine Spar Varnish: Clear, marine spar varnish with U.V. absorbers for use in coating exterior wood doors, trim, etc.

1. Miller (verify)
2. Sherwin-Williams Company (The): Minwax Spar Urethane G
3. Sherwin-Williams Company (The): A67V4 Exterior Varnish G

2.8 SURFACE PREPARATION AGENTS: Paint and varnish removers shall be non-flammable.

A. Oil and Grease Emulsifier: Oil and grease emulsifier for cleaning walls, ceilings floors and equipment.

1. Miller (verify)

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2. Sherwin-Williams Company (The): Krud Kutter G
 3. Benjamin Moore & Co.: (M83) Oil and Grease Emulsifier G
- B. Epoxy and Urethane Remover: For stripping old epoxy or urethane coatings from surfaces to be re-coated.
1. Miller (verify)
 2. Sherwin-Williams Company (The): Bix Stripper
 3. Benjamin Moore & Co.: None
- C. Rust Removal and Metal Pre-treatment: For use in converting rust oxide and treatment of metal to promote coating adhesion.
1. Miller (verify)
 2. Sherwin-Williams Company (The): None
 3. Benjamin Moore & Co.: (M84) Rust Pre-Treatment G
- D. Concrete Etch: Concrete pre-treatment for use in removing the laitance and etching smooth concrete to improve coating adhesion.
1. Miller (verify)
 2. Sherwin-Williams Company (The): Elroy Muriatic Acid
 3. Benjamin Moore & Co.: (M85) Concrete Pre-treatment & Etch G
- E. Rust Converter: For converting rust into a black protective film.
1. Miller (verify)
 2. Sherwin-Williams Company (The): Duro Extend
 3. Benjamin Moore & Co. (M82) Rust Converter G

PART 3 - EXECUTION

3.1 EXAMINATION

- A. Examine substrates and conditions, with applicator present, for compliance with requirements for maximum moisture content and other conditions affecting performance of work.
- B. Maximum Moisture Content of Substrates: When measured with an electronic moisture meter as follows:
1. Concrete: 12 percent.
 2. Masonry (Clay and CMU): 12 percent.
 3. Wood: 15 percent.
 4. Plaster: 12 percent.
 5. Gypsum Board: 2 percent.

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- C. Verify suitability of substrates, including surface conditions and compatibility with existing finishes and primers.
- D. Begin coating application only after unsatisfactory conditions have been corrected and surfaces are dry.
 - 1. Beginning coating application constitutes Contractor's acceptance of substrates and conditions.

3.2 PREPARATION

- A. Remove hardware and hardware accessories, plates, machined surfaces, lighting fixtures, electrical panel box doors and similar items already in place that are not to be painted. If removal is impractical or impossible because of size or weight of item, provide surface-applied protection before surface preparation and painting.
 - 1. After completing painting operations, use workers skilled in the trades involved to reinstall items that were removed. Remove surface-applied protection if any.
 - 2. Do not paint over labels of independent testing agencies or equipment name, identification, performance rating, or nomenclature plates.
- B. Protect work of other trades, whether to be painted or not, against damage by painting. Correct damage by cleaning, repairing, replacing, and/or repainting, as acceptable to the M.S.U. project representative. Provide "Wet Paint" signs to protect newly painted finishes. At completion of construction activities of other trades, touch up and restore all damaged or defaced painted surfaces.
- C. Clean substrates of substances that could impair bond of paints, including dirt, oil, grease, and incompatible paints and encapsulants.
 - 1. Schedule cleaning and painting so dust and other contaminants from the cleaning process will not fall onto wet, newly painted surfaces.
 - 2. Provide barrier coats over incompatible primers or remove and re-prime. Notify M.S.U. project representative in writing of problems anticipated with use of specified finish coat material with substrates primed by others.
- D. Cementitious Material Substrates: Remove dust, dirt, grease, oil, release agents, curing compounds, efflorescence, and chalk.
 - 1. Roughen as required to remove glaze. If hardeners or sealers have been used to improve curing, use mechanical methods of surface preparation. Use abrasive blast-cleaning methods if recommended by the paint manufacturer.
 - 2. Do not paint surfaces if moisture content or alkalinity of surfaces to be painted exceeds that permitted in manufacturer's written instructions.
 - 3. Clean concrete floors to be painted with a five percent solution of muriatic acid or other etching cleaner. Flush the floor with clean water to remove acid, neutralize with ammonia, vacuum, rinse and allow drying before painting.
- E. Steel Substrates: Clean non-galvanized ferrous-metal surfaces that have been shop coated: remove oil, grease, dirt, loose mill scale and other foreign substances. Use solvent or mechanical cleaning methods that comply with recommendations of the Steel Structures Painting Council. Touch up bare areas and shop-applied prime coats

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that have been damaged. Wire-brush, clean with solvents recommended by the paint manufacturer, and touch-up with the same primer as the shop coat.

- F. Galvanized-Metal Substrates: Clean galvanized surfaces with non-petroleum-based solvents so the surface is free of oil and surface contaminants. Remove grease and oil residue from galvanized sheet metal fabricated from coil stock by mechanical methods to produce clean, lightly etched surfaces that promote adhesion of subsequently applied paints. If galvanized metal is chromate passivated ("bonderized") consult manufacturers for appropriate surface preparation and primers.
- G. Aluminum Substrates: Remove surface oxidation.
- H. Wood Substrates:
 - 1. Scrape and clean knots, and apply coat of knot sealer before applying primer.
 - 2. Sand surfaces that will be exposed to view, and dust off.
 - 3. Prime edges, ends, faces, undersides, and backsides of wood.
 - 4. After priming, fill holes and imperfections in the finish surfaces with putty or plastic wood filler. Sand smooth when dried.
 - 5. Seal tops, bottoms, and cutouts of unprimed wood doors with a heavy coat of varnish or sealer immediately upon delivery.
 - 6. Stripping and refinishing existing wood doors, trim, etc.
 - a. Contractors shall take care to achieve clean and clear surfaces that will take stain uniformly. In some instances bleaching of the wood may be necessary. All existing varnish and stripping residue shall be removed and the surface neutralized and sanded smooth to assure a smooth and uniform finish.
- I. Plaster Substrates: Do not begin paint application until plaster is fully cured and dry.
- J. Exterior Gypsum Board Substrates: Do not begin paint application until finishing compound is dry and sanded smooth.
- K. Repainting: Prime coats may be omitted with the exception of patched or repaired areas that should be spot-primed to ensure a uniform finish. Special care should be taken in re-coating existing alkyd or epoxy surfaces to prevent inter-coat adhesion failures. Painting of patch and repair work shall be painted out to the nearest break line, including areas in corridors, as directed by the M.S.U. Project Representative.
- L. Paint: Carefully mix and prepare paint materials in accordance with manufacturer's directions. Maintain containers used in mixing and application of paint in a clean condition, free of foreign materials or residue. Stir material before application to produce a mixture of uniform density; stir as required during application. Remove any surface film and, if necessary, strain material before using. Do not stir surface film into material. Use only thinners approved by the paint manufacturer and only within recommended limits.
- M. Tinting: Where multiple coats of the same material are applied, tint undercoats to match the color of the finish coat, but in a sufficiently lighter shade to distinguish each separate coat.

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3.3 APPLICATION

- A. Paint colors, surface treatments, and finishes are indicated in schedules. Provide finish coats that are compatible with primers used.
- B. Before application of finish coats, apply a prime coat of material as recommended by the manufacturer to material that is required to be painted or finished and has not been primed by others. Re-coat primed and sealed surfaces where evidence of suction spots or unsealed areas in first coat appears, to ensure a finish coat with no burn through or other defects due to insufficient sealing.
- C. Apply materials at not less than the manufacturer's recommended spreading rate. Provide a total dry film thickness of the entire system as recommended by the manufacturer. Apply block fillers to concrete masonry block at a rate to ensure complete coverage with pores filled.
- D. Apply paints according to manufacturer's written instructions. Use applicators and techniques best suited for paint and substrate indicated. Do not paint over dirt, rust, scale, grease, moisture, scuffed surfaces, or conditions detrimental to formation of a durable paint film.
- E. The number of coats and film thickness required is the same regardless of the application method. Do not apply succeeding coats until the previous coat has cured as recommended by the manufacturer. Sand between applications where sanding is required in order to produce an even, smooth surface in accordance with the manufacturer's directions. Sand lightly between each succeeding enamel or varnish coat.
- F. Apply first coat to surfaces that have been cleaned, pre-treated or otherwise prepared for painting as soon as practicable after preparation and before subsequent surface deterioration.
- G. The term "exposed surfaces" includes areas visible when a permanent or built-in fixture, convector covers, covers for finned tube radiation, grilles, and similar components are in place. Extend coatings in these areas as required to maintain the system integrity and provide desired protection. Paint interior surfaces of ducts, where visible through registers or grilles, with a flat, nonspecular black paint. Paint back sides of access panels and removable or hinged covers to match exposed surfaces.
- H. Paint surfaces behind movable items same as similar exposed surfaces. Before final installation, paint surfaces behind permanently fixed items with prime coat only.
- I. Finish exterior doors on tops, bottoms, and side edges the same as exterior faces.
- J. If undercoats or other conditions show through topcoat, apply additional coats until cured film has a uniform paint finish, color, and appearance. Give special attention to ensure that surfaces, including edges, corners, crevices, welds and exposed fasteners receive a dry film thickness equivalent to that of flat surfaces.

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- K. All materials will be applied under adequate lighting, evenly spread and flowed on smoothly. Cut in sharp lines and color breaks.
 - 1. Pigmented (opaque) finishes: Completely cover to provide an opaque, smooth surface of uniform finish, color, appearance, and overage. Cloudiness, spotting, holidays, laps, brush marks, runs, sags, or other surface imperfections will not be acceptable.
 - 2. Transparent (clear) finishes: Use multiple coats to produce a glass-smooth surface film of even luster. Provide a finish free of laps, cloudiness, color irregularity, runs, brush marks, orange peel, nail holes, or other surface imperfections. Provide satin finish for final coats.

3.4 CLEANING AND PROTECTION

- A. At end of each workday, remove rubbish, empty cans, rags, and other discarded materials from Project site.
- B. After completing paint application, clean spattered surfaces. Remove spattered paints by washing, scraping, or other methods. Do not scratch or damage adjacent finished surfaces.

3.5 EXTERIOR PAINTING SCHEDULE

- A. Concrete Masonry Units Substrates:
 - 1. Lusterless (Flat) Acrylic System:
 - a. Two coats over block filler with total dry film thickness not less than 2.5 mils, excluding the block filler.
 - 1) Prime Coat: High Performance Latex Block Filler
 - 2) Intermediate Coat: Exterior Acrylic Emulsion
 - 3) Topcoat: Exterior Acrylic Emulsion
 - 2. Satin-Gloss Acrylic Finish:
 - a. Two coats over block filler with total dry film thickness not less than 2.5 mils, excluding the block filler.
 - 1) Prime Coat: High Performance Latex Block Filler
 - 2) Intermediate Coat: Exterior Satin Semi-Gloss Acrylic Emulsion
 - 3) Topcoat: Exterior Satin Semi-Gloss Acrylic Emulsion
- B. Ferrous (and Non-Ferrous Galvanized and Aluminum) Metal Substrates:
 - 1. Includes doors, doorframes, bumper posts, exposed structural steel, etc. Two finish coats over primer (primer is not required on shop-primed items).
 - a. Gloss Acrylic System
 - 1) Prime Coat: Acrylic Primer
 - 2) First Coat: DTM Acrylic Gloss

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- 3) Second Coat: DTM Acrylic Gloss
 - b. Semi-Gloss Acrylic System
 - 1) Prime Coat: Acrylic Metal Primer
 - 2) First Coat: DTM Acrylic Semi-Gloss Enamel
 - 3) Second Coat: DTM Acrylic Semi-Gloss Enamel
 - c. Gloss Acrylic System
 - 1) Prime Coat: Acrylic Metal Primer
 - 2) First Coat: Exterior Acrylic Machinery Enamel Gloss
 - 3) Second Coat: Exterior Acrylic Machinery Enamel Gloss
 - d. Semi-Gloss Acrylic System
 - 1) Prime Coat: Acrylic Metal Primer
 - 2) First Coat: Exterior Acrylic Machinery Enamel Semi-Gloss
 - 3) Second Coat: Exterior Acrylic Machinery Enamel Semi-Gloss
- C. Dressed Lumber and Wood Panel Substrates:
1. Gloss Finish: 45-70 degrees
 - a. Two finish coats over primer with total dry film thickness not less than 3.5 mils.
 - 1) Prime Coat: Exterior Acrylic Wood Primer.
 - 2) Intermediate Coat: Exterior Gloss Acrylic Emulsion
 - 3) Topcoat: Exterior Gloss Acrylic Emulsion
 2. Satin Semi Gloss Finish: 20-45 degrees
 - a. Two finish coats over primer with total dry film thickness not less than 3.5 mils.
 - 1) Prime Coat: Exterior Acrylic Wood Primer.
 - 2) Intermediate Coat: Exterior Satin Semi-Gloss Acrylic Emulsion
 - 3) Topcoat: Exterior Satin Semi-Gloss Acrylic Emulsion
 3. Low Luster Finish: 0-20 degrees
 - a. Two finish coats over primer with total dry film thickness not less than 3.5 mils.
 - 1) Prime Coat: Exterior Acrylic Wood Primer.
 - 2) Intermediate Coat: Exterior Acrylic Emulsion
 - 3) Topcoat: Exterior Acrylic Emulsion
- D. Cedar wood products:
1. Solid Body Stain:
 - a. First Coat: Acrylic Latex Solid Body Stain
 - b. Second Coat: Acrylic Latex Solid Body Stain

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2. Semi-Transparent Stain Finish:
 - a. First Coat: Exterior Semi-Transparent Oil Stain
 - b. Second Coat: Exterior Semi-Transparent Oil Stain

E. Problem Areas:

1. Glazed Tile, Ceramic, Porcelain, Tile, Glass, and Marble
 - a. First Coat: Acrylic Bonding Primer
 - b. Second Coat and Top Coat (required): Use appropriate systems as specified.
2. Damp Areas, Boiler Rooms, etc./ Pipes, Concrete, Walls, and Ceilings
 - a. First Coat: Acrylic Moisture Bond Primer
 - b. Second Coat: Acrylic Moisture Bond Enamel
3. Handicap ramps, steps, areas where anti-slip coatings may be required:
 - a. Surface preparation: Acid-etch concrete if required. Prime if previously painted.
 - b. First Coat: Epoxy Modified Acrylic Anti-slip Coating
 - c. Second Coat: Epoxy Modified Acrylic Anti-slip Coating

END OF SECTION

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PART 1 - GENERAL

1.1 ISSUES

A. TOXICITY

1. For paints and coatings applied on the interior of buildings and applied on-site maximum VOC shall be in accordance with Green Seal Standard GS-11, Paints, First Edition, May 20, 1993.
 - a. Flat paints and coatings: VOC content of not more than 50 g/L
 - b. Non-flat paints and coatings: VOC content of not more than 150 g/L
2. Anticorrosive and anti-rust paints shall meet requirements of Green Seal Standard GC-03, Anti-corrosive Paints, Second Edition, January 7, 1997
 - a. Anticorrosive coatings: VOC content of not more than 250 g/L
3. Clear wood finishes, floor coatings, stains, and shellacs applied to interior elements shall meet requirements OSHA.
 - a. Varnish: VOC content of not more than 350 g/L
 - b. Lacquer: VOC content of not more than 550 g/L
 - c. Floor coatings: VOC content of not more than 100 g/L
 - d. Shellacs (clear): VOC content of not more than 730 g/L
 - e. Shellacs (pigmented): VOC content of not more than 550 g/L
 - f. Stains: VOC content of not more than 550 g/L
 - g. Sealers (waterproofing sealers): VOC content of not more than 250 g/L
 - h. Sealers (sanding sealers): VOC content of not more than 275 g/L
 - i. Sealers: (other than above listed) VOC content of not more than 200 g/L
4. Paints and coatings shall have a maximum of 1.0% of Total Aromatic Compounds (hydrocarbon compounds containing one or more benzene rings).
5. Paints and coatings shall not contain any of the following:
 - a. Acrolein
 - b. Acrylonitrile
 - c. Antimony
 - d. Benzene
 - e. Butyl benzyl phthalate
 - f. Cadmium
 - g. Di(2-ethylhexyl) phthalate
 - h. Di-n-butyl phthalate
 - i. Di-n-octyl phthalate
 - j. 1,2-dichlorobenzene
 - k. Diethyl phthalate
 - l. Dimethyl phthalate
 - m. Ethylbenzene
 - n. Formaldehyde

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- o. Hexavalent chromium
- p. Isophorone
- q. Lead
- r. Mercury
- s. Methyl ethyl ketone
- t. Methyl isobutyl ketone
- u. Methylene chloride
- v. Napthalene
- w. Toluene (methylbenzene)
- x. 1,1,1-trichloroethane
- y. Vinyl chloride

- B. Painting is not required on pre-finished items, finished metal surfaces, concealed surfaces, operating parts, and labels.
1. Pre-finished items NOT to be painted include the following factory-finished components:
 - a. Metal toilet enclosures
 - b. Acoustic materials
 - c. Architectural woodwork and casework
 - d. Elevator entrance doors and frames
 - e. Elevator equipment
 - f. Finished mechanical and electrical equipment
 - g. Light fixtures
 - h. Switchgear
 2. Concealed surfaces NOT to be painted include wall or ceiling surfaces in the following generally inaccessible areas:
 - a. Foundation spaces
 - b. Furred areas
 - c. Utility tunnels
 - d. Pipe spaces
 - e. Duct shafts
 - f. Elevator shafts
 - g. Mechanical rooms
 3. Operating parts NOT to be painted include moving parts of operating equipment such as the following:
 - a. Valve and damper operators
 - b. Linkages
 - c. Sensing devices
 - d. Motor and fan shafts
 4. Finished metal surfaces NOT to be painted include:

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- a. Anodized aluminum
 - b. Stainless steel
 - c. Chromium plate
 - d. Copper
 - e. Bronze
 - f. Brass
 - g. Galvanized steel (unless specifically designated to be painted)
5. Do not paint over Underwriter's Laboratories, Factory Mutual or other code-required labels or equipment name, identification, performance rating or nomenclature plates.
- C. Painting includes field painting exposed bare and covered pipes and ducts (including color coding), hangers, exposed steel and ironwork, and primed metal surfaces of mechanical and electrical equipment, in interior finished spaces only. Access panel covers must be painted separately, according to the following code: Electrical – orange, Communications – blue, Alarms – red.
- D. Paint exposed surfaces whether or not colors are designated in paint schedules, except where a specific designation indicates the surface or material is not to be painted or is to remain natural. Where an item or surface is not specifically mentioned, paint the same as similar adjacent materials or surfaces. If color or finish is not designated, the Owner's project representative will select from standard colors or finishes available.

1.2 SUMMARY

- A. This Section includes surface preparation and the application of paint systems on the following interior substrates:
1. Concrete.
 2. Concrete masonry units (CMU).
 3. Steel.
 4. Galvanized metal.
 5. Aluminum (not anodized or otherwise coated).
 6. Wood.
 7. Gypsum board.
 8. Plaster.
 9. Cotton or canvas insulation covering.
- B. Surface preparation, priming and finish coats specified in this section are in addition to shop priming and surface treatment specified under other sections.
- C. Related Sections include the following:
1. Division 05 Sections for shop priming of metal substrates with primers specified in this Section.

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2. Division 08 Sections for factory priming windows and doors with primers specified in this Section.
3. Division 09 Section EXTERIOR PAINTING for surface preparation and the application of paint systems on exterior substrates.

1.3 SUBMITTALS

- A. Product Data: For each type of product indicated, submitted to the the Owner's Project Representative prior to project inception. List each material by the manufacturer's catalog number and general classification. The University retains the right to approve or disapprove any proposed equivalent paint products.
 1. Submit printed VOC statements.
 2. Submit printed aromatic compound statements.
 3. Submit printed statements demonstrating that no restricted compounds are used.
- B. Samples for initial color selection: in the form of manufacturer's color charts. After color selection, the Owner's project representative will furnish color chips for surfaces to be coated. It is the contractor's responsibility to provide the Owner's project representative with three draw downs of each product and color combination to be used for final approval.
- C. Samples for Verification, when requested: For each type of paint system and each color and gloss of topcoat indicated.
 1. Submit Samples on rigid backing, 8 inches square.
 2. Step coats on Samples to show each coat required for system.
 3. Label each coat of each Sample.
 4. Label each Sample for location and application area.
- D. An actual color sample, 4' X 4', shall be painted on one wall of the jobsite for verification of actual wall color prior to any other painting. Actual color samples of other selected paints shall be painted on appropriate surfaces for verification as directed by the M.S.U. project representative.
- E. Product List: For each product indicated, include the following:
 1. Cross-reference to paint system and locations of application areas. Use same designations indicated on Drawings and in schedules.

1.4 DELIVERY, STORAGE, AND HANDLING

- A. Deliver materials to the job site in the manufacturer's original, unopened packages and containers bearing manufacturer's name and label and the following information:
 1. Product name or title of material.
 2. Product description (generic classification or binder type).
 3. Federal Specification number, if applicable

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4. Manufacturer's stock number and date of manufacture.
 5. Thinning instructions.
 6. Application instructions.
 7. Color name and number.
- B. Store materials not in use in tightly covered containers in well-ventilated areas with ambient temperature continuously maintained at not less than 45 deg F.
1. Maintain containers in clean condition, free of foreign materials and residue.
 2. Keep storage area neat and orderly. Remove rags and waste from storage areas daily. Take necessary measures to ensure that workers and work areas are protected from fire and health hazards from handling, mixing and application.
 3. Paint/varnish removers shall be non-flammable.

1.5 PROJECT CONDITIONS

- A. Apply water based paints only when temperature of surfaces to be painted and ambient air temperatures are between 50 and 90 deg F.
- B. Apply solvent-thinned paints only when temperature of surfaces to be painted and ambient air temperatures are between 45 and 95 deg F.
- C. Do not apply paints in snow, rain, fog, or mist; when relative humidity exceeds 85 percent; at temperatures less than 5 deg F above the dew point; or to damp or wet surfaces. Painting may continue during inclement weather if surfaces and areas to be painted are enclosed and heated within temperature limits specified by the manufacturer during application and drying periods.

PART 2 - PRODUCTS

2.1 MANUFACTURERS

- A. Available Manufacturers: Subject to compliance with requirements, manufacturers offering products that may be incorporated into the Work include, but are not limited to, the following:
 1. ICI Paints.
 2. O'Leary Paints (O'Leary)
 3. Sherwin-Williams Company (The).
 4. Benjamin Moore & Co.
 5. Miller Paint

If products by manufacturers not listed above are recommended, they must be approved by M.S.U. at least 2 weeks prior to bidding.

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2.2 PAINT, GENERAL

A. Material Compatibility:

1. Provide materials for use within each paint system that are compatible with one another and substrates indicated, under conditions of service and application as demonstrated by manufacturer, based on testing and field experience.
2. For each coat in a paint system, provide products recommended in writing by manufacturers of topcoat for use in paint system and on substrate indicated.

2.3 BLOCK FILLERS

A. High Performance Latex Block Filler: Used for filling open textured interior and exterior concrete block, above grade, before application of topcoats. This material should not be used in areas that are subject to continuous high moisture conditions such as daily washing, etc.

1. Miller (verify)
2. O'Leary Paints: C946-11 Industrial Latex Block Filler G
3. Sherwin-Williams Company (The): Heavy Duty Block Filler B42W46 G
4. Benjamin Moore & Co.: M88-01 Industrial Block Filler

B. Severe Duty Two Component Epoxy Block Filler: Epoxy block filler used for filling open textured interior concrete block, before the application of high performance top coats. This filler should be used in all high moisture areas such as kitchens, showers, animal rooms, custodial wash areas, etc.

1. Miller (verify)
2. Sherwin-Williams Company (The): B42-WA8 WA9 or W42200/B42V201-Cement Plex G
3. Benjamin Moore & Co.: M31/M32 Acrylic Epoxy Block Filler G

C. METAL PRIMERS

D. Synthetic Int., Rust-Inhibiting Acrylic Primer: Quick drying, rust-inhibiting primer for priming galvanized and ferrous and non-ferrous metal on the interior under acrylic paints and odorless alkyd semigloss or alkyd gloss enamels.

1. Miller (verify)
2. Sherwin-Williams Company (The): ProCryl-B66-W310 G
3. Benjamin Moore & Co.: M04 Acrylic Metal Primer G

E. Alkyd-Type Zinc Metal Primer: Primers used for priming galvanized and ferrous metals under acrylic or alkyd enamel finishes.

1. Miller (verify)

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2. Sherwin-Williams Company (The): ProCryl B66-W310 G
3. Benjamin Moore & Co.: M04 Acrylic Metal Primer G

F. Non-Ferrous Metal Primer: Bonding type primer used to prime interior non-ferrous metal surfaces:

1. Miller (verify)
2. Sherwin-Williams Company (The): DTM Bonding Primer ProCryl B66-W310 G
3. Benjamin Moore & Co.: (023) Fresh Start Acrylic Primer G

2.4 WOOD PRIMERS

A. Interior Latex Enamel Undercoat: Ready-mixed latex primer for use as an undercoat over wood and hardboard under latex enamel topcoat.

1. Miller (verify)
2. Sherwin-Williams Company (The): Pro Block B51W20
3. Benjamin Moore & Co.: (253) Super-Spec Latex Enamel Undercoater G

2.5 INTERIOR LATEX PRIMERS

A. Interior 100% Acrylic Primer: Acrylic primer used on plaster under flat, semi-gloss and gloss finishes. This primer must be specifically designed for application to plaster, gypsum drywall, block and masonry surfaces and over all alkyd paints as primer for re-coat.

1. Miller (verify)
2. Sherwin-Williams Company (The): B-28-W300 G or PrepRite B28 W300
3. Benjamin Moore & Co.: 023 Fresh Start Acrylic Primer G

B. Wall-covering Primer: New drywall and plaster surfaces that are to receive a wall-covering finish are to be primed with heavy-duty acrylic primer to allow easy stripping of wall-coverings off of surfaces.

1. Miller (verify)
2. Sherwin-Williams Company (The): PreRite B 28W980 G Heavy Duty Acrylic Primer
3. Benjamin Moore & Co.: (023) Fresh Start Acrylic Primer Sealer G

2.6 INTERIOR LATEX PAINTS

A. Interior/Exterior Acrylic Machinery Enamel Gloss: Premium quality gloss 100% acrylic enamel for use on interior and exterior metal and concrete surfaces where abrasion is a problem. This product shall have excellent adhesion characteristics even to existing alkyd finish coats and provide a smooth brush-mark free surface. TO BE USED ON

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METAL DOORS AND FRAMES. Use deep base and ultra deep base in the same product line.*

1. Miller (verify)
 2. Sherwin-Williams Company (The): DTM B66 – W611 G*
 3. Benjamin Moore & Co.: P28 DTM Gloss*
- B. Interior/Exterior Acrylic Machinery Enamel Semi-Gloss: Premium quality semi-gloss 100% acrylic enamel for use on interior and exterior metal and concrete surfaces where abrasion is a problem. This product shall have excellent adhesion characteristics even to existing alkyd finish coats and provide a smooth brush-mark free surface. TO BE USED ON METAL DOORS AND FRAMES. Use deep base and ultra deep base in the same product line.*
1. Miller (verify)
 2. Sherwin-Williams Company (The): DTM B66 W 651 G*
 3. Benjamin Moore & Co.: P29 Semi*
- C. Acrylic DTM Semi-Gloss: Weather resistant, exterior acrylic semi-gloss for use on metal ducts, galvanized metals and ferrous and non-ferrous. Use deep base and ultra deep base in the same product line.*
1. Miller (verify)
 2. Sherwin-Williams Company (The): DTM Acrylic Semi-Gloss B66 W 651 G*
 3. Benjamin Moore & Co.: P29 DTM Semi*
- D. Latex Based Interior Semi-Gloss Latex Enamel: Low odor 100% acrylic or modified styrene acrylic, (NO VINYL ACRYLIC) latex enamel for use as a semi-gloss finish over primed concrete, concrete block, wood, plaster, and gypsum drywall. This product shall have abrasion resistance at least equal to 100% of the Leneta “C” Panel when tested in accordance with ASTM D2486. Use deep base and ultra deep base in the same product line.*
1. Miller (verify)
 2. Sherwin-Williams Company (The): Acrylic A 20 100% Acrylic Semi-Gloss
(Deep Base) 0 VOC B66-W663
(Ultra Deep Base) 0 VOC B66-T664
 3. Benjamin Moore & Co.: 224 Eco-Spec Acrylic Semi Gloss G*
- E. Latex Based Interior Eggshell Enamel: Low odor 100% acrylic or modified styrene acrylic, (NO VINYL ACRYLIC) latex enamel for use as a eggshell finish over primed concrete, concrete block, wood, plaster, and gypsum drywall. This product shall have abrasion resistance at least equal to 75% of the Leneta “C” Panel when tested in accordance with ASTM D2486. Use deep base and ultra deep base in the same product line.*
1. Miller (verify)
 2. Sherwin-Williams Company (The): A28 100% Acrylic Eggshell G
(Deep Base) 0 VOC B66-W663

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(Ultra Deep Base) 0 VOC B66-T664

3. Benjamin Moore & Co.: (223) Eco-Spec Eggshell Enamel G*

F. Latex Based Interior Flat Paint: Ready mixed, latex based paint for use over primed concrete, concrete block, wood, plaster, and gypsum drywall, acoustical plaster surfaces and as a "size" on cotton or canvas covering over insulation. Use deep base and ultra deep base in the same product line.*

1. Miller (verify)
2. Sherwin-Williams Company (The): A27-WF G*
3. Benjamin Moore & Co.: (219) Eco-Spec Latex Flat Enamel G*

2.7 INTERIOR EPOXY FINISHES

A. Acrylic Epoxy Gloss: Catalyzed acrylic epoxy gloss for use in areas of very high abrasion or where repetitive cleaning will be necessary.

1. Miller (verify)
2. Sherwin-Williams Company (The): B70W 211 B60 V-15 G
3. Benjamin Moore & Co.: M43/M44 Acrylic Epoxy Gloss Enamel

B. Polyamide Epoxy Gloss: Catalyzed polyamide epoxy gloss for use in areas where the maximum in abrasion, moisture and chemical resistance is required.

1. Miller (verify)
2. Sherwin-Williams Company (The): B62-W101-V60 V70 Polyamide Epoxy Gloss
3. Benjamin Moore & Co.: M36/M37 Polyamide Epoxy Gloss

2.8 INTERIOR WOOD FINISHING MATERIALS

A. Oil-Type Interior Wood Stain: Slow-penetrating oil-type wood stain for general use on interior wood surfaces under varnishes or was finishes.

1. Miller (verify)
2. Sherwin-Williams Company (The): Oil Stain Min Wax 250 G
3. Benjamin Moore & Co.: (234) Benwood Interior Wood Finishes Penetrating Stain G

B. Paste Wood Filler: Solvent based, air-drying, paste type wood filler for use on open grain wood on interior wood surfaces.

1. Sherwin-Williams Company (The): Sher-wood Fast-Dry Filler D70+1 G
2. Benjamin Moore & Co.: (236) Benwood Paste Wood Filler G

C. Interior Waterborne Urethane Satin: Clear, non-yellowing, water thinned, urethane sating, with excellent abrasion and moisture resistance. This product for use on interior stained or natural finished woodwork.

1. Miller (verify)

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2. Sherwin-Williams Co. (The): Woodclassics Waterborne Polyurethane A-68 series V91 G
3. Benjamin Moore & Co.: (423) Stays Clear Acrylic Urethane G

2.9 SURFACE PREPARATION AGENTS: Paint and varnish removers shall be non-flammable.

- A. Oil and Grease Emulsifier: Oil and grease emulsifier for cleaning walls, ceilings floors and equipment.
 1. Miller (verify)
 2. Sherwin-Williams Company (The): Krud Kuttder G
 3. Benjamin Moore & Co.: M83-00 Oil & Grease Emulsifier
- B. Epoxy and Urethane Remover: For stripping old epoxy or urethane coatings from surfaces to be re-coated.
 1. Miller (verify)
 2. Sherwin-Williams Company (The): Bix-Stipper
- C. Rust Removal and Metal Pre-treatment: For use in converting rust oxide and treatment of metal to promote coating adhesion.
 1. Miller (verify)
 2. Sherwin-Williams Company (The): Duro Extend
 3. Benjamin Moore & Co.: M84-00 Rust Pre-treatment
- D. Concrete Etch: Concrete pre-treatment for use in removing the laitance and etching smooth concrete to improve coating adhesion.
 1. Sherwin-Williams Company (The): Elroy Muriatic Acid
 2. Benjamin Moore & Co.: M85-00 Concrete Pre-treatment and Etch
- E. Rust Converter: For converting rust into a black protective film.
 1. Miller (verify)
 2. Sherwin-Williams Company (The): Duro Extend
 3. Benjamin Moore & Co.: M82 Rust Converter

PART 3 - EXECUTION

3.1 EXAMINATION

- A. Examine substrates and conditions, with applicator present, for compliance with requirements for maximum moisture content and other conditions affecting performance of work.

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- B. Maximum Moisture Content of Substrates: When measured with an electronic moisture meter as follows:
 - 1. Concrete: 12 percent.
 - 2. Masonry (Clay and CMU): 12 percent.
 - 3. Wood: 15 percent.
 - 4. Plaster: 12 percent.
 - 5. Gypsum Board: 12 percent.
- C. Verify suitability of substrates, including surface conditions and compatibility with existing finishes and primers.
- D. Begin coating application only after unsatisfactory conditions have been corrected and surfaces are dry.
 - 1. Beginning coating application constitutes Contractor's acceptance of substrates and conditions.

3.2 PREPARATION

- A. Remove hardware and hardware accessories, plates, machined surfaces, lighting fixtures, electrical panel box doors and similar items already in place that are not to be painted. If removal is impractical or impossible because of size or weight of item, provide surface-applied protection before surface preparation and painting.
 - 1. After completing painting operations, use workers skilled in the trades involved to reinstall items that were removed. Remove surface-applied protection if any.
 - 2. Do not paint over labels of independent testing agencies or equipment name, identification, performance rating, or nomenclature plates.
- B. Protect work of other trades, whether to be painted or not, against damage by painting. Correct damage by cleaning, repairing, replacing, and/or repainting, as acceptable to the M.S.U. project representative. Provide "Wet Paint" signs to protect newly painted finishes. At completion of construction activities of other trades, touch up and restore all damaged or defaced painted surfaces.
- C. Clean substrates of substances that could impair bond of paints, including dirt, oil, grease, and incompatible paints and encapsulants.
 - 1. Schedule cleaning and painting so dust and other contaminants from the cleaning process will not fall onto wet, newly painted surfaces.
 - 2. Provide barrier coats over incompatible primers or remove and re-prime. Notify M.S.U. project representative in writing of problems anticipated with use of specified finish coat material with substrates primed by others.
- D. Cementitious Material Substrates: Remove dust, dirt, grease, oil, release agents, curing compounds, efflorescence, and chalk.

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1. Roughen as required to remove glaze. If hardeners or sealers have been used to improve curing, use mechanical methods of surface preparation. Use abrasive blast-cleaning methods if recommended by the paint manufacturer.
 2. Do not paint surfaces if moisture content or alkalinity of surfaces to be painted exceeds that permitted in manufacturer's written instructions.
 3. Clean concrete floors to be painted with a five percent solution of muriatic acid or other etching cleaner. Flush the floor with clean water to remove acid, neutralize with ammonia, vacuum, rinse and allow drying before painting.
- E. Steel Substrates: Clean non-galvanized ferrous-metal surfaces that have been shop coated: remove oil, grease, dirt, loose mill scale and other foreign substances. Use solvent or mechanical cleaning methods that comply with recommendations of the Steel Structures Painting Council. Touch up bare areas and shop-applied prime coats that have been damaged. Wire-brush; clean with solvents recommended by the paint manufacturer, and touch-up with the same primer as the shop coat.
- F. Galvanized-Metal Substrates: Clean galvanized surfaces with non-petroleum-based solvents so the surface is free of oil and surface contaminants. Remove grease and oil residue from galvanized sheet metal fabricated from coil stock by mechanical methods to produce clean, lightly etched surfaces that promote adhesion of subsequently applied paints. If galvanized metal is chromate passivated ("bonderized") consult manufacturers for appropriate surface preparation and primers.
- G. Aluminum Substrates: Remove surface oxidation.
- H. Wood Substrates:
1. Scrape and clean knots, and apply coat of knot sealer before applying primer.
 2. Sand surfaces that will be exposed to view, and dust off.
 3. Prime edges, ends, faces, undersides, and backsides of wood.
 4. After priming, fill holes and imperfections in the finish surfaces with putty or plastic wood filler. Sand smooth when dried.
 5. Seal tops, bottoms, and cutouts of unprimed wood doors with a heavy coat of varnish or sealer immediately upon delivery.
 6. Stripping and refinishing existing wood doors, trim, etc.
 - a. Contractors shall take care to achieve clean and clear surfaces that will take stain uniformly. In some instances bleaching of the wood may be necessary. All existing varnish and stripping residue shall be removed and the surface neutralized and sanded smooth to assure a smooth and uniform finish.
- I. Plaster Substrates: Do not begin paint application until plaster is fully cured and dry.
- J. Exterior Gypsum Board Substrates: Do not begin paint application until finishing compound is dry and sanded smooth.
- K. Repainting: Prime coats may be omitted with the exception of patched or repaired areas that should be spot-primed to ensure a uniform finish. Special care should be

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taken in re-coating existing alkyd or epoxy surfaces to prevent inter-coat adhesion failures. Painting of patch and repair work shall be painted out to the nearest break line, including areas in corridors, as directed by the M.S.U. Project Representative.

- L. Paint: Carefully mix and prepare paint materials in accordance with manufacturer's directions. Maintain containers used in mixing and application of paint in a clean condition, free of foreign materials or residue. Stir material before application to produce a mixture of uniform density; stir as required during application. Remove any surface film and, if necessary, strain material before using. Do not stir surface film into material. Use only thinners approved by the paint manufacturer and only within recommended limits.
- M. Tinting: Where multiple coats of the same material are applied, tint undercoats to match the color of the finish coat, but in a sufficiently lighter shade to distinguish each separate coat.

3.3 APPLICATION

- A. Paint colors, surface treatments, and finishes are indicated in schedules. Provide finish coats that are compatible with primers used.
- B. Before application of finish coats, apply a prime coat of material as recommended by the manufacturer to material that is required to be painted or finished and has not been primed by others. Re-coat primed and sealed surfaces where evidence of suction spots or unsealed areas in first coat appears, to ensure a finish coat with no burn through or other defects due to insufficient sealing.
- C. Apply materials at not less than the manufacturer's recommended spreading rate. Provide a total dry film thickness of the entire system as recommended by the manufacturer. Apply block fillers to concrete masonry block at a rate to ensure complete coverage with pores filled.
- D. Apply paints according to manufacturer's written instructions. Use applicators and techniques best suited for paint and substrate indicated. Do not paint over dirt, rust, scale, grease, moisture, scuffed surfaces, or conditions detrimental to formation of a durable paint film.
- E. The number of coats and film thickness required is the same regardless of the application method. Do not apply succeeding coats until the previous coat has cured as recommended by the manufacturer. Sand between applications where sanding is required in order to produce an even, smooth surface in accordance with the manufacturer's directions. Sand lightly between each succeeding enamel or varnish coat.
- F. Apply first coat to surfaces that have been cleaned, pre-treated or otherwise prepared for painting as soon as practicable after preparation and before subsequent surface deterioration.

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- G. The term “exposed surfaces” includes areas visible when a permanent or built-in fixture, convector covers, covers for finned tube radiation, grilles, and similar components are in place. Extend coatings in these areas as required to maintain the system integrity and provide desired protection. Paint interior surfaces of ducts, where visible through registers or grilles, with a flat, nonspecular black paint. Paint back sides of access panels and removable or hinged covers to match exposed surfaces.
- H. Paint surfaces behind movable items same as similar exposed surfaces. Before final installation, paint surfaces behind permanently fixed items with prime coat only.
- I. Finish exterior doors on tops, bottoms, and side edges the same as exterior faces.
- J. If undercoats or other conditions show through topcoat, apply additional coats until cured film has a uniform paint finish, color, and appearance. Give special attention to ensure that surfaces, including edges, corners, crevices, welds and exposed fasteners receive a dry film thickness equivalent to that of flat surfaces.
- K. All materials will be applied under adequate lighting, evenly spread and flowed on smoothly. Cut in sharp lines and color breaks.
 - 1. Pigmented (opaque) finishes: completely cover to provide an opaque, smooth surface of uniform finish, color, appearance, and overage. Cloudiness, spotting, holidays, laps, brush marks, runs, sags, or other surface imperfections will not be acceptable.
 - 2. Transparent (clear) finishes: Use multiple coats to produce a glass-smooth surface film of even luster. Provide a finish free of laps, cloudiness, color irregularity, runs, brush marks, orange peel, nail holes, or other surface imperfections. Provide satin finish for final coats.

3.4 CLEANING AND PROTECTION

- A. At end of each workday, remove rubbish, empty cans, rags, and other discarded materials from Project site.
- B. After completing paint application, clean spattered surfaces. Remove spattered paints by washing, scraping, or other methods. Do not scratch or damage adjacent finished surfaces.
- C. Protect work of other trades against damage from paint application. Correct damage to work of other trades by cleaning, repairing, replacing, and refinishing, as approved by Architect, and leave in an undamaged condition.
- D. At completion of construction activities of other trades, touch up and restore damaged or defaced painted surfaces.

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3.5 INTERIOR PAINTING SCHEDULE

A. Concrete and Masonry (other than Concrete Masonry Units):

1. Semi-Gloss Latex Finish:

- a. Two coats latex semi-gloss over a primer. This system for use on surfaces that are not subject to high abrasion or continuously moist conditions.

- 1) Prime Coat: Interior 100% Acrylic Primer
- 2) Intermediate Coat: Latex Based Interior Semi-Gloss Latex Enamel
- 3) Intermediate Coat: Latex Based Interior Semi-Gloss Latex Enamel

2. Polyamide Epoxy Gloss Finish:

- a. Two coats over epoxy sealer, total dry film thickness of the two finish coats not less than 4.0 total mils. This system to be used in all areas that are exposed to chemical attract, constant moisture or frequent washing.

- 1) Prime Coat: Epoxy Sealer
- 2) Intermediate Coat: Polyamide Epoxy Gloss
- 3) Intermediate Coat: Polyamide Epoxy Gloss

B. Concrete Masonry Units Substrates:

1. Semi-Gloss Latex Enamel Finish:

- a. Two coats over block filler. This system for use on surfaces that are not subject to high abrasion or continuously moist conditions.

- 1) Prime Coat: High Performance Latex Block Filler
- 2) Intermediate Coat: Latex Based Interior Semi-Gloss Latex Enamel
- 3) Topcoat: Latex Based Interior Semi-Gloss Latex Enamel

2. Semi-Gloss Alkyd Enamel Finish:

- a. Two coats over block filler with total dry film thickness not less than 3.5 mils, excluding the block filler.

- 1) Prime Coat: High Performance Latex Block Filler
- 2) Intermediate Coat: DTM Alkyd Semi-Gloss Enamel
- 3) Topcoat: DTM Alkyd Semi-Gloss Enamel

3. Polyamide Epoxy Gloss Finish:

- a. Two coats over block filler, total dry film thickness of the two finish coats not less than 4.0 mils. This system to be used in all areas that are exposed to constant moisture or frequent washing.

- 1) Prime Coat: Severe Duty Two Component Epoxy Block Filler

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- 2) Intermediate Coat: Polyamide Epoxy Gloss
- 3) Topcoat: Polyamide Epoxy Gloss

C. Ferrous (and Non-Ferrous, Galvanized, and Aluminum) Metal Substrates:

a. Semi-Gloss Acrylic System

- 1) Two coats over primer with total dry film thickness not less than 2.5 mils.
 - a) Prime Coat: Acrylic Zinc Metal Primer
 - b) First Coat: DTM Acrylic Semi-Gloss Enamel
 - c) Second Coat: DTM Acrylic Semi-Gloss Enamel

D. Gypsum Drywall Systems:

1. Lusterless (Flat) Emulsion System

- a. Two coats. Flat latex finish with good washability and excellent touch-up characteristics. This system to be used only on ceilings, or on wall surfaces that are above eight feet high.
 - 1) Prime Coat: Interior 100% Acrylic Primer
 - 2) Topcoat: Latex Based Interior Flat Paint

2. Latex Interior Eggshell System

- a. Two coats over primer
 - 1) Prime Coat: Interior 100% Acrylic Primer
 - 2) Intermediate Coat: Latex Based Interior Eggshell Enamel
 - 3) Topcoat: Latex Based Interior Eggshell Enamel

3. Latex Interior Semi-Gloss System

- a. Two coats over primer
 - 1) Prime Coat: Interior 100% Acrylic Primer
 - 2) Intermediate Coat: Latex Based Interior Semi-Gloss Latex Enamel
 - 3) Topcoat: Latex Based Interior Semi-Gloss Latex Enamel

4. Odorless Acrylic Enamel Semi-Gloss System

- a. Three coats with total dry film thickness not less than 2.5 mils.
 - 1) Prime Coat: Interior 100% Acrylic Primer
 - 2) Intermediate Coat: DTM Acrylic Semi-Gloss Enamel
 - 3) Topcoat: DTM Acrylic Semi-Gloss Enamel

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5. Polyamide Epoxy Gloss System

- a. Two coats over Interior 100% Acrylic Primer, total dry film thickness of the two finish coats not less than 2.5 mils. This system to be used for drywall and plaster surfaces that are exposed to constant moisture or frequent washing.
 - 1) Prime Coat: Interior 100% Acrylic Primer
 - 2) Intermediate Coat: Polyamide Epoxy Gloss
 - 3) Topcoat: Polyamide Epoxy Gloss

E. Plaster Systems:

1. Lusterless (Flat) Emulsion System

- a. Two coats. Flat latex finish with good washability and excellent touch-up characteristics. This system to be used only on ceilings, or on wall surfaces that are above eight feet high.
 - 1) Prime Coat: Interior 100% Acrylic Primer
 - 2) Finish Coat: Latex Based Interior Flat Paint

2. Latex Interior Eggshell System

- a. Two coats over primer
 - 1) Prime Coat: Interior 100% Acrylic Primer
 - 2) Intermediate Coat: Latex Based Interior Eggshell Enamel
 - 3) Topcoat: Latex Based Interior Eggshell Enamel

3. Latex Interior Semi-Gloss System

- a. Two coats over primer
 - 1) Prime Coat: Interior 100% Acrylic Primer
 - 2) Intermediate Coat: Latex Based Interior Semi-Gloss Latex Enamel
 - 3) Topcoat: Latex Based Interior Semi-Gloss Latex Enamel

4. Polyamide Epoxy Gloss System

- a. Two coats over Interior 100% Acrylic Primer, total dry film thickness of the two finish coats not less than 4.0 mils. This system to be used for drywall and plaster surfaces that are exposed to constant moisture or frequent washing.
 - 1) Prime Coat: Interior 100% Acrylic Primer
 - 2) Intermediate Coat: Polyamide Epoxy Gloss
 - 3) Topcoat: Polyamide Epoxy Gloss

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F. Woodwork and Hardboard System:

1. Semi-Gloss Enamel Finish:

a. Three coats

- 1) Undercoat: Acrylic Enamel Undercoat
- 2) First Coat: DTM Acrylic Semi-Gloss Enamel
- 3) Second Coat: DTM Acrylic Semi-Gloss Enamel

G. Stained Woodwork System:

1. Three finish coats over stain

- a. Stain Coat: Oil-Type Interior Wood Stain
- b. First Coat: Interior Waterborne Urethane Satin
- c. Second Coat: Interior Waterborne Urethane Satin
- d. Third Coat: Interior Waterborne Urethane Satin

H. Problem Areas:

1. Glazed Tile, Ceramic, Porcelain, Tile, Glass, and Marble

- a. First Coat: Acrylic Bonding Primer
- b. Second Coat and Top Coat (required): Use appropriate systems as specified.

2. Damp Areas, Boiler Rooms, etc./ Pipes, Concrete, Walls, and Ceilings

- a. First Coat: Acrylic Moisture Bond Primer
- b. Second Coat: Acrylic Moisture Bond Enamel

3. Commercial Kitchens, Public Restrooms, Animal Care Areas, Shower Rooms, etc. Areas where high abuse and daily cleaning occur.

a. Primer/First Coat:

- 1) Masonry surfaces: Severe Duty Two Component Epoxy Block Filler
- 2) Plaster and Drywall Surfaces: Interior 100% Acrylic Primer

b. Second and third coats: Acrylic Epoxy Gloss or Polyamide Epoxy Gloss

4. Handicap ramps, steps, areas where anti-slip coatings may be required:

- a. Surface preparation: Acid-etch concrete if required. Prime if previously painted.
- b. First Coat: Epoxy Modified Acrylic Anti-slip Coating
- c. Second Coat: Epoxy Modified Acrylic Anti-slip Coating

END OF SECTION

TOILET AND BATH ACCESSORIES

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PART 1 - GENERAL

1.1 ISSUES

- A. None.

1.2 SUMMARY

- A. This Section includes the following:
 - 1. Toilet room accessories.
 - 2. Shower stall accessories.

1.3 SUBMITTALS

- A. Product Data: For each type of product indicated. Include the following:
 - 1. Construction details and dimensions.
 - 2. Anchoring and mounting requirements, including requirements for cutouts in other work and substrate preparation.
 - 3. Material and finish descriptions.
 - 4. Manufacturer's warranty.
- B. Samples: If requested, full size, for each accessory item to verify design, operation, and finish requirements.
- C. Product Schedule: Indicating types, quantities, sizes, and installation locations by room of each accessory required.
 - 1. Identify locations using room designations indicated on Drawings.
- D. Maintenance Data: For toilet and bath accessories to include in maintenance manuals.

1.4 QUALITY ASSURANCE

- A. Source Limitations: For products listed together in the same articles in Part 2, provide products of same manufacturer unless otherwise approved by Architect.
- B. Electrical Components, Devices, and Accessories: Listed and labeled as defined in NFPA 70, Article 100, by a testing agency acceptable to authorities having jurisdiction, and marked for intended use.

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1.5 COORDINATION

- A. Coordinate accessory locations with other work to prevent interference with clearances required for access by people with disabilities, and for proper installation, adjustment, operation, cleaning, and servicing of accessories.
- B. Deliver inserts and anchoring devices set into concrete or masonry as required to prevent delaying the Work.

1.6 WARRANTY

- A. Special Mirror Warranty: Manufacturer's standard form in which manufacturer agrees to replace mirrors that develop visible silver spoilage defects and that fail in materials or workmanship within specified warranty period.
 - 1. Warranty Period: 15 years from date of Substantial Completion.

PART 2 - PRODUCTS

2.1 MATERIALS

- A. Stainless Steel: ASTM A 666, Type 304, 0.0312-inch minimum nominal thickness, unless otherwise indicated.
- B. Brass: ASTM B 19 flat products; ASTM B 16, rods, shapes, forgings, and flat products with finished edges; or ASTM B 30, castings.
- C. Galvanized Steel Mounting Devices: ASTM A 153/A 153M, hot-dip galvanized after fabrication.
- D. Fasteners: Screws, bolts, and other devices of same material as accessory unit and tamper-and-theft resistant where exposed, and of galvanized steel where concealed.
- E. Chrome Plating: ASTM B 456, Service Condition Number SC 2 (moderate service).
- F. Mirrors: ASTM C 1503, Mirror Glazing Quality, clear-glass mirrors, nominal 6.0 mm thick.

2.2 TOILET ROOM ACCESSORIES

- A. Manufacturers: Subject to compliance with requirements, provide all products specified by one of the following manufacturers:
 - 1. A & J Washroom Accessories, Inc.
 - 2. American Specialties, Inc.
 - 3. Bobrick Washroom Equipment, Inc.

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4. Bradley Corporation.
- B. Toilet Tissue (Roll) Dispenser.
 1. Reuse existing.
- C. Grab Bar (Bobrick B6806 or approved equal)
 1. Mounting: Flanges with concealed fasteners.
 2. Material: Stainless steel, 0.05 inch thick with smooth, No. 4, satin finish.
 3. Outside Diameter: 1-1/2 inches.
- D. Mirror Unit (Bobrick B-2908 or approved equal)
 1. Frame: Stainless-steel angle, 0.05 inch thick.
 - a. Corners: Welded and ground smooth.
 2. Hangers: Produce rigid, tamper- and theft-resistant installation, using method indicated below.
 - a. Wall bracket of galvanized steel, equipped with concealed locking devices.
- E. Towel Bar (Bobrick B-550 Series or approved equal)
 1. 18-8 S, type-304, 18-gauge (1.2mm) stainless steel tubing with peened gripping surface. 1-1/4" (32mm) outside diameter.
 2. Bright polished ends match plumbing trim. Ends are welded to flanges. Clearance between the towel bar and wall is 1-1/2" (38mm).
 3. Concealed Mounting Flanges — 18-8 S, type-304, 1/8" thick, stainless steel plate. 2" x 3-1/8" with two holes for attachment to wall.
- F. Coat and Hat Hook (Bobrick B-682 or approved equal)
 1. Hat and Coat Hook, bright polished stainless steel, flange is 2" x 2". Hook 1" W, 6-1/4" H; projects 3-1/16" from wall. Concealed wall plate.

2.3 SHOWER STALL ACCESSORIES

- A. Manufacturers: Subject to compliance with requirements, provide products by one of the following:
 1. A & J Washroom Accessories, Inc.
 2. American Specialties, Inc.
 3. Bobrick Washroom Equipment, Inc.
 4. Bradley Corporation.
- B. Shower Curtain Rod (Bobrick 6047 or approved equal):
 1. Provide rod as part of pre-fab shower unit package.

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- C. Folding Shower Seat (Bobrick B-5181 or approved equal):
 - 1. Provide seat as part of pre-fab shower unit package.

2.4 FABRICATION

- A. General: Fabricate units with tight seams and joints, and exposed edges rolled. Hang doors and access panels with full-length, continuous hinges. Equip units for concealed anchorage and with corrosion-resistant backing plates.
- B. Keys: All devices to be unlocked by a single key. Provide 5 copies of key.

PART 3 - EXECUTION

3.1 INSTALLATION

- A. Install accessories according to manufacturers' written instructions, using fasteners appropriate to substrate indicated and recommended by unit manufacturer. Install units level, plumb, and firmly anchored in locations and at heights indicated.
- B. Grab Bars: Install to withstand a load in any direction of at least 250 lbf, when tested according to method in ASTM F 446.
 - 1. Attach concealed anchors for masonry walls with toggle bolts.
 - 2. Bolt mounting plates to steel plate reinforcing in stud partitions, to expansion shields in concrete walls, to reinforcement in metal partitions, and to thru-bolts welded to back mounting plate, unless otherwise specified. Where back mounting plate on thru-bolts will be exposed to view, anchor the mounting plate to the wall with toggle bolts or concealed anchors.
 - 3. Install at where shown on drawings.
- C. Mirrors:
 - 1. Anchor wall hangers to wall with approved fasteners. Anchor frame to wall hangers with concealed setscrews.
 - 2. Lower edge of mirror will be installed no higher than 40" above the finished floor.
- D. Dispensers and Receptacles-General:
 - 1. Mount where shown on drawings.
- E. Toilet Paper Holders:
 - 1. Mount where shown on drawings.

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F. Paper Towel Dispensers:

1. Mount where shown on drawings.

G. Shower Accessories Mounting Heights:

1. Towel bars: 48 inches to center of bar.
2. Curtain rods: 74 inches to center of rod.
3. Shower seat: 18 inches to top of seat in down position.

3.2 ADJUSTING AND CLEANING

- A. Adjust accessories for unencumbered, smooth operation. Replace damaged or defective items.
- B. Remove temporary labels and protective coatings.
- C. Clean and polish exposed surfaces according to manufacturer's written recommendations.

END OF SECTION

TACTILE SIGNAGE

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PART 1 GENERAL

1.1 SECTION INCLUDES

- A. Interior Signage

1.2 REFERENCES

- A. ICC/ANSI A117.1.2009 Standard on Accessible and Useable Buildings and facilities or applicable standards or authorities having jurisdiction.
- B. ADA Accessibility Guidelines for Buildings and Facilities—ADAAG.

1.3 SUBMITTALS

- A. Submit all materials according to the Conditions of the Contract and Division 1 Specification Sections.
- B. Manufacturer's descriptive literature and product data for each sign product specified.
- C. Shop drawings showing each sign type with the following: size, colors, shape, designs, edge, corners, mounting, dimensions, text, Braille, pictograms as required, and components.
- D. Chart showing manufacturer's full range of available colors for Architect's selection.
- E. One full-size sample showing typical construction to verify materials, colors, and designs prior to production of full signage package.

1.4 DELIVERY, STORAGE, AND HANDLING

- A. Store products in manufacturer's protective packaging until ready for installation.
- B. Store in a dry environment away from dust and abrasive particles.

PART 2 PRODUCTS

2.1 MANUFACTURERS

- A. Kroy Sign Systems; Product Series Thermoformed
7575 E. Redfield Rd., Ste. 113 • Phone: 800-950-5769 • Fax: 480-483-0235
- B. 4.25" high by 8" wide, 1/8" thick thermoformed ABS sign panel with raised text and Braille, and surface painted accent bar.
- C. Requests for substitutions will be considered in accordance with the provisions set forth in Section 01630.

2.2 MATERIALS

- A. 100% Post-Consumer Recycled ABS Plastic suitable for both interior and exterior applications

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2.3 FABRICATION

- A. Signs shall comply with the regulations and standards referenced in Section 10440.1.2.
- B. Thermoformed plate shall be laser or rotary cut for precise dimensions according to specifications.
- C. Characters and pictograms shall be compression molded and raised 1/32" to meet ADA compliance regulations.
- D. Raised text shall be in all capital letters and accompanied by corresponding Grade 2 Braille.

2.4 SIGNS

- A. Provide signs in accordance with Section 10440.3.4 (See sign schedule and drawings)
- B. Compression Molded Plastic Signs:
 - 1. Colors:
 - a. Text and graphics as selected by Architect from manufacturer's standard colors.
 - b. Background as selected by Architect from manufacturer's standard colors.
 - 2. Sign sizes as shown in drawings for each sign type required.
 - 3. Text size: 5/8" minimum to 2" maximum based off a capital letter "I" spaced a minimum of 1/4" away from other lines of text.
 - 4. Font to be as selected by Architect from manufacturer's standard styles. Font to be sans serif in accordance with Section 10440.1.2.
 - 5. Grade 2 Braille to accompany raised text. Braille to be a minimum of 3/8" away from all other raised elements and sign edges for ADA compliance.
 - 6. Pictograms to be provided as required, and accompanied by the International Symbol of Accessibility when necessary.
 - 7. Overall thickness of sign to be 1/8".
 - 8. Corners to be 1/4" Radius.
 - 9. Edges to be straight.
 - 10. Texture to be letters to be smooth
 - 11. Texture of background to be flat matte.

PART 3 EXECUTION

3.1 EXAMINATION

- A. Verify that signage meets the standards set forth in section 10440 Tactile Signage.
- B. Walls should be examined to make sure they are free of debris and ready for installation of signage prior to proceeding.
- C. Notify Architect of unsatisfactory conditions before proceeding.

3.2 INSTALLATION

- A. Signs to be installed 60" Above Finished Floor to baseline of highest tactile copy maximum, and 48" Above Finished Floor to baseline of lowest tactile copy minimum.
- B. Signs to be located +/- 3" from latch side of door jamb. Where there is insufficient wall space, signs will be installed on nearest adjacent wall.

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- C. Signs to be installed level and plumb.
- D. Signs to be installed with double-sided tape and silicone.

3.3 CLEANING AND PROTECTION

- A. Store signs according to section 10 14 67.1.4 until ready for installation.
- B. Clean signs in accordance with manufacturer's written instructions.

3.4 SIGNAGE SCHEDULE

- A. Sign Schedule per sheet A1.02.

END OF SECTION

MISCELLANEOUS SPECIALTIES

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PART 1 GENERAL

1.1 SUMMARY

A. Section Includes:

1. Furnishing and installing miscellaneous specialties at locations shown on drawings.

1.2 SUBMITTALS

A. Samples:

1. Submit if requested by Architect.

B. Shop Drawings and/or Brochures:

1. Submit to Architect. Show pertinent details, shapes and sizes.

1.3 DELIVERY, STORAGE AND HANDLING

- ##### A.
- Store in a suitable condition and protect other materials against damage and discoloration caused by work of this Section.

PART 2 PRODUCTS

2.1 Louver

- ##### A.
- Airolite Model K8206A motorized damper and optional insect screen. Color: Selected from manufacturer's standard acrylic enamel colors.

1. Use Honeywell MS4102F series actuator. Louver is to be powered closed and spring/fail open. Connect actuator to a non-generator fed circuit.

- ##### B.
- Airolite Model 609 fixed damper. Color: Selected from manufacturer's standard acrylic enamel colors.

PART 3 EXECUTION

3.1 INSTALLATION

- ##### A.
- Install miscellaneous specialties at locations shown on drawings and in accordance with approved shop drawings, manufacturer's instructions, code requirements and details shown on drawings.

END OF SECTION

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1. GENERAL

A. RELATED DOCUMENTS

1. The heating, ventilating, and plumbing systems are "Design – Build" and shall follow the guidelines of the specifications, drawings and general provisions of the Contract.

B. SUMMARY

1. Scope of Work

- a. The scope of the project is to furnish, install, and place into operation the following items. Work shall include but is not limited to the following:
 1. Modification of existing plumbing system to accommodate the building renovation.
 2. Installation of vent hood over range in kitchen and ductwork to and through north exterior wall of building.
 3. Modification of existing louver opening to accommodate new motorized louver with a minimum free opening matching area of duct. See Section 10990.
 4. Specific Division 15 products to be used are listed on the drawings.
- b. The Division 15 contractor shall be fully responsible for the final design and permit documents. The contractor shall provide all equipment, controls, labors, sub-contractors and accessories required to install fully operational systems. All coordination between trades is the sole responsibility of the contractor. The contractor's bid shall include all items that are required by code and industry accepted practices.
- c. The contractor shall request all clarifications to the documents and design during the bidding period. By submitting a bid the contractor acknowledges that the firm is qualified to install and place into operation a new HVAC system and modification of the plumbing system, as required by this project.

2. General Conditions

The contractors are directed to incorporate the following conditions into their bid. By submitting a bid the contractor accepts these conditions.

- a. Service Calls during the Warranty Period. The contractor shall include in the bid the cost for three (3) service calls during the first year warranty period. These calls are additional to and above any and all normal warranty calls. This will cover any warranty calls, which are not the contractors warranty responsibility. All warranty calls shall be

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documented in writing and faxed to the owner's representative within 24 hours of the warranty call.

b. The Equipment Suppliers shall certify in writing that the equipment has been installed per the manufacturer's instructions. The supplier shall provide qualified personnel available to the job site at any time as maybe required by the owner, the architect, or the contractor. This representative shall be available within 24 hours during the construction and warranty periods.

c. O&M Manuals. The contractor shall provide the owner with three (3) copies of complete O&M manuals. The manuals shall include all "As-Built" drawings, the Control system diagrams, the control panel as-builts and the identification of all equipment by manufacturer-model number-tagging number. The O&M shall have a complete listing of the name, the address and the phone number of all equipment suppliers and sub-contractors used on the project.

d. Coordination Drawings. Coordination drawings shall be furnished by the Division 15 contractor for review and approval. The drawings shall denote any and all areas that the contractors considers to be a conflict or interference between trades. The coordination drawings shall be created prior to any construction and submitted with the submittal package. Items that considered to be a conflict shall be resolved before construction. Items that are not noted in the coordination drawings are considered to be satisfactory.

C. CODES AND STANDARDS

1. Information contained in this specification is intended to set minimum requirements and is not intended to provide complete design solutions.
2. Comply with the more stringent of governing laws, applicable local codes and regulations.

D. DESIGN CONSIDERATIONS

1. General: Provide energy efficient hvac and plumbing systems requiring minimum level maintenance and maximum level of safety and comfort.
2. Reference: Comply with current issue of local applicable codes, and ASHRAE standards whichever is more stringent.
3. Environment: Consider operating environment for system design and equipment selection. Design solution should allow quick and easy maintenance with little or no down time and a high degree of reliability.
4. Equipment: Locate to provide minimum impact to architecture and interior finishes of the building.
5. Match all exposed elements to similar items already found in building.

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E. SUBMITTALS

1. Submitted data must be complete and specific to this project. General catalog cut sheets will not be reviewed. When equipment or systems are inter-related the submitted data must be for the complete system. The submittals will be reviewed for general compliance with the system. Any system modifications that are due to the proposed equipment must be noted and are the sole responsibility of the contractor. Any additional cost are the sole responsibility of the contractor and will not be an extra to the project.

2. Coordination Drawings. The contractor shall furnish a complete set of drawings which fully coordinates all of the work of the various trades related to the mechanical systems. This includes, but is not limited to, ductwork, structure, piping, plumbing, roof penetrations, electrical, fire protection, lighting, etc. These drawings will disclose any coordination problems prior to construction and avoid field problems. No additional costs will be approved for field coordination problems.

2. DISTRIBUTION

A. Material

1. HVAC ducting (kitchen stove vent). Meet SMACNA standards.
2. Plumbing pipe and tube. Copper. Type appropriate for installation.

B. Distribution

1. Layout. Run horizontally and at right angles to the building structure to the highest extent possible.

END OF SECTION

FIRE SPRINKLER SYSTEM DESIGN / BUILD REQUIREMENTS

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SECTION 15550 – SPRINKLER SYSTEM – DESIGN / BUILD RESPONSIBILITY

PART ONE – GENERAL

1.1 SECTION INCLUDES

- A. Design, fabricate and install a complete fire protection automatic sprinkler system in accordance with the Codes and Standards set forth in these Specifications. Secure all necessary approvals. Sprinkler Contractor is responsible for the design of the system, including head types, spacing, pipe sizes, pipe routing, overall layout, sprinkler service lateral and equipment selection. “Sprinkler Service Lateral” is the piping from the tap in the water main in the public right-of-way to the sprinkler OS&Y control valve. The sprinkler contractor has design-build responsibility to design and construct a system that complies with all Codes. Part of the system will be located in unheated attic space.

1.2 RELATED SECTIONS

- A. The WORK of the following Sections applies to the WORK of this Section. Other Sections of the Specifications, not referenced below, shall also apply to the extent required for proper performance of this WORK.
 - 1. Section 00700 - General Conditions
 - 2. Section 01010- Summary of the Work
 - 3. Section 01350 - Submittals

1.3 QUALIFICATIONS OF CONTRACTOR

- A. For the design, installation and testing of Work under this Section, use only thoroughly trained and experienced personnel completely familiar with the items required and the methods of design installation required by the Codes and Standards indicated.

1.4 CODES AND STANDARDS

- A. The fire protection system shall comply in every respect with the Rules and Regulations of the following authorities:
 - 1. NFPA 13, latest edition.
 - 2. Local and State Codes & Regulations.
 - 3. Insurance Company Underwriter (Factory Mutual Insurance Office “ISO” or equal as approved by the Owner & FmHA).
 - 4. Oregon State Structural Specialty Code, latest edition.
 - 5. NFPA 14, Standpipes, as applicable, latest edition.
 - 6. For residential board & care facilities, comply with the edition of NFPA 101 shown on the title sheet in the drawing set. Obtain the occupant “evacuation capability” classification from the Architect. Design the sprinkler system as required for the “evacuation capability” of the occupants.

1.5 VOC REGULATIONS

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- A. All paints, primers and clear finishes used shall be low volatile organic compound (VOC) type in accordance with Green Seal Standard GS-11 for interior paint, GC-03 for anti-corrosive paint, and South Coast Air Quality Management District (SCAQMD) Rule #1113 for clear wood finishes and stains.
- B. All caulking, sealants and adhesives shall be low VOC type in accordance with SCAQMD Rule #1168.

1.6 FIRE HYDRANT FLOW TEST

- A. Sprinkler Contractor shall obtain and pay for flow test utilizing the piping in the building. The water authority will not permit a hydrant floor test in the street. Owner will apply for the Fire Service Water Line tap, but hydraulic information will be required from the Design Build Sprinkler Contractor. Owner will pay for the Fire Service water line tap fee.
- B. Comply with utility requirements in Specification Section 01010 Summary of the Work.

1.7 SYSTEM DESIGN

- A. Design Build Contract: The Contractor shall be fully responsible for the sprinkler service lateral piping sizing, all piping layouts, equipment selection, hydraulic design, engineering and construction of the system. Sprinkler head and pipe layout indicated on the Drawings is schematic only. The Contractor shall revise layout and pipe sizing as required by the applicable Code(s) and the Insurance Co. Underwriter. Sprinkler system shall be hydraulically calculated in accordance with NFPA 13.
- B. Layout: The Contractor shall be fully responsible for providing acceptable pipe routing and sprinkler coverage patterns complying with the Design Criteria provided herein.
- C. Installation: The Contractor shall be fully responsible for coordination with the contract Documents. If pipe or sprinkler head locations conflict with headroom, equipment access, ductwork, etc., contractor shall re-locate at no cost.
- D. Standpipes: Determine standpipe requirements. Design standpipes if they are required.

1.8 SUBMITTALS

- A. Within 35 calendar days after award of the contract, and before any materials of this Section are delivered to the job site, submit 6 sets of catalog cuts of all equipment furnished under this Section and complete shop drawings to the Architect in Accordance with Section 1340 Submittals
- B. Sprinkler Shop Drawings. Design-build contractor shall submit complete plans, sections, details, product data, hydraulic calculations, and fire hydrant test data. Sprinkler submittals shall comply with NFPA 13, Chapter 14 and the corresponding sections in Annex A14. The following NFPA 13 Sections, Annex Sections and Figures shall apply:
 - 1. Working Plans: 14.1 and Annex A14.1.
 - 2. Water Supply Information: 14.2.
 - 3. Summary Sheet: 14.3.2 and Annex A14.3.2.
 - 4. Detailed Work Sheets: 14.3.3 and Annex A14.3.3.
 - 5. Graph Sheet: 14.3.4 and Annex A14.3.4.
 - 6. Typical Preliminary Plan: Figure A.14.1(a).
 - 7. Owner's Information Certificate: Figure A14.1(b).
 - 8. Typical Working Plans: Figure A14.1.1.
 - 9. Summary Sheet: Figure A14.3.2(a).

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10. Hydraulic Calculation Sheet: Figure A14.3.2(b).
 11. Hydraulic Calculations: Figure A14.3.2(c).
 12. Hydraulic Graph: Figure A14.3.2(d).
 13. Grid System: Figure A14.3.3(15).
 14. Graph Sheet: Figure A14.3.4.
- C. Prior to submittal for Architect's review, secure the approval and stamp of acceptance of the Insurance Services Office (ISO) on 6 sets of drawings and other submittals. Any revisions to The design may require resubmission. In accordance with local code, ISO and/or NFPA requirements.
- D. Include layout drawing of the complete sprinkler system indication relationship of any other overhead items including lighting fixtures and beams.
- E. Include plot plan indicating location of underground connections, control valves, piping and related items, and showing location of all structures within 15 feet of the building being sprinklered.
- F. Include details and sections as required to clearly define and clarify the design, including a materials list describing all proposed materials by manufacturer's name and catalog number.
- G. Local Code Enforcement Agency: Will require copies of the sprinkler shop drawings to be submitted to them for review as a deferred condition of the Building Permit Plan Review. After the Architect reviews, the Contractor shall submit plans to the Local Code Official.
- H. Indicate on the floor plans that the attic piping is a dry system.
- I. Each type of sprinkler head shall be represented on the submittals by its own symbol.
- J. Show the following hydrant test data on the floor plans: required hydrant test data includes static pressure, residual pressure, GPM flowing at residual pressure, hydrant location & identification, date of test, etc.
- K. Product Data for the Fire Department Connection (FDC) shall show compliance with local Fire Department requirements.
- L. Calculation nodes must be shown on the floor plans.
- M. Submittals must be stamped as approved by ISO (Insurance Services Office). Submittals also need to be approved by the Authority Having Jurisdiction. These two (2) approvals shall be obtained prior to submittal to Architect.
- N. The following items that are required by Chapter 14 of NFPA 13 **must** be shown on the floor plans:
1. Section 14.1, Working Plans:
 - a. 14.1.3(10): data on city main, system elevation relative to test hydrant, etc.
 - b. 14.1.3(17): approx capacity, gallons, of the dry pipe system.
 - c. 14.1.3(34): hydraulic reference points that correspond with reference points on the design sheets.
 - d. 14.1.3(43): fire hydrant test data & identification.
 2. Section 14.2, Water Supply Information:
 - a. Water Supply Capacity Information: 14.2.1(1 through 9): hydrant flow, pressures, source of information, etc.
 3. Section 14.3, Hydraulic Calculation Forms:
 - a. Summary Sheet: 14.3.2(5), (7) and (9): hazard classification(s), approving agency and total water requirements, including hose allowances. b. Graph Sheet: 14.3.4(1), (2) and (3): water supply curve, system demand, hose demand, etc.
- O. Record Drawings: During progress of the Work, maintain an accurate record of any changes made in the fire sprinkler system installation from the layout and materials shown on the approved shop drawings.
- P. Manual: Upon completion of the Work, deliver to the Owner one operation manual. A copy of

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the record drawings shall be included in the manual.

1.9 PRODUCT HANDLING

- A. Protection: Use all means necessary to protect the materials of this Section before, during and after installation and to protect the Work and materials of all other trades.
- B. Replacements: In the event of damage, immediately make all repairs and replacements necessary to the approval of the Architect and at no additional cost to the Owner.

1.10 RESPONSIBILITIES OF SPRINKLER CONTRACTOR

- A. General. Sprinkler design/build contractor shall provide all design services required to comply with Codes. Sprinkler design/build contractor shall provide all work required to construct a Code-compliant system. Sprinkler design/build contractor shall provide the following:
 1. Verify Codes - verify all applicable NFPA and International Building Code with the Authority Having Jurisdiction (AHJ). Submit written verification of applicable Codes to the Architect.
 2. Design the system to comply with the International Building Code.
 3. Design the system to comply with NFPA 13.
 4. Design & provide standpipes as required by Codes.
 5. Obtain & pay for hydrant flow test data. If the water supply is a private system (wells, tanks, etc.) obtain & pay for the data required for hydraulic design.
 6. Provide a hydraulically designed system, using software.
 7. Comply with all requirements of the AHJ.
 8. Comply with all requirements of the Underwriter (I.S.O).
 9. Obtain & pay for all permits.
 10. Obtain & pay for all licenses and certifications.
 11. Obtain & pay for all approvals from the Underwriter (I.S.O).
 12. Design system to comply with NFPA 101, as applicable.
 13. Provide sprinkler service lateral that is capable of delivering the required flow and pressure.
 14. Comply with all requirements of the local utility.
 15. Supply all required signage.

PART TWO – PRODUCTS

2.1 PIPING MATERIALS & PIPING LAYOUT

- A. Piping and fittings shall be in conformance with NFPA Codes and listed for service in a sprinkler system, and as follows:
 1. Schedule 10 or schedule 40 steel sprinkler pipe, UL listed, FM approved, per ASTM A – 135 and NFPA 13. Roll-grooved pipe and fittings for working pressure up to 300 psi.
 2. Piping Layout: Lay out and provide all piping as **concealed**. The only exceptions shall be: sprinkler heads, sprinkler piping at the riser, sprinkler piping in Apparatus Bays, and standpipes.

2.2 SPRINKLER SERVICE LATERAL

- A. Provide sprinkler service lateral piping that is Factory Mutual Listed for Fire Line Service from the tap in the water main in the public right-of-way to the sprinkler header control valve.

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2.3 SPRINKLER HEADS

- A. Heads shall be pendant, sidewall, attic type, upright, or other configuration as required by the applicable sprinkler Code. Provide white finish and temperature ratings as required by the applicable Code. Provide freeze proof branch piping as required.

2.4 ALARM VALVE AND ACCESSORIES

- A. Alarm valve shall be as manufactured by Grinnel, Automatic Sprinkler or approved equal. Provide indicator valve, gauges, exterior mounted water flow alarm and any other necessary valves, wiring or accessories necessary for a complete and functional system.

2.5 FLOW AND TAMPER SWITCHES

- A. Sprinkler Monitor Panel: Electrical Contractor (EC) shall provide Sprinkler Monitor Panel where directed by Architect. The Panel will produce a local alarm and is connected to the Internet to provide annunciation at remote sites.
- B. Sprinkler System Devices and Interface:
 - 1. Interface of Signals from Sprinkler System Devices. EC shall provide ANY and ALL "Zone Addressable Modules", as well as ALL other devices and work, that are required to interface the signals from the "Sprinkler System Devices" with the Sprinkler Monitor Panel.
 - 2. Flow Switch. Sprinkler Contractor shall furnish and mount one (1) flow switch. Electrical Contractor shall provide all wiring, terminations and troubleshooting required for proper operation.
 - 3. Tamper Switches. Sprinkler Contractor shall furnish and mount two (2) control valve tamper switches. EC shall provide all wiring, terminations and troubleshooting required for proper operation.
 - 4. Water-Flow Alarm. Sprinkler Contractor shall furnish remote water-flow alarm device. EC shall mount the water-flow alarm. EC shall provide all wiring, terminations and troubleshooting required for proper operation.
 - 5. Coordination. Electrical Contractor shall coordinate with Sprinkler Contractor to obtain proper function of all fire alarm and supervisory signals per NFPA 72, National Fire Alarm Code.

2.6 LOCATIONS SUBJECT TO FREEZING

- A. Areas Subject to Freezing. Identify all coverage locations where sprinklers are subject to freezing: attics, porches, balconies, unheated spaces, etc. Provide suitable equipment to prevent freezing: dry sidewall sprinklers, dry sprinkler piping system, glycerin anti-freeze, etc. For a dry sprinkler system, provide all air compressors required for pressure maintenance. Provide all power and control wiring required for all pressure maintenance compressors, including but not limited to circuit breakers, wiring, cable, and conduit. If permitted by Codes, provide disconnect switch at compressors. Provide supervisory trouble and tamper switch signals per Codes.
- B. Dry System Areas: Provide air compressors for pressure maintenance in dry system areas.

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- C. Power & Control for Pressure Maintenance Compressors: Provide all power & control wiring required to operate pressure maintenance compressors, including but not limited to circuit breakers, wiring, cable, and conduit. If permitted by Codes, provide disconnect switch at compressors. Provide supervisory trouble and tamper switch signals per Codes.
- D. No Wet Piping in Outside Walls. Wet piping in outside walls is prohibited, even if anti-freeze protection is proposed. For protection of outdoor locations, such as porches & balconies, provide dry sprinkler heads only.
- E. Anti-Freeze. Glycerin is the only acceptable anti-freeze. Glycol is prohibited.

2.13 FIRE DEPARTMENT CONNECTIONS (FDC) & PIPING

- A. Provide Fire Department Connection (FDC). Comply with Fire Department requirements for FDC configuration, threads and covers. Provide piping between FDC and the sprinkler header. Provide check valve or backflow preventer in FDC piping, as directed by Fire Department.

2.14 SPRINKLER HEADER

- A. Provide sprinkler header per applicable sprinkler code, the International Plumbing Code and local plumbing code. Comply with water company requirements. Provide all items required for a complete system, including but not limited to: control valves, backflow preventer, check valves, flow meter, pressure gauges, drain fittings & valves.

2.15 BACKFLOW PREVENTER IN SPRINKLER HEADER

- A. Provide backflow preventer in sprinkler header. Comply with applicable sprinkler code, the International Plumbing Code and local plumbing code. If a reduced pressure zone (RPZ) backflow preventer is required, provide all drain fittings & piping between the RPZ and floor drain; plumbing contractor to provide floor drain only.

PART THREE – EXECUTION

3.1 INSTALLATION

- A. General: Install the complete fire sprinkler system in strict accordance with NFPA Codes, the requirements of all State and Local Codes, and of the Insurance Co. Underwriter.
- B. All piping shall be concealed unless otherwise approved by the Architect.
- C. Hangers and supports: Provide hangers and supports at the intervals listed in the manufacturers installation instructions. All branch lines shall be braced at a distance of 6" or less from the tee or ell at each sprinkler head, to resist pipe thrust from sprinkler head activation. Piping laid on open joists or rafters shall be secured to prevent lateral movement.

3.2 INSPECTION AND TESTS

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- A. General: Provide all inspections, approvals, examinations and tests required by NFPA Codes, Local and State Codes, the Insurance Company Underwriter and as indicated below. All tests shall be arranged, performed and paid for by the Sprinkler Contractor. A representative of the Owner and any other Authority having jurisdiction, shall be present during all tests.
- B. Underground piping: Underground mains and lead-in connections to system riser shall be flushed before connection is made to sprinkler piping to remove foreign materials that may have entered the underground piping during the course of the installation. Flushing shall be at the hydraulically calculated water demand rate of the system. Flushing shall continue until water is clear. Method of flushing shall be recorded on the test certificate.
- C. Above ground piping: Prior to closing in of any work, all above ground piping shall be pneumatically tested and visually inspected for leaks. Pressure drop shall not exceed 2 psi over the 24-hour period. Test results shall be recorded on the test certificate.
- D. The main drain valve shall be open and remain open until the system pressure stabilizes. The static and residual pressures shall be recorded on the contractors test certificate.
- E. If pressure-reducing valves are installed each valve shall be tested upon completing of the installation to ensure proper pressure reduction at both maximum and normal inlet pressures.
- F. Upon completion of the installation, a flow test shall be conducted at the most remote sprinkler head from the system riser, by means of a "bucket test". The test shall be performed as follows:
 - 1. At the most remote sprinkler head, install a take-off with a pressure gauge installed. Install an additional extension drop with ball valve attached, and lastly install an extension drop with ball valve attached, and lastly install an additional extension drop with reducer and an "Open" sprinkler head at a height sufficient to allow all water flow to occur into a 30 gallon minimum container. Ball valve shall be opened for exactly one minute. Water volume in container shall be measured and recorded on a Test Certificate along with the static and residual pressure. Water flow shall be a minimum of 18 gallons.
 - 2. The Sprinkler Contractor shall provide a certificate indicating the results of this test.
- G. Test certificates: After installation of the sprinkler system and prior to Substantial Completion of the project, the Sprinkler Contractor shall provide to the Architect, copies of all test certificates required by this Section, including Contractors Material Test Certificates for Underground and Aboveground Piping in accordance with NFPA 13 and "Bucket Test" Certificate. All certificates shall be signed by the contractor and witnessed by the Owners representative.

3.3 REPLACEMENT HEADS

- A. Replacement sprinkler heads shall be provided in the following quantities. Provide a minimum of 3 replacement heads for each sprinkler head type used in the building plus additional heads at the ratio of 1 for every 50 heads installed. Provide sprinkler wrenches as required for each head type.
- B. Sprinkler heads and wrenches shall be housed in a wall-mounted panel, clearly labeled and

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located near the sprinkler riser.

3.4 SYSTEM OPERATION

- A. The sprinkler contractor shall provide the Owner with copies of all manufacturers literature describing the proper operation and maintenance of all equipment and devices installed. The Sprinkler Contractor shall review the complete operation and maintenance of the sprinkler system with the Owners representative and maintenance staff.

END OF SECTION

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1. GENERAL

A. RELATED DOCUMENTS

The electrical system expansion is "Design – Build" and shall follow the guidelines of specifications, drawings, and general provisions of the Contract.

B. SUMMARY

1. Scope of Work

- a. The scope of the project is to furnish, install, and place into operation modifications to the existing electrical systems. The scope of work includes but is not limited to the following:
 1. Specific Division 16 products to be used are listed on drawings and in Luminaire Schedule.
 2. Replace all existing lamps in luminaires with an LED equivalent (2700K). Contractor option to replace luminaires with visually similar fixture with Architect approval.
 3. Provide electrical service to all new equipment in building.
 4. Provide design, coordination, installation, and wiring of all control devices described in drawings and required by equipment installed as part of project.
 5. Reroute conductors and conduits required by the demolition of building elements.
 6. Provide and install new apparatus bay door controls to allow delayed door closing. Provide option for user adjustable control up to at least 15 minutes.
 7. Wall mount fans to push diesel smoke out of apparatus bays through the apparatus bay doors.
 - a. Provide (4) receptacles tied to the opening of any apparatus bay door, locations shown on drawings. Provide user adjustable single timer to control all receptacles up to 15 minutes for fan shut-down. Provide manual override of system. Verify location of control with Architect.
 - b. Fan specifications: 30" diameter aluminum blades with powder coated steel blade cage, 1/2 hp., 2 speeds, 120 volts, adjustable mounting bracket, 90 degree oscillation and fixed position, 8,500-9,600 cfm., 3-prong cord connection.
 8. See architectural drawings for additional elements requiring electrical work and notes referring to electrical work.
 - a. The Division 16 contractor shall be fully responsible for the final design and permit documents. The contractor shall provide all equipment, controls, labors, sub-contractors and accessories required to install fully operational systems. All coordination between trades is the

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sole responsibility of the contractor. The contractor's bid shall include all items that are required by code and industry accepted practices.

b. The contractor shall request all clarifications to the documents and design during the bidding period. By submitting a bid the contractor acknowledges that the firm is qualified to install and place into operation an expansion to the existing electrical systems as required by this project.

2. General Conditions

The contractor is directed to incorporate the following conditions into their bid. By submitting a bid the contractor accepts these conditions.

- a. Service Calls during the Warranty Period. The contractor shall include in the bid the cost for three (3) service calls during the first year warranty period. These calls are additional to and above any and all normal warranty calls. This will cover any warranty calls, which are not the contractor's warranty responsibility. All warranty calls shall be documented in writing and faxed to the owner's representative within 24 hours of the warranty call.
- b. The Equipment Suppliers shall certify in writing that the equipment has been installed per the manufacturer's instructions. The supplier shall provide qualified personnel available to the job site at any time as maybe required by the owner, the architect, or the contractor. This representative shall be available within 24 hours during the construction and warranty periods.
- c. O&M Manuals. The contractor shall provide the owner with three (3) copies of complete O&M manuals. The manuals shall include all "As-Built" drawings, the Control system diagrams, the control panel as-builts and the identification of all equipment by manufacturer-model number-tagging number. The O&M shall have a complete listing of the name, the address and the phone number of all equipment suppliers and sub-contractors used on the project.
- d. Protection of Existing and Special Systems. The existing systems with the building are currently fully operational and functioning as designed. The contractor shall be responsible for making a special effort to protect and avoid damage to existing systems. The more sensitive devices shall be protected from damage and surface dust. Any defective or damaged device will be replaced by the contractor.
- e. Coordination Drawings. Coordination drawings shall be furnished by the Division 16 contractor for review and approval. The drawings shall denote any and all areas that the contractor considers to be a conflict or interference between trades. The coordination drawings shall be created prior to any construction and submitted with the submittal package. Items that considered to be a conflict shall be resolved before construction. Items that are not noted in the coordination drawings are considered to be satisfactory.

C. CODES AND STANDARDS

1. Information contained in this specification is intended to set minimum requirements and is not

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intended to provide complete design solutions.

2. Comply with the more stringent of governing laws, applicable local codes and regulations.

D. DESIGN CONSIDERATIONS

1. General: Provide an energy efficient electrical system requiring minimum level maintenance and maximum level of safety.
2. Reference: Comply with current issue of local applicable codes, including, but not limited to NEC and the NFPA, whichever is more stringent.
3. Environment: Consider operating environment for system design and equipment selection. Design solution should allow quick and easy maintenance with little or no down time and a high degree of reliability.
4. Equipment: Locate to provide minimum impact to architecture and interior finishes of the building.
5. Match all exposed elements to similar items already found in building.

E. SUBMITTALS

1. Submitted data must be complete and specific to this project. General catalog cut sheets will not be reviewed. When equipment or systems are inter-related the submitted data must be for the complete system. The submittals will be reviewed for general compliance with the system. Any system modifications that are due to the proposed equipment must be noted and are the sole responsibility of the contractor. Any additional cost are the sole responsibility of the contractor and will not be an extra to the project.
2. Coordination Drawings. The contractor shall furnish a complete set of drawings which fully coordinates all of the work of the various trades related to the electrical systems. These drawings will disclose any coordination problems prior to construction and avoid field problems. No additional costs will be approved for field coordination problems.

2. DISTRIBUTION

A. WIRING GENERAL

1. Copper wiring.: Four-wire color-coded grounded system. Provide non-continuous grounded systems, i.e. cable trays with separate ground at <25 ohms to ground.

B. POWER DISTRIBUTION

1. Throughout Building: Typically, with either bus duct or cables to sub-distribution panels for lighting, receptacles, and mechanical equipment.

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2. Branch Circuits: Run horizontally and at right angles to building structure.
3. Provide separate sub-panels when required for lighting loads, general power-receptacles loads and special loads.

C. SERVICE PANELS

1. Sub-distribution Panel Boards: Where new are required, circuit breaker type with rated interrupting capacity.
2. Panel Boards: Where new are required, locate where possible to be within 100 ft. of its loads (centrally located).

D. FEEDERS

1. Cable: Copper. Place in conduit.
2. Feeder Size: Comply with local standards but size elevator feeders to carry full load without use of demand factors.

E. BRANCH CIRCUITS

1. Conductors: Copper. Place in conduit.
2. Loads: Calculate with maximum loading of conductors at 100% of connected or calculated load, whichever is greater.
3. Generally, provide horizontal circuiting from panel boards.
4. Provide individual circuits for mechanical equipment.

F. RECEPTACLES

1. Public Spaces: Where new are required, maximum of six duplex receptacles per circuit, located at 25 ft. radius.
2. Gathering and open spaces: Where new are required, maximum of six duplex receptacles per circuit, located for convenience every 25 ft. along wall with one on each side of door.
3. Corridors: Where new are required, maximum of six duplex receptacles per circuit, located every (50 ft. along corridor walls).
4. Mechanical Areas: Where new are required, maximum of six duplex receptacles per circuit, located within 25 ft. of all mechanical equipment in mechanical rooms and on roofs.
5. Rooms and offices: Where new are required, placement to follow residential electrical code receptacle placement as a minimum.

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G. RATED CABLE:

1. Provide plenum cable for control, data and telephone.

3. LIGHTING

A. DESIGN CONSIDERATIONS

1. Service And Access: Locate new lighting fixtures where shown on drawings.
2. Lighting Levels: Design lighting systems to provide code minimum foot-candle (FC) levels or as described on drawings, whichever is more stringent.

B. TYPES

1. New luminaires, see Luminaire Schedule.

C. LIGHTING CONTROLS

1. Renovated spaces: Use existing switches.
2. Newly created rooms: Switch adjacent to door similar to existing rooms.

4. POWER

A. DEVICES

1. Receptacles: Match existing.
2. Switches: Match existing.
3. GFI Outlets: Provide residual current circuit protectors for receptacles as required by code.
4. Device plates: Match existing.

END OF SECTION

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Type		Manufacturer	Model	Notes: 1. All luminaires are 120V. 2. All luminaires are 2700K color temperature UNO. 3. Use pre-bid substitution process for Contractor Option luminaire approval.
A	Reserved			
B	Reserved			Use 100w LED equivalent bulb.
C	Reserved			
D	Restrooms	Sea Gull Lighting	4535791S-04	
E	Reserved			
F	Kitchen	Contractor option	See notes	1" max ht. White finish. Under cabinet linear LED fixture with acrylic diffuser. Fit within cabinet. Switch with overhead fixtures.
G	Exterior foyer	Contractor option	See notes	Replace existing bulb w/LED PAR 38 reflector flood bulb.
H	Reserved			
J	Building interior	Exit Light Company	Cast Aluminum w/options.	Black w/aluminum face. Green LED. Single-sided.
K	Reserved			