NICK FISH TENANT IMPROVEMENT MERKATO

PROJECT MANUAL - VOLUME 1 OF 2

SPECIFICATIONS DIVISIONS 01 - 14

100% CD

MAY 08, 2026

SALAZAR
ARCHITECT

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SECTION 01 10 00
SUMMARY OF WORK

PART 1 GENERAL

1.1 RELATED DOCUMENTS

A. General provisions of the Contract. Drawings and all other Specification Sections apply to this Section.

1.2 SUMMARY

A. This Section Includes:
1. Work Covered by Contract
2. Project Schedule
3. Special Work Requirements
4. Work by Owners and Others
5. Contractor Use of the Site
6. Work Hours, Noise and Temporary Cleanup
7. Site Survey and Staking
8. Staging, Access, Sanitation and Deliveries
9. Security
10. Utilities
11. Sustainability and Waste
12. Permits
13. Materials Testing & Special Inspections
14. Warranty

1.3 WORK COVERED by CONTRACT

A. Project Description:

1. Project Identification: “Merkato Ethiopian Market Tenant Improvements” as further described in the Drawings and Technical Specifications. The tenant improvement project will construct a commercial kitchen, restaurant, and butcher market from (2) existing cold shell commercial spaces.

2. Project Locations: 10550 NE Halsey Street, Portland, OR 97220

3. Project Owner: Prosper Portland (“Owner”). Primary Owner’s Project Representative is Kevin Flagg, Construction Project Manager, 503-823-3060. E-mail: flaggk@prosperportland.us

4. Architect/Engineer Identification: Drawings and Specifications dated May 8th, 2026, prepared by Salazar Architect, 2222 NE Oregon Street Suite 101, Portland, OR 92 S Macadam Ave #314, Portland, OR 97232. Architect of Record: Jennifer Nye

5. Base Bid Work:
   The proposed work at the existing Nick Fish "cold shell" ground floor commercial spaces 1-2 includes new mechanical, electrical, plumbing, and a kitchen equipment package to suit both a butcher shop, kitchen, and restaurant. Other building areas are to remain in use and inhabited throughout installation with no changes to occupancy or operations unless otherwise approved and coordinated by the Owner (Prosper Portland).

6. Alternate Bid Item:
   Owner reserves the exclusive right to accept any, all or none of the Alternate Bid Items. No modifications to Contract Performance Time will be provided by Owner approval of any Alternate bid items, except as shown in the description of the Alternate bid item. Owner further reserves the right to reject any alternate bid item that appears to be unbalanced bid pricing or bid loading.

7. Base Bid Allowance, Unit Prices and/or Design Build Items:
   No bid allowance, unit prices or specific design/build unit items are established for the base bid.

   Any other design build work is further set forth in the Technical Specifications and shown on Drawings – all design, installation work is part of the base bid lump sum price.

8. Contract: Project will be constructed under a Formal Public Improvement Contract for construction issued and managed by the Prosper Portland. All Base Bid Work is lump sum. All Alternative Bid Items unless otherwise indicated are lump sum. All quantities and measurements shown on the Drawings or otherwise set forth in Technical Specifications are estimates only. Contractor is solely responsible to verify all measurements, drawings and site conditions.

B. Contractor shall perform all duties and responsibilities as set forth in the Contract Documents including, but not limited to:

1. Providing and paying for labor, materials, tools, equipment, superintendence, temporary facilities and other services necessary for proper execution and completion of the Work.

2. Paying all required sales, consumer and use taxes.

3. Securing and paying for all Permits, as may be required for this Work, except as described elsewhere in this Section 01 10 00 as paid for by Owner.

4. Complying with all building codes, ordinances and regulations of public authorities having jurisdiction including, but not limited to:

    a. 2022 Oregon Structural Specialty Code, 2020 Oregon Fire Code, 2023 Oregon Plumbing Specialty Code, 2023 Oregon Electrical Specialty Code, and 2022 Oregon Mechanical Specialty Code, and 2021 Oregon Energy Efficiency Specialty Code and all amendments, unless otherwise modified by City of Portland.
    b. Applicable portions of the City of Portland 2020 Standard Construction Specifications.
    c. Drawings and Technical Specifications.
    d. All other related Contract Documents and instructions by the Owner.

C. Contractor Salvage, Furnish to Owner for Salvage materials:

1. N/A

D. Contractor Protection, existing site improvements and materials:

1. Protect all existing structures, signs, footings and related work as noted to ‘protect or preserve.’

E. Owner-Furnished, Contractor-Installed materials: None

F. Contractor Salvage and Recycling: see Construction Waste Management Section 01 74 19

G. Required Mock-ups: None

1.4 PROJECT SCHEDULE

A. Base Bid “Merkato Ethiopian Market”:

1. Must be Substantially Complete within one hundred and twenty (120) calendar days of issuance of Notice to Proceed. Upon reaching Substantial Completion, final Completion fifteen (15) calendar days later.

2. Failure to reach Substantial Completion within one hundred and twenty (120) calendar days shall result in Liquidated Damages being

assessed in the amount of $1000.00/day as further set forth in the General Conditions and the Contract.

1.5 SPECIAL WORK REQUIREMENTS

Contractor will coordinate with Owner/Tenant during prior to and throughout construction to ensure the least possible disturbance to the operating transit facility.

1.6 WORK by OWNER and OTHERS

A. Owner may award separate contracts which will commence and be executed anytime during construction period of this Contract. Cooperate and coordinate with Owner’s separate contractors.

B. Items noted NIC (Not-In-Contract) or OFOI (Owner-Furnished, Owner-Installed) will be furnished and installed by Owner during the construction period of the Contract.

1.7 CONTRACTOR USE of SITE

A. Contractor shall have use and control of the Project Site for construction, staging and other work during the construction period, unless otherwise directed by the Owner. Contractor's use of premises is limited only by Owner's right to perform work or to retain other Contractors on portions of Project.

B. The staging area shall be approved or determined by Owner/Tenant. Contractor to provide all necessary street permits and pay for any temporary utilities. Contractor shall restore staging area upon completion of Work.

C. Contractor shall confine all operations at Project Site to areas identified and authorized by Owner/Tenant.

D. For temporary utilities, weather protection and other constraints for all on-site Work and/or operations, Contractor shall comply with the following:

1. Limit use of premises for Work and storage to allow for work by Owner's separate Contractors, if any.

2. Do not encumber Site with materials or equipment used on any other project.

3. Assume full responsibility for protection and safekeeping of all materials, products and equipment stored on premises, as well as any and all improvements under construction.

4. Move stored products which interfere with operations of Owner, or otherwise as directed by Owner.

5. For temporary utilities, see Special Work Requirements, above.

E. Special Precaution on Access and Use of Site: Work areas are adjacent to city streets with moderate traffic levels, as well as operating passenger railways. Contractor is required deploy all required traffic control measures and devices as further set forth in Security and Traffic control below.

1.8 WORK HOURS, NOISE and TEMPORARY CLEANUP

A. Work to be performed during regular work hours.

B. Contractor shall comply with Noise Variance requirements and the standard City of Portland Ordinance on Noise Title 18 Section 18.10.060 with respect to construction work hours as applied to Loading and Receiving Locations.

C. Contractor may request the Owner consideration of overtime and weekend work hours. Note: Contractor to check Prevailing Wage requirements, if any, when considering overtime or weekend work. The Owner is not responsible to reimburse for any premium costs due to overtime or weekend work unless specifically agreed to in writing.

D. Contractor's failure to promptly perform all temporary cleanup, remove debris or remove equipment may result in the Owner self performing any and all actions necessary to restore the work area, and for Owner to collect damages from the Contractor pursuant to the General Conditions

1.9 SITE SURVEY and STAKING

A. n/a

1.10 STAGING, ACCESS, SANITATION and DELIVERIES

A. Contractor may use the site for necessary staging, stockpiling and performance of Work as set forth in Special Work Requirements.

B. Contractor shall provide for any/all garbage refuse pickup in compliance with OR-OSHA and other regulatory requirements prior to commencing Work.

C. Contractor shall provide temporary sanitation as required by OR-OSHA within the designated staging area.

D. Contractor is responsible for all subcontractor access and other deliveries to the site.

1.11 SECURITY and TRAFFIC CONTROL

A. Contractor is solely responsible for site security and site control, except for authorized Owner entry detailed herein. Contractor shall provide under the Base Bid any necessary site security to assure safety of the Work, of the public, and of the property.

B. Entry to the staging area shall be restricted by the Contractor to only authorized workers, permit and regulatory agencies, and Owner-authorized personnel.

C. All persons entering the work site will check in at job trailer and/or with the Contractor Superintendent and shall comply with any required PPE. Contractor shall have the authority to deny access to any personnel not specifically included on the Owner's Emergency Contact List, or lacking the proper PPE.

D. Prior to start of Field Work, Contractor shall furnish a Temporary Control Plan to Owner for review and approval. Any and all required traffic control barriers, signs, markers, lighted markers etc are the sole responsibility of the Contractor and part of the Base Bid or any Alternate Bid work.

1.12 UTILITIES

A. Utility Work by Contractor:

1. Contractor is responsible for completion of all utility work as set forth in the Drawings and Technical Specifications.

2. All temporary electrical and water used as part of the construction work shall be paid by the Owner.

3. Contractor is responsible for installation and removal of all temporary utility connections and services (if any).

B. Utility Locates & Utility Protection:

1. Contractor shall perform all required utility locates to include notification of Oregon Utility Notification Center prior to any subsurface excavation 1 800-332-2344**.** Additional requirements are set forth under Oregon Revised Statutes ORS 757.542 and Administrative Rule OAR 952-001.

2. If buried utilities not shown on Drawings are discovered, Contractor shall notify Owner immediately without further impacting the utility. Contractor is responsible for protection of any exposed utilities in compliance with applicable utility/code requirements.

C. Utility Work By Owner:

n/a

1.13 SUSTAINABILITY and WASTE

A. The Owner values and supports the highest level of sustainability on all projects. Contractor shall to the maximum extent reasonable and practicable make every effort to reduce waste and minimize net waste to the landfill, and to enhance material reuse by salvage and/or recycling.

B. Waste:

1. Contractor is responsible for the lawful and appropriate disposal of all construction debris.

2. Contractor shall to the extent practicable segregate all construction debris for maximum recycling and/or salvage.

C. Recycling:

Contractor shall maximize recycling of all construction debris in the appropriate manner, as feasible in accordance with BDS General Building Permit and Construction Waste Management Section 01 74 19

1.14 PERMITS

A. Contractor shall:

1. Comply with all permit requirements,

2. Call for any and all required inspections,

3. Close out all permits at the conclusion of the Project.

B. Permits Obtained by Owner:

1. Owner shall, if required, obtain and pay for General Building Permit

2. All general permits shall be furnished to the Contractor and the Contractor shall comply with all permit requirements and call for all inspections and close out all permits as part of base bid costs.

C. Permits Obtained by Contractor:

1. Contractor shall pay for as part of base bid and obtain prior to start of any Work, all trade permits that may be required including but not limited to roofing/reroofing permits and any associated licenses or registrations to obtain them.

1.15 MATERIALS TESTING and SPECIAL INSPECTIONS

A. The General Building Permit, if applicable, will require the Owner to retain an Independent Testing Agency Special Inspector for certain work as shown on the drawings or otherwise referenced in the Technical Specifications or otherwise required in the permit. Special inspections will be required for structural steel erection and fabrication, reinforced concrete and concrete anchors. Contractor shall participate in any City required preconstruction Special Inspection Meetings.

B. The Owner shall retain and pay for all required and necessary testing and Special Inspector reviews. The Owner will provide the Contractor with the name and contact information of the testing agent, and the Contractor shall make all necessary arrangements with the testing agent for all required tests and inspections, including on-site or off-site inspections.

C. The Contractor shall cooperate with the Special Inspector and follow all instructions consistent with the work outlined in the Contract as follows:

1. Any instructions by Special Inspector on work outside the terms of the Contract shall be immediately brought to the Owner's Representative attention.
2. Any work performed outside the terms of the Contract without expressed prior approval of the Owner is not subject to reimbursement, claim and/or dispute.

3. In the event that any test or inspection fails or otherwise deemed not satisfactory to the Special Inspector or General Building Permit, the Contractor is solely responsible for any and all actions necessary to pass the testing protocols including, but not limited to: materials, labor and/or equipment. Any retesting services necessary or required will be

at Contractor's sole cost and responsibility, and shall be deducted from the final Contract payment.

D. All Contractor coordination costs related to Special Inspections are considered part of the Base Contract Price or Alternative Bid work as general condition costs and no reimbursement or claim will be made for additional supervision, bonding or insurance or any other coordination.

1.16 WARRANTY

A. As set forth in the Contract Documents, Contractor upon date of Substantial Completion issued by the Owner, shall warrant all Work to include but not limited to materials, fabrication and workmanship for one (1) calendar year and all plant materials (shrubs and trees) for two (2) calendar years. This provision shall supersede any conflicts (if any) in the other Technical Specification Divisions. (Contractor shall promptly respond to and perform all Owner requests for Warranty work.

B. As set forth in the Contract Documents and as part of close out documents, Contractor shall transfer and assign to the Owner all manufacturer, product standard, and/or special warranties as may be required or otherwise obtained. This provision shall supersede any conflict (if any) in the other Technical Specification Division.

PART 2 PRODUCTS (Not used)

PART 3 EXECUTION (Not used)

END of SECTION 01 10 00

SECTION 01 26 00
CONTRACT MODIFICATION PROCEDURES

PART 1 GENERAL

1.1 RELATED DOCUMENTS

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

1.2 SUMMARY

A. This Section specifies administrative and procedural requirements for handling and processing Contract modifications. Other specific requirements for Changes in Work are set forth in General Conditions Article 7.

1.3 MINOR CHANGES in the WORK

A. When necessary, Owner will issue supplemental instructions authorizing Minor Changes or Clarifications in the Work, not involving adjustment to either the Contract Sum or the Contract Time.

1.4 PROPOSAL REQUESTS

A. Owner-Initiated Proposal Requests: Owner will issue a detailed description of proposed changes in the Work that may require adjustment to the Contract Sum or the Contract Time. If necessary, the description will include supplemental or revised Drawings and Specifications.

1. Proposal Requests issued by Owner are for information only. Do not consider them instructions either to stop work in progress or to execute the proposed change.

2. Change Proposal Requests are not actionable until authorized in written form by either a Construction Change Field Directive or a Change Order.

3. Within 5 working days after receipt of Proposal Request, Contractor shall submit to Owner proposal estimating cost adjustments to the Contract Sum and the Contract Time necessary to execute the change.
   a. Include a list of products and their quantities required or eliminated with unit costs, and the total amount of purchases or credits to be made. If requested, furnish survey data to substantiate quantities.

b. Indicate applicable taxes, delivery charges, equipment rental, and amounts of trade discounts.
c. Include an updated Contractor's Construction Schedule that indicates the effect of the change.

B. Contractor-Initiated Proposals: Contractor may request Owner consideration of Changes in Work that may require adjustment to the Contract Sum or the Contract Time or both. If latent or unforeseen conditions require modifications to the Contract, Contractor may propose changes by submitting a request for a change.

1. Include a complete description with reasons for the change on the Work, and the effect of the change. Indicate what, if any, impact there is of the proposed change on the Contract Sum and the Contract Time.

2. Include a list of quantities of products required or eliminated and unit costs, with total amount of purchases and credits to be made. If requested, furnish survey data to substantiate quantities.

3. Indicate applicable taxes, delivery charges, equipment rental, and amounts of trade discounts.

4. Include an updated Contractor's Construction Schedule that indicates the effect of the change.

1.5 CHANGE ORDER PROCEDURES

A. Follow General Conditions Article 7 Changes in the Work.

PART 2 PRODUCTS (not used)

PART 3 EXECUTION (not used)

END of SECTION 01 26 00

SECTION 01 29 00
PAYMENT PROCEDURES

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

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

1.2 SUMMARY

A. This Section specifies administrative and procedural requirements necessary to prepare and process Applications for Payment.
B. Reference Article 9 Payments in General Conditions for additional requirements.

1.3 APPLICATIONS for PAYMENT

A. General Protocols:

1. Each Application for Payment shall be consistent with previous applications and payments as certified by and reimbursed by Owner.

2. Applications for Payment shall include only work initially included in the Base Bid Work, or work for which a properly executed Change Order has been affected.

3. Payment Application Schedule: Monthly for the prior month's work.

4. Payment Application Forms: Use the Prosper Portland's forms 103 and 103a as form for Applications for Payment. Sample copies are available upon request.

5. Application Preparation: Complete every entry on form. Owner will return incomplete applications without action.

6. Only persons identified by the Contractor and authorized to sign legal documents on behalf of Contractor will be accepted for reimbursement.

7. Transmittal: Submit one electronic, signed and notarized copy of each Application for Payment to Owner. The copy shall include waivers of lien, as required.

8. A Retainage of 5% may be set aside for all partial applications of payment. Retainage will be released upon final payment Initial Application for Payment, Application for Payment at time of Substantial Completion, and Final Application for Payment involve respective requirements according to their order:

1. Application for Progress Payment: Administrative actions and submittals that coincide with submittal of an Application for Progress Payment include the following:

    a. A signed and notarized copy of the Payment Application
    b. Schedule of Values corroborating percentage of work for which reimbursement is being requested.
    c. Certified Payroll for all work for which reimbursement is being requested, as applicable.
    d. Conditional Release and Waiver for Progress Payment.

2. Application for Final Payment: After issuance of the Certificate of Substantial Completion, Final Acceptance is required for Final Payment and shall include submittal of all closeout materials required in Section 01 77 00 Closeout Procedures. Administrative actions and submittals that coincide with submittal of an Application for Final Payment include the following:

    a. One signed and notarized copies of the Payment Application.
    b. Schedule of Values corroborating full value of work, including any and all Changes Orders affected during the project.
    c. Certified Payroll for all work for which reimbursement is being requested, as applicable.
    d. All required closeout materials.
    e. Consent of Surety to Final Payment, as applicable.
    f. Conditional Release and Waiver for Final Payment.

B. For all projects in which Certified Payroll is required, all personnel, their job categories, dates, hours and rates must be accurate and consistent with the work for which reimbursement is being requested. This requirement includes any and all subcontractors utilized on the project.

C. It is generally beneficial to provide the Owner a week in advance of a draft of the Proposed Payment Application for review to mitigate delays that may be the result of clarifications required by the reviewing process.

D. Other specific requirements are set forth in General Conditions Article 9 Payments.

PART 2 PRODUCTS (not used)

PART 3 EXECUTION (not used)

END of SECTION 01 29 00

SECTION 01 31 00
PROJECT MANAGEMENT AND COORDINATION

PART 1 GENERAL

1.1 RELATED DOCUMENTS

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

1.2 SUMMARY

A. This section includes administrative provisions for coordinating construction operations on the Project including, but not limited to, the following:

1. General project coordination procedures
2. Coordination of drawings
3. Administrative and supervisory personnel
4. Project meetings

B. Related Sections: The following Sections contain requirements that relate to this section:

1. Division 1 Section 01 10 00 Summary of Work
2. Division 1 Section 01 32 00 Construction Progress Documentation (or 01 32 10 if applicable)
3. Division 1 Section 01 77 00 Closeout Procedures

1.3 COORDINATION

A. Coordinate construction operations included in various sections of the specifications to ensure efficient and orderly installation of each part of the Work. Coordinate construction operations, included in different Sections that depend on each other for proper installation, connection, quality control and operation.

1. Schedule construction operations in sequence required to obtain the best results where installation of one part of the Work depends on installation of other components, before or after its own installation.

2. Coordinate installation of different components with other contractors to ensure maximum accessibility for required maintenance, service and repair.

3. Make adequate provisions to accommodate items scheduled for later installation.

B. Coordination with others: The contractor is required to accommodate and cooperate with construction performed by other utilities, agencies and contractors working in the area. If necessary, prepare memoranda for distribution to each party involved, outlining special procedures required for coordination. Include such items as required notices, reports, and list of attendees at meetings.

C. Administrative Procedures: Contractor shall coordinate scheduling and timing of required administrative procedures with other construction activities and activities with other contractors to avoid other conflicts and to ensure orderly progress of the Work. Such administrative activities include, but are not limited to, the following:

1. Preparation of Contractor's Construction Schedule (and any other special project schedule requirements)

2. Installation and removal of temporary facilities and controls

3. Coordinating all permit inspections, coordination with special inspectors etc.

4. Delivery and processing of submittals

5. Submitting any RFI, PR/PC and other requests

6. Attending and responding to issues in weekly progress meetings

7. Submitting all Project Closeout items

1.4 SUBMITTALS

A. Staff Names: At the preconstruction meeting, prior to the start of construction operations, submit a list of principal staff assignments, including superintendent and other personnel in attendance at Project site.

B. Identify individuals and their duties and responsibilities; list address and telephone numbers, including office telephone and cell phone numbers.

Provide names, addresses and telephone numbers of individuals assigned as standbys in the absence of individuals assigned to Project. Post copies of list in Project meeting room, in temporary field office, and by each temporary telephone.

C. Provide at the preconstruction meeting for Owner's approval prior to work commencement: proposed subcontractor list, work schedule, schedule of values, pre-demolition waste management plan and any other pre-construction work documentation required.

D. Provide at the weekly progress meetings updated schedule, log information, issues open/closed and other status and update reports.

1.5 PROJECT MEETINGS

A. General: Owner in coordination with Contractor and others, shall schedule and conduct meetings and conferences at Project site, unless otherwise indicated.

B. A preconstruction meeting is required with Owner as well as other preconstruction permit and regulatory agency meetings as may be further specified in Section 01 10 00.

C. Meeting Attendees: Owner in coordination with Contractor and others, shall establish a date and time of each meeting. Upon mobilization on the site, weekly progress meetings shall be held unless otherwise specified in writing by Owner.

D. Meeting Agenda: Owner in coordination with Contractor shall prepare an Agenda and distribute to all invited at least two (2) days prior to the meeting. The agenda shall cover the following general topics:

1. Review of Contractor's 3 week out short-term schedule.

2. Review of the Submittal Log.

3. Review of RFI, ASI Logs.

4. Review of PC/PR, Field Change Directive and Change Order Log.

5. Issues Log indicating old/new issues, person to resolve, timeline to resolve and open/closed status.

E. Meeting Minutes: Owner shall record significant discussions and agreements achieved. Distribute the meeting minutes to everyone concerned, including Owner and Architect/Engineer, within two (2) days of meeting. Unless otherwise objected to, minutes will become final five (5) days after the meeting. Minutes may be used as basis for resolving any

claims, disputes, quality control, deficient work, liquidated damages or other progress documentation.

F. Cost Review Meetings: Owner and Contractor may establish other meetings to discuss cost PR/PC, T&M extra work sheets, changes to schedule etc as may be necessary. Results of these discussions will be shared between the parties.

G. Other On-Site Meetings: Owner may convene any other on-site or off-site meetings with the Contractor as determined necessary and/or prudent.

PART 2 PRODUCTS (Not Used)

PART 3 EXECUTION (Not Used)

END OF SECTION 01 31 00

SECTION 01 33 00
SUBMITTAL PROCEDURES

PART 1 GENERAL

1.1 RELATED DOCUMENTS

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

1.2 SUMMARY

A. This Section includes administrative and procedural requirements for all Submittals. Submittals will be grouped into Preconstruction, Construction and Closeout. Closeout submittals are detailed in Section 01 77 00. Special Project Schedule Submittals are detailed in Section 01 32 10, if applicable. Specific products Submittals are denoted in each Division of Work.

B. It is the Contractor's sole responsibility to timely submit all required Submittals to the Owner for review. Contractor shall prioritize and indicate critical review timelines for all product, shop drawings etc. to assist in the timely review.

C. Contractor shall retain and pay for as part of the Base Bid any necessary engineer or other specialist to prepare any required shop drawings, detail drawings, or other work necessary to comply with the Drawings and Technical Specifications. No extra payment for structural steel detailing, fabrication etc. will be made unless the Owner substantially changes the design.

1.3 PRECONSTRUCTION LIST OF SUBMITTALS

A. Contractor shall provide to the Owner for review and approval the following materials at the Preconstruction Conference prior to commencement any site work:

1. Baseline Construction Schedule: Detailing critical phases of the Work – Reference Section 01 32 00.

2. Schedule of Values: Cost by each Division of work to enable the Owner to adequately make progress payments. Any division of work that exceeds $50,000 value shall be further broken down in key work elements. Unbalanced schedule of values will be rejected, and Contractor shall submit an updated Schedule of Values for Owner

approval. No payment will be made by the Owner until Schedule of Values is approved.

3. Construction Waste Management Plan: Executed copy of Office of Sustainable Development form on construction waste and recycling as required under BDS General Building Permit.

4. List of Subcontractors: Complete listing of all subcontractors intended for use on the project. Owner must review, approve, and authorize all subcontractors.

5. Site Specific Health and Safety Plan

6. Emergency Contact List: Contractor to submit emergency contact personnel associated with the project, and their 24-hour contact numbers.

7. List of Trade Permits: List of all trade and specialty permits anticipated for the project.

8. Other Submittals: As specified in other Divisions or by Permit Requirements to include but not limited to staging plan, traffic control plan, temporary utility connection etc.

1.4 CONSTRUCTION LIST OF SUBMITTALS

A. Contractor shall provide to the Owner for review and approval the following materials at the weekly construction meeting.

1. Updated Construction Schedule: Detailing critical phases of the Work – Reference Section 01 32 00.

2. Other Submittals: As specified in other Divisions or by Permit Requirements to include but not limited to product submittals, shop drawings etc.

1.5 POST CONSTRUCTION CLOSEOUT SUBMITTALS

A. Prepare and submit all submittals per Section 01 77 00.

PART 2 PRODUCTS (Not Used)

PART 3 EXECUTION

3.1 Submittal Procedures

A. Contractor shall submit copies of all required Submittals to the Owner unless otherwise directed in writing. To the extent possible all Submittals will be electronic except where it is impossible (i.e. product samples). Product samples shall to the extent practicable be available for A/E review at the weekly meetings.

B. Identify Project, Submittal Number, Contractor, pertinent drawing number and specification section as appropriate.

C. Apply Contractor's stamp or signature certifying that review, approval, verification of products required, field dimensions, adjacent construction work and coordination of information is in accordance with requirements of the Contract Work and Contract Documents.

D. In general, the Owner will make every effort to timely review all Submittals and shall respond to the Contractor in writing on the disposition. The standard review time is five (5) business days and urgent review three (3) business days. Owner will maintain a Submittal Log to track all submittals and will review this log with the Contractor at the progress meeting.

E. Contractor shall timely resubmit any additional information as may be required by the Owner. No claim for delay will be considered by the Owner for the Contractors failure to timely provide to the Owner all complete and all required submittals nor shall the Contractor be entitled for additional contract performance time or dispensation on liquidated damages, if any.

F. Significant or substantive review comments of Submittals by the Owner, Engineer or Regulating Agency that have impact on cost or schedule, Contractor shall promptly and in no event later than ten (10) calendar days after the Contractor knew or should have known of the impacts notify the Owner in writing. Any changes will be negotiated pursuant to General Conditions Change in Work.

G. Owner will not review submittals to identify all omissions or errors. Owner will provide partial review of submittals when an error or omission is identified. Submittals containing errors or omissions will be returned to the Contractor for revision and re-submittal.

H. Revise and resubmit submittals as required, and identify all changes made since previous submittal. Except as specified otherwise in individual specification sections, submittals shall be resubmitted to the Owner within five (5) calendar days of return of initial reviewed submittals.

END of SECTION 01 33 00

SECTION 01 40 00
QUALITY REQUIREMENTS

PART 1 GENERAL

1.1 RELATED DOCUMENTS

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

1.2 SUMMARY

A. This section includes administrative provisions for quality assurance and quality control.

B. Testing and inspection services are required to verify compliance with requirements specified or indicated. These services do not relieve Contractor of responsibility for compliance with the Contract Document requirements.

1. Specific quality-control requirements for individual construction activities are listed in the Sections that specify those activities. Requirements in those Sections may also cover production of product standards.

2. Specified tests, inspections, and related actions do not limit Contractor's quality control procedures that facilitate compliance with the Contract Document requirements.

3. Requirements for Contractor to provide quality-control services required by Owner or authorities having jurisdiction are not limited by provisions of the Section.

4. Requirements for Contractor to perform stipulated mockup as required to enable Owner review and approval prior to commencing related work elements.

C. Related sections include the following:

1. Division 1 Section 01 10 00 for Special Inspection requirements

2. Divisions 2 through 16 Sections for specified test and inspection, mockup requirements.

1.3 DEFINITIONS

A. Quality-Assurance (Q/A) Services: Activities, actions and procedures performed before and during execution of the Work to guard against defects and deficiencies and to ensure the proposed construction complies with requirements.

B. Quality-Control (Q/C) Services: Test, inspections, procedures, and related actions during execution of the Work to evaluate that completed construction comply with requirements.

C. Testing Agency: An entity engaged to perform specific tests, inspections, or both. Testing Laboratory shall mean the same as testing agency.

1.4 SUBMITTALS

A. QA/QC Required Reports: Prepare and submit certified written reports that include the following:

1. Date of issue.
2. Project title and number.
3. Name, address, and telephone number if testing agency.
4. Dates and locations of samples and tests or inspections.
5. Names of individuals making tests and inspections.
6. Description of the Work and test and inspection method.
7. Identification of product and Specification Section.
8. Complete test or inspection data.
9. Test and inspection results and an interpretation of test results.
10. Ambient conditions at time of sample taking, testing and inspection.
11. Comments or professional opinion on whether tested or inspected Work complies with the Contract Document requirements.
12. Name and signature of laboratory inspector.
13. Recommendations on testing and reinspecting.

1.5 QUALITY ASSURANCE

A. Reference any specific experience requirements and submittal set forth in Section 01 10 00 for certain work elements.

B. Fabricator Qualifications: A firm experienced in producing products similar to those indicated for this project and with a record of successful in-service performance, as well as sufficient production capacity to produce required units.

C. Installer Qualifications: A firm or individual experienced in installing, erecting, or assembling work similar in material, design and extent to that indicated for this project, whose work has resulted in construction with a record of in-service performance.

D. Manufacturer Qualifications: A firm experienced in manufacturing products or systems similar to those indicated for this project and with a record of successful in-service performance.

E. Testing Agency Qualifications: An agency with the experience and capability to conduct testing and inspection indicated and that specializes in types of tests and inspections to be performed. Testing agency must be pre-approved by the City of Portland for the type of testing or Special Inspection required.

1.6 QUALITY CONTROL

A. Owner as set forth in Section 01 10 00 shall engage a testing agency to provide quality-control services specified and required by authorities having jurisdiction.

B. Costs for retesting and reinspecting construction that replaces or is necessitated by work that failed to comply with the Contract Documents will be the Contractor’s responsibility.

C. Special tests and Inspections: Owner shall engage and pay for a testing agency to conduct special tests and inspections required by authorities having jurisdiction.

1. Testing agency will notify Owner, Architect/Engineer and Contractor promptly of irregularities and deficiencies observed in the Work during performance of its services.

2. Testing agency will submit a certified written report of each test, inspection, and similar quality control service to Owner, Architect/ Engineer, Contractor and authorities having jurisdiction.

3. Testing Agency will submit a final report of special tests and inspections at Substantial Completion, which includes a list of unresolved deficiencies.

4. Testing Agency will interpret tests and inspections and state in each report whether tested and inspected work complies with or deviates from the Contract Documents.

5. Testing agency will retest and reinspect all corrected work.

D. Retesting/ Reinspecting: Regardless of whether original tests or inspections were Contractor's responsibility, Contractor shall cooperate with all retesting and reinspecting for construction that revised or replaced Work that failed to comply with requirements established by the Contract Documents at Contractor's sole expense.

E. Associated Services: Cooperate with agencies performing required tests, inspections, and similar quality-control services, and provide reasonable auxiliary services as requested. Notify agency sufficiently in advance of operations to permit assignment of personnel. Provide the following:

1. Access to the Work.

2. Incidental labor and facilities for storage and inspections.

3. Adequate quantities of representative samples of materials that require testing and inspecting. Assist agency in obtaining samples.

4. Facilities to storage and field curing of test samples.

5. Delivery of samples to testing agencies.

6. Preliminary design mix proposed for use for material mixes that require quality control by testing agency.

F. Coordination: Coordinate sequence of activities to accommodate required quality-assurance and quality-control services with a minimum of delay and to avoid necessity of removing and replacing construction to accommodate testing and inspection. Schedule times for tests, inspections, obtaining samples, and similar activity.

G. Required Mock-ups: Perform all required mock-ups for review and approval by Owner, if mock-up is rejected or partially rejected, Contractor at sole expense shall perform a second mock-up for review and approval. Location of mock-up and other specialized handling criteria will be set forth by Owner.

PART 2 PRODUCTS (Not Used)

PART 3 EXECUTION

3.1 REPAIR AND PROTECTION

A. General: On completion of testing, inspecting, sample taking and similar services, repair damaged construction and restore substrates and finishes. Provide materials and comply with installation requirements specified in other Sections of these Specifications. Restore patched areas and extend restoration into adjoining areas in a manner that eliminates evidence of patching.

B. Protect construction exposed by and for quality-control service activities.

C. Repair and protection are Contractor's responsibility, regardless of the assignment of responsibility for quality-control services.

D. Upon completion of all work, remove and properly dispose of any mock-up work and restore premises as set forth in Contract.

END OF SECTION 01 40 00

SECTION 01 74 19
CONSTRUCTION WASTE MANAGEMENT AND DISPOSAL

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

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

1.2 SUMMARY

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

1. Salvaging non-hazardous demolition waste.

2. Recycling non-hazardous demolition waste.

3. Reusing non-hazardous demolition waste.

4. Disposing of non-hazardous demolition waste.

B. Specifically, this section does not cover any requirements for handling hazardous or regulated waste. Contractor shall contact Owner immediately when any hazardous or regulated waste is encountered pursuant to the General Conditions.

C. Owner encourages to the maximum extent practicable Salvage for Reuse, Recycling and only if necessary net waste disposal at landfill.

1.3 DEFINITIONS

A. Demolition Waste: Solid wastes typically including building materials, trash, debris and rubble resulting from demolition activities. Demolition Waste may be recyclable, salvageable, or otherwise destined as Net Landfill Waste.

B. General Disposal/Trash: Any product or material unable to be reused, recycled or salvaged. General Disposal/Trash will ultimately terminate as Net Landfill Waste.

C. Net Landfill Waste: Materials destined for General Disposal that have no value or benefit in being either recycled, reused or salvaged.

D. Recycle: Recovery of demolition waste for subsequent processing into a new usable material.

E. Salvage: Recovery of demolition waste to be employed in its original purpose or function. This includes all salvage of demolition work that is not otherwise specifically identified for salvage for the Owner and/or salvage for reuse as part of the Work.

F. Waste Management Plan: Plan to make maximum environmental and economic use of Demolition Waste in a safe and efficient manner.

1.4 PERFORMANCE REQUIREMENTS

A. General: Develop Pre-Demolition Waste Management Plan that results in efficient use and reuse of resources.

1. Salvage: (as may be applicable to the project)

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2. Recycling: (as may be applicable to the project)
   a. All wood materials not salvageable. Manifest in tonnage.
   b. All concrete, CMU, brick and A/C material. Manifest in tonnage.
   c. All metal, by type. Manifest in tonnage.
   d. All other recyclable materials of value. Manifest in tonnage.

3. Divert as net landfill waste only non-salvageable or non-recyclable materials. No more than 10% of demolition waste shall be diverted as Net Landfill Waste. Manifest in tonnage.

B. Contractor shall provide total of salvaged and recycled materials as a percentage of total demolition waste documented on the *Pre Demolition and Post-Demolition Waste Reduction* form provided by the Owner. This form shall be submitted as part of closeout documents.

1.5 SUBMITTALS

A. Waste Management Plan: Contractor shall execute the Office of Sustainable Development Commercial Construction Project form and provide Owner a copy. In addition, Contractor shall submit five (5) copies of a detailed Pre Demolition Waste Management Plan prior to commencing demolition activities.

B. Waste Reduction forms: Contractor shall submit waste reduction form (supplied by Owner) as follows:

1. With the initial Waste Management Plan the Contractor shall submit a Pre-Demolition Waste Reduction form indicating the amount of recycling and general disposal that is estimated to occur on the project.

2. With the final payment the Contractor shall submit a Post-Demolition Waste Reduction form indicating the actual amount of recycling and general disposal that actually occurred on the Project.

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

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

1.6 QUALITY ASSURANCE

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

B. Waste Management Conference: Prior to commencement of demolition activities the Contractor shall meet with crew and pertinent subcontractors at the Project Site to review methods and procedures related to waste management including, but not limited to:

1. Reviewing and discussing the Waste Management Plan.

2. Reviewing the process of documenting the quantities of each type of waste and its disposition.

3. Reviewing and finalizing procedures for materials separation.

1.7 WASTE MANAGEMENT PLAN

A. General: By submitting a bid, the Contractor agrees to develop a plan consisting of waste identification and waste reduction. The Plan will indicate quantities by either weight or volume, and the Contractor will use the same units of measures consistently throughout the Waste Management Plan.

B. Waste Identification: Indicate anticipated types and quantities of demolition waste generated by the Work. Include estimated quantities, and the assumptions made for the estimates.

C. Waste Reduction Work Plan: List each type of waste and whether it will be recycled or disposed of either as net landfill waste or incinerated. Include points of waste generation, total quantity of each type of waste, quantity for each means of recovery, and handling and transportation procedures.

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

2. Disposed Materials: Indicate how and where materials will be disposed of. Include lists of their names, their addresses and their telephone numbers.

3. Handling and Transportation Procedures: Include method that will be used for separating all recoverable waste. The Plan may include sizes of containers, container labeling and designated location(s) on Project site where materials separation will be located.

D. Forms: Prepare and submit to the Owner with completed Pre- and Post-Waste Reduction forms.

PART 2 - PRODUCTS (Not used)

PART 3 - EXECUTION

3.1 PLAN IMPLEMENTATION

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

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

1. Distribute Waste Management Plan to everyone concerned within three days of return of approved submittal.

2. Distribute Waste Management Plan to crew members and pertinent subcontractors when they first begin work on Site. Review plan procedures and locations established for salvage, recycling and disposal.

3. Distribute to new crew members and pertinent subcontractors before they commence demolition activities.

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

3.2 ON-SITE SALE of DEMOLITION WASTE

A. Salvage items (if any) shall not be sold on the Project Site.

3.3 RECYCLING and SALVAGE DEMOLITION WASTE

A. Ownership:

1. Unless otherwise noted, all demolition recycling and or salvage belongs to the Contractor upon removal from the site. Any revenue generated from selling the materials belongs to the Contractor with no subsequent credit to the Owner.

2. When applicable, Contractor is responsible for notifying all parties that receive demolition waste that the materials may potentially contain hazardous substances.

B. Procedures:

1. Separate recyclable and salvageable demolition waste from general disposal waste, trash and debris to the maximum extent practical.

2. Inspect stockpiles for contamination and, if found, remove contaminated materials.

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

4. Store components off the ground and protect from the weather, as necessary.

5. Remove recyclable waste off Owner's property, and transport to an approved recycling receiver salvage yard or other processor.

3.4 DISPOSAL of WASTE

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

B. Accumulation: Except as otherwise specified, do not allow demolition waste to accumulate on site to the extent that it creates a work hazard.

C. Burning: Waste materials shall only be burned at an approved incinerator acceptable to authorities having jurisdiction.

D. Transportation: Remove and transport demolition waste materials in a manner that will prevent spillage or effluence onto adjacent environs on adjacent areas and public roadways.

END of SECTION 01 74 19

SECTION 01 77 00
CLOSEOUT PROCEDURES

GENERAL

1.1 RELATED DOCUMENTS

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

1.2 SUMMARY

A. This Section includes administrative and procedural requirements for contract closeout, including, but not limited to, the following:

1. Inspection procedures.

2. Final cleaning.

B. Related Sections include the following:

1. Division 1 Section 01 29 00 Payment Procedures for requirements for Applications for Payment for Substantial and Final Completion.

1.3 SUBSTANTIAL COMPLETION

A. Preliminary Procedures: Before requesting inspection for determining date of Substantial Completion, complete the following. List items below that are incomplete in request.

1. Prepare a list of items to be completed and corrected (punch list), the value of items on the list, and reasons why the Work is not complete.

2. Terminate and remove temporary facilities from Project site, along with construction tools, and similar elements.

3. Complete final cleaning requirements.

4. Touch up and otherwise repair and restore marred exposed finishes to eliminate visual defects, including perimeter features.

B. Inspection: Submit a request for inspection for Substantial Completion. On receipt of request, Owner will either proceed with inspection or notify Contractor of unfulfilled requirements. Owner will prepare the Certificate

of Substantial Completion after inspection or will notify Contractor of items that must be completed or corrected before certificate will be issued.

1. Re-inspection: Request re-inspection when the Work identified in previous inspections as incomplete has been completed or corrected.

2. Results of completed inspection will form the basis of requirements for Final Completion.

1.4 FINAL COMPLETION

A. Preliminary Procedures: Before requesting final inspection for determining date of Final Completion, complete the following:

1. Submit a final Application for Payment according to General Conditions Article 5 Payments.

2. Submit certified copy of Substantial Completion inspection list of items to be completed or corrected (punch list). The certified copy of the list shall state that each item has been completed or otherwise resolved for acceptance.

3. Submit all required close-out documentation.

B. Inspection: Submit a request for final inspection for acceptance. On receipt of request, Owner will either proceed with inspection and prepare a final Certificate for Payment if Work is deemed complete and satisfactory or notify Contractor of unfulfilled requirements that must be completed or corrected before certificate will be issued.

1. Re-inspection: Request re-inspection when the Work identified in previous inspections as incomplete is completed or corrected.

1.5 LIST of INCOMPLETE ITEMS (PUNCH LIST)

A. Preparation: Upon request, submit punchlist of uncompleted Work. Include name and identification of each space and area affected by construction operations for incomplete items and items needing correction including, if applicable, areas disturbed by Contractor that are outside the limits of construction.

1.6 CLOSEOUT SUBMITTALS

A. Upon completion of the project, the following items must be provided to the Commission to achieve Final Acceptance, and for the Owner to process final payment:

1. Contractor's final pay application: two (2) copies with original signatures, signed and notarized.

2. Documents demonstrating required inspections have been completed and approved for all Permits.

   a. Preliminary erosion control measures, if applicable
   b. Special compaction testing, if applicable
   c. Specialty permits, as applicable

3. All documentation concerning Construction Waste Management, including all required receipts for recycling, salvage and disposal.

4. Testing reports.

5. Completion documentation of any other permits.

6. Consent of Surety to Final Payment.

7. Final Waiver and Release.

8. As-Builts, and other items listed in the Contract as Submittals.

PART 2 - PRODUCTS (Not used)

PART 3 - EXECUTION

3.1 FINAL CLEANING

A. General: Provide final cleaning. Conduct cleaning and waste-removal operations to comply with local laws and ordinances and Federal and local environmental and antipollution regulations.

B. Complete the following cleaning operations before requesting inspection for certification of Substantial Completion for entire Project or for a portion of Project:

1. Clean Project site and grounds in areas disturbed by construction activities, including landscape development areas, of rubbish, waste material, litter and other foreign substances.

2. Sweep paved areas broom clean. Remove petrochemical spills, stains and other foreign deposits.

3. Rake grounds that are neither planted nor paved to a smooth, even-textured surface.

4. Remove tools, construction equipment, machinery and surplus material from Project site.

5. Clean exposed exterior and interior hard-surfaced finishes to a dirt-free condition free of stains, films and similar foreign substances. Avoid disturbing natural weathering of exterior surfaces.

C. Comply with safety standards for cleaning. Do not burn waste materials. Do not bury debris or excess materials on Owner's property. Do not discharge volatile, harmful or dangerous materials into drainage systems. Remove waste materials from Project site and dispose of lawfully.

END of SECTION 01 77 00

SECTION 03 30 00 - CAST-IN-PLACE CONCRETE

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

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

1.2 SUMMARY

A. Section Includes:

1. Cast-in place concrete, including formwork, reinforcement, concrete materials, mixture design, placement procedures, and finishes for building construction, including the following applications:

a. Horizontal slabs.

2. Concrete finishes and treatments:

a. Smooth-finished concrete slabs, to receive sealer.

3. Void-filling.

B. Related Requirements:

1. Section 05 50 00 “Metal Fabrications” for coordination and provision of embedments and nosings to this Section for installation in forms prior to concrete placement.

1.3 DEFINITIONS

A. Finished Appearance Concrete:

1. Concrete Slabs Exposed to View: Smooth-formed finish concrete, exposed to view on surfaces where indicated, and that requires special concrete materials, formwork, placement, and finishes to obtain specified finish appearance.

B. Cementitious Materials: Portland cement alone or in combination with one or more of the following: blended hydraulic cement, fly ash, slag cement, other pozzolans, and silica fume; materials subject to compliance with requirements.

C. STG: Surface Texture Grade.

1. Ra: Roughness Average.

D. COF: Coefficient of friction.

E. W/C Ratio: The ratio by weight of water to cementitious materials.

1.4 SUBMITTALS

A. Product Data: For each type of product.

B. Design Mixtures: For each concrete mixture. Submit alternate design mixtures when characteristics of materials, Project conditions, weather, test results, or other circumstances warrant adjustments.

1. Indicate amounts of mixing water to be withheld for later addition at Project site.

C. Steel Reinforcement Shop Drawings: Placing Drawings that detail fabrication, bending, and placement. Include bar sizes, lengths, material, grade, bar schedules, stirrup spacing, bent bar diagrams, bar arrangement, splices and laps, mechanical connections, tie spacing, hoop spacing, and supports for concrete reinforcement. The steel reinforcement detailer shall generate all shop

drawing bending and installation details from the structural and architectural drawings and specifications. The use of reproductions or photocopies of the contract drawings shall not be permitted.

1. Provide details of fabrication, bending, and placement prepared according to ACI 315, "Details and Detailing of Concrete Reinforcement." Include special reinforcement required for openings through concrete structures.
2. Shop drawings re-submittals shall clearly identify all revisions to previous submittals.
    a. Heavy ink clouded outlines (revision clouds) shall be drawn around revised areas of individual sheets.
    b. Architect/ Engineer will not review information outside of revision clouds on resubmitted drawings.
3. Separate shop drawing submittal packages shall be made for each of the building sectors shown on the contract drawings. The submittal for each sector shall contain complete fabrication and installation/ erection information for all elements within that sector. References to shop drawings contained in other shop drawing submittal packages shall not be permitted. Submittal packages for each sector shall be staggered at least 14 calendar days.

D. Qualification Data: For Installer, manufacturer, and testing agency.
1. Qualification Data: For firms and persons specified in "Quality Assurance" Article to demonstrate their capabilities and experience. Include lists of completed projects with project names and addresses, names and addresses of Architects and owners, and other information specified.

E. Welding certificates.

F. Material Certificates: For each of the following, signed by manufacturers:
1. Cementitious materials.
2. Admixtures.
3. Form materials and form-release agents.
4. Steel reinforcement and accessories.
5. Fiber reinforcement.
6. Curing compounds.
7. Floor and slab treatments.
8. Bonding agents.
9. Adhesives.
10. Vapor barriers.
11. Semirigid joint filler.
12. Joint-filler strips.
13. Repair materials.

G. Material Test Reports: For the following, from a qualified testing agency:
1. Aggregates: Include service record data indicating absence of deleterious expansion of concrete due to alkali aggregate reactivity.

H. Floor surface flatness and levelness measurements indicating compliance with specified tolerances.

I. Field quality-control reports.

1.5 QUALITY ASSURANCE

A. Installer Qualifications: A qualified installer who employs on Project personnel qualified as ACI-certified Flatwork Technician and Finisher and a supervisor who is an ACI-certified Concrete Flatwork Technician.

B. Manufacturer Qualifications: A firm experienced in manufacturing ready-mixed concrete products and that complies with ASTM C94/C94M requirements for production facilities and equipment.

1. Manufacturer certified according to NRMCA's "Certification of Ready Mixed Concrete Production Facilities."

C. Testing Agency Qualifications: An independent agency, acceptable to authorities having jurisdiction, qualified according to ASTM C1077 and ASTM E329 for testing indicated.

1. Personnel conducting field tests shall be qualified as ACI Concrete Field Testing Technician, Grade 1, according to ACI CP-1 or an equivalent certification program.

2. Personnel performing laboratory tests shall be ACI-certified Concrete Strength Testing Technician and Concrete Laboratory Testing Technician, Grade I. Testing agency laboratory supervisor shall be an ACI-certified Concrete Laboratory Testing Technician, Grade II.

D. Source Limitations: Obtain each type or class of cementitious material of the same brand from the same manufacturer's plant, obtain aggregate from one source, and obtain admixtures through one source from a single manufacturer.

E. Welding Qualifications: Qualify procedures and personnel according to AWS D1.4/D 1.4M.

F. ACI Publications: Comply with the following unless modified by requirements in the Contract Documents:

1. ACI 117, "Specifications for Tolerances for Concrete Construction and Materials."

2. ACI 301, "Specification for Structural Concrete", Sections 1 through 5.

3. ACI 303.R-12, “Guide to Cast-in-Place Architectural Concrete Practice”.

4. ACI 305 “Recommended Practice for Hot Weather Concreting”.

5. ACI 306 “Recommended Practice for Cold Weather Concreting”.

6. ACI 315 “Details and Detailing of Concrete Reinforcement”.

7. ACI 318 “Building Code Requirements for Reinforced Concrete”.

G. Concrete Testing Service: Engage a qualified independent testing agency to perform material evaluation tests and to design concrete mixtures.

1.6 DELIVERY, STORAGE, AND HANDLING

A. Steel Reinforcement: Deliver, store, and handle steel reinforcement to prevent bending and damage. Avoid damaging coatings on steel reinforcement.

1.7 FIELD CONDITIONS

A. Cold-Weather Placement: Comply with ACI 306.1 and as follows. Protect concrete work from physical damage or reduced strength that could be caused by frost, freezing actions, or low temperatures.

1. When average high and low temperature is expected to fall below 40 deg F for three successive days, maintain delivered concrete mixture temperature within the temperature range required by ACI 301.

2. Do not use frozen materials or materials containing ice or snow. Do not place concrete on frozen subgrade or on subgrade containing frozen materials.

3. Do not use calcium chloride, salt, or other materials containing antifreeze agents or chemical accelerators unless otherwise specified and approved in mixture designs.

B. Hot-Weather Placement: Comply with ACI 301 and ACI 305.1, and as follows:

1. Maintain concrete temperature below 90 deg F at time of placement. Chilled mixing water or chopped ice may be used to control temperature, provided water equivalent of ice is calculated to total amount of mixing water. Using liquid nitrogen to cool concrete is Contractor's option.

2. Fog-spray forms, steel reinforcement, and subgrade just before placing concrete. Keep subgrade uniformly moist without standing water, soft spots, or dry areas.

PART 2 - PRODUCTS

2.1 PERFORMANCE REQUIREMENTS

A. ACI Publications: Comply with the following unless modified by requirements in the Contract Documents:

1. ACI 301.

2. ACI 117.

3. ACI 303R, for architectural concrete finishes.

B. Redesign or Departures from Requirements of the Contract Documents Initiated by Contractor:

1. Obtain written acceptance from the Architect and Architect’s consultants.

2. Bear costs for Contractor-initiated or construction error due to changes in type, form, system, or details of construction from those indicated by the contract documents.

3. Costs of review of such changes by Architect and Architect’s consultants will be deducted from the Contract Sum by Change Order.

2.2 STEEL REINFORCEMENT

A. Reinforcing Bars: ASTM A615/A615M, Grade 60, deformed. Refer to Structural Notes or structural drawings.

B. Recycled Content of Steel Products: Postconsumer recycled content plus one-half of preconsumer recycled content not less than 25.

C. Low-Alloy-Steel Reinforcing Bars: ASTM A706/A706M, deformed.

D. Plain-Steel Welded-Wire Reinforcement: ASTM A1064/A1064M, plain, fabricated from as-drawn steel wire into flat sheets.

2.3 REINFORCEMENT ACCESSORIES

A. Joint Dowel Bars: ASTM A615/A615M, Grade 60, plain-steel bars, cut true to length with ends square and free of burrs.

B. Bar Supports: Bolsters, chairs, spacers, and other devices for spacing, supporting, and fastening reinforcing bars and welded-wire reinforcement in place. Manufacture bar supports from steel wire, plastic, or precast concrete according to CRSI's "Manual of Standard Practice," of greater compressive strength than concrete and as follows:

1. For concrete surfaces exposed to view, where legs of wire bar supports contact forms, use CRSI Class 1 plastic-protected steel wire or CRSI Class 2 stainless-steel bar supports.

2.4 CONCRETE MATERIALS

A. Source Limitations: Obtain each type or class of cementitious material of the same brand from the same manufacturer's plant, obtain aggregate from single source, and obtain admixtures from single source from single manufacturer.

1. Regional Materials: Coordinate with requirements in Section 01 81 13 “Sustainability Requirements”.

B. Cementitious Materials:

1. Portland Cement: ASTM C150/C150M, Type I/II.

2. Fly Ash: ASTM C618, Class F or C. Refer to Structural Notes in Drawings for allowed quantities.

3. Silica Fume: ASTM C1240, amorphous silica.

C. Normal-Weight Aggregates: ASTM C33/C33M, coarse aggregate or better, graded. Provide aggregates from a single source.

1. Maximum Coarse-Aggregate Size: Refer to Structural Notes in Drawings.

2. Combined Aggregate Gradation: Well graded from coarsest to finest with not more than 18 percent and not less than 8 percent retained on an individual sieve, except that less than 8 percent may be retained on coarsest sieve and on No. 50 sieve, and less than 8 percent may be retained on sieves finer than No. 50.

3. Recycled Content: Coordinate with project’s structural engineer to maximize recycled content and meet requirements in Section 01 81 13 “Sustainability Requirements”.

D. Water: ASTM C94/C94M and potable.

2.5 ADMIXTURES

A. Air-Entraining Admixture: ASTM C260/C260M.

B. Chemical Admixtures: Certified by manufacturer to be compatible with other admixtures and that do not contribute water-soluble chloride ions exceeding those permitted in hardened concrete. Do not use calcium chloride or admixtures containing calcium chloride.

1. Water-Reducing Admixture: ASTM C494/C494M, Type A.

2. Retarding Admixture: ASTM C494/C494M, Type B.

3. Water-Reducing and Retarding Admixture: ASTM C494/C494M, Type D.

4. High-Range, Water-Reducing Admixture: ASTM C494/C494M, Type F.

5. High-Range, Water-Reducing and Retarding Admixture: ASTM C494/C494M, Type G.

6. Plasticizing and Retarding Admixture: ASTM C1017/C1017M, Type II.

C. Set-Accelerating Corrosion-Inhibiting Admixture: Commercially formulated, anodic inhibitor or mixed cathodic and anodic inhibitor; capable of forming a protective barrier and minimizing chloride reactions with steel reinforcement in concrete and complying with ASTM C494/C494M, Type C.

D. Non-Set-Accelerating Corrosion-Inhibiting Admixture: Commercially formulated, non-set-accelerating, anodic inhibitor or mixed cathodic and anodic inhibitor; capable of forming a protective barrier and minimizing chloride reactions with steel reinforcement in concrete.

2.6 CONCRETE CURING MATERIALS

A. Evaporation Retarder: Waterborne, monomolecular film forming, manufactured for application to fresh concrete.

B. Absorptive Cover: AASHTO M 182, Class 2, burlap cloth made from jute or kenaf, weighing approximately 9 ox./sq. yd. when dry.

C. Moisture-Retaining Cover: ASTM C171, polyethylene film or white burlap-polyethylene sheet.

D. Water: Potable.

E. Clear, Waterborne, Membrane-Forming Curing Compound/ Sealer: ASTM C309, Type 1, Class B, dissipating.

1. Approved Products:

a. MasterKure CC 200 WB by BASF Corp. Construction Systems; www.master-builders-solutions.basf.us.

b. Safe-Cure Clear by ChemMasters, Inc.; www.chemmasters.net.

c. KUREZ W VOX by Euclid Chemical Co. (The); www.euclidchemical.com.

d. TAMMSCURE WB 30 by Euclid Chemical Co. (The).

e. L&M Cure R by Laticrete International, Inc.; www.laticrete.com.

f. 1100 (formerly 1100-CLEAR) by W. R. Meadows, Inc.; www.wrmeadows.com.

2.7 RELATED MATERIALS

A. Reglets: Fabricate reglets of not less than 0.022-inch-thick, galvanized-steel sheet. Temporarily fill or cover face opening of reglet to prevent intrusion of concrete or debris.

B. Epoxy-Bonding Adhesive: ASTM C881, two-component epoxy resin, capable of humid curing and bonding to damp surfaces, of class, suitable for application temperature and grade to suit requirements, and as follows:

1. Types IV and V, load bearing, for bonding hardened or freshly mixed concrete to hardened concrete.

C. Bonding Agent: ASTM C1059, Type II, non-redispersable, acrylic emulsion or styrene butadiene.

2.8 CONCRETE MIXTURES, GENERAL

A. Prepare design mixtures for each type and strength of concrete, proportioned on the basis of laboratory trial mixture or field test data, or both, according to ACI 301.

1. Use a qualified independent testing agency for preparing and reporting proposed mixture designs based on laboratory trial mixtures.

B. Cementitious Materials: Limit percentage, by weight, of cementitious materials other than portland cement in concrete as follows:

1. Fly Ash: 25 percent.

2. Combined Fly Ash or Pozzolan and Slag Cement: 20 percent portland cement minimum, with fly ash or pozzolan not exceeding 25 percent.

3. Silica Fume: 10 percent.

C. Limit water-soluble, chloride-ion content in hardened concrete to 0.15 percent by weight of cement.

D. Synthetic Fiber: uniformly disperse in concrete mix at manufacturer's recommended rate, but not less than 1.5 lb/cu. yd. (0.90 kg/cu. m).

E. Admixtures: Use admixtures according to manufacturer's written instructions.

1. Use high-range water-reducing or plasticizing admixture in concrete, as required, for placement and workability.

2. Use water-reducing and -retarding admixture when required by high temperatures, low humidity, or other adverse placement conditions.

3. Use water-reducing admixture in pumped concrete, concrete for heavy-use industrial slabs and parking structure slabs, concrete required to be watertight, and concrete with a w/c ratio below 0.50.

4. Use corrosion-inhibiting admixture in concrete mixtures where indicated.

2.9 FABRICATING REINFORCEMENT

A. Fabricate steel reinforcement according to CRSI's "Manual of Standard Practice."

2.10 CONCRETE MIXING

A. Ready-Mixed Concrete: Measure, batch, mix, and deliver concrete according to ASTM C94/C94M and ASTM C1116/C1116M, and furnish batch ticket information.

1. When air temperature is between 85 and 90 deg F, reduce mixing and delivery time from 1-1/2 hours to 75 minutes; when air temperature is above 90 deg F, reduce mixing and delivery time to 60 minutes.

PART 3 - EXECUTION

3.1 STEEL REINFORCEMENT INSTALLATION

A. General: Comply with CRSI's "Manual of Standard Practice" for fabricating, placing, and supporting reinforcement.

1. Do not cut or puncture vapor barrier. Repair damage and reseal vapor barrier before placing concrete.

B. Clean reinforcement of loose rust and mill scale, earth, ice, and other foreign materials that reduce bond to concrete.

C. Accurately position, support, and secure reinforcement against displacement. Locate and support reinforcement with bar supports to maintain minimum concrete cover. Do not tack weld crossing reinforcing bars.

1. Weld reinforcing bars according to AWS D1.4, where indicated.

D. Set wire ties with ends directed into concrete, not toward exposed concrete surfaces.

E. Install welded wire fabric in longest practicable lengths on bar supports spaced to minimize sagging. Lap edges and ends of adjoining sheets at least one mesh spacing. Offset laps of adjoining sheet widths to prevent continuous laps in either direction. Lace overlaps with wire.

3.2 JOINTS

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

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

1. Place joints perpendicular to main reinforcement. Continue reinforcement across construction joints, unless otherwise indicated.

2. Form keyed joints as indicated. Embed keys at least 1-1/2 inches into concrete.

3. Locate joints for beams, slabs, joists, and girders in the middle third of spans. Offset joints in girders a minimum distance of twice the beam width from a beam-girder intersection.

4. Locate horizontal joints in walls and columns at underside of floors, slabs, beams, and girders and at the top of footings or floor slabs.

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

6. Use a bonding agent or roughen interface to 1/4 inch amplitude at locations where fresh concrete is placed against hardened or partially hardened concrete surfaces.

C. Contraction Joints: Form weakened-plane contraction joints, sectioning concrete into areas as indicated, or if not indicated, then following column center lines.

1. Slabs Exposed to View: Saw cuts (scoring) are required at exposed slabs-on-grade and elevated slabs as an aesthetic feature to minimize visibility and direct cracking along the cut.

2. Sawed Joints: Cut contraction joints with power saws equipped with shatterproof abrasive or diamond-rimmed blades. Cut 1/8-inch-wide joints into concrete to a depth equal to at least one-fourth of concrete thickness. Perform when cutting action will not tear, abrade, or otherwise damage surface and before concrete develops random contraction cracks, but no more than 12 hours after the slab has been placed.

D. Isolation Joints in Slabs-on-Grade: After removing formwork, install joint-filler strips at slab junctions with vertical surfaces, such as column pedestals, foundation walls, grade beams, and other locations, as indicated.

1. Extend joint-filler strips full width and depth of joint, terminating flush with finished concrete surface, unless otherwise indicated.

2. Install joint-filler strips in lengths as long as practicable. Where more than one length is required, lace or clip sections together.

E. Doweled Joints: Install dowel bars and support assemblies at joints where indicated. Lubricate or asphalt coat one-half of dowel length to prevent concrete bonding to one side of joint.

3.3 CONCRETE PLACEMENT

A. Before placing concrete, verify that installation, reinforcement, and embedded items is complete and that required inspections are completed.

B. Do not add water to concrete during delivery, at Project site, or during placement unless approved by Architect.

C. Before test sampling and placing concrete, water may be added at Project site, subject to limitations of ACI 301.

1. Do not add water to concrete after adding high-range water-reducing admixtures to mixture.

D. Deposit concrete continuously in one layer or in horizontal layers of such thickness that no new concrete is placed on concrete that has hardened enough to cause seams or planes of weakness. If a section cannot be placed continuously, provide construction joints as indicated. Deposit concrete to avoid segregation.

1. Deposit concrete in horizontal layers of depth not to exceed formwork design pressures and in a manner to avoid inclined construction joints.

2. Consolidate placed concrete with mechanical vibrating equipment according to ACI 301.

3. Do not use vibrators to transport concrete inside forms. Insert and withdraw vibrators vertically at uniformly spaced locations to rapidly penetrate placed layer and at least 6 inches into preceding layer. Do not insert vibrators into lower layers of concrete that have begun to lose plasticity. At each insertion, limit duration of vibration to time necessary to consolidate concrete and complete embedment of reinforcement and other embedded items without causing mixture constituents to segregate.

E. Deposit and consolidate concrete for floors and slabs in a continuous operation, within limits of construction joints, until placement of a panel or section is complete.

1. Consolidate concrete during placement operations so concrete is thoroughly worked around reinforcement and other embedded items and into corners.

2. Maintain reinforcement in position on chairs during concrete placement.

3. Screed slab surfaces with a straightedge and strike off to correct elevations.

4. Slope surfaces uniformly to drains where required.

5. Begin initial floating using bull floats or darbies to form a uniform and open-textured surface plane, before excess bleedwater appears on the surface. Do not further disturb slab surfaces before starting finishing operations.

F. Cold-Weather Placement: Comply with ACI 306.1 and as follows. Protect concrete work from physical damage or reduced strength that could be caused by frost, freezing actions, or low temperatures.

1. When average high and low temperature is expected to fall below 40 deg F, maintain delivered concrete mixture temperature within the temperature range required by ACI 301.

2. Do not use frozen materials or materials containing ice or snow. Do not place concrete on frozen subgrade or on subgrade containing frozen materials.

3. Do not use calcium chloride, salt, or other materials containing antifreeze agents or chemical accelerators, unless otherwise specified and approved in mixture designs.

G. Hot-Weather Placement: Comply with ACI 301 and as follows:

1. Maintain concrete temperature below 90 deg F at time of placement. Chilled mixing water or chopped ice may be used to control temperature, provided water equivalent of ice is calculated to total amount of mixing water. Using liquid nitrogen to cool concrete is Contractor's option.

2. Fog-spray forms, steel reinforcement, and subgrade just before placing concrete. Keep subgrade moisture uniform without standing water, soft spots, or dry areas.

3.4 FLOOR FLATNESS AND LEVELNESS TOLERANCES

A. General: Levelness requirements do not apply where sloped surface is required.

B. Flat and Level: Comply with the following requirements, as evaluated by ASTM E1155.

1. Special Finish Work:

a. At slabs-on-grade where indicated to receive other floor finish: FF 50, FF 30 and FL 20, minimum values not less than FF 15 and FL 10.

b. At concrete toppings where indicated to receive other floor finish: FF 50, FF 30 and FL 20, minimum values not less than FF 15 and FL 10.

C. Ramps: Provide maximum slope as described in Drawings, but not to exceed 1:12 when measured with a 24 inch level at any point in the direction of slope.

D. Except as otherwise required, correct surfaces that do not conform to tolerance limitations by grinding high points and filling low points with approved leveling compound, or by removal and replacement of defective work. Areas requiring corrective work will be identified by the Architect. Re-measure corrected areas by the same process.

3.5 FINISHING FLOORS AND SLABS

A. General: Comply with ACI 302.1R recommendations for screeding, restraightening, and finishing operations for concrete surfaces. Do not wet concrete surfaces.

B. Scratch Finish: While still plastic, texture concrete surface that has been screeded and bull-floated or darbied. Use stiff brushes, brooms, or rakes to produce a profile amplitude of 1/4 inch in one direction.

1. Apply scratch finish to surfaces to receive concrete floor toppings.

C. Float Finish: Consolidate surface with power-driven floats or by hand floating if area is small or inaccessible to power-driven floats. Restraighten, cut down high spots, and fill low spots. Repeat float passes and restraightening until surface is left with a uniform, smooth, granular texture.

1. Apply float finish to surfaces to receive trowel finish and to be covered with fluid-applied or sheet waterproofing.

D. Trowel Finish: After applying float finish, apply first troweling and consolidate concrete by hand or power-driven trowel. Continue troweling passes and restraighten until surface is free of trowel marks and uniform in texture and appearance. Grind smooth any surface defects that would telegraph through applied coatings or floor coverings.

1. Apply a trowel finish to surfaces indicated and to floor and slab surfaces exposed to view or to be covered with resilient flooring, carpet, ceramic or quarry tile set over a cleavage membrane, paint, or another thin film-finish coating system.

2. Finish surfaces to the following tolerances, according to ASTM E1155, for a randomly trafficked floor surface:

a. At Slabs-on-Grade: Specified overall values of flatness, F(F) 35; and of levelness, F(L) 25; with minimum local values of flatness, F(F) 24; and of levelness, F(L) 17.

3. The concrete thicknesses indicated are minimums; Contractor shall anticipate additional concrete at center of structural bays where framing will deflect with placement.

4. Concrete floor placement and sequencing shall consider cambers and deflections of steel floor framing; deflections are indicated in General Structural Notes in order to facilitate level placement.

5. At Coated Finish Slabs: For slabs indicated to receive coatings, including clear sealers, lightly machine grind floor surfaces, equivalent to Level 1: Matte finish, 100 grit.

6. Sealed Concrete: At locations indicated provide sealer.

E. Broom Finish: Apply a broom finish to exterior concrete platforms, steps, ramps, and elsewhere as indicated.

1. Immediately after float finishing, slightly roughen trafficked surface by brooming with fiber-bristle broom perpendicular to main traffic route.

2. Coordinate and confirm approval of required final finish with Architect prior to application.

3.6 MISCELLANEOUS CONCRETE ITEM INSTALLATION

A. Filling In: Fill in holes and openings left in concrete structures after work of other trades is in place unless otherwise indicated. Mix, place, and cure concrete, as specified, to blend with in-place construction. Provide other miscellaneous concrete filling indicated or required to complete the Work.

3.7 CONCRETE PROTECTING AND CURING

A. General: Protect freshly placed concrete from premature drying and excessive cold or hot temperatures. Comply with ACI 306.1 for cold-weather protection and ACI 305.1 for hot-weather protection during curing.

B. Evaporation Retarder: Apply evaporation retarder to unformed concrete surfaces if hot, dry, or windy conditions cause moisture loss approaching 0.2 lb/sq. ft. x h before and during finishing

operations. Apply according to manufacturer's written instructions after placing, screeding, and bull floating or darbying concrete, but before float finishing.

C. Unformed Surfaces: Begin curing immediately after finishing concrete. Cure unformed surfaces, including floors and slabs, concrete floor toppings, and other surfaces.

D. Cure concrete according to ACI 308.1, by one or a combination of the following methods:

1. Moisture Curing: Keep surfaces continuously moist for not less than seven days with the following materials:

a. Water.

b. Continuous water-fog spray.

c. Absorptive cover, water saturated, and kept continuously wet. Cover concrete surfaces and edges with 12-inch lap over adjacent absorptive covers.

2. Moisture-Retaining-Cover Curing: Cover concrete surfaces with moisture-retaining cover for curing concrete, placed in widest practicable width, with sides and ends lapped at least 12 inches, and sealed by waterproof tape or adhesive. Cure for not less than seven days. Immediately repair any holes or tears during curing period, using cover material and waterproof tape.

a. Moisture cure or use moisture-retaining covers to cure concrete surfaces to receive floor coverings.

b. Moisture cure or use moisture-retaining covers to cure concrete surfaces to receive penetrating liquid floor treatments.

c. Cure concrete surfaces to receive floor coverings with either a moisture-retaining cover or a curing compound that the manufacturer certifies does not interfere with bonding of floor covering used on Project.

3. Curing Compound: Apply uniformly in continuous operation by power spray or roller according to manufacturer's written instructions. Recoat areas subjected to heavy rainfall within three hours after initial application. Maintain continuity of coating and repair damage during curing period.

a. Removal: After curing period has elapsed, remove curing compound without damaging concrete surfaces by method recommended by curing compound manufacturer unless manufacturer certifies curing compound does not interfere with bonding of floor covering used on Project.

4. Curing and Sealing Compound: Apply uniformly to floors and slabs indicated in a continuous operation by power spray or roller according to manufacturer's written instructions. Recoat areas subjected to heavy rainfall within three hours after initial application. Repeat process 24 hours later and apply a second coat. Maintain continuity of coating and repair damage during curing period.

3.8 JOINT FILLING

A. Prepare, clean, and install joint filler according to manufacturer's written instructions.

1. Defer joint filling until concrete has aged at least six months. Do not fill joints until construction traffic has permanently ceased.

B. Remove dirt, debris, saw cuttings, curing compounds, and sealers from joints; leave contact faces of joints clean and dry.

C. Install semirigid joint filler full depth in saw-cut joints and at least 2 inches deep in formed joints. Overfill joint and trim joint filler flush with top of joint after hardening.

3.9 CONCRETE SURFACE REPAIRS

A. Defective Concrete: Repair and patch defective areas when approved by Architect. Remove and replace concrete that cannot be repaired and patched to Architect's approval.

B. Patching Mortar: Mix dry-pack patching mortar, consisting of 1 part portland cement to 2-1/2 parts fine aggregate passing a No. 16 sieve, using only enough water for handling and placing.

C. Repairing Unformed Surfaces: Test unformed surfaces, such as floors and slabs, for finish and verify surface tolerances specified for each surface. Correct low and high areas. Test surfaces sloped to drain for trueness of slope and smoothness; use a sloped template.

1. Repair finished surfaces containing defects. Surface defects include spalls, popouts, honeycombs, rock pockets, crazing and cracks in excess of 0.01 inch wide or that penetrate to reinforcement or completely through unreinforced sections regardless of width, and other objectionable conditions.

2. After concrete has cured at least 14 days, correct high areas by grinding.

3. Correct localized low areas during or immediately after completing surface finishing operations by cutting out low areas and replacing with patching mortar. Finish repaired areas to blend into adjacent concrete.

4. Correct other low areas scheduled to receive floor coverings with a repair underlayment. Prepare, mix, and apply repair underlayment and primer according to manufacturer's written instructions to produce a smooth, uniform, plane, and level surface. Feather edges to match adjacent floor elevations.

5. Correct other low areas scheduled to remain exposed with a repair topping. Cut out low areas to ensure a minimum repair topping depth of 1/4 inch to match adjacent floor elevations. Prepare, mix, and apply repair topping and primer according to manufacturer's written instructions to produce a smooth, uniform, plane, and level surface.

6. Repair defective areas, except random cracks and single holes 1 inch or less in diameter, by cutting out and replacing with fresh concrete. Remove defective areas with clean, square cuts and expose steel reinforcement with at least a 3/4-inch clearance all around. Dampen concrete surfaces in contact with patching concrete and apply bonding agent. Mix patching concrete of same materials and mixture as original concrete, except without coarse aggregate. Place, compact, and finish to blend with adjacent finished concrete. Cure in same manner as adjacent concrete.

7. Repair random cracks and single holes 1 inch or less in diameter with patching mortar. Groove top of cracks and cut out holes to sound concrete and clean off dust, dirt, and loose particles. Dampen cleaned concrete surfaces and apply bonding agent. Place patching mortar before bonding agent has dried. Compact patching mortar and finish to match adjacent concrete. Keep patched area continuously moist for at least 72 hours.

D. Perform structural repairs of concrete, subject to Architect's approval, using epoxy adhesive and patching mortar.

E. Repair materials and installation not specified above may be used, subject to Architect's approval.

3.10 VOID-FILLING

A. Fill voids at cast-in-place concrete and masonry throughout the project to prevent access to interior spaces, both occupied and not-occupied, by insects and rodents. This includes at openings created for the passage of piping, wiring, or other work which creates openings that could provide access to vermin.

B. Void-Filling Mortar: Mix dry-pack patching mortar, consisting of 1 part portland cement to 2-1/2 parts fine aggregate passing a No. 16 sieve, using only enough water for handling and placing.

3.11 FIELD QUALITY CONTROL

A. Special Inspections: Owner will engage a special inspector and qualified testing and inspecting agency to perform field tests and inspections and prepare test reports.

B. Testing Agency: Engage a qualified testing and inspecting agency to perform tests and inspections and to submit reports.

C. Inspections: As indicated in the General Structural Notes.

D. Concrete Tests: Testing of composite samples of fresh concrete obtained according to ASTM C172/C172M shall be performed according to the following requirements:

1. Testing Frequency: Obtain one composite sample for each day's pour of each concrete mixture exceeding 5 cu. yd., but less than 25 cu. yd., plus one set for each additional 50 cu. yd. or fraction thereof.

2. Testing Frequency: Obtain at least one composite sample for each 150 cu. yd. or fraction thereof of each concrete mixture placed each day.

   a. When frequency of testing provides fewer than five compressive-strength tests for each concrete mixture, testing shall be conducted from at least five randomly selected batches or from each batch if fewer than five are used.

3. Slump: ASTM C143/C143M; one test at point of placement for each composite sample, but not less than one test for each day's pour of each concrete mixture. Perform additional tests when concrete consistency appears to change.

4. Air Content: ASTM C231/C231M, pressure method, for normal-weight concrete; ASTM C173/C173M, volumetric method, for structural lightweight concrete; one test for each composite sample, but not less than one test for each day's pour of each concrete mixture.

5. Concrete Temperature: ASTM C1064/C1064M; one test hourly when air temperature is 40 deg F and below or 80 deg F and above, and one test for each composite sample.

6. Unit Weight: ASTM C567/C567M, fresh unit weight of structural lightweight concrete; one test for each composite sample, but not less than one test for each day's pour of each concrete mixture.

7. Compression Test Specimens: ASTM C31/C31M.

   a. Cast and laboratory cure two sets of two standard cylinder specimens for each composite sample.

   b. Cast and field cure two sets of two standard cylinder specimens for each composite sample.

8. Compressive-Strength Tests: ASTM C39/C39M; test one set of two laboratory-cured specimens at 7 days, one set of two specimens at 28 days, and one set of two specimens at 90 days when indicated in the general structural notes.

   a. Test one set of two field-cured specimens at 7 days and one set of two specimens at 28 days.

   b. A compressive-strength test shall be the average compressive strength from a set of two specimens obtained from same composite sample and tested at age indicated.

9. When strength of field-cured cylinders is less than 85 percent of companion laboratory-cured cylinders, Contractor shall evaluate operations and provide corrective procedures for protecting and curing in-place concrete.

10. Strength of each concrete mixture will be satisfactory if every average of any three consecutive compressive-strength tests equals or exceeds specified compressive strength

and no compressive-strength test value falls below specified compressive strength by more than 500 psi.

11. Test results shall be reported in writing to Architect, concrete manufacturer, and Contractor within 48 hours of testing. Reports of compressive-strength tests shall contain Project identification name and number, date of concrete placement, name of concrete testing and inspecting agency, location of concrete batch in Work, design compressive strength at 28 days and 90 days if applicable, concrete mixture proportions and materials, compressive breaking strength, and type of break for both 7-, 28-, and 90-day tests where required in the general structural notes.
12. Nondestructive Testing: Impact hammer, sonoscope, or other nondestructive device may be permitted by Architect but will not be used as sole basis for approval or rejection of concrete.
13. Additional Tests: Testing and inspecting agency shall make additional tests of concrete when test results indicate that slump, air entrainment, compressive strengths, or other requirements have not been met, as directed by Architect. Testing and inspecting agency may conduct tests to determine adequacy of concrete by cored cylinders complying with ASTM C42/C42M or by other methods as directed by Architect.
14. Additional testing and inspecting, at Contractor's expense, will be performed to determine compliance of replaced or additional work with specified requirements.
15. Correct deficiencies in the Work that test reports and inspections indicate do not comply with the Contract Documents.

E. Measure floor and slab flatness and levelness according to ASTM E1155 within 48 hours of finishing.

END OF SECTION

SECTION 03 35 43 - POLISHED CONCRETE FLOOR FINISHING

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

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

1.2 SUMMARY

A. Section Includes:

1. Hardened, ground, and polished concrete treatment (CONC-1).

B. Related Requirements:

1. Section 03 30 00 "Cast-in-Place Concrete" for concrete materials, coordination of mix design, aggregates, placements procedures, and curing requirements for concrete slabs indicated for polished concrete finish.

1.3 COORDINATION

A. Coordinate concrete mix designs and polishing requirements with Section 03 30 00 “Cast-in-Place Concrete”.

1.4 SUBMITTALS

A. Product Data: For each type of product.

B. Polishing Schedule: Submit plan showing polished concrete surfaces and schedule of polishing operations for each area of polished concrete before start of polishing operations. Include locations of all joints, including construction joints.

C. Samples for Initial Selection: For each type of product.

D. Samples for Verification: For each type of exposed color.

E. Qualification Data: For Installer.

F. Material Certificates: For each of the following, signed by manufacturers:

1. Repair materials.

2. Liquid floor treatments.

1.5 QUALITY ASSURANCE

A. Special Finish Concrete Work: Performed by expert entity having in-depth knowledge of a wide variety of finish methods and equipment suitable for the type of finish in the locations required for the Work. Applicator shall be approved by the manufacturer of the required finishing system and have a successful record of experience with this finish process and the equipment proposed for the Work. Submit documentation for five previous projects including equipment and methods used and the name of the equipment operator(s), complete information on the finishing process and photographic documentation of finishing from original surface to completion.

1. Individual in Responsible Control: For work of this s have ACI Craftsman Certification as Commercial/Industrial Flatwork Specialist - High Tolerance; individual shall be on site at all times work is actively in progress.

B. Field Sample Panels: After approval of verification sample and before casting concrete, produce field sample panels to demonstrate the approved range of selections made under Sample

submittals. Produce a minimum of three sets of full-scale panels, approximately 48 by 48 inches minimum, to demonstrate the expected range of finish, color, and appearance variations.

1. Locate panels as indicated or, if not indicated, as directed by Architect.
2. Maintain field sample panels during construction in an undisturbed condition as a standard for judging the completed Work.
3. Demolish and remove field sample panels when directed.

1.6 FIELD CONDITIONS

A. Traffic Control: Maintain access for vehicular and pedestrian traffic as required for other construction activities.

PART 2 - PRODUCTS

2.1 PERFORMANCE REQUIREMENTS

A. General: Polished concrete surfaces shall match Architect's control reference sample. Installer is responsible for coordinating concrete mix designs, placement, finishing procedures and any other concrete related items impacting finishing for concrete floors to receive polished concrete finishing.

B. Polish Level: Provide polished concrete surfaces meeting the following criteria, as determined by Concrete Sawing and Drilling Assoc. (CSDA) standard CSDA-ST-115 Measuring Concrete Micro Surface Texture:

1. Surface Texture Grade (STG): B-3; 64 microinches (µin).
2. Surface Grade: Hone Smooth.
3. Final Grit: 400 grit; high sheen.

C. Aggregate Level: Provide polished concrete surfaces meeting the following criteria, as determined by Concrete Polishing Assoc. of America. (CPAA) standard:

1. Class B: 1/8-inch minimum depth of cut, or depth required for specified aggregate exposure.
2. Standard drainage rock; chunky aggregate exposure; large aggregate exposure at random locations.

D. Clarity and Gloss: Provide polished concrete surfaces meeting the following criteria, as determined by Concrete Polishing Assoc. of America. (CPAA) standard:

1. Clarity/ Gloss Level: Level 2 to 3.
2. Reflective Clarity: Not less than 50 as tested per ASTM D5767.
3. Reflective Sheen (Gloss): 30-40 as tested per ASTM D523.

E. Finished Surface Coefficient of Friction: Not less than 0.60 Static Coefficient of Friction (SCOF) and 0.40 Dynamic Coefficient of Friction (DCOF) on non-sloped surfaces as tested per ANSI/ NFSI B101.1 and B101.3.

2.2 LIQUID FLOOR TREATMENTS

A. Penetrating Liquid Floor Treatments for Hardened, Ground, and Polished Concrete Finish: Clear, waterborne solution of inorganic silicate or siliconate materials and proprietary components; odorless; that penetrates, hardens, and is suitable for polished concrete surfaces.

B. Acceptable Finishing Systems: Provide one of the following:

1. Euco Diamond Hard by Euclid Chemical Co.; www.euclid.com.

2. Hiperfloor Commercial Finish by Husqvarna; www.husqvarna.com.
3. FGS PermaShine by L&M Construction Chemicals, Inc., Div. of Laticrete International, Inc.; www.fgs-permashine.com.
4. Retroplate Concrete Polishing System by Retroplate; www.retroplatesystem.com.

PART 3 - EXECUTION

3.1 PREPARATION

A. Prior to starting work identify FF values of slab in each area where diamond polish finish is required and verify compliance with requirements in Section 03 30 00 “Cast-in-Place Concrete”. Correct areas that deviate beyond specified tolerance until they are brought into compliance.
   1. Utilize grout mortar forced into the pore structure of the concrete substrate to fill cracks and surface imperfections
   2. Provide coordination with subsequent work to ensure finished concrete is without damage and deterioration at Substantial Completion.

B. Joints: Coordinate joint location and installation with work of Section 03 30 00 “Cast-in-Place Concrete”; provide for joint treatments as work of this Section.
   1. Utilize compressible joint Filler to fill joints to prevent the infiltration of debris and provide support for sealants applied to the exposed surface; refer to Section 07 92 00 “Joint Sealants” for requirements.

3.2 POLISHING

A. General: Avoid hand tools to greatest extent possible for consistent finish and control. Grind, hone and polish using grits required to achieve approved finish.

B. Apply penetrating liquid floor treatment to cured and prepared slabs.

C. Machine grind floor surfaces to receive polished finishes level and smooth and to depth required to reveal aggregate.
   1. Perform finishing operations in as continuous an operation as possible. Provide uniform appearance throughout the finished Work
   2. Provide edge grinding at floor and ramp perimeters, and at stair treads and risers at Lounge 102.

D. Apply penetrating liquid floor treatment for polished concrete in polishing sequence and according to manufacturer's written instructions, allowing recommended drying time between successive coats.

E. Continue polishing with progressively finer-grit diamond polishing pads to finish level specified.
   1. Provide edge polishing at floor and ramp perimeters and stair treads and risers.
   2. Control and dispose of waste products produced by grinding and polishing operations.
   3. Neutralize and clean polished floor surfaces.

F. Apply liquid floor sealer to ground, treated and polished slabs.

3.3 FIELD QUALITY CONTROL

A. Provide measuring and evaluation of Texture of concrete micro surface texture in accordance with CSDA-ST-115 Measuring Concrete Micro Surface Texture as work of this Section

B. Slip Resistance Traffic surface: Evaluate finished flatwork per ANSI B101.1 Static Coefficient of Friction and B101.3 Dynamic Coefficient of Friction for compliance with requirements.

1. Flatness and Level: FF 50 and FL 30 with minimum values not less than FF 35 and FL 20; evaluated per ACI 117 and ASTM E1155.
2. Reflective Clarity and Gloss: Evaluate per ASTM D5767 and ASTM D523 following surface refinement and prior to and additional work other than the specified Finish Treatment.

C. Review recommendation of the manufacturer of the specified Finish System materials for the finish floors including products, procedures and frequency.

3.4 CLEANING AND PROTECTION

A. Clean and protect floor finishes from damage during remaining construction period.

B. Coordinate subsequent work to ensure finished concrete is free from damage and deterioration at Substantial Completion.

3.5 APPLICATIONS

A. Provide hardened, ground, and polished concrete treatment at the following locations, and as indicated in Drawings:

END OF SECTION

SECTION 05 50 00 - METAL FABRICATIONS

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

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

B. The General Structural Notes shall be used in conjunction with these specifications. The General Structural Notes shall supersede items in this specification when discrepancies exist.

1.2 SUMMARY

A. Section Includes:

1. Steel framing and supports, including but not limited to the following:
    a. For applications where framing and supports are not specified in other Sections.
    b. For countertops.
    c. For mechanical and electrical equipment.
2. Slotted channel framing for re-configurable structures (Unistrut).
3. Loose bearing and leveling plates for applications where they are not specified in other Sections.
4. Shelf angles.

B. Products furnished, but not installed, under this Section include the following:

1. Anchor bolts, steel pipe sleeves, slotted-channel inserts, and wedge-type inserts indicated to be cast into concrete or built into unit masonry.
2. Steel weld plates and angles for casting into concrete for applications where they are not specified in other Sections.

C. Related Requirements:

1. Section 01 81 13 “Sustainability Requirements”.

1.3 COORDINATION

A. Coordinate selection of shop primers with topcoats to be applied over them. Comply with paint and coating manufacturers' written recommendations to ensure that shop primers and topcoats are compatible with one another.

B. Coordinate installation of metal fabrications that are anchored to or that receive other work. Furnish setting drawings, templates, and directions for installing anchorages, including sleeves, concrete inserts, anchor bolts, and items with integral anchors, that are to be embedded in concrete or masonry. Deliver such items to Project site in time for installation.

1.4 SUBMITTALS

A. Product Data: For the following:

1. Paint products.
2. Grout.

B. Shop Drawings: Show fabrication and installation details. Include plans, elevations, sections, and details of metal fabrications and their connections. Show anchorage and accessory items. Provide

Shop Drawings for all items specified in this Section, including but not limited to all items indicated in “Summary” Article above.

C. Sustainable Design Submittals: Refer to Section 01 81 13 “Sustainability Requirements”.

D. Samples for Verification: For each type and finish where not field painted.

E. Mill Certificates: Signed by stainless-steel manufacturers, certifying that products furnished comply with requirements.

F. Welding certificates.

G. Paint Compatibility Certificates: From manufacturers of topcoats applied over shop primers, certifying that shop primers are compatible with topcoats.

H. Research/Evaluation Reports: For post-installed anchors, from ICC-ES.

1.5 QUALITY ASSURANCE

A. Welding Qualifications: Qualify procedures and personnel according to AWS D1.1/D1.1M, "Structural Welding Code - Steel."

B. Welding Qualifications: Qualify procedures and personnel according to the following:

1. AWS D1.1/D1.1M, "Structural Welding Code - Steel."

2. AWS D1.2/D1.2M, "Structural Welding Code - Aluminum."

3. AWS D1.6/D1.6M, "Structural Welding Code - Stainless Steel."

1.6 FIELD CONDITIONS

A. Field Measurements: Verify actual locations of walls and other construction contiguous with metal fabrications by field measurements before fabrication.

PART 2 - PRODUCTS

2.1 PERFORMANCE REQUIREMENTS

A. Seismic Performance: Metal fabrications shall withstand the effects of earthquake motions determined according to ASCE/SEI 7 and as indicated.

B. Thermal Movements: Allow for thermal movements from ambient and surface temperature changes acting on exterior metal fabrications by preventing buckling, opening of joints, overstressing of components, failure of connections, and other detrimental effects.

1. Temperature Change: 120 deg F, ambient; 180 deg F, material surfaces.

C. Interior Paints, Primers and Sealers: Comply with low/ no VOC requirements in Section 01 81 13 “Sustainability Requirements”.

2.2 METALS

A. Metal Surfaces, General: Provide materials with smooth, flat surfaces unless otherwise indicated. For metal fabrications exposed to view in the completed Work, provide materials without seam marks, roller marks, rolled trade names, or blemishes.

B. Steel Plates, Shapes, and Bars: ASTM A36/A36M or A529 GR.50 as indicated in structural drawings.

C. Stainless-Steel Sheet, Strip, and Plate: ASTM A240/A240M or ASTM A666, Type 304 at interior locations, Type 316L at exterior locations.

D. Stainless-Steel Bars and Shapes: ASTM A276, Type 304 at interior locations, Type 316L at exterior locations.

E. Steel Tubing: ASTM A500/A500M, cold-formed steel tubing.

F. Steel Pipe: ASTM A53/A53M, Standard Weight (Schedule 40) unless otherwise indicated.

G. Slotted Channel Framing (Unistrut): Cold-formed metal box channels (struts) complying with MFMA-4.

1. Size of Channels: Size and configuration as required.

2. Material, Exterior and Garage and Other Unconditioned/ Uncontrolled Humidity Locations: Galvanized steel, ASTM A653/A653M, structural steel, Grade 33 (Grade 230), with G90 (Z275) coating; thickness indicated.

3. Material, Interior (Conditioned/ Controlled Humidity) Locations: Cold-rolled steel, ASTM A1008/A1008M, structural steel, Grade 33 (Grade 230); with G40 (Z120) coating; thickness indicated.

4. Recycled Content: 25% minimum post-consumer recycled content.

H. Aluminum Plate and Sheet: ASTM B209 (ASTM B209M), Alloy 6061-T6.

I. Aluminum Extrusions: ASTM B221 (ASTM B221M), Alloy 6063-T6.

J. Aluminum-Alloy Rolled Tread Plate: ASTM B632/B632M, Alloy 6061-T6.

K. Aluminum Castings: ASTM B26/B26M, Alloy 443.0-F.

2.3 FASTENERS

A. General: Unless otherwise indicated, provide Type 316 stainless-steel fasteners for exterior use and zinc-plated fasteners with coating complying with ASTM B633 or ASTM F1941 (ASTM F1941M), Class Fe/Zn 5, at exterior walls. Select fasteners for type, grade, and class required.

1. Provide stainless-steel fasteners for fastening aluminum.

2. Provide stainless-steel fasteners for fastening stainless steel.

B. Steel Bolts and Nuts: Regular hexagon-head bolts, ASTM A307, Grade A (ASTM F568M, Property Class 4.6); with hex nuts, ASTM A563; and, where indicated, flat washers.

C. Steel Bolts and Nuts: Regular hexagon-head bolts, ASTM A325, Type 3 (ASTM A325M, Type 3); with hex nuts, ASTM A563, Grade C3 (ASTM A563M, Class 8S3); and, where indicated, flat washers.

D. Stainless-Steel Bolts and Nuts: Regular hexagon-head annealed stainless-steel bolts, ASTM F593 (ASTM F738M); with hex nuts, ASTM F594 (ASTM F836M); and, where indicated, flat washers; Alloy Group 2 (A4).

E. Anchor Bolts: ASTM F 1554, Grade 36, of dimensions indicated; with nuts, ASTM A563 (ASTM A563M); and, where indicated, flat washers.

1. Hot-dip galvanize or provide mechanically deposited, zinc coating where item being fastened is indicated to be galvanized.

F. Anchors, General: Anchors capable of sustaining, without failure, a load equal to six times the load imposed when installed in unit masonry and four times the load imposed when installed in concrete, as determined by testing according to ASTM E488/E488M, conducted by a qualified independent testing agency.

G. Post-Installed Anchors: As indicated on Structural Drawings.

H. Slotted-Channel Inserts: Cold-formed, hot-dip galvanized-steel box channels (struts) complying with MFMA-4, 1-5/8 by 7/8 inches by length indicated with anchor straps or studs not less than 3 inches long at not more than 8 inches o.c. Provide with temporary filler and tee-head bolts,

complete with washers and nuts, all zinc-plated to comply with ASTM B633, Class Fe/Zn 5, as needed for fastening to inserts.

2.4 MISCELLANEOUS MATERIALS

A. Shop Primer for Galvanized Steel: Primer formulated for exterior use over zinc-coated metal and compatible with finish paint systems indicated.

B. Galvanizing Repair Paint: High-zinc-dust-content paint complying with SSPC-Paint 20 and compatible with paints specified to be used over it.

C. Bituminous Paint: Cold-applied asphalt emulsion complying with ASTM D1187/D1187M.

D. Nonshrink, Nonmetallic Grout: Factory-packaged, nonstaining, noncorrosive, nongaseous grout complying with ASTM C1107/C1107M. Provide grout specifically recommended by manufacturer for interior and exterior applications.

E. Shop Primer, Interior: Zinc-rich, compatible with Section 09 91 00 “Painting” system for steel substrates.

F. Shop Primer, Exterior: Refer to Section 09 96 00 “High-Performance Coatings.”

2.5 FABRICATION, GENERAL

A. Shop Assembly: Preassemble items in the shop to greatest extent possible. Disassemble units only as necessary for shipping and handling limitations. Use connections that maintain structural value of joined pieces. Clearly mark units for reassembly and coordinated installation.

B. Cut, drill, and punch metals cleanly and accurately. Remove burrs and ease edges to a radius of approximately 1/32 inch unless otherwise indicated. Remove sharp or rough areas on exposed surfaces.

C. Form bent-metal corners to smallest radius possible without causing grain separation or otherwise impairing work.

D. Form exposed work with accurate angles and surfaces and straight edges.

E. Weld corners and seams continuously to comply with the following:

1. Use materials and methods that minimize distortion and develop strength and corrosion resistance of base metals.

2. Obtain fusion without undercut or overlap.

3. Remove welding flux immediately.

4. At exposed connections, finish to NOMMA’s "Voluntary Joint Finish Standards" for Finish No. 3: Partially dressed weld with spatter removed. No roughness or burrs permitted. Weld appearance shall be consistent and even.

F. Form exposed connections with hairline joints, flush and smooth, using concealed fasteners or welds where possible. Where exposed fasteners are required, use Phillips flat-head (countersunk) fasteners unless otherwise indicated. Locate joints where least conspicuous.

G. Fabricate seams and other connections that are exposed to weather in a manner to exclude water. Provide weep holes where water may accumulate.

H. Cut, reinforce, drill, and tap metal fabrications as indicated to receive finish hardware, screws, and similar items.

I. Provide for anchorage of type indicated; coordinate with supporting structure. Space anchoring devices to secure metal fabrications rigidly in place and to support indicated loads.

J. Evidence of grinding on surfaces is not permitted on fabrications. Surfaces shall match adjacent base surface without imperfections.

2.6 MISCELLANEOUS FRAMING AND SUPPORTS

A. General: Provide steel framing and supports not specified in other Sections as needed to complete the Work.

B. Fabricate units from steel shapes, plates, and bars of welded construction unless otherwise indicated. Fabricate to sizes, shapes, and profiles indicated and as necessary to receive adjacent construction.

1. Fabricate units from slotted channel framing where indicated.

2. Furnish inserts for units installed after concrete is placed.

C. Galvanize miscellaneous framing and supports where indicated.

D. Prime miscellaneous framing and supports with primer specified where indicated.

2.7 STEEL SHAPES

A. Fabricate from steel angles and shapes of size indicated. Fabricate in single lengths unless otherwise indicated. Weld adjoining members together where indicated.

B. Galvanize and prime steel located in exterior walls.

1. Prime steel items located in exterior walls with zinc-rich primer.

2.8 MISCELLANEOUS STEEL TRIM

A. Unless otherwise indicated, fabricate units from steel shapes, plates, and bars of profiles shown with continuously welded joints and smooth exposed edges. Miter corners and use concealed field splices where possible.

B. Provide cutouts, fittings, and anchorages as needed to coordinate assembly and installation with other work.

C. Galvanize and prime exterior miscellaneous steel trim.

2.9 LOOSE BEARING AND LEVELING PLATES

A. Provide loose bearing and leveling plates for steel items bearing on masonry or concrete construction. Drill plates to receive anchor bolts and for grouting.

B. Galvanize plates.

C. Prime plates with zinc-rich primer.

2.10 STEEL WELD PLATES AND ANGLES

A. Provide steel weld plates and angles not specified in other Sections, for items supported from concrete construction as needed to complete the Work. Provide each unit with no fewer than two integrally welded steel strap anchors for embedding in concrete.

2.11 FINISHES, GENERAL

A. Finish metal fabrications after assembly.

B. Finish exposed surfaces to remove tool and die marks and stretch lines, and to blend into surrounding surface.

2.12 STEEL AND IRON FINISHES

A. Galvanizing: Hot-dip galvanize items as indicated to comply with ASTM A153/A153M for steel and iron hardware and with ASTM A123/A123M for other steel and iron products.

1. Do not quench or apply post galvanizing treatments that might interfere with paint adhesion.

B. Preparation for Shop Priming Galvanized Items: After galvanizing, thoroughly clean railings of grease, dirt, oil, flux, and other foreign matter, and treat with metallic phosphate process.

C. Shop prime iron and steel items not indicated to be galvanized unless they are to be embedded in concrete, sprayed-on fireproofing, or masonry, or unless otherwise indicated.

1. Shop prime with universal shop primer indicated.

2. Shop prime with primer indicated in Section 09 96 00 “High-Performance Coatings” where finish is indicated to be high-performance or at exterior steel fabrications.

D. Preparation for Shop Priming: Prepare surfaces to comply with requirements indicated below:

1. Items Indicated to Receive Zinc-Rich Primer: SSPC-SP 6/NACE No. 3, "Commercial Blast Cleaning."

2. Items Indicated to Receive Primers Specified in Section 09 96 00 "High-Performance Coatings": SSPC-SP 6/NACE No. 3, "Commercial Blast Cleaning."

3. Other Items: SSPC-SP 3, "Power Tool Cleaning."

E. Shop Priming: Apply shop primer to comply with SSPC-PA 1, "Paint Application Specification No. 1: Shop, Field, and Maintenance Painting of Steel," for shop painting.

1. Stripe paint corners, crevices, bolts, welds, and sharp edges.

2.13 ALUMINUM FINISHES

A. Clear Anodic Finish: AAMA 611, AA-M12C22A31, Class II, 0.010 mm or thicker.

B. Baked-Enamel or Powder-Coat Finish: AAMA 2603 except with a minimum dry film thickness of 1.5 mils (0.04 mm). Comply with coating manufacturer's written instructions for cleaning, conversion coating, and applying and baking finish.

1. Color and Gloss: As indicated.

PART 3 - EXECUTION

3.1 INSTALLATION, GENERAL

A. Cutting, Fitting, and Placement: Perform cutting, drilling, and fitting required for installing metal fabrications. Set metal fabrications accurately in location, alignment, and elevation; with edges and surfaces level, plumb, true, and free of rack; and measured from established lines and levels.

B. Fit exposed connections accurately together to form hairline joints. Weld connections that are not to be left as exposed joints but cannot be shop welded because of shipping size limitations. Do not weld, cut, or abrade surfaces of exterior units that have been hot-dip galvanized after fabrication and are for bolted or screwed field connections.

C. Field Welding: Comply with the following requirements:

1. Use materials and methods that minimize distortion and develop strength and corrosion resistance of base metals.

2. Obtain fusion without undercut or overlap.

3. Remove welding flux immediately.

4. At exposed connections, finish exposed welds and surfaces smooth and blended so no roughness shows after finishing and contour of welded surface matches that of adjacent surface. Finish exposed welds to comply with NOMMA's "Voluntary Joint Finish Standards" for Type 1 welds: no evidence of a welded joint.

D. Fastening to In-Place Construction: Provide anchorage devices and fasteners where metal fabrications are required to be fastened to in-place construction. Provide threaded fasteners for use with concrete and masonry inserts, toggle bolts, through bolts, lag screws, wood screws, and other connectors.

E. Provide temporary bracing or anchors in formwork for items that are to be built into concrete, masonry, or similar construction.

F. Corrosion Protection: Coat concealed surfaces of aluminum that come into contact with grout, concrete, masonry, wood, or dissimilar metals with the following:

1. Cast Aluminum: Heavy coat of bituminous paint.

2. Extruded Aluminum: Two coats of clear lacquer.

3.2 INSTALLING MISCELLANEOUS FRAMING AND SUPPORTS

A. General: Install framing and supports to comply with requirements of items being supported, including manufacturers' written instructions and requirements indicated on Shop Drawings.

B. Anchor supports for operable partitions, aluminum-framed folding storefront system, and overhead doors securely to, and rigidly brace from, building structure.

C. Support steel girders on solid grouted masonry, concrete, or steel pipe columns. Secure girders with anchor bolts embedded in grouted masonry or concrete or with bolts through top plates of pipe columns.

1. Where grout space under bearing plates is indicated for girders supported on concrete or masonry, install as specified in "Installing Bearing and Leveling Plates" Article.

D. Install pipe columns on concrete footings with grouted baseplates. Position and grout column baseplates as specified in "Installing Bearing and Leveling Plates" Article.

1. Grout baseplates of columns supporting steel girders after girders are installed and leveled.

3.3 INSTALLING BEARING AND LEVELING PLATES

A. Clean concrete and masonry bearing surfaces of bond-reducing materials, and roughen to improve bond to surfaces. Clean bottom surface of plates.

B. Set bearing and leveling plates on wedges, shims, or leveling nuts. After bearing members have been positioned and plumbed, tighten anchor bolts. Do not remove wedges or shims but, if protruding, cut off flush with edge of bearing plate before packing with nonshrink grout. Pack grout solidly between bearing surfaces and plates to ensure that no voids remain.

3.4 ADJUSTING AND CLEANING

A. Touchup Painting: Immediately after erection, clean field welds, bolted connections, and abraded areas. Paint uncoated and abraded areas with the same material as used for shop painting to comply with SSPC-PA 1 for touching up shop-painted surfaces.

1. Apply by brush or spray to provide a minimum 2.0-mil (0.05-mm) dry film thickness.

B. Touchup Painting: Cleaning and touchup painting of field welds, bolted connections, and abraded areas of shop paint are specified in Section 09 96 00 “High-Performance Coatings."

C. Galvanized Surfaces: Clean field welds, bolted connections, and abraded areas and repair galvanizing to comply with ASTM A780/A780M.

3.5 FIELD QUALITY CONTROL

A. Tests and Inspections: The owner will employ the services of an independent testing laboratory for performing test and to conduct inspection services on all shop fabricated and on-site structural welding and bolting plus expansion anchor, grouted anchor, and adhesive anchor placement required for this construction and as required per the Statement of Special Inspections within the Structural Drawings.

END OF SECTION

SECTION 06 10 00 - ROUGH CARPENTRY

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

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

B. The General Structural Notes shall be used in conjunction with this specification. The General Structural Notes shall supersede items in this specification when discrepancies exist.

1.2 SUMMARY

A. Section Includes:

1. Wood blocking and nailers.
2. Wood furring and grounds.

1.3 DEFINITIONS

A. Boards or Strips: Lumber of less than 2 inches nominal size in least dimension.

B. Dimension Lumber: Lumber of 2 inches nominal size or greater but less than 5 inches nominal size in least dimension.

1.4 SUBMITTALS

A. Product Data: For each type of process and factory-fabricated product. Indicate component materials and dimensions and include construction and application details.

1. Include data for wood-preservative treatment from chemical treatment manufacturer and certification by treating plant that treated materials comply with requirements. Indicate type of preservative used and net amount of preservative retained.
2. Include data for fire-retardant treatment from chemical treatment manufacturer and certification by treating plant that treated materials comply with requirements. Include physical properties of treated materials based on testing by a qualified independent testing agency.
3. For fire-retardant treatments, include physical properties of treated lumber both before and after exposure to elevated temperatures, based on testing by a qualified independent testing agency according to ASTM D5664.
4. For products receiving a waterborne treatment, include statement that moisture content of treated materials was reduced to levels specified before shipment to Project site.

B. Material Certificates: For dimension lumber specified to comply with minimum allowable unit stresses. Indicate species and grade selected for each use and design values approved by the ALSC Board of Review.

C. Evaluation Reports: For the following, from ICC-ES:

1. Wood-preservative-treated wood.
2. Fire-retardant-treated wood.

1.5 QUALITY ASSURANCE

A. Engineer Qualifications: Qualified professional engineer responsible for delegated design.

B. Testing Agency Qualifications: For testing agency providing classification marking for fire-retardant treated material, an inspection agency acceptable to authorities having jurisdiction that periodically performs inspections to verify that the material bearing the classification marking is representative of the material tested.

1.6 DELIVERY, STORAGE, AND HANDLING

A. Stack wood products flat with spacers beneath and between each bundle to provide air circulation. Protect wood products from weather by covering with waterproof sheeting, securely anchored. Provide for air circulation around stacks and under coverings.

PART 2 - PRODUCTS

2.1 WOOD PRODUCTS, GENERAL

A. Lumber: DOC PS 20 and applicable rules of grading agencies indicated. If no grading agency is indicated, comply with the applicable rules of any rules-writing agency certified by the ALSC Board of Review. Grade lumber by an agency certified by the ALSC Board of Review to inspect and grade lumber under the rules indicated.

1. Factory mark each piece of lumber with grade stamp of grading agency.

2. Dress lumber, S4S, unless otherwise indicated.

B. Maximum Moisture Content of Lumber: All wood shall be S-Dry.

2.2 WOOD-PRESERVATIVE-TREATED LUMBER

A. Preservative Treatment by Pressure Process: AWPA U1; Use Category UC2 for interior construction not in contact with ground.

1. Preservative Chemicals: Acceptable to authorities having jurisdiction and containing no arsenic or chromium.

B. Kiln-dry lumber after treatment to a maximum moisture content of 19 percent. Do not use material that is warped or that does not comply with requirements for untreated material.

C. Mark lumber with treatment quality mark of an inspection agency approved by the ALSC Board of Review.

1. For exposed lumber indicated to receive a stained or natural finish, mark end or back of each piece.

D. Application: Treat items indicated on Drawings, and the following:

1. Treat all rough carpentry in contact with concrete, masonry, and where in exterior cavity walls at grade level.

2.3 FIRE-RETARDANT-TREATED MATERIALS

A. General: Where fire-retardant-treated materials are indicated, materials shall comply with requirements in this article, that are acceptable to authorities having jurisdiction, and with fire-test-response characteristics specified as determined by testing identical products per test method indicated by a qualified testing agency.

B. Fire-Retardant-Treated Lumber and Plywood by Pressure Process: Products with a flame-spread index of 25 or less when tested according to ASTM E 84, and with no evidence of significant progressive combustion when the test is extended an additional 20 minutes, and with the flame front not extending more than 10.5 feet beyond the centerline of the burners at any time during the test.

1. Use treatment that does not promote corrosion of metal fasteners.

2. Exterior Type: Treated materials shall comply with requirements specified above for fire-retardant-treated plywood by pressure process after being subjected to accelerated weathering according to ASTM D 2898. Use for exterior locations and where indicated.

3. Interior Type A: Treated materials shall have a moisture content of 28 percent or less when tested according to ASTM D 3201/D 3201M at 92 percent relative humidity. Use where exterior type is not indicated.

4. Design Value Adjustment Factors: Treated lumber plywood shall be tested according to ASTM D 5516 and design value adjustment factors shall be calculated according to ASTM D 6305. Span ratings after treatment shall be not less than span ratings specified.

C. Kiln-dry plywood after treatment to S-DRY (19 percent maximum moisture content). Do not use material that is warped or does not comply with requirements for untreated material.

D. Identify fire-retardant-treated wood with appropriate classification marking of qualified testing agency.

E. Application: Treat items indicated on Drawings and the following:

1. Fire-rated plywood on all walls at Data/ IT Rooms; full height, minimum 8-feet.

2.4 MISCELLANEOUS LUMBER

A. General: Provide miscellaneous lumber indicated and lumber for support or attachment of other construction, including the following:

1. Blocking.

2. Nailers.

3. Furring.

4. Grounds.

B. For blocking not used for attachment of other construction, Utility, Stud, or No. 3 grade lumber of any species may be used provided that it is cut and selected to eliminate defects that will interfere with its attachment and purpose.

C. For blocking and nailers used for attachment of other construction, select and cut lumber to eliminate knots and other defects that will interfere with attachment of other work.

D. For furring strips for installing plywood or hardboard paneling, select boards with no knots capable of producing bent-over nails and damage to paneling.

2.5 PLYWOOD PANELS

A. Equipment Backing Panels: Plywood, DOC PS 1, Exterior, A-C, fire-retardant treated, in thickness indicated or, if not indicated, not less than 3/4-inch nominal thickness.

1. Provide void free faced plywood, compliant with ASTM E84 Class B flame spread and developed smoke index, where exposed and mounted for electrical/ telecom panels.

B. Plywood Panels: Plywood, interior, C-D grade, plugged sanded, in thickness indicated or, if not indicated, not less than 3/4-inch nominal thickness.

1. Finish: Field painted with epoxy paint, refer to Section 09 91 00 “Painting”.

2. Application: Wainscoting at Trash Rooms.

2.6 FASTENERS

A. General: Fasteners shall be of size and type indicated and shall comply with requirements specified in this article for material and manufacture.

1. Provide stainless steel fasteners at all wood-preservative-treated lumber. Galvanized fasteners not permitted for use with treated lumber due to dissimilar metal reactions caused by preservative materials.

B. Nails, Brads, and Staples: ASTM F1667.

C. Wood Screws: ASME B18.6.1.

D. Lag Bolts: ASME B18.2.1.

E. Bolts: Steel bolts complying with ASTM A307, Grade A, with ASTM A563 hex nuts and flat washer.

F. Fasteners for Treated Lumber: Provide G185 galvanized ASTM A653 or Type 304 stainless steel in contact with pressure treated or fire-retardant treated wood, If connectors are utilized, the finish on the connectors and fasteners shall be of the same type.

G. Power-Driven Fasteners: Fastener systems with an evaluation report acceptable to authorities having jurisdiction, based on ICC-ES AC70.

H. Concrete Screw Anchors: As indicated on the Structural Drawings.

I. Powder Actuated Fasteners: As indicated on the Structural Drawings.

2.7 MISCELLANEOUS MATERIALS

A. Flexible Flashing: Composite, self-adhesive, flashing product consisting of a pliable, butyl rubber or rubberized-asphalt compound, bonded to a high-density polyethylene film, aluminum foil, or spunbonded polyolefin to produce an overall thickness of not less than 0.025 inch (0.6 mm).

B. Adhesives for Gluing Furring to Concrete: Formulation complying with ASTM D3498 that is approved for use indicated by adhesive manufacturer.

C. Water-Repellent Preservative: NWWDA-tested and -accepted formulation containing 3-iodo-2-propynyl butyl carbamate, combined with an insecticide containing chloropyrifos as its active ingredient.

PART 3 - EXECUTION

3.1 INSTALLATION, GENERAL

A. Set rough carpentry to required levels and lines, with members plumb, true to line, cut, and fitted. Fit rough carpentry accurately to other construction. Locate furring, nailers, blocking, grounds, and similar supports to comply with requirements for attaching other construction.

B. Install plywood backing panels by fastening to studs; coordinate locations with utilities requiring backing panels. Install fire-retardant-treated plywood backing panels with classification marking of testing agency exposed to view.

C. Provide blocking as indicated and as required to support facing materials, fixtures, specialty items, and trim.

D. Sort and select lumber so that natural characteristics do not interfere with installation or with fastening other materials to lumber. Do not use materials with defects that interfere with function of member or pieces that are too small to use with minimum number of joints or optimum joint arrangement.

E. Comply with AWPA M4 for applying field treatment to cut surfaces of preservative-treated lumber.

1. Use inorganic boron for items that are continuously protected from liquid water.

2. Use copper naphthenate for items not continuously protected from liquid water.

F. Where wood-preservative-treated lumber is installed adjacent to or in contact with galvanized metal, metal decking, metal framing, or zinc-coated metal, install continuous flexible flashing separator between wood and metal.

G. Provide stainless steel fasteners to attach all wood-preservative-treated lumber and plywood products.

H. Securely attach rough carpentry work to substrate by anchoring and fastening as indicated, complying with the following:

1. Table 2304.9.1, "Fastening Schedule," in ICC's International Building Code (IBC).

2. ICC-ES evaluation report for fastener.

I. Use steel common nails unless otherwise indicated. Select fasteners of size that will not fully penetrate members where opposite side will be exposed to view or will receive finish materials. Make tight connections between members. Install fasteners without splitting wood. Drive nails snug but do not countersink nail heads unless otherwise indicated.

J. For exposed work, arrange fasteners in straight rows parallel with edges of members, with fasteners evenly spaced, and with adjacent rows staggered.

K. Do not splice structural members between supports unless otherwise indicated.

3.2 WOOD BLOCKING, AND NAILER INSTALLATION

A. Install where indicated and where required for screeding or attaching other work. Form to shapes indicated and cut as required for true line and level of attached work. Coordinate locations with other work involved.

B. Attach items to substrates to support applied loading. Recess bolts and nuts flush with surfaces unless otherwise indicated.

C. Provide permanent grounds of dressed, pressure-preservative-treated, key-beveled lumber not less than 1-1/2 inches wide and of thickness required to bring face of ground to exact thickness of finish material. Remove temporary grounds when no longer required.

3.3 WOOD FURRING INSTALLATION

A. Install level and plumb with closure strips at edges and openings. Shim with wood as required for tolerance of finish work.

B. Furring to Receive Plywood or Hardboard Paneling: Install 1-by-3-inch nominal-size furring horizontally and vertically at 24 inches o.c.

3.4 PROTECTION

A. Protect wood that has been treated with inorganic boron (SBX) from weather. If, despite protection, inorganic boron-treated wood becomes wet, apply EPA-registered borate treatment. Apply borate solution by spraying to comply with EPA-registered label.

B. Protect rough carpentry from weather. If, despite protection, rough carpentry becomes wet enough that moisture content exceeds that specified, apply EPA-registered borate treatment. Apply borate solution by spraying to comply with EPA-registered label.

END OF SECTION

SECTION 06 20 23 - INTERIOR FINISH CARPENTRY

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

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

1.2 SUMMARY

A. Section Includes:

1. Wood wall panel at bar.

B. Related Requirements:

1. Section 01 81 13 “Sustainability Requirements”.
2. Section 06 10 00 "Rough Carpentry" for furring, blocking, and other carpentry work not exposed to view.
3. Section 08 14 16 “Flush Wood Doors” for coordination of wood frames and jambs installed with flush wood doors.
4. Section 09 91 00 "Painting" for priming and backpriming of interior finish carpentry for opaque finishes.

1.3 DEFINITIONS

A. WI – Woodwork Institute; http://woodworkinstitute.com; 916-372-9943.

B. NAAWS - Definitions in the "North American Architectural Woodwork Standards" (NAAWS), latest edition, apply to the Work of this Section. 3.1 or latest edition, jointly published by the Woodwork Institute (WI) and the Architectural Woodwork Manufacturers Association of Canada (AWMAC)

1. For free downloads in PDF format, www.naaws-committee.com.

C. CCP – Certified Compliance Program. https://woodworkinstitute.com/services/certified-compliance-program/.

1.4 COORDINATION

A. Coordinate sizes and locations of framing, blocking, furring, reinforcements, and other related units of Work specified in other Sections to ensure that architectural woodwork can be supported and installed as indicated.

1.5 SUBMITTALS

A. Product Data: For each type of process and factory-fabricated product. Indicate component materials, dimensions, profiles, textures, and colors and include construction and application details.

1. Include data for wood-preservative treatment from chemical-treatment manufacturer and certification by treating plant that treated materials comply with requirements. Indicate type of preservative used and net amount of preservative retained. Include chemical-treatment manufacturer's written instructions for finishing treated material.
2. Include data for fire-retardant treatment from chemical-treatment manufacturer and certification by treating plant that treated materials comply with requirements.

3. For products receiving a waterborne treatment, include statement that moisture content of treated materials was reduced before shipment to Project site to levels specified.

B. Sustainable Design Submittals: Refer to Section 01 81 13 “Sustainability Requirements”.

C. Samples for Verification:

1. For each species and cut of lumber products with nonfactory-applied finish, with half of exposed surface finished, 50 sq. in. for lumber.

2. For each finish system and color of lumber products with factory-applied finish, 50 sq. in. for lumber.

1.6 QUALITY ASSURANCE

A. Testing Agency Qualifications: For testing agency providing classification marking for fire-retardant-treated material, an inspection agency acceptable to authorities having jurisdiction that periodically performs inspections to verify that the material bearing the classification marking is representative of the material tested.

1.7 DELIVERY, STORAGE, AND HANDLING

A. Stack lumber flat with spacers between each bundle to provide air circulation. Protect materials from weather by covering with waterproof sheeting, securely anchored. Provide for air circulation around stacks and under coverings.

B. Deliver interior finish carpentry materials only when environmental conditions comply with requirements specified for installation areas. If interior finish carpentry materials must be stored in other than installation areas, store only where environmental conditions comply with requirements specified for installation areas.

1.8 FIELD CONDITIONS

A. Environmental Limitations: Do not deliver or install interior finish carpentry materials until building is enclosed and weatherproof, wet work in space is completed and nominally dry, and HVAC system is operating and maintaining temperature and relative humidity at occupancy levels during the remainder of the construction period.

B. Do not install finish carpentry materials that are wet, moisture damaged, or mold damaged.

1. Indications that materials are wet or moisture damaged include, but are not limited to, discoloration, sagging, or irregular shape.

2. Indications that materials are mold damaged include, but are not limited to, fuzzy or splotchy surface contamination and discoloration.

PART 2 - PRODUCTS

2.1 MATERIALS, GENERAL

A. Fire Performance: Provide interior wood finishes to meet NFPA 286 or the following Classes based on ASTM E84 or UL 723:

1. Wood Base: Class C.

2. All Other Wood Fabrications: Class B.

B. Lumber: DOC PS 20 and applicable rules of grading agencies indicated. If no grading agency is indicated, comply with the applicable rules of any rules-writing agency certified by the American Lumber Standard Committee's Board of Review. Grade lumber by an agency certified by the

American Lumber Standard Committee's Board of Review to inspect and grade lumber under the rules indicated.

1. Factory mark each piece of lumber with grade stamp of grading agency.
2. For exposed lumber, mark grade stamp on end or back of each piece, or omit grade stamp and provide certificates of grade compliance issued by grading agency.

C. Softwood Plywood: DOC PS 1.

D. Regional Materials: If available, provide materials and products manufactured and containing raw materials produced within 500 mile radius of Project Site.

E. Interior Paints, Primers, Sealers, Adhesives and Sealants: Comply with low/ no VOC requirements in Section 01 81 13 “Sustainability Requirements”.

F. Composite Wood Installed Within the Building Interior: Comply with California Air Resources Board (CARB) Airborne Toxic Control Measure (ATCM), Phase II for ultra-low-emitting formaldehyde (ULEF) resins or containing no formaldehyde resins.

1. Exception: If composite wood product that does not comply with California 93120 Phase II (CARB Phase II) is used, all exposed edges and sides shall be sealed with low/ no VOC requirements in Section 01 81 13 “Sustainability Requirements”.

2.2 WOOD WALL PANEL

A. Wood Wall Panel:

1. Material: SlatSolution Flexible Tambour wood panels for interior walls by Panel Prestige Outdoor; as indicated and approved by Architect.
2. Cut and Grade: See drawings.
3. Color: Pure white
4. Size: See drawings.
5. Finish: Painted P-1; refer to drawings.
6. Application: At bar, as indicated in Drawings.

2.3 MISCELLANEOUS MATERIALS

A. Fasteners for Interior Finish Carpentry: Nails, screws, and other anchoring devices of type, size, material, and finish required for application indicated to provide secure attachment, concealed where possible.

B. Exposed Fasteners at Wood Paneling: Trim head, auger point, stainless steel type 316, #1 square drive.

1. Basis-of- Design Products: #7 x 1-5/8 inch by McFeely's, div. of Lab Safety Supply, Inc.; www.mcfeelys.com.
2. Other Approved Manufacturers:
    a. Headcote, div. of Starborn Industries, Inc.; www.starbornidustries.com.
    b. Rockler; www.rockler.com.
    c. Or approved equal.

C. Glue: Aliphatic-resin, polyurethane, or resorcinol wood glue recommended by manufacturer for general carpentry use.

D. Multipurpose Construction Adhesive: Formulation complying with ASTM D 3498 that is recommended for indicated use by adhesive manufacturer.

2.4 FABRICATION

A. Back out or kerf backs of the following members, except those with ends exposed in finished work:

1. Interior standing and running trim, except shoe and crown molds.

B. Ease edges of lumber less than 1 inch in nominal thickness to 1/16-inch radius and edges of lumber 1 inch or more in nominal thickness to 1/8-inch radius.

2.5 FINISHES

A. Preparations for Finishing: Comply with the Architectural Woodwork Standards for sanding, filling countersunk fasteners, sealing concealed surfaces, and similar preparations for finishing interior architectural woodwork, as applicable to each unit of work.

B. Interior Architectural Woodwork for Opaque Finishes: Shop prime with one coat of wood primer for field painting as specified in Section 09 91 00 "Painting."

C. Interior Architectural Woodwork for Transparent Finish: Shop-prestaining; one coat water repellent penetrating sealer.

D. Preparation for Finishing: Comply with Architectural Woodwork Standards, Section 5 for sanding, filling countersunk fasteners, sealing concealed surfaces, and similar preparations for finishing interior architectural woodwork, as applicable to each unit of work.

PART 3 - EXECUTION

3.1 EXAMINATION

A. Examine substrates, with Installer present, for compliance with requirements for installation tolerances and other conditions affecting performance of the Work.

B. Examine finish carpentry materials before installation. Reject materials that are wet, moisture damaged, and mold damaged.

C. Proceed with installation only after unsatisfactory conditions have been corrected.

3.2 PREPARATION

A. Clean substrates of projections and substances detrimental to application.

B. Before installing interior finish carpentry, condition materials to average prevailing humidity in installation areas for a minimum of 24 hours unless longer conditioning is recommended by manufacturer.

3.3 INSTALLATION, GENERAL

A. Do not use materials that are unsound; warped; improperly treated or finished; inadequately seasoned; too small to fabricate with proper jointing arrangements; or with defective surfaces, sizes, or patterns.

B. Install interior finish carpentry level, plumb, true, and aligned with adjacent materials. Use concealed shims where necessary for alignment.

1. Scribe and cut interior finish carpentry to fit adjoining work. Refinish and seal cuts as recommended by manufacturer.

2. Where face fastening is unavoidable, countersink fasteners, fill surface flush, and sand unless otherwise indicated.

3. Install to tolerance of 1/8 inch in 96 inches for level and plumb. Install adjoining interior finish carpentry with 1/32-inch maximum offset for flush installation and 1/16-inch maximum offset for reveal installation.

4. Install stairs with no more than 3/16-inch variation between adjacent treads and risers and with no more than 3/8-inch variation between largest and smallest treads and risers within each flight.

5. Coordinate interior finish carpentry with materials and systems in or adjacent to it. Provide cutouts for mechanical and electrical items that penetrate interior finish carpentry.

3.4 ADJUSTING

A. Replace interior finish carpentry that is damaged or does not comply with requirements. Interior finish carpentry may be repaired or refinished if work complies with requirements and shows no evidence of repair or refinishing. Adjust joinery for uniform appearance.

3.5 CLEANING

A. Clean interior finish carpentry on exposed and semiexposed surfaces. Restore damaged or soiled areas and touch up factory-applied finishes if any.

3.6 PROTECTION

A. Protect installed products from damage from weather and other causes during construction.

B. Remove and replace finish carpentry materials that are wet, moisture damaged, and mold damaged.

1. Indications that materials are wet or moisture damaged include, but are not limited to, discoloration, sagging, or irregular shape.

2. Indications that materials are mold damaged include, but are not limited to, fuzzy or splotchy surface contamination and discoloration.

END OF SECTION

SECTION 06 41 00 - ARCHITECTURAL CASEWORK

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

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

1.2 SUMMARY

A. Section Includes:

1. Architectural wood casework.
2. Cabinet hardware and accessories.
3. Wood furring, blocking, shims, and hanging strips for installing architectural wood cabinets unless concealed within other construction before cabinet installation.

B. Related Requirements:

1. Section 01 81 13 “Sustainability Requirements”.
2. Section 06 10 00 "Rough Carpentry" for wood furring, blocking, shims, and hanging strips required for installing cabinets and concealed within other construction before cabinet installation.
3. Section 06 61 19 “Quartz Surfacing Fabrications” for coordination of countertop installation.
4. Section 11 31 10 “Appliances” for coordination of appliances and equipment with casework.
5. Division 22 “Plumbing” Sections for coordination of fixtures with cabinets.

1.3 SUBMITTALS

A. Product Data: For each type of product, including panel products, cabinet hardware and accessories, and finishing materials and processes.

B. Sustainable Design Submittals: Refer to Section 01 81 13 “Sustainability Requirements”.

C. Shop Drawings: Show location of each item, dimensioned plans and elevations, large-scale details, attachment devices, and other components.

1. Show details full size.
2. Show locations and sizes of furring, blocking, and hanging strips, including concealed blocking and reinforcement specified in other Sections.
3. Show locations and sizes of cutouts and holes for electrical switches and outlets and other items installed in architectural wood cabinets.
4. Show veneer leaves with dimensions, grain direction, exposed face, and identification numbers indicating the flitch and sequence within the flitch for each leaf.
5. For countertops. Show materials, finishes, edge and backsplash profiles, methods of joining, and cutouts for plumbing fixtures.

D. Samples for Initial Selection:

1. Shop-applied transparent finishes.
2. Shop-applied opaque finishes.

3. Powder coated finishes.
4. Painted and primed finishes.

E. Samples for Verification:

1. Corner pieces as follows:
   a. Cabinet-front frame joints between stiles and rails, as well as exposed end pieces, 18 inches high by 18 inches wide by 6 inches deep.
   b. Miter joints for standing trim.
2. Exposed cabinet hardware and accessories, one unit for each type and finish.
3. Countertop Products:
   a. Countertop material, 6 inches square.
   b. Wood trim, 8 inches long.
   c. One full-size solid surface material countertop, with front edge, 8 by 10 inches, of construction and in configuration specified.

1.4 QUALITY ASSURANCE

A. Forest Certification: Provide wood products made from forests certified by an FSC-accredited certification body.

1. All Non-FSC Wood in Assemblies with FSC-Certified Wood: Meet FSC Controlled Wood (CW) criteria.

B. Fabricator Qualifications: Shop that employs skilled workers who custom fabricate products similar to those required for this Project and whose products have a record of successful in-service performance. Shop is a certified participant in AWI's Quality Certification Program.

1.5 DELIVERY, STORAGE, AND HANDLING

A. Do not deliver cabinets until painting and similar operations that could damage woodwork have been completed in installation areas. If cabinets must be stored in other than installation areas, store only in areas where environmental conditions comply with requirements specified in "Field Conditions" Article.

1.6 FIELD CONDITIONS

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

B. Environmental Limitations: Do not deliver or install cabinets until building is enclosed, wet work is complete, and HVAC system is operating and maintaining temperature between 60 and 90 deg F and relative humidity between 17 and 50 percent during the remainder of the construction period.

C. Field Measurements: Where cabinets are indicated to fit to other construction, verify dimensions of other construction by field measurements before fabrication, and indicate measurements on Shop Drawings. Coordinate fabrication schedule with construction progress to avoid delaying the Work.

1. Locate concealed framing, blocking, and reinforcements that support cabinets by field measurements before being enclosed, and indicate measurements on Shop Drawings.

D. Established Dimensions: Where cabinets are indicated to fit to other construction, establish dimensions for areas where cabinets are to fit. Provide allowance for trimming at site, and coordinate construction to ensure that actual dimensions correspond to established dimensions.

1.7 DEFINITIONS

A. MDF: Medium-density fiberboard.

B. Exposed Surfaces of Cabinets: Surfaces visible when doors and drawers are closed, including visible surfaces in open cabinets or behind glass doors.

C. Semiexposed Surfaces of Cabinets: Surfaces behind opaque doors or drawer fronts, including interior faces of doors, interiors and sides of drawers, and bottoms of wall cabinets.

D. Concealed Surfaces of Cabinets: Surfaces not usually visible after installation, including sleepers, web frames, dust panels, bottoms of drawers, ends of cabinets installed directly against and completely concealed by walls or other cabinets, and tops of wall cabinets and utility cabinets.

1.8 COORDINATION

A. Coordinate sizes and locations of framing, blocking, furring, reinforcements, and other related units of Work specified in other Sections to ensure that wood-veneer-faced architectural cabinets can be supported and installed as indicated.

PART 2 - PRODUCTS

2.1 ARCHITECTURAL CABINET MANUFACTURERS

A. Source Limitations: Engage a qualified woodworking firm to assume undivided responsibility for production of architectural wood cabinets with sequence-matched wood paneling, wood doors with face veneers that are sequence matched with woodwork and transparent-finished wood doors that are required to be of same species as woodwork.

2.2 ARCHITECTURAL CABINETS, GENERAL

A. Recycled Content: Provide particleboard and MDF with minimum 80 percent recycled content. Provide plastic panels with recycled content.

B. Interior Wet-Applied Adhesives and Sealants: Comply with low-emitting requirements in Section 01 81 13 “Sustainability Requirements”.

C. Quality Standard: Unless otherwise indicated, comply with the "Architectural Woodwork Standards" for grades of architectural wood cabinets indicated for construction, finishes, installation, and other requirements.

1. The Contract Documents contain selections chosen from options in the quality standard and additional requirements beyond those of the quality standard. Comply with those selections and requirements in addition to the quality standard.

2.3 ARCHITECTURAL WOOD CASEWORK

A. Grade: Premium.

B. Type of Construction: Frameless.

C. Cabinet and Door and Drawer Front Interface Style: Flush overlay.

D. Reveal Dimension: As indicated.

E. Materials: 100% FSC Certified recycled OSB; muted neutral wood tones; 4 ft.x 8 ft. panels; 3/4 in. or 1-1/2 in. thickness as indicated; sanded to 150-grit; edges squared.

1. Basis-of-Design Product: CLT OSB Panel, from SecondStory Collection by Sankofa Lumber; www.sankofalumber.com.

F. Finish:; refer to Finishes articles below.

G. Application: Bar cabinetry, or as indicated in Drawings.

2.4 WOOD MATERIALS

A. Wood Products: Provide materials that comply with requirements of referenced quality standard for each type of woodwork and quality grade specified unless otherwise indicated.

1. Do not use plain-sawn softwood lumber with exposed, flat surfaces more than 3 inches wide.

2. Wood Moisture Content: 8 to 13 percent.

B. Composite Wood and Agrifiber Products: Provide materials that comply with requirements of referenced quality standard for each type of woodwork and quality grade specified unless otherwise indicated.

1. Medium-Density Fiberboard (MDF): ANSI A208.2, Grade 130, unless indicated otherwise.

2. Softwood Plywood: DOC PS 1, medium-density overlay.

3. Veneer-Faced Panel Products (Hardwood Plywood): HPVA HP-1.

4. Particleboard shall not be used.

5. Thermoset Decorative Panels: Particleboard or medium-density fiberboard finished with thermally fused, melamine-impregnated decorative paper and complying with requirements of NEMA LD 3, Grade VGL, for test methods 3.3, 3.4, 3.6, 3.8, and 3.10.

2.5 CABINET HARDWARE AND ACCESSORIES

A. General: Provide cabinet hardware and accessory materials associated with architectural cabinets except for items specified in Section 08 71 00 "Door Hardware”.

B. Frameless Concealed Hinges (European Type): BHMA A156.9, B01602, 135 degrees of opening.

C. Back-Mounted Pulls: BHMA A156.9, B02011:

1. Basis-of-Design Product: Model no. DP268 by Doug Mockett and Co., Inc.; www.mockett.com.

a. Style:Knurled bar pull.

b. Length: As selected by Architect.

c. Finish: As selected by Architect.

2. Applications: As indicated on Drawings.

D. Adjustable Shelf Standards and Supports: BHMA A156.9, B04071; with shelf rests, B04081.

E. Shelf Rests: BHMA A156.9, B04013; metal, two-pin type with shelf hold-down clip.

F. Drawer Slides: BHMA A156.9.

1. Grade 1: Side mounted and extending under bottom edge of drawer; full-extension type; zinc-plated steel with polymer rollers.

2. Grade 1HD-100 and Grade 1HD-200: Side mounted; full-overtravel-extension type; zinc-plated-steel ball-bearing slides.

3. For drawers not more than 3 inches high and not more than 24 inches wide, provide Grade 1.

4. For drawers more than 3 inches high but not more than 6 inches high and not more than 24 inches wide, provide Grade 1HD-100.

5. For drawers more than 6 inches high or more than 24 inches wide, provide Grade 1HD-200.

G. Locks, General: Provide locks at all doors and drawers at casework.

1. Door Locks: BHMA A156.11, E07121. Coring to be verified with Owner.
2. Drawer Locks: BHMA A156.11, E07041. Coring to be verified with Owner.

H. Door and Drawer Silencers: BHMA A156.16, L03011.

I. Inside Wall Mount Counter Bracket, HDW-5:

1. Basis-of-Design Product Model no. EH-1212FM by Rakks, div. of Rangine Corp.; www.rakks.com.
   a. Size: 12 inches high by 12 inches deep.
   b. Finish: Manufacturer's standard "Black".
2. Applications: As indicated on Drawings.

J. Exposed Hardware Finishes: For exposed hardware, provide finish that complies with BHMA A156.18 for BHMA finish number indicated.

1. Dark, Oxidized, Satin Bronze, Oil Rubbed: BHMA 613 for bronze base; BHMA 640 for steel base; match Architect's sample.
2. Bright Brass, Clear Coated: BHMA 605 for brass base; BHMA 632 for steel base.
3. Bright Brass, Vacuum Coated: BHMA 723 for brass base; BHMA 729 for zinc-coated-steel base.
4. Satin Brass, Blackened, Bright Relieved, Clear Coated: BHMA 610 for brass base; BHMA 636 for steel base.
5. Satin Chromium Plated: BHMA 626 for brass or bronze base; BHMA 652 for steel base.
6. Bright Chromium Plated: BHMA 625 for brass or bronze base; BHMA 651 for steel base.
7. Satin Stainless Steel: BHMA 630.

2.6 MISCELLANEOUS MATERIALS

A. Furring, Blocking, Shims, and Hanging Strips: Fire-retardant-treated softwood lumber, kiln dried to less than 15 percent moisture content.

B. Anchors: Select material, type, size, and finish required for each substrate for secure anchorage. Provide metal expansion sleeves or expansion bolts for post-installed anchors. Use nonferrous-metal or hot-dip galvanized anchors and inserts at inside face of exterior walls and at floors.

C. Adhesive for Bonding Plastic Laminate: Unpigmented contact cement.

1. Adhesive for Bonding Edges: Hot-melt adhesive or adhesive specified above for faces.

2.7 FABRICATION

A. Fabricate woodwork to dimensions, profiles, and details indicated. Ease edges to radius indicated for the following:

1. Corners of Cabinets: 1/16 inch unless otherwise indicated.

B. Complete fabrication, including assembly, finishing, and hardware application, to maximum extent possible before shipment to Project site. Disassemble components only as necessary for shipment and installation. Where necessary for fitting at site, provide ample allowance for scribing, trimming, and fitting.

1. Notify Architect seven days in advance of the dates and times woodwork fabrication will be complete.
2. Trial fit assemblies at fabrication shop that cannot be shipped completely assembled. Install dowels, screws, bolted connectors, and other fastening devices that can be removed

after trial fitting. Verify that various parts fit as intended and check measurements of assemblies against field measurements before disassembling for shipment.

C. Shop-cut openings to maximum extent possible to receive hardware, appliances, electrical work, and similar items. Locate openings accurately and use templates or roughing-in diagrams to produce accurately sized and shaped openings. Sand edges of cutouts to remove splinters and burrs.

2.8 FINISHES

A. Preparations for Finishing: Comply with the Architectural Woodwork Standards for sanding, filling countersunk fasteners, sealing concealed surfaces, and similar preparations for finishing interior architectural woodwork, as applicable to each unit of work.

B. Interior Architectural Woodwork for Opaque and Transparent Finishes: Shop prime with one coat of wood primer for field painting as specified in Section 09 91 00 "Painting."

C. Preparation for Finishing: Comply with Architectural Woodwork Standards, Section 5 for sanding, filling countersunk fasteners, sealing concealed surfaces, and similar preparations for finishing interior architectural woodwork, as applicable to each unit of work.

PART 3 - EXECUTION

3.1 PREPARATION

A. Before installation, condition cabinets to average prevailing humidity conditions in installation areas.

B. Before installing cabinets, examine shop-fabricated work for completion and complete work as required, including removal of packing and backpriming.

3.2 EXAMINATION

A. Examine substrates to receive solid surface material countertops and conditions under which countertops will be installed, with Installer present, for compliance with requirements for installation tolerances and other conditions affecting performance of countertops.

B. Proceed with installation only after unsatisfactory conditions have been corrected.

3.3 CABINET INSTALLATION

A. Grade: Install cabinets to comply with same grade as item to be installed.

B. Assemble cabinets and complete fabrication at Project site to the extent that it was not completed in the shop.

C. Install cabinets level, plumb, true, and straight. Shim as required with concealed shims. Install level and plumb to a tolerance of 1/8 inch in 96 inches.

D. Scribe and cut cabinets to fit adjoining work, refinish cut surfaces, and repair damaged finish at cuts.

E. Anchor cabinets to anchors or blocking built in or directly attached to substrates. Secure with countersunk, concealed fasteners and blind nailing. Use fine finishing nails or finishing screws for exposed fastening, countersunk and filled flush with woodwork.

1. For shop finished items use filler matching finish of items being installed.

F. Cabinets: Install without distortion so doors and drawers fit openings properly and are accurately aligned. Adjust hardware to center doors and drawers in openings and to provide unencumbered operation. Complete installation of hardware and accessory items as indicated.

1. Install cabinets with no more than 1/8 inch in 96-inch sag, bow, or other variation from a straight line.

2. Maintain veneer sequence matching of cabinets with transparent finish.

3. Fasten wall cabinets through back, near top and bottom, and at ends not more than 16 inches o.c. with No. 10 wafer-head sheet metal screws through metal backing or metal framing behind wall finish.

G. Touch up finishing work specified in this Section after installation of woodwork. Fill nail holes with matching filler where exposed.

1. Apply specified finish coats, including stains and paste fillers if any, to exposed surfaces where only sealer/prime coats are applied in shop.

3.4 COUNTERTOP INSTALLATION

A. Install countertops level to a tolerance of 1/8 inch in 8 feet, 1/4 inch maximum. Do not exceed 1/64-inch difference between planes of adjacent units.

B. Fasten countertops by screwing through corner blocks of base units into underside of countertop. Predrill holes for screws as recommended by manufacturer. Align adjacent surfaces and, using adhesive in color to match countertop, form seams to comply with manufacturer's written instructions. Carefully dress joints smooth, remove surface scratches, and clean entire surface.

C. Fasten subtops to cabinets by screwing through subtops into cornerblocks of base cabinets. Shim as needed to align subtops in a level plane.

D. Secure countertops to subtops with adhesive according to solid surface material manufacturer's written instructions. Align adjacent surfaces and, using adhesive in color to match countertop, form seams to comply with manufacturer's written instructions. Carefully dress joints smooth, remove surface scratches, and clean entire surface.

E. Bond joints with adhesive and draw tight as countertops are set. Mask areas of countertops adjacent to joints to prevent adhesive smears.

1. Install metal splines in kerfs in countertop edges at joints. Fill kerfs with adhesive before inserting splines and remove excess immediately after adjoining units are drawn into position.

2. Clamp units to temporary bracing, supports, or each other to ensure that countertops are properly aligned and joints are of specified width.

F. Install backsplashes and end splashes by adhering to wall and countertops with adhesive. Mask areas of countertops and splashes adjacent to joints to prevent adhesive smears.

G. Install aprons to backing and countertops with adhesive. Mask areas of countertops and splashes adjacent to joints to prevent adhesive smears. Fasten by screwing through backing. Predrill holes for screws as recommended by manufacturer.

H. Complete cutouts not finished in shop. Mask areas of countertops adjacent to cutouts to prevent damage while cutting. Make cutouts to accurately fit items to be installed, and at right angles to finished surfaces unless beveling is required for clearance. Ease edges slightly to prevent snipping.

1. Seal edges of cutouts in particleboard subtops by saturating with varnish.

I. Apply sealant to gaps at walls; comply with Section 07 92 00 "Joint Sealants."

3.5 ADJUSTING AND CLEANING

A. Repair damaged and defective cabinets, where possible, to eliminate functional and visual defects; where not possible to repair, replace woodwork. Adjust joinery for uniform appearance.

B. Clean, lubricate, and adjust hardware.

C. Clean cabinets on exposed and semi-exposed surfaces. Touch up shop-applied finishes to restore damaged or soiled areas.

END OF SECTION

SECTION 06 61 19 - QUARTZ SURFACING FABRICATIONS

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

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

1.2 SUMMARY

A. Section Includes:

1. Composite quartz surface material, (QRZ-1), for countertops.

B. Related Requirements:

1. Section 01 81 13 “Sustainability Requirements”.
2. Section 06 41 00 “Architectural Casework” for coordination with casework.
3. Section 07 92 00 “Joint Sealants”.
4. Division 22 “Plumbing” Sections for coordination with fixtures.

1.3 SUBMITTALS

A. Product Data: For countertop materials.

B. Sustainable Design Submittals: Refer to Section 01 81 13 “Sustainability Requirements”.

C. Shop Drawings: For countertops. Show materials, finishes, edge profiles, methods of joining, and cutouts for plumbing fixtures.

1. Show locations and details of joints.
2. Show direction of directional pattern, if any.
3. Samples for Initial Selection: For each type of material exposed to view.

D. Samples for Verification: For the following products:

1. Countertop material, 6 inches square and showing edge condition.

E. Qualification Data: For fabricator.

F. Maintenance Data: For quartz surface material countertops to include in maintenance manuals. Include Product Data for care products used or recommended by Installer and names, addresses, and telephone numbers of local sources for products.

1.4 QUALITY ASSURANCE

A. Fabricator Qualifications: Shop that employs skilled workers who custom-fabricate countertops similar to that required for this work, and whose products have a record of successful in-service performance.

B. Installer Qualifications: Fabricator of countertops.

1.5 FIELD CONDITIONS

A. Field Measurements: Verify dimensions of countertops by field measurements after base cabinets are installed but before countertop fabrication is complete.

1.6 COORDINATION

A. Coordinate locations of utilities that will penetrate countertops.

PART 2 - PRODUCTS

2.1 QUARTZ SURFACE COUNTERTOP MATERIALS

A. Quality Standard: Unless otherwise indicated, comply with the "Architectural Woodwork Standards" for grades indicated for construction, installation, and other requirements.

B. Composite Quartz: Solid sheets of quartz composite material complying with material and performance requirements in ANSI Z124.6. Product shall be composed of a minimum of 93 percent quartz.

1. Basis-of-Design Product, QRZ-1: Classico Collection by Caesarstone; www.ceasarstone.com.

2. Color: See drawings.

3. Finish: Polished finish.

4. Thickness: 3 cm.

5. Applications: Bar, or as indicated in Drawings.

C. Plywood Substrates: Exterior grade softwood plywood complying with DOC PS 1, Grade C-C Plugged, touch sanded. Waterproof. Comply with Section 06 40 00 “Architectural Casework.”

1. Sourcing: Provide FSC-certified plywood, or plywood of recycled or reclaimed content.

2. Composite Wood Installed Within the Building Interior: Comply with California Air Resources Board (CARB) Airborne Toxic Control Measure (ATCM), Phase II for ultra-low-emitting formaldehyde (ULEF) resins or containing no formaldehyde resins.

a. Exception: If composite wood product that does not comply with California 93120 Phase II (CARB Phase II) is used, all exposed edges and sides shall be sealed with low/ no VOC requirements in Section 01 81 13 “Sustainability Requirements”.

2.2 ACCESSORIES

A. Trim Accessories: Manufacturer's standard vinyl extrusions designed to retain and cover edges of panels. Provide division bars, inside corners, outside corners, and caps as needed to conceal edges.

B. Exposed Fasteners: Nylon drive rivets recommended by panel manufacturer.

C. Concealed Mounting Splines: Continuous, H-shaped aluminum extrusions designed to fit into grooves routed in edges of factory-laminated panels and to be fastened to substrate.

D. Adhesive: As recommended by plastic paneling manufacturer.

E. Sealant: Sealant recommended by plastic paneling manufacturer and complying with requirements in Section 07 92 00 "Joint Sealants."

2.3 COUNTERTOP FABRICATION

A. Fabricate countertops according to quartz surface material manufacturer's written instructions and to the AWI/AWMAC/WI's "Architectural Woodwork Standards."

1. Grade: Premium.

B. Configuration:

1. Front: Straight, slightly eased at top, with laminated edge, size as indicated in Drawings.

C. Countertops: Quartz surface material with front edge built up with same material as indicated in Drawings.

D. Fabricate tops with shop-applied edges unless otherwise indicated. Comply with quartz surface material manufacturer's written instructions for adhesives, sealers, fabrication, and finishing.

E. Joints: Fabricate countertops without joints.

F. Cutouts and Holes:

1. Retain "Undercounter Plumbing Fixtures" Subparagraph below for undercounter lavatories and sinks. Shop fabrication usually provides better results, but large openings, such as for kitchen sinks, are better completed after top is in place to avoid possibility of breakage during delivery or installation.

2. Undercounter Plumbing Fixtures: Make cutouts for fixtures in shop using template or pattern furnished by fixture manufacturer. Form cutouts to smooth, even curves.

3. Provide vertical edges, slightly eased at juncture of cutout edges with top and bottom surfaces of countertop and projecting 3/16 inch into fixture opening.

4. Provide vertical edges, rounded to 3/8-inch radius at juncture of cutout edges with top surface of countertop, slightly eased at bottom, and projecting 3/16 inch into fixture opening.

5. Provide 3/4-inch full bullnose edges projecting 3/8 inch into fixture opening.

6. Counter-Mounted Plumbing Fixtures: Prepare countertops in shop for field cutting openings for counter-mounted fixtures. Mark tops for cutouts and drill holes at corners of cutout locations. Make corner holes of largest radius practical.

7. Fittings: Drill countertops in shop for plumbing fittings, undercounter soap dispensers, and similar items.

8. Counter-Mounted Cooktops: Prepare countertops in shop for field cutting openings for cooktops. Mark tops for cutouts and drill holes at corners of cutout locations. Make corner holes of largest radius practical.

2.4 INSTALLATION MATERIALS

1. Adhesive: Product recommended by quartz surface material manufacturer.

2. Sealant for Countertops: Comply with applicable requirements in Section 079200 "Joint Sealants."

PART 3 - EXECUTION

3.1 EXAMINATION

A. Examine substrates to receive quartz surface material countertops and conditions under which countertops will be installed, with Installer present, for compliance with requirements for installation tolerances and other conditions affecting performance of countertops.

B. Proceed with installation only after unsatisfactory conditions have been corrected.

3.2 COUNTERTOP INSTALLATION

A. Install countertops level to a tolerance of 1/8 inch in 8 feet, 1/4 inch maximum. Do not exceed 1/64-inch difference between planes of adjacent units.

B. Fasten countertops by screwing through corner blocks of base units into underside of countertop. Predrill holes for screws as recommended by manufacturer. Align adjacent surfaces and, using adhesive in color to match countertop, form seams to comply with manufacturer's written instructions. Carefully dress joints smooth, remove surface scratches, and clean entire surface.

C. Fasten subtops to cabinets by screwing through subtops into cornerblocks of base cabinets. Shim as needed to align subtops in a level plane.

D. Secure countertops to subtops with adhesive according to quartz surface material manufacturer's written instructions. Align adjacent surfaces and, using adhesive in color to match countertop, form seams to comply with manufacturer's written instructions. Carefully dress joints smooth, remove surface scratches, and clean entire surface.

E. Mask areas of countertops adjacent to joints to prevent adhesive smears.

F. Install aprons to backing and countertops with adhesive. Mask areas of countertops and splashes adjacent to joints to prevent adhesive smears. Fasten by screwing through backing. Predrill holes for screws as recommended by manufacturer.

G. Complete cutouts not finished in shop. Mask areas of countertops adjacent to cutouts to prevent damage while cutting. Make cutouts to accurately fit items to be installed, and at right angles to finished surfaces unless beveling is required for clearance. Ease edges slightly to prevent snipping.

H. Seal edges of cutouts in particleboard subtops by saturating with varnish.

I. Apply sealant to gaps at walls; comply with Section 07 92 00 "Joint Sealants."

END OF SECTION

SECTION 07 21 00 - THERMAL INSULATION

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

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

1.2 SUMMARY

A. Section Includes:

1. Glass-fiber batt insulation.
2. Under slab insulation.
3. Insulation for miscellaneous voids.
4. Vapor retarder.

B. Related Requirements:

1. Section 01 81 13 “Sustainability Requirements”.
2. Section 03 30 00 “Cast-in-Place Concrete” for under-slab insulation.
3. Section 09 29 00 “Gypsum Board” for acoustic insulation.

1.3 SUBMITTALS

A. Product Data: For each type of product.

B. Product Test Reports: For each product, for tests performed by a qualified testing agency.

C. Sustainable Design Submittals: Refer to Section 01 81 13 “Sustainability Requirements”.

1.4 DEFINITIONS

A. Mineral-Fiber Insulation: Insulation composed of rock-wool fibers, slag-wool fibers, or glass fibers; produced in boards and blankets with latter formed into batts (flat-cut lengths) or rolls.

1.5 DELIVERY, STORAGE, AND HANDLING

A. Protect insulation materials from physical damage and from deterioration due to moisture, soiling, and other sources. Store inside and in a dry location. Comply with manufacturer's written instructions for handling, storing, and protecting during installation.

B. Protect foam-plastic board insulation as follows:

1. Do not expose to sunlight except to necessary extent for period of installation and concealment.
2. Protect against ignition at all times. Do not deliver foam-plastic board materials to Project site until just before installation time.
3. Quickly complete installation and concealment of foam-plastic board insulation in each area of construction.

PART 2 - PRODUCTS

2.1 PERFORMANCE REQUIREMENTS

A. Source Limitations: Obtain each type of building insulation through one source.

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: One of the following standards shall apply:

a. ASTM E84 "Standard Test Method for Surface Burning Characteristics of Building Materials"

2. Fire-Resistance Ratings: One of the following standard shall apply:

a. ASTM E119 "Standard Test Methods for Fire Tests for Building Construction and Materials"

b. ISO 834 - Parts 1 and 3-9 “Fire Resistance Tests - Elements of Building Construction.”

3. Combustion Characteristics: One of the following standards shall apply:

a. ASTM E136 "Standard Test method for Behavior of Materials in a Vertical Tube Furnace at 750 Degrees Celsius"

C. Formaldehyde-Free: Batt insulation products shall not contain formaldehyde (or formaldehyde precursors).

D. Recycled Content: Batt insulation products shall contain a minimum of 50 percent post-consumer recycled glass content.

2.2 BATT INSULATION

A. Glass-Fiber Batt Insulation, Unfaced: ASTM C665, Type I; passing ASTM E136 for combustion characteristics.

1. Basis-of-Design Product: EcoBatt (Unfaced) by Knauf; www.knaufinsulation.us.

2. Other Acceptable Product: Formaldehyde-Free Fiberglass Insulation by Johns Manville; www.johnsmanville.com.

2.3 UNDER SLAB INSULATION

A. Where underslab insulation is removed for trenching, install new to match existing.

2.4 VAPOR RETARDER

A. Sheet Vapor Retarder at Interior Spaces: Polyamide film vapor retarder for use with unfaced, vapor permeable glass fiber and mineral wool insulation in wall and ceiling cavities. Material shall have a permeance of 1 perm or less when tested to ASTM E 86, dry cup method and permeability shall increase to greater than 10 perms when tested to ASTM E 86, wet cup method.

1. Water Vapor Permeance:

a. ASTM E86, dry cup method: Maximum of 1.0 perm (57ng/Pa*s*m2).

b. ASTM E86, wet cup method: Minimum of 10.0 perms (1144ng/Pa*s*m2).

2. Fire Hazard Classification: ASTM E 84:

a. Maximum Flame Spread Index; 20.

b. Maximum Smoke Developed Index; 55.

3. Basis-of-Design Product: MemBrain by CertainTeed, Div. of Saint Gobain; www.certainteed.com.

4. Application: Interior face of exterior walls.

B. Vapor-Retarder Tape: Pressure-sensitive tape of type recommended by vapor-retarder manufacturer for sealing joints and penetrations in vapor retarder.

C. Adhesive for Vapor Retarders: Product recommended by vapor-retarder manufacturer and has demonstrated capability to bond vapor retarders securely to substrates indicated.

2.5 ACCESSORIES

A. Insulation for Miscellaneous Voids: Provide closure throughout framed portions of the project to prevent air movement as well as prevent access by insects and rodents to interior spaces, both occupied and not-occupied. This includes at openings created for the passage of piping, wiring, or other work which creates openings that could provide movement of air and access to vermin. Do not provide closure where screening or other means has been indicated to allow air movement while preventing access to vermin.

1. Glass-Fiber Insulation: ASTM C764, Type II, loose fill; with maximum flame-spread and smoke-developed indexes of 5, per ASTM E84.

2. Spray Polyurethane Foam Insulation: ASTM C1029, Type II, closed cell, with maximum flame-spread and smoke-developed indexes of 75 and 450, respectively, per ASTM E84.

a. Basis-of-Design Product: Great Stuff Insulating Foam Sealant by DuPont; greatstuff.dupont.com.

PART 3 - EXECUTION

3.1 PREPARATION

A. Clean substrates of substances that are harmful to insulation, including removing projections capable of puncturing insulation, or that interfere with insulation attachment.

3.2 INSTALLATION, GENERAL

A. Comply with insulation manufacturer's written instructions applicable to products and applications.

B. Install insulation that is undamaged, dry, and unsoiled and that has not been left exposed to ice, rain, or snow at any time.

C. Extend insulation to envelop entire area to be insulated. Fit tightly around obstructions and fill voids with insulation. Remove projections that interfere with placement.

D. Provide sizes to fit applications and selected from manufacturer's standard thicknesses, widths, and lengths. Apply single layer of insulation units unless multiple layers are otherwise shown or required to make up total thickness or to achieve R-value.

3.3 INSTALLATION OF CAVITY-WALL INSULATION

A. Mineral-Wool Board Insulation: Install insulation fasteners 4 inches from each corner of board insulation, at center of board, and as recommended by manufacturer.

1. Fit courses of insulation between obstructions, with edges butted tightly in both directions, and with faces flush.

2. Press units firmly against inside substrates.

3.4 INSTALLATION OF INSULATION IN FRAMED CONSTRUCTION

A. Blanket Insulation: Install in cavities formed by framing members according to the following requirements:

1. Use insulation widths and lengths that fill the cavities formed by framing members. If more than one length is required to fill the cavities, provide lengths that will produce a snug fit between ends.
2. Place insulation in cavities formed by framing members to produce a friction fit between edges of insulation and adjoining framing members.
3. Maintain 3-inch clearance of insulation around recessed lighting fixtures not rated for or protected from contact with insulation.
4. For metal-framed wall cavities where cavity heights exceed 96 inches, support unfaced blankets mechanically and support faced blankets by taping flanges of insulation to flanges of metal studs.

B. Miscellaneous Voids: Install insulation in miscellaneous voids and cavity spaces where required to prevent gaps in insulation using the following materials:

1. Glass-Fiber Insulation: Compact to approximately 40 percent of normal maximum volume equaling a density of approximately 2.5 lb/cu. ft.
2. Spray Polyurethane Insulation: Apply according to manufacturer's written instructions.
    a. Do not apply insulation until installation of pipes, ducts, conduits, wiring, and electrical outlets in walls is completed and windows, electrical boxes, and other items not indicated to receive insulation are masked.
    b. After insulation is applied, make flush with face of studs by using method recommended by insulation manufacturer.

3.5 INSTALLATION OF VAPOR RETARDERS ON FRAMING

A. Place vapor retarders on side of construction indicated on Drawings.

B. Extend vapor retarders to extremities of areas to protect from vapor transmission. Secure vapor retarders in place with adhesives, vapor retarder fasteners, or other anchorage system as recommended by manufacturer. Extend vapor retarders to cover miscellaneous voids in insulated substrates, including those filled with loose-fiber insulation.

C. Seal vertical joints in vapor retarders over framing by lapping no fewer than two studs and sealing with vapor-retarder tape according to vapor-retarder manufacturer's written instructions. Locate all joints over framing members or other solid substrates.

D. Seal joints caused by pipes, conduits, electrical boxes, and similar items penetrating vapor retarders with vapor-retarder tape to create an airtight seal between penetrating objects and vapor retarders.

E. Repair tears or punctures in vapor retarders immediately before concealment by other work. Cover with vapor-retarder tape or another layer of vapor retarders.

3.6 PROTECTION

A. Protect installed insulation from damage due to harmful weather exposures, physical abuse, and other causes. Provide temporary coverings or enclosures where insulation is subject to abuse and cannot be concealed and protected by permanent construction immediately after installation.

END OF SECTION

SECTION 07 84 13 - PENETRATION FIRESTOPPING

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

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

1.2 SUMMARY

A. Section Includes:

1. Penetrations in fire-resistance-rated walls.
2. Penetrations in horizontal assemblies.
3. Penetrations in smoke barriers.

B. Related Requirements:

1. Section 01 81 13 “Sustainability Requirements”.
2. Section 07 92 00 “Joint Sealants” for non-fire-resistant joint sealants.

1.3 SUBMITTALS

A. Product Data: For each type of product indicated.

B. Sustainable Design Submittals: Refer to Section 01 81 13 “Sustainability Requirements”.

C. Product Schedule: For each penetration firestopping system. Include location and design designation of qualified testing and inspecting agency.

1. Where Project conditions require modification to a qualified testing and inspecting agency's illustration for a particular penetration firestopping condition, submit illustration, with modifications marked, approved by penetration firestopping manufacturer's fire-protection engineer as an engineering judgment or equivalent fire-resistance-rated assembly.

1.4 QUALITY ASSURANCE

A. Installer Qualifications: A firm that has been approved by FM Global according to FM Global 4991, "Approval of Firestop Contractors," or been evaluated by UL and found to comply with its "Qualified Firestop Contractor Program Requirements."

B. Installer Qualifications: A firm experienced in installing penetration firestopping similar in material, design, and extent to that indicated for this Project, whose work has resulted in construction with a record of successful performance. Qualifications include having the necessary experience, staff, and training to install manufacturer's products per specified requirements. Manufacturer's willingness to sell its penetration firestopping products to Contractor or to Installer engaged by Contractor does not in itself confer qualification on buyer.

C. Fire-Test-Response Characteristics: Penetration firestopping shall comply with the following requirements:

1. Penetration firestopping tests are performed by a qualified testing agency acceptable to authorities having jurisdiction.

2. Penetration firestopping is identical to those tested per testing standard referenced in "Penetration Firestopping" Article. Provide rated systems complying with the following requirements:

a. Penetration firestopping products bear classification marking of qualified testing and inspecting agency.

b. Classification markings on penetration firestopping correspond to designations listed by the following:

1) UL in its "Fire Resistance Directory."

2) FM Global in its "Building Materials Approval Guide."

D. Preinstallation Conference: Conduct conference at Project site.

1.5 PROJECT CONDITIONS

A. Environmental Limitations: Do not install penetration firestopping when ambient or substrate temperatures are outside limits permitted by penetration firestopping manufacturers or when substrates are wet because of rain, frost, condensation, or other causes.

B. Install and cure penetration firestopping per manufacturer's written instructions using natural means of ventilations or, where this is inadequate, forced-air circulation.

1.6 COORDINATION

A. Coordinate construction of openings and penetrating items to ensure that penetration firestopping is installed according to specified requirements.

B. Coordinate sizing of sleeves, openings, core-drilled holes, or cut openings to accommodate penetration firestopping.

C. Notify Owner's testing agency at least seven days in advance of penetration firestopping installations; confirm dates and times on day preceding each series of installations.

PART 2 - PRODUCTS

2.1 PENETRATION FIRESTOPPING

A. Provide penetration firestopping that is produced and installed to resist spread of fire according to requirements indicated, resist passage of smoke and other gases, and maintain original fire-resistance rating of construction penetrated. Penetration firestopping systems shall be compatible with one another, with the substrates forming openings, and with penetrating items if any.

B. Penetrations in Fire-Resistance-Rated Walls: Provide penetration firestopping with ratings determined per ASTM E 814 or UL 1479, based on testing at a positive pressure differential of 0.01-inch wg.

1. Fire-resistance-rated walls include fire walls.

2. F-Rating: Not less than the fire-resistance rating of constructions penetrated.

C. Penetrations in Horizontal Assemblies: Provide penetration firestopping with ratings determined per ASTM E 814 or UL 1479, based on testing at a positive pressure differential of 0.01-inch wg.

1. Horizontal assemblies include floors.

2. F-Rating: At least 1 hour, but not less than the fire-resistance rating of constructions penetrated.

3. T-Rating: At least 1 hour, but not less than the fire-resistance rating of constructions penetrated except for floor penetrations within the cavity of a wall.

D. Penetrations in Smoke Barriers: Provide penetration firestopping with ratings determined per UL 1479.

1. L-Rating: Not exceeding 5.0 cfm/sq. ft. of penetration opening at 0.30-inch wg at both ambient and elevated temperatures.

E. W-Rating: Provide penetration firestopping showing no evidence of water leakage when tested according to UL 1479.

F. Exposed Penetration Firestopping: Provide products with flame-spread and smoke-developed indexes of less than 25 and 450, respectively, as determined per ASTM E 84.

G. Accessories: Provide components for each penetration firestopping system that are needed to install fill materials and to maintain ratings required. Use only those components specified by penetration firestopping manufacturer and approved by qualified testing and inspecting agency for firestopping indicated.

1. Permanent forming/damming/backing materials, including the following:

a. Slag-wool-fiber or rock-wool-fiber insulation.

b. Sealants used in combination with other forming/damming/backing materials to prevent leakage of fill materials in liquid state.

c. Fire-rated form board.

d. Fillers for sealants.

2. Temporary forming materials.

3. Substrate primers.

4. Collars.

5. Steel sleeves.

2.2 FILL MATERIALS

A. Cast-in-Place Firestop Devices: Factory-assembled devices for use in cast-in-place concrete floors and consisting of an outer metallic sleeve lined with an intumescent strip, a radial extended flange attached to one end of the sleeve for fastening to concrete formwork, and a neoprene gasket.

B. Single-component latex formulations that do not re-emulsify after cure during exposure to moisture.

C. Firestop Devices: Factory-assembled collars formed from galvanized steel and lined with intumescent material sized to fit specific diameter of penetrant.

D. Intumescent Composite Sheets: Rigid panels consisting of aluminum-foil-faced elastomeric sheet bonded to galvanized-steel sheet.

E. Intumescent Putties: Nonhardening dielectric, water-resistant putties containing no solvents, inorganic fibers, or silicone compounds.

F. Intumescent Wrap Strips: Single-component intumescent elastomeric sheets with aluminum foil on one side.

G. Mortars: Prepackaged dry mixes consisting of a blend of inorganic binders, hydraulic cement, fillers, and lightweight aggregate formulated for mixing with water at Project site to form a nonshrinking, homogeneous mortar.

H. Pillows/Bags: Reusable heat-expanding pillows/bags consisting of glass-fiber cloth cases filled with a combination of mineral-fiber, water-insoluble expansion agents, and fire-retardant additives. Where exposed, cover openings with steel-reinforcing wire mesh to protect pillows/bags from being easily removed.

I. Silicone Foams: Multicomponent, silicone-based liquid elastomers that, when mixed, expand and cure in place to produce a flexible, nonshrinking foam.

J. Silicone Sealants: Single-component, silicone-based, neutral-curing elastomeric sealants of grade indicated below:

1. Grade: Pourable (self-leveling) formulation for openings in floors and other horizontal surfaces, and nonsag formulation for openings in vertical and sloped surfaces, unless indicated firestopping limits use of nonsag grade for both opening conditions.

2.3 MIXING

A. For those products requiring mixing before application, comply with penetration firestopping manufacturer's written instructions for accurate proportioning of materials, water (if required), type of mixing equipment, selection of mixer speeds, mixing containers, mixing time, and other items or procedures needed to produce products of uniform quality with optimum performance characteristics for application indicated.

PART 3 - EXECUTION

3.1 EXAMINATION

A. Examine substrates and conditions, with Installer present, for compliance with requirements for opening configurations, penetrating items, substrates, and other conditions affecting performance of the Work.

B. Proceed with installation only after unsatisfactory conditions have been corrected.

3.2 PREPARATION

A. Surface Cleaning: Clean out openings immediately before installing penetration firestopping to comply with manufacturer's written instructions and with the following requirements:

1. Remove from surfaces of opening substrates and from penetrating items foreign materials that could interfere with adhesion of penetration firestopping.

2. Clean opening substrates and penetrating items to produce clean, sound surfaces capable of developing optimum bond with penetration firestopping. Remove loose particles remaining from cleaning operation.

3. Remove laitance and form-release agents from concrete.

B. Priming: Prime substrates where recommended in writing by manufacturer using that manufacturer's recommended products and methods. Confine primers to areas of bond; do not allow spillage and migration onto exposed surfaces.

C. Masking Tape: Use masking tape to prevent penetration firestopping from contacting adjoining surfaces that will remain exposed on completion of the Work and that would otherwise be permanently stained or damaged by such contact or by cleaning methods used to remove stains. Remove tape as soon as possible without disturbing firestopping's seal with substrates.

3.3 INSTALLATION

A. General: Install penetration firestopping to comply with manufacturer's written installation instructions and published drawings for products and applications indicated.

B. Install forming materials and other accessories of types required to support fill materials during their application and in the position needed to produce cross-sectional shapes and depths required to achieve fire ratings indicated.

1. After installing fill materials and allowing them to fully cure, remove combustible forming materials and other accessories not indicated as permanent components of firestopping.

C. Install fill materials for firestopping by proven techniques to produce the following results:

1. Fill voids and cavities formed by openings, forming materials, accessories, and penetrating items as required to achieve fire-resistance ratings indicated.

2. Apply materials so they contact and adhere to substrates formed by openings and penetrating items.

3. For fill materials that will remain exposed after completing the Work, finish to produce smooth, uniform surfaces that are flush with adjoining finishes.

3.4 IDENTIFICATION

A. Identify penetration firestopping with preprinted metal or plastic labels. Attach labels permanently to surfaces adjacent to and within 6 inches of firestopping edge so labels will be visible to anyone seeking to remove penetrating items or firestopping. Use mechanical fasteners or self-adhering-type labels with adhesives capable of permanently bonding labels to surfaces on which labels are placed. Include the following information on labels:

1. The words "Warning - Penetration Firestopping - Do Not Disturb. Notify Building Management of Any Damage."

2. Contractor's name, address, and phone number.

3. Designation of applicable testing and inspecting agency.

4. Date of installation.

5. Manufacturer's name.

6. Installer's name.

3.5 FIELD QUALITY CONTROL

A. Owner will engage a qualified testing agency to perform tests and inspections.

B. Where deficiencies are found or penetration firestopping is damaged or removed because of testing, repair or replace penetration firestopping to comply with requirements.

C. Proceed with enclosing penetration firestopping with other construction only after inspection reports are issued and installations comply with requirements.

3.6 CLEANING AND PROTECTION

A. Clean off excess fill materials adjacent to openings as the Work progresses by methods and with cleaning materials that are approved in writing by penetration firestopping manufacturers and that do not damage materials in which openings occur.

B. Provide final protection and maintain conditions during and after installation that ensure that penetration firestopping is without damage or deterioration at time of Substantial Completion. If, despite such protection, damage or deterioration occurs, immediately cut out and remove damaged or deteriorated penetration firestopping and install new materials to produce systems complying with specified requirements.

END OF SECTION

SECTION 07 92 00 - JOINT SEALANTS

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

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

1.2 SUMMARY

A. Section Includes:

1. Silicone joint sealants.
2. Urethane joint sealants.
3. Mildew-resistant joint sealants.
4. Latex joint sealants.

B. Related Requirements:

1. Section 01 81 13 “Sustainability Requirements”.
2. Section 07 84 13 “Penetration Firestopping” for fire-resistant joint sealants.
3. Section 09 29 00 “Gypsum Board” for acoustical sealant.

1.3 SUBMITTALS

A. Product Data: For each joint-sealant product.

B. Sustainable Design Submittals: Refer to Section 01 81 13 “Sustainability Requirements”.

C. Samples for Initial Selection: Manufacturer's color charts consisting of strips of cured sealants showing the full range of colors available for each product exposed to view.

D. Samples for Verification: For each kind and color of joint sealant required, provide Samples with joint sealants in 1/2-inch-wide joints formed between two 6-inch-long strips of material matching the appearance of exposed surfaces adjacent to joint sealants.

E. Joint-Sealant Schedule: Include the following information:

1. Joint-sealant application, joint location, and designation.
2. Joint-sealant manufacturer and product name.
3. Joint-sealant formulation.
4. Joint-sealant color.

F. Qualification Data: For qualified testing agency.

G. Product Test Reports: For each kind of joint sealant, for tests performed by a qualified testing agency.

H. Preconstruction Laboratory Test Schedule: Include the following information for each joint sealant and substrate material to be tested:

1. Joint-sealant location and designation.
2. Manufacturer and product name.
3. Type of substrate material.
4. Proposed test.

5. Number of samples required.

I. Preconstruction Laboratory Test Reports: From sealant manufacturer, indicating the following:

1. Materials forming joint substrates and joint-sealant backings have been tested for compatibility and adhesion with joint sealants.

2. Interpretation of test results and written recommendations for primers and substrate preparation are needed for adhesion.

J. Preconstruction Field-Adhesion-Test Reports: Indicate which sealants and joint preparation methods resulted in optimum adhesion to joint substrates based on testing specified in "Preconstruction Testing" Article.

K. Field-Adhesion-Test Reports: For each sealant application tested.

L. Sample Warranties: For special warranties.

1.4 QUALITY ASSURANCE

A. Installer Qualifications: An authorized representative who is trained and approved by manufacturer.

B. Product Testing: Test joint sealants using a qualified testing agency.

1. Testing Agency Qualifications: Qualified according to ASTM C1021 to conduct the testing indicated.

1.5 PRECONSTRUCTION TESTING

A. Preconstruction Laboratory Testing: Submit to joint-sealant manufacturers, for testing indicated below, samples of materials that will contact or affect joint sealants.

1. Adhesion Testing: Use ASTM C794 to determine whether priming and other specific joint preparation techniques are required to obtain rapid, optimum adhesion of joint sealants to joint substrates.

2. Compatibility Testing: Use ASTM C1087 to determine sealant compatibility when in contact with glazing and gasket materials.

3. Stain Testing: Use ASTM C1248 to determine stain potential of sealant when in contact with porous substrates.

4. Submit manufacturer's recommended number of pieces of each type of material, including joint substrates, joint-sealant backings, and miscellaneous materials.

5. Schedule sufficient time for testing and analyzing results to prevent delaying the Work.

6. For materials failing tests, obtain joint-sealant manufacturer's written instructions for corrective measures, including use of specially formulated primers.

7. Testing will not be required if joint-sealant manufacturers submit data that are based on previous testing, not older than 24 months, of sealant products for adhesion to, staining of, and compatibility with joint substrates and other materials matching those submitted.

B. Preconstruction Field-Adhesion Testing: Before installing sealants, field test their adhesion to Project joint substrates as follows:

1. Locate test joints where indicated on Project or, if not indicated, as directed by Architect.

2. Conduct field tests for each kind of sealant and joint substrate.

3. Notify Architect seven days in advance of dates and times when test joints will be erected.

4. Arrange for tests to take place with joint-sealant manufacturer's technical representative present.

a. Test Method: Test joint sealants according to Method A, Field-Applied Sealant Joint Hand Pull Tab, in Appendix X1.1 in ASTM C1193 or Method A, Tail Procedure, in ASTM C1521.

1) For joints with dissimilar substrates, verify adhesion to each substrate separately; extend cut along one side, verifying adhesion to opposite side. Repeat procedure for opposite side.

5. Report whether sealant failed to adhere to joint substrates or tore cohesively. Include data on pull distance used to test each kind of product and joint substrate. For sealants that fail adhesively, retest until satisfactory adhesion is obtained.

6. Evaluation of Preconstruction Field-Adhesion-Test Results: Sealants not evidencing adhesive failure from testing, in absence of other indications of noncompliance with requirements, will be considered satisfactory. Do not use sealants that fail to adhere to joint substrates during testing.

1.6 FIELD CONDITIONS

A. Do not proceed with installation of joint sealants under the following conditions:

1. When ambient and substrate temperature conditions are outside limits permitted by joint-sealant manufacturer.

2. When joint substrates are wet.

3. Where joint widths are less than those allowed by joint-sealant manufacturer for applications indicated.

4. Where contaminants capable of interfering with adhesion have not yet been removed from joint substrates.

1.7 WARRANTY

A. Special Installer's Warranty: Installer agrees to repair or replace joint sealants that do not comply with performance and other requirements specified in this Section within specified warranty period.

1. Warranty Period: Two (2) years from date of Substantial Completion.

B. Special Manufacturer's Warranty: Manufacturer agrees to furnish joint sealants to repair or replace those joint sealants that do not comply with performance and other requirements specified in this Section within specified warranty period.

1. Warranty Period: Five (5) years from date of Substantial Completion.

C. Special warranties specified in this article exclude deterioration or failure of joint sealants from the following:

1. Movement of the structure caused by stresses on the sealant exceeding sealant manufacturer's written specifications for sealant elongation and compression.

2. Disintegration of joint substrates from causes exceeding design specifications.

3. Mechanical damage caused by individuals, tools, or other outside agents.

4. Changes in sealant appearance caused by accumulation of dirt or other atmospheric contaminants.

PART 2 - PRODUCTS

2.1 PERFORMANCE REQUIREMENTS

A. All openings, gaps, and joints in floor and wall assemblies in contact with soil and at gaps around pipes, toilets, bathtubs, or drains penetrating these assemblies shall be filled or closed with materials that provide a permanent air-tight seal.

B. Only smaller gaps shall be sealed with elastomeric joint sealant, as defined by ASTM C920; maximum joint width as recommended by sealant manufacturer.

1. Large openings shall not be sealed with elastomeric joint sealant, but rather with nonshrink grout or expanding foam materials; refer to Sections 03 30 00 “Cast-in-Place Concrete” for nonshrink grout and to Section 07 21 00 "Thermal Insulation" for expanding foam.

C. Physical properties of elastomeric joint sealants shall meet requirements of Radon Mitigation System as indicated in the Drawings

2.2 MANUFACTURERS

A. Approved Manufacturers:

1. Dow Corp.; www.dow.com.
2. DuPont de Nemours, Inc.; www.dupont.com.
3. Euclid Chemical Co.; www.euclidchemical.com.
4. GE Construction Sealants; www.siliconeforbuilding.com.
5. Quad Max by OSI, div. of Henkel Corp.; www.ositough.com.
6. Master Builders Solutions, formerly BASF Corp.; www.master-builders-soultions.com.
7. Metzger/McGuire; www.metzgermcguire.com.
8. Pecora Corp.; www.pecora.com.
9. Sika Corp.; www.sika.com.
10. Tremco, Inc.; www.tremcosealants.com.

2.3 JOINT SEALANTS, GENERAL

A. Compatibility: Provide joint sealants, backings, and other related materials that are compatible with one another and with joint substrates under conditions of service and application, as demonstrated by joint-sealant manufacturer, based on testing and field experience.

B. Colors of Exposed Joint Sealants: As selected by Architect from manufacturer's full range.

C. Adhesives and Sealants: Comply with low/ no VOC requirements in Section 01 81 13 “Sustainability Requirements”.

2.4 URETHANE JOINT SEALANTS

A. Urethane, M, P, 25, T, NT: Multicomponent, pourable, plus 25 percent and minus 25 percent movement capability, traffic- and nontraffic-use, urethane joint sealant; ASTM C920, Type M, Grade P, Class 25, Uses T and NT.

1. Basis-of-Design Product: Pecora Dynatrol II SG by Pecora.
2. Applications: Interior horizontal concrete joints, as indicated in Drawings.

2.5 MILDEW-RESISTANT JOINT SEALANTS

A. Mildew-Resistant Joint Sealants: Formulated for prolonged exposure to humidity with fungicide to prevent mold and mildew growth.

B. Silicone, Mildew Resistant, Acid Curing, S, NS, 25, NT: Mildew-resistant, single-component, nonsag, plus 25 percent and minus 25 percent movement capability, nontraffic-use, acid-curing silicone joint sealant; ASTM C920, Type S, Grade NS, Class 25, Use NT.

1. Basis-of-Design Product: Tremsil 200by Tremco; www.tremcosealants.com.

2. Other Approved Manufacturers:

a. Dow Corning Corporation; www.dowcorning.com.

b. GE Construction Sealants; Momentive Performance Materials Inc.; www.siliconeforbuilding.com.

c. Tremco Incorporated; www.tremco.com.

3. Applications: At joints in ceramic tile walls and floor, around equipment and around plumbing fixtures.

2.6 BUTYL JOINT SEALANTS

A. Butyl-Rubber-Based Joint Sealants: ASTM C1311.

1. Basis of Design Product: Tremco Butyl by Tremco; www.tremcosealants.com.

2. Other Approved Manufacturers:

a. Pecora Corporation; www.pecora.com.

b. Tremco Incorporated; www.tremco.com.

3. Applications: For bedding thresholds.

2.7 LATEX JOINT SEALANTS

A. Acrylic Latex: Acrylic latex or siliconized acrylic latex, ASTM C834, Type OP, Grade NF.

1. Basis-of-Design Product: Tremflex 834 by Tremco; www.tremcosealants.com.

2. Other Approved Product: Pecora AC-20 +Silicone by Pecora.

3. Applications: Paintable sealant at interiors.

2.8 LOW EXPANDING FOAM SEALANTS

A. Low expanding, one-component, polyurethane foam sealant, curing to a semi-rigid, closed cell urethane foam.

1. Applications:

a. Apply between top of precast concrete panels and metal framing.

b. Miscellaneous openings and voids in exterior walls.

2.9 JOINT-SEALANT BACKING

A. Sealant Backing Material, General: Nonstaining; compatible with joint substrates, sealants, primers, and other joint fillers; and approved for applications indicated by sealant manufacturer based on field experience and laboratory testing.

B. Cylindrical Sealant Backings: Preformed, resilient, plastic foam joint-filler strips, complying with ASTM C717.

1. Basis-of-Design Product: Bicellular, ASTM C1330 Type B: SOF Rod by NOMACO Inc.; www.nomaco.com.

C. Bond-Breaker Tape: Polyethylene tape or other plastic tape recommended by sealant manufacturer for preventing sealant from adhering to rigid, inflexible joint-filler materials or joint surfaces at back of joint. Provide self-adhesive tape where applicable.

2.10 MISCELLANEOUS MATERIALS

A. Primer: Material recommended by joint-sealant manufacturer where required for adhesion of sealant to joint substrates indicated, as determined from preconstruction joint-sealant-substrate tests and field tests.

B. Cleaners for Nonporous Surfaces: Chemical cleaners acceptable to manufacturers of sealants and sealant backing materials, free of oily residues or other substances capable of staining or harming joint substrates and adjacent nonporous surfaces in any way and formulated to promote optimum adhesion of sealants to joint substrates.

C. Masking Tape: Nonstaining, nonabsorbent material compatible with joint sealants and surfaces adjacent to joints.

PART 3 - EXECUTION

3.1 EXAMINATION

A. Examine joints indicated to receive joint sealants, with Installer present, for compliance with requirements for joint configuration, installation tolerances, and other conditions affecting performance of the Work.

B. Proceed with installation only after unsatisfactory conditions have been corrected.

3.2 PREPARATION

A. Surface Cleaning of Joints: Clean out joints immediately before installing joint sealants to comply with joint-sealant manufacturer's written instructions and the following requirements:

1. Remove all foreign material from joint substrates that could interfere with adhesion of joint sealant, including dust, paints (except for permanent, protective coatings tested and approved for sealant adhesion and compatibility by sealant manufacturer), old joint sealants, oil, grease, waterproofing, water repellents, water, surface dirt, and frost.

2. Clean porous joint substrate surfaces by brushing, grinding, mechanical abrading, or a combination of these methods to produce a clean, sound substrate capable of developing optimum bond with joint sealants. Remove loose particles remaining after cleaning operations above by vacuuming or blowing out joints with oil-free compressed air. Porous joint substrates include the following:

a. Concrete.

b. Masonry.

c. Unglazed surfaces of ceramic tile.

d. Exterior insulation and finish systems.

3. Remove laitance and form-release agents from concrete.

4. Clean nonporous joint substrate surfaces with chemical cleaners or other means that do not stain, harm substrates, or leave residues capable of interfering with adhesion of joint sealants. Nonporous joint substrates include the following:
    a. Metal.
    b. Glass.
    c. Porcelain enamel.
    d. Glazed surfaces of ceramic tile.

B. Joint Priming: Prime joint substrates where recommended by joint-sealant manufacturer or as indicated by preconstruction joint-sealant-substrate tests or prior experience. Apply primer to comply with joint-sealant manufacturer's written instructions. Confine primers to areas of joint-sealant bond; do not allow spillage or migration onto adjoining surfaces.

C. Masking Tape: Use masking tape where required to prevent contact of sealant or primer with adjoining surfaces that otherwise would be permanently stained or damaged by such contact or by cleaning methods required to remove sealant smears. Remove tape immediately after tooling without disturbing joint seal.

3.3 INSTALLATION OF JOINT SEALANTS

A. General: Comply with joint-sealant manufacturer's written installation instructions for products and applications indicated, unless more stringent requirements apply.

B. Sealant Installation Standard: Comply with recommendations in ASTM C1193 for use of joint sealants as applicable to materials, applications, and conditions indicated.

C. Install sealant backings of kind indicated to support sealants during application and at position required to produce cross-sectional shapes and depths of installed sealants relative to joint widths that allow optimum sealant movement capability.
    1. Do not leave gaps between ends of sealant backings.
    2. Do not stretch, twist, puncture, or tear sealant backings.
    3. Remove absorbent sealant backings that have become wet before sealant application and replace them with dry materials.

D. Install bond-breaker tape behind sealants where sealant backings are not used between sealants and backs of joints.

E. Install sealants using proven techniques that comply with the following and at the same time backings are installed:
    1. Place sealants so they directly contact and fully wet joint substrates.
    2. Completely fill recesses in each joint configuration.
    3. Produce uniform, cross-sectional shapes and depths relative to joint widths that allow optimum sealant movement capability.

F. Tooling of Nonsag Sealants: Immediately after sealant application and before skinning or curing begins, tool sealants according to requirements specified in subparagraphs below to form smooth, uniform beads of configuration indicated; to eliminate air pockets; and to ensure contact and adhesion of sealant with sides of joint.
    1. Remove excess sealant from surfaces adjacent to joints.
    2. Use tooling agents that are approved in writing by sealant manufacturer and that do not discolor sealants or adjacent surfaces.
    3. Provide concave joint configuration per Figure 5A in ASTM C1193, unless otherwise indicated.

3.4 PATCHING VOIDS

A. Installation procedures of elastomeric joint sealants shall meet requirements of Radon Mitigation System as indicated in the Drawings.

B. At above-grade applications, inject elastomeric joint sealants into all smaller openings, gaps, and joints in floor and wall assemblies in contact with soil and at gaps around all pipes, toilets, bathtubs, or drains penetrating these assemblies so no voids remain and to provide a permanent air-tight seal.

C. Where appropriate, larger gaps shall be sealed with nonshrink grout or expanding foam; refer to Sections 03 30 00 “Cast-in-Place Concrete” and 07 21 00 “Thermal Insulation”.

3.5 FIELD QUALITY CONTROL

A. Field-Adhesion Testing: Field test joint-sealant adhesion to joint substrates as follows:

1. Extent of Testing: Test completed and cured sealant joints as follows:

a. Perform 10 tests for the first 1000 feet of joint length for each kind of sealant and joint substrate.

b. Perform one test for each 1000 feet of joint length thereafter or one test per each floor per elevation.

2. Test Method: Test joint sealants according to Method A, Field-Applied Sealant Joint Hand Pull Tab, in Appendix X1 in ASTM C1193 or Method A, Tail Procedure, in ASTM C1521.

a. For joints with dissimilar substrates, verify adhesion to each substrate separately; extend cut along one side, verifying adhesion to opposite side. Repeat procedure for opposite side.

3. Inspect tested joints and report on the following:

a. Whether sealants filled joint cavities and are free of voids.

b. Whether sealant dimensions and configurations comply with specified requirements.

c. Whether sealants in joints connected to pulled-out portion failed to adhere to joint substrates or tore cohesively. Include data on pull distance used to test each kind of product and joint substrate. Compare these results to determine if adhesion complies with sealant manufacturer's field-adhesion hand-pull test criteria.

4. Record test results in a field-adhesion-test log. Include dates when sealants were installed, names of persons who installed sealants, test dates, test locations, whether joints were primed, adhesion results and percent elongations, sealant material, sealant configuration, and sealant dimensions.

5. Repair sealants pulled from test area by applying new sealants following same procedures used originally to seal joints. Ensure that original sealant surfaces are clean and that new sealant contacts original sealant.

B. Evaluation of Field-Adhesion-Test Results: Sealants not evidencing adhesive failure from testing or noncompliance with other indicated requirements will be considered satisfactory. Remove sealants that fail to adhere to joint substrates during testing or to comply with other requirements. Retest failed applications until test results prove sealants comply with indicated requirements.

3.6 CLEANING

A. Clean off excess sealant or sealant smears adjacent to joints as the Work progresses by methods and with cleaning materials approved in writing by manufacturers of joint sealants and of products in which joints occur.

3.7 PROTECTION

A. Protect joint sealants during and after curing period from contact with contaminating substances and from damage resulting from construction operations or other causes so sealants are without deterioration or damage at time of Substantial Completion. If, despite such protection, damage or deterioration occurs, cut out, remove, and repair damaged or deteriorated joint sealants immediately so installations with repaired areas are indistinguishable from original work.

END OF SECTION

SECTION 08 11 13 - HOLLOW METAL DOORS AND FRAMES

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

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

1.2 SUMMARY

A. Section Includes:

1. Interior standard steel doors and frames, including fully welded (HM).

B. Related Requirements:

1. Section 08 71 00 "Door Hardware" for door hardware for hollow-metal doors.

1.3 DEFINITIONS

A. Minimum Thickness: Minimum thickness of base metal without coatings according to NAAMM-HMMA 803 or SDI A250.8.

1.4 COORDINATION

A. Coordinate anchorage installation for hollow-metal frames. Furnish setting drawings, templates, and directions for installing anchorages, including sleeves, concrete inserts, anchor bolts, and items with integral anchors. Deliver such items to Project site in time for installation.

1.5 SUBMITTALS

A. Product Data: For each type of product.

1. Include construction details, material descriptions, core descriptions, and finishes.

B. Shop Drawings: Include the following:

1. Elevations of each door type.
2. Details of doors, including vertical- and horizontal-edge details and metal thicknesses.
3. Frame details for each frame type, including dimensioned profiles and metal thicknesses.
4. Locations of reinforcement and preparations for hardware.
5. Details of each different wall opening condition.
6. Details of anchorages, joints, field splices, and connections.
7. Details of accessories.
8. Details of moldings and removable stops.
9. Details of conduit and preparations for power, signal, and control systems.

C. Samples for Initial Selection: For hollow-metal doors and frames with factory-applied color finishes.

D. Product Schedule: For hollow-metal doors and frames, prepared by or under the supervision of supplier, using same reference numbers for details and openings as those on Drawings. Coordinate with final door hardware schedule.

E. Field quality control reports.

F. Record Documents: For doors, list any revisions made during construction to door numbers and applicable room name and number to which door accesses.

1.6 DELIVERY, STORAGE, AND HANDLING

A. Deliver hollow-metal work palletized, packaged, or crated to provide protection during transit and Project-site storage. Do not use nonvented plastic.

1. Provide additional protection to prevent damage to factory-finished units.

B. Deliver welded frames with two removable spreader bars across bottom of frames, tack welded to jambs and mullions.

C. Store hollow-metal work vertically under cover at Project site with head up. Place on minimum 4-inch- high wood blocking. Provide minimum 1/4-inch space between each stacked door to permit air circulation.

PART 2 - PRODUCTS

2.1 MANUFACTURERS

A. Source Limitations: Obtain hollow-metal work from single source from single manufacturer.

B. Approved Manufacturers, Fully Welded Types (HM):

1. Ceco Door, div. of Assa Abloy; www.cecodoor.com.

2. Curries Co., div. of Assa Abloy; www.curries.com.

3. Overly Door Co.; www.door.overly.com.

2.2 INTERIOR DOORS AND FRAMES

A. Construct interior doors and frames to comply with the standards indicated for materials, fabrication, hardware locations, hardware reinforcement, tolerances, and clearances, and as specified.

B. Doors and Frames: ANSI/SDI A250.8, Level 2; ANSI/SDI A250.4, Level B. At locations indicated in the Door and Frame Schedule.

1. Doors:

a. Type: As indicated in the Door and Frame Schedule.

b. Thickness: 1-3/4 inches.

c. Face: Uncoated steel sheet, minimum thickness of nominal 16-gauge, 0.063 inch.

d. Edge Construction: Model 1, Full Flush.

e. Edge Bevel: Provide manufacturer's standard beveled or square edges.

f. Core: Manufacturer's standard Kraft-paper honeycomb, polystyrene, polyurethane, polyisocyanurate or vertical steel stiffener.

2. Frames:

a. Materials: Uncoated steel sheet, minimum thickness of nominal 14-gauge, 0.078 inch.

b. Construction: Prefinished steel type.

1) At Pocket Doors: Pocket door leaves shall extend 3 inches beyond jamb when fully open; provide 39 inches clear opening where possible.

3. Exposed Finish: Factory-primed, for field-painted finish by others; coordinate with Section 09 91 00 “Painting”.

2.3 FRAME ANCHORS

A. Jamb Anchors:

1. Type: Anchors of minimum size and type required by applicable door and frame standard, and suitable for performance level indicated.

2. Quantity: Minimum of three anchors per jamb, with one additional anchor for frames with no floor anchor. Provide one additional anchor for each 24 inches of frame height above 7 feet.

3. Postinstalled Expansion Anchor: Minimum 3/8-inch- diameter bolts with expansion shields or inserts, with manufacturer's standard pipe spacer.

B. Floor Anchors: Provide floor anchors for each jamb and mullion that extends to floor.

C. Floor Anchors for Concrete Slabs with Underlayment: Adjustable-type anchors with extension clips, allowing not less than 2-inch height adjustment. Terminate bottom of frames at top of underlayment.

D. Material: ASTM A879/A879M, Commercial Steel (CS), 04Z (12G) coating designation; mill phosphatized.

1. For anchors built into exterior walls, steel sheet complying with ASTM A1008/A1008M or ASTM A1011/A1011M; hot-dip galvanized according to ASTM A153/A153M, Class B.

2.4 MATERIALS

A. Cold-Rolled Steel Sheet: ASTM A1008/A1008M, Commercial Steel (CS), Type B; suitable for exposed applications.

B. Hot-Rolled Steel Sheet: ASTM A1011/A1011M, Commercial Steel (CS), Type B; free of scale, pitting, or surface defects; pickled and oiled.

C. Metallic-Coated Steel Sheet: ASTM A653/A653M, Commercial Steel (CS), Type B.

D. Inserts, Bolts, and Fasteners: Hot-dip galvanized according to ASTM A153/A153M.

E. Power-Actuated Fasteners in Concrete: Fastener system of type suitable for application indicated, fabricated from corrosion-resistant materials, with clips or other accessory devices for attaching hollow-metal frames of type indicated.

F. Mineral-Fiber Insulation: ASTM C665, Type I (blankets without membrane facing); consisting of fibers manufactured from slag or rock wool; with maximum flame-spread and smoke-developed indexes of 25 and 50, respectively; passing ASTM E136 for combustion characteristics.

2.5 FABRICATION

A. Door Astragals: Provide overlapping astragal on one leaf of pairs of doors where indicated. Extend minimum 3/4 inch beyond edge of door on which astragal is mounted.

B. Hollow-Metal Frames: Fabricate in one piece except where handling and shipping limitations require multiple sections. Where frames are fabricated in sections, provide alignment plates or angles at each joint, fabricated of metal of same or greater thickness as frames.

1. Provide countersunk, flat- or oval-head exposed screws and bolts for exposed fasteners unless otherwise indicated.

2. Door Silencers: Except on weather-stripped frames, drill stops to receive door silencers as follows. Keep holes clear during construction.

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.

C. Hardware Preparation: Factory prepare hollow-metal doors and frames to receive templated mortised hardware, and electrical wiring; include cutouts, reinforcement, mortising, drilling, and tapping according to ANSI/SDI A250.6, the Door Hardware Schedule, and templates.

1. Reinforce doors and frames to receive nontemplated, mortised, and surface-mounted door hardware.

2. Comply with BHMA A156.115 for preparing hollow-metal doors and frames for hardware.

2.6 STEEL FINISHES

A. Prime Finish: Clean, pretreat, and apply manufacturer's standard primer.

1. Shop Primer: Manufacturer's standard, fast-curing, lead- and chromate-free primer complying with ANSI/SDI A250.10; recommended by primer manufacturer for substrate; compatible with substrate and field-applied coatings despite prolonged exposure.

B. Factory Finish: Clean, pretreat, and apply manufacturer's standard two-coat, baked-on finish consisting of prime coat and thermosetting topcoat, complying with ANSI/SDI A250.3.

1. Color and Gloss: As selected by Architect from manufacturer's full range.

PART 3 - EXECUTION

3.1 EXAMINATION

A. Examine substrates, areas, and conditions, with Installer present, for compliance with requirements for installation tolerances and other conditions affecting performance of the Work.

B. Examine roughing-in for embedded and built-in anchors to verify actual locations before frame installation.

C. Proceed with installation only after unsatisfactory conditions have been corrected.

3.2 PREPARATION

A. Remove welded-in shipping spreaders installed at factory. Restore exposed finish by grinding, filling, and dressing, as required to make repaired area smooth, flush, and invisible on exposed faces. Touch up factory-applied finishes where spreaders are removed.

B. Drill and tap doors and frames to receive nontemplated, mortised, and surface-mounted door hardware.

3.3 INSTALLATION

A. General: Install hollow-metal doors and frames plumb, rigid, properly aligned, and securely fastened in place. Comply with approved Shop Drawings and with manufacturer's written instructions.

B. Hollow-Metal Frames: Install hollow-metal frames for doors of size and profile indicated. Comply with SDI A250.11 or NAAMM-HMMA 840 as required by standards specified.

1. Set frames accurately in position; plumbed, aligned, and braced securely until permanent anchors are set. After wall construction is complete, remove temporary braces, leaving surfaces smooth and undamaged.

a. Where frames are fabricated in sections because of shipping or handling limitations, field splice at approved locations by welding face joint continuously; grind, fill, dress, and make splice smooth, flush, and invisible on exposed faces.

b. Install frames with removable stops located on secure side of opening.

c. Install door silencers in frames before grouting.

d. Remove temporary braces necessary for installation only after frames have been properly set and secured.

e. Check plumb, square, and twist of frames as walls are constructed. Shim as necessary to comply with installation tolerances.

2. Floor Anchors: Provide floor anchors for each jamb and mullion that extends to floor, and secure with postinstalled expansion anchors.

a. Floor anchors may be set with power-actuated fasteners instead of postinstalled expansion anchors if so indicated and approved on Shop Drawings.

3. Metal-Stud Partitions: Solidly pack mineral-fiber insulation inside frames.

4. Installation Tolerances: Adjust hollow-metal door frames for squareness, alignment, twist, and plumb to the following tolerances:

a. Squareness: Plus or minus 1/16 inch, measured at door rabbet on a line 90 degrees from jamb perpendicular to frame head.

b. Alignment: Plus or minus 1/16 inch, measured at jambs on a horizontal line parallel to plane of wall.

c. Twist: Plus or minus 1/16 inch, measured at opposite face corners of jambs on parallel lines, and perpendicular to plane of wall.

d. Plumbness: Plus or minus 1/16 inch, measured at jambs at floor.

C. Hollow-Metal Doors: Fit hollow-metal doors accurately in frames, within clearances specified below. Shim as necessary.

1. Non-Fire-Rated Steel Doors:

a. Between Door and Frame Jambs and Head: 1/8 inch plus or minus 1/32 inch.

b. Between Edges of Pairs of Doors: 1/8 inch to 1/4 inch plus or minus 1/32 inch.

c. At Bottom of Door: 1/2-inch or as indicated on Drawings.

d. Between Door Face and Stop: 1/16 inch to 1/8 inch plus or minus 1/32 inch.

3.4 ADJUSTING AND CLEANING

A. Final Adjustments: Check and readjust operating hardware items immediately before final inspection. Leave work in complete and proper operating condition. Remove and replace defective work, including hollow-metal work that is warped, bowed, or otherwise unacceptable.

B. Remove grout and other bonding material from hollow-metal work immediately after installation.

C. Prime-Coat Touchup: Immediately after erection, sand smooth rusted or damaged areas of prime coat and apply touchup of compatible air-drying, rust-inhibitive primer.

D. Metallic-Coated Surface Touchup: Clean abraded areas and repair with galvanizing repair paint according to manufacturer's written instructions.

END OF SECTION

SECTION 08 14 16 - FLUSH WOOD DOORS

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

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

1.2 SUMMARY

A. Section Includes:

1. Solid-core, veneer-faced, non-rated doors (WD-2).

B. Related Requirements:

1. Section 01 81 13 “Sustainability Requirements”.
2. Section 06 20 23 “Interior Finish Carpentry” for wood door frames and jambs.
3. Section 08 71 00 “Door Hardware” for coordination of door hardware, including hardware for pocket doors.

1.3 SUBMITTALS

A. Product Data: For each type of door. Include details of core and edge construction and trim for openings. Include factory-finishing specifications.

B. Sustainable Design Submittals: Refer to Section 01 81 13 “Sustainability Requirements”.

C. Shop Drawings: Indicate location, size, and hand of each door; elevation of each kind of door; construction details not covered in Product Data; location and extent of hardware blocking; and other pertinent data.

1. Indicate doors to be factory finished and finish requirements.

D. Samples for Initial Selection: Color charts consisting of actual materials in small sections for the following:

1. Faces of Factory-Finished Doors: Show the full range of colors available for stained and opaque finishes.

E. 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. Frames for light openings, 6 inches long, for each material, type, and finish required.

1.4 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."

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

C. Preinstallation Conference: Conduct conference at Project site.

1.5 DELIVERY, STORAGE, AND HANDLING

A. Comply with requirements of referenced standard and manufacturer's written instructions.

B. Package doors individually in cardboard cartons and wrap bundles of doors in plastic sheeting package and deliver as required.

C. Mark each door on top and bottom rail with opening number used on Shop Drawings.

1.6 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.

B. Environmental Limitations: Do not deliver or install woodwork until building is enclosed, wet work is complete, and HVAC system is operating and maintaining temperature between 16 and 32 deg C and relative humidity between 43 and 70 percent during the remainder of the construction period.

PART 2 - PRODUCTS

2.1 FLUSH WOOD DOORS, GENERAL

A. Composite Wood Products: Comply with California Air Resources Board (CARB) Airborne Toxic Control Measure (ATCM), Phase II for ultra-low-emitting formaldehyde (ULEF) resins or containing no formaldehyde resins.

1. Exception: If composite wood product that does not comply with California 93120 Phase II (CARB Phase II) is used, all exposed edges and sides shall be sealed with low/ no VOC requirements in Section 01 81 13 “Sustainability Requirements”.

B. Interior Paints, Primers, Sealers, Adhesives and Sealants: Comply with low/ no VOC requirements in Section 01 81 13 “Sustainability Requirements”.

C. Quality Standard: In addition to requirements specified, comply with AWI's, AWMAC's, and WI's "Architectural Woodwork Standards.

D. WDMA I.S.1-A Performance Grade: Heavy-Duty unless otherwise indicated.

E. Particleboard-Core Doors: Not permitted unless otherwise indicated.

F. Structural-Composite-Lumber-Core Doors:

1. Structural Composite Lumber: WDMA I.S.10.

a. Screw Withdrawal, Face: 700 lbf.

b. Screw Withdrawal, Edge: 400 lbf.

2.2 SOLID-CORE DOORS VENEER-FACED, WD-2

A. Interior Veneer-Faced Doors:

1. Performance Grade:

a. Doors with Opaque Finish: ANSI/WDMA I.S. 1A Standard Duty.

b. Doors with Transparent Finish: ANSI/WDMA I.S. 1A Heavy Duty.

2. Species and Cut:

a. Doors with Opaque Finish: Paint-grade hardwood veneer.

b. Doors with Transparent Finish: White oak (Quercus alba); plain sliced/ flat sawn.

3. Core: Structural-composite-lumber.

4. Construction: Seven plies, hot-pressed or cold-pressed bonded (vertical and horizontal edging is bonded to core), with entire unit abrasive planed before veneering.
5. Exposed Vertical Edges:
    a. Doors with Opaque Finish: Any closed-grain hardwood.
    b. Doors with Transparent Finish: Species matching face veneer.
6. Adhesives: Type I in accordance with WDMA T.M. 6.
7. Finish: As indicated in Door Schedule.
8. Applications: As indicated in Drawings.

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.

C. Factory machine doors for hardware that is not surface applied. Locate hardware to comply with DHI-WDHS-3. Comply with final hardware schedules, door frame Shop Drawings, DHI A115-W series standards, and hardware templates.

1. Coordinate measurements of hardware mortises in metal frames to verify dimensions and alignment before factory machining.
2. For doors scheduled to receive electrified locksets, provide factory-installed raceway and wiring to accommodate specified hardware.

2.4 FACTORY PRIMING

A. Doors for Opaque Finish: Factory prime faces, all four edges, edges of cutouts, and mortises with one coat of wood primer specified in Section 09 91 00 "Painting."

2.5 FACTORY FINISHING

A. Comply with referenced quality standard for factory finishing.

1. Complete fabrication, including fitting doors for openings and machining for hardware that is not surface applied, before finishing.
2. Finish faces, all four edges, edges of cutouts, and mortises.

B. Factory finish doors that are indicated on Drawings to receive transparent finish.

C. Transparent Finish:

1. Architectural Woodwork Standards or ANSI/WDMA I.S. 1A Grade: Custom.
2. Finish: Architectural Woodwork Standards System-10, UV Curable, Water Based.
3. Staining: As selected by Architect from manufacturer's full range.
4. Effect: Semi-filled finish, produced by applying an additional finish coat to partially fill the wood pores.
5. Sheen: Satin.

PART 3 - EXECUTION

3.1 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.

3.2 INSTALLATION

A. Hardware: For installation, refer to Section 08 71 00 "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.

2. Bevel non-fire-rated doors 3-1/2 degrees 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.

3.3 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

SECTION 08 31 13 - ACCESS DOORS AND FRAMES

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

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

1.2 SUMMARY

A. Section Includes:

1. Wall access doors and frames.
2. Ceiling access doors and frames.

1.3 SUBMITTALS

A. Product Data: For each type of door and frame indicated. Include construction details relative to materials, individual components and profiles, finishes, and fire ratings (if required) for access doors and frames.

B. Schedule: Provide complete door and frame schedule, including types, general locations, sizes, construction details, latching or locking provisions, and other data pertinent to installation.

C. Coordination Drawings: Reflected ceiling plans drawn to scale and coordinating penetrations and ceiling-mounted items with concealed framing, suspension systems, piping, ductwork, and other construction. Show the following:

1. Method of attaching door frames to surrounding construction.
2. Ceiling-mounted items including access doors and frames, lighting fixtures, diffusers, grilles, speakers, sprinklers, and special trim.

1.4 QUALITY ASSURANCE

A. Source Limitations: Obtain doors and frames through one source from a single manufacturer.

PART 2 - PRODUCTS

2.1 MANUFACTURERS

A. Basis-of-Design Manufacturer:

1. Acudor, div. of Nelson Industrial Inc.; www.acodor.com.

B. Other Approved Manufacturers:

1. Babcock-Davis; www.babcockdavis.com.
2. Mifab, Inc.; www.mifab.com.
3. Milcor, div. of Hart & Cooley, Inc.; www.milcorinc.com.

2.2 ACCESS DOORS AND FRAMES

A. Flush, Insulated, Non Fire-Rated Access Doors and Frames with Concealed Trim:

1. Basis-of-Design Products:

a. At Gypsum Board Finish: Factory-primed steel recessed door to receive gypsum board to match adjacent wall surfaces or ceilings.

1) DW-5058 Recessed Access Door by Acudor.

b. At Tile Finishes: Stainless steel recessed door to receive tile backer and tile flush with adjacent wall surfaces.

1) AT-5020 Recessed Access Door by Acudor.

2. Hinges: Concealed pin type.

3. Automatic Closer: Spring type. At wall units only.

4. Latch: Self-latching bolt operated by key with interior release.

5. Lock: Key-operated cylinder lock**,** with interior release.

B. Size: As indicated or as required.

2.3 MATERIALS

A. Steel Plates, Shapes, and Bars: ASTM A36/A36M.

B. Hot-Rolled Steel Sheets: ASTM A569/A569M, Commercial Steel (CS), Type B; free of scale, pitting, and surface defects; pickled and oiled; with minimum thickness indicated representing specified nominal thickness according to ASTM A568/A568M.

C. Cold-Rolled Steel Sheets: ASTM A366/A366M, Commercial Steel (CS), or ASTM A620/A620M, Drawing Steel (DS), Type B; stretcher-leveled standard of flatness; with minimum thickness indicated representing specified nominal thickness according to ASTM A568/A568M. Electrolytic zinc-coated steel sheet, complying with ASTM A591/A591M, Class C coating, may be substituted at fabricator's option.

D. Stainless-Steel Sheet, Strip, Plate, and Flat Bars: ASTM A666, Type 316; with minimum sheet thickness indicated representing specified thickness according to ASTM A480/A480M.

E. Drywall Beads: Edge trim formed from 0.03-inch (0.76-mm) zinc-coated steel sheet formed to receive joint compound and in size to suit thickness of gypsum board.

2.4 FABRICATION

A. General: Provide access door assemblies manufactured as integral units ready for installation.

B. Metal Surfaces: For metal surfaces exposed to view in the completed Work, provide materials with smooth, flat surfaces without blemishes. Do not use materials with exposed pitting, seam marks, roller marks, rolled trade names, or roughness.

C. Steel Doors and Frames: Grind exposed welds smooth and flush with adjacent surfaces. Furnish attachment devices and fasteners of type required to secure access panels to types of supports indicated.

1. Exposed Flanges: Nominal 1 to 1-1/2 inches wide around perimeter of frame.

2. For trimless frames with plaster bead for full-bed plaster applications, provide zinc-coated expanded metal lath and exposed casing bead welded to perimeter of frames.

D. Provide stainless steel access doors and frame assemblies at ceramic tile wall locations.

2.5 FINISHES

A. Comply with NAAMM's "Metal Finishes Manual for Architectural and Metal Products" for recommendations for applying and designating finishes.

B. Protect mechanical finishes on exposed surfaces from damage by applying a strippable, temporary protective covering before shipping.

C. Appearance of Finished Work: Noticeable variations in same piece are not acceptable. Variations in appearance of adjoining components are acceptable if they are within the range of approved Samples and are assembled or installed to minimize contrast.

D. Painted Finishes: Comply with coating manufacturer's written instructions for cleaning, conversion coating, and applying and baking finish.

1. Factory Primed: Apply manufacturer's standard, lead- and chromate-free, universal primer immediately after surface preparation and pretreatment.

2. Factory Finished: Apply manufacturer's standard baked-enamel or powder-coat finish immediately after cleaning and pretreating, with minimum dry-film thickness of 1 mil (0.025 mm) for topcoat.

a. Color: As selected by Architect from full range of industry colors.

E. Stainless Steel Finishes:

1. Surface Preparation: Remove tool and die marks and stretch lines, or blend into finish.

2. Polished Finish: ASTM A480/A480M No. 4 finish. Grind and polish surfaces to produce uniform finish, free of cross scratches.

a. Run grain of directional finishes with long dimension of each piece.

b. When polishing is completed, passivate and rinse surfaces. Remove embedded foreign matter and leave surfaces chemically clean.

PART 3 - EXECUTION

3.1 PREPARATION

A. Advise installers of other work about specific requirements relating to access door and floor door installation, including sizes of openings to receive access door and frame, as well as locations of supports, inserts, and anchoring devices.

3.2 INSTALLATION

A. Set frames accurately in position and attach securely to supports with plane of face panels aligned with adjacent finish surfaces.

B. Install recessed finish material.

3.3 ADJUSTING AND CLEANING

A. Adjust doors and hardware after installation for proper operation.

B. Remove and replace doors and frames that are warped, bowed, or otherwise damaged.

END OF SECTION

SECTION 083800 - DOUBLE ACTING IMPACT TRAFFIC DOORS

Part 1- GENERAL

Section 1.01 SUMMARY

A. This section includes double acting impact traffic doors.

B. Related sections: Include appropriate section below indicating proper frame/jamb details. Recommended jamb is ¼" thick and 4" wide minimum steel frame.

Section 1.02 SUBMITTALS

A. Product data: Submit manufacturer's data indicating products provided.

B. Shop drawings: Submit indicating locations of required block outs, frame fabrication requirements, sizes, elevations, and other related items.

Section 1.03 DELIVERY, STORAGE AND HANDLING

A. Packing and shipping: Deliver work packaged for protection.

B. Acceptance at site: Inspect work upon delivery for damage; rejecting any damaged items.

C. Storage and protection: Store materials under cover, 4" off floor, minimum, raised platforms, in vertical position with minimum ¼" space between doors. Avoid use of non vented plastic or canvas shelters creating humidity chambers. Immediately remove wet wrappers.

Part 2 PRODUCTS

Section 1.04 MANUFACTURERS

A. Acceptable Manufacturer:

1. Products specified as standard of quality are manufactured by:

National Access Design, LLC.

1924 Losantiville Ave.

Cincinnati, OH. 45237

1-513-351-3400

www.nationalaccessdesign.com

Section 1.05 MANUFACTURED UNITS

A. Traffic Doors:

1. Acceptable product: National Access Design Model 9000SS.
2. Traffic type: Retail/Commercial, Medium duty.
3. Sizes: As indicated on drawings (door schedule).
4. Panels:

a. 3/4” thick solid wood core with .093 ABS facings. Overall thickness 1”

b. 20 GA Stainless Steel facings (Model 9000SS)

Full gasket optional. (Model 9000SS)

5. Hinges:

a. Hinges are G.S. style with hardened rollers, hinge covers and *bottom pin system*.

6. Vision Area:

a. 22” x 22”

7. Panel Protection: Impact Plate

a. 24” high Impact plate.

Part 3 EXECUTION

Section 1.06 EXAMINATION

A. Verification of conditions:

1. Verify traffic door frames are in accord with reviewed shop drawings.

2. Examine conditions and substrates under which products of this section are to be installed; submit written notification of unacceptable conditions or substrates.

3. Submit copy of installer’s report to Architect of record within 72 hours of report receipt.

4. Proceeding with construction activity of this section:

a. Prior to correction of unacceptable conditions or substrates are prohibited.

b. Indicated installer’s acceptance of condition of product and substrates.

Section 1.07 INSTALLATION

A. Steel tube frames: Or minimum double 2 by 4 wood or C-Channel or reinforced hollow metal frames. Installed in Metal Fabrication section.

B. Steel tube or C-Channel frames required for heavy duty traffic doors.

C. Traffic doors:

1. Install in prepared openings in accordance with reviewed shop drawings and manufacturer’s

Installation instructions

2. Plumb and level units.

3. Adjust for proper operation.

D. Clean surfaces per manufacturer’s instructions just prior to Date of Substantial Completion.

END OF SECTION

SECTION 087100 - DOOR HARDWARE

PART 1 - GENERAL

1.01 SUMMARY

A. Section includes:

1. Mechanical and electrified door hardware

B. Related Sections:

1. Division 01 "General Requirements" sections for Allowances, Alternates, Owner Furnished Contractor Installed, Project Management and Coordination.
2. Division 08 Sections:
   a. "Metal Doors and Frames"
   b. "Flush Wood Doors"

1.02 REFERENCES

A. DHI - Door and Hardware Institute

1. Sequence and Format for the Hardware Schedule
2. Recommended Locations for Builders Hardware
3. Keying Systems and Nomenclature
4. Installation Guide for Doors and Hardware

B. ANSI - American National Standards Institute

1. ANSI A117.1 – 2017 Edition – Accessible and Usable Buildings and Facilities
2. ANSI/BHMA A156.1 - A156.29, and ANSI/BHMA A156.31 - Standards for Hardware and Specialties
3. ANSI/BHMA A156.28 - Recommended Practices for Keying Systems
4. ANSI/WDMA I.S. 1A - Interior Architectural Wood Flush Doors
5. ANSI/SDI A250.8 - Standard Steel Doors and Frames

1.03 SUBMITTALS

A. General:

1. Submit in accordance with Conditions of Contract and Division 01 Submittal Procedures.
2. Prior to forwarding submittal:
   a. Review drawings and Sections from related trades to verify compatibility with specified hardware.
   b. Highlight, encircle, or otherwise specifically identify on submittals: deviations from Contract Documents, issues of incompatibility or other issues which may detrimentally affect the Work.

B. Informational Submittals:

1. Provide Qualification Data for Supplier, Installer and Architectural Hardware Consultant.
2. Provide Product Data:

a. Certify that door hardware approved for use on types and sizes of labeled fire-rated doors complies with listed fire-rated door assemblies.
b. Include warranties for specified door hardware.

C. Closeout Submittals:

1. Operations and Maintenance Data: Provide in accordance with Division 01 and include:
   a. Complete information on care, maintenance, and adjustment; data on repair and replacement parts, and information on preservation of finishes.
   b. Catalog pages for each product.
   c. Final approved hardware schedule edited to reflect conditions as installed.
   d. Final keying schedule
   e. Copy of warranties including appropriate reference numbers for manufacturers to identify project.
   f. As-installed wiring diagrams for each opening connected to power, both low voltage and 110 volts.

D. Inspection and Testing:

1. Submit written reports to the Owner and Authority Having Jurisdiction (AHJ) of the results of functional testing and inspection for:
   a. Required egress door assemblies, in compliance with NFPA 101.

1.04 QUALITY ASSURANCE

A. Qualifications and Responsibilities:

1. Supplier: Recognized architectural hardware supplier with a minimum of 5 years documented experience supplying both mechanical and electromechanical door hardware similar in quantity, type, and quality to that indicated for this Project. Supplier to be recognized as a factory direct distributor by the manufacturer of the primary materials with a warehousing facility in the Project's vicinity. Supplier to have on staff, a certified Architectural Hardware Consultant (AHC) or Door Hardware Consultant (DHC) available to Owner, Architect, and Contractor, at reasonable times during the Work for consultation.
2. Installer: Qualified tradesperson skilled in the application of commercial grade hardware with experience installing door hardware similar in quantity, type, and quality as indicated for this Project.
3. Architectural Hardware Consultant: Person who is experienced in providing consulting services for door hardware installations that are comparable in material, design, and extent to that indicated for this Project and meets these requirements:
   a. For door hardware: DHI certified AHC or DHC.
   b. Can provide installation and technical data to Architect and other related subcontractors.
   c. Can inspect and verify components are in working order upon completion of installation.
   d. Capable of producing wiring diagram and coordinating installation of electrified hardware with Architect and electrical engineers.

4. Single Source Responsibility: Obtain each type of door hardware from single manufacturer.

B. Certifications:

1. Accessibility Requirements:

a. Comply with governing accessibility regulations cited in "REFERENCES" article 087100, 1.02.D3 herein for door hardware on doors in an accessible route. This project must comply with all Federal Americans with Disability Act regulations and all Local Accessibility Regulations.

C. Pre-Installation Meetings

1. Keying Conference
   a. Incorporate keying conference decisions into final keying schedule after reviewing door hardware keying system including:
      1) Function of building, flow of traffic, purpose of each area, degree of security required, and plans for future expansion.
      2) Preliminary key system schematic diagram.
      3) Requirements for key control system.
      4) Requirements for access control.
      5) Address for delivery of keys.

2. Pre-installation Conference
   a. Review and finalize construction schedule and verify availability of materials, Installer's personnel, equipment, and facilities needed to make progress and avoid delays.
   b. Inspect and discuss preparatory work performed by other trades.
   c. Inspect and discuss electrical roughing-in for electrified door hardware.
   d. Review sequence of operation for each type of electrified door hardware.
   e. Review required testing, inspecting, and certifying procedures.
   f. Review questions or concerns related to proper installation and adjustment of door hardware.

1.05 DELIVERY, STORAGE, AND HANDLING

A. Inventory door hardware on receipt and provide secure lock-up for hardware delivered to Project site. Promptly replace products damaged during shipping

B. Tag each item or package separately with identification coordinated with final door hardware schedule, and include installation instructions, templates, and necessary fasteners with each item or package. Deliver each article of hardware in manufacturer's original packaging.

C. Maintain manufacturer-recommended environmental conditions throughout storage and installation periods.

D. Provide secure lock-up for door hardware delivered to Project. Control handling and installation of hardware items so that completion of Work will not be delayed by hardware losses both before and after installation.

E. Handle hardware in manner to avoid damage, marring, or scratching. Correct, replace or repair products damaged during Work. Protect products against malfunction due to paint, solvent, cleanser, or any chemical agent.

F. Deliver keys to manufacturer of key control system for subsequent delivery to Owner.

1.06 COORDINATION

A. Coordinate layout and installation of floor-recessed door hardware with floor construction. Cast anchoring inserts into concrete.

B. Installation Templates: Distribute for doors, frames, and other work specified to be factory or shop prepared. Check Shop Drawings of other work to confirm that adequate provisions are made for locating and installing door hardware to comply with indicated requirements.

C. Security: Coordinate installation of door hardware, keying, and access control with Owner's security consultant.

1.07 WARRANTY

A. Manufacturer's standard form in which manufacturer agrees to repair or replace components of door hardware that fail in materials or workmanship within published warranty period.

1. Warranty does not cover damage or faulty operation due to improper installation, improper use or abuse.
2. Warranty Period: Beginning from date of Substantial Completion, for durations indicated in manufacturer's published listings.
    a. Mechanical Warranty
        1) Locks
            a) Schlage ALX Series: 10 years
        2) Closers
            a) LCN 4050 Series: 25 years

1.08 MAINTENANCE

A. Furnish complete set of special tools required for maintenance and adjustment of hardware, including changing of cylinders.

B. Turn over unused materials to Owner for maintenance purposes.

PART 2 - PRODUCTS

2.01 MANUFACTURERS

A. Approval of alternate manufacturers and/or products other than those listed as "Scheduled Manufacturer" or "Acceptable Manufacturers" in the individual article for the product category are only to be considered by official substitution request in accordance with section 01 25 00.

2.02 MATERIALS

A. Fabrication

1. Provide door hardware manufactured to comply with published templates generally prepared for machine, wood, and sheet metal screws. provide screws according to manufacturer’s recognized installation standards for application intended.
2. Finish exposed screws to match hardware finish, or, if exposed in surfaces of other work, to match finish of this other work including prepared for paint surfaces to receive painted finish.

3. Provide concealed fasteners wherever possible for hardware units exposed when door is closed. Coordinate with “Metal Doors and Frames”, “Flush Wood Doors”, “Stile and Rail Wood Doors” to ensure proper reinforcements. Advise the Architect where visible fasteners, such as thru bolts, are required.

B. Provide screws, bolts, expansion shields, drop plates and other devices necessary for hardware installation.

1. Where fasteners are exposed to view: Finish to match adjacent door hardware material.

2.03 HINGES

A. Manufacturers and Products:

1. Scheduled Manufacturer and Product:
   a. Ives 5BB series

2. Acceptable Manufacturers and Products:
   a. By Approval Only

B. Requirements:

1. Provide hinges conforming to ANSI/BHMA A156.1.
2. Provide five knuckle, ball bearing hinges.
3. 1-3/4 inch (44 mm) thick doors, up to and including 36 inches (914 mm) wide:
   a. Exterior: Standard weight, bronze or stainless steel, 4-1/2 inches (114 mm) high
   b. Interior: Standard weight, steel, 4-1/2 inches (114 mm) high

4. 1-3/4 inch (44 mm) thick doors over 36 inches (914 mm) wide:
   a. Exterior: Heavy weight, bronze/stainless steel, 5 inches (127 mm) high
   b. Interior: Heavy weight, steel, 5 inches (127 mm) high

5. 2 inches or thicker doors:
   a. Exterior: Heavy weight, bronze or stainless steel, 5 inches (127 mm) high
   b. Interior: Heavy weight, steel, 5 inches (127 mm) high

6. Adjust hinge width for door, frame, and wall conditions to allow proper degree of opening.
7. Provide three hinges per door leaf for doors 90 inches (2286 mm) or less in height, and one additional hinge for each 30 inches (762 mm) of additional door height.
8. Hinge Pins: Except as otherwise indicated, provide hinge pins as follows:
   a. Steel Hinges: Steel pins
   b. Non-Ferrous Hinges: Stainless steel pins
   c. Out-Swinging Exterior Doors: Non-removable pins
   d. Out-Swinging Interior Lockable Doors: Non-removable pins
   e. Interior Non-lockable Doors: Non-rising pins

2.04 CYLINDRICAL LOCKS – GRADE 2

A. Manufacturers and Products:

1. Scheduled Manufacturer and Product:
   a. Schlage ALX series

2. Acceptable Manufacturers and Products:
   a. By Approval Only

B. Requirements

1. Provide cylindrical locks conforming to ANSI/BHMA A156.2 Series 4000, Grade 2, and UL Listed for 3-hour fire doors with a minimum cycle life of 1 million.
2. Cylinders: Refer to "KEYING" article, herein.
3. Provide locks with standard 2-3/4 inches (70 mm) backset, unless noted otherwise, with 1/2-inch latch throw. Provide ¾" latch throw for UL listing at pairs.
4. Provide locksets with separate anti-rotation thru-bolts, and no exposed screws.
5. Provide independently operating levers with two external return spring cassettes mounted under roses to prevent lever sag.
6. Provide a minimum of 5 points of lever engagement between the cassette spindle and lever shank to prevent lever sag.
7. Provide standard ASA strikes unless extended lip strikes are necessary to protect trim.
8. Plug-n-Play – Provide modular lockset allowing lock functions to be created for 7 typical functions by inserting/installing parts into the exterior of a fully assembled chassis
9. Reconfigurable Chassis - Provide modular lockset that allows the function to be reconfigured by removing external components from the chassis
10. Lever Trim: Solid cast levers and wrought roses on both sides.
    a. Lever Design: Longitude

2.05 CYLINDERS

A. Manufacturers and Products:

1. Scheduled Manufacturer and Product:
    a. Schlage Everest 29 S

2. Acceptable Manufacturers and Products:
    a. By Approval Only

B. Requirements:

1. Provide cylinders/cores compliant with ANSI/BHMA A156.5; latest revision; cylinder face finished to match lockset; manufacturer’s series as indicated. Refer to “KEYING” article, herein.
2. Provide cylinders in the below-listed configuration(s), distributed throughout the Project as indicated.
    a. Patented Open: cylinder with permanent core with open keyway.

3. Nickel silver bottom pins.

2.06 KEYING

A. Scheduled System:

1. New factory registered system:
    a. Provide a factory registered keying system, complying with guidelines in ANSI/BHMA A156.28, incorporating decisions made at keying conference.

2. Existing factory registered system:
    a. Provide cylinders/cores keyed into Owner’s existing factory registered keying system. Comply with guidelines in ANSI/BHMA A156.28, incorporating decisions made at keying conference.

3. Existing non-factory registered system:

a. Provide cylinders/cores keyed into Owner's existing keying system managed by Owner's locksmith, complying with guidelines in ANSI/BHMA A156.28, incorporating decisions made at keying conference. Contact:
   1) Firm Name:
   2) Contact Person:
   3) Telephone:

B. Requirements:

1. Permanent Keying:
   a. Provide permanent cylinders/cores keyed by the manufacturer according to the following key system.
      1) Master Keying system as directed by the Owner.
   b. Forward bitting list and keys separately from cylinders, by means as directed by Owner. Failure to comply with forwarding requirements will be cause for replacement of cylinders/cores involved at no additional cost to Owner.
   c. Provide keys with the following features:
      1) Material: Nickel silver; minimum thickness of .107-inch (2.3mm)
      2) Patent Protection: Keys and blanks protected by one or more utility patent(s).
   d. Identification:
      1) Mark permanent cylinders/cores and keys with applicable blind code for identification. Do not provide blind code marks with actual key cuts.
      2) Identification stamping provisions must be approved by the Architect and Owner.
      3) Stamp cylinders/cores and keys with Owner's unique key system facility code as established by the manufacturer; key symbol and embossed or stamped with "DO NOT DUPLICATE" along with the "PATENTED" or patent number to enforce the patent protection.
      4) Failure to comply with stamping requirements will be cause for replacement of keys involved at no additional cost to Owner.
      5) Forward permanent cylinders/cores to Owner, separately from keys, by means as directed by Owner.
   e. Quantity: Furnish in the following quantities.
      1) Master Keys: 6.
      2) Change (Day) Keys: 3 per cylinder/core that is keyed differently
      3) Key Blanks: Quantity as determined in the keying meeting.

2.07 DOOR CLOSERS

A. Manufacturers and Products:

1. Scheduled Manufacturer and Product:
   a. LCN 4050A series

2. Acceptable Manufacturers and Products:
   a. By Approval Only

B. Requirements:

1. Provide door closers conforming to ANSI/BHMA A156.4 Grade 1 requirements by BHMA certified independent testing laboratory. ISO 9000 certify closers. Stamp units with date of manufacture code.
2. Provide door closers with fully hydraulic, full rack and pinion action with cast aluminum cylinder.
3. Closer Body: 1-1/2-inch (38 mm) diameter with 11/16-inch (17 mm) diameter heat-treated pinion journal and full complement bearings.

4. Hydraulic Fluid: Fireproof, passing requirements of UL10C, and all weather requiring no seasonal closer adjustment for temperatures ranging from 120 degrees F to -30 degrees F.
5. Spring Power: Continuously adjustable over full range of closer sizes, and providing reduced opening force as required by accessibility codes and standards.
6. Hydraulic Regulation: By tamper-proof, non-critical valves, with separate adjustment for latch speed, general speed, and back check.
7. Pressure Relief Valve (PRV) Technology: Not permitted.
8. Provide stick on templates, special templates, drop plates, mounting brackets, or adapters for arms as required for details, overhead stops, and other door hardware items interfering with closer mounting.

2.08 DOOR TRIM

A. Manufacturers:

1. Scheduled Manufacturer:
   a. Ives

2. Acceptable Manufacturers:
   a. Trimco

B. Requirements:

1. Provide push plates, push bars, pull plates, pulls, and hands-free reversible door pulls with diameter and length as scheduled.

2.09 DOOR TRIM

A. Manufacturers:

1. Scheduled Manufacturer:
   a. Trimco

2. Acceptable Manufacturers:
   a. Ives

B. Requirements:

1. Provide push plates, push bars, pull plates, pulls, and hands-free reversible door pulls with diameter and length as scheduled.

2.10 PROTECTION PLATES

A. Manufacturers:

1. Scheduled Manufacturer:
   a. Ives

2. Acceptable Manufacturers:
   a. Trimco

B. Requirements:

1. Provide protection plates with a minimum of 0.050 inch (1 mm) thick, beveled four edges as scheduled. Furnish with sheet metal or wood screws, finished to match plates.
2. Sizes plates 2 inches (51 mm) less width of door on single doors, pairs of doors with a mullion, and doors with edge guards. Size plates 1 inch (25 mm) less width of door on pairs without a mullion or edge guards.
3. At fire rated doors, provide protection plates over 16 inches high with UL label.

2.11 DOOR STOPS AND HOLDERS

A. Manufacturers:

1. Scheduled Manufacturer:
   a. Ives

2. Acceptable Manufacturers:
   a. Trimco

B. Provide door stops at each door leaf:

1. Provide wall stops wherever possible. Provide concave type where lockset has a push button of thumbturn.
2. Where a wall stop cannot be used, provide universal floor stops.
3. Where wall or floor stop cannot be used, provide overhead stop.
4. Provide roller bumper where doors open into each other and overhead stop cannot be used.

2.12 DOOR STOPS AND HOLDERS

A. Manufacturers:

1. Scheduled Manufacturer:
   a. Trimco

2. Acceptable Manufacturers:
   a. Ives

B. Provide door stops at each door leaf:

1. Provide wall stops wherever possible. Provide concave type where lockset has a push button of thumbturn.
2. Where a wall stop cannot be used, provide universal floor stops.
3. Where wall or floor stop cannot be used, provide overhead stop.
4. Provide roller bumper where doors open into each other and overhead stop cannot be used.

2.13 THRESHOLDS, SEALS, DOOR SWEEPS, AND GASKETING

A. Manufacturers:

B. Scheduled Manufacturer:

1. Zero International

C. Acceptable Manufacturers:

1. National Guard

D. Seals and Gasketing: Provide continuous gasketing on exterior openings, to the head and jambs, forming a continuous seal between the door and the frame. Provide smoke, light, or sound gasketing on interior doors where indicated.

1. Provide self-tapping fasteners for aluminum extruded gasketing being applied to hollow metal frames.
   a. Provide non-corrosive fasteners for all exterior applications.
   b. Provide security fasteners where indicated.

2. Provide neoprene, EPDM, silicone, or nylon brush inserts as specified in hardware sets. Provide non brush inserts of solid or sponge cell, as specified in hardware sets. Vinyl inserts are not allowed except where specified in hardware sets.

E. Sound-Rated Gasketing: Provide acoustic gasketing to meet Sound Transmission Class (STC) rating required.

F. Meeting-Stile Gasketing: Provide meeting-stile gasketing that fastens to the meeting stiles forming a continuous seal when doors are closed.

G. Door Sweeps or Shoes: Apply to the bottom of the door to close the gap between the door bottom and finished floor or saddle threshold.

1. Provide solid neoprene, EPDM, silicone, or nylon brush type of seal as specified in hardware sets. Vinyl inserts are not allowed except where specified in hardware sets.

H. Thresholds: Provide threshold units not less than 4 inches wide, formed to accommodate change in floor elevation where indicated, and fabricated to accommodate door hardware and fit door frames.

1. Threshold extrusion to be a minimum thickness as specified in hardware sets.

2.14 FINISHES

A. FINISH: BHMA 626/652 (US26D); EXCEPT:

1. Hinges at Exterior Doors: BHMA 630 (US32D)
2. Aluminum Geared Continuous Hinges: BHMA 628 (US28)
3. Push Plates, Pulls, and Push Bars: BHMA 630 (US32D)
4. Protection Plates: BHMA 630 (US32D)
5. Overhead Stops and Holders: BHMA 630 (US32D)
6. Wall Stops: BHMA 630 (US32D)
7. Latch Protectors: BHMA 630 (US32D)
8. Weatherstripping: Clear Anodized Aluminum
9. Thresholds: Mill Finish Aluminum

B. FINISH: BHMA 630 (US32D); EXCEPT:

1. Aluminum Geared Continuous Hinges: BHMA 628 (US28)
2. Door Closers: Powder Coat to Match
3. Weatherstripping: Clear Anodized Aluminum
4. Thresholds: Mill Finish Aluminum

PART 3 - EXECUTION

3.01 EXAMINATION

A. Prior to installation of hardware, examine doors and frames, with Installer present, for compliance with requirements for installation tolerances, labeled fire-rated door assembly construction, wall and floor construction, and other conditions affecting performance. Verify doors, frames, and walls have been properly reinforced for hardware installation.

B. Examine roughing-in for electrical power systems to verify actual locations of wiring connections before electrified door hardware installation.

C. Submit a list of deficiencies in writing and proceed with installation only after unsatisfactory conditions have been corrected.

3.02 INSTALLATION

A. Mount door hardware units at heights to comply with the following, unless otherwise indicated or required to comply with governing regulations.

1. Standard Steel Doors and Frames: ANSI/SDI A250.8.
2. Custom Steel Doors and Frames: HMMA 831.
3. Interior Architectural Wood Flush Doors: ANSI/WDMA I.S. 1A
4. Installation Guide for Doors and Hardware: DHI TDH-007-20

B. Install door hardware in accordance with NFPA 80, NFPA 101 and provide post-install inspection, testing as specified in section 1.03.E unless otherwise required to comply with governing regulations.

C. Install each hardware item in compliance with manufacturer's instructions and recommendations, using only fasteners provided by manufacturer.

D. Do not install surface mounted items until finishes have been completed on substrate. Protect all installed hardware during painting.

E. Set units level, plumb and true to line and location. Adjust and reinforce attachment substrate as necessary for proper installation and operation.

F. Drill and countersink units that are not factory prepared for anchorage fasteners. Space fasteners and anchors according to industry standards.

G. Install operating parts so they move freely and smoothly without binding, sticking, or excessive clearance.

H. Hinges: Install types and in quantities indicated in door hardware schedule but not fewer than quantity recommended by manufacturer for application indicated.

I. Key Control System: Tag keys and place them on markers and hooks in key control system cabinet, as determined by final keying schedule.

J. Continuous Hinges: Re-locate the door and frame fire rating labels where they will remain visible so that the hinge does not cover the label once installed.

K. Door Closers & Auto Operators: Mount closers/operators on room side of corridor doors, inside of exterior doors, and stair side of stairway doors from corridors. Mount closers/operators so they are not visible in corridors, lobbies and other public spaces unless approved by Architect.

L. Overhead Stops/Holders: Mount overhead stops/holders on room side of corridor doors, inside of exterior doors, and stair side of stairway doors.

M. Thresholds:

1. Set thresholds in full bed of sealant complying with requirements specified in Division 07 Section "Joint Sealants."
2. Aluminum thresholds to be cut-in, and scribed around mullions, frame members, and stops. Do not butt to thresholds. Provide a continuous surface across full width of opening from jamb to jamb.
3. Where aluminum panic-type (rabbeted) thresholds with neoprene inserts are specified, undercut doors as required to properly mate with seal in threshold.

N. Stops: Provide floor stops for doors unless wall or other type stops are indicated in door hardware schedule. Do not mount floor stops where they may impede traffic or present tripping hazard.

O. Perimeter Gasketing:

1. Apply to head and jamb, forming seal between door and frame.
2. Install gasketing in a manner eliminating need to cut any seal to install surface mounted hardware. Install compatible mounting bracket for surface mounted hardware unless minimum 1/4 inch thick solid aluminum seals are provided for mounting of surface applied hardware.

P. Meeting Stile Gasketing: Fasten to meeting stiles, forming seal when doors are closed.

Q. Door Bottoms and Sweeps: Apply to bottom of door, forming seal with threshold when door is closed.

3.03 ADJUSTING

A. Initial Adjustment: Adjust and check each operating item of door hardware and each door to ensure proper operation or function of every unit. Replace units that cannot be adjusted to operate as intended. Adjust door control devices to compensate for final operation of heating and ventilating equipment and to comply with referenced accessibility requirements.

1. Spring Hinges: Adjust to achieve positive latching when door can close freely from an open position of 30 degrees.
2. Electric Strikes: Adjust horizontal and vertical alignment of keeper to properly engage lock bolt.
3. Door Closers: Adjust sweep period to comply with accessibility requirements and requirements of authorities having jurisdiction.

B. Occupancy Adjustment: Approximately three to six months after date of Substantial Completion, examine and readjust each item of door hardware, including adjusting operating forces, as necessary to ensure function of doors and door hardware.

3.04 CLEANING AND PROTECTION

A. Clean adjacent surfaces soiled by door hardware installation.

B. Clean operating items per manufacturer's instructions to restore proper function and finish.

C. Provide final protection and maintain conditions that ensure door hardware is without damage or deterioration at time of Substantial Completion.

3.05 DOOR HARDWARE SCHEDULE

A. The intent of the hardware specification is to specify the hardware for interior and exterior doors, and to establish a type, continuity, and standard of quality. However, it is the door hardware supplier's responsibility to thoroughly review existing conditions, schedules, specifications, drawings, and other Contract Documents to verify the suitability of the hardware specified.

B. Discrepancies, conflicting hardware, and missing items are to be brought to the attention of the architect with corrections made prior to the bidding process. Omitted items not included in a hardware set should be scheduled with the appropriate additional hardware required for proper application.

C. Hardware items are referenced in the following hardware schedule. Refer to the above specifications for special features, options, cylinders/keying, and other requirements.

D. Hardware Sets:

Legend:
Link to catalog cut sheet
Electrified Opening

Hardware Group No. 00DA

For use on Door #(s):
100 201

Provide each DA door(s) with the following:

QTY	DESCRIPTION	CATALOG NUMBER	FINISH	MFR
1		HARDWARE BY DOOR MANUF.		

Hardware Group No. 00DAP

For use on Door #(s):
207

Provide each DAP door(s) with the following:

QTY	DESCRIPTION	CATALOG NUMBER	FINISH	MFR
1		HARDWARE BY DOOR MANUF.		

Hardware Group No. 01

For use on Door #(s):
203 204

Provide each SGL door(s) with the following:

QTY		DESCRIPTION	CATALOG NUMBER		FINISH	MFR
3	EA	HINGE	5BB1HW 4.5 X 4.5		652	IVE
1	EA	ELEC PRIVACY LOCK	CO-100-CY-40-KP-LON-P6 4B BATTERY OPERATED		626AM	SCE
1	EA	SURFACE CLOSER	4050A REG		689	LCN
1	EA	KICK PLATE	8400 10" X 2" LDW B-CS		630	IVE
1	EA	WALL STOP	WS406/407CVX		630	IVE
1	EA	GASKETING	488SBK PSA		BK	ZER
1	EA	DOOR SWEEP	110AA		AA	ZER
1	EA	THRESHOLD	545A		A	ZER

Hardware Group No. 02

For use on Door #(s):
202A 202B

Provide each SGL door(s) with the following:

QTY		DESCRIPTION	CATALOG NUMBER		FINISH	MFR
3	EA	HINGE	5BB1HW 4.5 X 4.5 NRP		652	IVE
1	EA	STOREROOM LOCK	ALX80P6 LON		626	SCH
1	EA	SURFACE CLOSER	4050A SHCUSH		689	LCN
1	EA	ARMOR PLATE	8400 36" X 1" LDW B-CS		630	IVE
1	EA	GASKETING	488SBK PSA		BK	ZER
1	EA	DOOR SWEEP	39A		A	ZER
1	EA	THRESHOLD	545A		A	ZER

Hardware Group No. 03

For use on Door #(s):
101

Provide each SGL door(s) with the following:

QTY		DESCRIPTION	CATALOG NUMBER		FINISH	MFR
3	EA	HINGE	5BB1HW 4.5 X 4.5 NRP		652	IVE
1	EA	CLASSROOM LOCK	ALX70P6 LON		626AM	SCH
1	EA	SURFACE CLOSER	4050A SHCUSH		689	LCN
1	EA	KICK PLATE	8400 10" X 2" LDW B-CS		630	IVE
1	EA	GASKETING	488SBK PSA		BK	ZER
1	EA	DOOR SWEEP	39A		A	ZER
1	EA	THRESHOLD	545A		A	ZER

Hardware Group No. 04

For use on Door #(s):
102

Provide each PD door(s) with the following:

QTY		DESCRIPTION	CATALOG NUMBER		FINISH	MFR
1	EA	POCKET DOOR HW	1560		626	JOH
1	EA	POCKET DOOR HW	1560SC		626	JOH
1	EA	POCKET DOOR HW	2060		626	JOH
1	EA	ARCHITECTURAL LADDER PULL	AP411G-1210-4		630	TRM
1	EA	ARCHITECTURAL LADDER PULL	AP411G-80006-4		630	TRM

END OF SECTION

SECTION 08 71 00.01 - DOOR HARDWARE INDEX

Door#	Hardware Set#
100	00DA
101	03
102	04
201	00DA
202A	02
202B	02
203	01
204	01
207	00DAP

END OF SECTION

SECTION 08 80 00 - GLAZING

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

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

1.2 SUMMARY

A. Section Includes:

1. Glass for interior doors and interior borrowed lites.
2. Mirror glass.
3. Decorative films
4. Glazing sealants and accessories.

B. Related Requirements:

1. Section 01 81 13 “Sustainability Requirements”.
2. Section 08 11 13 “Hollow Metal Door and Frames”.
3. Section 08 14 16 “Flush Wood Doors”.

1.3 DEFINITIONS

A. Glass Manufacturers: Firms that produce primary glass, fabricated glass, or both, as defined in referenced glazing publications.

B. Glass Thicknesses: Indicated by thickness designations in millimeters according to ASTM C 1036.

C. IBC: International Building Code.

D. Interspace: Space between lites of an insulating-glass unit.

1.4 COORDINATION

A. Coordinate glazing channel dimensions to provide necessary bite on glass, minimum edge and face clearances, and adequate sealant thicknesses, with reasonable tolerances.

1.5 SUBMITTALS

A. Product Data: For each type of product.

B. Sustainable Design Submittals: Refer to Section 01 81 13 “Sustainability Requirements”.

C. Glass Samples: For each type of glass product other than clear monolithic vision glass; 12 inchessquare.

D. Glazing Accessory Samples: For sealants and colored spacers, in 12-inch lengths. Install sealant Samples between two strips of material representative in color of the adjoining framing system.

E. Glazing Schedule: List glass types and thicknesses for each size opening and location. Use same designations indicated on Drawings.

F. Qualification Data: For Installer manufacturers of insulating-glass units with sputter-coated, low-E coatings.

G. Product Certificates: For glass.

H. Preconstruction adhesion and compatibility test report.

I. Sample Warranties: For special warranties.

1.6 QUALITY ASSURANCE

A. Manufacturer Qualifications for Insulating-Glass Units with Sputter-Coated, Low-E Coatings: A qualified insulating-glass manufacturer who is approved and certified by coated-glass manufacturer.

B. Installer Qualifications: A qualified installer who employs glass installers for this Project who are certified under the National Glass Association's Certified Glass Installer Program.

C. Glass Testing Agency Qualifications: A qualified independent testing agency accredited according to the NFRC CAP 1 Certification Agency Program.

D. Sealant Testing Agency Qualifications: An independent testing agency qualified according to ASTM C 1021 to conduct the testing indicated.

1.7 PRECONSTRUCTION TESTING

A. Preconstruction Adhesion and Compatibility Testing: Test each glass product, tape sealant, gasket, glazing accessory, and glass-framing member for adhesion to and compatibility with elastomeric glazing sealants.

1. Testing is not required if data are submitted based on previous testing of current sealant products and glazing materials matching those submitted.

2. Use ASTM C 1087 to determine whether priming and other specific joint-preparation techniques are required to obtain rapid, optimum adhesion of glazing sealants to glass, tape sealants, gaskets, and glazing channel substrates.

3. Test no fewer than eight Samples of each type of material, including joint substrates, shims, sealant backings, secondary seals, and miscellaneous materials.

4. Schedule enough time for testing and analyzing results to prevent delaying the Work.

5. For materials failing tests, submit sealant manufacturer's written instructions for corrective measures including the use of specially formulated primers.

1.8 DELIVERY, STORAGE, AND HANDLING

A. Protect glazing materials according to manufacturer's written instructions. Prevent damage to glass and glazing materials from condensation, temperature changes, direct exposure to sun, or other causes.

B. Comply with insulating-glass manufacturer's written instructions for venting and sealing units to avoid hermetic seal ruptures due to altitude change.

1.9 FIELD CONDITIONS

A. Environmental Limitations: Do not proceed with glazing when ambient and substrate temperature conditions are outside limits permitted by glazing material manufacturers and when glazing channel substrates are wet from rain, frost, condensation, or other causes.

1. Do not install glazing sealants when ambient and substrate temperature conditions are outside limits permitted by sealant manufacturer or are below 40 deg F.

1.10 WARRANTY

A. Manufacturer's Special Warranty for Coated-Glass Products: Manufacturer agrees to replace coated-glass units that deteriorate within specified warranty period. Deterioration of coated glass is defined as defects developed from normal use that are not attributed to glass breakage or to

maintaining and cleaning coated glass contrary to manufacturer's written instructions. Defects include peeling, cracking, and other indications of deterioration in coating.

1. Warranty Period: Ten (10) years from date of Substantial Completion.

B. Manufacturer's Special Warranty for Laminated Glass: Manufacturer agrees to replace laminated-glass units that deteriorate within specified warranty period. Deterioration of laminated glass is defined as defects developed from normal use that are not attributed to glass breakage or to maintaining and cleaning laminated glass contrary to manufacturer's written instructions. Defects include edge separation, delamination materially obstructing vision through glass, and blemishes exceeding those allowed by referenced laminated-glass standard.

1. Warranty Period: Ten (10) years from date of Substantial Completion.

PART 2 - PRODUCTS

2.1 PERFORMANCE REQUIREMENTS

A. General: Installed glazing systems shall withstand normal thermal movement and wind and impact loads (where applicable) without failure, including loss or glass breakage attributable to the following: defective manufacture, fabrication, or installation; failure of sealants or gaskets to remain watertight and airtight; deterioration of glazing materials; or other defects in construction.

B. Structural Performance: Glazing shall withstand the following design loads within limits and under conditions indicated determined according to the IBC and ASTM E 1300.

1. Thickness of Patterned Glass: Base design of patterned glass on thickness at thinnest part of the glass.

2. Maximum Lateral Deflection: For glass supported on all four edges, limit center-of-glass deflection at design wind pressure to not more than 1/50 times the short-side length or 1 inch, whichever is less.

3. Differential Shading: Design glass to resist thermal stresses induced by differential shading within individual glass lites.

C. Safety Glazing: Where safety glazing is indicated or required by code, provide glazing that complies with 16 CFR 1201, Category II.

D. Thermal and Optical Performance Properties: Provide glass with performance properties specified, as indicated in manufacturer's published test data, based on procedures indicated below:

1. For monolithic-glass lites, properties are based on units with lites 6 mm thick.

2. For laminated-glass lites, properties are based on products of construction indicated.

E. Glazing and Mirror Adhesives and Sealants: Comply with low/ no VOC requirements in Section 01 81 13 “Sustainability Requirements”.

2.2 MANUFACTURERS

A. Source Limitations for Glass: Obtain from single source from single manufacturer for each glass type.

B. Source Limitations for Glazing Accessories: Obtain from single source from single manufacturer for each product and installation method.

C. Basis-of-Design Manufacturer: Vitro Architectural Glass; www.vitroglazings.com.

D. Other Approved Manufacturers:

1. AGC Glass North America; www.agcglass.com.

2. Oldcastle Building Envelope; www.obe.com.

3. Pilkington, a div. of Nippon Sheet Glass Co., Ltd; www.pilkington.com.

2.3 GLASS PRODUCTS, GENERAL

A. Glazing Publications: Comply with published recommendations of glass product manufacturers and organizations below unless more stringent requirements are indicated. See these publications for glazing terms not otherwise defined in this Section or in referenced standards.

1. GANA Publications: "Laminated Glazing Reference Manual" and "Glazing Manual."

2. AAMA Publications: AAMA GDSG-1, "Glass Design for Sloped Glazing," and AAMA TIR A7, "Sloped Glazing Guidelines."

3. IGMA Publication for Sloped Glazing: IGMA TB-3001, "Guidelines for Sloped Glazing."

B. Safety Glazing Labeling: Where safety glazing is provided, permanently mark glazing with certification label of the SGCC or another certification agency acceptable to authorities having jurisdiction. Label shall indicate manufacturer's name, type of glass, thickness, and safety glazing standard with which glass complies.

C. Thickness: Where glass thickness is indicated, it is a minimum. Provide glass that complies with performance requirements and is not less than the thickness indicated.

1. Minimum Glass Thickness for Exterior Lites: 6 mm.

2. Thickness of Tinted Glass: Provide same thickness for each tint color indicated throughout Project.

D. Strength: Where annealed float glass is indicated, provide annealed float glass, heat-strengthened float glass, or fully tempered float glass as needed to comply with "Performance Requirements" Article. Where heat-strengthened float glass is indicated, provide heat-strengthened float glass or fully tempered float glass as needed to comply with "Performance Requirements" Article. Where fully tempered float glass is indicated, provide fully tempered float glass.

2.4 GLASS PRODUCTS

A. Clear Annealed Float Glass: ASTM C 1036, Type I, Class 1 (clear), Quality-Q3.

B. Fully Tempered Float Glass: ASTM C 1048, Kind FT (fully tempered), Condition A (uncoated) unless otherwise indicated, Type I, Class 1 (clear) or Class 2 (tinted) as indicated, Quality-Q3.

1. Fabrication Process: By horizontal (roller-hearth) process with roll-wave distortion parallel to bottom edge of glass as installed unless otherwise indicated.

C. Heat-Strengthened Float Glass: ASTM C 1048, Kind HS (heat strengthened), Type I, Condition A (uncoated) unless otherwise indicated, Type I, Class 1 (clear) or Class 2 (tinted) as indicated, Quality-Q3.

1. Fabrication Process: By horizontal (roller-hearth) process with roll-wave distortion parallel to bottom edge of glass as installed unless otherwise indicated.

D. Interspace Content: Where indicated to provide argon-filled interspace, provide the Insulating Glass Manufacturers Association of Canada (IGMAC) accepted standard argon gas fill level of 90 percent argon and 10 percent dry air.

E. Edge Treatment at Monolithic and Laminated Glazing: Where monolithic or laminated glazing is indicated and edges are exposed to view, provide glazing with polished edges and the following edge treatments:

1. At Structural Sealant Butt Joints: Provide flat ground smooth edges.

2. At Exposed Edges: Provide flat polished edges with beveled edges and corners, 1/8 inch (3 mm) at outer edges and corners.

2.5 LAMINATED GLASS

A. Laminated Glass: meeting requirements of ASTM C1172 “Standard Specification for Laminated Architectural Flat Glass”. Use materials that have a proven record of no tendency to bubble, discolor, or lose physical and mechanical properties after fabrication and installation.

1. Construction: Laminate glass with polyvinyl butyral (PVB) interlayer ionomeric polymer interlayer cast-in-place and cured-transparent-resin interlayer to comply with interlayer manufacturer's written instructions.

2. Interlayer Thickness: Provide thickness not less than that indicated and as needed to comply with requirements.

3. Interlayer Color: Clear unless otherwise indicated.

4. Basis-of-Design Product, Clear: SentryGlas by by E.I. DuPont DeNemours & Co., Inc.; www.dupont.com.

2.6 MIRROR GLASS

A. Mirrors, General: ASTM C1503; manufactured using copper-free, low-lead mirror coating process.

B. Mirror Glass: Mirror Glazing Quality for blemish requirements and complying with ASTM C 1048 for Kind FT, Condition A, tempered float glass before silver coating is applied, Quality Q1 (mirror select).

1. Silvered Flat Glass Mirrors, Acceptable Manufacturers:

a. Donisi Mirror Co.; www.donisimirror.com.

b. Gilded Mirrors, Inc.; www.gildedmirrorsinc.com.

c. Walker Glass Co., Ltd.; www.walkerglass.com.

2. Provide tempered mirror units where cantilevered edges, and adhered to substrates.

a. Where set in channels and mechanically attached, provide annealed monolithic mirror, Select Quality with clear float glass.

2.7 GLAZING TYPES

A. Glazing Type 2: Interior glazing, structural, monolithic interior single lites.

1. Fully tempered 1/4 inch (6 mm) clear float glass.

2. Provide safety glazing where required.

B. Mirrored, Monolithic Interior Single Lites:

1. Mirror Glass: Fully tempered; 1/4-inch (6-mm) minimum thick.

a. Provide annealed mirror glass where installed in j-channels.

b. Sizes as indicated. Field verify openings in tile and other construction where insetting mirrors, with edge clearances indicated. Mirrors are subject to rejection where dimensional clearances indicated are not maintained.

2. Select materials and/or provide supports as required to limit mirrored glass deflection to 1/200 or flexure limit of glass with full recovery of glazing materials, whichever is less.

3. Provide J-channels where indicated on Drawings.

4. Edge polished where exposed.

5. Edge seal all mirrors.

2.8 DECORATIVE FILMS

A. Decorative Film Overlay, F-1: Translucent, dimensionally stable film, with pressure-sensitive, clear adhesive back for adhering to glass and releasable protective backing.

1. Fire Classification: Class A.

a. Basis-of-Design Product: Fasara Glass Finish Natural SH2FGSW “Straight Washi” by 3M; www.3m.com.

1) Style: Natural/ Washi.

2) Length: 98.4 inches.

3) Width: 50 inches.

4) Application: Office Area, or as indicated in Drawings.

2.9 GLAZING SEALANTS

A. General:

1. Compatibility: Compatible with one another and with other materials they contact, including glass products, seals of insulating-glass units, and glazing channel substrates, under conditions of service and application, as demonstrated by sealant manufacturer based on testing and field experience.

2. Suitability: Comply with sealant and glass manufacturers' written instructions for selecting glazing sealants suitable for applications indicated and for conditions existing at time of installation.

3. Colors of Exposed Glazing Sealants: As selected by Architect from manufacturer's full range.

B. Glazing Sealant: Neutral-curing silicone glazing sealant complying with ASTM C 920, Type S, Grade NS, Class 100/50, Use NT.

2.10 GLAZING TAPES

A. Back-Bedding Mastic Glazing Tapes: Preformed, butyl-based, 100 percent solids elastomeric tape; nonstaining and nonmigrating in contact with nonporous surfaces; with or without spacer rod as recommended in writing by tape and glass manufacturers for application indicated; and complying with ASTM C 1281 and AAMA 800 for products indicated below:

1. AAMA 804.3 tape, where indicated.

2. AAMA 806.3 tape, for glazing applications in which tape is subject to continuous pressure.

3. AAMA 807.3 tape, for glazing applications in which tape is not subject to continuous pressure.

B. Expanded Cellular Glazing Tapes: Closed-cell, PVC foam tapes; factory coated with adhesive on both surfaces; and complying with AAMA 800 for the following types:

1. AAMA 810.1, Type 1, for glazing applications in which tape acts as the primary sealant.

2. AAMA 810.1, Type 2, for glazing applications in which tape is used in combination with a full bead of liquid sealant.

2.11 MISCELLANEOUS GLAZING MATERIALS

A. General: Provide products of material, size, and shape complying with referenced glazing standard, with requirements of manufacturers of glass and other glazing materials for application indicated, and with a proven record of compatibility with surfaces contacted in installation.

B. Cleaners, Primers, and Sealers: Types recommended by sealant or gasket manufacturer.

C. Setting Blocks: Elastomeric material with a Shore, Type A durometer hardness of 85, plus or minus 5.

D. Spacers: Elastomeric blocks or continuous extrusions of hardness required by glass manufacturer to maintain glass lites in place for installation indicated.

E. Edge Blocks: Elastomeric material of hardness needed to limit glass lateral movement (side walking).

F. Cylindrical Glazing Sealant Backing: ASTM C 1330, Type O (open-cell material), of size and density to control glazing sealant depth and otherwise produce optimum glazing sealant performance.

2.12 MIRROR GLASS AND ACCESSORIES

A. Mirror Mastic: An adhesive setting compound, asbestos-free, produced specifically for setting mirrors and certified by both mirror and mastic manufacturer as compatible with glass coating and substrates on which mirrors will be installed.

1. Acceptable Manufacturers:

a. Franklin Intl.

b. C.R. Laurence, Co.

c. Macco Adhesives.

d. OSI Sealants, Inc.

e. Palmer Products Corp.

f. Pecora Corp.

g. Royal Adhesives & Sealants.

2. Edge Profiles: Ground, polished unless indicated otherwise.

B. Edge Sealer: Coating compatible with glass coating and approved by mirror manufacturer for use in protecting against silver deterioration at mirrored glass edges.

C. Mirror Hardware:

1. Mirror clips are not acceptable.

2. Aluminum J-Channels and Cleat: Aluminum extrusions with a return deep enough to produce a glazing channel to accommodate mirrors of thickness indicated and in lengths required to cover edges of mirrors in a single piece.

a. Provide trim with front leg size of 1/4-inch on all sides of mirror.

3. Fasteners: Fabricated of same basic metal and alloy as fastened metal and matching it in finished color and texture where fasteners are exposed.

4. Anchors and Inserts: Provide devices as required for mirror hardware installation. Provide toothed or lead-shield, expansion-bolt devices for drilled-in-place anchors. Provide galvanized anchors and inserts for applications on inside face of exterior walls and where indicated.

2.13 FABRICATION OF GLAZING UNITS

A. Fabricate glazing units in sizes required to fit openings indicated for Project, with edge and face clearances, edge and surface conditions, and bite complying with written instructions of product manufacturer and referenced glazing publications, to comply with system performance requirements.

1. Allow for thermal movements from ambient and surface temperature changes acting on glass framing members and glazing components.
    a. Temperature Change: 120 deg F (67 deg C), ambient; 180 deg F (100 deg C), material surfaces Insert temperature change.

B. Clean-cut or flat-grind vertical edges of butt-glazed monolithic lites to produce square edges with slight chamfers at junctions of edges and faces.

C. Grind smooth and polish exposed glass edges and corners.

2.14 FABRICATION, MIRRORS

A. Fabricate mirrors in the shop to greatest extent possible.

B. Fabricate cutouts for notches and holes in mirrors without marring visible surfaces. Locate and size cutouts so they fit closely around penetrations in mirrors.

C. Mirror Edge Treatment: Flat polished where exposed.

1. Seal edges of mirrors with edge sealer after edge treatment to prevent chemical or atmospheric penetration of glass coating.

2. Require mirror manufacturer to perform edge treatment and sealing in factory immediately after cutting to final sizes.

D. Film-Backed Safety Mirrors: Apply film backing with adhesive coating over mirror backing paint, as recommended in writing by film-backing manufacturer, to produce a surface free of bubbles, blisters, and other imperfections.

PART 3 - EXECUTION

3.1 EXAMINATION

A. Examine framing, glazing channels, and stops, with Installer present, for compliance with the following:

1. Manufacturing and installation tolerances, including those for size, squareness, and offsets at corners.

2. Presence and functioning of weep systems.

3. Minimum required face and edge clearances.

4. Effective sealing between joints of glass-framing members.

B. Proceed with installation only after unsatisfactory conditions have been corrected.

3.2 PREPARATION

A. Clean glazing channels and other framing members receiving glass immediately before glazing. Remove coatings not firmly bonded to substrates.

B. Examine glazing units to locate exterior and interior surfaces. Label or mark units as needed so that exterior and interior surfaces are readily identifiable. Do not use materials that leave visible marks in the completed Work.

3.3 GLAZING, GENERAL

A. Comply with combined written instructions of manufacturers of glass, sealants, gaskets, and other glazing materials, unless more stringent requirements are indicated, including those in referenced glazing publications.

B. Protect glass edges from damage during handling and installation. Remove damaged glass from Project site and legally dispose of off Project site. Damaged glass includes glass with edge

damage or other imperfections that, when installed, could weaken glass, impair performance, or impair appearance.

C. Apply primers to joint surfaces where required for adhesion of sealants, as determined by preconstruction testing.

D. Install setting blocks in sill rabbets, sized and located to comply with referenced glazing publications, unless otherwise required by glass manufacturer. Set blocks in thin course of compatible sealant suitable for heel bead.

E. Do not exceed edge pressures stipulated by glass manufacturers for installing glass lites.

F. Provide spacers for glass lites where length plus width is larger than 50 inches.

1. Locate spacers directly opposite each other on both inside and outside faces of glass. Install correct size and spacing to preserve required face clearances, unless gaskets and glazing tapes are used that have demonstrated ability to maintain required face clearances and to comply with system performance requirements.

2. Provide 1/8-inch minimum bite of spacers on glass and use thickness equal to sealant width. With glazing tape, use thickness slightly less than final compressed thickness of tape.

G. Provide edge blocking where indicated or needed to prevent glass lites from moving sideways in glazing channel, as recommended in writing by glass manufacturer and according to requirements in referenced glazing publications.

H. Set glass lites in each series with uniform pattern, draw, bow, and similar characteristics.

I. Set glass lites with proper orientation so that coatings face exterior or interior as specified.

J. Where wedge-shaped gaskets are driven into one side of channel to pressurize sealant or gasket on opposite side, provide adequate anchorage so gasket cannot walk out when installation is subjected to movement.

K. Square cut wedge-shaped gaskets at corners and install gaskets in a manner recommended by gasket manufacturer to prevent corners from pulling away; seal corner joints and butt joints with sealant recommended by gasket manufacturer.

3.4 TAPE GLAZING

A. Position tapes on fixed stops so that, when compressed by glass, their exposed edges are flush with or protrude slightly above sightline of stops.

B. Install tapes continuously, but not necessarily in one continuous length. Do not stretch tapes to make them fit opening.

C. Cover vertical framing joints by applying tapes to heads and sills first, then to jambs. Cover horizontal framing joints by applying tapes to jambs, then to heads and sills.

D. Place joints in tapes at corners of opening with adjoining lengths butted together, not lapped. Seal joints in tapes with compatible sealant approved by tape manufacturer.

E. Do not remove release paper from tape until right before each glazing unit is installed.

F. Apply heel bead of elastomeric sealant.

G. Center glass lites in openings on setting blocks, and press firmly against tape by inserting dense compression gaskets formed and installed to lock in place against faces of removable stops. Start gasket applications at corners and work toward centers of openings.

H. Apply cap bead of elastomeric sealant over exposed edge of tape.

3.5 GASKET GLAZING (DRY)

A. Cut compression gaskets to lengths recommended by gasket manufacturer to fit openings exactly, with allowance for stretch during installation.

B. Insert soft compression gasket between glass and frame or fixed stop so it is securely in place with joints miter cut and bonded together at corners.

C. Installation with Drive-in Wedge Gaskets: Center glass lites in openings on setting blocks, and press firmly against soft compression gasket by inserting dense compression gaskets formed and installed to lock in place against faces of removable stops. Start gasket applications at corners and work toward centers of openings. Compress gaskets to produce a weathertight seal without developing bending stresses in glass. Seal gasket joints with sealant recommended by gasket manufacturer.

D. Installation with Pressure-Glazing Stops: Center glass lites in openings on setting blocks, and press firmly against soft compression gasket. Install dense compression gaskets and pressure-glazing stops, applying pressure uniformly to compression gaskets. Compress gaskets to produce a weathertight seal without developing bending stresses in glass. Seal gasket joints with sealant recommended by gasket manufacturer.

E. Install gaskets so they protrude past face of glazing stops.

3.6 SEALANT GLAZING (WET)

A. Install continuous spacers, or spacers combined with cylindrical sealant backing, between glass lites and glazing stops to maintain glass face clearances and to prevent sealant from extruding into glass channel and blocking weep systems until sealants cure. Secure spacers or spacers and backings in place and in position to control depth of installed sealant relative to edge clearance for optimum sealant performance.

B. Force sealants into glazing channels to eliminate voids and to ensure complete wetting or bond of sealant to glass and channel surfaces.

C. Tool exposed surfaces of sealants to provide a substantial wash away from glass.

3.7 INSTALLATION, MIRROR GLASS

A. General: Install mirrors to comply with mirror manufacturer's written instructions and with referenced GANA publications. Mount mirrors accurately in place in a manner that avoids distorting reflected images.

1. GANA Publications: "Glazing Manual" and "Mirrors, Handle with Extreme Care: Tips for the Professional on the Care and Handling of Mirrors."

B. Provide a minimum airspace of 1/8 inchbetween back of mirrors and mounting surface for air circulation between back of mirrors and face of mounting surface.

C. Install mirrors with mastic and mirror hardware where frames are indicated. Attach mirror hardware securely to mounting surfaces with mechanical fasteners installed with anchors or inserts as applicable. Install fasteners so heads do not impose point loads on backs of mirrors.

1. Aluminum J-Channels and Cleat: Fasten J-channel directly to wall and attach top trim to continuous cleat fastened directly to wall.

2. Install mastic as follows:

a. Apply barrier coat to mirror backing where approved in writing by manufacturers of mirrors and backing material.

b. Apply mastic to comply with mastic manufacturer's written instructions for coverage and to allow air circulation between back of mirrors and face of mounting surface.

c. After mastic is applied, align mirrors and press into place while maintaining a minimum airspace of 1/8 inch between back of mirrors and mounting surface.

3.8 CLEANING AND PROTECTION

A. Immediately after installation remove nonpermanent labels and clean surfaces.

B. Protect glass from contact with contaminating substances resulting from construction operations. Examine glass surfaces adjacent to or below exterior concrete and other masonry surfaces at frequent intervals during construction, but not less than once a month, for buildup of dirt, scum, alkaline deposits, or stains.

1. If, despite such protection, contaminating substances do come into contact with glass, remove substances immediately as recommended in writing by glass manufacturer. Remove and replace glass that cannot be cleaned without damage to coatings.

C. Remove and replace glass that is damaged during construction period.

D. Wash glass on both exposed surfaces not more than four days before date scheduled for inspections that establish date of Substantial Completion. Wash glass as recommended in writing by glass manufacturer.

END OF SECTION

SECTION 09 22 16 - NON-STRUCTURAL METAL FRAMING

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

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

1.2 SUMMARY

A. Section Includes:

1. Non-load-bearing steel framing systems for interior partitions.
2. Suspension systems for interior ceilings and soffits.

B. Related Requirements:

1. Section 06 10 00 “Rough Carpentry” for fire retardant-treated wood blocking.

1.3 SUBMITTALS

A. Product Data: For each type of product.

1. Studs and Runners: Provide documentation that framing members' certification is according to SIFA's "Code Compliance Certification Program for Cold-Formed Steel Structural and Non-Structural Framing Members."

B. Evaluation Reports: For embossed steel studs and runners and firestop tracks, from ICC-ES or other qualified testing agency acceptable to authorities having jurisdiction.

PART 2 - PRODUCTS

2.1 PERFORMANCE REQUIREMENTS

A. STC-Rated Assemblies: For STC-rated assemblies, provide materials and construction identical to those tested in assembly indicated, according to ASTM E90 and classified according to ASTM E413 by an independent testing agency.

B. Horizontal Deflection: For wall assemblies, limited to 1/360 of the wall height based on horizontal loading of 5 lbf/sq. ft.

C. Vertical Deflection: Match horizontal deflection requirements.

D. Framing Spacing: As required for wall equipment and finishes indicated.

1. Limit framing at walls scheduled to receive level 4 and 5 finishes, and tile finishes to 16-inches o.c. maximum.

E. Recycled Content, Light-Gauge Metal Framing: Provide framing with minimum 25 percent total recycled content, including at least 20 percent post-consumer recycled content.

2.2 FRAMING SYSTEMS

A. Framing Members, General: Comply with ASTM C754 for conditions indicated.

1. Steel Sheet Components: Comply with ASTM C645 requirements for metal unless otherwise indicated.
2. Protective Coating: Comply with ASTM C645; ASTM A653/A653M, G40; or coating with equivalent corrosion resistance. Galvannealed products are unacceptable.

B. Studs and Runners: ASTM C645. Use either steel studs and runners or embossed steel studs and runners.

1. Steel Studs and Runners:

a. Minimum Base-Metal Thickness: As required by performance requirements for horizontal deflection.

b. Depth: As indicated on Drawings.

2. Embossed Steel Studs and Runners:

a. Minimum Base-Metal Thickness: As required by performance requirements for horizontal deflection.

b. Depth: As indicated on Drawings.

C. Slip-Type Head Joints: Where indicated, provide one of the following:

1. Clip System: Clips designed for use in head-of-wall deflection conditions that provide a positive attachment of studs to runners while allowing 2-inch minimum vertical movement.

a. Approved Manufacturers:

1) CEMCO; www.cemcosteel.com.

2) Fire Trak Corp.; www.firetrak.com.

3) SCAFCO Steel Stud Co.; www.scafco.com.

2. Double-Runner System: ASTM C645 top runners, inside runner with 2-inch-deep flanges in thickness not less than indicated for studs and fastened to studs, and outer runner sized to friction fit inside runner.

3. Deflection Track: Steel sheet top runner manufactured to prevent cracking of finishes applied to interior partition framing resulting from deflection of structure above; in thickness not less than indicated for studs and in width to accommodate depth of studs.

a. Approved Manufacturers:

1) CEMCO.

2) Marino\WARE; www.marinoware.com.

3) SCAFCO Steel Stud Co.

4) Steel Network, Inc., The; www.steelnetwork.com.

D. Cold-Rolled Channel Bridging: Steel, 0.0538-inch minimum base-metal thickness, with minimum 1/2-inch-wide flanges.

1. Depth: As indicated on Drawings.

2. Clip Angle: Not less than 1-1/2 by 1-1/2 inches, 0.068-inch-thick, galvanized steel.

3. Approved Manufacturers:

a. Marino\WARE.

b. SCAFCO Steel Stud Co.

E. Hat-Shaped, Rigid Furring Channels: ASTM C645.

1. Minimum Base-Metal Thickness: As indicated on Drawings.

2. Depth: As indicated on Drawings.

3. Approved Manufacturers:

a. Marino\WARE.

b. MRI Steel Framing, LLC; www.mristeelframing.com.

c. SCAFCO Steel Stud Co.

d. Steel Construction Systems; www.steelconsystems.com.

F. Resilient Furring Channels: 1/2-inch-deep, steel sheet members designed to reduce sound transmission.

1. Configuration: Asymmetrical; 2 inches x 1/2 inch deep with 1-1/4 inches screw flange.

2. Material: Grade 33 ksi min. yield strength; G40; 25 Gauge (0.0179-inch) minimum thickness.

3. Basis-of-Design Manufacturer: RC-1 Pro Resilient Channel (RCUR) by Clark-Dietrich; wwwclarkdietrich.com.

4. Other Approved Manufacturers:

a. Marino\WARE.

b. MRI Steel Framing, LLC.

c. SCAFCO Steel Stud Co.

d. Steel Construction Systems.

G. Cold-Rolled Furring Channels: 0.053-inch uncoated-steel thickness, with minimum 1/2-inch-wide flanges.

1. Depth: As indicated on Drawings.

2. Furring Brackets: Adjustable, corrugated-edge-type steel sheet with minimum uncoated-steel thickness of 0.0329 inch.

3. Tie Wire: ASTM A641/A641M, Class 1 zinc coating, soft temper, 0.062-inch-diameter wire, or double strand of 0.048-inch-diameter wire.

H. Z-Shaped Furring: With slotted or nonslotted web, face flange of 1-1/4 inches, wall attachment flange of 7/8 inch, minimum uncoated-metal thickness of 0.0179 inch, and depth required to fit insulation thickness indicated.

1. Approved Manufacturers:

a. Marino\WARE.

b. MRI Steel Framing, LLC.

c. SCAFCO Steel Stud Co.

d. Steel Construction Systems.

2.3 SUSPENSION SYSTEMS

A. Tie Wire: ASTM A641/A641M, Class 1 zinc coating, soft temper, 0.062-inch-diameter wire, or double strand of 0.048-inch-diameter wire.

B. Hanger Attachments to Concrete:

1. Expansion Anchors: Fabricated from corrosion-resistant materials, with allowable load or strength design capacities calculated according to ICC-ES AC193 and ACI 318 greater than or equal to the design load, as determined by testing per ASTM E488/E488M conducted by a qualified testing agency.

2. Power-Actuated Anchors: Fastener system of type suitable for application indicated, fabricated from corrosion-resistant materials, with allowable load capacities calculated according to ICC-ES AC70, greater than or equal to the design load, as determined by testing per ASTM E1190 conducted by a qualified testing agency.

a. At post-tensioned concrete slab/ deck conditions, do not exceed 3/4 inch maximum embedment of fasteners.

C. Wire Hangers: ASTM A641/A641M, Class 1 zinc coating, soft temper, 0.16 inch in diameter.

D. Flat Hangers: Steel sheet, 1 by 3/16 inch by length indicated.

E. Carrying Channels: Cold-rolled, commercial-steel sheet with a base-metal thickness of 0.0538 inch and minimum 1/2-inch-wide flanges.

1. Depth: 2 inches.

F. Furring Channels (Furring Members):

1. Cold-Rolled Channels: 0.0538-inch uncoated-steel thickness, with minimum 1/2-inch-wide flanges, 3/4 inch deep.

2. Steel Studs and Runners: ASTM C645.

a. Minimum Base-Metal Thickness: As indicated on Drawings.

b. Depth: As indicated on Drawings.

3. Embossed Steel Studs and Runners: ASTM C645.

a. Minimum Base-Metal Thickness: As indicated on Drawings.

b. Depth: As indicated on Drawings.

4. Hat-Shaped, Rigid Furring Channels: ASTM C645, 7/8 inch deep.

a. Minimum Base-Metal Thickness: As indicated on Drawings.

5. Resilient Furring Channels: 1/2-inch-deep, steel sheet members designed to reduce sound transmission.

a. Configuration: Asymmetrical; 2 inches x 1/2 inch deep with 1-1/4 inches screw flange.

b. Material: Grade 33 ksi min. yield strength; G40; 25 Gauge (0.0179-inch) minimum thickness.

c. Basis-of-Design Manufacturer: RC-1 Pro Resilient Channel (RCUR) by Clark-Dietrich; wwwclarkdietrich.com.

G. Grid Suspension System for Gypsum Board Ceilings: ASTM C645, direct-hung system composed of main beams and cross-furring members that interlock.

1. Approved Manufacturers:

a. Armstrong World Industries, Inc.; www.armstrong.com.

b. Rockfon; www.rockfon.com.

c. USG Corporation; www.usg.com.

2.4 AUXILIARY MATERIALS

A. General: Provide auxiliary materials that comply with referenced installation standards.

1. Fasteners for Metal Framing: Of type, material, size, corrosion resistance, holding power, and other properties required to fasten steel members to substrates.

B. Isolation Strip at Exterior Walls: Provide the following:

1. Foam Gasket: Adhesive-backed, closed-cell vinyl foam strips that allow fastener penetration without foam displacement, 1/8 inch thick, in width to suit steel stud size.

C. Resilient Clips:

1. Description: Molded rubber and galvanized steel sound isolation clips for separating gypsum board from partition framing.
2. Basis-of-Design Product: RSIC-1 by Pac International; www.pac-intl.com.

PART 3 - EXECUTION

3.1 EXAMINATION

A. Examine areas and substrates, with Installer present, and including welded hollow-metal frames, cast-in anchors, and structural framing, for compliance with requirements and other conditions affecting performance of the Work.

B. Proceed with installation only after unsatisfactory conditions have been corrected.

3.2 PREPARATION

A. Suspended Assemblies: Coordinate installation of suspension systems with installation of overhead structure to ensure that inserts and other provisions for anchorages to building structure have been installed to receive hangers at spacing required to support the Work and that hangers will develop their full strength.

1. Furnish concrete inserts and other devices indicated to other trades for installation in advance of time needed for coordination and construction.

3.3 INSTALLATION, GENERAL

A. Installation Standard: ASTM C754.

1. Gypsum Board Assemblies: Also comply with requirements in ASTM C 40 that apply to framing installation.

B. Install framing and accessories plumb, square, and true to line, with connections securely fastened.

C. Install supplementary framing, and blocking to support fixtures, equipment services, heavy trim, grab bars, toilet accessories, furnishings, or similar construction.

D. Install bracing at terminations in assemblies.

E. Do not bridge building control and expansion joints with non-load-bearing steel framing members. Frame both sides of joints independently.

3.4 INSTALLING FRAMED ASSEMBLIES

A. Install framing system components according to spacings indicated, but not greater than spacings required by referenced installation standards for assembly types.

1. Single-Layer Application: 24 inches on center, unless otherwise indicated.
2. Multilayer Application: 24 inches on center, unless otherwise indicated.
3. Tile Backing Panels: 16 inches on center, unless otherwise indicated.

B. Where studs are installed directly against exterior masonry walls or dissimilar metals at exterior walls, install isolation strip between studs and exterior wall.

C. Install studs so flanges within framing system point in same direction.

D. Install tracks (runners) at floors and overhead supports. Extend framing full height to structural supports or substrates above suspended ceilings except where partitions are indicated to terminate at suspended ceilings. Continue framing around ducts that penetrate partitions above ceiling.

1. Slip-Type Head Joints: Where framing extends to overhead structural supports, install to produce joints at tops of framing systems that prevent axial loading of finished assemblies.
2. Door Openings: Screw vertical studs at jambs to jamb anchor clips on door frames; install runner track section (for cripple studs) at head and secure to jamb studs.
    a. Install two studs at each jamb unless otherwise indicated.
    b. Install cripple studs at head adjacent to each jamb stud, with a minimum 1/2-inch clearance from jamb stud to allow for installation of control joint in finished assembly.
    c. Extend jamb studs through suspended ceilings and attach to underside of overhead structure.
3. Other Framed Openings: Frame openings other than door openings the same as required for door openings unless otherwise indicated. Install framing below sills of openings to match framing required above door heads.
4. Fire-Resistance-Rated Partitions: Install framing to comply with fire-resistance-rated assembly indicated and support closures and to make partitions continuous from floor to underside of solid structure.
    a. Firestop Track: Where indicated, install to maintain continuity of fire-resistance-rated assembly indicated.
5. Sound-Rated Partitions: Install framing to comply with sound-rated assembly indicated.

E. Direct Furring:
1. Screw to framing.
2. Attach to concrete or masonry with stub nails, screws designed for masonry attachment, or powder-driven fasteners spaced 24 inches on center.

F. Z-Shaped Furring Members:
1. Erect insulation, specified in Section 07 21 00 "Thermal Insulation," vertically and hold in place with Z-shaped furring members spaced 24 inches on center.
2. Except at exterior corners, securely attach narrow flanges of furring members to wall with concrete stub nails, screws designed for masonry attachment, or powder-driven fasteners spaced 24 inches on center.
3. At exterior corners, attach wide flange of furring members to wall with short flange extending beyond corner; on adjacent wall surface, screw-attach short flange of furring channel to web of attached channel. At interior corners, space second member no more than 12 inches from corner and cut insulation to fit.

G. Resilient Furring Members: Follow the manufacturer’s recommendations for the installation of resilient furring channels.
1. Gypsum panels shall be attached to resilient furring channels using a correct screw length to ensure that no part of the screw makes contact with the framing member.

H. Installation Tolerance: Install each framing member so fastening surfaces vary not more than 1/8 inch from the plane formed by faces of adjacent framing.

3.5 INSTALLING SUSPENSION SYSTEMS

A. Install suspension system components according to spacings indicated, but not greater than spacings required by referenced installation standards for assembly types.
1. Hangers: 48 inches on center.
2. Carrying Channels (Main Runners): 48 inches on center.

3. Furring Channels (Furring Members): 16 inches on center.

B. Isolate suspension systems from building structure where they abut or are penetrated by building structure to prevent transfer of loading imposed by structural movement.

C. Suspend hangers from building structure as follows:

1. Install hangers plumb and free from contact with insulation or other objects within ceiling plenum that are not part of supporting structural or suspension system.

a. Splay hangers only where required to miss obstructions and offset resulting horizontal forces by bracing, countersplaying, or other equally effective means.

2. Where width of ducts and other construction within ceiling plenum produces hanger spacings that interfere with locations of hangers required to support standard suspension system members, install supplemental suspension members and hangers in the form of trapezes or equivalent devices.

a. Size supplemental suspension members and hangers to support ceiling loads within performance limits established by referenced installation standards.

3. Wire Hangers: Secure by looping and wire tying, either directly to structures or to inserts, eye screws, or other devices and fasteners that are secure and appropriate for substrate, and in a manner that will not cause hangers to deteriorate or otherwise fail.

4. Flat Hangers: Secure to structure, including intermediate framing members, by attaching to inserts, eye screws, or other devices and fasteners that are secure and appropriate for structure and hanger, and in a manner that will not cause hangers to deteriorate or otherwise fail.

5. Do not attach hangers to permanent metal forms. Furnish cast-in-place hanger inserts that extend through forms.

6. Do not connect or suspend steel framing from ducts, pipes, or conduit.

D. Seismic Bracing: Sway-brace suspension systems with hangers used for support.

E. Grid Suspension Systems: Attach perimeter wall track or angle where grid suspension systems meet vertical surfaces. Mechanically join main beam and cross-furring members to each other and butt-cut to fit into wall track.

F. Installation Tolerances: Install suspension systems that are level to within 1/8 inch in 12 feet measured lengthwise on each member that will receive finishes and transversely between parallel members that will receive finishes.

END OF SECTION

SECTION 09 29 00 - GYPSUM BOARD

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

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

1.2 SUMMARY

A. Section Includes:

1. Interior gypsum board.
2. Sound-absorbing panel.
3. Acoustic insulation.
4. Acoustical sealants.
5. Acoustical wall closure at window system mullions.

B. Related Requirements:

1. Section 06 10 00 "Rough Carpentry" for framing substrate for gypsum board and plywood sheathing for exterior walls.
2. Section 09 22 16 "Non-Structural Metal Framing" for non-structural steel framing and suspension systems that support gypsum board panels.

1.3 SUBMITTALS

A. Product Data: For each type of product.

B. Samples: For the following products:

1. Trim Accessories: Full-size Sample in 12-inch-long length for each trim accessory indicated.

1.4 DELIVERY, STORAGE AND HANDLING

A. Store materials inside under cover and keep them dry and protected against weather, condensation, direct sunlight, construction traffic, and other potential causes of damage. Stack panels flat and supported on risers on a flat platform to prevent sagging.

1.5 FIELD CONDITIONS

A. Environmental Limitations: Comply with ASTM C840 requirements or gypsum board manufacturer's written instructions, whichever are more stringent.

B. Do not install paper-faced gypsum panels until installation areas are enclosed and conditioned.

C. Do not install panels that are wet, moisture damaged, and mold damaged.

1. Indications that panels are wet or moisture damaged include, but are not limited to, discoloration, sagging, or irregular shape.
2. Indications that panels are mold damaged include, but are not limited to, fuzzy or splotchy surface contamination and discoloration.

PART 2 - PRODUCTS

2.1 PERFORMANCE REQUIREMENTS

A. STC-Rated Assemblies: For STC-rated assemblies, provide materials and construction identical to those tested in assembly indicated according to ASTM E90 and classified according to ASTM E413 by an independent testing agency.

2.2 GYPSUM BOARD, GENERAL

A. Size: Provide maximum lengths and widths available that will minimize joints in each area and that correspond with support system indicated.

2.3 MANUFACTURERS

A. Approved Manufacturers:

1. CertainTeed Corp.; www.certainteed.com.
2. Custom Building Products; www.custombuildingproducts.com.
3. Georgia-Pacific Building Products; www.buildgp.com.
4. James Hardie Building Products, Inc.; www.jameshardie.com.
5. National Gypsum Co.; www.nationalgypsum.com.
6. PABCO Gypsum; www.pabcogypsum.com.
7. USG Corp.; www.usg.com.

2.4 INTERIOR GYPSUM BOARD

A. Gypsum Wallboard: ASTM C1396/C1396M.

1. Thickness: 1/2 and 5/8 inch, as indicated.
2. Long Edges: Tapered.

B. Gypsum Ceiling Board: ASTM C1396/C1396M.

1. Thickness: 1/2 inch.
2. Long Edges: Tapered.

C. Mold-Resistant Gypsum Board, GBD-MR: ASTM C1396/C1396M. With moisture- and mold-resistant core and paper surfaces.

1. Core: As indicated 5/8 inch, Type X.
2. Long Edges: Tapered.
3. Mold Resistance: ASTM D3273, score of 10 as rated according to ASTM D3274.

D. Sound-Absorbing Panel:

1. Basis-of-Design Product: Acoustibuilt Ceiling System by Armstrong; www.armstrongceilings.com.
    a. Surface Texture: Fine.
    b. Composition: Mineral Fiber.
    c. Color: White.
    d. Size: 48 in x 72 in x 7/8 in.
    e. Edge Profile: Tapered edges four sides.

f. Noise Reduction Coefficient (NRC): ASTM C423; Panel 0.80 (UL).

g. Flame Spread: ASTM E1264; Class A

2.5 TRIM ACCESSORIES

A. Plastic Trim: 1-3/8 inch radiused standard corner beads.

1. Basis-of-Design Product: Rigid Low-Profile, 90º Outside, 1-3/8-inch Mud Flange by Trim-Tex, Inc.; www.trim-tex.com.

a. Or approved equal.

2. Application: All outside corners, as indicated.

B. Aluminum Trim: Extruded accessories of profiles and dimensions indicated.

1. Aluminum: Alloy and temper with not less than the strength and durability properties of ASTM B221, Alloy 6063-T5.

2. Profiles: MB1: No. DRMB-50-400 Reveal Molding by Fry Reglet.

a. Finish: Powder-coat finish; AAMA 2603 except with a minimum dry film thickness of 1.5 mils. Comply with coating manufacturer's written instructions for cleaning, conversion coating, and applying and baking finish.

b. Color: As selected by Architect.

C. Acoustical Wall Closure: Partition closure at window systems; where indicated.

1. Basis-of-Design Product: Mullion Mate by Gordon Interior Specialties Division, Gordon Inc.; www.gordoninteriors.com.

2. General: Provide finishes free from surface blemishes.

3. Finish: As selected by Architect.

a. Powder Coat: Match adjacent window system. Refer to Section 08 41 13 “Aluminum-Framed Entrances and Storefronts”.

2.6 JOINT TREATMENT MATERIALS

A. General: Comply with ASTM C475/C475M.

B. Joint Tape:

1. Interior Gypsum Board: Paper.

C. Joint Compound for Interior Gypsum Board: For each coat, use formulation that is compatible with other compounds applied on previous or for successive coats.

1. Prefilling: At open joints, rounded or beveled panel edges, and damaged surface areas, use setting-type taping compound.

2. Embedding and First Coat: For embedding tape and first coat on joints, fasteners, and trim flanges, use setting-type taping compound.

a. Use setting-type compound for installing paper-faced metal trim accessories.

3. Fill Coat: For second coat, use drying-type, all-purpose compound.

4. Finish Coat: For third coat, use drying-type, all-purpose compound.

5. Skim Coat: For final coat of Level 5 finish, use drying-type, all-purpose compound.

2.7 AUXILIARY MATERIALS

A. General: Provide auxiliary materials that comply with referenced installation standards and manufacturer's written instructions.

B. Laminating Adhesive: Adhesive or joint compound recommended for directly adhering gypsum panels to continuous substrate.

1. Adhesives shall have a VOC content of 50 g/L or less.

2. Adhesive shall comply with the testing and product requirements of the California Department of Public Health's "Standard Method for the Testing and Evaluation of Volatile Organic Chemical Emissions from Indoor Sources Using Environmental Chambers."

C. Steel Drill Screws: ASTM C1002 unless otherwise indicated.

1. Use screws complying with ASTM C954 for fastening panels to steel members from 0.033 to 0.112 inch thick.

2. For fastening cementitious backer units, use screws of type and size recommended by panel manufacturer.

D. Putty Pad Sealant: At acoustic rated partitions and fire-rated partitions in order to provide noise transmission resistance and fire resistance at electrical boxes and other penetrations.

1. Approved Products:

a. Fire Barrier Moldable Putty Pads MPP+ by 3M; www.3m.com.

b. Firestop Putty Pad by Acoustical Solutions; www.acousticalolutionss.com.

c. CP 617 Firestop Putty Pad by Hilti North America; www.hilti.com.

d. Fire-Rated Putty Pads by Metacaulk; www.metacaulk.com.

E. Sound-Attenuation Blankets: ASTM C665, Type I (blankets without membrane facing) produced by combining thermosetting resins with mineral fibers manufactured from glass, slag wool, or rock wool.

1. Fire-Resistance-Rated Assemblies: Comply with mineral-fiber requirements of assembly.

2. Basis-of-Design Product: QuietZone Acoustic Batts with PureFiber Technology by Owens Corning; www.owenscorning.com.

a. Thickness: As required to fill stud cavity in friction-fit application.

F. Acoustical Sealant, ACOUSTICAL SEALANT: Manufacturer's standard nonsag, paintable, nonstaining latex sealant complying with ASTM C834. Product effectively reduces airborne sound transmission through perimeter joints and openings in building construction as demonstrated by testing representative assemblies according to ASTM E90.

1. Basis-of-Design Product: Quiet Seal Pro by Quiet Rock; www.quietrock.com.

2. Other Approved Manufacturers:

a. Accumetric, LLC; www.accumetricinc.com.

b. Franklin International; www.franklininternational.com.

c. Grabber Construction Products, Inc.; www.grabberman.com.

d. Hilti Corp.; www.hilti.com.

e. Pecora Corp.; www.pecora.com.

f. Specified Technologies, Inc.; www.stifirestop.com.

2.8 TEXTURE FINISHES

A. Primer: As recommended by textured finish manufacturer.

B. Non-Aggregate Finish: Premixed, vinyl texture finish for spray application.

1. Texture: Smooth.

PART 3 - EXECUTION

3.1 EXAMINATION

A. Examine areas and substrates including welded hollow-metal frames and support framing, with Installer present, for compliance with requirements and other conditions affecting performance of the Work.

B. Examine panels before installation. Reject panels that are wet, moisture damaged, and mold damaged.

C. Proceed with installation only after unsatisfactory conditions have been corrected.

3.2 APPLYING AND FINISHING PANELS, GENERAL

A. Comply with ASTM C840.

B. Install ceiling panels across framing to minimize the number of abutting end joints and to avoid abutting end joints in central area of each ceiling. Stagger abutting end joints of adjacent panels not less than one framing member.

C. Install panels with face side out. Butt panels together for a light contact at edges and ends with not more than 1/16 inch of open space between panels. Do not force into place.

D. Locate edge and end joints over supports, except in ceiling applications where intermediate supports or gypsum board back-blocking is provided behind end joints. Do not place tapered edges against cut edges or ends. Stagger vertical joints on opposite sides of partitions. Do not make joints other than control joints at corners of framed openings.

E. Form control and expansion joints with space between edges of adjoining gypsum panels.

F. Cover both faces of support framing with gypsum panels in concealed spaces (above ceilings, etc.), except in chases braced internally.

1. Unless concealed application is indicated or required for sound, fire, air, or smoke ratings, coverage may be accomplished with scraps of not less than 8 sq. ft. in area.

2. Fit gypsum panels around ducts, pipes, and conduits.

3. Where partitions intersect structural members projecting below underside of floor/roof slabs and decks, cut gypsum panels to fit profile formed by structural members; allow 1/4- to 3/8-inch-wide joints to install sealant.

G. Isolate perimeter of gypsum board applied to non-load-bearing partitions at structural abutments. Provide 1/4- to 1/2-inch-wide spaces at these locations and trim edges with edge trim where edges of panels are exposed. Seal joints between edges and abutting structural surfaces with acoustical sealant.

H. Attachment to Steel Framing: Attach panels so leading edge or end of each panel is attached to open (unsupported) edges of stud flanges first.

I. STC-Rated Assemblies: Seal construction at perimeters, behind control joints, and at openings and penetrations with a continuous bead of acoustical sealant. Install acoustical sealant at both faces of partitions at perimeters and through penetrations. Comply with ASTM C919 and with manufacturer's written instructions for locating edge trim and closing off sound-flanking paths around or through assemblies, including sealing partitions above acoustical ceilings.

J. Install sound attenuation blankets before installing gypsum panels unless blankets are readily installed after panels have been installed on one side.

3.3 APPLYING INTERIOR GYPSUM BOARD

A. Install interior gypsum board in the following locations:

1. Type X: As indicated on Drawings Where required for fire-resistance-rated assembly.
2. Ceiling Type: Ceiling surfaces.
3. Mold-Resistant Type: Provide in lieu of regular gypsum board at all backsplash and surrounding areas of sinks, lavatories, drinking fountains, and mop sinks, to a distance of not less than 18 inches from edge of sinks, lavatories, drinking fountains, and mop sink, to a distance not less than 18 inches from edge of sinks, lavatories and map sinks.
4. Sound-Absorbing Panel, AC-1: As indicated on Drawings.

B. Single-Layer Application:

1. On ceilings, apply gypsum panels before wall/partition board application to greatest extent possible and at right angles to framing unless otherwise indicated.
2. On partitions/walls, apply gypsum panels horizontally (perpendicular to framing) unless otherwise indicated or required by fire-resistance-rated assembly, and minimize end joints.
    a. Stagger abutting end joints not less than one framing member in alternate courses of panels.
    b. At stairwells and other high walls, install panels horizontally unless otherwise indicated or required by fire-resistance-rated assembly.
3. On Z-shaped furring members, apply gypsum panels vertically (parallel to framing) with no end joints. Locate edge joints over furring members.
4. Fastening Methods: Apply gypsum panels to supports with steel drill screws.

C. Multilayer Application:

1. On ceilings, apply gypsum board indicated for base layers before applying base layers on walls/partitions; apply face layers in same sequence. Apply base layers at right angles to framing members and offset face-layer joints one framing member, 16 inches minimum, from parallel base-layer joints, unless otherwise indicated or required by fire-resistance-rated assembly.
2. On partitions/walls, apply gypsum board indicated for base layers and face layers vertically (parallel to framing) with joints of base layers located over stud or furring member and face-layer joints offset at least one stud or furring member with base-layer joints unless otherwise indicated or required by fire-resistance-rated assembly. Stagger joints on opposite sides of partitions.
3. On Z-shaped furring members, apply base layer vertically (parallel to framing) and face layer either vertically (parallel to framing) or horizontally (perpendicular to framing) with vertical joints offset at least one furring member. Locate edge joints of base layer over furring members.
4. Fastening Methods: Fasten base layers with screws; fasten face layers with adhesive and supplementary fasteners.

D. Laminating to Substrate: Where gypsum panels are indicated as directly adhered to a substrate (other than studs, joists, furring members, or base layer of gypsum board), comply with gypsum board manufacturer's written instructions and temporarily brace or fasten gypsum panels until fastening adhesive has set.

3.4 INSTALLING TRIM ACCESSORIES

A. General: For trim with back flanges intended for fasteners, attach to framing with same fasteners used for panels. Otherwise, attach trim according to manufacturer's written instructions.

B. Control Joints: Install control joints according to ASTM C840 and in specific locations approved by Architect for visual effect.

C. Interior Trim: Install in the following locations:

1. Cornerbead: Use at outside corners, unless otherwise indicated.

2. LC-Bead: Use at exposed panel edges.

3. L-Bead: Use where indicated.

D. Aluminum Trim: Install in locations indicated on Drawings.

3.5 FINISHING GYPSUM BOARD

A. General: Treat gypsum board joints, interior angles, edge trim, control joints, penetrations, fastener heads, surface defects, and elsewhere as required to prepare gypsum board surfaces for decoration. Promptly remove residual joint compound from adjacent surfaces.

B. Prefill open joints, rounded or beveled edges, and damaged surface areas.

C. Apply joint tape over gypsum board joints, except for trim products specifically indicated as not intended to receive tape.

D. Gypsum Board Finish Levels: Finish panels to levels indicated below and according to ASTM C840:

1. Level 1: Ceiling plenum areas, concealed areas, and where indicated.

2. Level 2: Panels that are substrate for acoustical tile where indicated on Drawings.

3. Level 3: Where indicated on Drawings.

4. Level 4: At panel surfaces that will be exposed to view unless otherwise indicated.

a. Primer and its application to surfaces are specified in Section 09 91 00 "Painting."

E. Cementitious Backer Units: Finish according to manufacturer's written instructions.

F. Sound-Absorbing Panel, AC-1: Finish using standard gypsum board finishing methods to Level 4 finish, or as recommended by manufacturer.

3.6 PROTECTION

A. Protect adjacent surfaces from drywall compound and promptly remove from floors and other non-drywall surfaces. Repair surfaces stained, marred, or otherwise damaged during drywall application.

B. Protect installed products from damage from weather, condensation, direct sunlight, construction, and other causes during remainder of the construction period.

C. Remove and replace panels that are wet, moisture damaged, and mold damaged.

1. Indications that panels are wet or moisture damaged include, but are not limited to, discoloration, sagging, or irregular shape.

2. Indications that panels are mold damaged include, but are not limited to, fuzzy or splotchy surface contamination and discoloration.

END OF SECTION

SECTION 09 30 00 - TILING

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

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

1.2 SUMMARY

A. Section Includes:

1. Interior wall tile (TL-1).
2. Interior wall tile base (TB-1).
3. Grout (TG-1).

B. Related Requirements:

1. Section 01 81 13 “Sustainability Requirements”.
2. Section 07 92 00 "Joint Sealants" for sealing of expansion, contraction, control, and isolation joints in tile surfaces.
3. Section 09 29 00 "Gypsum Board" for cementitious backer units.

1.3 DEFINITIONS

A. General: Definitions in the ANSI A108 series of tile installation standards and in ANSI A137.1 apply to Work of this Section unless otherwise specified.

B. ANSI A108 Series: ANSI A108.01, ANSI A108.02, ANSI A108.1A, ANSI A108.1B, ANSI A108.1C, ANSI A108.4, ANSI A108.5, ANSI A108.6, ANSI A108.8, ANSI A108.9, ANSI A108.10, ANSI A108.11, ANSI A108.12, ANSI A108.13, ANSI A108.14, ANSI A108.15, ANSI A108.16, and ANSI A108.17, which are contained in its "Specifications for Installation of Ceramic Tile."

C. Module Size: Actual tile size plus joint width indicated.

D. Face Size: Actual tile size, excluding spacer lugs.

1.4 PREINSTALLATION MEETINGS

A. Preinstallation Conference: Conduct conference at Project site.

1. Review requirements in ANSI A108.01 for substrates and for preparation by other trades.

1.5 SUBMITTALS

A. Product Data: For each type of product.

B. Sustainable Design Submittals: Refer to Section 01 81 13 “Sustainability Requirements”.

C. Samples for Initial Selection: For tile, grout, and accessories involving color selection.

D. Samples for Verification:

1. Full-size units of each type and composition of tile and for each color and finish required. For ceramic mosaic tile in color blend patterns, provide full sheets of each color blend.

2. Assembled samples mounted on a rigid panel, with grouted joints, for each type and composition of tile and for each color and finish required. Make samples at least 12 inches square, but not fewer than four tiles. Use grout of type and in color or colors approved for completed Work.
3. Full-size units of each type of trim and accessory for each color and finish required.
4. Stone thresholds in 6-inch lengths.
5. Metal edge strips in 6-inch lengths.

1.6 MAINTENANCE MATERIAL SUBMITTALS

A. Furnish extra materials that match and are from same production runs as products installed and that are packaged with protective covering for storage and identified with labels describing contents.
1. Tile and Trim Units: Furnish quantity of full-size units equal to 3 percent of amount installed for each type, composition, color, pattern, and size indicated.
2. Grout: Furnish quantity of grout equal to 3 percent of amount installed for each type, composition, and color indicated.

1.7 QUALITY ASSURANCE

A. Installer Qualifications:
1. Installer is a five-star member of the National Tile Contractors Association or a Trowel of Excellence member of the Tile Contractors' Association of America.
2. Installer's supervisor for Project holds the International Masonry Institute's Foreman Certification.
3. Installer employs Ceramic Tile Education Foundation Certified Installers or installers recognized by the U.S. Department of Labor as Journeyman Tile Layers.

1.8 DELIVERY, STORAGE, AND HANDLING

A. Deliver and store packaged materials in original containers with seals unbroken and labels intact until time of use. Comply with requirements in ANSI A137.1 for labeling tile packages.
B. Store tile and cementitious materials on elevated platforms, under cover, and in a dry location.
C. Store aggregates where grading and other required characteristics can be maintained and contamination can be avoided.
D. Store liquid materials in unopened containers and protected from freezing.

1.9 FIELD CONDITIONS

A. Environmental Limitations: Do not install tile until construction in spaces is complete and ambient temperature and humidity conditions are maintained at the levels indicated in referenced standards and manufacturer's written instructions.

PART 2 - PRODUCTS

2.1 MANUFACTURERS

A. Source Limitations for Products: Obtain each of the following products specified in this Section from a single manufacturer:

2.2 PRODUCTS, GENERAL

A. ANSI Ceramic Tile Standard: Provide tile that complies with ANSI A137.1 for types, compositions, and other characteristics indicated.

1. Provide tile complying with Standard grade requirements unless otherwise indicated.

B. ANSI Standards for Tile Installation Materials: Provide materials complying with ANSI A108.02, ANSI standards referenced in other Part 2 articles, ANSI standards referenced by TCNA installation methods specified in tile installation schedules, and other requirements specified.

C. Factory Blending: For tile exhibiting color variations within ranges, blend tile in factory and package so tile units taken from one package show same range in colors as those taken from other packages and match approved Samples.

D. Mounting: For factory-mounted tile, provide back- or edge-mounted tile assemblies as standard with manufacturer unless otherwise indicated.

E. Adhesives, Grouts and Sealants: Comply with low/ no VOC requirements in Section 01 81 13 “Sustainability Requirements”.

2.3 TILE PRODUCTS

A. Interior Wall Tile, TL-1:

1. Basis-of-Design Product: Color By Numbers, product no. WT02.10408G by Crossville, Inc.; www.crossvilleinc.com.

a. Color: "Tea For Two".

b. Finish: Gloss.

c. Size: 4 x 8 inch.

d. Grout Color: As selected by Architect.

e. Grout Width: As selected by Architect.

f. Install Pattern: As selected by Architect.

g. Cove Base and Bullnose: as selected by Architect

2. Application: Restrooms, or as indicated in Drawings.

2.4 TILE BACKING PANELS

A. Refer to Section 09 29 00 "Gypsum Board" for interior applications.

2.5 SETTING MATERIALS

A. Modified Dry-Set Mortar (Thinset): ANSI A118.4.

1. For wall applications, provide mortar that complies with requirements for nonsagging mortar in addition to the other requirements in ANSI A118.4.

B. Improved Modified Dry-Set Mortar (Thinset): ANSI A118.15.

1. For wall applications, provide mortar that complies with requirements for nonsagging mortar in addition to the other requirements in ANSI A118.15.

2.6 GROUT MATERIALS

A. Sand-Portland Cement Grout: ANSI A108.10, consisting of white or gray cement and white or colored aggregate as required to produce color indicated.

B. Standard Cement Grout: ANSI A118.6.

C. High-Performance Tile Grout: ANSI A118.7.

D. Basis-of-Design Manufacturer: Laticrete International, Inc.; www.laticrete.com.

1. Colors:

a. TG-1: By Architect

2. Applications:

a. TG-1: At tile TL-1, or as indicated in Drawings.

2.7 MISCELLANEOUS MATERIALS

A. Trowelable Underlayments and Patching Compounds: Latex-modified, portland cement-based formulation provided or approved by manufacturer of tile-setting materials for installations indicated.

B. Vapor-Retarder Membrane:

1. At Restrooms: Polyethylene sheeting, ASTM D4397, 10.0 mils thick, unless otherwise indicated.

C. Tile Cleaner: A neutral cleaner capable of removing soil and residue without harming tile and grout surfaces, specifically approved for materials and installations indicated by tile and grout manufacturers.

2.8 MIXING MORTARS AND GROUT

A. Mix mortars and grouts to comply with referenced standards and mortar and grout manufacturers' written instructions.

B. Add materials, water, and additives in accurate proportions.

C. Obtain and use type of mixing equipment, mixer speeds, mixing containers, mixing time, and other procedures to produce mortars and grouts of uniform quality with optimum performance characteristics for installations indicated.

PART 3 - EXECUTION

3.1 EXAMINATION

A. Examine substrates, areas, and conditions where tile will be installed, with Installer present, for compliance with requirements for installation tolerances and other conditions affecting performance of the Work.

1. Verify that substrates for setting tile are firm; dry; clean; free of coatings that are incompatible with tile-setting materials, including curing compounds and other substances that contain soap, wax, oil, or silicone; and comply with flatness tolerances required by ANSI A108.01 for installations indicated.

2. Verify that installation of grounds, anchors, recessed frames, electrical and mechanical units of work, and similar items located in or behind tile has been completed.

3. Verify that joints and cracks in tile substrates are coordinated with tile joint locations; if not coordinated, adjust joint locations in consultation with Architect.

B. Proceed with installation only after unsatisfactory conditions have been corrected.

3.2 PREPARATION

A. Where indicated, prepare substrates to receive waterproofing by applying a reinforced mortar bed that complies with ANSI A108.1A and is sloped 1/4 inch per foot toward drains.

B. Blending: For tile exhibiting color variations, verify that tile has been factory blended and packaged so tile units taken from one package show same range of colors as those taken from other packages and match approved Samples. If not factory blended, either return to manufacturer or blend tiles at Project site before installing.

3.3 CERAMIC TILE INSTALLATION

A. Comply with TCNA's "Handbook for Ceramic, Glass, and Stone Tile Installation" for TCNA installation methods specified in tile installation schedules. Comply with parts of the ANSI A108 series "Specifications for Installation of Ceramic Tile" that are referenced in TCNA installation methods, specified in tile installation schedules, and apply to types of setting and grouting materials used.

B. Extend tile work into recesses and under or behind equipment and fixtures to form complete covering without interruptions unless otherwise indicated. Terminate work neatly at obstructions, edges, and corners without disrupting pattern or joint alignments.

C. Accurately form intersections and returns. Perform cutting and drilling of tile without marring visible surfaces. Carefully grind cut edges of tile abutting trim, finish, or built-in items for straight aligned joints. Fit tile closely to electrical outlets, piping, fixtures, and other penetrations so plates, collars, or covers overlap tile.

D. Provide manufacturer's standard trim shapes where necessary to eliminate exposed tile edges.

E. Where accent tile differs in thickness from field tile, vary setting-bed thickness so that tiles are flush.

F. Jointing Pattern: Lay tile in grid pattern unless otherwise indicated. Lay out tile work and center tile fields in both directions in each space or on each wall area. Lay out tile work to minimize the use of pieces that are less than half of a tile. Provide uniform joint widths unless otherwise indicated.

1. For tile mounted in sheets, make joints between tile sheets same width as joints within tile sheets so joints between sheets are not apparent in finished work.

2. Where adjoining tiles on floor, base, walls, or trim are specified or indicated to be same size, align joints.

3. Where tiles are specified or indicated to be whole integer multiples of adjoining tiles on floor, base, walls, or trim, align joints unless otherwise indicated.

G. Joint Widths: Unless otherwise indicated, install tile with the following joint widths:

1. Ceramic Mosaic Tile: As selected by Architect.

2. Glazed Wall Tile: As selected by Architect.

3. Porcelain Tile: As selected by Architect.

H. Lay out tile wainscots to dimensions indicated or to next full tile beyond dimensions indicated.

I. Expansion Joints: Provide expansion joints and other sealant-filled joints, including control, contraction, and isolation joints, where indicated. Form joints during installation of setting materials, mortar beds, and tile. Do not saw-cut joints after installing tiles.

1. Where joints occur in concrete substrates, locate joints in tile surfaces directly above them.

J. Stone Thresholds: Install stone thresholds in same type of setting bed as adjacent floor unless otherwise indicated.

K. Metal Edge Strips: Install [at locations indicated] [where exposed edge of tile flooring meets carpet, wood, or other flooring that finishes flush with top of tile] [where exposed edge of tile flooring meets carpet, wood, or other flooring that finishes flush with or below top of tile and no threshold is indicated].

L. Floor Sealer: Apply floor sealer to cementitious grout joints in tile floors according to floor-sealer manufacturer's written instructions. As soon as floor sealer has penetrated grout joints, remove excess sealer and sealer from tile faces by wiping with soft cloth.

3.4 ADJUSTING AND CLEANING

A. Remove and replace tile that is damaged or that does not match adjoining tile. Provide new matching units, installed as specified and in a manner to eliminate evidence of replacement.

B. Cleaning: On completion of placement and grouting, clean all ceramic tile surfaces so they are free of foreign matter.

1. Remove grout residue from tile as soon as possible.

2. Clean grout smears and haze from tile according to tile and grout manufacturer's written instructions but no sooner than 10 days after installation. Use only cleaners recommended by tile and grout manufacturers and only after determining that cleaners are safe to use by testing on samples of tile and other surfaces to be cleaned. Protect metal surfaces and plumbing fixtures from effects of cleaning. Flush surfaces with clean water before and after cleaning.

3.5 PROTECTION

A. Protect installed tile work with kraft paper or other heavy covering during construction period to prevent staining, damage, and wear. If recommended by tile manufacturer, apply coat of neutral protective cleaner to completed tile walls and floors.

B. Before final inspection, remove protective coverings and rinse neutral protective cleaner from tile surfaces.

END OF SECTION

SECTION 09 51 13 - ACOUSTICAL PANEL CEILINGS

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

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

1.2 SUMMARY

A. Section Includes:

1. Acoustical ceilings (ACT-1 and ACT-2).
2. Suspension systems.
3. Trim and accessories.
4. Seismic restraints for suspended ceiling systems.
5. Delegated design.

B. Related Requirements:

1. Section 01 61 16 “Delegated Design Requirements”.
2. Section 01 81 13 “Sustainability Requirements”.
3. Division 21 “Fire Suppression” Sections for fire sprinkler work to be coordinated with ceiling.
4. Division 23 “HVAC” Sections for ducts, diffusers and other mechanical work to be coordinated with ceiling.
5. Division 26 “Electrical” Sections for lighting work to be coordinated with ceiling.
6. Division 28 “Electrical Safety and Security” Sections for fire alarm work to be coordinated with ceiling.

1.3 SUBMITTALS

A. 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.

B. Sustainable Design Submittals: Refer to Section 01 81 13 “Sustainability Requirements”.

C. Coordinate Drawings: Reflected ceiling plans drawn to scale and coordinating penetrations and ceiling-mounted items. Show the following:

1. Ceiling suspension members.
2. Method of attaching hangers to building structure.
3. Ceiling-mounted items including but not limited to lighting fixtures, diffusers, grilles, speakers, sprinklers, access panels, and special moldings.
4. Edge and transition details to Work not in this section.
5. Minimum Drawing Scale: 1/8 inch = 1 foot.

D. Delegated-Design Submittal: For ceilings indicated to comply with performance requirements and design criteria, including analysis data signed and sealed by the qualified professional engineer responsible for their preparation.

E. Qualification Data: For professional engineer.

F. Samples for Verification: For each component indicated and for each exposed finish required, prepared on Samples of size indicated below.

1. Acoustical Ceiling: Set of 6-inch- (150-mm-) square samples of each type, color, pattern, and texture.

2. Exposed Suspension System Members, Moldings, and Trim: Set of 12 inch (300 mm) long Samples of each type, finish, and color.

3. Clips: Full-size of each type required.

G. Maintenance Data: For finishes to include in maintenance manuals.

1.4 MAINTENANCE MATERIAL SUBMITTALS

A. Furnish extra materials that match products installed and that are packaged with protective covering for storage and identified with labels describing contents. Confirm with Owner prior to purchasing.

1. Acoustical Tile Ceilings: Full-size panels equal to 2 percent of quantity of each type installed, but no less than 100 sf.

2. Suspension-System Components: Quantity of each exposed component equal to 2 percent of quantity installed, but no less than 100 sf.

3. Hold-Down Clips: Equal to 2 percent of quantity installed, but no less than quantity required for 100 sf.

4. Impact Clips: Equal to 2 percent of quantity installed, but no less than quantity required for 100 sf.

1.5 QUALITY ASSURANCE

A. Acoustical Testing Agency Qualifications: An independent testing laboratory, or an NVLAP-accredited laboratory, with the experience and capability to conduct the testing indicated. NVLAP-accredited laboratories must document accreditation, based on a "Certificate of Accreditation" and a "Scope of Accreditation" listing the test methods specified.

B. Source Limitations:

1. Acoustical Ceiling: Obtain each type through one source from a single manufacturer.

2. Suspension System: Obtain each type through one source from a single manufacturer.

C. Pre-installation Conference: Conduct conference at Project site.

1.6 DELIVERY, STORAGE, AND HANDLING

A. Deliver acoustical panels, suspension system components, and accessories to Project site in original, unopened packages and store them in a fully enclosed, conditioned space where they will be protected against damage from moisture, humidity, temperature extremes, direct sunlight, surface contamination, and other causes.

B. Before installing acoustical panels, permit them to reach room temperature and a stabilized moisture content.

C. Handle acoustical panels carefully to avoid chipping edges or damaging units in any way.

1.7 PROJECT CONDITIONS

A. Environmental Limitations: Do not install acoustical panel ceilings until spaces are enclosed and weatherproof, wet work in spaces is complete and dry, work above ceilings is complete, and ambient temperature and humidity conditions are maintained at the levels indicated for Project when occupied for its intended use.

1.8 COORDINATION

A. Coordinate layout and installation of acoustical ceilings and suspension system with other construction that penetrates ceilings or is supported by them, including light fixtures, HVAC equipment, fire-suppression system, and partition assemblies.

PART 2 - PRODUCTS

2.1 PERFORMANCE REQUIREMENTS

A. Delegated Design: Engage a qualified professional engineer, as defined in Section 01 61 16 “Delegated Design Requirements," to design seismic restraints for ceiling systems attachment and spans.

1. Panel Deflection: 1/240, with acoustic insulation.

B. Seismic Standard: Suspended ceilings shall withstand the effects of earthquake motions determined according to ASCE/SEI 7.

1. Risk Category: As indicated on Drawings.

C. Product Standards: Comply with the following:

1. ASTM C635/C635M, “Standard Practice for Installation of Metal Ceiling Suspension Systems for Acoustical Tile and Lay-in Panels”.

2. ASTM C636/C636M, “Standard Specification for the Manufacture, Performance, and Testing of Metal Suspension Systems for Acoustical Tile and Lay-in Panel Ceilings”.

3. ASTM E580/E580M, “Standard Practice for Installation of Ceiling Suspension Systems for Acoustical Tile and Lay-in Panels in Areas Subject to Earthquake Ground Motions”.

4. Acoustical Standard: Provide manufacturer's standard panels of configuration indicated that comply with classifications as designated by types, patterns, acoustical ratings, and light reflectance, unless otherwise indicated. Comply with one of the following standards:

a. ASTM E 1264 "Standard Classification for Acoustical Ceiling Products."

1) Mounting Method for Measuring NRC: Type E-400; plenum mounting in which face of test specimen is 400 mm away from test surface per ASTM E 795 "Standard Practice for Mounting Test Specimens During Sound Absorption Tests."

2) Match appearance characteristics, including color and patterns of named product.

5. Coating-Based Antimicrobial Treatment: Provide acoustical panels with face and back surfaces coated with antimicrobial treatment consisting of manufacturer's standard formulation with fungicide added to inhibit growth of mold and mildew and showing no mold or mildew growth when tested according to one of the following standards:

a. ASTM D 3273 "Standard Test Method for Resistance to Growth of Mold on the Surface of Interior Coatings in an Environmental Chamber."

D. Fire-Test-Response Characteristics: Provide acoustical ceilings that comply with the following requirements:

1. Fire-Resistance Characteristics: Where indicated, provide acoustical tile ceilings identical to those of assemblies tested for fire resistance according to one of the following standards, or another testing and inspecting agency acceptable to authorities having jurisdiction:

a. ASTM E119 "Test Methods for Fire Tests of Building Construction and Materials."

b. Underwriters Laboratory (UL) "Fire Resistance Directory."

c. ISO 834, Parts 1, 3-9, “Fire Resistance Tests: Elements of Building Construction",

2. Identify materials with appropriate markings of applicable testing and inspecting agency.

3. Surface-Burning Characteristics: Provide acoustical panels with the following surface-burning characteristics complying with one of the following:

a. ASTM E1264 "Standard Classification for Acoustical Ceiling Products" for Class A materials as determined by testing identical products per ASTM E84 "Standard Test Method for Surface Burning Characteristics of Building Materials":

1) Flame Spread Index: 25 or less.

2) Smoke-Developed Index: 450 or less.

2.2 MANUFACTURERS

A. Basis-of-Design Manufacturer: Armstrong Ceiling and Wall Solutions; www.armstrongceilings.com.

2.3 ACOUSTICAL CEILING PANELS

A. Acoustical Tile, ACT-1:

1. Basis-of-Design Product: Kitchen Zone by Armstrong.

a. Color: White.

b. Size: 24 x 48 inches.

c. Thickness: 5/8 inch.

d. Edge: 15/16 inch, Square Lay-in.

e. CAC: 33.

f. Light Reflectance: 0.88.

2. Application: as indicated in Drawings.

B. Acoustical Tile, ACT-2:

1. Basis-of-Design Product: PRISM FACET / DCT86-wm-D by From Plain To Beautiful In Hours

a. Color: White Matte.

b. Size: 24 x 24 inches.

c. Thickness: 5/8 inch.

d. Edge: 15/16 inch, square lay-in.

e. CAC: 35.

f. Light Reflectance: 0.89.

2. Application: Bar, or as indicated in Drawings.

2.4 METAL SUSPENSION SYSTEMS, GENERAL

A. Basis-of-Design Suspension Systems: Prelude XL 15/16 in. Exposed Tee by Armstrong.

1. Accessories: Transition molding to match suspension system finish.

B. General: Provide manufacturer’s suspension indicated; compliant with requirements herein.

C. Metal Suspension System Standard: Provide manufacturer's system indicated, direct-hung metal suspension systems of types, structural classifications, and finishes indicated that comply with applicable requirements of the following standards:

1. ASTM C 635 "Standard Specification for the Manufacture, Performance and Testing of Metal Suspension Systems for Acoustical Tile and Lay-In Panel Ceilings."

D. Finishes and Colors, General: Comply with NAAMM's "Metal Finishes Manual for Architectural and Metal Products" for recommendations for applying and designating finishes. Provide manufacturer's standard factory-applied finish for type of system indicated.

1. High-Humidity Finish: Comply with:

a. ASTM C 635 requirements for "Coating Classification for Severe Environment Performance" where high-humidity finishes are indicated.

E. Attachment Devices: Size for five times the design load indicated, suited for Project application:

1. ASTM C 635, Table 1, "Direct Hung," unless otherwise indicated.

2. Power-Actuated Fasteners in Concrete: Fastener system of type suitable for application indicated, fabricated from corrosion-resistant materials, with clips or other accessory devices for attaching hangers of type indicated, and with capability to sustain, without failure, a load equal to 10 times that imposed by ceiling construction, as determined by testing per ASTM E 1190 "Standard Test Methods for Strength of Power-Actuated Fasteners Installed in Structural Members", conducted by a qualified testing and inspecting agency.

F. Wire Hangers, Braces, and Ties: Provide wires complying with the following requirements:

1. Zinc-Coated Carbon-Steel Wire: ASTM A 641/A 641M, "Standard Specification for Zinc-Coated (Galvanized) Carbon Steel Wire", Class 1 zinc coating, soft temper

2. Size: Select wire diameter so its stress at three times hanger design load (ASTM C 635, Table 1, "Direct Hung", or BS EN 13964:2004 "Suspended Ceilings-Requirements and Test Methods") will be less than yield stress of wire, but provide not less than 3.5-mm-diameter wire.

G. Hanger Rods: Mild steel, zinc coated or protected with rust-inhibitive paint.

H. Flat Hangers: Mild steel, zinc coated or protected with rust-inhibitive paint.

I. Angle Hangers: Angles with legs not less than 7/8 inch (22 mm) wide; formed with 0.04-inch (1-mm-) thick, galvanized steel sheet complying with ASTM A 653/A 653M, G90 (Z275) coating designation:

1. ASTM A 653/A 653M "Standard specification for Sheet Steel, zinc-Coated (Galvanized) or Zinc Iron Alloy-Coated (Galvannealed) by the Hot Dip Process"; Z275.

J. Seismic Struts: Manufacturer's standard compression struts designed to accommodate seismic forces.

K. Seismic Clips: Manufacturer's standard seismic clips designed and spaced to secure acoustical panels in-place.

L. Single Tee Adapter Clips: At off-module cross tee connections, provide manufacturer’s standard single tee adapter clips designed and spaced to secure acoustical panels in-place.

M. Hold-Down Clips: Where indicated, provide manufacturer's standard hold-down clips spaced 24 inches (610 mm) o.c. on all cross tees.

N. Impact Clips: Where indicated, provide manufacturer's standard impact-clip system designed to absorb impact forces against acoustical panels.

PART 3 - EXECUTION

3.1 EXAMINATION

A. Examine substrates, areas, and conditions, including structural framing to which acoustical panel ceilings attach or abut, with Installer present, for compliance with requirements specified in this and other Sections that affect ceiling installation and anchorage and with requirements for installation tolerances and other conditions affecting performance of acoustical panel ceilings.

B. Proceed with installation only after unsatisfactory conditions have been corrected.

3.2 PREPARATION

A. Measure each ceiling area and establish layout of acoustical panels to balance border widths at opposite edges of each ceiling. Avoid using less-than-half-width panels at borders, and comply with layout shown on reflected ceiling plans.

3.3 INSTALLATION, GENERAL

A. General: Install acoustical panel ceilings to comply with one of the following:

1. ASTM C 636 "Standard Practice for Installation of Metal Ceiling Suspension Systems for Acoustical Tile and Lay-in Panels" and seismic requirements indicated, per manufacturer's written instructions and CISCA's "Ceiling Systems Handbook."

B. Suspend ceiling hangers from building's structural members and as follows:

1. Install hangers plumb and free from contact with insulation or other objects within ceiling plenum that are not part of supporting structure or of ceiling suspension system.

2. Splay hangers only where required and, if permitted with fire-resistance-rated ceilings, to miss obstructions; offset resulting horizontal forces by bracing, countersplaying, or other equally effective means.

3. Where width of ducts and other construction within ceiling plenum produces hanger spacings that interfere with location of hangers at spacings required to support standard suspension system members, install supplemental suspension members and hangers in form of trapezes or equivalent devices. Size supplemental suspension members and hangers to support ceiling loads within performance limits established by referenced standards and publications.

4. Secure wire hangers to ceiling suspension members and to supports above with a minimum of three tight turns. Connect hangers directly either to structures or to inserts, eye screws, or other devices that are secure and appropriate for substrate and that will not deteriorate or otherwise fail due to age, corrosion, or elevated temperatures.

5. Do not support ceilings directly from permanent metal forms or floor deck. Fasten hangers to cast-in-place hanger inserts, postinstalled mechanical, or power-actuated fasteners that extend through forms into concrete.

6. Space hangers not more than 48 inches (1200 mm) o.c. along each member supported directly from hangers, unless otherwise indicated; provide hangers not more than 8 inches (200 mm) from ends of each member.

7. Finish suspension wires where indicated to be finished, and where partially exposed to view. Painted black or color as selected by Architect.

C. Install suspension system runners so they are square and securely interlocked with one another. Remove and replace dented, bent, or kinked members.

D. Install acoustical panels with undamaged edges and fit accurately into suspension system runners and edge moldings. Scribe and cut panels at borders and penetrations to provide a neat, precise fit.

1. For square-edged panels, install panels with edges fully hidden from view by flanges of suspension system runners and moldings.

2. For reveal-edged panels on suspension system runners, install panels with bottom of reveal in firm contact with top surface of runner flanges.

3. For reveal-edged panels on suspension system members with box-shaped flanges, install panels with reveal surfaces in firm contact with suspension system surfaces and panel faces flush with bottom face of runners.

4. Paint cut edges of panel remaining exposed after installation; match color of exposed panel surfaces using coating recommended in writing for this purpose by acoustical panel manufacturer.

5. Install hold-down clips in areas indicated, in areas required by authorities having jurisdiction, and for fire-resistance ratings; space as recommended by panel manufacturer's written instructions, unless otherwise indicated.

6. Install clean-room gasket system in areas indicated, sealing each panel and fixture as recommended by panel manufacturer's written instructions.

7. Protect lighting fixtures and air ducts to comply with requirements indicated for fire-resistance-rated assembly.

E. Install field-installed acoustic backing with methods and materials recommended by panel manufacturer.

3.4 CLEANING

A. Clean exposed surfaces of acoustical tile ceilings, including trim, edge moldings, and suspension system members. Comply with manufacturer's written instructions for cleaning and touchup of minor finish damage. Remove and replace ceiling components that cannot be successfully cleaned and repaired to permanently eliminate evidence of damage.

END OF SECTION

SECTION 09 65 00 - RESILIENT FLOORING

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

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

1.2 SUMMARY

A. Section Includes:

1. Luxury vinyl plank tile (LVT) (LVT-1).
2. Sheet Vinyl flooring

B. Drawings and general provisions of the Contract, including General and Supplementary

1. Conditions and Division 01 Specification Sections, apply to this Section.
2.

C. Related Sections

1. Section 01 81 13 “Sustainability Requirements”.
2. Section 03 30 00 “Cast-in-Place Concrete” for substrate coordination.
3. Section 09 65 13 "Resilient Base and Accessories" for resilient wall base and accessories installed with resilient flooring.
4. Section 07 92 00 - Joint Sealants: Provision of sealants and caulks.
5. Schedules – See Drawing for finishes.

1.3 1.02 REFERENCES

A. ADA - Americans with Disabilities Act

B. ASTM - American Society for Testing and Materials

1. F710 - Standard Practice for Preparing Concrete Floors to Receive Resilient Flooring.
2. F1303 - Standard Specification for Sheet Vinyl Floor Covering with Backing.
3. F1861 - Standard Specification for Resilient Wall Base.

1.4 SUBMITTALS

A. Product Data: For each type of product.

B. Sustainable Design Submittals: Refer to Section 01 81 13 “Sustainability Requirements”.

C. Samples: For each exposed product and for each color and texture specified, not less than 12 inches square.

D. Samples for Initial Selection: For each type of product indicated.

E. Samples for Verification: For each type of product indicated and for each color, texture, and pattern required in manufacturer's standard-size Samples, but not less than 12 inches long.

F. Product Schedule: For resilient base and accessory products. Use same designations indicated on Drawings.

G. Contract Closeout Submittals: Submit maintenance data for resilient floor coverings.

1.5 MAINTENANCE MATERIAL SUBMITTALS

A. Furnish extra materials, from the same product run, that match products installed and that are packaged with protective covering for storage and identified with labels describing contents.

1. Furnish 1 box of each class, wearing surface, color, pattern, and size of tile flooring installed.

2. Furnish 50 linear feet in roll form of each different composition, wearing surface, color, and pattern of sheet vinyl and wall base installed.

B. DELIVERY, STORAGE, AND HANDLING

C. Store resilient products and installation materials in dry spaces protected from the weather, with ambient temperatures maintained within range recommended by manufacturer, but not less than 50 deg F or more than 90 deg F.

1.6 FIELD CONDITIONS

A. Maintain ambient temperatures within range recommended by manufacturer, but not less than 70 deg F or more than 95 deg F, in spaces to receive resilient products during the following periods:

1. 48 hours before installation.

2. During installation.

3. 48 hours after installation.

B. After installation and until Substantial Completion, maintain ambient temperatures within range recommended by manufacturer, but not less than 55 deg F or more than 95 deg F.

C. Install resilient products after other finishing operations, including painting, have been completed.

PART 2 - PRODUCTS

2.1 PERFORMANCE REQUIREMENTS

A. Flooring products shall comply with California’s Section 01350 program or NSF/ANSI 332 standard.

B. Adhesives and Sealants: Comply with low/ no VOC requirements in Section 01 81 13 “Sustainability Requirements”.

2.2 RESILIENT FLOORING

A. Acceptable Manufacturers

1. Luxury Vinyl Plank Tile (LVT): Refer to Schedules - Drawing Sheet A811.

2. Sheet Vinyl: Refer to Schedules - Drawing Sheet A811.

3. Resilient Base: Refer to Schedules - Drawing Sheet A811.

B. MATERIALS

1. Luxury Vinyl Plank Tile (LVT): Hard surface flooring manufactured from several layers of medium or high-density fiberboard (MDF or HDF) fused together with heat and pressure to form rigid, fixed size boards; high performance polyurethane finish.

a. Plank Size: Refer to Schedules - Drawing Sheet A811.

b. Color: Refer to Schedules - Drawing Sheet A811.

2. Sheet Vinyl: ASTM F1303, with backing.

a. Wearing Surface: Smooth.

b. Interlayer Material: Foamed plastic.

c. Backing Class: Class B (nonfoamed plastic).

d. Seaming Method at Sheet: Heat welded.

e. Color: Refer to Schedules - Drawing Sheet A811.

2.3 INSTALLATION MATERIALS

A. Concrete Slab Primer: Non-staining type as recommended by flooring manufacturer.

B. Trowelable Underlayment and Patching Compounds: Latex modified, Portland cement-based formulation provided or approved by resilient flooring manufacturer for applications indicated.

C. Adhesives (Cements): Waterproof type recommended by manufacturer to suit resilient floor products and substrate conditions indicated. Adhesive shall contain less than 50 g/L VOC content.

1. Seam Adhesive: As manufactured by Armstrong World Industries, Inc., “S-761”, or equal.

D. Caulking: Acrylic latex silicon caulk as specified in Section 07 92 00.

E. Transition Strips

1. Type 1: Profile with sloped exposed surface, 5/32-inch tall leading edge, integrated trapezoid-perforated anchoring leg, and integrated grout joint spacer.

a. Material and Finish: As selected by the Architect.

b. Height: As required.

c. Provide alternate profile as recommended by the installer after reviewing existing conditions. Review with the Architect for approval.

d. Product: As manufactured by Schluter® Systems, “Schluter®-RENO-U”, or equal.

2. Type 2: L-shaped profile with 1/8-inch wide top section and vertical wall section that together form the visible surface, integrated trapezoid-perforated anchoring leg, and integrated grout joint spacer.

a. Anchoring Leg: Straight or with special radius as required.

b. Material and Finish: As selected by the Architect.

c. Height: As required.

d. Provide alternate profile as recommended by the installer after reviewing existing conditions. Review with the Architect for approval

e. Product: As manufactured by Schluter® Systems, “Schluter®-SCHIENE”, or equal.

PART 3 - EXECUTION

3.1 EXAMINATION

A. General: Examine areas where installation of products specified in this Section will occur, with installer present, to verify that substrates and conditions are satisfactory for resilient flooring installation and comply with manufacturer’s requirements and those specified in this Section.

B. Concrete Subfloors: Verify that concrete slabs comply with ASTM F710 and the following:

1. Slab substrates are dry and free of curing compounds, sealers, hardeners, and other materials whose presence would interfere with bonding of adhesive. Determine adhesion and dryness characteristics by performing bond and moisture tests recommended by resilient flooring manufacturer.

2. Subfloors are free of cracks, ridges, depressions, scale, and foreign deposits of any kind.

3. The General Contractor shall be responsible for acceptability of moisture emission of concrete. Before installing resilient flooring, concrete slab shall be tested for moisture emission. The test shall be conducted around the perimeter of each room, at columns, and where moisture may be evident. A diagram of the areas showing the locations and results of each calcium chloride test shall be submitted to the Architect. At each area where the moisture emission exceeds 3.5 pounds per 1,000 square feet per 24 hours, a sealant shall be applied.

3.2 PREPARATION

A. Prepare substrates according to manufacturer's written instructions to ensure adhesion of resilient products.

B. Concrete Substrates for Resilient Flooring: Prepare horizontal surfaces according to ASTM F 710.

1. Verify that substrates are dry and free of curing compounds, sealers, and hardeners.

2. Remove substrate coatings and other substances that are incompatible with adhesives and that contain soap, wax, oil, or silicone, using mechanical methods recommended by manufacturer. Do not use solvents.

3. Alkalinity and Adhesion Testing: Perform tests recommended by manufacturer. Proceed with installation only after substrate alkalinity falls within range on pH scale recommended by manufacturer in writing, but not less than 5 or more than 9 pH.

4. Moisture Testing: Perform tests so that each test area does not exceed 200 sq. ft., and perform no fewer than three tests in each installation area and with test areas evenly spaced in installation areas.

a. Relative Humidity Test: Using in-situ probes, ASTM F 2170. Proceed with installation only after substrates have a maximum 75 percent relative humidity level measurement.

C. Fill cracks, holes, and depressions in substrates with trowelable leveling and patching compound; remove bumps and ridges to produce a uniform and smooth substrate.

D. Do not install resilient products until materials are the same temperature as space where they are to be installed.

1. At least 48 hours in advance of installation, move resilient products and installation materials into spaces where they will be installed.

E. Apply concrete slab primer, if recommended by flooring manufacturer, prior to applying adhesive. Apply according to manufacturer’s directions.

F. Immediately before installation, sweep and vacuum clean substrates to be covered by resilient products.

3.3 RESILIENT FLOORING INSTALLATION

A. General: Comply with manufacturer’s installation directions and other requirements indicated that are applicable to each type of installation included in Project.

B. Tile Flooring Installation

1. Lay out tiles from center marks established with principal walls, discounting minor offsets, so tiles at opposite edges of room are of equal width. Adjust as necessary to avoid using cut widths at perimeter that equal less than 1/2 tile. Install tiles square with room axis, unless otherwise indicated.

2. Match tiles for color and pattern by selecting tiles from cartons in same sequence as manufactured and packaged, if so numbered. Cut tiles neatly around all fixtures. Discard broken, cracked, chipped, or deformed tiles.
    a. Lay tiles in ashlar pattern with grain running in one direction, unless otherwise directed by the Architect.
3. Scribe, cut, and fit tiles to butt tightly to vertical surfaces, permanent fixtures, built-in furniture including, pipes, outlets, edgings, thresholds, and nosings.
4. Extend tiles into toe spaces, door reveals, closets, and similar openings.
5. Maintain reference markers, holes, or openings that are in place or plainly marked for future cutting by repeating on finish flooring as marked on subfloor. Use chalk or other nonpermanent marking devices.
6. Adhere tiles to flooring substrates without producing open cracks, voids, raising and puckering at joints, telegraphing of adhesive spreader marks, or other surface imperfections in completed tile installation.

C. Sheet Vinyl Installation
1. Unroll floor covering and allow to stabilize before cutting and fitting.
2. Lay out linoleum floor coverings to comply with the following requirements:
    a. Terminate joints at centerline of doorways where adjacent flooring is dissimilar.
    b. The Architect will approve all seaming patterns.
    c. Maintain uniformity of linoleum floor covering direction.
    d. Arrange for a minimum number of seams and place them in inconspicuous and low traffic areas, but in no case less than 6 inches away from parallel joints in flooring substrates.
    e. Match edges of resilient floor coverings for color shading and pattern at seams.
    f. Avoid cross seams.
    g. Scribe, cut and fit floor coverings to butt neatly and tightly to vertical surfaces and permanent fixtures, including cabinets, pipes, outlets, edgings, door frames and thresholds.
3. Where demountable partitions and other items are indicated for installing on top of finished floor covering, install floor covering before these items are installed.
4. Extend floor coverings into toe spaces, door reveals, closets, and similar openings.
5. Maintain reference markers, holes or openings that are in place or plainly marked for future cutting by repeating on finish flooring as marked on subfloor. Use chalk or other nonpermanent marking devices.
6. Adhere floor coverings to flooring substrates by method approved by floor covering manufacturer.
    a. Produce completed installation without open cracks, voids, raising and puckering at joints, telegraphing of adhesive spreader marks, or other surface imperfections.
    b. Comply with floor covering manufacturer’s directions including those for trowel notching, adhesive mixing, and adhesive open and working times.
7. Heat-weld seams in vinyl floor coverings where this seaming method is indicated.
8. Prepare, weld and finish seams to produce a surface flush with adjoining sheets.

9. Hand roll vinyl floor coverings in both directions from center out to embed floor coverings in adhesive and eliminate trapped air. At walls, door casings and other locations where access by roller is impractical, press floor coverings firmly in place with flat-bladed instrument.

3.4 RESILIENT BASE AND ACCESSORY INSTALLATION

A. As specified in Section 09 65 13 "Resilient Base and Accessories."

3.5 CLEANING AND PROTECTION

A. Comply with manufacturer's written instructions for cleaning and protecting resilient products.

B. Perform the following operations immediately after completing resilient-product installation:

1. Remove adhesive and other blemishes from surfaces.

2. Sweep and vacuum horizontal surfaces thoroughly.

3. Damp-mop horizontal surfaces to remove marks and soil.

C. Protect resilient products from mars, marks, indentations, and other damage from construction operations and placement of equipment and fixtures during remainder of construction period.

D. Cover resilient products subject to wear and foot traffic until Substantial Completion.

END OF SECTION

SECTION 09 65 13 - RESILIENT BASE AND ACCESSORIES

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

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

1.2 SUMMARY

A. Section Includes:

1. Rubber wall base (RB-1).
2. Resilient molding and installation accessories.

B. Related Requirements:

1. Section 01 81 13 “Sustainability Requirements”.
2. Section 09 65 00 “Resilient Flooring” for resilient accessories installed with resilient flooring.

1.3 SUBMITTALS

A. Product Data: For each type of product.

B. Sustainable Design Submittals: Refer to Section 01 81 13 “Sustainability Requirements”.

C. Samples: For each exposed product and for each color and texture specified, not less than 12 inches long.

D. Samples for Initial Selection: For each type of product indicated.

E. Samples for Verification: For each type of product indicated and for each color, texture, and pattern required in manufacturer's standard-size Samples, but not less than 12 inches long.

F. Product Schedule: For resilient base and accessory products. Use same designations indicated on Drawings.

1.4 MAINTENANCE MATERIAL SUBMITTALS

A. Furnish extra materials, from the same product run, that match products installed and that are packaged with protective covering for storage and identified with labels describing contents.

1. Furnish not less than 10 linear feet for every 500 linear feet or fraction thereof, of each type, color, pattern, and size of resilient product installed.

1.5 DELIVERY, STORAGE, AND HANDLING

A. Store resilient products and installation materials in dry spaces protected from the weather, with ambient temperatures maintained within range recommended by manufacturer, but not less than 50 deg F or more than 90 deg F.

1.6 FIELD CONDITIONS

A. Maintain ambient temperatures within range recommended by manufacturer, but not less than 70 deg F or more than 95 deg F, in spaces to receive resilient products during the following periods:

1. 48 hours before installation.
2. During installation.

3. 48 hours after installation.

B. After installation and until Substantial Completion, maintain ambient temperatures within range recommended by manufacturer, but not less than 55 deg F or more than 95 deg F.

C. Install resilient products after other finishing operations, including painting, have been completed.

PART 2 - PRODUCTS

2.1 PERFORMANCE REQUIREMENTS

A. Flooring products shall comply with California's Section 01350 program or NSF/ANSI 332 standard.

B. Adhesives and Sealants: Comply with low/ no VOC requirements in Section 01 81 13 "Sustainability Requirements".

2.2 RUBBER WALL BASE

A. Basis-of-Design Product, RB-1: Pinnacle Rubber Base by Roppe Corp.; www.roppe.com.

1. Color: As selected by Architect.
2. Height: 6 inches.
3. Applications: as indicated in Drawings.

2.3 RESILIENT FLOORING ACCESSORIES

A. Metal Edge Strips: Extruded aluminum with mill finish, nominal 2 inches wide, of height required to protect exposed edges of flooring, and in maximum available lengths to minimize running joints.

1. Basis-of-Design Manufacturer: Schluter; www.schluter.com.
2. Profile and Dimensions: As indicated.

B. Rubber Edge Strips: Rubber transition strips in dimensions required to protect exposed edges of flooring.

1. Color: As selected by Architect.

2.4 INSTALLATION MATERIALS

A. Trowelable Leveling and Patching Compounds: Latex-modified, portland-cement-based or blended hydraulic-cement-based formulation provided or approved by resilient-product manufacturer for applications indicated.

B. Adhesives: Water-resistant type recommended by resilient-product manufacturer for resilient products and substrate conditions indicated.

C. Floor Polish: Provide protective, liquid floor-polish products recommended by resilient stair-tread manufacturer.

PART 3 - EXECUTION

3.1 EXAMINATION

A. Examine substrates, with Installer present, for compliance with requirements for maximum moisture content and other conditions affecting performance of the Work.

1. Verify that finishes of substrates comply with tolerances and other requirements specified in other Sections and that substrates are free of cracks, ridges, depressions, scale, and foreign deposits that might interfere with adhesion of resilient products.

B. Proceed with installation only after unsatisfactory conditions have been corrected.

1. Installation of resilient products indicates acceptance of surfaces and conditions.

3.2 PREPARATION

A. Prepare substrates according to manufacturer's written instructions to ensure adhesion of resilient products.

B. Concrete Substrates for Resilient Stair Accessories: Prepare horizontal surfaces according to ASTM F710.

1. Verify that substrates are dry and free of curing compounds, sealers, and hardeners.

2. Remove substrate coatings and other substances that are incompatible with adhesives and that contain soap, wax, oil, or silicone, using mechanical methods recommended by manufacturer. Do not use solvents.

3. Alkalinity and Adhesion Testing: Perform tests recommended by manufacturer. Proceed with installation only after substrate alkalinity falls within range on pH scale recommended by manufacturer in writing, but not less than 5 or more than 10 pH.

4. Moisture Testing: Perform tests so that each test area does not exceed 200 sq. ft., and perform no fewer than three tests in each installation area and with test areas evenly spaced in installation areas.

a. Anhydrous Calcium Chloride Test: ASTM F1869. Proceed with installation only after substrates have maximum moisture-vapor-emission rate of 3 lb of water/100 sq. ft. in 24 hours.

b. Relative Humidity Test: Using in-situ probes, ASTM F2170. Proceed with installation only after substrates have a maximum 75 percent relative humidity level measurement/ 5 percent moisture content. Use pinned meter for moisture content test.

C. Fill cracks, holes, and depressions in substrates with trowelable leveling and patching compound; remove bumps and ridges to produce a uniform and smooth substrate.

D. Do not install resilient products until materials are the same temperature as space where they are to be installed.

1. At least 48 hours in advance of installation, move resilient products and installation materials into spaces where they will be installed.

E. Immediately before installation, sweep and vacuum clean substrates to be covered by resilient products.

3.3 RESILIENT BASE INSTALLATION

A. Comply with manufacturer's written instructions for installing resilient base.

B. Apply resilient base to walls, columns, pilasters, casework and cabinets in toe spaces, and other permanent fixtures in rooms and areas where base is required.

C. Install resilient base in lengths as long as practical without gaps at seams and with tops of adjacent pieces aligned.

D. Tightly adhere resilient base to substrate throughout length of each piece, with base in continuous contact with horizontal and vertical substrates.

E. Do not stretch resilient base during installation.

F. On masonry surfaces or other similar irregular substrates, fill voids along top edge of resilient base with manufacturer's recommended adhesive filler material.

3.4 RESILIENT ACCESSORY INSTALLATION

A. Comply with manufacturer's written instructions for installing resilient accessories.

3.5 CLEANING AND PROTECTION

A. Comply with manufacturer's written instructions for cleaning and protecting resilient products.

B. Perform the following operations immediately after completing resilient-product installation:

1. Remove adhesive and other blemishes from surfaces.

2. Sweep and vacuum horizontal surfaces thoroughly.

3. Damp-mop horizontal surfaces to remove marks and soil.

C. Protect resilient products from mars, marks, indentations, and other damage from construction operations and placement of equipment and fixtures during remainder of construction period.

D. Cover resilient products subject to wear and foot traffic until Substantial Completion.

END OF SECTION

SECTION 096723 - RESINOUS FLOORING

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

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

1.2 SUMMARY

A. This Section includes one resinous flooring system, one with urethane body.

1. Application Method: Metal hand troweled, raked.

1.3 SUBMITTALS

A. Product Data: For each type of product indicated. Include manufacturer's technical data, application instructions, and recommendations for each resinous flooring component required.

B. Samples for Verification: For each resinous flooring system required, 5 inches square, applied to a rigid backing.

C. Product Schedule: Use resinous flooring designations indicated in Part 2 and room designations indicated on Drawings in product schedule.

D. Installer Certificates: Signed by manufacturer certifying that installers comply with specified requirements.

E. Maintenance Data: For resinous flooring to include in maintenance manuals.

1.4 QUALITY ASSURANCE

A. No request for substitution shall be considered that would change the generic type of floor system specified (i.e. Urethane mortar-based system). Equivalent materials of other manufactures may be substituted only on approval of Architect or Engineer. Request for substitution will only be considered only if submitted 10 days prior to bid date. Request will be subject to specification requirements described in this section.

B. Installer Qualifications: Engage an experienced installer (applicator) who is experienced in applying resinous flooring systems similar in material, design, and extent to those indicated for this Project, whose work has resulted in applications with a record of successful in-service performance, and who is acceptable to resinous flooring manufacturer.
1. Engage an installer who is certified in writing by resinous flooring manufacturer as qualified to apply resinous flooring systems indicated.
2. Contractor shall have completed at least 10 projects of similar size and complexity.

C. Source Limitations: Obtain primary resinous flooring materials, including primers, resins, hardening agents, grouting coats, and topcoats, through one source from a single manufacturer, with not less than ten years of successful experience in manufacturing and installing principal

materials described in this section. Provide secondary materials, including patching and fill material, joint sealant, and repair materials, of type and from source recommended by manufacturer of primary materials.

D. Manufacturer Field Technical Service Representatives: Resinous flooring manufacture shall retain the services of Field Technical Service Representatives who are trained specifically on installing the system to be used on the project.

1. Field Technical Services Representatives shall be employed by the system manufacture to assist in the quality assurance and quality control process of the installation and shall be available to perform field problem solving issues with the installer.

E. Mockups: Apply mockups to verify selections made under sample submittals and to demonstrate aesthetic effects and set quality standards for materials and execution.

1. Apply full-thickness mockups on 48-inch- square floor area selected by Architect.

a. Include 48-inch length of integral cove base, if appropriate.

2. Approved mockups may become part of the completed Work if undisturbed at time of Substantial Completion.

3. Sign off from Architect and Owner/Owners agent on texture for slip resistance must be complete before installation of flooring system.

F. Pre-installation Conference:

1. General contractor shall arrange a meeting not less than thirty days prior to starting work.

2. Attendance:

a. General Contractor

b. Architect/Owner's Representative.

c. Manufacturer/Installer's Representative.

1.5 DELIVERY, STORAGE, AND HANDLING

A. Deliver materials in original packages and containers, with unbroken seals, bearing manufacturer's labels indicating brand name and directions for storage and mixing with other components.

B. Store materials to prevent deterioration from moisture, heat, cold, direct sunlight, or other detrimental effects. Store material per product data sheet.

C. All materials used shall be factory pre-weighed and pre-packaged in single, easy to manage batches to eliminate on site mixing errors. No on site weighing or volumetric measurements allowed.

1.6 PROJECT CONDITIONS

A. Environmental Limitations: Comply with resinous flooring manufacturer's written instructions for substrate temperature, ambient temperature, moisture, ventilation, and other conditions affecting resinous flooring application.

1. Maintain material temperature between 60 and 85 deg F (16 and 30 deg C) and substrate temperature between 45 and 85 (7 and 30 de C) during resinous flooring application and for not less than 24 hours after application.

B. Lighting: Provide permanent lighting or, if permanent lighting is not in place, simulate permanent lighting conditions during resinous flooring application.

C. Close spaces to traffic during resinous flooring application and for not less than 24 hours after application, unless manufacturer recommends a longer period.

D. Concrete substrate shall be properly cured. A vapor barrier must be present for concrete subfloors on or below grade. Otherwise, an osmotic pressure resistant grout must be installed prior to the resinous flooring

1.7 WARRANTY

A. Manufacturer shall furnish a single, written warranty covering both material and workmanship for a period of (1) full years from date of installation, or provide a joint and several warranty signed on a single document by material manufacturer and applicator jointly and severally warranting the materials and workmanship for a period of (1) full year from date of installation. A sample warranty letter must be included with bid package or bid may be disqualified.

PART 2 - PRODUCTS

2.1 RESINOUS FLOORING (EP-1)

A. Available Products: Subject to compliance with requirements, product that may be incorporated into the work include,

1. “Self-sealing” urethane mortar systems, multiple layers of liquids and broadcasts will not be accepted and will result in a disqualification from bid.

B. Acceptable Manufactures,

1. Stonhard Basis of design.

C. Products: Subject to compliance with requirements:

D. Stonhard, Inc.; Stonclad UT®

E. System Characteristics:

1. Color and Pattern: Selected By Architect
2. Wearing Surface: Selected By Architect
3. Integral Cove Base: 6”
4. Overall System Thickness: nominal 3/16”, ¼”, ½”

F. System Components: Manufacturer's standard components that are compatible with each other and as follows:

1. Mortar:

a. Material design basis: Stonclad UT
b. Resin: Urethane.
c. Formulation Description: (4) four-component, 100 percent solids.
d. Application Method: Screed, Trowel.
1) Thickness of Coats: 3/16", 1/4", 1/2"
2) Number of Coats: One.
3) Broadcast texture into wet mortar base.
e. Aggregates: Silica Pigmented Quartz, Granite Aggregate.

2. Top coat option 1: Stonseal UT7

a. Material design basis: Stonseal UT7
b. Resin: Urethane.
c. Formulation Description: (2) two-component urethane coating
d. Type: pigmented.
e. Finish: standard.
f. Number of Coats: One.

3. Top coat option 2: Stonseal HT4

a. Material design basis: Stonkote HT4
b. Resin: Epoxy.
c. Formulation Description: (2) two-component Epoxy coating
d. Type: pigmented.
e. Finish: standard.
f. Number of Coats: One.

NOTE: COMPONENTS LISTED ABOVE ARE THE BASIS OF DESIGN INTENT; ALL BIDS WILL BE COMPARED TO THIS STANDARD INCLUDING RESIN CHEMISTRY, COLOR, WEARING SURFACE, THICKNESS, AND INSTALLATION PROCEDURES, INCLUDING NUMBER OF COATS. CONTRACTOR SHALL BE REQUIRED TO COMPLY WITH ALL THE REQUIREMENTS OF THE SPECIFICATIONS AND ALL OF THE COMPONENTS REQUIRED BY THE SPECIFICATIONS, WHETHER OR NOT SUCH PRODUCTS ARE SPECIFICALLY LISTED ABOVE.

G. System Physical Properties: Provide resinous flooring system with the following minimum physical property requirements when tested according to test methods indicated:

1. Compressive Strength: 7,700 psi after 7 days per ASTM C 579.
2. Tensile Strength: 1,000 psi per ASTM C 307.
3. Flexural Strength: 2,400 psi per ASTM C 580.
4. Water Absorption: < 1% per ASTM C 413.
5. Impact Resistance: > 160 in. lbs. per ASTM D 2794.
6. Flammability: Class 1 per ASTM E-648.
7. Hardness: 80 to 84, Shore D per ASTM D 2240.
8. Flexural Modulus of Elasticity: $2.6x10^{6}$ psi per ASTM C-580
9. Thermal Coefficient of Linear Expansion: $1.1x10^{-5}$ in./in.˚F per ASTM C-531

2.2 ACCESSORY MATERIALS

A. Primer: Type recommended by manufacturer for substrate and body coats indicated. Formulation Description: Stonclad UT urethane mortar is self priming.

B. Patching and Leveling: Use a four component fast setting Urethane grout. Moisture resistant polyurethane based grout designed for permanent repairs under flooring system. Stonhard, Stonset TG6. See drawings 1/4” per foot slope to drains. Use standard drain detail, saw cut and chase.

C. Waterproofing Membrane: Type recommended by manufacturer for substrate and primer and body coats indicated. Formulation Description Only if application above grade Stonproof ME7. Must include texture 3 broadcast to ensure intercoat adhesion.

PART 3 - EXECUTION

3.1 PREPARATION

A. General: Prepare and clean substrates according to resinous flooring manufacturer's written instructions for substrate indicated. Provide clean and dry substrate for resinous flooring applications.

B. Concrete Substrates: Provide sound concrete surfaces free of laitance, glaze, efflorescence, curing compounds, form-release agents, dust, dirt, grease, oil, and other contaminants incompatible with resinous flooring.

1. Mechanically prepare substrates as follows:

a. Shot-blast surfaces with an apparatus that abrades the concrete surface, contains the dispensed shot within the apparatus, and recirculates the shot by vacuum pickup.
b. Comply with ASTM C 811 requirements, unless manufacturer's written instructions are more stringent.

2. Repair damaged and deteriorated concrete according to resinous flooring manufacturer's written recommendations.
1. Verify that concrete substrates are dry. Stonclad UT with a properly placed vapor barrier is suitable for application after 7-days of concrete cure time. If it is unknown or there is no vapor barrier, the following moisture tests should be performed.
2.

a. Perform in situ probe test, ASTM F 2170. Proceed with application only after substrates do not exceed a maximum potential equilibrium relative humidity of 85 percent.
b. Perform anhydrous calcium chloride test, ASTM F 1869. Proceed with application only after substrates have maximum moisture-vapor-emission rate of 6 lb of water/1000 sq. ft. of slab in 24 hours.
c. Perform additional moisture tests recommended by manufacturer. Proceed with application only after substrates pass testing.

C. Use patching and fill material to fill holes and depressions in substrates according to manufacturer's written instructions.

D. Treat control joints and other nonmoving substrate cracks to prevent cracks from reflecting through resinous flooring according to manufacturer's written recommendations. Allowances should be included for Stonflex MP7 joint fill material, and CT5 concrete crack treatment.

3.2 APPLICATION

A. General: Apply components of resinous flooring system according to manufacturer's written instructions to produce a uniform, monolithic wearing surface of thickness indicated.

1. Coordinate application of components to provide optimum adhesion of resinous flooring system to substrate, and optimum intercoat adhesion.
2. Cure resinous flooring components according to manufacturer's written instructions. Prevent contamination during application and curing processes.
3. At substrate expansion and isolation joints, provide joint in resinous flooring to comply with resinous flooring manufacturer's written recommendations.

    a. Apply joint sealant to comply with manufacturer's written recommendations.

B. This product is self-priming. Additional primer not required.

C. Integral Cove Base: Stonclad UT mortar, apply cove base mix to wall surfaces before applying flooring. Apply according to manufacturer's written instructions and details including those for taping, mixing, priming, troweling, sanding, of cove base. Round internal and external corners.

1. Integral Cove Base: 6” inches high.

D. Mortar: Mix mortar material according to manufacturer's recommended procedures. Uniformly spread mortar over substrate at manufacturer’s recommended height using specially designed trowel and/or Screed box. If applying thin system, spread mortar over substrate using specially designed rake, and then spike roll. Broadcast desired texture directly into mortar base. Field verify texture needed

E. Apply topcoat in number of coats indicated for flooring system and at spreading rates recommended in writing by manufacturer.

3.3 TERMINATIONS

A. Chase edges to “lock” the flooring system into the concrete substrate along lines of termination.

B. Penetration Treatment: Lap and seal the flooring system onto the perimeter of the penetrating item by bridging over compatible elastomer at the interface to compensate for possible movement.

C. Trenches: Continue flooring system into trenches to maintain monolithic protection. Treat cold joints to assure bridging of potential cracks. Utilize Stonclad UT mortar to coat trenches

D. Treat floor drains by chasing the flooring system to lock in place at point of termination.

3.4 JOINTS AND CRACKS

A. Treat control joints to bridge potential cracks and to maintain monolithic protection.

B. Treat cold joints and construction joints to bridge potential cracks and to maintain monolithic protection on horizontal and vertical surfaces as well as horizontal and vertical interfaces.

C. Discontinue floor coating system at vertical and horizontal contraction and expansion joints by installing backer rod and compatible sealant after coating installation is completed. Provide sealant type recommended by manufacturer for traffic conditions and chemical exposures to be encountered.

3.5 FIELD QUALITY CONTROL

A. Material Sampling: Owner may at any time and any numbers of times during resinous flooring application require material samples for testing for compliance with requirements.

1. Owner will engage an independent testing agency to take samples of materials being used. Material samples will be taken, identified, sealed, and certified in presence of Contractor.
2. Testing agency will test samples for compliance with requirements, using applicable referenced testing procedures or, if not referenced, using testing procedures listed in manufacturer's product data.
3. If test results show applied materials do not comply with specified requirements, pay for testing, remove noncomplying materials, prepare surfaces coated with unacceptable materials, and reapply flooring materials to comply with requirements.

3.6 CLEANING, PROTECTING, AND CURING

A. Cure resinous flooring materials in compliance with manufacturer's directions, taking care to prevent contamination during stages of application and prior to completion of curing process. Close area of application for a minimum of 18 hours.

B. Protect resinous flooring materials from damage and wear during construction operation. Where temporary covering is required for this purpose, comply with manufacturer's recommendations for protective materials and method of application. General Contractor is responsible for protection and cleaning of surfaces after final coats.

C. Cleaning: Remove temporary covering and clean resinous flooring just prior to final inspection. Use cleaning materials and procedures recommended by resinous flooring manufacturer.

END OF SECTION

SECTION 09 84 33 - SOUND-ABSORBING WALL PANELS

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

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

1.2 SUMMARY

A. Section Includes:

1. Felt acoustical wall treatment (AWP-1).

B. Related Requirements:

1. Section 01 81 13 “Sustainability Requirements”.
2. Section 09 22 16 “Non-Structural Metal Framing” for substrate framing and blocking.

1.3 SUBMITTALS

A. Product Data: For each type of panel edge, core material, and mounting indicated.

B. Sustainable Design Submittals: Refer to Section 01 81 13 “Sustainability Requirements”.

C. Shop Drawings: For acoustical wall panels. Include mounting devices and details; details at panel head, base, joints, and corners; and details at ceiling, floor base, and wall intersections. Include elevations showing panel sizes and direction of fabric weave and pattern matching. Indicate panel edge and core materials.

D. Coordination Drawings: Show intersections with wall base, shelves, countertops, drawers, doors, chalk rails, electrical outlets and switches, thermostats, lighting fixtures, air outlets and inlets, speakers, sprinklers, access panels, and other adjacent work. Show operation of casework doors and drawers and doors.

E. Samples for Initial Selection: For each type of fabric facing material from acoustical wall panel manufacturer's full range.

1. Fabric: Full-width by 36 inches long. Sample from dye lot to be used for the Work, and as follows:
   a. With specified treatments applied.
   b. Show complete pattern repeat.
   c. Mark top and face of fabric.
2. Panel Edge: 12 inches long Sample showing edge profile, corner, and finish.
3. Core Material: 12 inches square Sample showing corner.
4. Mounting Device: Full-size Sample.
5. Sample Panels: No larger than 36 by 36 inches. Show joints and mounting methods.

F. Product Certificates: For each type of acoustical wall panel, signed by product manufacturer.

G. Qualification Data: For fabricator and testing agency.

H. Product Test Reports: Based on evaluation of comprehensive tests performed by a qualified testing agency, for each type of acoustical wall panel.

I. Maintenance Data: For acoustical wall panels to include in maintenance manuals. Include fabric manufacturers' written cleaning and stain-removal recommendations.

1.4 QUALITY ASSURANCE

A. Manufacturer Qualifications: A firm with commercial experience in manufacturing acoustical wall panels similar to those indicated for this Project and with a record of successful in-service performance.

B. Testing Agency Qualifications: An independent testing agency, acceptable to authorities having jurisdiction, with the commercial experience and capability to conduct the testing indicated, as documented according to ASTM E 548.

C. Source Limitations for Acoustical Wall Panels: Obtain acoustical wall panels from one source with resources to provide products of consistent quality in appearance and physical properties.

D. Fire-Test-Response Characteristics: Provide acoustical wall panels with the following surface-burning characteristics as determined by testing identical products per ASTM E 84 by UL or another testing and inspecting agency acceptable to authorities having jurisdiction. Identify acoustical wall panels with appropriate markings of applicable testing and inspecting agency.

1. Flame Spread: 25 or less.

2. Smoke Developed: 450 or less.

1.5 DELIVERY, STORAGE, AND HANDLING

A. Protect acoustical wall panels from excessive moisture when shipping, storing, and handling. Deliver in unopened bundles and store in a dry place with adequate air circulation. Do not deliver material to building until wet-work, such as concrete and plaster, has been completed and cured to a condition of equilibrium. Protect panel edges from crushing and impact.

1.6 PROJECT CONDITIONS

A. Environmental Limitations: Do not install acoustical wall panels until construction in spaces is complete and ambient temperature and humidity conditions are maintained at the levels indicated for Project when occupied for its intended use.

B. Air-Quality Limitations: Protect acoustical wall panels from exposure to airborne odors, such as tobacco smoke, and install panels under conditions free from odor contamination of ambient air.

C. Field Measurements: Verify wall surface dimensions by field measurements before fabrication and indicate measurements on Shop Drawings. Coordinate fabrication schedule with construction progress to avoid delaying the Work.

PART 2 - PRODUCTS

2.1 MANUFACTURERS

A. Basis-of-Design Manufacturers: Pico Panel by Kirei, www.kireiusa.com.

2.2 ACOUSTICAL WALL PANELS, GENERAL

A. Fabricate panels to sizes and configurations indicated; attach facing materials to cores to produce installed panels with visible surfaces fully covered and free from waves in fabric weave, wrinkles, sags, blisters, seams, adhesive, or other foreign matter.

1. Fabricate back-mounted panels in factory to exact sizes required to fit wall surfaces, based on field measurements of completed substrates indicated to receive acoustical wall panels.

2. Where square corners are indicated, tailor corners.

3. Where fabrics with directional or repeating patterns, or directional weave, are indicated, mark fabric top and attach fabric in same direction.

4. Where fabric facings with seams are indicated, fabricate invisible seams and comply with Shop Drawings for location.

B. Dimensional Tolerances of Finished Units: Plus or minus 1.6 mm for the following:

1. Thickness.
2. Edge straightness.
3. Overall length and width.
4. Squareness from corner to corner.

C. Sound-Absorption Performance: Provide acoustical wall panels with minimum noise reduction coefficient (NRC) of 0.35 minimum, as determined by testing per ASTM C 423 for mounting type specified under individual product requirements.

D. Panel Characteristics: Comply with requirements indicated in the Acoustical Wall Panel Schedule at the end of Part 3.

E. Back-Mounting Accessories: Manufacturer's standard or recommended accessories for securely mounting panels, of type and size indicated, to substrates provided; and complying with the following requirements:

1. Mechanically-Mounted Wall Panels: Z-clip hanger system at back of panels along the long edges and at wall; secured to wall with leveling mastic or shims.
2. Direct application with heavy duty adhesive at Felt Acoustical Wall Treatment only.

2.3 ACOUSTICAL WALL PANELS

A. Felt Acoustical Wall Treatment: Prefinished, factory pre-cut industrial acoustic panels.

1. Basis-of-Design Product, AWP-1: Pico Panel by Kirei; www.kireiusa.com
2. Panel Sizes: as indicated.
3. Thickness: 3/8 inch.
4. Face Type: See Drawings.
5. Color: See Drawings.

B. Surface Burning Characteristics: All panel components shall have a Class A rating, with flame spread rating of less than 25 and smoke developed less than 50 per ASTM E84 and ASTM E1264.

C. Mounting: Direct-adhered; manufacturer’s standard low-VOC adhesive.

D. Application: As indicated.

PART 3 - EXECUTION

3.1 EXAMINATION

A. Examine substrates and blocking, with Installer present, for compliance with requirements for installation tolerances and other conditions affecting acoustical wall panel performance. Proceed with installation only after unsatisfactory conditions have been corrected.

3.2 INSTALLATION

A. Install acoustical wall panels in locations indicated with vertical surfaces and edges plumb, top edges level and in alignment with other panels, and scribed to fit adjoining work accurately at borders and at penetrations. Comply with panel manufacturer's written instructions for installation of panels using type of mounting accessories indicated or, if not indicated, as recommended by manufacturer.

1. Cut units to be at least 50 percent of unit width, with facing material extended over cut edge to match uncut edge. Scribe acoustical wall panels to fit adjacent work. Butt joints tightly.

B. Construction Tolerances: As follows:

1. Variation from Plumb and Level: Plus or minus 1/16 inch.

2. Variation of Joints from Hairline: Not more than 1/16 inch.

3.3 CLEANING

A. Clip loose threads; remove pills and extraneous materials.

B. Clean panels with fabric facing, on completion of installation, to remove dust and other foreign materials according to manufacturer's written instructions.

C. Remove surplus materials, rubbish, and debris resulting from acoustical wall panel installation, on completion of the Work, and leave areas of installation in a neat and clean condition.

3.4 PROTECTION

A. Provide final protection and maintain conditions, in a manner acceptable to manufacturer and Installer that ensure acoustical wall panels are without damage or deterioration at time of Substantial Completion.

B. Replace panels that cannot be cleaned and repaired, in a manner approved by Owner’s representative, before time of Substantial Completion.

END OF SECTION

SECTION 09 91 00 - PAINTING

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

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

1.2 SUMMARY

A. This Section includes surface preparation and field painting of exposed items and surfaces, except as indicated in the Related Requirements article below.

1. Surface preparation, priming, and finish coats specified in this Section are in addition to shop priming and surface treatment specified in other Sections. Substrates include:

a. Interior substrates:

1) Gypsum wall and ceiling board.

2) Wood.

3) Hollow-metal work, factory-primed.

4) Steel, shop-primed.

2. Paint schedule for all finish colors in Project.

B. Paint exposed surfaces, except where these Specifications indicate that the surface or material is not to be painted or is to remain natural. If an item or a surface is not specifically mentioned, paint the item or surface the same as similar adjacent materials or surfaces. If a color of finish is not indicated, Architect will select from standard colors and finishes available.

1. Painting includes field painting of exposed bare and covered pipes and ducts (including color coding), hangers, exposed steel and iron supports, and surfaces of mechanical and electrical equipment that do not have a factory-applied final finish.

C. Do not paint prefinished items, concealed surfaces, finished metal surfaces, operating parts, and labels.

1. Prefinished items include the following factory-finished components:

a. Architectural woodwork, unless indicated in the drawings.

b. Acoustical wall panels.

c. Finished mechanical and electrical equipment.

d. Light fixtures.

2. Concealed surfaces include walls or ceilings in the following generally inaccessible spaces:

a. Furred areas.

b. Ceiling plenums.

c. Pipe spaces.

d. Duct shafts.

3. Finished metal surfaces include the following:

a. Anodized aluminum.

b. Stainless steel.

c. Chromium plate.

d. Copper and copper alloys.

e. Bronze and brass.

4. Operating parts include moving parts of operating equipment and the following:

a. Valve and damper operators.

b. Linkages.

c. Sensing devices.

d. Motor and fan shafts.

5. Labels: Do not paint over UL, FMG, or other code-required labels or equipment name, identification, performance rating, or nomenclature plates.

D. Products and materials in this Section have been selected for indoor chemical and pollutant source control and/ or low-VOC emitting characteristics.

E. Related Requirements:

1. Section 01 81 13 “Sustainability Requirements”.

1.3 DEFINITIONS

A. Volatile Organic Compounds (VOCs): Compounds as defined by the U.S. Environmental Protection Agency (EPA) in 40 CFR § 51.100 (s), (1).

B. Anti-Corrosive Paints: Coatings formulated and recommended for use in preventing the corrosion of ferrous metal substrates.

1.4 SUBMITTALS

A. Product Data: For each type of product indicated.

B. Sustainable Design Submittals: Refer to Section 01 81 13 “Sustainability Requirements”.

C. Samples for Initial Selection:

1. For each type of topcoat product indicated.

D. Samples for Verification: For each type of paint system and in 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.

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.

1.5 MAINTENANCE MATERIAL SUBMITTALS

A. Furnish extra materials, from the same product run,] that match products installed and that are packaged with protective covering for storage and identified with labels describing contents.

1. Paint: 5 percent, but not less than 1 gal. (3.8 L) of each material and color applied.

1.6 DELIVERY, STORAGE, AND HANDLING

A. Store materials not in use in tightly covered containers in well-ventilated areas with ambient temperatures continuously maintained at not less than 45 deg F.

1. Maintain containers in clean condition, free of foreign materials and residue.

2. Remove rags and waste from storage areas daily.

1.7 FIELD CONDITIONS

A. Apply paints only when temperature of surfaces to be painted and ambient air temperatures are between 50 and 95 deg F.

B. Do not apply paints when relative humidity exceeds 85 percent; at temperatures of less than 5 deg F above the dew point; or to damp or wet surfaces.

C. Do not apply exterior coatings in snow, rain, fog, or mist.

PART 2 - PRODUCTS

2.1 MANUFACTURERS

A. Basis-of-Design Manufacturer: Sherwin-Williams Co., The; www.sherwin-williams.com.

B. Other Approved Manufacturers:

1. Benjamin Moore and Co.; www.benjaminmoore.com.

2. PPG Industries, Inc.; www.ppg.com.

3. Rodda Paint Co.; www.roddapaint.com.

4. Miller Paint Co. www.millerpaint.com.

2.2 PAINT MATERIALS, GENERAL

A. Material Compatibility: Provide block fillers, primers, and finish-coat materials that are compatible with one another and with the substrates indicated under conditions of service and application, as demonstrated by manufacturer based on testing and field experience.

B. Material Quality: Provide manufacturer's best-quality paint material of the various coating types specified that are factory formulated and recommended by manufacturer for application indicated. Paint-material containers not displaying manufacturer's product identification will not be acceptable.

C. Interior Paints, Primers and Sealers: Comply with low/ no VOC requirements in Section 01 81 13 “Sustainability Requirements”.

D. Chemical Components of Interior Paints and Coatings: Provide products that comply with the following limits for VOC content when calculated according to 40 CFR 59, Subpart D (EPA Method 24) and the following chemical restrictions.

1. The following chemicals shall not be used as an ingredient in any of the paints or coatings applied indoors and on-site:

a. Aromatic Compounds: The product must contain no more than 1.0% by weight of the sum total of aromatic compounds.

b. Halomethanes: Methylene Chloride.

c. Chlorinated Ethanes: 1,1,1-trichloroethane.

d. Aromatic Solvents: Benzene, Toluene (methylbenzene), Ethylbenzene.

e. Chlorinated Ethylenes: Vinyl Chloride.

f. Polynuclear Aromatics: Naphthalene.

g. Chlorobenzenes: 1,2-dichlorobenzene.

h. Phthalate Esters: di (2-ethylhexyl) phthalate, butyl benzyl phthalate, di-n-butyl phthalate, di-n-octyl phthalate, diethyl phthalate, dimethyl phthalate.

i. Miscellaneous Semi-Volatile Organics: Isophorone.Metals and their compounds: Antimony, Cadmium, Hexavalent Chromium, Lead, Mercury.

j. Preservatives (Anti-Fouling Agents): Formaldehyde.

k. Ketones: Methyl ethyl ketone, Methyl isobutyl Ketone.

l. Miscellaneous Volatile Organics: Acrolein, Acrylonitrile.

2.3 PREPARATORY COATS

A. Concrete Unit Masonry Block Filler: High-performance latex block filler of finish coat manufacturer and recommended in writing by manufacturer for use with finish coat and on substrate indicated.

B. Interior Primer: Interior latex-based or alkyd primer of finish coat manufacturer and recommended in writing by manufacturer for use with finish coat and on substrate indicated.

1. Ferrous-Metal Substrates: Quick drying, rust-inhibitive metal primer.

2. Zinc-Coated Metal Substrates: Galvanized metal primer.

3. Where manufacturer does not recommend a separate primer formulation on substrate indicated, use paint specified for finish coat.

PART 3 - EXECUTION

3.1 APPLICATION

A. Comply with procedures specified in PDCA P4 for inspection and acceptance of surfaces to be painted.

B. Coordination of Work: Review other Sections in which primers are provided to ensure compatibility of the total system for various substrates. On request, furnish information on characteristics of finish materials to ensure use of compatible primers.

C. Remove hardware and hardware accessories, plates, machined surfaces, lighting fixtures, and similar items already installed that are not to be painted. If removal is impractical or impossible because of size or weight of the item, provide surface-applied protection before surface preparation and painting.

1. After completing painting operations in each space or area, reinstall items removed using workers skilled in the trades involved.

D. Surface Preparation: Clean and prepare surfaces to be painted according to manufacturer's written instructions for each particular substrate condition and as specified.

1. Provide barrier coats over incompatible primers or remove and reprime.

2. Cementitious Materials: Remove efflorescence, chalk, dust, dirt, grease, oils, and release agents. Roughen as required to remove glaze. If hardeners or sealers have been used to improve curing, use mechanical methods of surface preparation.

3. Wood: Clean surfaces of dirt, oil, and other foreign substances with scrapers, mineral spirits, and sandpaper, as required. Sand surfaces exposed to view smooth and dust off.

a. Scrape and clean small, dry, seasoned knots, and apply a thin coat of white shellac or other recommended knot sealer before applying primer. After priming, fill holes

and imperfections in finish surfaces with putty or plastic wood filler. Sand smooth when dried.

b. Prime, stain, or seal wood to be painted immediately on delivery. Prime edges, ends, faces, undersides, and back sides of wood, including cabinets, counters, cases, and paneling.

c. If transparent finish is required, backprime with spar varnish.

d. Backprime paneling on interior partitions where masonry, plaster, or other wet wall construction occurs on back side.

e. Seal tops, bottoms, and cutouts of unprimed wood doors with a heavy coat of varnish or sealer immediately on delivery.

4. Ferrous Metals: Clean ungalvanized ferrous-metal surfaces that have not been shop coated; remove oil, grease, dirt, loose mill scale, and other foreign substances. Use solvent or mechanical cleaning methods that comply with SSPC's recommendations.

a. Blast steel surfaces clean as recommended by paint system manufacturer and according to SSPC-SP 6/NACE No. 3, SSPC-SP 10/NACE No. 2.

b. Treat bare and sandblasted or pickled clean metal with a metal treatment wash coat before priming.

c. Touch up bare areas and shop-applied prime coats that have been damaged. Wire-brush, clean with solvents recommended by paint manufacturer, and touch up with same primer as the shop coat.

5. Galvanized Surfaces: Clean galvanized surfaces with nonpetroleum-based solvents so surface is free of oil and surface contaminants. Remove pretreatment from galvanized sheet metal fabricated from coil stock by mechanical methods.

E. Material Preparation:

1. Maintain containers used in mixing and applying paint in a clean condition, free of foreign materials and residue.

2. Stir material before application to produce a mixture of uniform density. Stir as required during application. Do not stir surface film into material. If necessary, remove surface film and strain material before using.

F. Exposed Surfaces: Include areas visible when permanent or built-in fixtures, grilles, convector covers, covers for finned-tube radiation, and similar components are in place. Extend coatings in these areas, as required, to maintain system integrity and provide desired protection.

1. Paint surfaces behind movable equipment and furniture the same as similar exposed surfaces. Before final installation of equipment, paint surfaces behind permanently fixed equipment or furniture with prime coat only.

2. Paint interior surfaces of ducts with a flat, nonspecular black paint where visible through registers or grilles.

3. Paint back sides of access panels and removable or hinged covers to match exposed surfaces.

4. Finish interior of wall and base cabinets and similar field-finished casework to match exterior.

G. Sand lightly between each succeeding enamel or varnish coat.

H. Scheduling Painting: Apply first coat to surfaces that have been cleaned, pretreated, or otherwise prepared for painting as soon as practicable after preparation and before subsequent surface deterioration.

1. Omit primer over metal surfaces that have been shop primed and touchup painted.

2. If undercoats, stains, or other conditions show through final coat of paint, apply additional coats until paint film is of uniform finish, color, and appearance.

I. Application Procedures: Apply paints and coatings by brush, roller, spray, or other applicators according to manufacturer's written instructions.

J. Minimum Coating Thickness: Apply paint materials no thinner than manufacturer's recommended spreading rate. Provide total dry film thickness of the entire system as recommended by manufacturer.

K. Mechanical and Electrical Work: Painting of mechanical and electrical work is limited to items exposed in equipment rooms and occupied spaces.

L. Prime Coats: Before applying finish coats, apply a prime coat, as recommended by manufacturer, to material that is required to be painted or finished and that has not been prime coated by others. Recoat 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.

M. Pigmented (Opaque) Finishes: Completely cover surfaces as necessary to provide a smooth, opaque surface of uniform finish, color, appearance, and coverage. Cloudiness, spotting, holidays, laps, brush marks, runs, sags, ropiness, or other surface imperfections will not be acceptable.

N. Transparent (Clear) Finishes: Use multiple coats to produce a glass-smooth surface film of even luster. Provide a finish free of laps, runs, cloudiness, color irregularity, brush marks, nail holes, or other surface imperfections.

3.2 CLEANING AND PROTECTING

A. At the end of each workday, remove empty cans, rags, rubbish, and other discarded paint materials from Project site.

B. Protect work of other trades, whether being painted or not, against damage from painting. Correct damage by cleaning, repairing or replacing, and repainting, as approved by Architect.

C. Provide "Wet Paint" signs to protect newly painted finishes. After completing painting operations, remove temporary protective wrappings provided by others to protect their work.

1. After work of other trades is complete, touch up and restore damaged or defaced painted surfaces. Comply with procedures specified in PDCA P1.

3.3 INTERIOR PAINT SYSTEM SCHEDULE

A. Painting Fire Suppression, Plumbing, HVAC, Electrical, Communication, and Electronic Safety and Security Work:

1. Paint the following work where exposed to view, with paint compatible with substrate:

a. Plywood backing.

b. Uninsulated metal piping.

c. Uninsulated plastic piping.

d. Pipe hangers and supports.

e. Metal conduit.

f. Plastic conduit.

g. Tanks that do not have factory-applied final finishes.

B. Exposed Structure, Ceilings: Where scheduled to be painted.

1. System: One coat modified acrylic dryfall.

2. Verify substrate and acceptable product.

C. Interior Steel Fabrications and Steel Doors and Frames (Factory- or Shop-Primed):

1. System: Two coats, water-based alkyd enamel finish.

2. Sheen: Semi-gloss.

D. Gypsum Board Substrates:

1. Acrylic Latex System, institutional low-odor/ -VOC.

a. Prime/Sealer Coat: Latex, interior.

b. Intermediate Coat: Latex, interior, matching topcoat.

c. Topcoat: Latex, interior.

2. Sheen:

a. Walls: Eggshell.

b. Ceilings: Flat.

E. Gypsum Board Substrates: Moisture-resistant finish:

1. System:

a. Prime Coat: Acrylic, interior.

b. Intermediate Coat: Match topcoat.

c. Topcoat: Waterborne epoxy coating, interior.

2. Sheen: Semi-gloss.

3. Applications: At janitor, restrooms, kitchen, bar, and butcher area.

F. Gypsum Board: Provide the following finish system over interior gypsum board surfaces:

1. Acrylic Latex System:

a. Primer: As recommended by top-coat manufacturer.

b. Top-Coat: Abuse-resistive latex.

1) Approved Products:

a) Ultra Spec SCUFF-X by Benjamin Moore and Co.; www.benjaminmoore.com.

b) ProMar 200 HP Zero V.O.C. Interior Latex by Sherwin-Williams Co., The; www.sherwin-williams.com.

2. Application: Market, seating area, hallways, and office, as indicated.

G. Wood Substrates:

1. Latex over Latex Primer System:

a. Prime Coat: Primer, latex, for interior wood.

b. Intermediate Coat: Latex, interior, matching topcoat.

c. Topcoat: Latex, interior.

2. Sheen: Semi-gloss.

3.4 COLOR SCHEDULE

A. Coordinate finish colors with systems indicated in other Sections.

B. Basis-of-Design Manufacturer is for color only. Provide color match where different paint manufacturer is used.

C. Where surfaces are scheduled for primer only, provide primer indicated for substrate in systems listed above.

No.	Color	Manufacturer	Application
PC-1	As selected by Architect	SW	General gypsum board wall and ceiling paint, or as indicated
PC-2	As selected by Architect	SW	General gypsum board wall paint, or as indicated
PC-3	As selected by Architect	SW	General gypsum board wall paint, or as indicated

END OF SECTION

SECTION 10 11 00 - VISUAL DISPLAY UNITS

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

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

1.2 SUMMARY

A. Section Includes:

1. Magnetic markerboard (MB-1).

B. Related Requirements:

1. Section 09 22 16 “Non-Structural Metal Framing” for coordination with blocking.

1.3 SUBMITTALS

A. Product Data: For each type of product.

1. Include construction details, material descriptions, dimensions of individual components and profiles, finishes, and accessories for visual display units.

B. Shop Drawings: For visual display units.

1. Include plans, elevations, sections, details, and attachment to other work.
2. Show locations and layout of special-purpose graphics.
3. Include sections of typical trim members.

C. Samples for Initial Selection: For each type of visual display unit indicated, for units with factory-applied color finishes, and as follows:

1. Samples of facings for each visual display panel type, indicating color and texture.
2. Include accessory Samples to verify color selected.

D. Samples for Verification: For each type of visual display unit indicated.

1. Visual Display Panel: Not less than 8-1/2 by 11 inches, with facing, core, and backing indicated for final Work. Include one panel for each type, color, and texture required.
2. Trim: 6-inch-long sections of each trim profile.
3. Display Rail: 6-inch-long section of each type.
4. Rail Support System: 6-inch-long sections.
5. Accessories: Full-size Sample of each type of accessory.

E. Product Schedule: For visual display units. Use same designations indicated on Drawings.

F. Qualification Data: For qualified Installer.

G. Sample Warranties: For special warranties.

H. Operation and Maintenance Data: For visual display units to include in maintenance manuals.

1.4 QUALITY ASSURANCE

A. Installer Qualifications: An entity that employs installers and supervisors who are trained and approved by manufacturer.

1.5 DELIVERY, STORAGE, AND HANDLING

A. Deliver factory-fabricated visual display units completely assembled in one piece. If dimensions exceed maximum manufactured unit size, or if unit size is impracticable to ship in one piece, provide two or more pieces with joints in locations indicated on approved Shop Drawings.

1.6 PROJECT CONDITIONS

A. Environmental Limitations: Do not deliver or install visual display units until spaces are enclosed and weathertight, wet-work in spaces is complete and dry, work above ceilings is complete, and temporary HVAC system is operating and maintaining ambient temperature and humidity conditions at occupancy levels during the remainder of the construction period.

B. Field Measurements: Verify actual dimensions of construction contiguous with visual display units by field measurements before fabrication.

1. Allow for trimming and fitting where taking field measurements before fabrication might delay the Work.

1.7 WARRANTY

A. Special Warranty for Porcelain-Enamel Face Sheets: Manufacturer agrees to repair or replace porcelain-enamel face sheets that fail in materials or workmanship within specified warranty period.

1. Failures include, but are not limited to, the following:

a. Surfaces lose original writing and erasing qualities.

b. Surfaces exhibit crazing, cracking, or flaking.

2. Warranty Period: Life of the building.

B. Special Warranty for Glass Markerboards: Manufacturer agrees to repair or replace glass markerboards that fail in materials or workmanship within specified warranty period.

1. Failures include, but are not limited to, the following:

a. Surfaces lose original writing and erasing qualities.

b. Surfaces exhibit chipping, cracking or deterioration of paint coating.

2. Warranty Period: Ten years.

PART 2 - PRODUCTS

2.1 PERFORMANCE REQUIREMENTS

A. Surface-Burning Characteristics: Comply with ASTM E84; testing by a qualified testing agency. Identify products with appropriate markings of applicable testing agency.

1. Flame-Spread Index: 25 or less.

2. Smoke-Developed Index: 450 or less.

2.2 MANUFACTURERS

A. Source Limitations: Obtain each type of visual display unit from single source from single manufacturer.

2.3 MAGNETIC WRITABLE SURFACES

A. Magnetic White Board, MB-1:

1. Basis-of-Design Product: Sans 2420, Sans Collection Frameless Whiteboards by PolyVisions Corp.; www.polyvision.com.
2. Size:1185 mm x 2420 mm / 47 in. x 95 in.
3. Thickness: 13 mm / 0.51 in.
4. Color: “Arctic White Gloss”.
5. Mounting Method: As recommended by the manufacturer for substrate.

B. Application: Office Area, as indicated in Drawings.

2.4 MATERIALS

A. Porcelain-Enamel Face Sheet: PEI-1002, with face sheet manufacturer's standard two- or three-coat process.

B. Extruded Aluminum: ASTM B221, Alloy 6063.

2.5 GENERAL FINISH REQUIREMENTS

A. Comply with NAAMM's "Metal Finishes Manual for Architectural and Metal Products" for recommendations for applying and designating finishes.

B. Protect mechanical finishes on exposed surfaces from damage by applying a strippable, temporary protective covering before shipping.

C. Appearance of Finished Work: Noticeable variations in same piece are unacceptable. Variations in appearance of adjoining components are acceptable if they are within the range of approved Samples and are assembled or installed to minimize contrast.

PART 3 - EXECUTION

3.1 EXAMINATION

A. Examine substrates and conditions, with Installer present, for compliance with requirements for installation tolerances, surface conditions of wall, and other conditions affecting performance of the Work.

B. Examine roughing-in for electrical power systems to verify actual locations of connections before installation of motorized, sliding visual display units.

C. Examine walls and partitions for proper preparation and backing for visual display units.

D. Examine walls and partitions for suitable framing depth where sliding visual display units will be installed.

E. Proceed with installation only after unsatisfactory conditions have been corrected.

3.2 PREPARATION

A. Comply with manufacturer's written instructions for surface preparation.

B. Clean substrates of substances, such as dirt, mold, and mildew, that could impair the performance of and affect the smooth, finished surfaces of visual display boards.

C. Prepare surfaces to achieve a smooth, dry, clean surface free of flaking, unsound coatings, cracks, defects, projections, depressions, and substances that will impair bond between visual display units and wall surfaces.

D. Prime wall surfaces indicated to receive visual display units and as recommended in writing by primer/sealer manufacturer and visual display unit manufacturer.

E. Prepare recesses for sliding visual display units as required by type and size of unit.

3.3 INSTALLATION

A. General: Install visual display surfaces in locations and at mounting heights indicated on Drawings, or if not indicated, at heights indicated below. Keep perimeter lines straight, level, and plumb. Provide grounds, clips, backing materials, adhesives, brackets, anchors, trim, and accessories necessary for complete installation.

B. Factory-Fabricated Visual Display Board Assemblies: Adhere to wall surfaces with fasteners or adhesive, as recommended by manufacturer.

3.4 CLEANING AND PROTECTION

A. Clean visual display units according to manufacturer's written instructions. Attach one removable cleaning instructions label to visual display unit in each room.

B. Touch up factory-applied finishes to restore damaged or soiled areas.

C. Cover and protect visual display units after installation and cleaning.

END OF SECTION

SECTION 10 14 00 - SIGNAGE

PART 1 - GENERAL

1.1 SUMMARY

A. Section Includes:

1. Code-required room identification signs.

B. Related Requirements:

1. Division 26 “Electrical” for lighted egress signage and illuminated panel signage at entry.

1.2 SUBMITTALS

A. General: Ensure that requests for substitution have been provided to the Architect and that the Architect has provided clear approval of the proposed substitution products prior to order placement, delivery and installation of products. Refer to Section 01 25 00 “Product Substitution Procedures”.

B. Product Data: For information only, include manufacturer’s printed specifications, anchorage details and installation, and maintenance instructions for products to be used in the fabrication of signage and graphics work, and installation instructions for each type of sign and graphic unit.

C. Shop Drawings: For manufacturing including plans, elevations, sections, details, fabrication and erection of signs and graphic work at not less than 1:20 scale. Show jointage, anchorage, accessory items, and finishes. Submit full-scale drawings of typical sign faces showing copy layout. Half-scale drawings shall be sufficient for sign faces 1 m by 1 m and larger.

D. Samples for Initial Selection: For each type of sign indicated.

1. Aluminum: Samples of each finish type and color, on 150 mm long sections of extrusions and not less than 100 mm squares of sheet or plate showing the full range of colors available

2. Acrylic and Polycarbonate Sheet: Samples of each paint and silkscreen ink color painted onto the required thickness of material.

E. For identification purposes, mark samples with the appropriate sign type application.

F. Manufacturer Certificates: Signed by manufacturers certifying that they comply with requirements.

1.3 CLOSEOUT SUBMITTALS

A. Maintenance Data.

1.4 QUALITY ASSURANCE

A. Installer Qualifications.

1.5 WARRANTY

A. Special Warranty: Manufacturer Warranty Period of Five years.

PART 2 - PRODUCTS

2.1 PERFORMANCE REQUIREMENTS

A. Thermal Movements: For exterior signs, allow for thermal movements from ambient and surface temperature changes.

B. Accessibility Standard: Comply with applicable provisions in the U.S. Architectural & Transportation Barriers Compliance Board's ADA-ABA Accessibility Guidelines for Buildings and Facilities and ICC A117.1 for signs.

2.2 SIGNS

A. Panel Sign, General: Sign with smooth, uniform surfaces; with message and characters having uniform faces, sharp corners, and precisely formed lines and profiles. Provide signs as indicated in Drawings.

B. Room-Identification Sign: Sign with smooth, uniform surfaces; with message and characters having uniform faces, sharp corners, and precisely formed lines and profiles. Provide signs as indicated by architect.

C. Accessibility Signage.

D. Languages: Signage shall be bilingual in English and Ethiopian, as indicated on Drawings.

2.3 SIGNAGE MATERIALS

A. Refer to Drawings for signage requirements. Specifications provide guidelines for materials and other requirements.

B. Aluminum Sheet and Plate: ASTM B209, alloy and temper recommended by aluminum producer and finisher for type of use and finish indicated.

C. Aluminum Extrusions: ASTM B221, alloy and temper recommended by aluminum producer and finisher for type of use and finish indicated.

D. Steel Materials:

1. Metallic-Coated Steel Sheet: ASTM A653, G90 coating, either commercial or forming steel.

2. Steel Sheet: Uncoated, cold-rolled, ASTM A1008, commercial steel, Type B, exposed electrolytic zinc-coated, ASTM A879, Coating Designation 08Z, with steel-sheet substrate according to ASTM A1008, commercial steel, exposed].

3. Steel Members Fabricated from Plate or Bar Stock: ASTM A529 or ASTM A572, 42,000-psi minimum yield strength.

E. Acrylic Sheet: ASTM D4802, category as standard with manufacturer for each sign, Type UVF (UV filtering).

F. Fiberglass Sheet: Multiple laminations of glass-fiber-reinforced polyester resin with UV-light stable, colorfast, nonfading, weather- and stain-resistant, colored polyester gel coat, and with manufacturer's standard finish.

G. PVC Sheet: Manufacturer's standard, UV-light stable, PVC plastic.

H. Vinyl Film: UV-resistant vinyl film of nominal thickness indicated, with pressure-sensitive, permanent adhesive on back; die cut to form characters or images as indicated and suitable for exterior applications.

I. Paints and Coatings for Sheet Materials: Inks, dyes, and paints that are recommended by manufacturer for optimum adherence to surface and are UV and water resistant for colors and exposure indicated.

2.4 ACCESSORIES

A. Fasteners and Anchors: Manufacturer's standard as required for secure anchorage of signage, noncorrosive and compatible with each material joined.

B. Adhesive: As recommended by sign manufacturer.

C. Two-Face Tape: Manufacturer's standard high-bond, foam-core tape, with adhesive on both sides.

D. Magnetic Tape: Manufacturer's standard magnetic tape with adhesive on one side.

E. Bituminous Paint: Cold-applied asphalt emulsion complying with ASTM D1187.

2.5 FABRICATION

A. General: Provide manufacturer's standard sign assemblies according to requirements indicated.

B. Surface-Engraved Graphics: Machine engrave characters and other graphic devices into panel surface indicated to produce precisely formed copy, incised to uniform depth.

C. Subsurface-Applied Graphics: Apply graphics to back face of clear face-sheet material to produce precisely formed image. Image shall be free of rough edges.

D. Shop- and Subsurface-Applied Vinyl: Align vinyl film in final position and apply to surface. Firmly press film from the middle outward to obtain good bond without blisters or fishmouths.

E. Brackets: Fabricate brackets, fittings, and hardware for bracket-mounted signs to suit sign construction and mounting conditions indicated. Modify manufacturer's standard brackets as required.

2.6 GENERAL FINISH REQUIREMENTS

A. Refer to Drawings for signage finishes. Specifications provide guidelines for finishes and other requirements.

B. Organic, Anodic, and Chemically Produced Finishes: Apply to formed metal after fabrication but before applying contrasting polished finishes on raised features unless otherwise indicated.

2.7 ALUMINUM FINISHES

A. Clear Anodic Finish: AAMA 611, Class I, 0.018 mm or thicker.

B. Baked-Enamel or Powder-Coat Finish: AAMA 2603 except with a minimum dry film thickness of 1.5 mils. Comply with coating manufacturer's written instructions for cleaning, conversion coating, and applying and baking finish.

2.8 METALLIC-COATED STEEL FINISHES

A. Factory Prime Finish: After cleaning and pretreating, apply an air-dried primer compatible with the organic coating to be applied over it.

B. Baked-Enamel or Powder-Coat Finish: After cleaning and pretreating, apply manufacturer's standard two-coat, baked-on finish consisting of prime coat and thermosetting topcoat to a minimum dry film thickness of 2 mils.

2.9 STEEL FINISHES

A. Factory Prime Finish: After surface preparation and pretreatment, apply manufacturer's standard, fast-curing, lead- and chromate-free, universal primer.

B. Baked-Enamel or Powder-Coat Finish: After cleaning and pretreating, apply manufacturer's standard two-coat, baked-on finish consisting of prime coat and thermosetting topcoat to a minimum dry film thickness of 2 mils.

PART 3 - EXECUTION

3.1 INSTALLATION

A. General: Install signs using mounting methods indicated and according to manufacturer's written instructions.

B. Room-Identification Signs and Other Accessible Signage: Install in locations on walls as indicated and according to accessibility standard.

END OF SECTION

SECTION 10 26 00 - WALL PROTECTION

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

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

1.2 SUMMARY

A. Section Includes:

1. Corner guards (CG-1).

B. Related Requirements:

1. Section 01 81 13 “Sustainability Requirements”.

1.3 SUBMITTALS

A. Product Data: For each type of product.

1. Include construction details, material descriptions, impact strength, dimensions of individual components and profiles, and finishes.

B. Sustainable Design Submittals: Refer to Section 01 81 13 “Sustainability Requirements”.

C. Shop Drawings: For each type of wall and door protection showing locations and extent.

1. Include plans, elevations, sections, and attachment details.

D. Samples for Initial Selection: For each type of impact-resistant wall-protection unit indicated, in each color and texture specified.

1. Include Samples of accent strips and accessories to verify color selection.

E. Samples for Verification: For each type of exposed finish on the following products, prepared on Samples of size indicated below:

1. Corner Guards: 12 inches long. Include example top caps.

F. Product Certificates: For each type of handrail.

G. Material Certificates: For each type of exposed plastic material.

H. Sample Warranty: For special warranty.

I. Maintenance Data: For each type of wall and door protection product to include in maintenance manuals.

1. Include recommended methods and frequency of maintenance for maintaining best condition of plastic covers under anticipated traffic and use conditions. Include precautions against using cleaning materials and methods that may be detrimental to finishes and performance.

1.4 MAINTENANCE MATERIAL SUBMITTALS

A. Furnish extra materials, from the same product run, that match products installed and that are packaged with protective covering for storage and identified with labels describing contents.

1. Corner-Guard Covers: Full-size plastic covers of maximum length equal to 2 percent of each type, color, and texture of cover installed, but no fewer than two, 48 inch long units.

2. Mounting and Accessory Components: Amounts proportional to the quantities of extra materials. Package mounting and accessory components with each extra material.

1.5 DELIVERY, STORAGE, AND HANDLING

A. Store wall and door protection in original undamaged packages and containers inside well-ventilated area protected from weather, moisture, soiling, extreme temperatures, and humidity.

1. Maintain room temperature within storage area at not less than 70 deg F during the period plastic materials are stored.

2. Keep plastic materials out of direct sunlight.

3. Store plastic wall- and door-protection components for a minimum of 72 hours, or until plastic material attains a minimum room temperature of 70 deg F.

a. Store corner-guard covers in a vertical position.

1.6 WARRANTY

A. Special Warranty: Manufacturer's standard form in which manufacturer agrees to repair or replace components of impact-resistant wall protection units that fail in materials or workmanship within specified warranty period.

1. Failures include, but are not limited to, the following:

a. Structural failures.

b. Deterioration of plastic and other materials beyond normal use.

2. Warranty Period: Five (5) years from date of Substantial Completion.

PART 2 - PRODUCTS

2.1 PERFORMANCE REQUIREMENTS

A. Surface Burning Characteristics: Comply with ASTM E84 or UL 723; testing by a qualified testing agency. Identify products with appropriate markings of applicable testing agency.

1. Flame-Spread Index: 25 or less.

2. Smoke-Developed Index: 450 or less.

2.2 MANUFACTURERS

A. Source Limitations: Obtain wall- and door-protection products of each type from single source from single manufacturer.

2.3 CORNER GUARDS, CG-1

A. Surface-Mounted, Plastic-Cover Corner Guards : Manufacturer's standard, PVC-free assembly consisting of snap-on, resilient plastic cover installed over retainer; including mounting hardware; fabricated with 90- or 135-degree turn to match wall condition.

1. Basis-of-Design Product: Korogard G900 Series Vinyl Extruded Corner Guard by Koroseal Interior Products, LLC; www.koroseal.com.

2. Height: As indicated in Drawings.

3. Wing Length: 1-1/2 inch.

4. Thickness: 0.078 inch (2 mm).

5. Color: As selected by Architect.

6. Mounting: Surface-mounted; as indicated in Drawings.

2.4 MATERIALS

A. Plastic Materials: Chemical- and stain-resistant, high-impact-resistant plastic with integral color throughout; extruded and sheet material as required, thickness as indicated.

B. Fasteners: Aluminum, nonmagnetic stainless-steel, or other noncorrosive metal screws, bolts, and other fasteners compatible with items being fastened. Use security-type fasteners where exposed to view.

C. Adhesives and Sealants: Comply with low/ no VOC requirements in Section 01 81 13 “Sustainability Requirements”.

D. Adhesive: As recommended by impact-resistant plastic wall protection manufacturer and that complies with the testing and product requirements of the California Department of Health Services' "Standard Practice for the Testing of Volatile Organic Emissions from Various Sources Using Small-Scale Environmental Chambers."

2.5 FABRICATION

A. Fabricate wall and door protection according to requirements indicated for design, performance, dimensions, and member sizes, including thicknesses of components.

B. Factory Assembly: Assemble components in factory to greatest extent possible to minimize field assembly. Disassemble only as necessary for shipping and handling.

C. Quality: Fabricate components with uniformly tight seams and joints and with exposed edges rolled. Provide surfaces free of wrinkles, chips, dents, uneven coloration, and other imperfections. Fabricate members and fittings to produce flush, smooth, and rigid hairline joints.

2.6 FINISHES

A. Protect finishes on exposed surfaces from damage by applying a strippable, temporary protective covering before shipping.

B. Appearance of Finished Work: Noticeable variations in same piece are not acceptable. Variations in appearance of adjoining components are acceptable if they are within the range of approved Samples and are assembled or installed to minimize contrast.

PART 3 - EXECUTION

3.1 EXAMINATION

A. Examine substrates and wall areas, with Installer present, for compliance with requirements for installation tolerances and other conditions affecting performance of work.

B. Examine walls to which impact-resistant wall protection will be attached for blocking, grounds, and other solid backing that have been installed in the locations required for secure attachment of support fasteners.

1. For impact-resistant wall protection units attached with adhesive or foam tape, verify compatibility with and suitability of substrates, including compatibility with existing finishes or primers.

C. Proceed with installation only after unsatisfactory conditions have been corrected.

3.2 PREPARATION

A. Complete finishing operations, including painting, before installing impact-resistant wall protection system components.

B. Before installation, clean substrate to remove dust, debris, and loose particles.

3.3 INSTALLATION

A. General: Install impact-resistant wall protection units level, plumb, and true to line without distortions. Do not use materials with chips, cracks, voids, stains, or other defects that might be visible in the finished Work.

B. Installation Quality: Install wall and door protection according to manufacturer's written instructions, level, plumb, and true to line without distortions. Do not use materials with chips, cracks, voids, stains, or other defects that might be visible in the finished Work.

C. Mounting Heights: Install wall and door protection in locations and at mounting heights indicated on Drawings.

D. Accessories: Provide splices, mounting hardware, anchors, trim, joint moldings, and other accessories required for a complete installation.

1. Provide anchoring devices to withstand imposed loads.

2. Where splices occur in horizontal runs of more than 20 feet, splice aluminum retainers and plastic covers at different locations along the run, but no closer than 12 inches.

3. Adjust end and top caps as required to ensure tight seams.

3.4 CLEANING

A. Immediately after completion of installation, clean plastic covers and accessories using a standard, ammonia-based, household cleaning agent.

B. Remove excess adhesive using methods and materials recommended in writing by manufacturer.

END OF SECTION

SECTION 10 26 23 – WALL AND DOOR PROTECTION

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

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

1.2 SUMMARY

A. Section Includes:

1. PVC Wall Cladding (PVC-1).
2. Moldings and accessories.

B. Related Requirements:

1. Section 01 81 13 “Sustainability Requirements”.
2. Section 07 92 00 “Joint Sealants”.
3. Section 09 29 00 “Gypsum Board” for panel substrate.

1.3 SUBMITTALS

A. Product Data: Product Data: Submit manufacturer’s current printed product literature, specifications, installation instructions, and field reports in accordance with Section 01330 - Submittal Procedures.

B. Sustainable Design Submittals: Refer to Section 01 81 13 “Sustainability Requirements”.

C. Shop Drawings: Submit shop drawings to indicate materials, details, and accessories in accordance with Section 01330 - Submittal Procedures including but limited to the following.
1. Submit a layout diagram indicating the location of each panel and joining method
2. Include trim types and locations and section details.

D. Samples for Initial Selection: Submit duplicate sample pieces of Altro Puraguard™ material, as well as accessory pieces in accordance with Section 01330 - Submittal Procedures .

E. Samples for Verification: For each type of wall covering and for each color, pattern, texture, and finish specified, 3 inches square in size.

F. Product Schedule: For wall coverings. Use same designations indicated on Drawings.

G. Qualification Data: For testing agency. Certified test reports showing compliance with specified performance characteristics and physical properties

H. Product Test Reports: For each wall covering, for tests performed by a qualified testing agency.

1.4 CLOSEOUT SUBMITTALS

A. Submit the following:

1. Operation and Maintenance Data: Operation and maintenance data for installed products in accordance with Division 1 Closeout Submittals (Maintenance Data and Operation Data) Section. Include methods for maintaining installed products and precautions against cleaning materials and methods detrimental to finishes and performance.
2. Warranty: Warranty documents specified herein.

1.5 QUALITY ASSURANCE

A. Installer Qualifications: Installer experienced in performing work of this section who has specialized in installation of work similar to that required for this project.

1. Training: Installer who has a min. of five years of experience installing wall covering.

B. Mock-ups: Install at project site a job mock-up using acceptable products and manufacturer approved installation methods. Obtain Owner's and Consultant's acceptance of finish color, texture and pattern, and workmanship standards.

1. Mock-Up Size: 24x24

2. Maintenance: Maintain mock-up during construction for workmanship comparison; remove and legally dispose of mock-up when no longer required.

3. Incorporation: Mock-up may be incorporated into final construction upon Owner's approval.

D. Pre-installation Meeting: Conduct pre-installation meeting to verify project requirements, substrate conditions, manufacturer's installation instructions and manufacturer's warranty requirements.

1.6 DELIVERY, STORAGE, AND HANDLING

A. Ordering: Comply with manufacturer's ordering instructions and lead time requirements to avoid construction delays.

B. Deliver, store and handle Altro Puraguard™ wall panels in accordance with Section 01610 - Basic Material Requirements.

C. Deliver materials in manufacturer's original, unopened, undamaged containers with identification labels intact.

D. Store materials protected from exposure to harmful weather conditions, at temperature and humidity conditions recommended by manufacturer.

E. Store panels in temperature controlled environments. Leave protective blue film on panel until ready to use

1.7 WASTE MANAGEMENT AND DISPOSAL

A. Deposit all packaging materials in appropriate container on site for recycling or reuse.

B. Avoid using landfill waste disposal procedures when recycling facilities are available.

C. Keep all discarded packaging away from children

1.8 PROJECT CONDITIONS

A. Temperature Requirements: If storage temperature is below 65F (18C), the Altro Puraguard wall panel must be moved to a warmer place and allowed to reach this temperature before installation. For further information, refer to current Installation Guide.

B. Maintain air temperature and structural base temperature at installation area between 65F (18C) and 80F (26C) for 48 hours before, during and 24 hours after installation.

1.9 WARRANTY

A. Project Warranty: Refer to Conditions of the Contract for project warranty provisions.

B. Manufacturer's Warranty: Submit, for Owner's acceptance, manufacturer's standard warranty document executed by authorized company official. Manufacturer's warranty is in addition to, and not a limitation of, other rights Owner may have under Contract Documents.

Note: Altro Puraguard wall covering has been manufactured by Altro to maintain performance criteria stated by manufacturer without defects.

C. Warranty Period for Altro Puraguard shall be 1 year commencing on Date of Substantial Completion. Please see current Altro Puraguard Warranty online at www.altro.com

1.10 EXTRA MATERIALS

A. Provide extra materials of product and adhesives in accordance with Section 01780 - Closeout Submittals.

B. Provide 10% extra of each color, pattern and type material required for project for maintenance use.

C. Provide 10% of extra materials in one piece and from same production run as installed materials.

D. Clearly identify each wall panel and each container of adhesive.

E. Deliver to Consultant, upon completion of the work of this section and store where directed.

PART 2 - PRODUCTS

NOTE: FOR INFORMATION ON ALTRO PURAGUARD™ WALL PROTECTION FOR COMMERCIAL KITCHENS, CONTACT ALTRO DIRECTLY TO OBTAIN INFORMATION AND ASSISTANCE

2.1 MANUFACTURERS

A. Manufacturer: Altro
1. USA: 80 Industrial Way, Wilmington MA 01887
Toll-free: 800.377.5597 Fax: 610.746.4325
E-mail: support@altro.com Web Site: www.altro.com

2.2 PERFORMANCE REQUIREMENTS

A. Fire-Test-Response Characteristics: As determined by testing identical wall coverings applied with identical adhesives to substrates according to test method indicated below by a qualified testing agency. Identify products with appropriate markings of applicable testing agency.

1. Surface-Burning Characteristics: Comply with ASTM E 84; testing by a qualified testing agency. Identify products with appropriate markings of applicable testing agency.

a. Flame-Spread Index: 25 or less.

b. Smoke-Developed Index: 50 or less.

B. Adhesives and Sealants: Comply with low/ no VOC requirements in Section 01 81 13 “Sustainability Requirements”.

2.3 PVCU WALL COVERING (FOR COMMERCIAL KITCHENS) PVC-1

A. Altro Puraguard™ is a semi-rigid PVCu panel. Altro Puraguard™ contains no plasticizers or fillers. Altro Puraguard™ is homogenous

B. Acceptable material: Altro Puraguard™ (measurements and product weights given below are approximate):

1. Salt W139: Thickness: 0.080" (2.0 mm); Panel Width: 4’ (1.22m) Panel Height 9’ (2.44m) Weight per panel: 21.05 lbs (9.5 kg)

2. Salt W135: Thickness: 0.080" (2.0 mm); Panel Width: 4’ (1.22m) Panel Height 10’ (3.05m) Weight per panel: 23.37 lbs (10.6 kg)

2.4 ACCESSORIES

A. Joint Strips:

1. 1-Part Joint Strip – [G731/30 White, 300 Barley, 301 Pepper] 10’

B. Start and Edge Trim:

1. 2-Part Start and Edge Trim – [G733/30 White, 300 Barley, 301 Pepper] 10’

C. Corners, Covers and Gasket Trims:
1. Internal/External Corner [A826/30 White, White, 300 Barley, 301 Pepper] 10’
2. External Corner Cover [A839/30 White, White, 300 Barley, 301 Pepper] 10’
3. Altrotite Gasket Trim [A840/30 White, White, 300 Barley, 301 Pepper] 10’

D. Optional Accessories:
1. Stainless Steel Corner Protector – [A861/12 Brushed Steel] Dimensions: 4’ x 3” x 3”
2. C4 Cap Strip – [C4 CAP White, 300 Barley, 301 Pepper] Length 8’2”
3. C8 Cap Strip – [C8 CAP White, 300 Barley, 301 Pepper] Length 8’2”

E. Acrylic Adhesive: For dry, climate-controlled areas, use AltroFix W157, a one-part, water-based, acrylic adhesive as recommended by manufacturers.

F. Polyurethane Adhesive: The default adhesive for most installations, suitable for wet area, non-climate-controlled areas, and non-absorbent surfaces, use AltroFix W39, a two-part resin-based polyurethane adhesive as recommended by manufacturer.

G. Spray Adhesive: For surfaces in dry climate-controlled areas and for most all absorbent and non-absorbent surfaces, use Altro W147, a versatile water-based acrylic blend spray adhesive.

H. Sanitary Sealant and Mastic Compounds and Tools:

1. Altro Sanitary Sealant – (color by architect) 10.5 oz

2.5 SOURCE QUALITY

A. Source Quality: Obtain wall products from a single manufacturer.

PART 3 - EXECUTION

3.1 MANUFACTURER’S INSTRUCTIONS

A. Compliance: Comply with manufacturer’s product data, including product technical bulletins, product catalog, installation instructions and product label instructions for installation.

3.2 EXAMINATION

A. Verification of Conditions:

1. Verify that all surfaces are smooth, level, clean, and free of irregularities that may be detrimental to proper application.

2. Commencement of installation denotes acceptance of substrate.

3. Do not begin installation until the work of all other trades, including painting, has been completed and the temperature of the rooms has been maintained within humidity and temperature requirements by adhesive manufacturer for at least 48 hours before commencing Work.

3.3 SUBSTRATE PREPARATION

A. Walls should be smooth and level. High points must be removed and low points filled with filler intended for the substrate and environmental conditions.

B. Surfaces must be permanently dry and free from all substances that may contribute to adhesive bond failure.

C. Remove loose paint and conduct an adhesive bond test with paint.

D. Exterior walls must be adequately damp-proofed and insulated.

E. Dry wall substrates should be paint ready

3.4 PREPARATION

A. All surfaces must be free from dust and cleaned prior to Altro PuraguardTM installation. The working environment must also be dust free. Failure to comply with these conditions will reduce the bond strength between the adhesive and substrate, and may cause the Altro PuraguardTM panels to de-bond.

B. All electrical switches, power points etc., should be in a first fix / installation state. All electrical equipment should only be moved or altered by a qualified electrician.

C. All plumbing should have pipe-work removed to a first fix or installation state and “tails” left protruding from the substrate. Altro PuraguardTM panels can then be drilled and slid over the pipe tails. All holes should be drilled 1/8” (3mm) oversize to allow for expansion, then sealed with Altro Sanitary Sealant. Plumbing should always be done by a qualified plumber.

D. Hot pipes and steam pipes should be insulated and a 1/8” to 1/4” (3-6mm) expansion gap should be created when installing panels around these pipes, then sealed with Sanitary Sealant.

E. All pipes, fixing bolts, etc. extending through the Altro PuraguardTM panels should have a minimum 1/8” (3mm) expansion gap and be sealed using Sanitary Sealant.

F. If fitting to door frames, these must be in place prior to installation of Altro PuraguardTM.

G. Prior to installation, it is advisable to complete any painting which comes in contact with Altro PuraguardTM, as sealant used at junctions is non-paintable.

H. Panels should be stored flat and be pre-conditioned a minimum of 24 hours in ambient temperatures similar to the prevailing operational conditions.

I. The panels must be stored on a level flat surface off the ground (risk of condensation on the panels if stored on damp surfaces). Storage on uneven surfaces could cause the panels to distort prior to installation.

J. First, check the room using a 6’ (2 m) level to ensure all walls are flat, paying particular attention to the corners, window reveals, and door entrances. These need to be inspected to ensure they are free of any debris or irregularities, which could prevent the panels from laying flat to the substrate after the adhesive has been applied and the panel installed.

3.5 INSTALLATION

A. PVC Wall Installation: Install Altro Puraguard™ in accordance with the current Altro Puraguard™ Installation Guide.

B. Handle and install wall covering in conformance with manufacturer’s installation bulletin.

C. Install wall covering to provide a proper symmetrical pattern in each area, with joints straight and true, and all panel edges concealed with appropriate molding for finished appearance; joints sealed with silicone sealant.

3.6 FIELD QUALITY REQUIREMENTS

A. Manufacturer’s Field Services: Upon Owner’s request, provide manufacturer’s field service consisting of product use recommendations and periodic site visits for inspection of product installation in accordance with manufacturer’s instructions.

1. Site Visits: min. 3.

3.7 CLEANING AND PROTECTION

Note: Once all panels and joints are installed, remove protective film and clean all surfaces down with antistatic solution or antistatic wipes. This is required as the panel may have static build up and any dust in the atmosphere will adhere to the surface of the panel.

A. Altro Puraguard™ can be cleaned with a diluted soap/detergent solution, such as Altro 44 Cleaner.

B. When cleaning the Altro Puraguard™ surface, we recommend the temperature of water does not exceed 140° F (60° C).

C. Pressure cleaning with hot water may be used with the pressure nozzle a minimum of 2 feet (600mm) away from the surface, not recommended with acrylic adhesive installations.

D. To reduce the buildup of static, cleaning the panels with an anti-static solution is recommended.

E. For scuff marks, we recommend using a cream cleaner such as Altro A859/325.

F. Remove construction debris from project site and legally dispose of debris.

G. Do not install near open heat sources (ovens, etc). Stainless steel panels should be used in such areas

END OF SECTION

SECTION 10 28 00 - RESTROOM AND CUSTODIAL ACCESSORIES

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

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

1.2 SUMMARY

A. Section Includes:

1. Restroom Accessories:
    a. Dual toilet paper dispenser (ACC-1).
    b. Recessed paper towel dispenser/ trash receptacle (ACC-2).
    c. Grab bars (ACC-3, ACC-4, and ACC-5).
    d. Recessed Sanitary Napkin Disposal (ACC-6)
    e. Surface-mounted toilet seat cover dispenser (ACC-7).
    f. Double coat hook (ACC-8).
    g. Mirror (ACC-9).
    h. Baby changing station (ACC-10).
    i. Surface-mounted automatic foam soap dispenser (ACC-11)
    j. Recessed sanitary napkin disposal (ACC-12)
2. Commercial Kitchen Accessories:
    a. Surface-mounted paper towel dispenser.
    b. Soap dispenser.
3. Custodial Accessories:
    a. Mop and broom holder.

B. Related Requirements:

1. Section 06 10 00 “Rough Carpentry” for coordination of blocking.

1.3 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. Coordinate blocking locations for accessory anchor and attachment to partitions.

C. Deliver inserts and anchoring devices set into concrete or masonry as required to prevent delaying the Work.

D. All locations to be confirmed during site walk with Owner prior to installation.

1.4 SUBMITTALS

A. Product Data: For each type of product.

1. Include construction details, material descriptions, dimensions of individual components and profiles, and finishes.
2. Include anchoring and mounting requirements, including requirements for cutouts in other work and substrate preparation.
3. Include electrical characteristics.

B. Samples: Full size, for each exposed product and for each finish specified.
1. Approved full-size Samples will be returned and may be used in the Work.

C. Product Schedule: Indicating types, quantities, sizes, and installation locations by room of each accessory required.
1. Identify locations using room designations indicated.
2. Identify accessories using designations indicated.

D. Sample Warranty: For manufacturer's special warranty.

1.5 CLOSEOUT SUBMITTALS

A. Maintenance Data: For accessories to include in maintenance manuals.

1.6 WARRANTY

A. Manufacturer's Special Warranty for Mirrors: Manufacturer agrees to repair or replace mirrors that fail in materials or workmanship within specified warranty period.
1. Failures include, but are not limited to, visible silver spoilage defects.
2. Warranty Period: 15 years from date of Substantial Completion.

PART 2 - PRODUCTS

2.1 PERFORMANCE REQUIREMENTS

A. Electrical Components, Devices, and Accessories: Listed and labeled as defined in NFPA 70, by a qualified testing agency, and marked for intended location and application.

2.2 MANUFACTURERS

A. Source Limitations: Obtain restroom and shower accessories from single source from single manufacturer for each type, except as otherwise indicated.

B. Basis-of-Design Manufacturer: Bobrick Washroom Equipment, Inc. (Bobrick); www.bobrick.com.

C. Other Approved Manufacturers:
1. Dyson; www.dyson.com.
2. Kohler Co.; us.kohler.com.
3. Rejuvenation; www.rejuvenation.com.
4. Schoolhouse Electric; www.schoolhouse.com.
5. Taymor; www.taymorusa.com.

2.3 RESTROOM ACCESSORIES

A. Dual Toilet Paper Dispenser, ACC-1:
1. Basis-of-Design Product: Model no. B-4288, ConturaSeries Surface-Mounted Multi-Roll Toilet Tissue Dispenser by Bobrick.

a. Finish: 304 Stainless Steel; Satin.

B. Recessed Paper Towel Dispenser/ Trash Receptacle, ACC-2:

1. Basis-of-Design Product: Model no. B-4369, Conturaseries Recessed Paper Towel Dispenser And Waste Receptacle By Bobrick.

a. Finish: 304 Stainless Steel; Satin.

C. Grab Bars, ACC-3:

1. Basis-of-Design Product: Model no. B-6806.99 x 36, Straight Grab Bar by Bobrick.

a. Finish: 304 Stainless Steel; Satin.

D. Grab Bars, ACC-4:

1. Basis-of-Design Product: Model no. B-6806.99 x 42, Straight Grab Bar by Bobrick.

a. Finish: 304 Stainless Steel; Satin.

E. Vertical Grab Bars, ACC-5:

1. Basis-of-Design Product: Model no. B-6806.99 x 18, Straight Grab Bar by Bobrick.

a. Finish: 304 Stainless Steel; Satin.

F. Recessed Sanitary Napkin Disposal, ACC-6:

1. Basis-of-Design Product: Model no. B-35303, Recessed sanitary napkin disposal by Bobrick.

a. Finish: 304 Stainless Steel; Satin.

G. Surface-Mounted Toilet Seat Cover Dispenser, ACC-7:

1. Basis-of-Design Product: Model no. B-221, ClassicSeries Surface Mounted Seat-Cover Dispenser by Bobrick.

a. Finish: 304 Stainless Steel; Satin.

H. Double Coat Hook, ACC-8:

1. Basis-of-Design Product: Model no. B-7672, Double Robe Hook by Bobrick.

a. Finish: 304 Stainless Steel.

I. Mirror, ACC-9:

1. Basis-of-Design Product: Model no. 596718-GLD, Isla Metal Framed Wall Mirror 36" x 24" by DesignHouse.

a. Finish: Brushed Gold - 265.

J. Baby Changing Station, ACC-10:

1. Basis-of-Design Product: Model no. KB200-SS, Horizontal Wall Mounted by Koala Kare Products, div. of Bobrick; www.koalabear.com.

a. Finish: 304 Stainless Steel; Satin.

K. Soap Dispenser, ACC-11:

1. Basis-of-Design Product: Model no. B-2013, Automatic Wall-Mounted Foam Soap Dispenser By Bobrick.

2.4 COMMERCIAL KITCHEN ACCESSORIES:

A. Surface-Mounted Paper Towel Dispenser:

1. Basis-of-Design Product: Model no. B-9262, Surface-Mounted Paper Towel Dispenser by Bobrick.
    a. Finish: Satin stainless Steel.
    b. Accessory: Manufacturer’s built-in TowelMate.

B. Soap Dispenser:
1. Basis-of-Design Product: Model no. B-40, Surface-Mounted Soap Dispenser by Bobrick.

2.5 CUSTODIAL ACCESSORIES:

A. Mop and Broom Holder:
1. Basis-of-Design Product: Model no. B-223 x 24, Mop and Broom Holder by Bobrick.
    a. Length: 24 inches.
    b. Finish: 430 Stainless Steel.

2.6 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: Provide universal keys for internal access to accessories for servicing and resupplying. Provide minimum of six keys to Owner's representative.

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.

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 instructions.

END OF SECTION

SECTION 10 43 13 - DEFIBRILLATOR CABINETS

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

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

1.2 SUMMARY

A. Section Includes:

1. Automated external defibrillator (AED) cabinets.

1.3 COORDINATION

A. Coordinate with wall framing or masonry construction for rough opening requirements.

1.4 SUBMITTALS

A. Product data: Include material descriptions and dimensions of individual components and profiles, including wiring diagrams with rough-in requirements and installation instructions.

B. Maintenance Data: For defibrillators and cabinets, to include in maintenance manuals.

C. Keys: Provide a set of four keys to Owner at time of substantial completion.

1.5 DELIVERY, STORAGE, AND HANDLING

A. Deliver, store and handle defibrillators and cabinets as recommended by manufacturer. Protect from damage.

PART 2 - PRODUCTS

2.1 DEFIBRILLATOR CABINETS

A. Basis-of-Design Product: Model No. 1425 by Activar Construction Products Group, Inc.

B. Materials, Cabinet:

1. 20-gauge, stainless steel cabinet; clear acrylic door.
2. Solid die cast, chrome-plated handle.
3. Adjustable roller catch.
4. Heavy-duty hinge.
5. AED decals.

C. Finish: Stainless steel, No. 4 finish.

D. Alarm: Manufacturer's alarm. Key-activated audible door alarm, adjustable from 85 to 120 dB. Siren to be located inside cabinet. Alarm to be wired into terminal fire alarm system for remote monitoring. Provide connection to building power with battery backup.

E. Door Locks: BHMA A156.11, E07121. Comply with Section 08 71 00 “Door Hardware.”

1. Lock cylinders and keying where noted:

PART 3 - EXECUTION

3.1 EXAMINATION

A. Examine substrates, areas, and conditions, with Installer present, for compliance with requirements for installation tolerances, clearances, service rough-ins, and other conditions affecting performance of the Work.

B. Examine walls and partitions for suitable framing depth and blocking where cabinets will be installed.

C. Proceed with installation only after unsatisfactory conditions have been corrected.

3.2 PREPARATION

A. Prepare recesses for defibrillator cabinets as required by type and size of cabinet and trim style.

3.3 INSTALLATION

A. Install AED units in cabinets immediately prior to substantial completion.

B. General: Install defibrillators in cabinets at locations and at mounting heights indicated or, if not indicated, at heights indicated below or otherwise acceptable to authorities having jurisdiction.

1. Defibrillator Cabinets, Mounting Height: 54 inches above finished floor to top of cabinet unless otherwise indicated.

C. Install and fasten defibrillator cabinets to structure, square and plumb.

3.4 ADJUSTING AND CLEANING

A. Remove temporary protective coverings and strippable films, if any, as defibrillator cabinets are installed, unless otherwise indicated in manufacturer's written installation instructions.

B. Adjust defibrillator cabinet doors to operate easily without binding. Verify that integral locking devices operate properly.

C. On completion of defibrillator cabinet installation, clean interior and exterior surfaces as recommended by manufacturer.

D. Touch up marred finishes or replace defibrillator cabinets that cannot be restored to factory-finished appearance. Use only materials and procedures recommended or furnished by defibrillator cabinet manufacturer.

E. Replace defibrillator cabinets that have been damaged or have deteriorated beyond successful repair by finish touchup or similar minor repair procedures.

END OF SECTION

SECTION 10 44 13 - FIRE PROTECTION CABINETS

PART 1 - GENERAL

1.1 SUMMARY

A. Section Includes:

1. Fire-protection cabinets for the following:

a. Portable fire extinguishers.

B. Related Requirements:

1. Section 10 44 16 “Fire Extinguishers” for extinguishers for cabinets.

1.2 ACTION SUBMITTALS

A. Product Data: For each type of product. Show door hardware, cabinet type, trim style, and panel style. Include roughing-in dimensions and details showing recessed-, or semi-recessed-mounting method and relationships of box and trim to surrounding construction.

B. Samples for Verification: For each type of exposed finish required, prepared on Samples 6 by 6 inches square.

1.3 CLOSEOUT SUBMITTALS

A. Maintenance Data: For fire-protection cabinets to include in maintenance manuals.

1.4 COORDINATION

A. Coordinate size of fire-protection cabinets to ensure that type and capacity of fire extinguishers indicated are accommodated.

B. Coordinate sizes and locations of fire-protection cabinets with wall depths.

1.5 SEQUENCING

A. Apply decals on field-painted fire-protection cabinets after painting is complete.

PART 2 - PRODUCTS

2.1 PERFORMANCE REQUIREMENTS

A. Fire-Rated Fire-Protection Cabinets: Listed and labeled to comply with requirements in ASTM E 814 for fire-resistance rating of walls where they are installed.

2.2 FIRE-PROTECTION CABINET

A. Cabinet Type: Suitable for fire extinguisher.

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

a. American Specialties, Inc.

b. Guardian Fire Equipment, Inc.

c. JL Industries.

d. Larsen.

e. Modern Metal Products, div. of Technico, Inc.

B. Cabinet Construction: Non fire-rated.

C. Cabinet Material: Steel sheet.

D. Semi-recessed Cabinet: One-piece combination trim and perimeter door frame overlapping surrounding wall surface with exposed trim face and wall return at outer edge (backbend).

1. Square-Edge Trim: 2-1/2-inch backbend depth.

E. Cabinet Trim Material: Steel sheet.

F. Door Material: Steel sheet.

G. Door Style: Flush, full acrylic with frame.

H. Door Glazing: Acrylic sheet.

1. Acrylic Sheet Color: Clear transparent acrylic sheet.

I. Door Hardware: Manufacturer's standard door-operating hardware of proper type for cabinet type, trim style, and door material and style indicated.

1. Provide recessed door pull and friction latch.

2. Provide manufacturer's standard hinge permitting door to open 180 degrees.

J. Accessories:

1. Identification: Lettering complying with authorities having jurisdiction for letter style, size, spacing, and location. Locate on cabinet.

a. Identify fire extinguisher in fire-protection cabinet with the words "FIRE EXTINGUISHER."

1) Location: Applied to cabinet door.

2) Application Process: Decals.

3) Lettering Color: As selected by Architect.

4) Orientation: Vertical.

2. Door Lock: Cam lock that allows door to be opened during emergency by pulling sharply on door handle.

K. Materials:

1. Cold-Rolled Steel: ASTM A1008/A1008M, Commercial Steel (CS), Type B.

a. Finish: Baked enamel.

b. Color: “White”.

2.3 FABRICATION

A. Fire-Protection Cabinets: Provide manufacturer's standard box (tub) with trim, frame, door, and hardware to suit cabinet type, trim style, and door style indicated.

1. Weld joints and grind smooth.

2. Provide factory-drilled mounting holes.

3. Prepare doors and frames to receive locks.

4. Install door locks at factory.

B. Cabinet Doors: Fabricate doors according to manufacturer's standards, from materials indicated and coordinated with cabinet types and trim styles.

1. Fabricate door frames with tubular stiles and rails and hollow-metal design, minimum 1/2 inch thick.

2. Miter and weld perimeter door frames.

C. Cabinet Trim: Fabricate cabinet trim in one piece with corners mitered, welded, and ground smooth.

2.4 GENERAL FINISH REQUIREMENTS

A. Comply with NAAMM's AMP 500, "Metal Finishes Manual for Architectural and Metal Products," for recommendations for applying and designating finishes.

B. Protect mechanical finishes on exposed surfaces of fire-protection cabinets from damage by applying a strippable, temporary protective covering before shipping.

C. Finish fire-protection cabinets after assembly.

D. Appearance of Finished Work: Noticeable variations in same piece are not acceptable. Variations in appearance of adjoining components are acceptable if they are within the range of approved Samples and are assembled or installed to minimize contrast.

PART 3 - EXECUTION

3.1 EXAMINATION

A. Examine walls and partitions for suitable framing depth and blocking where recessed and semi-recessed cabinets will be installed.

B. Proceed with installation only after unsatisfactory conditions have been corrected.

3.2 PREPARATION

A. Prepare recesses for recessed and semi-recessed fire-protection cabinets as required by type and size of cabinet and trim style.

3.3 INSTALLATION

A. General: Install fire-protection cabinets in locations and at mounting heights indicated

1. Fire-Protection Cabinets: 48 inches above finished floor to top of cabinet unless otherwise indicated.

B. Fire-Protection Cabinets: Fasten cabinets to structure, square and plumb.

1. Unless otherwise indicated, provide recessed fire-protection cabinets. If wall thickness is inadequate for recessed cabinets, provide semi-recessed fire-protection cabinets.

2. Provide inside latch and lock for break-glass panels.

3. Fasten mounting brackets to inside surface of fire-protection cabinets, square and plumb.

C. Identification: Apply decals at locations indicated.

3.4 ADJUSTING AND CLEANING

A. Remove temporary protective coverings and strippable films, if any, as fire-protection cabinets are installed unless otherwise indicated in manufacturer's written installation instructions.

B. Adjust fire-protection cabinet doors to operate easily without binding. Verify that integral locking devices operate properly.

C. On completion of fire-protection cabinet installation, clean interior and exterior surfaces as recommended by manufacturer.

D. Touch up marred finishes or, replace fire-protection cabinets that cannot be restored to factory-finished appearance. Use only materials and procedures recommended or furnished by fire-protection cabinet and mounting bracket manufacturers.

E. Replace fire-protection cabinets that have been damaged or have deteriorated beyond successful repair by finish touchup or similar minor repair procedures.

END OF SECTION

SECTION 10 44 16 - FIRE EXTINGUISHERS

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

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

1.2 SUMMARY

A. Section Includes:

1. Portable, hand-carried fire extinguishers and mounting brackets for fire extinguishers.

B. Related Requirements:

1. Section 104413 "Fire Protection Cabinets."

1.3 ACTION SUBMITTALS

A. Product Data: For each type of product. Include rating and classification, material descriptions, dimensions of individual components and profiles, and finishes for fire extinguisher and mounting brackets.

1.4 INFORMATIONAL SUBMITTALS

A. Warranty: Sample of special warranty.

1.5 CLOSEOUT SUBMITTALS

A. Operation and Maintenance Data: For fire extinguishers to include in maintenance manuals.

1.6 COORDINATION

A. Coordinate type and capacity of fire extinguishers with fire-protection cabinets to ensure fit and function.

1.7 WARRANTY

A. Special Warranty: Manufacturer's standard form in which manufacturer agrees to repair or replace fire extinguishers that fail in materials or workmanship within specified warranty period.

1. Failures include, but are not limited to, the following:

a. Failure of hydrostatic test according to NFPA 10 when testing interval required by NFPA 10 is within the warranty period.

b. Faulty operation of valves or release levers.

2. Warranty Period: Six (6) years from date of Substantial Completion.

PART 2 - PRODUCTS

2.1 PERFORMANCE REQUIREMENTS

A. NFPA Compliance: Fabricate and label fire extinguishers to comply with NFPA 10, "Portable Fire Extinguishers."

B. Fire Extinguishers: Listed and labeled for type, rating, and classification by an independent testing agency acceptable to authorities having jurisdiction.

2.2 PORTABLE, HAND-CARRIED FIRE EXTINGUISHERS

A. Fire Extinguishers: Type, size, and capacity for each mounting bracket indicated.

1. Instruction Labels: Include pictorial marking system complying with NFPA 10, Appendix B, and bar coding for documenting fire-extinguisher location, inspections, maintenance, and recharging.

B. Multipurpose Dry-Chemical Type: UL-rated 2-A:10:B:C, 5-lb nominal capacity, with monoammonium phosphate-based dry chemical in manufacturer's standard enameled steel or aluminum container.

2.3 MOUNTING BRACKETS

A. Mounting Brackets: Manufacturer's standard galvanized steel, designed to secure fire extinguisher to wall or structure, of sizes required for types and capacities of fire extinguishers indicated, with plated or black baked-enamel finish.

B. Identification: Lettering complying with authorities having jurisdiction for letter style, size, spacing, and location. Locate as indicated by Contracting Officer.

1. Identify bracket-mounted fire extinguishers with the words "FIRE EXTINGUISHER" in red letter decals applied to mounting surface.

a. Orientation: Vertical.

PART 3 - EXECUTION

3.1 EXAMINATION

A. Examine fire extinguishers for proper charging and tagging.

1. Remove and replace damaged, defective, or undercharged fire extinguishers.

B. Proceed with installation only after unsatisfactory conditions have been corrected.

3.2 INSTALLATION

A. General: Install fire extinguishers and mounting brackets in locations indicated and in compliance with requirements of authorities having jurisdiction.

1. Mounting Brackets: Top of fire extinguisher to be at 42 inches above finished floor.

B. Mounting Brackets: Fasten mounting brackets to surfaces, square and plumb, at locations indicated.

END OF SECTION

SECTION 10 57 23 - CLOSET AND UTILITY SHELVING

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

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

1.2 SUMMARY

A. Section Includes:

1. Wire shelving, brackets and accessories for closets.

1.3 SUBMITTALS

A. Product Data: Manufacturer's data sheets on each product to be used, including installation instructions.

B. Shop Drawings: Submit plans, elevations and perspective drawings as necessary to properly depict the design, fabrication and installation of each product specified.

C. Verification Samples: For each finish product specified, two samples representing actual product, color, and patterns.

D. Research/Evaluation Reports.

1.4 QUALITY ASSURANCE

A. Installer Qualifications: An entity that employs installers and supervisors who are trained and approved by manufacturer.

PART 2 - PRODUCTS

2.1 PERFORMANCE REQUIREMENTS

A. Fire Performance: Surface-Burning Characteristics: Comply with ASTM E84.

2.2 MANUFACTURERS

A. Source Limitations: Obtain closet and utility shelving and accessories from single source from single manufacturer for each type.

2.3 WIRE SHELVING SYSTEM

A. General: Provide complete coated wire shelving system as detailed on Drawings consisting of modular components that can be field assembled using simple hand tools.

B. Basis-of-Design Products: 7 ft.-10 ft. ShelfTrack Closet Organizer Kit by ClosetMaid LLC; www.closetmaid.com.

1. Color: “White”.

2. Size: 84 inches high by 120 inches wide by 13 inches deep at janitor closet, verify dimensions with architect.

PART 3 - EXECUTION

3.1 EXAMINATION

A. Examine walls and substrate with Installer present, for compliance with requirements for installation tolerances and other conditions affecting performance of the Work.

B. Prepare written report, endorsed by Installer, listing conditions detrimental to performance of the Work.

C. Proceed with installation only after unsatisfactory conditions have been corrected.

3.2 INSTALLATION

A. General: Install shelving system according to manufacturer's written instructions. All Work requiring wall attachment shall be securely anchored to framing or blocking as required. No work requiring attachment to walls shall be installed where no blocking is provided.

B. Bracket Spacing: Shelving shall be supported on brackets or standards no more than 8 inches from each end and no more than 30 inches apart throughout the length of the shelf.

C. Anchors: Shelving brackets shall be securely anchored to the framing and blocking. Shelving shall not be installed where no blocking is provided.

D. Install shelving level and plumb to a tolerance of 1/8 inch in 6 feet.

END OF SECTION

SECTION 11 40 00 – FOODSERVICE EQUIPMENT

PART 1 - GENERAL

1.1 SUMMARY

A. The work described in this section is to be performed by the Kitchen Equipment Contractor (K.E.C.) unless noted otherwise. The General Contractor is responsible for all work within the scope of the General Contract and for the work performed by subcontractors.

B. Provide all equipment and custom fabricated items with accessories as indicated on drawings.

C. Verify utility connection requirements, including but not limited to, drain and supply sizes, capacities, voltages, phasing and loads and compare to project drawings. Verify dimensions of equipment and space available.

D. This work includes all costs of equipment and fixtures as specified and associated freight, receiving, handling, storage, delivery and installation.

1.2 RELATED REQUIREMENTS

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

B. Plumbing Division 22 and Mechanical Division 23. Rough-in and final connections to all foodservice equipment as indicated on drawings. Division 22 and 23 to supply and install all required pipes, fittings, regulators, drain traps, steam traps, grease traps, atmospheric vents, valves, ductwork and other materials necessary to complete mechanical hook-up of food service equipment.

C. Electrical Division 26. Rough-in and final connections to all foodservice equipment as indicated on drawings. Division 26 to supply and install all required wiring, disconnects, wall switches, shunt trip breakers and other materials necessary to complete electrical hook-up of food service equipment.

1.3 SUBMITTALS

A. Consultant drawings and specifications are supplied for informational purposes only for use by the architect, engineers and bidding contractors and are not for construction purposes. It is the responsibility of the Kitchen Equipment Contractor to verify all equipment requirements and job conditions and provide submittals in accordance with the requirements below.

B. Procedure: Submit all items in electronic PDF format. The following packages shall be submitted as separate pdf files, where applicable:

1. Product Data with AutoQuotes specifications, if available
2. Plans with Wall Backing
3. Custom Stainless Fabrication Drawings
4. Walk-in Cold Storage Rooms
5. Type 1 Exhaust Hoods
6. Other Custom fabricated items

Do not combine shop drawings with product data or utility drawings. Kitchen equipment contractor is required to perform a precursory review of all shop drawings and sign/stamp the drawings prior to releasing them to the consultant for review.

C. Plans: Upon signing the Foodservice Consultant’s Electronic Media Release Form, the Consultant shall furnish electronic CADD or Revit files for use by the K.E.C. as a courtesy to

generate equipment, floor penetrations, plumbing, electrical, and mechanical plan submittals. The K.E.C. is strongly encouraged to maintain the Consultant's plan formatting, including utility schedules, and to simply review and modify information as necessary and add horizontal dimensions for all utility rough-ins. Redundant information on the plans, including more than one plumbing or electrical schedule with identical information shall not be reviewed and may be rejected at the Consultant's discretion. Elevation drawings are not required for review.

D. Wall Backing: Show all wall backing required to adequately support wall shelves, wall mount hand sinks, pot racks, pre-rinse brackets, etc. Backing shall be shown in plan and elevation views with vertical and horizontal dimensions. Wall backing is provided by the General Contractor.

E. Shop drawings: Submit dimensioned fabrication drawings for all custom fabricated equipment including plans, elevations and sections showing materials, gauges, finishes, construction methods and identification of hardware and fittings. K.E.C. shall review fabrication drawings for accuracy, require fabricator to correct errors and shall sign prior to sending to consultant for review. Shop drawings must be submitted and approved before the fabrication of custom equipment is commenced. Shop drawing plan and elevation views shall be formatted with a minimum scale of ¾" = 1'-0". Section views shall be formatted with a minimum scale of 1 ½" = 1'-0".

F. Operation and Maintenance data: Submit O & M manuals in electronic PDF format prior to completion of installation of kitchen equipment. Include parts list, operation instructions, product data, and wiring diagrams in maintenance manual. Organize equipment factories alphabetically with letter index tabs. Include a list showing warranty information for each piece of food service equipment, along with company names and telephone numbers of the service and parts agencies for all food service equipment.

G. Resubmittals: Should any of the above items require corrections and a resubmittal for follow-up review, resubmit only the affected files as outlined in item B above, including all pages per the original submittal. Partial submittal files shall be rejected for correction.

H. As-Built Plans: Include updated plans and shop drawings, updated with all relevant changes during the construction process.

1.4 SUBSTITUTIONS

A. All equipment and materials for this section shall be provided as specified and as indicated on the drawings. Substitution requests must be submitted to the Foodservice Consultant and approved prior to the bid date. Only those products deemed to be equal in quality, capacity and operation for this project will be considered.

1.5 ALTERNATES AND OPTIONAL ITEMS

A. The kitchen equipment contractor may propose cost-saving alternative manufacturers and models for consideration on a separate document from the base bid. Equipment cut sheets must be submitted with the proposed alternates in order to be considered.

B. This bid set contains optional items which are to be priced as part of the base bid but not included in the overall total.

1.6 QUALITY ASSURANCE

A. Manufacturers' qualifications: firms regularly engaged in the manufacturer of food service equipment of types, capacities and sizes required, whose products have been in satisfactory use in similar service for not less than 5 years. All products must be manufactured for commercial foodservice use and must be listed and comply with the appropriate agencies.

B. All work and materials shall conform to the rules, regulations, and health and safety regulations as set out by governing local agencies, building codes, and all other codes applying to this section to include but not limited to the following: National Sanitation Foundation, Underwriters

Laboratories, National Fire Protection Association, Air Conditioning and Refrigeration Institute, American Gas Association, and the National Electrical Code. Additionally, equipment and installation thereof must meet the approval of the local building, mechanical, health and fire departments and all local, state and national codes.

C. All work in this section shall be performed by competent tradesmen, using adequate plant facilities and good trade practices to maintain the intent of the drawings and specifications. The K.E.C. and its subcontractors must demonstrate that they have been actively engaged in the procurement and installation of foodservice equipment for a minimum of five years and must provide references upon request.

1.7 DELIVERY, STORAGE, AND HANDLING

A. Equipment shall be received and staged at K.E.C.'s warehouse until jobsite is ready to receive equipment. Store food service equipment in original containers and in location to provide adequate protection to equipment.

B. Repair damage to the building and other equipment resulting from this work. Maintain work area clear of debris, crating and packaging materials.

1.8 PROJECT CONDITIONS

A. Cover and protect equipment on job site from damage during the time of construction until final inspection. Damaged items will be replaced at no cost to the owner.

B. Repair damage to the building and other equipment resulting from this work. Maintain work area clear of debris, crating and packaging materials.

1.9 WARRANTY

A. Leave the work in perfect order at completion and guarantee parts and labor of all work for a period of one year from date of final acceptance. Provide an additional parts warranty of four years on refrigeration condensing units. Final payment shall not relieve the K.E.C. of responsibility for negligence or faulty materials or workmanship within the one year period. Upon written notice, contractor shall promptly remedy any defects and pay all expenses for any damage to their work resulting from faulty materials and/or manufacture negligence during the one year guarantee period.

PART 2 - PRODUCTS

2.1 MATERIALS

A. Stainless steel: ASTM Type 304. Provide non-magnetic sheets, free of buckles, waves, and surface imperfections. Provide No. 4 polished finish for exposed surfaces. All welds shall be ground smooth and polished to a No. 4 finish. 18 gauge or heavier stainless steel to be welded.

B. Galvanized sheet steel: ASTM A526, except ASTM A 527 for extensive forming: ASTM A525, G90 zinc coating, chemical treatment.

C. Sheet metal: ASTM A 569 hot-rolled carbon steel.

D. Stainless steel tube: ASTM A554, Type 304 with No. 4 polished finish.

E. Aluminum: ASTM B 209 sheet and plate, ASTM B 221 extrusions, 0.40-mil clear anodized finish where exposed, unless otherwise indicated.

F. Sound deadening: Heavy-bodied resinous coating, filled with granulated cork or other resilient material, compounded for permanent, non flaking adhesion to metal in 1/8"-thick-coating.

G. Sealants: ASTM C 920; Type S, Grade NS, Class 25, Use NT. Provide sealant that when fully cured and washed meets requirements of Food and Drug Administration Regulation 21 CFR 177.2600 for use in areas where it comes in contact with food.

H. Appropriate caulk/sealant colors:

Silver – Stainless steel

White or beige – FRP on wall surface contact. Match FRP color where possible

Clear – Joints between steel and wood: steel and plastic laminate; and steel and plastic

Backer rod: Closed-cell polyethylene rod stock, larger than joint width

I. Gaskets: Solid or hollow (not cellular) neoprene or PVC; light gray, minimum 40 Shore A hardness, self-adhesive or prepared for either adhesive application or mechanical anchorage.

2.2 FABRICATION OF CUSTOM METAL EQUIPMENT

A. Dish tables and drain boards: Fabricate of 16-gauge stainless steel, with exposed edges formed into 1 1/2" by 190- degree rolled rim approximately 3" high. Provide built-in pitch of 1/2" minimum. Provide 10" high backsplashes with 2" return on 45 degree angle as indicated. Construct front rim and backsplash on drain boards with continuous level plane with sink it adjoins. Support drain boards up to 36" in length by 1"-diameter stainless steel tube welded to underside of drain board and leg gusset. Support drain boards 36" and longer with legs. Cove horizontal and vertical corners with not less than 3/4" radius. Apply sound deaden to underside.

B. Framing: Mount table tops on 4" wide by 1 1/2” 14-gauge galvanized channels. Mount dish tables and drain boards on 4" wide x 1 1/2” 14-gauge stainless steel channels.

Run framework around entire perimeter of the unit, and cross brace on 30". For dishtables and drain boards, run framing from front to back at each leg location, and run additional channel lengthwise, located at center of table width and welded to leg channels. Fasten framing to underside of top surfaces with 1/4" stud welds at approximately 6" centers. Provide each stud with suitable chrome plated lock washer and cap nut and make stud lengths such that cap nut can be made up tight bringing top down snugly to framing.

C. Table Tops: Fabricate of single thickness material of no lighter than 16-gauge stainless steel, suitably reinforced with welded or separate supporting members for anchoring to bases or supporting frames, except where otherwise specified. Tops to have integrally formed splashes as required, nosings, and /or raised rims as detailed and specified, with all corners welded. Sound deaden underside of all custom fabricated stainless steel tops and sink bowls.

D. Legs and cross rails: Construct legs of 1 5/8" OD by 16-gauge stainless steel tubing, with fully enclosed stainless steel bullet shaped adjustable foot with minimum adjustment of 1" up or down without any threads showing. Weld legs to 4" high stainless steel gusset with top completely sealed by means of stainless steel plate. Weld gusset continuously to bottom of unit framing.

E. Undershelves: Fabricate as to be easily cleaned and not harbor any vermin. Shelves in fixtures with enclosed backs shall be turned up on the back and sides feathered slightly to insure a tight fit to enclosed panels. Elevated shelves are to be fabricated of 16-gauge stainless steel minimum with integral edges as specified.

F. Cabinet Bodies: Fabricate vertical members of 18-gauge stainless steel where exposed; 18-gauge galvanized steel where concealed. Reinforce bases at tops with 1 1/2” x 1 1/2” x 12-gauge galvanized angle. Hold back and ends of body 1” from walls to allow for adjustment. Extend tops and splashes tight to wall. Provide flush vertical stainless steel trim strips at sides. Interior shelves, mullions and aprons shall be set back 1” from top or as specified in drawings and shall be flush with the body of the cabinet. Weld, grind and polish all joints smooth. Cabinets on channel bases shall be set in sealant to provide vermin-proof seal.

G. Doors: 18-gauge stainless steel double pan construction with sound deaden core. Weld, grind and polish all corners smooth. Finished door thickness: 3/4”. Hinged doors shall have piano-style stainless steel hinges with stainless steel pulls. Sliding doors shall have concealed heavy

duty top track with ball bearing rollers and shall be easily removable for cleaning without the use of tools. Provide limit stops to prevent telescoping of doors. Pulls shall be flush stainless steel.

H. Drawers: Drawer pans shall be 18-gauge stainless steel with all corners coved, mounted on fabricated 16-gauge stainless steel interlocking channel supports with large size quiet ball bearing wheel suspension and stops to prevent drawers from being pulled out of fixture. Drawers shall be easily removable without use of tools. Drawer fronts shall be 18-gauge stainless steel double pan construction with sound deaden core, provided with full-width recessed flush type stainless steel pulls. Drawers shall be self-closing.

I. Custom fabricated sinks: Sink compartments shall be fabricated with a minimum of 3/4” diameter cove at all bottom and vertical corners, and sloped to drain. Sinks to be 16-gauge stainless steel unless specified otherwise.

J. Wall flashing: Standard wall flashing shall be 22-gauge stainless steel and fluted on 6” centers. Flashing shall be applied with a suitable mastic. Stainless steel “J” mold strips with hemmed edges and concealed fasteners shall be used on open outside ends. Stainless steel “T” mold with concealed fasteners shall be used between panels. Flashing shall be fabricated with 48” nominal width sheets and installed with grain running vertically with no exposed fasteners or raw edges.

K. Wastes: Waste outlets for custom sinks shall be lever-type with connected overflow, Fisher model 22309 or as specified.

L. Butt joints: Butt joints made by riveting straps under seams and then filled with solder will not be permitted or accepted.

M. Welding: Welding corners, joints, and connections shall be electrically welded and seamless, with joints invisible and welds free from pits, cracks, discolorations, and other mechanical imperfections. Welds shall be ground smooth and polished to match the original finish. Welding or soldering shall be of a non-toxic nature when used on working surfaces exposed to unpacked food.

N. Wall Shelves: Fabricate of 16-gauge stainless steel with back turned up 2”, feathered slightly to wall to ensure a tight fit. Sides and front shall be turned down 90 deg. 1 1/2” and back 1/2" at 15 degrees or as shown on plans. Angled shelf brackets shall be 14-gauge stainless steel and fastened to underside of shelves with studs and nuts. Brackets shall be spaced 48” O.C. maximum and shall be fastened to the wall through suitable wall backing or studs.

O. Sharp edges will not be accepted and shall be deburred, filed, or otherwise made smooth.

P. Metal openings and rims such as top openings for pipes shall be fitted with minimum 1/2" high raised watertight ferrules or fittings to prevent seepage.

Q. Plumbing and electrical connections: all plumbing and electrical connections and trim are to be provided and installed by the plumbing or electrical contractor.

2.3 PRE-FABRICATED WALK-IN COLD STORAGE ROOMS

A. Provide walk-in unit manufactured for food service use, per Nor-Lake Quote #NL2588700JL-A. Overall size: 8’-0” long x 6’-0” wide x 8’-3-5/8” high

1. Operating temperature

a. Cooler: + 35 degrees F

B. Construction

a. Prefabricated modular construction, with 3/8” radius at all corners and T panels. Panel cores shall be UL listed, Class 1 fire rated, polyurethane foam, using non CFC propellant.

b. Walls: 4” foamed-in-place urethane NSF wall panels. R-25 for cooler. Connect to floor and ceiling panels with cam-locks. Finish shall be 26 guage corrosion resistant stucco embossed coated steel.

c. Ceiling: 4” foamed-in-place polyurethane NSF panels. R-25. Finish shall be 26 guage corrosion resistant stucco embossed coated steel interior, smooth galvanized exterior.

d. Cooler Floor: supplied with NSF listed vinyl sealer. Finished floor material and cove base by general contractor to match kitchen floor.

e. Cooler door: 30” by 78”, self-closing flush design framed with 3-sided 4” high-density urethane with stucco embossed steel interior and exterior. Provide two rows of NSF approved, neoprene extruded closed cell gasket adhered to magnetic liner on the top and sides, 30” high x .10” aluminum diamond tread plate on interior and exterior, heater wire, double sweep gasket, cam lift hinges, NL9800 deadbolt key/padlock handle w/ inside release, magnetic gasket, (1) 1094 closer x, (1) LED vapor proof light, NL508 combination digital thermometer and switch w/pilot light.

f. Parts

1) LED light fixtures

2) Normal Chase Doors strip curtains

3) Seismic restraints and engineering

4) (Lot) Vertical and horizontal closure panels to match walk-in finish

2.4 REFRIGERATION EQUIPMENT

A. General: Provide refrigeration condensing units of size and capacities as indicated, consisting of compressors, condenser, receivers, motors, mounting bases, vibration isolators, refrigeration components, safety devices, electrical controls, refrigerant, and protective controls, all factory assembled and tested. Provide refrigeration lines as required to connect all components.

B. Refrigerant: Charge units with refrigerant. Charge units with non-CFC refrigerant, R-454C. Provide quick-connect-type piping connections to receive piping from evaporator coils.

C. Weatherproof shroud: Provide compressor shroud(s) and appropriate controls for units mounted on the roof above the kitchen. Advise the General Contractor and Architect of necessary clearances and connections for the compressors.

D. Refrigeration piping: Type ACR copper tubing, hard temper with wrought fittings and silver solder joints. Insulate suction lines with 1/2" premolded foamed plastic insulation.

E. Refrigerant piping installation: Tubing shall be installed in a neat workmanlike manner with horizontal runs sloped towards toward the compressor at a rate of 1" per 20'. All lines shall be supported at intervals of not more than 8' and suitably anchored. Rubber grommets shall be used between tubing and clamps to prevent line chafing. Where vertical risers of more than 5 feet occur in a suction line, the riser shall be trapped at the bottom.

F. Arrange the piping so that normal inspection and servicing of the compressor and other equipment is not hindered. Do not obstruct the view of the crankcase oil sight glass or run piping so that it interferes with removal of the compressor or other components.

G. Electrical wiring: Electrical contractor is to provide required wiring between electrical rough-in and refrigeration units for proper operation.

H. Plumbing piping: Plumbing contractor is to provide required water and drain piping between plumbing rough-in and refrigeration units for proper operation.

I. Refrigeration specialties: Provide required refrigerant dryer, liquid line solenoid valve, suction line filter and expansion valve. Provide pump down control circuit consisting of thermostat and solenoid valve.

2.5 ITEMIZED EQUIPMENT

ITEM 1: RETAIL SHELVING 1 lot required
Provided by Owner / Not in Contract

ITEM 2: CASHIER COUNTER 1 required
Provided by General Contractor / Not in Contract

ITEM 3: Point of Sale System 1 required
Provided by Owner / Not in Contract

ITEM 4: DISPLAY CASE, REFRIGERATED 1 required
Manufacturer: True Manufacturing
Model: GDM-49-HC~TSL01
1. Verify exterior color with owner.

ITEM 5: SPARE NUMBER

ITEM 6: SPARE NUMBER

ITEM 7: MEAT CUTTING TABLE 1 required
Manufacturer: Pacific Stainless Products
Model: MES303024FS

ITEM 8: MEAT SAW 1 required
Provided by Owner / Not in Contract

ITEM 9: MEAT CUTTING TABLE 1 required
Manufacturer: John Boos
Model: ST6R5-3048SBK

ITEM 9.1: SHELF, WALL MOUNT 1 required
Manufacturer: John Boos
Model: BHS1248

ITEM 10: MEAT LUG CART 1 required
Manufacturer: SPG International
Model: ALR-1
1. ML-7 lug

ITEM 11: MEAT GRINDER 1 required
Provided by Owner / Not in Contract

ITEM 12: MEAT WRAPPING TABLE 1 required
Manufacturer: John Boos
Model: ST6R5-3072SSK

ITEM 12.1: SHELF, WALL MOUNT 2 required
Manufacturer: John Boos
Model: BHS1272

ITEM 13: WASTE CAN 1 lot required

Provided by Owner / Not in Contract

ITEM 14: MEAT CUTTER 1 required
Provided by Owner / Not in Contract

ITEM 15: SPARE NUMBER

ITEM 16: SCALE 1 required
Provided by Owner / Not in Contract

ITEM 17: WRAPPER 1 required
Provided by Owner / Not in Contract

ITEM 18: 3-COMPARTMENT SINK 1 required
Manufacturer: John Boos
Model: 3PB18244-2D18
1. X-0414A additional set of faucet holes
2. (3) PB-LWB lever waste support brackets
2. T&S Brass B-0133-ADF12-BC Pre-rinse unit
3. T&S Brass B-0230-KIT Inlet kit
4. T&S Brass B-0290 Sink mixing faucet
5. T&S Brass B-0427 supply nipple
6. (3) Fisher 22209 Drainking waste valve

ITEM 19: SHELVING, WALL MOUNT 1 lot required
Manufacturer: Metro
Model: Super Adjustable Metroseal 3
1. SW23C Super Erecta Wall Mount set
2. (2) A1424NK3 shelves

ITEM 20: SPARE NUMBER

ITEM 21: SPARE NUMBER

ITEM 22: SPARE NUMBER

ITEM 23: SPARE NUMBER

ITEM 24: SHELVING, WALL MOUNT 1 lot required
Manufacturer: Metro
Model: Super Adjustable Metroseal 3
1. SW23C Super Erecta Wall Mount set
2. (2) A1442NK3 shelves

ITEM 25: SPARE NUMBER

ITEM 26: WALK-IN MEAT COOLER 1 required
Manufacturer: Nor-Lake
Model: FAST-TRAK INDOOR Walk-In Cooler
1. See Quote No. NL2588700JL-A

ITEM 26.1: REMOTE COOLER COMPRESSOR 1 required
Manufacturer: Nor-Lake
Model: MSMC007MB
1. See Quote No. NL2588700JL-A

ITEM 26.2: COOLER EVAPORATOR COIL 1 required
Manufacturer: Nor-Lake
Model: E1MCK060B-MA
1. See Quote No. NL2588700JL-A

ITEM 26.3: MEAT HANGING SYSTEM 1 required
Provided by Owner / Not in Contract

ITEM 27: FLOOR TROUGH 1 required
Provided by General Contractor / Not in Contract

ITEM 28: STORAGE SHELVING 1 lot required
Provided by Owner / Not in Contract

ITEM 29: SPARE NUMBER

ITEM 30: SPARE NUMBER

ITEM 31: OFFICE FURNITURE & EQUIPMENT 1 lot required
Provided by Owner / Not in Contract

ITEM 32: EMPLOYEE LOCKERS 1 lot required
Provided by Owner / Not in Contract

ITEM 33: SPARE NUMBER

ITEM 34: MILLWORK STORAGE CABINET 2 required
Provided by Owner / Not in Contract

ITEM 34.1: STORAGE SHELVING 1 lot required
Provided by Owner / Not in Contract

ITEM 35: SPARE NUMBER

ITEM 35.1: SPARE NUMBER

ITEM 36: DINING SEATING 1 lot required
Provided by Owner / Not in Contract

ITEM 37: BAR TOP & DIE WALL 1 required
Provided by General Contractor / Not in Contract

ITEM 38: UNDERBAR HAND SINK 1 required
Manufacturer: Perlick
Model: TSF12HS
1. 934GN-LF faucet

ITEM 39: BRIDGE TRASH 1 required
Manufacturer: Perlick
Model: TSF12BTB

ITEM 40: SPARE NUMBER

ITEM 41: UNDERBAR DUMP SINK 1 required
Manufacturer: Perlick
Model: TSF12DS

1. 934GN-LF faucet
2. 736BIN factory installed towel ring

ITEM 42: UNDERBAR GLASS RACK STORAGE 1 required
Manufacturer: Perlick
Model: TSF24SC-GR

ITEM 43: UNDERBAR ICE BIN 1 required
Manufacturer: Perlick
Model: TS24IC

ITEM 43.1: SPEED RAIL 1 required
Manufacturer: Perlick
Model: SR-S24A

ITEM 44: LIQUOR STORAGE STEP 1 required
Manufacturer: Perlick
Model: TS12LS

ITEM 45: UNDERBAR CABINET 1 required
Provided by General Contractor / Not in Contract

ITEM 46: COFFEE MAKER, AIRPOT, AUTOMATIC 1 required
Manufacturer: Bunn
Model: 38700.0013
1. 56000.0024 filter system, WEQ-10(1.5)5L
2. 56000.0121 filter cartridge, WEQ-10(1.5)5L

ITEM 47: AIRPOT 3 required
Manufacturer: Bunn
Model: 32130.0000

ITEM 48: BACK BAR TOP 1 required
Provided by General Contractor / Not in contract

ITEM 49: BACK BAR SHELVING 1 required
Provided by General Contractor / Not in contract

ITEM 50: WASTE CHUTE 1 required
Manufacturer: Vollrath
Model: 3Y0502

ITEM 51: DISPENSING KIT 1 required
Manufacturer: Perlick
Model: 69526-3TT
1. Verify finish with Owner

ITEM 52: BACK BAR COOLER 1 required
Manufacturer: Perlick
Model: BBS84
1. Factory laminated solid doors. Verify selection with architect.
2. No finished top.
3. Compressor located on left.
4. Doors hinged per plan.
5. Left and center door sections without shelves
6. Right door section with flat shelves

ITEM 53: Point of Sale System 1 required
Provided by Owner / Not in Contract

ITEM 54: SINK, HAND, WALL MOUNT 2 required
Manufacturer: John Boos
Model: PBHS-W-1410-KV1APS-EW-SS-X

ITEM 54.1: SOAP & PAPER TOWEL DISPENSER 2 required
Provided by Owner / Not in Contract

ITEM 55: SPARE NUMBER

ITEM 56: MILLWORK STORAGE SHELVING 1 required
Provided by Owner / Not in Contract

ITEM 57: WIRE STORAGE SHELVING 1 lot required
Provided by Owner / Not in Contract

ITEM 58: ICE MAKER W/ BIN 1 required
Manufacturer: Manitowoc
Model: IYT0420A
1. D320 Ice Bin
2. 3M Purification ICE120-S (5616003) water filter system
3. 3M Purification HF20-S (5615103) replacement cartridge

ITEM 59: STORAGE SHELVING 1 lot required
Provided by Owner / Not in Contract

ITEM 60: SPARE NUMBER

ITEM 61: WALK-IN COOLER 1 required
Manufacturer: Nor-Lake
Model: FAST-TRAK INDOOR walk-in cooler
1. See Quote No. NL2588704JL-A

ITEM 61.1: REMOTE COOLER COMPRESSOR 1 required
Manufacturer: Nor-Lake
Model: MSMC007MB
1. See Quote No. NL2588704JL-A

ITEM 61.2: COOLER EVAPORATOR COIL 1 required
Manufacturer: Nor-Lake
Model: E1MCK060B-MA
1. See Quote No. NL2588704JL-A

ITEM 62: COOLER SHELVING 1 lot required
Provided by Owner / Not in Contract

ITEM 63: TABLE, WORK 1 required
Manufacturer: John Boos
Model: ST6R5-2436SSK

ITEM 64: COUNTER TOP MIXER 1 required
Provided by Owner / Not in Contract

ITEM 65: SPARE NUMBER

ITEM 66: TABLE, WORK 1 required
Manufacturer: John Boos
Model: ST6R5-3084SSK

ITEM 66.1: SHELF, WALL MOUNT 2 required
Manufacturer: John Boos
Model: BHS1284

ITEM 67: PREP SINK 1 required
Manufacturer: John Boos
Model: 1PB1620-2D18
1. T&S Brass B-1147-XS Workboard/Bar sink faucet
2. T&S Brass B-1105-KIT Inlet Kit
3. Fisher 22209 Drainking waste valve
4. PB-LWB lever waste support bracket

ITEM 67.1 SHELF, WALL MOUNT 1 required
Manufacturer: John Boos
Model: BHS1248

ITEM 68: FOOD PROCESSOR 1 required
Provided by Owner / Not in Contract

ITEM 69: TYPE 1 EXHAUST HOOD 1 required
Manufacturer: Captive-Aire
Model: Factory Quote # 8423180
1. Refer to factory drawings and specifications

ITEM 69.1: EXHAUST DUCT & FAN 1 lot required
Provided by General Contractor / Not in Contract

ITEM 69.2: SUPPLY AIR DUCTWORK & FAN 1 lot required
Provided by General Contractor / Not in Contract

ITEM 69.3: HOOD CLOSURE PANELS 1 lot required
Manufacturer: Pacific Stainless Products
Model: Custom

ITEM 69.4: FIRE PROTECTION SYSTEM 1 required
Manufacturer: Captive-Aire
Model: TANK-FS
1. Refer to factory drawings and specifications.

ITEM 69.5: TYPE K FIRE EXTINGUISHER 1 required
Manufacturer: Captive-Aire
Model:

ITEM 69.6: HOOD CONTROL SCREEN 1 required
Manufacturer: Captive-Aire
Model:

ITEM 70: WALL FLASHING 1 lot required
Manufacturer: Pacific Stainless Products
Model: Custom

ITEM 71: HOT PLATE, GAS 3 required
Manufacturer: Royal Range of California
Model: RHP-24-2
1. (3) Dormont 1675KITCFS36 gas connector kit

ITEM 71.1: STAND, EQUIPMENT 1 required
Manufacturer: John Boos
Model: EES8-3072
1. CAS02-R-X casters, 5”, heavy duty, locking
2. (2) Krowne 28-200 caster positioning chock sets

ITEM 72: GRIDDLE, GAS 1 required
Manufacturer: Star
Model: 624TF
1. Dormont 1675KITCFS36 dormont blue hose moveable gas connector kit

ITEM 72.1: EQUIPMENT STAND 1 required
Manufacturer: John Boos
Model: GS6-3024SSK
2. Krowne 28-200 caster positioning chock set

ITEM 73: BREAD OVEN, ELECTRIC 1 required
Manufacturer: Bakers Pride
Model: DP-2

ITEM 73.1: EQUIPMENT STAND 1 required
Manufacturer: Pacific Stainless Products
Model: MES303024FS

ITEM 74: SHELF, WALL MOUNT 2 required
Manufacturer: John Boos
Model: BHS1296-X

ITEM 75: POWER POLE 1 required
Provided by General Contractor / Not in Contract

ITEM 76: REFRIGERATOR, SANDWICH / SALAD PREP 1 required
Manufacturer: Continental Refrigerator
Model: SW32N12M
1. Stainless steel finished back
2. DOS32 Double overshelves for 32” models

ITEM 77: HOT FOOD TABLE 1 required
Manufacturer: Vollrath
Model: 38217
1. 2342901 ServeWell SL poly cutting board
2. 38043 ServeWell work/overshelf
3. 3809934 ServeWell caster set, 4” dia.

ITEM 78: RACK, HALF HEIGHT, MOBILE WORK TABLE 1 required
Manufacturer: Channel Manufacturing
Model: 425S

ITEM 79: CART, UTILITY 1 required
Manufacturer: Lakeside Manufacturing

Model: 422

ITEM 80: SPARE NUMBER

ITEM 81: 3-COMPARTMENT SINK 1 required
Manufacturer: John Boos
Model: 3PB18244-2D24
1. T&S Brass B-0133-ADF12-BC Pre-rinse unit
2. T&S Brass B-0230-KIT
3. T&S Brass B-0290 sink mixing faucet
4. T&S Brass B-0427 supply nipple
5. Fisher 22209 drainking waste valve
6. X-0414A additional set of faucet holes
7. (3) PB-LWB lever waste support brackets

ITEM 82: SHELF, SOLID SORTING 1 required
Manufacturer: John Boos
Model: PB-SRW-42

ITEM 83: SHELF, SOLID SORTING 1 required
Manufacturer: John Boos
Model: PB-SRW-42

ITEM 84: WAREWASHER, UNDERCOUNTER, HIGH TEMP 1 required
Manufacturer: CMA Dishmachines
Model: UC65E
1. Safe-T-Temp feature
2. Drain water tempering kit

ITEM 85: SPARE NUMBER

ITEM 86: STORAGE SHELVING 1 lot required
Provided by Owner / Not in Contract

ITEM 87: END CAPS & CORNER GUARDS 1 lot required
Manufacturer: Pacific Stainless Products
Model: Custom

PART 3 - EXECUTION

3.1 INSPECTION

A. All work in this section shall be performed by competent tradesmen, using adequate plant facilities and good trade practices, to maintain the intent of the drawings and specifications.

B. The Kitchen Equipment Contractor will visit the jobsite as often as is deemed necessary prior to equipment installation to verify all mechanical, electrical and ventilation rough-in outlets and sleeve outlets and will instruct the pertinent parties with approved shop drawings, service drawings, and /or correct connections. Upon signing the contract for the supply of the kitchen equipment, the Kitchen Equipment Contractor becomes responsible for the accuracy of the rough-ins.

C. The Kitchen Equipment Contractor shall examine the work of other trades for defect and/or shortcomings, which might affect the proper installation of this equipment. If such conditions are found the Architect must be notified at once, and a written copy mailed to the Architect.

3.2 INSTALLATION

A. General: Set each item of non-mobile and non-portable equipment securely in place, level and adjust to correct height. Anchor to supporting substrate where indicated and where required for sustained operation and use without shifting or dislocation. Conceal anchorages where possible. Adjust countertops and other work surfaces to level tolerance of 1/16" maximum offset, and maximum variation from level or indicated slope of 1/16" per foot.

Where indicated or required for safety of equipment operator, anchor equipment to counter top, floor or wall. Where equipment is indicated to be anchored to floor, provide legs with adjustable flanged foot. Install 2 anchors on each foot.

B. Field joints: Complete field-assembly joints in work (joints that cannot be completed in shop) by welding, bolting and gasketing, or similar methods as indicated. Grind welds smooth and restore finish. Set or trim gaskets flush, except for "T" gaskets as indicated.

C. Enclosed spaces: Treat spaces that are inaccessible after equipment installation by covering horizontal surfaces with powdered borax at rate of 4 oz. per square foot.

D. Closure plates and strips: Install where required, with joints coordinated with units of equipment.

E. Cutouts: Provide cutouts in food service equipment where required to run plumbing, electric, gas, or steam lines through equipment items for final connections.

F. Sealants and gaskets: Install all around each unit to make joints airtight, watertight, vermin-proof, and sanitary for cleaning purposes. In general, make sealed joints not less than 1/8" wide, and stuff backer rod to shape sealant bead properly, at 1/4" depth. Shape exposed surfaces of sealant slightly concave, with edges flush with faces of materials at joint. At internal corner joints, apply sealant or gaskets to form a sanitary cove, of not less than 3/8" radius. Provide sealant-filled or gasketed joints up to 3/4" joint width; metal closure strips for wider joints, with sealant application each side of strips. Anchor gaskets mechanically or with adhesives to prevent displacement.

G. The equipment supplied under this section, both manufactured and purchased, will be uncrated and set-in place, and resultant waste materials will be disposed of, at no cost to the owner.

H. Seismic restraints: The K.E.C. shall furnish and install seismic restraints if required and in a manner acceptable by the local building department. Associated engineering fees and parts shall be the responsibility of the K.E.C.

3.3 FIELD QUALITY CONTROL

A. Testing: Coordinate start-up of food service equipment when service lines have been tested, balanced, and adjusted for pressure, voltage, and similar considerations. Do not operate steam lines until they have been cleaned and treated for sanitation. Before testing, lubricate each equipment item in accordance with manufacturer's recommendations.

Test each item of operational equipment to demonstrate that it is operating properly and that controls and safety devices are functioning. Repair or replace equipment found to be defective in its operation, including units that are below capacity or operating with excessive noise or vibration.

3.4 CLEANING

A. After completion of installation and other major work in food device areas, remove protective coverings and clean food service equipment, internally and externally. Restore exposed and semi exposed finishes to remove abrasions and other damages; polish exposed metal surfaces and touch-up painted surfaces. Replace work that cannot be successfully restored.

3.5 CLOSEOUT PROCEDURES

A. Provide services of Installer's technical representative, and manufacturer's technical representative where required, to instruct Owner's personnel in operation and maintenance of food service equipment. Set up a maintenance schedule to be followed thereafter. Schedule training with Owner: provide at least 7 days' notice to Owner of training date.

B. Final acceptance of equipment: The Architect and Food Service Consultant will review the equipment and placement prior to final acceptance. Any deviations from the plans and specifications will be rejected and the Kitchen Equipment Contractor shall promptly replace and execute his own work, which results from rejected materials as per the specifications as stated herein and at no expense to the owner.

END OF SECTION

SECTION 12 24 13 - ROLLER WINDOW SHADES

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

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

1.2 SUMMARY

A. Section Includes:

1. Manually operated roller shades with single rollers.
2. Installation accessories.

B. Related Requirements:

1. Section 06 10 00 "Rough Carpentry" for wood blocking and grounds for mounting roller shades and accessories.
2. Section 07 92 00 "Joint Sealants" for sealing the perimeters of installation accessories for light-blocking shades with a sealant.

1.3 SUBMITTALS

A. Product Data: For each type of product.

1. Include construction details, material descriptions, dimensions of individual components and profiles, features, finishes, and operating instructions for roller shades.

B. Shop Drawings: Show fabrication and installation details for roller shades, including shadeband materials, their orientation to rollers, and their seam and batten locations.

1. Motor-Operated Shades: Include details of installation and diagrams for power, signal, and control wiring.

C. Samples: For each exposed product and for each color and texture specified, 10 inches long.

D. Samples for Verification: For each type of roller shade.

1. Shadeband Material: Not less than 10 inches square. Mark interior face of material if applicable.
2. Roller Shade: Full-size operating unit, not less than 16 inches wide by 36 inches long for each type of roller shade indicated.
3. Installation Accessories: Full-size unit, not less than 10 inches long.

1.4 CLOSEOUT SUBMITTALS

A. Operation and Maintenance Data: For roller shades to include in maintenance manuals.

1.5 QUALITY ASSURANCE

A. Installer Qualifications: Fabricator of products.

1.6 DELIVERY, STORAGE, AND HANDLING

A. Deliver roller shades in factory packages, marked with manufacturer, product name, and location of installation using same designations indicated on Drawings.

1.7 FIELD CONDITIONS

A. Environmental Limitations: Do not install roller shades until construction and finish work in spaces, including painting, is complete and dry and ambient temperature and humidity conditions are maintained at the levels indicated for Project when occupied for its intended use.

B. Field Measurements: Where roller shades are indicated to fit to other construction, verify dimensions of other construction by field measurements before fabrication and indicate measurements on Shop Drawings. Allow clearances for operating hardware of operable glazed units through entire operating range. Notify Architect of installation conditions that vary from Drawings. Coordinate fabrication schedule with construction progress to avoid delaying the Work.

PART 2 - PRODUCTS

2.1 MANUFACTURERS

A. Source Limitations: Obtain roller shades from single source from single manufacturer.

B. Basis-of-Design Manufacturer: MechoShade Systems, LLC; www.mechoshade.com.

C. Other Approved Manufacturers:

1. Draper, Inc.; www.draperinc.com.

2. Hunter Douglas; www.hunterdouglasarchitectural.com.

3. Lutron Electronics Co., Inc.; www.lutron.com.

2.2 MANUALLY OPERATED SHADES WITH SINGLE ROLLERS, RS-1

A. Basis-of-Design Product: Mecho/5 Manual Shade System by MechoShade Systems, LLC; www.mechoshade.com.

1. Application: As indicated in Drawings.

B. Chain-and-Clutch Operating Mechanisms: With continuous-loop bead chain and clutch that stops shade movement when bead chain is released; permanently adjusted and lubricated.

1. Bead Chains: Manufacturer's standard.

a. Loop Length: Full length of roller shade.

b. Limit Stops: Provide upper and lower ball stops.

c. Chain-Retainer Type: Clip or chain tensioner, jamb mount.

2. Spring Lift-Assist Mechanisms: Manufacturer's standard for balancing roller shade weight and for lifting heavy roller shades.

a. Provide for shadebands that weigh more than 10 lb or for shades as recommended by manufacturer, whichever criterion is more stringent.

C. Rollers: Corrosion-resistant steel or extruded-aluminum tubes of diameters and wall thicknesses required to accommodate operating mechanisms and weights and widths of shadebands indicated without deflection. Provide with permanently lubricated drive-end assemblies and idle-end assemblies designed to facilitate removal of shadebands for service.

1. Roller Drive-End Location: As indicated on Drawings.

2. Direction of Shadeband Roll: Regular, from back (exterior face) of roller.

3. Shadeband-to-Roller Attachment: Manufacturer's standard method.

D. Mounting Hardware: Brackets or endcaps, corrosion resistant and compatible with roller assembly, operating mechanism, installation accessories, and mounting location and conditions indicated.

1. Basis-of-Design Product, Brackets: Catch-Pin Bracket by MechoShade.

E. Roller-Coupling Assemblies: Coordinated with operating mechanism and designed to join up to three inline rollers into a multiband shade that is operated by one roller drive-end assembly.

F. Installation Accessories:

1. Front Fascia: Aluminum extrusion that conceals front and underside of roller and operating mechanism and attaches to roller endcaps without exposed fasteners.

a. Basis-of-Design Product: SnapLoc Fascia by MechoShade.

2. Exposed Headbox: Rectangular, extruded-aluminum enclosure including front fascia, top and back covers, endcaps, and removable bottom closure.

a. Height: Manufacturer's standard height required to enclose roller and shadeband assembly when shade is fully open, but not less than 3 inches.

3. Endcap Covers: To cover exposed endcaps.

4. Closure Panel and Wall Clip: Removable aluminum panel designed for installation at bottom of site-constructed ceiling recess or pocket and for snap-in attachment to wall clip without fasteners.

a. Closure-Panel Width: As indicated on Drawings.

2.3 SHADEBAND MATERIALS

A. Shadeband Material Flame-Resistance Rating: Comply with NFPA 701 Insert requirement. Testing by a qualified testing agency. Identify products with appropriate markings of applicable testing agency.

B. Light-Filtering Fabric: Woven fabric, stain and fade resistant.

1. Basis-of-Design Product: 1 EcoVeil Sheer Screen by MechoShade.

a. Openness Factor: 3 percent.

b. Color: As selected by Architect.

C. Roller-Coupling Assemblies: Where required.

D. Installation Accessories:

1. Side Channels: With light seals and designed to eliminate light gaps at sides of shades as shades are drawn down. Provide side channels with shadeband guides or other means of aligning shadebands with channels at tops.

2. Bottom Sill Channel: With light seals and designed to eliminate light gaps at bottoms of shades when shades are closed.

2.4 ROLLER SHADE FABRICATION

A. Product Safety Standard: Fabricate roller shades to comply with WCMA A 100.1, including requirements for flexible, chain-loop devices; lead content of components; and warning labels.

B. Unit Sizes: Fabricate units in sizes to fill window and other openings as follows, measured at 74 deg F:

1. Between (Inside) Jamb Installation: Width equal to jamb-to-jamb dimension of opening in which shade is installed less 1/4 inch per side or 1/2-inch total, plus or minus 1/8 inch .

Length equal to head-to-sill or -floor dimension of opening in which shade is installed less 1/4 inch , plus or minus 1/8 inch .

2. Outside of Jamb Installation: Width and length as indicated, with terminations between shades of end-to-end installations at centerlines of mullion or other defined vertical separations between openings.

C. Shadeband Fabrication: Fabricate shadebands without battens or seams to extent possible, except as follows:

1. Vertical Shades: Where width-to-length ratio of shadeband is equal to or greater than 1:4 Insert ratio, provide battens and seams at uniform spacings along shadeband length to ensure shadeband tracking and alignment through its full range of movement without distortion of the material.

2. Railroaded Materials: Railroad material where material roll width is less than the required width of shadeband and where indicated. Provide battens and seams as required by railroaded material to produce shadebands with full roll-width panel(s) plus, if required, one partial roll-width panel located at top of shadeband.

PART 3 - EXECUTION

3.1 EXAMINATION

A. Examine substrates, areas, and conditions, with Installer present, for compliance with requirements for installation tolerances, operational clearances, locations of connections to building electrical system, and other conditions affecting performance of the Work.

B. Proceed with installation only after unsatisfactory conditions have been corrected.

3.2 ROLLER SHADE INSTALLATION

A. Install roller shades level, plumb, and aligned with adjacent units according to manufacturer's written instructions.

1. Opaque Shadebands: Located so shadeband is not closer than 2 inches to interior face of glass. Allow clearances for window operation hardware.

B. Electrical Connections: Connect motor-operated roller shades to building electrical system.

3.3 ADJUSTING

A. Adjust and balance roller shades to operate smoothly, easily, safely, and free from binding or malfunction throughout entire operational range.

3.4 CLEANING AND PROTECTION

A. Clean roller shade surfaces, after installation, according to manufacturer's written instructions.

B. Provide final protection and maintain conditions, in a manner acceptable to manufacturer and Installer, that ensure that roller shades are without damage or deterioration at time of Substantial Completion.

C. Replace damaged roller shades that cannot be repaired, in a manner approved by Architect, before time of Substantial Completion.

3.5 DEMONSTRATION

A. Engage a factory-authorized service representative to train Owner's maintenance personnel to adjust, operate, and maintain motor-operated roller shades.

END OF SECTION