Project

UBS Financial Services, Inc.
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Suite 303
Princeton, NJ 08540

Owner

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Design Specifications

November 19, 2021

LIST OF SPECIFICATIONS
FOR CONSTRUCTION

SECTION I-01010

SUMMARY OF WORK

PART 1 – GENERAL

1.01 WORK COVERED BY CONTRACT DOCUMENTS

A. The scope of this Project consists of the demolition and fit out of Suite 303 at 100 Overlook Center | Princeton, NJ 08540.

1.02 CONTRACT DOCUMENTS

A. Contract Documents: The Owner will furnish the Contractor the following documents at no cost:

Written Material	-	Electronic PDF
(Specifications, Addenda Modifications, etc.)		
Drawings:	-	Electronic PDF

B. For purposes related to these specifications, the terms “Contractor,” “General Contractor,” and “Construction Manager” shall be interchangeable.

1.03 OWNER FURNISHED ITEMS

A. The Owner will arrange for and deliver necessary shop drawings, product data, and samples to the Contractor. The Contractor shall review shop drawings, product data, and samples and return them to the Architect noting discrepancies or problems anticipated in use of the product.

B. The Owner will arrange and pay for delivery of Owner-furnished items per the Contractor's Construction Schedule. The Contractor shall designate delivery dates of Owner-furnished items in the Contractor's Construction Schedule and shall be responsible for receiving, unloading, and handling Owner-furnished items at the site. Following delivery, the Owner will inspect items delivered for damage. If Owner-furnished items are damaged, defective, or missing, the Owner will arrange for replacement.

C. The Owner will arrange for manufacturer's field services and for the delivery of manufacturer's warranties to the appropriate Contractor.

D. The Contractor is responsible for protecting Owner-furnished items from damage, including damage from exposure to the elements. The Contractor shall repair or replace items damaged as a result of his operations.

E. The Work includes providing support systems to receive Owner's equipment, and mechanical and electrical connections.

F. The following items are furnished by the Owner and installed by the Contractor:

Owner furnished items as indicated on drawings.

G. The following items are furnished and installed by the Owner:

1. Telephone system / Audio Visual Equipment
2. Furniture, furnishings, and equipment.
3. Carpet and base at carpeted areas.

1.04 COORDINATION

A. General: Coordinate construction activities included under various Sections of these Specifications to assure efficient and orderly installation of each part of the Work. Coordinate construction operations included under different Sections of the Specifications that are dependent upon each other for proper installation, fit, connection, and operation.

1. Where installation of one part of the Work is dependent on installation of other components, either before or after its own installation, schedule construction activities in the sequence required to obtain coordinated results.

2. Where availability of space is limited, coordinate installation of different components to assure maximum accessibility for required maintenance, service and repair.

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

B. The Contractor shall produce and submit for review and record purposes, a set of color-coded AutoCAD developed "Coordination Drawings" to confirm that the work of all subcontractors is coordinated. These drawings shall show the interrelationship of components shown on separate shop drawings and shall indicate all mechanical, plumbing, electrical, structural, fire protection and contiguous architectural Work in sufficient detail so as to verify that subcontractors will accomplish their respective Work without conflicting with other contiguous trades. The following is a list of such Work requiring coordination drawings:

1. Ceiling assemblies and cavities.

2. Ductwork, sprinklers, lighting, security and Audio Visual and Millwork.

3. Furniture and Power/ Data locations.

C. At completion of the Work, all original coordination drawings shall be modified to indicate as-built conditions and transmitted to the Owner.

D. Conflicts Within Contract Documents: Every reasonable effort has been made to coordinate the Contract Documents of all disciplines involved. Examine the Contract documents of all disciplines to determine that coordination is satisfactory. All apparent conflicts shall be brought to the attention of the Architect for resolution prior to award of the Contract.

E. Quantities: Insofar as the Contract Documents may, in some instances, be schematic in nature, precise quantities and sizes of some items may not be explicitly indicated. The Contractor shall provide materials of the size and quantity necessary to accomplish the Work and satisfy all performance criteria. If sizes, quantities and/or performance criteria cannot be reasonably inferred from the Contract Documents, the Contractor shall request a resolution from the Architect prior to award of contract.

F. Dimensions: Where, in the opinion of the Contractor, the Contract Documents lack dimensional information or contain dimensional conflicts that are critical to his formulation of a bid proposal or the execution of the Work, the Contractor shall refer questions to the Architect for resolution.

1.05 CORRESPONDENCE/REQUESTS FOR INFORMATION

A. General Contractor correspondence related to the execution of the Work shall be addressed to the Architect.

B. If, after issuance of the "Notice to Proceed" the General Contractor desires to make a written inquiry concerning questions which may have arisen during the course of the Work, the General Contractor may initiate a process of standard form letters] identified as "Request(s) for Information" (RFI) subject to the following conditions:

1. The format of RFI inquires shall be subject to the review and approval of the Architect.

2. All RFI's shall contain specific reference to the drawing number, detail number, specification section and paragraph number, schedule type, or other related document which is pertinent to

the General Contractor's inquiry. The date of all referenced documents or drawings must be clearly identified.

3. All RFI's shall be numbered sequentially with the date of issue clearly noted.

4. All RFI's shall be typewritten and shall be forwarded to the Architect in duplicate.

5. All RFI's shall only originate from the General Contractor and shall bear the original signature of a designated single senior officer of the General Contractor's on-site staff. The name of this senior officer and his credentials (with respect to the administration of this Contract) shall be subject to the acceptance of the Architect prior to the commencement of the RFI process. RFI's submitted to the Architect by individuals other that the General Contractor's designated senior officer will not be accepted.

6. It shall be the responsibility of the General Contractor's senior officer charged with signing RFI's to maintain an up-to-date log of all RFI's and to advise the Architect, in writing of the status and disposition of all RFI's at the weekly progress meeting.

7. RFI's shall not be utilized by the General Contractor to solicit consideration by the Architect of a "substitution".

8. RFI's shall not be utilized by the General Contractor to request any extension of Contract time or to request any revision of Contract cost. If the General Contractor believes that the response received from the Architect to any RFI warrants adjustment of the Contract time or cost, he shall advise the Owner and the Architect in writing immediately upon receipt of the response.

9. RFI's shall not be utilized by the General Contractor to solicit clarification of comments that have been communicated to the General Contractor by the Architect in the course of shop drawing review or the review of other required submittals.

10. The Owner reserves the right to assess the cost (based on time and materials) of the review process performed by the Architect and/or any of the Architect's or Owner consultants which fail to conform to the requirements stated herein, or in the opinion of the Architect, are unnecessary or frivolous (i.e.; the subject of the inquiry noted in the RFI is suitably and/or clearly addressed in the Contract Documents).

C. Any written procedure selected by the General Contractor to solicit responses to questions which arise during the course of the Work shall be required to comply with the procedures stated in paragraphs 1.08 A. and B.

1.06 CONTRACTOR USE OF PREMISES

A. General: During the construction period the Contractor shall have full use of the premises for construction operations, including use of the site. The Contractor's use of the premises is limited only by the Owner's right to perform work or to retain other contractors on portions of the Project.

B. Driveways and Building Entrances: Keep driveways and entrances serving the premises clear and available to the Owner, the Owner's employees, and emergency vehicles at all times. Do not use these areas for parking or storage of materials. Schedule deliveries to minimize space and time requirements for storage of materials and equipment on-site.

1.07 SURVEYS, LINES AND LEVELS

A. The Contractor shall be responsible for properly laying out the Work and for lines and measurements for the Work. Verify the figures shown on the Drawings before laying out the Work and report errors or inaccuracies to the Architect before commencing work.

The Contractor shall be responsible for sketching out all partitions, furniture and power prior to commencing work. Contractor shall be responsible for coordination of all trades.

The Contractor shall be responsible for sketching out all ceiling trade related items for coordination including ceiling construction, lighting, sprinkler, plumbing, AV, etc. Any discrepancies shall be brought to Architect's attention for final resolution before construction.

B. Existing Conditions

1. Examine the site, the records of existing construction and the conditions under which the Work is to be performed.

2. The Contract Documents are based upon the information furnished to the Architect by the Owner. Such information is available from the Owner. The records are furnished for information only and are not guaranteed to represent all conditions that will be encountered. The records of existing construction represent all conditions known to the Owner. Other construction, of which no records are available, may be encountered. All dimensions of existing construction are based on data retrieved from existing contract documents created by the original base building architect and from information provided to the Architect by the Owner. Each subcontractor shall field verify all existing dimensions.

3. Each subcontractor shall formulate his own conclusion as to the extent of such construction.

4. Each subcontractor shall take every precaution to guard against any movement or settlement of existing or new construction. Provide bracing, shoring, underpinning or other retaining structures necessary in connection therewith. Assume responsibility for the design, safety and support of such construction and for any movement, settlement, damage or injury thereto.

PART 2 – PRODUCTS

(NOT APPLICABLE)

PART 3 – EXECUTION

(NOT APPLICABLE)

END OF SECTION I-01010

SECTION I-01035

CONTRACT MODIFICATION PROCEDURES

PART I – GENERAL

1.01 DESCRIPTION

A. General: This section specifies administrative and procedural requirements for modifications to the Work of the Contract.

1.02 DEFINITIONS

A. Definitions used in this Article are not intended to change or modify the meaning of other terms used in the Contract Documents.

B. Modification: Refer to General Conditions, for Contract definition of a Modification.

C. Change Order: Refer to General Conditions, for Contract definition of a Change Order.

D. Bulletin

1. A Bulletin is a proposed modification to the Contract Documents prepared and issued by the Architect that accomplishes one or all of the following:

a. Clarifies or changes the Work.

b. Furnishes information which is supplemental to the Contract which may or may not change the Contract Sum or Contract Time as specified in the Bulletin.

2. A bulletin is not an order to proceed. (Refer to Paragraph 2.01).

3. No bulletin shall be issued to the Contractor by the Architect until such bulletin has been reviewed and approved for release by the Owner.

E. Proposal Requests

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

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

b. Within 10 working days after receipt of Proposal Request, submit a quotation estimating cost adjustments to the Contract Sum and the Contract Time necessary to execute the change.

1) 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.

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

3) Include an updated Construction Schedule that indicates the effect of the change, including, but not limited to, changes in activity duration, start and finish times, and activity relationship. Use available total float before requesting an extension of the Contract Time.

2. Contractor-Initiated Proposals: A written statement from the Contractor addressed to the Owner and the Architect identifying all revisions to the Contract Sum or Contract Time which are alleged to arise from the changes to the Work described in the Bulletin(s), Modifications or other unforeseen conditions which the Contractor contends an adjustment to the Contract Sum or Contract Time is warranted and containing the following information:

   a. Include a statement outlining reasons for the change and the effect of the change on the Work. Provide a complete description of the proposed change. Indicate the effect of the proposed change on the Contract Sum and the Contract Time.

   b. 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.

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

   d. Include an updated Contractor's Construction Schedule that indicates the effect of the change, including, but not limited to, changes in activity duration, start and finish times, and activity relationship. Use available total float before requesting an extension of the Contract Time.

   e. Comply with requirements in Section "Material, Equipment and Systems" if the proposed change requires substitution of one product or system for product or system specified.

F. Sketches: At any time during the course of the Work, the Architect may issue "Sketches" intended to clarify questions, which arise concerning the intention of the Contract Documents, address field conditions, or to otherwise expedite the Work. No sketch issued by the Architect will be permitted as cause to increase in Contract sum or Contract Time unless such sketch is specifically identified in an approved Change Order. Should the Contractor believe that the information communicated in any sketch issued by the Architect warrants a Change Order, he shall notify the Architect and the Owner and prepare a Change Order Proposal request in the manner described in Paragraph 2.02 "Processing Change Order Proposal Requests".

PART 2 – PROCEDURES

2.01 PROCESSING BULLETINS

A. With the approval of the Owner, the Architect may issue Bulletins as defined above.

1. Bulletins issued by the Architect are for information only. Bulletins are not to be considered as an instruction either to stop work in progress, or to execute the proposed change.

2. Unless otherwise indicated in the bulletin, within 10 working days of receipt of the Bulletin, submit to the Architect for the Owner's review a detailed Change Order Proposal request of cost necessary to execute any proposed change as described in the bulletin.

   a. Include a list of quantities of products to be purchased and unit costs, along with the total amount of purchases to be made. Where requested, furnish survey data to substantiate quantities.

   b. Indicate applicable taxes, delivery charges, equipment rental, amounts of trade discounts, labor costs, re-stocking charges, legitimate markups and all other costs associated with the proposed change.

   c. Identify any changes to Work already executed which, if not addressed in the Bulletin, will require revision as part of the proposed change.

3. Include a statement in the Change Order Proposal Request indicating the effect the proposed change in the Work will have on the Contract Time.

4. The Owner will review and respond to the Contractor's proposal within ten (10) working days after its receipt.

2.02 PROCESSING CHANGE ORDER PROPOSAL REQUESTS

A. Should the Contractor discover a discrepancy, latent or other unforeseen conditions requiring modifications to the Contract Documents that was not previously noted or determines upon receipt of clarification from the Architect that the work described therein may necessitate a Change Order, he shall promptly notify the Architect and Owner, of his intention to submit a Change Order Proposal request related to the item of Work.

B. Within ten (10) working days of such notice, the Contractor shall submit a Change Order Proposal request to the Owner and Architect; Change Order Proposal Requests shall include the following:

1. A statement outlining the effect of the change on the Work. Provide a complete description of the proposed change. Indicate the effect of the proposed change on the Contract Sum and Contract Time.

2. A list of quantities of products to be purchased and unit costs along with the total amount of purchases to be made. Where requested, furnish survey data to substantiate quantities.

3. An indication of applicable taxes, delivery charges, equipment rental, and amounts of trade discounts, labor costs, re-stocking charges, legitimate markups and all other costs associated with the proposed change.

4. Coordination information, including a list of changes or modifications made necessary to other parts of the Work and to construction performed by separate contractors that will become necessary to accommodate the proposed change or modification.

5. Failure by the Contractor to include the above requirements in the change order request may cause rejection of the request in its entirety.

C. Comply with requirements in Section 01600 "Material, Equipment and Systems" if the proposed change in the Work requires the substitution of one product or system for a product or system specified.

PART 3 – EXECUTION

3.01 COORDINATION

A. Promptly revise Schedule of Values and Application for Payment forms to record each authorized Change Order as a separate line item.

B. Promptly revise Progress Schedule to reflect any change in Contract Time; revise schedules to adjust times for other items of work affected by the change and resubmit.

3.02 DISPUTES

A. Should the Contractor and Owner disagree about the value of the proposed change in the Contract Sum or Contract Time, the Contractor shall notify the Owner, in writing, stating the reason for the disagreement. Disagreement about the value of a Change Order does not relieve the Contractor of responsibility to proceed with the change as ordered and to seek settlement of the dispute under the pertinent provisions of the Contract Documents.

3.03 CHANGE ORDER PROCEDURE

A. Upon the Owner's approval of a Change Order Proposal Request or bulletin, the Contractor will generate, sign, issue and forward the Change Order for the signature of the Owner as provided in the Conditions of the Contract.

B. Work on proposed changes that affect the Contract Sum and/or the Contract Time shall not be started until an approved signed Change Order has been received by the Contractor, unless otherwise directed by the Owner in writing.

C. In all cases, the Contractor shall maintain an accurate account of all labor and materials involved in the change.

END OF SECTION I-01035

SECTION I-01045

CUTTING AND PATCHING

PART 1 – GENERAL

1.01 DESCRIPTION

A. Provide cutting and patching in accordance with the Contract Documents.

B. Refer to General Conditions, for contractual requirements governing cutting and patching.

C. Related Work Specified Elsewhere:

1. Alterations/Demolition Work.

1.02 SUBMITTALS

A. Cutting and Patching Proposal: Where approval of procedures for cutting and patching is required before proceeding, submit a proposal describing procedures well in advance of the time cutting and patching will be performed and request approval to proceed. Include the following information, as applicable, in the proposal:

1. Describe the extent of cutting and patching required and how it is to be performed.
2. Describe anticipated results in terms of changes to existing construction; include changes to structural elements and operating components as well as changes in the building's appearance and other significant visual elements.
3. List products to be used and firms or entities that will perform Work.
4. Indicate dates when cutting and patching is to be performed.
5. List utilities that will be disturbed or affected, including those that will be relocated and those that will be temporarily out-of-service. Indicate how long service will be disrupted.
6. Where cutting and patching involves addition of reinforcement to structural elements, submit details and engineering calculations to show how reinforcement is integrated with the original structure.
7. Approval to proceed with cutting and patching does not waive the right to later require complete removal and replacement of a part of the Work found to be unsatisfactory.

1.03 QUALITY ASSURANCE

A. Requirements for Structural Work: Do not cut and patch structural elements in a manner that would reduce their load-carrying capacity or load-deflection ratio.

B. Operational and Safety Limitations: Do not cut and patch operating elements or safety related components in a manner that would result in reducing their capacity to perform as intended, or result in increased maintenance, or decreased operational life or safety.

C. Visual Requirements: Do not cut and patch construction exposed on the exterior or in occupied spaces, in a manner that would, in the Architect's opinion, reduce the building's aesthetic qualities, or result in visual evidence of cutting and patching. Remove and replace Work, cut and patched in a visually unsatisfactory manner.

1.04 MATERIALS

A. Use materials that are identical to existing materials. If identical materials are not available or cannot be used where exposed surfaces are involved, ascertain compatibility, and then use materials that match existing adjacent surfaces to the fullest extent possible with regard to visual effect. Use materials whose installed performance will equal or surpass that of existing materials.

1.05 INSPECTION

A. Before cutting existing surfaces, examine surfaces to be cut and patched and conditions under which cutting and patching is to be performed. Take corrective action before proceeding, if unsafe or unsatisfactory conditions are encountered.

B. Before proceeding, meet at the site with parties involved in cutting and patching, including mechanical and electrical trades. Review areas of potential interference and conflict. Coordinate procedures and resolve potential conflicts before proceeding.

1.06 PREPARATION

A. Temporary Support: Provide temporary support of Work to be cut.

B. Protection: Protect existing construction during cutting and patching to prevent damage. Provide protection from adverse weather conditions for portions of the Project that might be exposed during cutting and patching operations.

C. Avoid interference with use of adjoining areas or interruption of free passage to adjoining areas.

D. Take all precautions necessary to avoid cutting existing pipe, conduit or ductwork serving the building, but scheduled to be removed or relocated until provisions have been made to bypass them.

1.07 PERFORMANCE

A. General: Employ skilled workmen to perform cutting and patching. Proceed with cutting and patching at the earliest feasible time and complete without delay.

1. Cut existing construction to provide for installation of other components or performance of other construction activities and the subsequent fitting and patching required to restore surfaces to their original condition.

B. Cutting: Cut existing construction using methods least likely to damage elements to be retained or adjoining construction. Where possible review proposed procedures with the original installer; comply with the original installer's recommendations.

1. In general, where cutting is required use hand or small power tools designed for sawing or grinding, not hammering or chopping. Cut holes and slots neatly to size required with minimum disturbance of adjacent surfaces. Cover openings when not in use with temporary protection.

2. To avoid marring existing finished surfaces, cut or drill from the exposed or finished side into concealed surfaces.

3. Comply with requirements of applicable Sections of Division-2 where cutting and patching requires excavating and backfilling.

4. Where services are shown or required to be removed, relocated or abandoned, by-pass utility services including pipe or conduit, before cutting. Cut-off pipe or conduit in walls or partitions to be removed. Cap, valve or plug and seal the remaining portion of pipe or conduit to prevent entrance of moisture or other foreign matter after by-passing and cutting.

C. Patching: Patch with durable seams that are as invisible as possible. Comply with specified tolerances.

1. Where feasible, inspect and test patched areas to demonstrate integrity of the installation.

2. Restore exposed finishes of patched areas and extend finish restoration into retained adjoining construction in a manner that will eliminate evidence of patching and refinishing.

3. Where removal of walls or partitions extends from one finished area into another, patch and

repair floor and wall surfaces in the new space to provide an even surface of uniform color and appearance. If necessary, remove existing floor and wall coverings and replace with new materials to achieve uniform color and appearance.

a. Where patching occurs in a smooth painted surface, extend final paint coat over entire unbroken surface area containing the patch, after the patched area has received primer and second coat.

4. Patch, repair or rehang existing ceilings as necessary to provide an even plane surface of uniform appearance.

1.08 CLEANING

A. Thoroughly clean areas and spaces used for access and areas where cutting and patching is performed.

Completely remove paint, mortar, oils, putty, and items of similar nature. Thoroughly clean piping, conduit and other items before painting or finishing surfaces. Restore damaged pipe covering to its original condition.

PART 2 – PRODUCTS

(NOT APPLICABLE)

PART 3 – EXECUTION

(NOT APPLICABLE)

END OF SECTION I-01045

SECTION I-01090

REFERENCE STANDARDS AND DEFINITIONS

PART 1 – GENERAL

1.01 STANDARDS

A. All references to codes, specifications and standards referred to in the Contract Documents shall mean, and are intended to be, the latest edition, amendment or revision of such reference standard in effect as of the date of these Contract Documents.

B. Applicability of Standards: Except where the Contract Documents include more stringent requirements, applicable construction industry standards have the same force and effect as if bound or copied directly into the Contract Documents to the extent referenced. Such standards are made a part of the Contract Documents by reference.

C. Conflicting Requirements: Where compliance with two or more standards is specified, and the standards may establish different or conflicting requirements for minimum quantities or quality levels, refer requirements that are different, but apparently equal, and uncertainties to the Architect for a decision before proceeding.

D. Minimum Quantity or Quality Levels: The quantity or quality level shown or specified shall be the minimum provided or performed. The actual installation may comply exactly with the minimum quantity or quality specified, or it may exceed the minimum within reasonable limits. To comply with these requirements, indicated numeric values are minimum or maximum, as appropriate, for the context of the requirements. Refer uncertainties to Architect for a decision before proceeding.

E. Copies of Standards: Each entity engaged in construction on the Project is required to be familiar with industry standards applicable to that entity's construction activity. Copies of applicable standards are not bound with the Contract Documents.

1. Where copies of standards are needed for performance of a required construction activity, the Contractor shall obtain copies directly from the publication source.

1.02 DEFINITIONS

A. Where "as shown", "as indicated", "as detailed" or words of similar import are used, it shall be understood that reference to the Drawings accompanying the Specifications is made unless otherwise stated. Where "as directed", "as required", "as authorized", "as reviewed", "as accepted" or words of similar import are used, it shall be understood that the direction, requirement, permission, authorization, review, or acceptance of the Architect is intended, unless otherwise stated.

B. As used in the Contract Documents, "provide" shall be understood to mean "provide complete in place", that is, "furnish and install".

C. The term "furnish" is used to mean "supply and deliver to the Project site, ready for unloading, unpacking, assembly, installation, and similar operations."

D. The term "install" is used to describe operations at project site including the actual "unloading, unpacking, assembly, erection, placing, anchoring, applying, working to dimension, finishing, curing, protecting, cleaning, and similar operations."

E. The term "Regulations" includes laws, ordinances, statutes, and lawful orders issued by authorities having jurisdiction, as well as rules, conventions, and agreements within the construction industry that control performance of the Work.

F. Use of titles such as "carpentry" is not intended to imply that certain construction activities must be

performed by accredited or unionized individuals of a corresponding generic name, such as "carpenter." It also does not imply that requirements specified apply exclusively to tradespersons of the corresponding generic name.

G. The term "Project Site" is defined as the space available to the Contractor for performance of construction activities, either exclusively or in conjunction with others performing other work as part of the Project. The extent of the Project Site is shown on the Drawings and may or may not be identical with the description of the land on which the Project is to be built.

H. A "testing laboratory" is an independent entity with the experience and capability to conduct testing and inspecting indicated, as documented by ASTM E548, and that specializes in types of tests and inspections to be performed and is engaged to perform specific inspections or tests, either at the Project Site or elsewhere, and to report on and, if required, to interpret results of those inspections or tests.

I. The term "Professional Engineer" is defined as the entity who is legally qualified to practice in the jurisdiction where the Project is located and who is experienced in providing engineering services of the kind indicated. Engineering services are defined as those performed for installations of the system, assembly, or product that are similar to those indicated for this Project in material, design, and extent.

J. The term "Installer" is defined as the Contractor or another entity engaged by the Contractor, either as an employee, subcontractor, or contractor of lower tier, to perform a particular construction activity, including installation, erection, application, or similar operations. Installers are required to be experienced in the operations they are engaged to perform.

1. The term "experienced," when used with the term "installer," means having successfully completed a minimum of five previous projects similar in size and scope to this Project; being familiar with the special requirements indicated; and having complied with requirements of authorities having jurisdiction.

2. Assigning Specialists: Certain Sections of the Specifications require that specific construction activities shall be performed by specialists who are recognized experts in those operations. The specialists must be engaged for those activities, and their assignments are requirements over which the Contractor has no option. However, the ultimate responsibility for fulfilling contract requirements remains with the Contractor. This requirement shall not be interpreted to conflict with enforcing building codes and similar regulations governing the Work. It is also not intended to interfere with local trade-union jurisdictional settlements and similar conventions.

K. The term "factory-authorized service representative "is a authorized representative of a manufacturer who is trained and approved by the manufacturer to inspect and approve the installation of manufacturer's products that are similar in material, design, and extent to those indicated for this Project and who is authorized by the manufacturer to confirm the issuance of appropriate warranties.

L. The term “Contractor”, “General Contractor” or “G.C.” and “Construction Manager” or “C.M.” shall all mean same.

1.03 SPECIFICATION FORMAT AND CONTENT EXPLANATION

A. Specification Format: These Specifications are organized into Divisions and Sections based on the Construction Specifications Institute's 16-Division format.

B. Specification Content: This Specification uses certain conventions in the use of language and the intended meaning of certain terms, words, and phrases when used in particular situations or circumstances. These conventions are explained as follows:

1. Abbreviated Language: Language used in Specifications and other Contract Documents is the abbreviated type. Words and meanings shall be interpreted as appropriate. Words that are implied, but not stated shall be interpolated as the sense required. Singular words will be interpreted as plural and plural words interpreted as singular where applicable and the context of the Contract Documents so indicates.

Imperative and streamlined language is used generally in the Specifications. Requirements expressed in the imperative mood are to be performed by the Contractor. At certain locations in the

text, for clarity, subjective language is used to describe responsibilities that must be fulfilled indirectly by the Contractor, or by others when so noted. The words "shall be" shall be included by inference wherever a colon (:) is used within a sentence or phrase.

1.04 ABBREVIATIONS AND SYMBOLS

A. Reference to a technical society, institution, association or governmental authority is made in the Specifications in accordance with the following abbreviations:

AA	Aluminum Association
AABC	Associated Air Balance Council
AAMA	American Architectural Manufacturers Association
AAN	American Association of Nurserymen
AASHTO	American Association of State Highway and Transportation Officials
AATCC	American Association of Textile Chemists and Colorists
ABMA	American Boiler Manufacturers Association
ACI	American Concrete Institute
ACIL	American Council of Independent Laboratories
ACPA	American Concrete Pipe Association
ACRI	Air Conditioning and Refrigeration Institute
ADC	Air Diffuser Council
API	Air Filter Institute
AGA	American Gas Association
AGCA	Associated General Contractors of America
AGMA	American Gear Manufacturers Association
AHA	American Hardboard Association
AI	Asphalt Institute
AIA	American Institute of Architects
AIMA	Acoustical & Insulating Materials Association
AIEE	American Institute of Electrical Engineers
AISC	American Institute of Steel Construction
AISI	American Iron and Steel Institute
AITC	American Institute of Timber Construction
ALSC	American Lumber Standards Committee
AMCA	Air Moving and Conditioning Association
ANSI	American National Standards Institute
AOAC	Association of Official Agricultural Chemists
APA	American Plywood Association
API	American Petroleum Institute
AREA	American Railway Engineering Association
ARMA	Asphalt Roofing Manufacturers Assoc.
ARI	Air Conditioning & Refrigeration Institute
ASA	Acoustical Society of America
ASC	Adhesive and Sealant Council
ASHRAE	American Society of Heating, Refrigerating and Air Conditioning Engineers
ASME	American Society of Mechanical Engineers
ASPE	American Society of Plumbing Engineers
ASSE	American Society of Sanitary Engineering
ASTM	American Society for Testing and Materials
AWCI	Association of the Wall & Ceiling Industries
AWCMA	American Window Covering Manufacturers Association
AWI	Architectural Woodwork Institute
AWPA	American Wood Preservers Association
AWPB	American Wood Preservers Bureau
AWPI	American Wood Preservers Institute
AWS	American Welding Society
AWWA	American Water Works Association
BHMA	Builders Hardware Manufacturers Association

BIA	Brick Institute of America
BIFMA	Business and Institutional Furniture Manufacturers Association
BRI	Building Research Institute
CAGI	Compressed Air and Gas Institute
CBMA	Certified Ballast Manufacturers Association
CCC	Carpet Cushion Council
CDA	Copper Development Association
CE	Corps, of Engineers
CGSB	Canadian General Standards Board
CISCA	Ceilings & Interior Systems Construction Association
CISPI	Cast Iron Soil Pipe Institute
CLFMI	Chain Link Fence Manufacturers Institute
CRI	Carpet and Rug Institute
CRSI	Concrete Reinforcing Steel Institute
CS	Commercial Standard, U.S. Department of Commerce
CSI	Construction Specifications Institute
CTI	Ceramic Tile Institute of America
DHI	Door and Hardware Institute
DLPA	Decorative Laminate Products Assoc.
EIMA	Exterior Insulation Manufacturers Assoc.
EJMA	Expansion Joint Manufacturers Assoc.
ETL	Electrical Testing Laboratories
FAA	Federal Aviation Agency
FGMA	Flat Glass Marketing Association (See GANA)
FHA	Federal Housing Administration
FIA	Factory Insurance Association
FM	Factory Mutual Research Organization
FPL	Forest Products Laboratory
FS	Federal Specification
FSIWA	Federation of Sewage & Industrial Waste Association
FTI	Facing Tile Institute
GA	Gypsum Association
GANA	Glass Association of North America
GTA	Glass Tempering Association
HI	Hydronics Institute
HMA	Hardwood Manufacturers Assoc.
HPMA	Hardwood Plywood Manufacturers Association
IBRM	Institute of Boiler and Radiator Manufacturers
IEEE	Institute of Electrical & Electronics Engineers
IESNA	Illuminating Engineering Society of North America
IGCC	Insulating Glass Certification Council
ILI	Indiana Limestone Institute of America
IPCEA	Insulated Power Cable Engineers Association
LGSI	Light Gage Structural Institute
LIA	Lead Industries Association, Inc.
LPI	Lightning Protection Institute
KCMA	Kitchen Cabinet Manufacturing Assoc.
MBMA	Metal Building Manufacturer's Assoc.
MCAA	Mechanical Contractors Association of America
MFMA	Maple Flooring Manufacturers' Assoc.
MIA	Marble Institute of America
ML/SFA	Metal Lath/Steel Framing Assoc.
MS	Military Specification
MSSVFI	Manufacturers Standardization Society of the Valves and Fittings Industries
MSTD	Military Standard
NAAMM	National Association of Architectural Metal Manufacturers
NAFM	National Association of Fan Manufacturers

NAIMA	North American Insulation Manufacturers
NAP A	National Asphalt Pavement Assoc.
NAPF	National Association of Plastic Fabricators
NBGQA	National Building Granite Quarries Association
NBHA	National Builders Hardware Association
NBS	National Bureau of Standards
NCMA	National Concrete Masonry Association
NCSPA	National Corrugated Steel Pipe Association
NEC	National Electrical Code
NEMA	National Electrical Manufacturers Association
NEII	National Elevator Industry, Inc.
NFC	National Fire Code
NFPA	National Fire Protection Association
NFPA	National Forest Products Association
NHLA	National Hardwood Lumber Association
NHPMA	National Hardwood & Pine Manufacturers Association
NOFMA	National Oak Flooring Manufacturers Assoc.
NPA	National Particleboard Association
NPCA	National Paint and Coatings Assoc.
NRCA	National Roofing Contractors Assoc.
NRMCA	National Ready Mixed Concrete Association
NSC	National Safety Council
NSF	National Sanitation Foundation
NSSEA	National School Supply & Equipment Association
NTMA	National Terrazzo & Mosaic Association
NWWMA	National Wood Window & Door Association
OSHA	Occupational Safety & Health Administration
PCA	Portland Cement Association
PCI	Precast/Pre-stressed Concrete Institute
PDCA	Painting and Decorating Contractors of America
PEI	Porcelain Enamel Institute
PS	Product Standard, U.S. Dept. of Commerce
RFCI	Resilient Floor Covering Institute
RIS	Redwood Inspection Service
RMA	Rubber Manufacturers Assoc.
RTI	Resilient Tile Institute
RTI	Resilient Tile Institute
SAE	Society of Automotive Engineers
SBI	Steel Boiler Institute
SCMA	Southern Cypress Manufacturers Association
SDI	Steel Deck Institute
SDI	Steel Door Institute
SGCC	Safety Glazing Certification Council
SHLMA	Southern Hardwood Lumber Manufacturers Assoc.
SIGMA	Sealed Insulating Glass Manufacturers Association
SJI	Steel Joist Institute
SMACNA	Sheet Metal & Air Conditioning Contractors National Association
SMFMA	Sprayed Mineral Fiber Manufacturers Association, Inc.
SPIB	Southern Pine Inspection Bureau
SPRI	Single Ply Roofing Institute
SSPC	Steel Structures Painting Council
SSPMA	Sump and Sewage Pump Manufacturers Assoc.
SWFPA	Structural Wood Fiber Products Association
SWI	Steel Window Institute
TCA	Tile Council of America
TEMA	Tubular Exchange Manufacturing Association
TPI	Truss Plate Institute

UL	Underwriters' Laboratories, Inc.
UPC	Uniform Plumbing Code
USCGS	U.S. Coast and Geodetic Survey
WCLIB	West Coast Lumber Inspection Bureau
WCMA	Wallcovering Manufacturers Assoc.
WRI	Wire Reinforcement Institute
WSC	Water Systems Council
WSFI	Wood and Synthetic Flooring Institute
WWPA	Western Wood Products Association
WWPA	Woven Wire Products Association

B. Refer to Drawings for additional abbreviations and for symbols.

PART 2 – PRODUCTS

(NOT APPLICABLE)

PART 3 – EXECUTION

(NOT APPLICABLE)

END OF SECTION I-01090

SECTION I-01200

PROJECT MEETINGS

PART 1 – GENERAL

1.01 GENERAL

A. The General Contractor/Construction Manager shall schedule and administer project meetings throughout the progress of
the Work. The General Contractor shall prepare agenda, conduct meetings, record meeting results, and distribute recorded proceedings and decisions to participants and all other affected parties.

The General Contractor/Construction Manager shall be responsible for 3D scanning of the construction progress on a weekly basis. The GC/CM shall procure a Matterport Pro2 3D camera and provide full floor 3D scans of the entire project site. Scans shall be uploaded to the Matterport cloud site for the project team to access for the duration of the project on a weekly basis. Upon completion of the project, the contractor shall provide a full floor 3D scan of the completed space for client access.

B. Attendance: For each regularly scheduled project meeting, the following parties must attend when requested by the General Contractor: the Owner, the Architect, the Engineer, the Contractor, Subcontractor executing the Work, other subcontractors affected by the Work, sub-subcontractors, manufacturer's representatives, suppliers and testing agencies.

Weekly meetings shall be held via conference call and on site as requested by Owner. Call information to be provided by Client upon start of construction.

C. Notification: For meetings not regularly scheduled, give participants not less than three (3) days prior notice.

1.02 PRE-CONSTRUCTION CONFERENCE

A. The General Contractor shall schedule a pre-construction conference and organizational meeting, within five (5) days after execution of the Agreement and prior to commencement of construction activities, at a time and place as mutually agreed to by the Owner and the Architect. Conduct the meeting to review responsibilities and personnel assignments.

B. Attendees: The Owner, Architect and their consultants, the General Contractor and its superintendent, major subcontractors, manufacturers, suppliers and other concerned parties shall each be represented at the conference by persons familiar with and authorized to conclude matters relating to the Work.

C. Agenda: Discuss items of significance that could affect progress including such topics as:

1. Building Department Filing / Permits.
2. Tentative construction schedule.
3. Critical Work sequencing.
4. Designation of responsible personnel.
5. Procedures for processing field decisions and Change Orders.
6. Procedures for processing Applications for Payment.
7. Distribution of Contract Documents.

8. Submittal of Shop Drawings, Product Data and Samples.
9. Preparation of record document.
10. Use of the premises.
11. Office, Work and storage areas.
12. Equipment deliveries and priorities.
13. Safety procedures.
14. First aid.
15. Security.
16. Housekeeping.
17. Working hours.

B. Prior to the execution of the Work, and in addition to pre-construction or pre-installation meetings specified in technical specification sections, the General Contractor shall schedule a pre-construction conference with each sub-contractor to review product selection, the procedures for executing the Work and the coordination required with other trades.

1.03 PROGRESS MEETINGS

A. The General Contractor shall schedule not less than four onsite meetings per month on a regular basis for expediting and scheduling the Work. Coordinate dates of meetings with preparation of the payment request.

B. Attendees: In addition to representatives of the Owner, General Contractor and Architect, each subcontractor, supplier or other entity concerned with current progress or involved in planning, coordination or performance of future activities shall be represented at these meetings by persons familiar with the Project and authorized to conclude matters relating to progress.

C. Agenda: Review and correct or approve minutes of the previous progress meeting. Review other items of significance that could affect progress. Include topics for discussion as appropriate to the current status of the Project.

1. Construction Schedule: Review progress since the last meeting. Determine where each activity is in relation to the Contractor's Construction Schedule, whether on time or ahead or behind schedule. Determine how construction behind schedule will be expedited; secure commitments from parties involved to do so. Discuss whether schedule revisions are required to ensure that current and subsequent activities will be completed within the Contract Time.
2. Review the present and future needs of each entity present, including such items as:
    a. Interface requirements.
    b. Time.
    c. Sequences.
    d. Deliveries.
    e. Off-site fabrication problems.
    f. Access.
    g. Site utilization.
    h. Temporary facilities and services.
    I. Hours of Work.
    j. Hazards and risks.

k. Housekeeping.

l. Quality and Work standards.

m. Change Orders.

n. Requests for information (RFI's).

o. Documentation of information for payment requests.

D. Reporting: No later than 3 days after each progress meeting date, Contractor shall create and distribute copies of minutes of the meeting to each party present and to other parties who should have been present. Include a brief summary, in narrative form, of progress since the previous meeting and report.

E. Schedule Updating: Revise the construction schedule after each progress meeting where revisions to the schedule have been made or recognized. Issue the revised schedule concurrently with the report of each meeting.

F. Project Directory: General Contractor shall provide every week a contact directory of the entire team, updating the directory as needed.

1.04 COORDINATION MEETINGS

A. The General Contractor shall conduct Project coordination meetings at regularly scheduled times convenient for all parties involved. Project coordination meetings are in addition to specific meetings held for other purposes, such as regular progress meetings and special pre-installation or pre-construction meetings.

B. Request representation at each meeting by every party currently involved in coordination or planning for the construction activities involved.

C. The General Contractor shall record meeting results and distribute copies within 3 days to everyone in attendance and to others affected by decisions or actions resulting from each meeting.

1.05 SPECIAL MEETINGS

A. Special meetings may be called as required, at a place and time as mutually agreed to by the Owner, the General Contractor and the Architect.

PART 2 – PRODUCTS

(NOT APPLICABLE)

PART 3 – EXECUTION

(NOT APPLICABLE)

END OF SECTION I-01200

SECTION I-01300

SUBMITTALS

PART 1 – GENERAL

1.01 SUMMARY

A. This Section specifies administrative and procedural requirements for submittals required for performance of the Work. The items to be submitted are defined in this and other Specifications
Sections, and include but not limited to:

1. Progress Schedule.
2. Progress Reports.
3. Schedule of Values and Trade Payments Breakdowns.
4. Survey Data.
5. Submittal Schedule.
6. Shop Drawings.
7. Product Data.
8. Samples.
9. Calculations.
10. Certifications.
11. Weekly Construction Photographs.
12. Project Record Documents and As-Built Drawings.
13. Operations and Maintenance Manuals.
14. Warranties Guarantees and Certificates.
15. Certificate of Occupancy.
16. Service and Maintenance Contracts.

B. DEFINITIONS

1. Action Submittals: Written and graphic information that requires Architect's responsive action.
2. Informational Submittals: Written information that does not require Architect's approval. Submittals may be rejected for not complying with requirements.

C. Administrative Submittals: Refer to General Conditions and other sections of the Contract Documents for requirements for administrative submittals. Such submittals include, but are not limited to:

1. Licenses and Permits.
2. Applications for payment.
3. Insurance certificates.
4. List of Subcontractors.

5. Contractors Construction Schedules

6. Daily construction reports.

D. See General Conditions, for other contractual requirements governing Shop Drawings, Product Data and Samples.

E. Related Submittal Requirements Specified Elsewhere

1. Division 1 Section "Summary of Work" specifies requirements governing preparation and submittal of required Coordination Drawings.

2. Division 1 Section "Contract Closeout" specifies requirements for submittal of Project Record Documents, including copies of final Shop Drawings, at project closeout.

1.02 SUBMITTALS, GENERAL

A. Coordination: Coordinate preparation and processing of submittals with performance of construction activities. Transmit each submittal sufficiently in advance of performance of related construction activities to avoid delay.

1. Coordinate each submittal with fabrication, purchasing, testing, delivery, other submittals and related activities.

2. Where architectural or technical considerations require close coordination of a number of products, the Contractor shall coordinate a concurrent submittal of all such products.

a. The Architect reserves the right to withhold action on a submittal requiring coordination with other submittals until all related submittals are received.

B. Contractor's Responsibilities: The Contractor is responsible for the scheduling and submission of all submittals. All submittals shall be submitted in accordance with the approved "Submittal Schedule" to the Architect who in turn will forward to the appropriate parties for review.

1. It shall be the Contractor's responsibility to carefully, thoroughly and fully review submittals to ensure conformance with the Contract requirements which shall include dimensions, clearances, compatibility, and coordination with product data and shop drawings submitted for other work. Submission of submittals to the Architect shall be construed as an acknowledgment that the Contractor has reviewed, coordinated and approved the submittal and that the entire submittal is in compliance with the Contract Documents.

2. Submittals shall be marked to show the Contract name and number, the Architect, Contractor, and applicable subcontractor, manufacturer or supplier. Submittals shall completely identify the specification section, Contract Drawings, and the locations at which materials or equipment are to be installed.

3. Where printed materials describe more than one product or model, clearly identify which is submitted for review.

4. If the Contractor has not checked submittal carefully, the submittals shall be returned to the Contractor for proper checking before further processing or review by the Architect regardless of any urgency claimed by the Contractor. In such a situation, the Contractor will be responsible for any resulting delays to the scheduled Contract completion. Furthermore, the Owner will hold the Contractor responsible for increased costs resulting from the Contractor's failure to comply with the requirements set forth herein.

5. No extension of Contract time will be authorized because of failure to transmit submittals to the Architect sufficiently in advance of the Work to permit the time specified for review and processing. Furthermore, the Contractor shall provide submittals in accordance with the approved Submittal Schedule. Should the Contractor vary from the approved schedule in his submissions, such that the number of submissions made at one time is greater than the Architect's scheduled staffing, additional time will be allowed as is reasonable and necessary

for the proper review of submittals. This additional time shall in no way relieve the Contractor from performing his work on schedule. Resubmissions shall be treated the same as initial submissions with respect to review time.

6. Notations by the Architect which the Contractor believes will increase Contract cost or time of completion shall be brought to the Architect's attention before proceeding with the Work. The Owner will not acknowledge increases to the Contract time or cost alleged by the Contractor as resulting from the Architect's review of submittals unless written authorization is received from the Owner prior to fabrication of any part of the Work.

C. Architect Responsibilities: The review of submittals by the Architect will be for general conformance with the requirements of the Contract Documents only and shall not be interpreted as a checking of detailed dimensions, quantities or approval of deviations from the Contract Documents. The Architect's review shall not relieve the Contractor of his responsibility for accuracy of the submittals nor for the furnishing and installation of materials or equipment in accordance with Contract requirements. The Architect's review of a separate item shall not indicate review of the complete assembly in which it functions.

1. Review of submittals is not to be interpreted as an analysis of a substitute material or system nor utilized for a "Request for Information". Review of substitutions will be accomplished in accordance with the requirements set forth in Specification Section 01600, "Materials, Equipment and Systems". Procedure for "Request for Information" shall be in accordance with the requirements set forth in Specification Section 01010, "Summary of Work".

2. The Architect will review submittals in seven (7) working days of receipt in the Architect's office and will return them to the Contractor with the Design Review Stamp applied thereto. Notations by the Architect which increase contract cost or time of completion shall be brought to the Architect's attention before proceeding with the Work. Failure to do so indicates the Contractor agrees that notations do not represent additional cost or time.

3. Unsolicited Submittals: The Architect will return unsolicited submittals to the sender without action.

1.03 PROGRESS SCHEDULE

A. Refer to General Conditions, for contractual requirements governing progress schedule.

B. The General Contractor shall prepare the progress schedule in the form of a bar chart. On a monthly basis, enter the actual progress of the Work on the chart, and confirm in writing any delay or deviation from the preceding month's schedule, including the action to be undertaken to correct each deficiency. Maintain the progress of the Work in accordance with the progress schedule. If the time for completion is revised, submit a revised Progress Schedule.

C. The schedule shall indicate the starting and completion dates for all construction activities. Activities shall also include the submission of shop drawings and samples and reviews therefore, delivery of critical materials and equipment, and all other items that may affect the progress schedule. Related activities shall be grouped for convenience.

D. During the progress of the Work, any changes in the original schedule desired by the Contractor which affect Contract completion dates must be approved by the Owner before being put into effect.

E. When changes in the Work are required the original schedule shall be revised without delay to incorporate such changed or new work and indicate the effect thereof on the Project as a whole.

F. When the progress schedule and reports indicate delays, the Contractor shall take steps as necessary to improve the progress and to submit for review, revised schedules to demonstrate that the rate of progress will be regained, all without additional cost to the Owner.

1.04 SCHEDULE OF VALUES

A. Refer to General Conditions, for contractual requirements governing schedule of values.

B. The schedule of values shall be related to Sections and Divisions of the Work, aggregating the total Contract Sum and shall include overhead and profit as separate line items.

C. The Contractor shall also submit a schedule of anticipated monthly requisition amounts which shall be related to the progress schedule.

1.05 SUBMITTAL SCHEDULE

A. Prepare a submittal schedule that contains a complete listing of all submittals required by Contract. Submit the schedule to the Architect a minimum of 30 days prior to submitting any submittals grouped and regulated so as not to burden the reviewing facilities, while maintaining job progress. Organize the submittal schedule by specification section number. Assign each submittal a sequential number for identification and tracking purposes.

B. The Submittal Schedule shall be submitted for the Architect's review and approval. Include the following information:

1. Title of Submittal/Description.
2. Submittal Number (sequential).
3. Scheduled date for the first submittal.
4. Drawing Number (if applicable).
5. Applicable specification Section Number.
6. Name of subcontractor/vendor.

1.06 SHOP DRAWINGS, PRODUCT DATA, CALCULATIONS AND SAMPLES (SUBMITTALS AND DISTRIBUTION)

A. Refer to General Conditions, for other requirements governing Shop Drawings, Product Data and Samples.

B. Shop Drawings

1. Shop drawings shall show in detail, materials, dimensions, thicknesses, assembly, attachments, relation to adjoining work, compliance with specified standards, notations of coordination requirements and all other pertinent data and information. Do not reproduce Contract Documents or copy standard printed information as the basis of Shop Drawings.
2. Shop drawings include fabrication and installation drawings, setting diagrams, schedules, patterns, templates and similar drawings. In checking shop drawings, verify all dimensions and field conditions and check and coordinate the shop drawings of any section or trade with the requirements of other sections or trades as related thereto, as required for proper and complete installation of the Work.
3. Prepare composite shop drawings and installation layouts, of ceiling finishes, trades above ceilings and elsewhere as directed by the Architect to depict proposed solutions for tight field conditions. These composite shop drawings and field installation layouts shall be coordinated in the field by the Contractor and his subcontractors for proper relationship to the work of all other trades, based on field conditions.
4. Submit shop drawings, drawn to accurate scale. Highlight, encircle, or otherwise indicate deviations from the Contract Documents. Reproductions of Contract Documents will not be acceptable.
5. The submission of shop drawings shall include:
    a. Provide clear adequate space on submitted shop drawings for the reviewer's Shop Drawing Review Stamp as shown in attachments at end of this specification section.
    b. The Contractor shall not use or distribute for construction purposes any shop

drawings that do not include the design review stamp.

6. The Architect will review shop drawings and return the reproducible drawings and one blue-line print to the Contractor for revision, processing or resubmission. The Contractor is responsible for distributing approved prints of shop drawings to its subcontractors and materials suppliers.

7. The Contractor shall bear all costs incurred for such reproduction and distribution.

8. Coordination drawings are shop drawings that detail the relationship and integration of different construction elements that require careful coordination during fabrication or installation.

9. Shop drawings shall be provided for (but not limited to) the following:

   a. Millwork

   b. Stone fabrication/Slab installation/Tile layout

   c. Glass/Glazing

   d. Fabric ceiling and wall panel systems

   e. Demountable office front systems

   f. Stainless steel/ornamental metal

10. Prepare and submit coordination drawings of all involved trades in a scale of not less than 3/8 in. = 1 ft. or larger for integration of different construction elements. Show sequences and relationships of separate components to avoid conflicts in use of space. Any Work installed prior to review of coordination drawings shall be at the Contractor's risk and subsequent relocations required to avoid interference shall be made at no additional cost.

C. Product Data

1. Compile Product Data into a single submittal for each element of construction or system. Product Data includes, among other information, printed information such as manufacturer's installation instructions, compliance with trade association standards, catalog cuts, standard color charts, compliance with recognized testing agency standards, notations of coordination requirements, roughing-in diagrams and templates, standard wiring diagrams and performance curves. Where Product Data must be specially prepared because standard printed data is inadequate, submit as "Shop Drawings".

2. The submission of product data literature shall include the following:

   a. Mark each copy to show applicable choices and options. Where printed Product Data includes information on several products, some of which are not required, mark copies to indicate the applicable information. Include the following information:

      1) Manufacturer's printed recommendations.

      2) Compliance with recognized trade association standards.

      3) Compliance with recognized testing agency standards.

      4) Application of testing agency labels and seals.

      5) Notation of dimensions verified by field measurement.

      6) Notation of coordination requirements.

   b. Do not submit Product Data until compliance with requirements of the Contract Documents has been confirmed.

D. Samples

1. The Contractor shall submit sample(s) to the Architect as required in the specifications or as may be requested by the Architect. All costs associated with sample submittals shall be borne by the Contractor.

a. Each required sample must be submitted in quantities as required by each technical specification section, or if not specified, a minimum of two (2). Refer to technical specifications sections for samples to be returned to the Contractor for incorporation in the Work. Such samples shall be undamaged at time of use.

b. Every sample submittal shall have a typed label showing:

1) Contract title and number.

2) Contractor's name, name of individual forwarding item.

3) Architect's names.

4) Description of item represented.

5) Manufacture's data sheets and drawings, and other information as applicable.

6) Applicable Specification Section and Contract drawing number(s).

2. Approval of samples will not preclude the rejection of the completed Work, if completed Work deviates from the sample submitted or does not otherwise comply with other Contract requirements. Samples shall show anticipated range of color and/or texture. The Architect may require additional submissions if the range is not satisfactory.

3. Preliminary Sample Submittals: Where Samples are for selection of color, pattern, texture or similar characteristics from a range of standard choices, submit a full set of choices for the material or product.

a. Preliminary sample submittals will be reviewed and returned with the Architect's mark indicating selection and other action required.

4. Maintain 2 sets of approved Samples at the Project site, for the purpose of comparison throughout the course of construction.

5. Field Samples required by individual Specification Sections are mock-ups erected on site to illustrate finishes, coatings, or textures and to establish the standard by which the Contract Work will be judged. Mock-ups shall be provided in the sizes prescribed in the Contract Documents or as may be required by the Architect.

a. Comply with submittal requirements, and process transmittal forms to provide a record of the submittal.

6. Samples of materials which are generally furnished in containers bearing manufacturer's descriptive labels and printed application instructions shall, if not submitted in standard containers, be furnished with such labels and application instructions.

E. Calculations

1 Calculations are the mathematical data specifically prepared for the Work by the Contractor or any subcontractor, manufacturer, supplier or Distributer which demonstrate, by use of legitimate accepted engineering principles, that a portion of the Work satisfies the performance criteria established in the Contract Documents.

2. Only those calculations which are for permanent parts of the Work will be reviewed by the Architect. These calculations will be reviewed only for compliance with stipulated design criteria.

F. Certifications: Where other Sections of the Specifications require certification that a product, material, or installation complies with specified requirements, submit a notarized certification from the manufacturer certifying compliance with specified requirements. Certification shall be signed by an officer of the manufacturer or other individual authorized to sign documents on behalf of the company.

1.07 SUBMITTAL PROCEDURES

A. Contractor shall submit Shop Drawings, Product Data, Samples and Calculations accompanied by a "Shop Drawing and Sample Transmittals" form in 'MS Excel' spreadsheet format.

B. Preparation of Submittal Form:

1.	Contr. Job no.	Contractor's name and job number
2.	Spec. Section	The Specification Section number where item is specified – do not submit items from more than one Specification Section on the same form.
3.	Submitted by	Name of Contractor's employee responsible for Contractor's review.
4.	Project/VCA No.	Project Name and Architect's Project Number.
5.	Transmittal No.	Transmittal numbers shall be consecutive for the Project.
6.	Date Submitted	Date leaving Contractor's office.
7.	Trade Subcontractor	Name of firm preparing original documents (shop drawings or sample)
8.	Submitted to	Name of firm and individual submitted to as lead reviewer.
9.	Copies to	Name of firms and individuals copied submitted to for info or follow-up and final review.
10.	First Reviewer Indicate in Date, Out Date, Second Reviewer Indicate In Date, Out Date, etc.	As per submittal procedure, first reviewer will log in shop drawing at received date and log out at out date and forward to second reviewer, etc.
11.	Final Review	VCA will consolidate consultant reviews and forward to contractor.
12.	Contractor Received	Date received by Contractor.
13.	File No.	Number given to each submission item per specification section. Number is to be consecutive per spec. section.
14.	Submission No.	1st, 2nd, 3rd, etc. depending on previous submissions for same items (see resubmittal procedure).
15.	Spec. Sec. Para.	Specific paragraph under which items are specified.
16.	Copies & Type	Number of copies submitted and type of material submitted (sepia, print, brochure or sample, etc.)
17.	Dwg. No./Descr. Date	Number on the drawing. Title on the submission (where possible) and date on the submission. Where a group of related drawings is submitted as one unit, only one entry need to be made with a general description of what is included.
18.	Contr.'s remarks	Note exceptions or deviations from the Contract Documents and reasons for them.

C. Resubmissions: Resubmittal procedure shall follow the same procedures as the initial submittal with the following exceptions:

1. Transmittal shall contain the same information as the first transmittal except that transmittal numbers shall run consecutively and the submission number shall indicate 2nd, 3rd, etc. submission. The drawing number/description shall be identical to the initial submission and the date shall be the revised date for that submission.
2. No new material shall be included on the same transmittal for a resubmission.
3. On resubmissions of shop drawings, the Architect's review shall be generally restricted to review of revisions to the original shop drawing. All changes (revisions) to re-submitted shop drawings must be clearly encircled or otherwise highlighted.

D. Architect's Action on Transmittal Form

1. Incomplete or erroneous transmittals will be returned without action.
2. The remainder of the transmittal will be filled out by the Architect.

E. Submittal Procedures by Contractor

1. Architectural and structural items as follows:
   a. One AutoCAD file and two prints of Shop Drawings with transmittal form to the Architect.
   b. Three Samples with transmittal form to the Architect.
   c. Three copies of brochures with transmittal forms to the Architect.
2. Mechanical and Electrical items as follows:
   a. One AutoCAD file and one print of Shop Drawings with photocopy of transmittal to the Mechanical/Electrical Engineer. One print of Shop Drawings with transmittal forms to the Architect.
   b. Three Samples with photocopy of transmittal to the Mechanical/Electrical Engineer. Transmittal forms to the Architect.
   c. Six copies of brochures with photocopy of transmittal to the Mechanical/Electrical Engineer. One copy of brochure with transmittal forms to the Architect.
3. Other Consultants as follows: (Acoustical, Lighting, AV...)
   a. One AutoCAD file and one print of Shop Drawings with photocopy of transmittal to the Consultant. One print of Shop Drawings with transmittal forms to the Architect.
   b. Three Samples with photocopy of transmittal to the Consultant. Transmittal forms to the Architect.
   c. Six copies of brochures with photocopy of transmittal to the Consultant. One copy of brochure with transmittal forms to the Architect.
   d. Copies of submission to be sent to other consultant as arranged during pre-submission meeting.

F. Design Review Stamp

1. The Architect will process the submission and indicate the appropriate action on the submission and the transmittal.
2. Each Shop Drawing, Product Data or Sample submittal will be stamped with the Design Review Stamp indicating the appropriate action as follows:

   "APPROVED" means that fabrication, manufacture, or construction may proceed providing submittal complies with the Contract Documents.

   b. **"APPROVED AS CORRECTED"** means that fabrication, manufacture, or construction

may proceed providing submittal complies with the Architect's notations and the Contract Documents. When noted, resubmit for verification that comments have been complied with. If, for any reason, Contractor cannot comply with the notations, Contractor shall make revisions and resubmit as described for submittals stamped **"APPROVED AS CORRECTED".**

c. **"REVISE AND RESUBMIT"** means that a portion of the submittal does not comply with the design intent of the Contract Documents and that fabrication, manufacture, or construction may not proceed. Contractor shall make revisions and resubmit entire submittal only revising portions as noted.

d. **"REJECTED"** means that submittal does not comply with the design intent of the Contract Documents and that fabrication, manufacture, or construction may not proceed. Submittals stamped **"REJECTED"** are not to be used. Contractor shall make revisions and resubmit.

3. Submittals of calculations for permanent parts of the structure will be reviewed only for compliance with stipulated design criteria. Each submittal will be stamped to indicate whether or not comments have been made.

   a. Submittals reviewed and without annotations or comments shall be stamped **"NO COMMENTS".**

   b. Submittals reviewed and with annotations or comments shall be stamped **"COMMENTS** AS **NOTED".**

4. Contractor shall make any corrections required and shall resubmit corrected shop drawings or new samples until stamped **"APPROVED" or "APPROVED AS CORRECTED".** Contractor shall direct specific attention in writing to all revisions other than the corrections requested.

5. No portion of the Work requiring a shop drawing or sample submission shall be commenced until the submission has been reviewed and actioned **"APPROVED", "APPROVED AS CORRECTED" or "REVISE AND RESUBMIT"** in writing. All such portions of the Work shall be in accordance with reviewed shop drawings and samples.

6. The Contractor/Subcontractor shall place the Architect's, Individual Consultant's, (etc.) "Action Stamp" and the Contractor "Reviewed Stamp" on all shop drawing title blocks and submissions for catalog cuts, samples, calculations, etc. Contractor/Subcontractor shall supply separate sheet for each item submitted. Architect will supply the electronic version of shop drawing action stamp for use by Contractor/Subcontractors. (See Attached Example)

7. The Architect will fill out transmittal in the following sequence:

   a. Date Rec'd. - Date arriving in the Architect's office.

   b. Date Return - Date leaving the Architect's office to the Contractor.

   c. In Date - Date received by consultant.

   d. Out Date - Date returned or forwarded by Consultant.

   e. Action - Indicate action taken on submission.

   f. Remarks - Note major deviations from the Contract Documents or reasons for **"REVISE AND RESUBMIT" or "REJECTED"** if there are no notes on the material submitted.

8. The Architect will print Shop Drawings for his own use. The Architect will return sepia of

Shop Drawings, one Sample, one brochure or one copy of calculations with photocopy of transmittal form to the Contractor.

1.08 PHOTOGRAPHS

A. Photographs shall be taken by a competent commercial photographer acceptable to the Architect.

B. During the progress of the Work, submit digital color photographs taken once a week, consisting of twenty (20) views, all taken where directed by the Architect. Files shall be emailed to the Architect on a weekly basis.

C. **At the completion of all Work, upon final move-in and artwork installation, twenty-five (25) final professional color photographs shall be taken as directed by the Architect.**

D. Two (2) high resolution glossy prints of each photograph shall be mailed to the Architect. The photographs shall be neatly labeled, dated, and identified in a title box in the lower right-hand corner showing the date of exposure, Project name, Project location and direction of view.

E. All final high-resolution JPEG or TIFF files shall be provided to the Architect on DVD and uploaded to ftp site.

PART 2 – PRODUCTS

(NOT APPLICABLE)

PART 3 – EXECUTION

(NOT APPLICABLE)

END OF SECTION I-01300

SECTION I-01500

CONSTRUCTION FACILITIES AND TEMPORARY CONTROLS

PART 1 – GENERAL

1.01 GENERAL

A. Specific administrative and procedural minimum actions are specified in this section, as extensions of provisions in other Contract Documents. These requirements have been included for special purposes as indicated. Nothing in this section is intended to limit types and amounts of temporary work required, and no omission from this section will be recognized as an indication that such temporary activity is not required for successful completion of the work and compliance with requirements of the Contract Documents.

B. Arrange for, provide and maintain temporary facilities and controls as required for the proper and expeditious prosecution of the Work. Pay all costs including fuel, power and water used until final acceptance of the Work unless the Owner makes arrangements for the use of completed portions of the Work after Substantial Completion in accordance with the provisions of the General Conditions.

C. Provide and maintain all temporary connections to utilities and services in locations acceptable to the Owner, Architect and local authorities having jurisdiction thereof. Make all installations in a manner subject to the acceptance of such authorities and the Architect. Remove temporary installations and connections when no longer required and restore the services and sources of supply to proper operating condition.

1.02 SUBMITTALS

A. Temporary Utilities: Submit reports of tests, inspections, meter readings and similar procedures performed on temporary utilities.

B. Implementation and Termination Schedule: Submit a schedule indicating implementation and termination of each temporary utility within 15 days of the date established for commencement of the Work.

1.03 QUALITY ASSURANCE

A. Regulations: Comply with industry standards and applicable laws and regulations and authorities having jurisdiction, including but not limited to:

1. Building Code requirements.
2. Health and safety regulations.
3. Utility company regulations.
4. Police, Fire Department and Rescue Squad rules.
5. Environmental protection regulations.

B. Inspections: Arrange for authorities having jurisdiction to inspect and test each temporary utility before use. Obtain required certifications and permits.

1.04 PROJECT CONDITIONS

A. Temporary Utilities: The General Contractor shall prepare a schedule indicating dates for implementation and termination of each temporary utility. At the earliest feasible time, when acceptable to the Owner, the General Contractor shall arrange for the change over from use of temporary service to use of the permanent service.

B. Conditions of Use: Keep temporary services and facilities clean and neat in appearance. Operate in a
safe and efficient manner. Take necessary fire prevention measures. Do not overload facilities, or permit them to interfere with progress. Do not allow hazardous, dangerous or unsanitary conditions, or
public nuisances to develop or persist on the site.

1.05 EQUIPMENT

A. General: Provide new equipment; if acceptable to the General Contractor, undamaged, previously used equipment in serviceable condition may be used. Provide equipment suitable for use intended.

B. Water Hoses: Provide % in. heavy-duty, abrasion-resistant, flexible rubber hoses 100 ft. long, with pressure rating greater than the maximum pressure of the water distribution system; provide adjustable shut-off nozzles at hose discharge.

C. Electrical Outlets: Provide properly configured NEMA polarized outlets to prevent insertion of 110-120 volt plugs into higher voltage outlets. Provide receptacle outlets equipped with ground-fault circuit interrupters, reset button and pilot light, for connection of power tools and equipment.

D. Electrical Power Cords: Provide grounded extension cords; use "hard-service" cords where exposed to abrasion and traffic. Provide waterproof connectors to connect separate lengths of electric cords, if single lengths will not reach areas where construction activities are in progress.

E. Lamps and Light Fixtures: Provide general service incandescent lamps of wattage required for adequate illumination. Provide guard cages or tempered glass enclosures, where exposed to breakage. Provide exterior fixtures where exposed to moisture.

F. Heating Units: Provide temporary heating units that have been tested and labeled by UL, FM or another recognized trade association related to the type of fuel being consumed.

1.06 TEMPORARY ELECTRICITY AND LIGHTING

A. Extend existing electrical service on the construction floor, and provide equipment necessary for temporary power and lighting, of adequate capacity for all construction tools and equipment without overloading the temporary facilities, and make available for power, lighting and construction operations of all trades.

B. The termination of power distribution shall be at convenient locations in the building. Provide terminations complete with circuit breakers, disconnect switches and other electrical devices required to protect the power supply system.

C. Provide and maintain a temporary lighting system to satisfy at least the minimum requirements of safety and security, and to maintain the progress of the Work. The temporary lighting system shall afford general illumination in all areas of the Project and any additional illumination, where necessary, in the areas of the Project where work is being performed.

D. Maintain temporary wiring in a safe manner, and use without hazard to persons or property.

E. At the completion of the Work remove temporary electrical equipment and wiring, replace worn or damaged parts of the permanent system, and leave equipment in first-class condition equal to new.

1.07 TEMPORARY HEATING, COOLING AND VENTILATING

A. Provide temporary heat during construction if necessary to ensure suitable conditions for the

construction operations of all trades. Where work is being conducted, maintain temperatures as specified in the various sections of the Specifications, but not less than 45 deg. F. Do not allow the temperature to reach a level which will cause damage to any portion of the Work.

B. The permanent heating system, or a portion thereof, may be used provided the Contractor obtains approval of the Owner.

C. Provide adequate ventilation to prevent accumulation of excess moisture.

D. The permanent air circulation system, or a portion thereof, may be used provided the Contractor obtains the approval of the Owner and assumes full responsibility for the entire air circulation system. Provide temporary filters to adequately filter air being distributed through the duct work to the supply outlets; disposable filters shall be placed in front of all exhaust registers to keep construction dirt out of exhaust duct work. Thoroughly clean the interior of the air handling units and duct work and install the permanent filters prior to acceptance of the Work.

E. At the completion of the Work remove all temporary heating equipment and piping and replace all worn or damaged parts of the permanent system. Leave equipment in first-class condition equal to new.

1.08 TEMPORARY WATER

A. Furnish drinking water with suitable containers and cups for use of employees. Locate drinking water dispensers where work is in progress.

B. The permanent water supply and distribution system, or a portion thereof, may be used provided the Contractor obtains the approval of the Owner.

C. Make provisions for drainage or collection of excess or spilled water.

D. At the completion of the Work, remove all temporary water service equipment and piping and replace all worn or damaged parts of the permanent system. Leave equipment in first-class condition equal to new.

1.09 TEMPORARY SANITARY FACILITIES

A. Use of existing toilet facilities in the building for construction personnel shall be coordinated and approved by building management.

Maintain toilets in accordance with the requirements of the state and local health regulations and ordinances. Upon completion of the Work, clean and restore these facilities and their appurtenances.

1.10 TEMPORARY FIRE PROTECTION

A. Provide temporary connections to existing fire standpipe system as required in all parts of the Work, for use of Fire Department during construction. Remove such temporary connections on completion of the Work.

B. Provide temporary hose and nozzles as required by Fire Department. Install permanent or temporary cross connections. Provide temporary Siamese connections to temporary or permanent cross connections.

C. Fire Extinguishers: Provide hand-carried, portable UL-rated, class "A" fire extinguishers for temporary offices and similar spaces. In other locations provide hand-carried, portable, UL-rated, class "ABC" dry chemical extinguishers, or a combination of extinguishers of NFPA recommended classes for the exposures. Comply with NFPA 10 and 241 for classification, extinguishing agent and size required by location and class of fire exposure.

1.11 TEMPORARY CONSTRUCTION OPENINGS

A. Provide openings in slabs, walls and partitions where required for moving in large pieces of equipment.

After the equipment is in place, close all openings and restore finish work to original condition. Maintain fire rating of existing rated construction utilizing firestopping as specified in Section

"Firestopping". Structural modifications shall be subject to review by the Architect.

1.12 TEMPORARY ELEVATORS AND HOISTS

A. Make arrangements with the Building Management for temporary elevator service during construction operations, including hours within which elevators may be used and meet costs which may arise for overtime use.

B. Provide protection for elevator cabs against damage of any kind due to construction use.

C. At the completion of the Work remove temporary elevator protection, replace worn or damaged parts of the permanent system and equipment, and restore to first-class condition equal to new.

1.13 SECURITY AND PROTECTION

A. Provide temporary enclosures required for protecting the Project from the exterior, for providing passageways, for the protection of openings both exterior and interior and any other location where temporary enclosures and protection may be required.

C. Take adequate precautions against fire, keep flammable material at an absolute minimum and ensure that such material is properly handled and stored. Except as otherwise provided herein, do not permit fires or open salamanders in any part of the Work.

D. Storage: Where materials and equipment must be stored, and are of value or attractive for theft, provide a secure lockup. Enforce discipline in connection with the installation and release of material to minimize the opportunity for theft and vandalism.

E. Environmental Protection: Provide protection, operate temporary facilities and conduct construction in ways and by methods that comply with environmental regulations, and minimize the possibility that air, waterways and subsoil might be contaminated or polluted, or that other undesirable effects might result. Avoid use of tools and equipment which produce harmful noise. Restrict use of noise making tools and equipment to hours that will minimize complaints from persons or firms near the site.

1.14 PROJECT IDENTIFICATION AND SIGNS

A. No signs or advertisements will be allowed to be displayed on the premises without the acceptance of the Architect.

1.15 TEMPORARY FIELD OFFICES AND SHEDS

A. Provide and maintain a field office with telephone on the construction floor, with temporary office space with not less than 200 sq. ft. of space for the use of the General Contractor, complete with light, heat, air conditioning, electric water cooler, plan racks, 4-drawer metal file with lock, shelves for samples, tables, chairs and janitor service. Provide a telephone for the General Contractor and pay for all charges for installation and for all calls, including long distance calls.

PART 2 – PRODUCTS

2.01 MATERIALS

A. General: Provide new materials. Undamaged, previously used materials in serviceable condition may be used if approved by Architect. Provide materials suitable for use intended.

B. Gypsum Board: Minimum 1/2" in. thick by 48 in. wide by maximum available lengths; regular-type panels with tapered edges. Comply with ASTM C36 and Section "Gypsum Drywall".

C. Insulation: Unfaced mineral-fiber blanket, manufactured from glass, slag wool, or rock wool; with maximum flame-spread and smoke-developed indices of 25 and 50, respectively. Comply with and Section "Building Insulation".

D. Paint: Comply with requirements in Section "Painting."

E. Tarpaulins: Fire-resistive labeled with flame-spread rating of 15 or less.

F. Water: Potable.

PART 3 – EXECUTION

3.01 INSTALLATION, GENERAL

A. Locate facilities where they will serve Project adequately and result in minimum interference with performance of the Work. Relocate and modify facilities as required.

B. Provide each facility ready for use when needed to avoid delay. Maintain and modify as required. Do not remove until facilities are no longer needed or are replaced by authorized use of completed permanent facilities.

3.02 SUPPORT FACILITIES INSTALLATION

A. Locate field offices, storage sheds, sanitary facilities, and other temporary construction and support facilities for easy access.

B. Provide incombustible construction for offices, shops, and sheds located within construction area Comply with NFPA 241.

C. Maintain support facilities until near Substantial Completion. Remove before Substantial Completion. Personnel remaining after Substantial Completion will be permitted to use permanent facilities, under conditions acceptable to Owner.

3.03 OPERATION, TERMINATION, AND REMOVAL

A. Supervision: Enforce strict discipline in use of temporary facilities. To minimize waste and abuse, limit availability of temporary facilities to essential and intended uses.

B. Maintenance: Maintain facilities in good operating condition until removal. Protect from damage caused by freezing temperatures and similar elements.

C. Termination and Removal: Remove each temporary facility when need for its service has ended, when it has been replaced by authorized use of a permanent facility, or no later than Substantial Completion. Complete or, if necessary, restore permanent construction that may have been delayed because of interference with temporary facility. Repair damaged Work, clean exposed surfaces, and replace construction that cannot be satisfactorily repaired.

D. Materials and facilities that constitute temporary facilities are the property of Contractor. Owner reserves right to take possession of Project identification signs.

END OF SECTION I-01500

SECTION I-01600

MATERIAL, EQUIPMENT AND SYSTEMS

PART 1 – GENERAL

1.01 DEFINITIONS

A. Definitions used in this Article are not intended to change the meaning of other terms used in the Contract Documents, such as "specialties," "systems," "structure," "finishes," "accessories," and similar terms. Such terms such are self-explanatory and have well recognized meanings in the construction industry.

1. Products: items purchased for incorporation in the Work, whether purchased for the Project or taken from previously purchased stock. The term "product" includes the terms "material," "equipment," "system," and terms of similar intent.

a. Named Products: Items identified by manufacturer's product name, including make or model designation, indicated in the manufacturer's published product literature, that is current as of the date of the Contract Documents.

b. Foreign Products: Distinguished from "domestic products," are considered items substantially manufactured (50% or more of value) outside of the United States and its possessions; or produced or supplied by entities substantially owned (more than 50%) by persons who are not citizens of nor living within the United States and its possessions.

2. Materials: Products that are substantially shaped, cut, worked, mixed, finished, refined or otherwise fabricated, processed, or installed to form a part of the Work.

3. Equipment: A product with operational parts, whether motorized or manually operated, that requires service connections such as wiring or piping.

4. Substitution: A product, material, equipment, method of construction or system proposed by the Contractor after award of the Contract which is different from that which is required by the Contract Documents. All proposed "substitutions" shall comply with the procedure for submission of substitutions as defined herein. In instances of dispute as to whether any proposal by the Contractor represents a "substitution", the judgment of the Architect shall govern. The burden of proof rests solely with the Contractor.

B. Equal Equivalent: With respect to products, the words "or approved equal" and "or equal" are used synonymously in the Contract Documents to mean like degree of features, attributes, performance or qualities deemed essential to the design indicated by the Architect for the Work. Use of these terms or language of similar import is intended to mean that the Architect will consider and must approve substitution proposals for the product.

1.02 PRODUCT SELECTION

A. General Product Requirements: Provide products that comply with the Contract Documents, that are undamaged and, unless otherwise shown or specified, unused at the time of installation.

1. Provide products complete with all accessories, trim, finish, safety guards and other devices and details needed for a complete installation and for the intended use and effect.

2. Standard Products: Where available, provide standard products of types that have been produced and used successfully in similar situations on other projects.

B. Product Selection Procedures: Product selection is governed by the Contract Documents and governing regulations, not by previous Project experience. Procedures governing product selection include the following:

1. Proprietary Specification Requirements: Where only a single product or manufacturer is named, provide the product indicated. Comply with Contract Document provisions concerning "substitutions" to obtain approval for use of an unnamed product.

2. Semi-Proprietary Specification Requirements: Where two or more products or manufacturers are named, provide one of the products specified.

   a. Where products or manufacturers are specified by name, accompanied by the term "or equal," or "or approved equal" comply with the Contract Document provisions concerning "substitutions" to obtain approval for use of an unnamed product.

3. Non-Proprietary Specifications: When the Specifications list products or manufacturers that are available and may be incorporated in the Work, but do not restrict the Contractor to use of these products only, the Contractor may propose any available product that complies with Contract requirements.

4. Descriptive Specification Requirements: Where Specifications describe a product or assembly, listing exact characteristics required, with or without use of a brand or trade name, provide a product or assembly that provides the characteristics and otherwise complies with Contract requirements.

5. Performance Specification Requirements: Where Specifications require compliance with performance requirements, provide products that comply with these requirements, and are recommended by the manufacturer for the application shown or specified. General overall performance of a product is implied where the product is specified for a specific application.

   a. Manufacturer's recommendations may be contained in published product literature, or by the manufacturer's certification of performance.

6. Compliance with Standards, Codes and Regulations: Where the Specifications only require compliance with an imposed code, standard or regulation, provide a product that complies with the standards, codes or regulations specified.

7. Visual Matching: Where Specifications require matching an established Sample, the Architect's decision will be final on whether a proposed product matches satisfactorily.

   a. Where no product available within the specified category matches satisfactorily and also complies with other specified requirements, comply with provisions of the Contract Documents concerning "substitutions" for selection of a matching product in another product category, or for noncompliance with specified requirements.

8. Color Selection

   a. As soon as possible, Contractor shall obtain from Subcontractors and submit to Architect, a complete list of materials for which colors are to be selected. Include manufacturer's name and all pertinent data which will facilitate completion of color schedule until all submittals and required samples have been submitted to and reviewed by Architect. Include items which may come in only one or a limited number of colors. Items which are specified without any reference to color, but which come in a color, shall be brought to the Architect's attention for his color selection. In no case shall the Contractor or his Subcontractors select a color for materials, products or equipment for which colors are available without first consulting the Architect.

   b. When the sentence "Color selected by Architect." is used in the specifications, it shall mean that color, texture or pattern will be selected by the Architect from the

manufacturer's full range of standard and special colors. The sentence "Custom color selected by Architect.", "Match existing color." or "Match Architect's approved sample." shall mean that color, texture or pattern has been selected or that it will be selected by the Architect and that the Contractor shall provide color, texture or pattern conforming to that selection.

c. When, due to the nature of the material, the material is available in a range of colors, i.e., natural stone, brick, and tile, Contractor shall submit the full available range of colors for that material for the Architect's review. Materials not conforming to the approved color range will be rejected and Contractor shall remove nonconforming materials from the site and replace them with materials in the approved color range at the Contractor's expense.

1.03 TRANSPORTATION AND HANDLING

A. Deliver, store and handle materials, products and equipment in accordance with the manufacturer's recommendations, using means and methods that will prevent damage, deterioration and loss, including theft.

1. Schedule delivery to minimize long-term storage at the site and to prevent overcrowding of construction spaces. Coordinate delivery with installation time to ensure minimum holding time for items that are flammable, hazardous, easily damaged, or sensitive to deterioration, theft and other losses.

2. Deliver products to the site in the manufacturer's original sealed container or other packaging system, complete with labels and instructions for handling, storing, unpacking, protecting and installing.

3. Inspect products upon delivery to ensure compliance with the Contract Documents, and to ensure that products are undamaged and properly protected.

B. More detailed requirements for transportation and handling are specified under the technical Sections.

1.04 STORAGE AND PROTECTION

A. Store products at the site in a manner that will facilitate inspection and measurement of quantity or counting of units. Store heavy materials away from the Project structure in a manner that will not endanger the supporting construction. Provide suitable temporary weather-tight storage facilities as may be required for materials that will be damaged by storage in the open and with ventilation adequate to prevent condensation. Maintain temperature and humidity within range required by manufacturer's instructions.

B. Available storage space at the job site is limited to the area within the Contract Limit lines. Any additional off-site space required is the responsibility of the Contractor.

C. Allocate the available storage areas and coordinate their use by the trades on the job. Maintain a current layout of all storage facilities.

D. Store and protect materials delivered at the site from damage. Do not use damaged material in the Work.

1.05 MANUFACTURER'S INSTRUCTIONS

A. Manufactured articles, materials and equipment shall be applied, installed, connected, erected, used, cleaned and conditioned in accordance with the respective manufacturer's written instructions, unless more stringent requirements are specified.

1.06 MANUFACTURER'S NAMEPLATES

A. Manufacturer's name plates and other identifying markings shall not be affixed on exposed surfaces of manufactured items installed in finished spaces.

B. This requirement does not apply to Underwriters' Laboratories labels where required. Each major component of mechanical and electrical equipment shall have, on a securely attached plate, the manufacturer's name, address, model and serial number, capacity, rating and any other information required by the Mechanical and Electrical Specifications.

1.07 PRODUCT OPTIONS AND SUBSTITUTIONS

A. Submittal of Substitution Requests Prior to Receipt of Bids: Requests for substitution will be considered if received within 5 days prior to bid date. Requests received later than 5 days prior to bid date may be considered or rejected at the sole discretion of the Owner.

1. Submit 6 copies of each request for substitution to the Architect for consideration.

2. Identify the product, or the fabrication or installation method to be replaced in each request. Include reference to related Specification Section and Contract Drawing numbers. Provide complete documentation showing compliance with the requirements for substitutions, and the following information, as appropriate:

a. Product Data, including Drawings, fabrication, and installation procedures.

b. Samples, where samples of the specified product are requested.

c. A detailed comparison of significant qualities of the proposed substitution with those of the material or work specified. Significant qualities may include elements such as size, weight, durability, performance, visual effect, code compliance, maintenance requirements, energy usage, and environmental considerations.

d. Coordination information, including a list of changes or modifications made necessary to other parts of the Work including the work of other trades that will become necessary to accommodate the proposed substitution.

e. A statement indicating the substitution's effect on the Contractor's Construction Schedule. Indicate the effect of the proposed substitution on overall Contract Time.

f. Cost comparison between the product specified and the requested substitution, including a proposal of the net change, if any in the Contract Sum. Include cost of fee for review of substitution by Architect, including all costs and labor for revision, printing and distribution of Contract Documents as may be necessitated by the proposed substitution. The determination of whether the substitution will require revision of the Contract Documents resides with the Architect.

g. Certification by the Contractor that the substitution proposed is equal to or better in every respect to that required by the Contract Documents, and that it will perform as intended. Include the Contractor's waiver of rights to additional payment or time, that may subsequently become necessary because of the failure of the substitution to perform adequately, or because of changes to other work made necessary as a consequence of the substitution.

h. Failure by the Contractor to include the above requirements in the submittal may cause rejection of the submittal in its entirety.

B. Owner's Action: Within two weeks of receipt of the request for substitution, the Owner may request additional information or documentation, if found necessary, for the evaluation of the request. Within 4 weeks of receipt of the request, or two weeks of receipt of the additional information or documentation, whichever is later, the Owner will notify the Contractor of acceptance or rejection of the proposed substitution. If a decision on the use of a proposed substitution cannot be made or obtained within the time allocated, the Contractor shall base his bid on the Work described in the Contract Documents. Acceptance of substitutions will be confirmed by the Owner in writing only.

C. Substitutions After Award of Contract

1. Conditions: Substitution of products will be considered after award of Contract only under one of the following conditions:

   a. The specified product is not available due to a strike, lockout, bankruptcy, discontinuance of the manufacture of a product or an unforeseeable natural disaster and the proposed substitution will maintain the quality standards established by the Contract Documents while either expediting the Work or providing the Owner with a cost savings.

   b. In the judgment of the Contractor, the specified product will not produce the desired results.

   c. Submit written request for substitution to the Architect within ten (10) days of the date that the Contractor ascertains he cannot obtain the specified product, or that the performance cannot be guaranteed.

2. Procedures Respecting Substitutions After Award of Contract: The procedure and conditions for submission of requests for substitutions after the award of the Contract shall be as described in paragraph 1.07 A. above for substitution requests submitted prior to bid date.

3. Any substitution after award of Contract shall be effected by a Change Order only, and shall not relieve the Contractor, any Subcontractor, manufacturer, fabricator or supplier from responsibility for any deficiency in the substituted product or for any deviations from the Contract Documents as modified by such Change Order.

4. Except as otherwise stipulated by the Contractor in his request for substitution and expressly approved in such Change Order, the Contractor shall be deemed to warrant by his request that the proposed substitution will satisfy all requirements satisfied by the originally specified product and the Change Order shall not be deemed to modify the Contract Documents with respect thereto.

1.08 PROOF OF COMPLIANCE

A. Whenever the Contract Documents require that a product complies with Federal Specification, ASTM

Designation, ANSI Specification or other association standard, the Contractor shall present an affidavit from the manufacturer certifying that the product complies therewith. Where requested or specified, submit supporting test data to substantiate compliance.

PART 2 – PRODUCTS

(NOT APPLICABLE)

PART 3 – EXECUTION

(NOT APPLICABLE)

END OF SECTION I-01600

SECTION I-01700

CONTRACT CLOSEOUT

PART 1 – GENERAL

1.01 FINAL CLEANING

A. Refer to General Conditions, for contractual requirements governing cleaning up.

B. Maintain the premises and the job site in a reasonably neat and orderly condition and free from accumulations of waste materials and rubbish during the entire construction period. Remove crates, cartons and other flammable waste materials or trash from the Work areas each working day.

C. Elevator shafts, electrical closets, pipe and duct shafts, chases, furred spaces and similar spaces which are generally unfinished shall be vacuum cleaned and left free from rubbish, loose plaster, mortar drippings, extraneous construction materials, dirt and dust.

D. Remove rubbish by means of chutes, hoists or receptacles. Do not drop or throw rubbish or waste from one level to another within or outside the building.

E. Care shall be taken by workmen not to mark, soil or otherwise deface finished surfaces. In the event that finished surfaces become defaced, clean and restore such surfaces to their original condition.

F. Clean up immediately upon completion of each trade's work.

G. Clean areas in which painting and finishing work is to be performed just prior to the start of this work, and maintain these areas in a clean condition. Cleaning includes the removal of rubbish, vacuum cleaning of floors, the removal of any plaster, mortar, dust and other extraneous materials from finish surfaces, and surfaces that will remain visible after the Project work is complete. Clean exposed exterior and interior hard-surfaced finishes to a dust-free condition, free of stains, films and similar foreign substances. Restore reflective surfaces to their original reflective condition. Leave concrete floors broom clean. Remove labels that are not permanent labels. Wipe surfaces of mechanical and electrical equipment. Remove excess lubrication and other substances. Clean plumbing fixtures to a sanitary condition. Clean light fixtures and lamps.

H. In addition to the cleaning specified above and the more specific cleaning which may be required in various sections of the Specifications, prepare the building for occupancy by a thorough cleaning, including washing (or cleaning by other appropriate methods) surfaces on which dirt or dust has collected and by washing glass on both sides. Wash exterior glass using a window cleaning contractor specializing in such work. Provide and maintain adequate runner strips of non-staining reinforced Kraft building paper on finished floors for protection. Leave equipment in an undamaged, bright, clean, polished condition. Re-cleaning will not be required after the Work has been accepted unless later operations of the Contract make re-cleaning necessary.

I. Clean the site, including landscape development areas, of rubbish, litter and other foreign substances. Sweep paved areas broom clean; remove stains, spills and other foreign deposits. Rake grounds that are neither paved nor planted, to a smooth even-textured surface.

J. Upon completion of the work, dismantle the temporary construction facilities and remove construction equipment, fences, scaffolding, surplus materials and rubbish of every kind from the site.

K. Compliance: Comply with regulations of authorities having jurisdiction and safety standards for cleaning. Do not burn waste materials. Do not bury debris or excess materials on the Owner's property. Do not discharge volatile, harmful, or dangerous materials into drainage systems. Remove waste materials from

the site and dispose of in a legal manner.

1.02 OPERATING AND MAINTENANCE DATA

A. Furnish three (3) complete sets of manuals containing the manufacturers' instructions for maintenance and operation of each item of equipment and apparatus furnished under the Contract and any additional data specifically required under the various Sections of the Specifications.

B. Arrange the manuals in proper order, indexed and suitably bound. Certify that each of the manuals is complete and accurate. Assemble these manuals for all Divisions of the Work, review them for completeness and submit them directly to the Owner as a condition of substantial completion Deliver the manuals in suitable transfer cases indexed and marked for each Division of the Work.

1.03 OPERATING AND MAINTENANCE INSTRUCTIONS

A. Arrange for each installer of equipment that requires regular maintenance to meet with the Owner's personnel to provide instruction in proper operation and maintenance. If installers are not experienced in procedures, provide instruction by manufacturer's representatives. Include a detailed review of the following items:

1. Maintenance manuals.
2. Record documents.
3. Spare parts and materials.
4. Tools.
5. Lubricants.
6. Fuels.
7. Identification systems.
8. Control sequences.
9. Hazards.
10. Cleaning.
11. Warranties and bonds.
12. Maintenance agreements and similar continuing commitments.

B. As part of instruction for operating equipment, demonstrate the following procedures:

1. Start-up.
2. Shutdown.
3. Emergency operations.
4. Noise and vibration adjustments.
5. Safety procedures.
6. Economy and efficiency adjustments.
7. Effective energy utilization.

1.04 PROJECT RECORD DOCUMENTS

A. Refer to General Conditions, for contractual requirements governing record documents.

B. As the work progresses keep a complete and accurate record of changes or deviations from the Contract Documents and the shop drawings, indicating the Work as installed. Show changes neatly and correctly on the affected document, using black line prints of the Drawings or the Specifications, with appropriate supplementary notes. Keep this record set of Drawings, shop drawings and Specifications at the job site available to the Architect and Owner.

C. At the completion of the work certify that each of the revised prints of the Contract Documents and shop drawings is complete and accurate. Prior to application for final payment, and as a condition to its acceptance by the Architect and Owner, deliver the record documents in AutoCAD and PDF format. Deliver the records in suitable transfer cases, indexed, and marked, for each Division of the Work.

D. Acceptance of such records by the Architect or Owner shall not be a waiver of any deviation from the Contract Documents or the shop drawings or in any way relieve the Contractor from his responsibility to perform the Work in accordance with the Contract Documents and the shop drawings to the extent they are in accordance with the Contract Documents.

1.05 WARRANTIES AND GUARANTIES

A. Refer to the General Conditions for terms of the Contractor's special warranty of workmanship and materials.

B. Definitions

1. Standard Product Warranties and/or Guarantees are preprinted written documents published by individual manufacturers for particular products and are specifically endorsed by the manufacturer to the Owner.

2. Special Warranties and/or Guarantees are written documents required by or incorporated in the Contract Documents, either to extend time limits provided by standard warranties and/or guarantees or to provide greater rights for the Owner. When a special warranty and/or guarantee is required to be executed by the Contractor, or the Contractor and a subcontractor, supplier, or manufacturer, prepare a written document that contains appropriate terms and identification, ready for execution by the required parties. Submit a draft to the Owner for Owner's approval prior to final execution.

C. Requirements

1. Related Damages and Losses: When correcting warrantied and/or guaranteed Work that has failed, remove and replace other Work that has been damaged as a result of such failure or that must be removed and replaced to provide access for correction of warranted and/or guaranteed Work.

2. Reinstatement of Warranty and/or Guarantee: When Work covered by a warranty and/or guarantee has failed and been corrected by replacement or rebuilding, reinstate the warranty and/or guarantee by written endorsement. The reinstated warranty and/or guarantee shall be equal to the original warranty and/or guarantee with an equitable adjustment for depreciation.

3. Replacement Cost: Upon determination that Work covered by a warranty and/or guarantee has failed, replace or rebuild the Work to an acceptable condition complying with requirements of the Contract Documents. The Contractor is responsible for the cost of replacing or rebuilding defective Work regardless of whether the Owner has benefitted from use of the Work through a portion of its anticipated useful service life.

4. Owner's Recourse: Written warranties and/or guarantees made to the Owner are in addition to implied warranties and/or guarantees, and shall not limit the duties, obligations, rights and remedies otherwise available under the law, nor shall warranty and/or guarantee periods be interpreted as limitations on time in which the Owner can enforce such other duties, obligations, rights, or remedies.

   a. Rejection of Warranties and/or Guarantees: The Owner reserves the right to reject warranties and/or guarantees and to limit selections to products with warranties and/or guarantees not in conflict with requirements of the Contract Documents.

5. The Owner reserves the right to refuse to accept Work for the Project where a special

warranty, guarantee, certification, or similar commitment is required on such Work or part of the Work, until evidence is presented that entities required to countersign such commitments are willing to do so.

D. Disclaimers and Limitations: Manufacturer's disclaimers and limitations on product warranties and/or guarantees do not relieve the Contractor of the warranty and/or guarantee on the Work that incorporates the products, nor does it relieve suppliers, manufacturers, and subcontractors required to countersign special warranties and/or guarantees with the Contractor.

E. Prior to final payment and before the issuance of a final Certificate for Payment, in accordance with the provisions of the General Conditions, provide the following documents directly to the Owner

1. Warranties and/or Guarantees: The warranties and/or guarantees required by the General Conditions and any other extended warranties and/or guarantees stated in the technical Sections of the Specifications.

2. Release or Waiver of Liens: As required by the General Conditions.

3. Service and Maintenance Contracts: Furnish properly executed contracts for any extended service or maintenance as required by the technical sections of the Specifications.

1.06 CERTIFICATE OF OCCUPANCY

A. Prior to final payment and before the issuance of a final Certificate for Payment, in accordance with the provisions of the General Conditions, file the following documents with the Architect for transmittal to the Owner:

1. Certificate of Occupancy: Where the local law at the site of the building requires either a temporary and/or permanent Certificate of Occupancy, obtain and pay for these certificates and deliver to the Architect.

PART 2 – PRODUCTS

(NOT APPLICABLE)

PART 3 – EXECUTION

(NOT APPLICABLE)

END OF SECTION I-01700

SECTION I-01800

ALTERATION/DEMOLITION WORK

PART 1 – GENERAL

1.01 DESCRIPTION

A. General: Perform Alteration/Demolition and related work in accordance with requirements of the Contract Documents.

B. Related Work Specified Elsewhere

1. Disconnecting, removal and/or relocation of existing mechanical and electrical work, including equipment, piping, wiring, etc. (See Engineering specifications on drawings.)

2. Cutting and patching.

1.02 DEFINITIONS

A. Remove: Remove and legally dispose of items except those indicated to be reinstalled, salvaged, or to remain the Owner's property.

B. Remove and Salvage: Items indicated to be removed and salvaged remain the Owner's property. Remove, clean, and pack or crate items to protect against damage. Identify contents of containers and deliver to Owner's designated storage area.

C. Remove and Reinstall: Remove items indicated; clean, service, and otherwise prepare them for reuse; store and protect against damage. Reinstall items in locations indicated.

D. Existing to Remain: Protect construction indicated to remain against damage and soiling during demolition. When permitted by the Architect, items may be removed to a suitable, protected storage location during demolition and then cleaned and reinstalled in their original locations.

1.03 SCHEDULING

A. Before commencing any alteration or demolition Work, submit for review by the Architect and approval by the Owner, a schedule showing the commencement, the order and the completion dates for the various parts of this work.

B. Before starting any work relating to existing utilities (electrical, sewer, water, heat, gas, fire lines, etc.) that will temporarily discontinue or disrupt service to the existing building, notify the Architect and the Owner 72 hours in advance and obtain the Owner's approval in writing before proceeding with this phase of the Work.

1.04 QUALITY ASSURANCE

A. Laws, Codes, Rules, and Regulations: Comply with applicable Local, State, and Federal laws, rules and regulations pertaining to the following:

1. Demolition and alteration work, including but not limited to the Federal Occupational Safety and Health Act and the Construction Safety Act.

2. The protection of the public during demolition and alterations, including but not limited to, requirements for safety of operations, noise control, removal and disposal of waste materials, control of dust, dirt, pollutants, flammable materials, explosive materials, corrosive substances, protection against fire.

B. Clean Air Act

1. Prior to commencement of alteration, demolition or renovation work, and in accordance with the Federal Clean Air Act, the Contractor shall engage a Certified Asbestos Consultant to conduct an inspection and survey to determine the presence of asbestos on the project. As required by Federal Regulations, provide notification to the Federal Environmental Protection Agency, utilizing EPA approved forms, not less than 10 days prior to the commencement of alteration, demolition or renovation work. Provide a copy of notification sent to the EPA both to the Owner and Architect. The compliance with this procedure does not supersede local requirements concerning asbestos regulations and certifications.

1.05 SUBMITTALS

A. Before commencing any work, submit for review, a detailed schedule showing the commencement, the order and the completion dates for the various parts of this work. Include the following:

1. Detailed sequence of demolition and removal work, with starting and ending dates for each activity.

2. Dates for shutoff, capping, and continuation of utility services.

3. Proposed dust-control measures.

4. Proposed noise-control measures.

B. Before starting any work relating to existing utilities (electrical, sewer, water, heat, gas, fire lines, etc.) that will temporarily discontinue or disrupt service to the existing building, submit a notification to the Owner 72 hours in advance and obtain the Owner's approval in writing before proceeding with this phase of the work.

C. The Contractor shall retain the services of a Professional Engineer to provide design of all temporary bracing, shoring, etc..., which may be required as part of alteration and demolition Work.

1. It shall be the responsibility of the Contractor's Engineer to prepare detail drawings and associated calculations representing all shoring, bracing or other temporary construction which may be required to maintain the structural stability and integrity of the existing construction during the course of the Work represented in these documents.

2. All drawings and calculations prepared by the Controlled Inspecting Agent shall bear an original signature and seal indicating the Engineer's Applicable State Registration. Duplicate copies of all drawings and calculations shall be forwarded to the Contractor prior to commencing any of the temporary Work represented in those documents. The Contractor shall, in turn, transmit those documents to the Structural Engineer of Record for his review.

3. The Structural Engineer of Record will review the documents only for how the shoring, bracing and other temporary construction interacts and affects the existing structure. The Structural Engineer of Record's review shall not be construed as complete check, nor relieve the Contractor's Engineer from responsibility for errors of any sort nor from the necessity of furnishing any additional details or calculations which may have been omitted or required by the Department of Buildings.

1.06 PROTECTION

A. Make such explorations and probes as are necessary to ascertain any required protective measures before proceeding with demolition and removal. Give particular attention to shoring and bracing requirements so as to prevent any damage to existing construction.

B. Provide, erect and maintain catch platforms, lights, barriers, weather protection, warning signs and other items as required for proper protection of the public, occupants of the building, workmen engaged in demolition operations, and adjacent construction.

C. Provide and maintain weather protection at exterior openings so as to fully protect the interior premises

against damage from the elements until such openings are closed by new construction.

D. Provide and maintain temporary protection of the existing structure designated to remain where demolition, removal and new work is being done, connections made, materials handled or equipment moved.

E. Take necessary precautions to prevent dust from rising by wetting demolished masonry, concrete, plaster and similar debris. Protect unaltered portions of the existing building affected by the operations under this Section by dustproof partitions and other adequate means.

F. Provide adequate fire protection in accordance with local Fire Department requirements.

G. Do not close or obstruct walkways, passageways or stairways. Do not store or place materials in passageways, stairs or other means of egress. Conduct operations with minimum traffic interference.

H. Be responsible for any damage to the existing structure or contents by reason of the insufficiency of protection provided.

1.07 WORKMANSHIP

A. Perform demolition, removal and alteration work as shown, with due care, including shoring, bracing, etc. Be responsible for damage, which may be caused by such work, to any part or parts of existing structures or items designated for reuse. Perform patching, restoration and new work in accordance with applicable technical sections of the Specifications.

B. Materials or items designated to become the property of the Owner shall be as shown. Remove such items with care and store them in a location at the site to be designated by the Owner.

C. Materials or items designated to be reinstalled shall be as shown. Remove such items with care, under the supervision of the trade responsible for reinstallation; protect and store until required. Replace any material or items damaged in its removal with approved similar and equal new material.

D. Materials or items demolished and not designated to become the property of the Owner or to be reinstalled shall become the property of the Contractor and shall be removed from the Owner's property.

E. Execute the work in a careful and orderly manner, with the least possible disturbance to the public and to the occupants of the building.

F. Noise Producing Operations: Take necessary precautions to keep noise-producing operations (such as impact hammering, Carborundum sawing, compressed air machinery and the like) to a minimum. Select equipment which is of a quieter nature than others and enclose areas of operation with acoustical screens and partitions or other means necessary to accomplish reduction of noise. Equip motorized equipment with mufflers or other type sound control and blanket equipment with acoustical materials.

G. In general, demolish masonry in small sections. Where necessary to prevent collapse of any construction, install temporary shores, struts or bracing.

H. Where alterations occur, or new and old work join, cut, remove, patch, repair or refinish the adjacent surfaces or so much thereof as is required by the involved conditions, and leave in as good a condition as existed prior to the commencing of the work. The materials and workmanship employed in the alterations, unless otherwise shown or specified, shall comply with that of the original work. Alteration work shall be performed by the various respective trades which normally perform the particular items of work.

I. Cut out embedded anchorage and attachment items as required to properly provide for patching and repair of the respective finishes.

J. Remove existing floor finishes complete down to original sound substrate in areas designated to receive new floor finishes. Patch and repair existing substrates with materials best suited for the intended use, to retain structural integrity and compatible with specified finishes. Gypsum based floor patching materials are prohibited. Level substrate patching to align with existing floor finishes or as required to align new

floor finishes as shown. Where feathering is required to align finishes at different elevations, extend patching to the greatest extent possible to prevent sudden transitions in flooring surfaces. Follow manufacturer's written instructions for use of repair products.

K. In areas where removal of existing resilient tile floor coverings, resilient sheet vinyl flooring or cutback asphaltic adhesives is required, comply with requirements of "Recommended Work Practices for the Removal of Resilient Floor Covering" as published by the Resilient Floor Covering Institute.

L. Finish new and adjacent existing surfaces as specified for new work. Clean existing surfaces of dirt, grease, loose paint, etc. before refinishing.

M. Where existing equipment and fixtures are indicated to be re-used, repair such equipment and fixtures and refinish to put in perfect working order. Refinish as directed.

1.05 CLEANING UP

A. Remove all debris as the work progresses. Maintain the premises in a neat and clean condition.

PART 2 – PRODUCTS

(NOT APPLICABLE)

PART 3 – EXECUTION

3.01 PREPARATION

A. General: Verify conditions in the field prior to the start of Work. If unanticipated mechanical, electrical, or structural elements that conflict with intended function or design are encountered, investigate and measure both nature and extent of the conflict. Submit report to the Architect in written, accurate detail. Rearrange alterations schedule as necessary to continue overall job progress without undue delay.

B. Inventory and record the condition of items to be removed and reinstalled and items to be removed and salvaged.

C. Provide shoring, bracing, or support to prevent movement, settlement, or collapse of areas to be removed and adjacent facilities to remain.

D. Cover and protect equipment and fixtures from damage and soiling during alteration work, including existing furniture, equipment and fixtures to remain or to be salvaged and stored. Erect and maintain dust-proof partitions and closures to prevent spread of dust or fumes to occupied portions of the building.

3.02 DEMOLITION OPERATION

A. Demolition and removal work shall be as shown on the Drawings. Do all such work required in connection with this Project with due care, including shoring, bracing, etc. Be responsible for any damage which may be caused by such work to any part or parts of existing structures to remain.

B. Materials or items designated to remain the property of the Owner shall be removed with care and stored in a location on the site to be designated by the Owner.

C. Materials or items demolished and not designated to become the property of the Owner shall become the property of the Contractor and shall be removed from the Owner's property.

D. Execute the work in a careful and orderly manner, with the least possible disturbance to the public. Proceed with demolition in systematic manner, from top of structure to ground. Complete demolition work above each floor or tier before disturbing supporting members on lower levels.

E. Remove steel framing members individually and lower to ground by hoists, derricks, or other suitable

methods. In general, demolish masonry and concrete in small sections.

F. Where necessary to prevent collapse of any construction, install temporary shores, struts or bracing. Do not commence demolition work until all temporary construction is complete.

G. Existing service piping, including sewer, water and gas lines shall be cut and capped and all electric, telephone and other wires shall be cut in compliance with the requirements of the local Public Utility Corporations and of all City Departments having jurisdiction. Before cutting in on the above services notify the proper officials, persons or corporations owning same, obtain instructions for carrying out the Work and take all precautionary measures they may deem necessary. Evidence of the discontinuation of these services shall be furnished in the form of proper releases from the appropriate agencies. Any individual water taps and electrical lines used for demolition purposes shall be shut off as soon as demolition work is completed and similar evidence of the discontinuation of such temporary services shall be furnished to the Owner.

3.03 SALVAGED MATERIALS

A. General: Remove carefully to avoid damages. Materials for reuse on this project are to be incorporated into new work as shown. Except for items indicated to be retained as Owner's property, other removed and salvaged materials not indicated for reuse shall become Contractor's property and removed from site with further disposition at Contractor's option.

3.04 DISPOSAL OF DEMOLISHED MATERIALS

A. General: Remove weekly from site accumulated debris, rubbish, and other materials resulting from demolition operations. Burning of combustible materials from demolished structures will not be permitted on site.

B. Removal: Transport materials removed from demolished structures and legally dispose of off-site.

END OF SECTION I-01800

SECTION I-035400

ARDEX K-15® SELF-LEVELING UNDERLAYMENT CONCRETE

PART 1 – GENERAL

1.01 SUMMARY

A. This is the specification for ARDEX K 15® SELF-LEVELING UNDERLAYMENT CONCRETE for use over specified interior substrates. To be used at all stone/tile floor areas.

B. Contractor's base bid shall include ARDEX K 15® SELF-LEVELING UNDERLAYMENT CONCRETE at all proposed floor tile locations.

C. Contractor to provide itemized line item for this scope.

1.02 SECTION INCLUDES

A. ARDEX K 15® SELF-LEVELING UNDERLAYMENT CONCRETE

B. ARDEX P 51™ PRIMER

C. ARDEX P 82™ ULTRA PRIME

D. ARDEX E 25™ RESILIENT EMULSION

1.03 QUALITY ASSURANCE

A. Installation of ARDEX K 15 must be by a factory-trained applicator, such as an ARDEX LevelMaster® or LevelMaster Elite® Installer, using mixing equipment and tools approved by the manufacturer. Please contact ARDEX at (888) 512-7339 for a complete list of Installers.

B. Underlayment shall be able to be installed from 1/8" to 1 ½" in one pour and up to 5" with the addition of aggregate. It may also be feathered to match existing elevations.

C. Underlayment to be applied to a minimum thickness of 1/8" over highest point in the subfloor, with an average typical thickness of ¼".

D. Underlayment compressive strength shall be 4100 psi after 28 days per ASTM C109/mod (air cure only).

E. Underlayment shall be walkable after 2 hours and allow floor covering to be installed after 16 hours at 70° F.

F. Manufacturer's certification that the product is cement-based having an inorganic binder context which is 100% cement, to include Portland cement per ASTM C150: Standard Specification for Portland Cement and other specialty hydraulic cements.

1.04 DELIVERY, STORAGE AND HANDLING

A. Deliver materials in their unopened packages and protect from extreme temperatures and moister. Protect liquids from freezing.

1.05 Site Conditions

A. ARDEX K 15 is a cementitious material. Observe the basic rules of concrete work. Do not install below 50°F surface temperature. Install quickly if floor is warm and follow how weather precautions available from the ARDEX Technical Service Department. Never mix with cement or additives other than ARDEX-approved products.

PART 2 – PRODUCTS

2.01 MATERIALS

A. The cement-based self-leveling underlayment shall be ARDEX K 15 Self-Leveling Underlayment Concrete.

B. Primer for standard absorbent concrete shall be ARDEX P 51 Primer.

C. Primer for non-porous subfloors such as burnished concrete, terrazzo, quarry and ceramic tile shall be ARDEX P 82 Ultra Prime.

D. Primer for non-porous subfloors, cutback and other non-water-soluble adhesive residues, metal, and wooden subfloors shall be ARDEX P 82 Ultra Prime.

E. The additive to be mixed with ARDEX K 15 when used over cutback adhesive, metal or wood subfloors shall be ARDEX E 25 Resilient Emulsion.

F. Aggregate shall be well graded, washed gravel (1/8" to 1/4" or larger) for use when underlayment is installed over 1 1/2" thick.

G. Water shall be clean, potable, and sufficiently cool (not warmer than 70°F). H. Moisture vapor suppression: ARDEX recommends the use of a moisture control system over existing concrete where the level of moisture emissions from the slab exceeds the

maximum permitted by the manufacturer of the finished coating or sealer as tested in accordance with Relative Humidity Method (ASTM F2170). If moisture problems exist, ARDEX recommends the use of an ARDEX MC™ Moisture Control System (ARDEX MC, MC RAPID or MC PLUS). For complete installation instructions, please refer to the appropriate ARDEX MC Moisture Control Technical Brochure.

2.01 MIX DESIGNS

A. Standard mixing ratio: ARDEX K 15 is mixed in 2-bag batches at one time. Mix each bag of ARDEX K 15 (55 lb.) with 7 quarts of water. Product shall be mixed in an ARDEX T-10 Mixing Drum using an ARDEX T-1 Mixing Paddle and a 1/2" heavy-duty drill (min. 650 rpm). Mix thoroughly for approximately 2-3 minutes to obtain a lump-free mixture. Follow written instructions per the ARDEX K 15 bag label.

B. Resilient mix for applications over cutback and non-water-soluble adhesive residues, wood and metal: Use 6 qt. of water and 2 qt. of ARDEX E 25 Resilient Emulsion for each bag of ARDEX K 15.

C. Aggregate mix: For areas to be installed over 1 1/2" thick, aggregate may be added to reduce material costs. Mix ARDEX K 15 with water first, then add from 1/3 up to 1 part by volume of aggregate (1/8" to 1/4" or larger). Do not use sand.

D. For pump installations, ARDEX K 15 shall be mixed using the ARDEX Levelcraft Automatic Mixing Pump. Start the pump at 210 gallons of water per hour, and then adjust to the minimum water reading that still allows self-leveling properties. DO NOT OVERWATER! Check the consistency of the product on the floor to ensure a uniform distribution of the sand aggregate at both the top surface and bottom of the pour. If settling is occurring, reduce the water amount and recheck. Conditions during the installation, such as variations in water, powder, substrate, and ambient temperature, require that the water setting be monitored and adjusted carefully to avoid overwatering.

PART 3 – EXECUTION

3.01 PREPARATION

A. All subfloors must be sound, solid, cleaned, and primed:

1. All concrete subfloors must be of adequate strength, clean, and free of all oil, grease, dirt,

curing compounds and any substance that might act as a bond breaker before priming. Mechanically clean if necessary, using shot blasting or other. Acid etching and the use of sweeping compounds and solvents are not acceptable.

2. Wood subfloors must be clean and free of all foreign matter. Sand to bare wood then vacuum to remove all dust. Re-nail any loose boards exhibiting movement.

3. Metal subfloors must be clean and free of all rust and foreign matter. Where required, a corrosive resistant coating should be applied and allowed to dry before priming.

4. Cutback and other non-water-soluble adhesive residues must be wet scraped to a thin, well-bonded layer.

5. Non-porous subfloors such as ceramic and quarry tile as well as terrazzo should be clean and free of all waxes and sealers. If necessary, have the surface professionally cleaned.

6. All cracks in the subfloor shall be repaired to minimize telegraphing through the underlayment.

7. Substrates shall be inspected and corrected for moisture or any other conditions that could affect the performance of the underlayment or the finished floor covering. ARDEX recommends the use of an ARDEX MC™ Moisture Control System (ARDEX MC, MC RAPID or MC PLUS). For complete installation instructions, please refer to the appropriate ARDEX MC Moisture Control Technical Brochure.

B. JOINT PREPARATION

1. Moving Joints – honor all expansion and isolation joints up through the underlayment or ARDEX MC Moisture Control System.

2. Saw Cuts and Control Joints – fill all non-moving joints with ARDEX FEATHER FINISHÒ or ARDEX SD-P as required.

3. When using an ARDEX MC Moisture Control System, follow instructions provided in the ARDEX MC Moisture Control Technical Brochure for the treatment of Saw Cuts, Control Joints and Dormant Cracks.

C. PRIMING

1. Primer for standard absorbent concrete subfloors: Mix ARDEX P 51, 1:1 with water and apply evenly with a soft push broom. Do not leave any bare spots. Remove all puddles and excess primer. Allow to dry to a clear, thin film (min. 3 hours, max. 24 hours). Underlayment shall not be applied until the primer is dry. Primer coverage is approximately 400 to 600 sq. ft. per gallon.

2. Primer for extremely absorbent concrete subfloors: Make an initial application of ARDEX P 51 mixed with 3 parts water using a soft push broom. Do not leave any bare spots. Remove all puddles and excess primer. Allow to dry thoroughly before proceeding with the standard application of primer as described above for standard absorbent concrete.

3. Primer for non-porous subfloors, wood or metal subfloors, or cutback and other non-water-soluble adhesive residues over concrete: Prime with ARDEX P 82. Mix Part A (red) with Part B (white) and apply with a short-nap or sponge paint roller, leaving a thin coat of primer no heavier than a thin coat of paint. Do not leave any bare spots. Remove all puddles and excess primer. Allow to dry to a clear, slightly tack film (minimum 3 hours, maximum 24 hours). Underlayment shall not be installed until primer is dry. Primer coverage is approximately 200 to 400 square feet per gallon.

4. Minimum drying time for ARDEX P 82 over cutback adhesive is 18 hours.

5. Note: When using an ARDEX MC Moisture Control System, the ARDEX MC will act as the primer layer for ARDEX K 15.

3.02 APPLICATION OF UNDERLAYMENT

A. INSTALLATION

1. Pour or pump the liquid ARDEX K 15 and spread in place with the ARDEX T-4 Spreader. Use the ARDEX T-5 Smoother for featheredge and touch-up. Wear baseball shoes with non-metallic cleats to avoid leaving marks in the liquid ARDEX K 15. Underlayment can be walked on in 2-3 hours at 70° F.

2. Wood subfloors require the use of the mesh-reinforced ARDEX K 15 + E 25 Underlayment System. After priming, install 3.4 galvanized diamond metal lath by stapling to the wooden subfloor approximately every 6 inches on center.

3. Steel subfloors require that the substrate first be primed with an anti-corrosive paint. After thorough drying of the paint, prime this surface with ARDEX P 82.

3.03 PREPARATION FOR FLOORING INSTALLATION

A. Underlayment can accept finish floor covering materials, to include Carpet, after 16 hours at 70°F and 50% relative humidity.

B. Due to the wide range of adhesives that are used to install floor coverings, some adhesives may dry more quickly over Ardex underlayment's than over other substrates. If this condition occurs, priming the surface of the underlayment with ARDEX P 51 Primer diluted 1:3 with water will even out the drying of the adhesive. Allow the primer to dry 1-3 hours before proceeding with the adhesive installation.

END OF SECTION I-035400

SECTION I-05500

MISCELLANEOUS METAL

PART 1 – GENERAL

1.01 DESCRIPTION

A. General: Provide miscellaneous metal in accordance with the Contract Documents.

B. Related Work Specified Elsewhere

1. Finish painting (except as specified herein) as specified in Section "Painting".

2. Access doors as specified in Section "Access Doors".

1.02 STRUCTURAL PERFORMANCE REQUIREMENTS

A. Countertop and Vanity Framing: Provide countertop and vanity framing capable of withstanding the following structural loads without exceeding the allowable design working stress of the materials involved, including anchors and connections, or of exhibiting excessive deflections in any of the components making up the countertops and varieties:

1. All deadloads.

2. 500 Pound live load placed on the countertop and vanity.

3. Deflection at Midspan: L/1000 times span or 1/8-inch- (3 mm) whichever is less

B. Tube Framing for Partial Height Walls: Provide tube framing for partial height walls capable of withstanding a deflection not to exceed 2L/1400 of the wall height when subjected to a positive and negative pressure of 5 psf.

C. All-Glass Entrances and Storefront Framing: Fabricate and install all-glass entrances and storefront framing so that when installed, it is capable of supporting all deadloads and withstanding the live loads imposed on it from the operation of the vertical all-glass entrance doors.

D. Window Shade Framing: Fabricate and install framing so that when installed it's capable of supporting all deadloads and withstanding the live loads imposed on it from the operation and the projection screens and window shades.

1.03 QUALITY ASSURANCE

A. Fabricator/Installer: A firm specializing in miscellaneous metal work similar to that indicated for this project for a minimum of 5 years and with sufficient production capacity to produce required units without causing delay to the Work.

1.04 STANDARDS

A. Except as modified by governing codes and by the Contract Documents, comply with the applicable provisions and recommendations of the following:

1. AWS DI.I "Structural Welding Code".

2. AWS D1.2 "Structural Welding Code -Sheet Steel"

3. SSPC "Steel Structures Painting Manual, Volume 2, Systems and Specifications".

4. Industrial Fasteners Institute "Fastener Standards Book".

B. Where the language in any of the documents referred to herein is in the form of a recommendation or suggestion, such recommendations or suggestions shall be deemed to be mandatory under this

Contract.

1.05 SUBMITTALS

A. Submittals: Submit, for record only, structural analysis data, for information only, signed and sealed by the qualified professional engineer responsible for their preparation.

B. Shop Drawings: Submit shop drawings detailing fabrication and erection of each miscellaneous metal
item, including dimensioned plans and elevations, details of sections, connections, anchorage and accessory items.

C. Setting Drawings: Provide setting drawings and templates for the location of miscellaneous metal items that are to be embedded in or anchored to concrete or masonry.

D. Product Data: Submit for Architect's record only manufacturer's specifications, load tables, diagrams,
details and installation instructions for products to be used in miscellaneous metal work. Provide product data for paint products, grout and other items specified herein.

E. Reports: Submit copies of welder pre-qualification and other welding procedures in form prescribed in AWS "Structural Welding Code".

F. Recycled Content: Submit certification, including written data and specifications, highlighting percentage of recycled content for all miscellaneous metal items.

1.06 QUALITY ASSURANCE

A. Professional Engineer Qualifications: A professional engineer who is legally qualified to practice in jurisdiction where Project is located and who is experienced in providing engineering services of the kind indicated. Engineer services are defined as those performed.

1.07 PRODUCT HANDLING

A. Store all miscellaneous metal items under cover and off the ground. Handle in such a manner so as to protect surfaces and to prevent distortion of, and any other type of damage to, fabricated pieces.

PART 2 – PRODUCTS

2.01 MATERIALS

A. Metal Surfaces, General: For fabrication of miscellaneous metal work which will be exposed to view in the finished work, use only materials which are smooth and free of surface blemishes including pitting, seam marks, roller marks, rolled trade names and roughness. Remove such blemishes by grinding, or by welding and grinding, prior to cleaning, treating, and applying surface finishes.

1. Provide miscellaneous metals utilizing a min. 30% recycled content.

B. Structural Steel Shapes, Plates and Bars: ASTM A36.

C. Steel Bars and Bar Size Shapes: ASTM A675, Grade 65, or ASTM A36.

D. Cold Rolled Carbon Steel Sheets: Commercial quality, complying with ASTM A366; or structural quality, complying with ASTM A611, Grade A, unless another grade is required by design loads, stretcher leveled if exposed, free from scale, pitting or other defects.

E. Galvanized Carbon Steel Sheets: ASTM A653, G90 coating (minimum spangle), either commercial quality or structural quality, Grade 33, unless another grade is required for design loads.

F. Concrete Inserts and Anchors: Anchors and inserts capable of sustaining, without failure, the load imposed within a safety factor of 4 as determined by tested in accordance with ASTM E448. Threaded or wedge type, galvanized ferrous castings, either malleable iron ASTM A47 or cast steel ASTM A27.

Provide bolts, washers and shims as required, hot dip galvanized, ASTM A153, Class A.

G. Fasteners and Anchorage Devices: Provide fasteners complying with the requirements of Industrial Fasteners Institute standards. Type, grade, class and style best suited for the respective purpose. Use countersunk flat-head Phillips type machine screws for exposed fasteners, except where Allen head screws are required. Use galvanized steel or stainless-steel fasteners for fastening components fabricated of galvanized steel.

1. Provide Type 304 or 316 stainless-steel fasteners and zinc-plated fasteners with coating complying with ASTM B 633, Class Fe/Zn 5, where built into exterior walls and fastening components fabricated of galvanized steel.

2. Expansion Anchors: Anchor bolt and sleeve assembly of material indicated below with capability to sustain, without failure, a load equal to six times the load imposed when installed in unit masonry and equal to four times the load imposed when installed in concrete, as determined by testing per ASTM E488, conducted by a qualified independent testing agency.

a. Material for Indoor Conditions: Carbon-steel components zinc-plated to comply with ASTM B633, Class Fe/Zn

H. Galvanizing

1. ASTM A153, Classes A and B, for galvanizing iron and steel hardware.

2. ASTM A123, for galvanizing rolled, pressed and forged steel shapes, plates, bars, strip 1/8 in. thick and heavier and for assembled steel products.

I. Paint: Provide primer and finish paint as supplied by a single manufacturer for the entire project.

1. Interior Ferrous Metal Primer: Compatible with the finish coats of paint (see Section "Painting" for finish coats of Paint); shop apply primer to the respective dry film mil thickness specified or as recommended by the manufacturer; Provide one of the following:

a. "4-55 Versare" (Tnemec Co. Inc.); 2.0 - 3.5 mils d.f.t.

b. "GP-818" (Carboline Co.); 2.0 mils d.f.t.

c. "Amercoat 5105" (Ameron Protective Coatings); 2.0 - 3.0 mils d.f.t.

2. Galvanizing Repair Paint: Zinc rich paint for repairing galvanized surfaces and field welds complying with requirements of ASTM A780. Thickness of applied galvanizing repair paint shall be not less than coating thickness required by ASTM A123 or ASTM A153 as applicable.

3. Dielectric Separator: Cold applied type, non-sagging, resistant to severe corrosion conditions; applied in two coats for an overall minimum dry film thickness of 25 mils. One of the following:

a. "Carbomastic 90" (Carboline Co.).

b. "Bitumastic 50" (Kop-Coat, Inc.)

c. "Jennite J-16" (Maintenance Inc.).

2.02 FABRICATION

A. Include supplementary parts necessary to complete miscellaneous metal work though not definitely shown or specified.

B. Verify measurements and dimensions at the job site and cooperate in the coordination and scheduling of the work of this Section with the work of related trades (with particular attention given to the installation of items embedded in concrete and masonry).

C. Form exposed work true to line and level with accurate angles and surfaces and straight sharp edges. Ease exposed edges to a radius of approximately 1/32 in., unless otherwise shown. Form bent metal

corners to smallest radius possible without causing grain separation or otherwise impairing work.

D. Form exposed connections with hairline joints, flush and smooth, using concealed fasteners where possible. Exposed threaded portion of bolts and screws shall be cut off flush with adjacent metal. Cut, drill, punch and tap as required for the installation and attachment of other work to miscellaneous metal work. Shear and punch metals cleanly and accurately. Remove all burrs. Remove sharp or rough areas on exposed traffic surfaces.

E. Form metal work built in with concrete or masonry for anchorage, or provide suitable anchors, expansion shields, or other anchoring devices shown or required to provide support for intended use. Furnish such metal work in ample time for setting and securing in place.

F. Make joints as strong and rigid as adjoining sections. Make welds continuous along entire line of contact, except where spot welding is indicated. Grind exposed welds flush and smooth to match and blend with adjoining surfaces. Welded connections may be used where bolted connections are shown. Fabricate joints exposed to weather in a manner to exclude water or provide weep holes where water may accumulate.

G. Make up threaded connections tight so that threads are entirely concealed. Shoulder and head, dowel and pin abutting bars. Provide bolt and screw heads flat and countersunk in exposed work. Carefully machine, fit and secure removable members by means of Allen-head set screws of proper size and spacing.

H. Galvanize all ferrous metal items embedded in concrete, unless otherwise specified. Galvanize all other items where specified or shown.

I. Preassemble items in shop to greatest extent possible to minimize field splicing and assembly. Following trial fit, disassemble units only as necessary for shipping and handling. Clearly mark units for reassembly. Provide alignment and splice plates for accurate field fit.

2.03 SHOP PAINTING

A. Shop paint miscellaneous metal work, except members or portions of members to be embedded in concrete or masonry, surfaces and edges to be field welded and stainless steel, unless otherwise specified.

B. Remove oil, grease and similar contaminants in accordance with SSPC SP-1 "Solvent Cleaning", prior to any additional surface preparation specified.

C. Clean and prepare metal surfaces before applying shop coat. Remove rust and mill scale in accordance with SSPC SP-3 "Power Tool Cleaning".

D. Immediately after surface preparation, apply primer in accordance with manufacturer's instructions. Use painting methods which will result in full coverage and dry film thickness specified.

E. Apply one shop coat of primer to fabricated metal items, except apply 2 coats of primer to surfaces inaccessible after assembly or erection. Change color of second or finish coat to distinguish it from the first coat. Color of paint shall be as selected by Architect. Use thinners only as specified by the coating manufacturer. The entire coating system shall be as supplied by a single manufacturer.

F. Separate dissimilar metals with one coat of dielectric separator. Do not extend coating onto exposed or finished surfaces.

2.04 FABRICATION, SPECIFIC ITEMS

A. Steel Tube Supports for all Countertops and Islands: Utilize steel tube supports sized to support dead loads of countertops, and in addition a uniform live load of 300 lbs. per square foot. Where exposed in the finish work, provide welded connections, ground smooth and primed for field painting specified in Section 09900, "Finish Painting". Where concealed, utilize bolts and connectors of capacity required to support imposed live and dead loads. Anchor steel tubes to structural walls and slabs as required for a secure and rigid installations. Fasten tubes to countertops with fasteners applied through the tubes into

the underside of tops, and in sufficient quantity for a secure installation.

B. Half Height Reinforced Wall

1. Provide steel tube reinforced wall with welded joints; complete with all sleeves, plate and bar supports, anchor bolts and fastening devices as required for a complete installation.

2. Design and construct to withstand a 200 Lb. load applied at any point, downward or horizontally or the simultaneous application of lateral force of 40 plf and a vertical force of 50 plf, both applied at the top of the half height wall; the more stringent requirement governing.

3. Provide expansion joint at interval not to exceed 40 ft. unless otherwise shown. Provide slip joint with internal sleeve extending 2 in. minimum beyond joint each side. Fasten internal sleeve securely to one side. Locate joints within 6 in. of post as shown.

4. Coordinate with the work of Section 'Gypsum Drywall' for application of gypsum drywall finishes, and Section 'Architectural Woodwork' for application of wood top.

2.05 MISCELLANEOUS FRAMING AND SUPPORTS

A. Provide steel framing and subframing and supports for applications shown and not specifically provided as part of the work of other trades.

B. Furnish bent, or otherwise custom-fabricated, bolts, plates, anchors, hangers, dowels, and other miscellaneous steel and iron shapes as required for framing and supporting woodwork and other type items, and for anchoring or securing woodwork and other type items, to concrete or other structures. Fabricate items to sizes, shapes, and dimensions required. Furnish malleable-iron washers for heads and nuts that bear on wood structural connections and furnish steel washers elsewhere.

C. Fabricate miscellaneous units to sizes, shapes and profiles shown or, if not shown, of required dimensions to receive adjacent work to be retained by framing. Fabricate from structural steel shapes and plates and steel bars, of welded construction using mitered joints for field connection, except where otherwise shown. Cut, drill and tap units to receive hardware and similar items.

D. Provide units with integrally welded anchors for casting into concrete or building into masonry. Furnish inserts if units must be installed after concrete is placed.

1. Space anchors 24 in. o.c. and provide minimum anchor units of 1-1/4 in. x 8 in. x % in. steel straps, except as otherwise shown.

PART 3 – EXECUTION

3.01 CONDITION OF SURFACES

A. Examine the substrates, adjoining construction and the conditions under which the Work is to be installed. Do not proceed with the Work until unsatisfactory conditions have been corrected.

3.02 INSTALLATION

A. Coordinate and furnish anchorages, setting drawings, diagrams, templates, instructions and directions for installation of anchorages, including concrete inserts, sleeves, anchor bolts and other miscellaneous items having integral anchors that are to be embedded in concrete or masonry construction. Coordinate delivery of such items to the project site. Deliver items which are to be built into the work of other Sections in time so as not to delay the progress of the Work.

B. Except where otherwise specified for a particular item for built-in work, fasten metal work to concrete or solid masonry with embedded anchors or expansion bolts, and to hollow block with toggle bolts. Fastening to wood plugs will not be permitted. Drill holes for bolts to the exact diameter of the bolt. Provide screws threaded full length to the screw head.

C. Field Welding: Comply with AWS Welding Code for procedures related to field welding as related to appearance and quality of welds made and for methods used in correcting welding work. Use materials and methods that minimize distortion and develop strength and corrosion resistance of base metals. Obtain fusion without undercut or overlap. Remove welding flux immediately. At exposed connections, finish exposed welds and surfaces smooth and blended so that no roughness shows after finishing and contour of welded surface matches those adjacent.

D. Install work as shown, plumb, level and in line with adjacent materials where required. Provide fastenings as indicated on the Drawings, specified herein or as shown on final shop drawings. Fit exposed connections accurately together to form tight hairline joints.

E. Half Height Reinforced Wall: Anchor metal plate and welded bar supports to structural substrate with anchor bolts as required to meet performance criteria for half height reinforced wall. Through bolt tubular steel posts on bar supports, do not use set screws.

F. Protect finished surfaces against damage during construction and remove protection at time of substantial completion.

G. Immediately after erection, clean field welds, bolted connections, marred and abraded surfaces. Paint and touch-up paint with the specified paint system. Touch up galvanized surfaces in accordance with ASTM A780.

END OF SECTION I-05500

SECTION I-05700

ORNAMENTAL METALS

PART 1 – GENERAL

1.01 DESCRIPTION

A. General: Provide ornamental metals in accordance with the Contract Documents.

B. Related Work Specified Elsewhere

1. Ornamental metalwork, including but not limited to metal panels metal bases and trim are specified in Section "Architectural Woodwork".

1.02 QUALITY ASSURANCE

A. Award the ornamental metal work to single firm specializing in this type of work so that there will be undivided responsibility for such work. The firm shall have a minimum of 5 years' successful experience in the fabrication and erection of similar systems as used for this Project.

1.03 STANDARDS

A. Except as modified by governing codes and by the Contract Documents, comply with the applicable provisions and recommendations of the following:

B. Where the language in any of the documents referred to herein is in the form of a recommendation or suggestion, such recommendations or suggestions shall be deemed to be mandatory under this Contract.

1.04 PERFORMANCE CRITERIA

A. Handrails and Railing

1. Structural Performance of Handrails and Railings: Comply with requirements of ASTM E 985 for structural performance based on testing performed according to ASTM E 894 and ASTM E 935.

2. Provide handrails and railings capable of withstanding the following structural loads without exceeding allowable design working stress of materials for handrails, railings, anchors, and connections:

a. Design and construct for a concentrated load of 200 lbf load applied at any point and in any direction and for a uniform load of 50 lbf ft. applied in any direction. The concentrated and uniform loading conditions shall not be applied simultaneously.

3. Infill Area: Provide infill areas of railings and guardrails capable of withstanding a horizontal concentrated load of 200 lbf applied to 1 sq. ft. at any point in system, including panels, intermediate rails, balusters, or other elements composing infill area of railings or guardrails. Load need not be assumed to act concurrently with loads on top rails in determining stress.

B. Design Modifications: Make design modifications of work shown only as may be necessary to meet performance requirements and coordinate the work. Variations in details and materials which do not adversely affect appearance, durability or strength shall be submitted to the Architect for review. Maintain the general design concept without altering profiles and alignments shown.

1.05 SUBMITTALS

A. Shop Drawings: Submit shop drawings for ornamental metal work, including dimensioned plans and

elevations, details of sections, connections and anchorage.

B. Samples: Submit samples of each of the following items:

1. Each finish of each metal on the gage and alloy to be used in the final work, 3 in. x 4 in.

2. Other specified items as requested.

C. Product Data: Submit for Architect's record only, manufacturer's specifications, load tables, diagrams, details and installation instructions for products to be used in ornamental metal work.

D. Maintenance Manual: Submit two copies of a bound maintenance manual, describing the materials, and procedures for cleaning and maintaining each metal panel system. Include manufacturer's data describing the materials and finishes used in the work.

1.06 MOCK-UPS

A. Provide mock-ups and shop drawings of the following items consisting of all the specified components of sizes as shown:

1. Stainless steel base.

2. Stainless Steel Millwork Surrounds.

3. Stainless Steel Elevator Surrounds.

B. Alter or revise mock-up, as directed, to obtain the approval of the Architect.

C. The approved mock-up(s) shall serve as a standard of quality for specified item(s) for the project and may remain as a permanent part of the Work if in same condition as new at time of final acceptance.

1.07 PRODUCT HANDLING

A. Deliver ornamental metal work fully sealed and identified. Protect from damage from any source. Provide removable protection as required.

B. Store indoors, above the floor, protected from construction activities and other sources of damage.

1.08 WARRANTIES AND GUARANTIES

A. Warranties and guaranties specified in this Article shall not deprive the Owner of other rights the Owner may have under other provisions of the Contract Documents and are in addition to and run concurrent with other warranties and guaranties made by the Contractor under requirements of the Contract Documents.

B. Warranty, Anodized Coatings: Provide a written Warranty, directly to the Owner, for a period of (5) five warrantying that the anodized aluminum will not develop excessive fading or excessive non-uniformity of color or shade, and will not crack, peel, pit, or corrode; all within limits defined as follows:

1. "Excessive fading": means a change in appearance which is perceptible and objectionable as determined by the Architect when viewed visually in comparison with the original color range standards.

2. "Excessive non-uniformity": means non-uniform fading during the period of the Warranty to the extent that adjacent panels have a color difference greater than the original acceptable color range.

3. "Will not crack, peel, pit or corrode": means there shall be no cracking, peeling, pitting or other type of corrosion discernible from a distance of 10 ft., resulting from the natural elements in the atmosphere.

4. Upon notification of such defects, within the warranty period, make the necessary replacements at the convenience of the Owner.

PART 2 – PRODUCTS

2.01 MATERIALS

General:

A. Metal Surfaces: For the fabrication of ornamental metal work which will be exposed to view, use only materials which are smooth and free of surface blemishes. Do not use materials which have stains and discolorations including welds which do not match the material, or do not match the Architect's sample in color and grain characteristics.

B. Surface Flatness and Edges: For exposed work provide materials which have been cold-rolled, cold-finished, cold-drawn, extruded, stretcher leveled, machine cut and otherwise produced to the highest commercial standard for flatness with edges and corners sharp and true to angle or curvature as required.

C. Alloys and Tempers: Wherever alloys or tempers of metals are not shown or specified or are shown or specified only by series or other general designation, provide the specific alloy which will weld and machine properly, and will finish to match the Architect's sample and other work in the same area, which is shown or specified to have the same finish. Use the temper or hardness which will provide the greatest strength and durability, consistent with necessary forming, fabrication and finishing processes.

D. Structural Steel Shapes: ASTM A36. N/A

E. Steel Plates: ASTM A283, Grade C. N/A

F. Aluminum: Provide alloy and temper recommended by aluminum producer or finisher for type of use and finish indicated, and with not less than the strength and durability properties of the alloy and temper designated below for each aluminum form required.

1. Extruded Pipe and Tube: ASTM B429, 6063-T6.
2. Plate and Sheet: ASTM B209, 6061-T6.

G. Stainless Steel: AISI Type 302 or 304.

1. Plate and Sheet: ASTM A666, Stretcher level sheets.
2. Bar Stock: ASTM A276.
3. Tubing: ASTM A554, Grades MT 301, MT 302, or MT 304, as standard with manufacturer.
4. Pipe: ASTM A312, Grade TP 304.
5. Castings: ASTM A743, Grade CF8 or CF20.

H. Glass and Glazing: As specified in Section "Glazing".

I. Fasteners: Stainless steel type 300 Series, type and size best suited for its intended use. Where exposed in finished surfaces, use oval-head countersunk Phillips heads with head diameter one screw size larger than the shank diameter. Material and finish to match adjacent surfaces. Where fasteners screw-anchor into material less than 1/8 in. thick, reinforce the interior surface with non-magnetic type stainless steel to receive screw threw threads or provide manufacturer's standard non-corrosive pressed-in splined grommet nuts.

J. Anchors and Inserts: Provide anchors and inserts for attachment of ornamental items to masonry and concrete. Anchors and inserts shall be non-corrosive and compatible with contiguous metals.

K. Welding Electrodes: Type and alloy recommended by the producer of the metal to be welded and as required for color match, strength and compatibility in the fabricated items.

L. Sound Damping Compound: Visco-elastic sound damping material in emulsion form, non-toxic, non-

flammable; spray, brush or trowel applied; air-dried after application to form a non-tacky, non-marring film of medium hardness, with a flame spread rating of less than 25 and a smoke development rating of less than 50 when tested in accordance with ASTM E84. Provide one of the following:

1. "Antivibe DL-10" (H.L. Bachford Ltd.; Distributed by AVNEC, Inc.).
2. "GP-1, Damping Compound" (Sound Coat; Distributed by Controlled Acoustics Corp.)
3. "Vibrasorb Damping Compound" (E.N. Murray Co., Inc.)

M. Galvanizing: ASTM A123 for galvanizing rolled, pressed and forged steel shapes, plates, bars, strip 1/8 in. thick and heavier and for assembled products.

2.02 FABRICATION

A. Field Measurements: Prior to fabrication, verify dimensions and conditions at the job site so that ornamental metal work will accurately fit to adjacent work.

B. Forming: Form work to true shapes, without distortion, with accurate surfaces and edges. Unless otherwise shown, form metal corners by bending to smallest radius possible without impairing the work. Produce flat, flush surfaces without cracking or grain separation at bends. Machine cut or saw material for butt-jointed or square corners.

1. Form simple and compound curves by bending members in jigs to produce uniform curvature for each repetitive configuration required; maintain profile of member throughout entire bend without buckling, twisting, or otherwise deforming exposed surfaces of components.

C. Assembly: Carefully fit and assemble all work with continuity of line and design, using rigidly secured joints with hairline contact, unless otherwise shown. Form butt hairline joints with roll-over edge exposed. Grind off roll-over edge flush with and matching of adjacent metal. Shop assemble all work. Disassemble units too large for shipment and provide them with alignment and splice plates for accurate field fit. Build in straps, plates, and brackets as needed to support and anchor fabricated items to adjoining construction. Reinforce formed-metal units as needed to attach and support other construction.

D. Welding: Weld with electrodes and by methods recommended by the base metal manufacturer, and in accordance with applicable recommendations of the AWS, to avoid distortion or discoloration of exposed faces. Make welds continuous unless otherwise shown. Grind exposed welds flush, to match adjacent metal. Bevel cut base metal before welding to maintain continuity of line at joints.

E. Reinforcing: Reinforce members and joints with structural shapes and plates in concealed locations, as necessary for adequate strength and rigidity.

F. Fastenings: Provide concealed fastenings unless otherwise shown. Locate necessary exposed fastenings in an orderly pattern, in accordance with reviewed shop drawings.

G. Dissimilar Metals: Separate dissimilar metals with dielectric separator to prevent galvanic action. Do not extend coatings onto exposed surfaces.

H. Prior to shipment protect finishes on exposed surfaces from damage by application of strippable temporary protective covering or other means.

2.03 MECHANICAL FINISHES

A. General: As shown for the respective units and matching the reviewed samples. Remove scratches, abrasions, dents, die markings and other defects prior to finishing operations. Perform this work in addition to finish treatment specified. Comply with NAAMM "Metal Finishes Manual" for finish designations and application recommendations unless otherwise specified.

B. Stainless Steel

1. No. 4 bright non-directional polish. All exposed edges No. 8 mirror polish.
2. No. 8 non-directional mirror polish.

2.04 APPLIED FINISHES

A. General: As shown for the respective units and matching the Architect's samples. Remove scratches, abrasions, dents, die markings and other defects prior to finishing operations. Perform this work in addition to finish treatment specified.

2.05 FABRICATION - SPECIFIC ITEMS

A. Stainless Steel Trim: Provide stainless steel trim, exposed to view in the finished work, fabricated from longest lengths available, 18-gauge minimum stainless-steel sheet material unless noted otherwise. Form trim to profiles and dimensions shown, complete with concealed fastening devices and finished on all exposed surfaces with finish indicated, unless otherwise specified or shown.

B. Miscellaneous Items: Provide other items of ornamental metal, exposed to view in the finished work, that is not included in other work.

PART 3 – EXECUTION

3.01 CONDITION OF SURFACES

A. Examination: Examine the substrates, adjoining construction and conditions under which the Work is to be installed. Do not proceed with the Work until unsatisfactory conditions have been corrected.

3.02 INSTALLATION GENERAL

A. Coordination: Coordinate ornamental metal work with the adjacent work of other sections. Provide items to be placed during the installation of other work at the proper time to avoid delays. Coordinate placement of such items, including inserts and anchors, accurately in relation to the final location of ornamental metal work.

B. Verify dimensions of supporting structure by field measurements so that ornamental metal work will be accurately designed, fabricated, and fitted to the structure. Tolerances for supporting structure are specified in other Sections.

C. Dimensions shown on Drawings are based on an assumed design temperature of 70 deg. F. Fabrication and erection procedures shall take into account the ambient temperature range at the time of the respective operations.

D. Perform all cutting, drilling, and fitting required. Install work in locations shown, plumb, level and in line with adjacent materials where required. Provide fastenings as shown on shop drawings, and as necessary for a rigid, secure, and permanent installation. Make provisions for removable items.

1. Fasten to metal with bolts or machine screws threaded full length of the shank, with lock nuts on bolts.

2. Fasten to inserts in concrete or solid masonry or use expansion bolts. Fasten to hollow masonry units with toggle bolts. Drill holes for bolts no larger than shank diameter.

E. Form tight joints with exposed connections accurately and uniformly fitted together. Do not cut or abrade finishes which cannot be completely restored in the field. Return items with such finishes to the shop for required alterations, followed by complete refinishing.

3.03 CLOSURES AND TRIM

A. Form closures and trim members from stainless steel sheet metal of type and minimum nominal thickness as indicated. Incorporate components required for support and installation of closures and trim. Fabricate closures and trim to tightly close with adjoining construction.

B. Provide concealed fasteners at all locations. Size fasteners to support closures and trim, with fasteners spaced to prevent buckling or waviness in finished surfaces. Drill and tap holes required for securing closures and trim to other surfaces.

C. Support joints with concealed stiffeners as required to hold exposed faces of adjoining sheets in flush alignment. Miter or cope trim members at corners to form tight joint.

3.06 TOUCH-UP AND PROTECTION

A. Touch-Up Painting: Field paint all marred or abraded shop paint and welds after cleaning these areas. Separate dissimilar metals and metals in contact with concrete or masonry with dielectric separator or gaskets. Do not extend coatings onto exposed surfaces.

B. Protection: Upon completion of installation clean exposed metal surfaces as recommended by manufacturer and install protection. Protect finished surfaces against damage during subsequent construction operations and remove such protection at time of substantial completion.

END OF SECTION I-05700

SECTION I-05730

ARCHITECTURAL SHEET METAL

PART 1 – GENERAL

1.01 DESCRIPTION

A. General: Provide architectural sheet metal in accordance with the Contract Documents. The Work of this Section includes, but is not limited to, the following:

1. Drapery pockets.
2. Blind enclosures.
3. Closures and trim.

B. Related Work Specified Elsewhere

1. Finish painting.

1.02 QUALITY ASSURANCE

A. Award the architectural sheet metal work to single firm specializing in this type of work so that there will be undivided responsibility for such work. The firm shall have a minimum of 5 years' successful experience in the fabrication and erection of similar systems as used for this Project.

1.03 STANDARDS

A. Except as modified by governing codes and by the Contract Documents, comply with the applicable provisions and recommendations of the following:

1. AWSD1.1 "Structural Welding Code".
2. NAAMM "Metal Finishes Manual".
3. Industrial Fasteners Institute "Fastener Standards Book".

B. Where the language in any of the documents referred to herein is in the form of a recommendation or suggestion, such recommendations or suggestions shall be deemed to be mandatory under this Contract.

1.04 SUBMITTALS

A. Shop Drawings

1. Submit shop drawings showing layout and dimensions of the Work and detail sections of all fabricated members including connections and anchorage.
2. Submit setting drawings and templates for the location of architectural sheet metal items that are to be embedded in or anchored to concrete or masonry.

B. Coordination Drawings: Submit coordination drawings for sheet metal fabrications housing items specified under other sections of these specifications.

C. Samples: Submit samples of each of the following:

1. Finish of each metal on the gauge to be used in the final work: 12 in. x 12 in.
2. Aluminum grille: 24 in. long.
3. Other specified items as requested.

1.05 PRODUCT HANDLING

A. Protect units from damage during transit, storage and installation. Tool marks, rust, blemishes and any other damage on exposed surfaces will not be acceptable. Store material in a dry location, off the ground.

1.06 PROTECTION

A. Protect units during construction period so that they will be without any indication of deterioration, use or damage at time of substantial completion.

PART 2 – PRODUCTS

2.01 MATERIALS

A. General: Provide materials selected for their surface flatness, smoothness, and freedom from surface blemishes where exposed to view in the finished unit. Do not use materials having exposed-to-view surfaces exhibiting pitting, seam marks, roller marks, oil canning, stains discolorations or any other imperfections.

B. Steel Sheets: ASTM A366, Class I, Matte Finish; Open hearth, full pickled, cold-rolled, annealed, stretcher leveled and phosphatized sheet steel, entirely free from scale, waves and other defects.

C. Galvanized Sheet Steel: ASTM A653, galvanized (minimum spangle) Coating Designation G90, phosphatized; stretcher leveled entirely free from scale, waves and other defects.

D. Structural Steel Shapes: ASTM A36.

E. Anchors and Inserts: Provide anchors and inserts for attachment of architectural sheet metal substructures to masonry, concrete or other contiguous construction. Anchors and inserts shall be non-corrosive and compatible with other materials.

F. Sound Damping Compound: Visco-elastic sound damping material in emulsion form, non-toxic, non flammable; spray, brush or trowel applied; air-dried after application to form a non-tacky, non-marring film of medium hardness, with a flame spread rating of less than 25 and a smoke development rating of less than 50 when tested in accordance with ASTM E84. Provide one of the following:

1. "Antivibe DL-10" (H.L. Bachford Ltd.; Distributed by AVNEC, Inc.).
2. "GP-1, Damping Compound" (Sound Coat; Distributed by Controlled Acoustics Corp.)
3. "Vibrasorb Damping Compound" (E.N. Murray Co., Inc.)

G. Fasteners: Galvanized or cadmium plated steel.

1. Expansion Bolts: FS FF-S-325, Group III, expansion shield self-drilling tubular expansion shell bolt anchors; Type 1 or 2 unless otherwise shown.
2. Machine Screws: FS FF-S-92, carbon steel, Type III cross-recessed, design 1 or 2 recess, style 2c flat head.
3. Bolts and Nuts: ASTM A307, Grade A.

H. Paint

1. Ferrous Metal Primer (For Reinforcing and Attachment Steel): Compatible with the finish coats of paint; One of the following:
   a. "4-55 Versare" (Tnemec Co. Inc.); 2.0 - 3.5 mils d.f.t.
   b. "GP-818" (Carboline Co.); 2.0 mils d.f.t.
   c. "Amercoat 5105" (Ameron Protective Coatings); 2.0 - 3.0 mils d.f.t.
   d. "Dulux, 67-Y-834" (DuPont Company); 2.0 mils d.f.t.
2. Primer (For Sheet): Manufacturer's or fabricator's standard, fast-curing, lead-free, "universal"

primer, selected for resistance to normal atmospheric corrosion, for compatibility with substrate and field-applied finish paint system specified, and for capability to provide a sound foundation for field-applied topcoats despite prolonged exposure.

3. Galvanizing Repair Paint: Zinc rich paint for repairing galvanized surfaces and field welds complying with requirements of ASTM A780. Thickness of applied galvanizing repair paint shall be not less than coating thickness required by ASTM A123 or ASTM A153 as applicable.

4. Dielectric Separator: Cold applied type, non-sagging, resistant to severe corrosion conditions; applied in two coats for an overall minimum dry film thickness of 25 mils. One of the following:

   a. "Carbomastic 90" (Carboline Co.).

   b. "Bitumastic 50" (Kop-Coat, Inc.)

   c. "Jennite J-16" (Maintenance Inc.).

2.02 FABRICATION

A. Fabricate units to the design and dimensions shown and in accordance with best shop practice. Take field measurements where coordination with adjoining work is necessary.

B. Make units strong, rigid, neat in appearance and free from defects. Reinforce as required to prevent twisting, sagging or deformation. Increase metal thickness or reinforce metal with concealed stiffeners or backing materials or both as required to produce surfaces whose variations in flatness exceed those permitted by referenced standards for stretcher-leveled metal sheet and to impart sufficient strength for use intended. Where stiffeners are used, fill space between them with sound deadening insulation permanently attached to face sheet.

C. Form exposed surfaces free from warp, wave and buckle; with all corners square, unless otherwise shown. Units shall not deviate from the flat more than 1/16 in. between any two points. Make arrises straight and true. Dress welded joints on exposed surfaces so they are invisible after finishing. Miter all corners.

D. Do not expose cut edges of sheet metal except as shown. Fold back exposed ends of unsupported sheet metal to form a 1/2 in. wide hem on the concealed side, or ease exposed edges to a radius of approximately 1/32 in.

E. Accurately machine, file and fit joints, corners and miters. Metal in contact shall have hairline joints, unless otherwise shown.

F. Conceal fastenings in exposed surfaces. Make threaded connections tight so that threads are entirely concealed by the fittings. Provide fiber shims or washers where required to prevent dimpling efface metal.

G. Make welds of adequate strength and durability. Continuously weld construction joints and seams to their full length. Grind, fill, and dress welds to produce smooth flush exposed surfaces in which welds are invisible after final finishing is completed.

H. Insofar as practicable, fabricate, assemble and fit the Work in the shop, with the various parts or assemblies ready for erection at the building. Work that cannot be completely shop assembled shall be given a trial fit at the shop to insure a proper and expeditious field assembly.

I. Provide metal back-up plates at joints so as to provide perfect alignment. Provide all angle brackets, bent plate clips and angles, framing, stiffeners, lug supports and fasteners as shown or required for a complete installation. Where slip joints are necessary, provide tight fitting sleeves immediately behind faces of members, formed to match the profiles of the faces, so that faces of adjoining members will be flush.

J. Build-in straps, plates and brackets as required for support and anchorage of fabricated items to

adjoining construction; reinforce sheet metal units as required for attachment and support of other construction.

K. Apply sound damping compounds to back side of units up to 7 ft. above finished floor.

L. Separate dissimilar metals and metals in contact with concrete or masonry with dielectric separator to prevent galvanic action. Do not extend coatings onto exposed surfaces.

2.03 FABRICATION, SPECIFIC ITEMS

A. Blind and Drapery Pockets

1. Form pockets to profiles shown using 18-gauge sheet steel min., unless otherwise shown with end closures. Coordinate dimensions and attachment methods with blind and drapery equipment, window frames, ceiling suspension systems and other related construction to produce a coordinated, closely fitting assembly.

2. Reinforce pockets for attachment of window treatment equipment and hardware or increase pocket metal thickness.

3. Divide continuous pockets by means of built-in partitions located to separate adjoining drapery and blind units, to coincide with window mullions, and to receive filler panel at ends of partitions.

B. Closures and Trim

1. Form closures and trim members from sheet metal of type and minimum nominal thickness as indicated below. Incorporate components required for support and installation of closures and trim. Fabricate closures and trim to tightly close with adjoining construction.

a. Metal: Steel sheet, 18-gauge minimum.

2. Conceal fasteners where possible; otherwise locate where they will be as inconspicuous as possible. Size fasteners to support closures and trim, with fasteners spaced to prevent buckling or waviness in finished surfaces.

3. Drill and tap holes required for securing closures and trim to other surfaces.

4. Incorporate gaskets where indicated or required for concealed, continuous seal at abutting surfaces.

5. Support joints with concealed stiffeners as required to hold exposed faces of adjoining sheets in flush alignment.

6. Miter or cope trim members at corners to form tight joint.

2.04 SHOP PAINTING

A. Clean, treat and paint surfaces of fabricated architectural sheet metal inside and out, whether exposed or concealed in the construction.

B. Thoroughly clean all metal surfaces of loose scale, shavings, filings, dirt and other deleterious materials by use of wire brushes or other effective means. Remove grease and oil by one of the methods specified in SSPC-SP-1 "Solvent Cleaning". Remove mill scale and rust, if present, from uncoated steel in compliance with SSPC-SP 8 (Pickling).

C. Chemically treat surfaces with phosphate compound to assure maximum paint adhesion. Apply one coat of enamel primer baked-on, to both inside and outside surfaces. Touch-up surfaces having runs, smears or bare spots.

D. Provide minimum mil thickness of coating as recommended by the paint manufacturer.

PART 3 – EXECUTION

3.01 CONDITION OF SURFACES

A. Examine the substrates and adjoining construction, and the conditions under which the Work is to be installed. Do not proceed with the Work until unsatisfactory conditions have been corrected.

3.02 INSTALLATION

A. Set architectural sheet metal units at location shown, in perfect alignment and elevation, plumb, level, straight, true and free from rack.

B. Use concealed anchorages and connections unless otherwise shown. Form tight hairline joints accurately fitted together. Provide reveals and openings for sealants and joint fillers, as shown.

C. Protect zinc-coated, galvanized and nonferrous metal surfaces from corrosion or galvanic action by application of a heavy coating of dielectric separator on surfaces which will be in contact with concrete, masonry or dissimilar metals.

D. Do not penetrate aluminum window wall mullion with any type of fastenings.

3.03 CLEANING AND PROTECTION

A. Repair finishes damaged during installation and construction period so that no evidence remains of corrective work. Return items which cannot be refinished in the field to the factory, make required alterations and refinish entire unit, or provide new units as required.

B. Upon completion of installation, clean exposed metal surfaces as recommended by manufacturer and leave ready for final painting. Paint and touch-up paint with the specified paint system. Touch up galvanized surfaces in accordance with ASTM A780.

C. Protect architectural sheet metal units and finishes from damage during construction period. Remove temporary protective coverings when directed.

END OF SECTION I-05730

SECTION I-06100

ROUGH CARPENTRY

PART 1 – GENERAL

1.01 DESCRIPTION

A. General: Provide rough carpentry in accordance with the Contract Documents.

B. Related Work Specified Elsewhere

1. Architectural Woodwork
2. Subflooring

1.02 REQUIREMENTS OF REGULATORY AGENCIES

A. Fire Retardant Treated Wood: Treat those items required by Building Code to be treated and those items shown or specified as "Fire Retardant Treated Wood".

1.03 QUALITY ASSURANCE

A. Single-Source Responsibility for Fire Retardant Treated Wood: Obtain each type of fire-retardant-treated wood products from one source for both treatment and fire-retardant formulation.

1.04 STANDARDS

A. Except as modified by governing codes and by the Contract Documents, comply with the applicable provisions and recommendations of the following:

1. American Forest and Paper Association (AFPA) "Manual for Wood Frame Construction".
2. AWPA "Fire Retardant Pressure Treatment".

B. Where the language in any of the documents referred to herein is in the form of a recommendation or suggestion, such recommendations or suggestions shall be deemed to be mandatory under this Contract.

1.05 SUBMITTALS

A. Product Data: Provide manufacturer's product data for each type of product and process specified in this section and incorporated into items of rough carpentry indicating component materials and dimensions and include construction and application details. Provide the following:

1. 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, both before and after exposure to elevated temperatures when tested according to ASTM D5516 and ASTM D5664. For products receiving a waterborne treatment, include statement that moisture content of treated materials was reduced to levels specified before shipment to Project site.
2. Include copies of warranties from chemical treatment manufacturers for each type of treatment specified.

B. Certification of Fire-Retardant Treatment: Submit certification stating name of fire-retardant materials used, compliance with local building code requirements and with AWPA Specification CI and C20 for lumber and C27 for plywood, and that fire retardant materials will not bleed through painted surfaces.

C. Recycled Content: Submit certification, including written data and specifications, highlighting percentage of recycled content for all miscellaneous metal items.

D. Low Emitting Materials: Submit certification listing the content of formaldehyde used in the fabrication of particleboard, evidencing compliance with requirements specified.

E. Certified Wood: Submit certification and documentation from the manufacturer or supplier declaring conformance with Forest Stewardship Guidelines for certified wood building components.

1.06 PRODUCT HANDLING

A. Keep rough carpentry work under cover and dry during delivery, storage and installation, and until finish is applied and building is enclosed. Protect against exposure to weather and contact with damp or wet surfaces. Provide for air circulation in stacks of lumber and plywood.

PART 2 – PRODUCTS

2.01 MATERIALS

A. General

1. Lumber Grading: Comply with "Simplified Practice Recommendations PS-20, American Softwood Lumber Standards" by U.S. Department of Commerce, and with the applicable lumbermen's association rules under which each species of lumber is produced.
2. Plywood Grading: Comply with PS-1 "U.S. Product Standard for Construction & Industrial Plywood" (ANSI A199.1).
3. Particleboard Grading: Comply with ANSI A208.1 "Wood Particleboard" for grade indicated.
4. Grade Marking: Factory mark each piece of lumber with the official grade mark of the appropriate association or authorized inspection service under whose rules the lumber is graded.
5. Sizes and Patterns: Provide lumber which is dressed S4S and worked to such patterns as shown or specified. Dimensions on Drawings designate the nominal undressed size of the item.
6. Moisture Content: Provide lumber which has been seasoned by air drying or kiln drying to a moisture content not to exceed 19%.
7. Recycled Content: Provide rough carpentry items utilizing a min. 20% recycled content.
8. Certified Wood: Use wood-based materials that are certified in accordance with the Forest Stewardship Council guidelines for wood building components.

B. Lumber

	USE	GRADE	SPECIES
1.	General framing	1200 f	Any species

C. Plywood

	USE	GRADE	SPECIES
1.	Equipment Backerboards	APA B-C Exposure 1	Group 2
2.	Mirror Backerboards	APA B-C Exterior	Group 1
3.	Subfloor/ Underlayment	APA Rated Sturd-1-Floor Exposure 1	Group 1 or Group 2

4.	Countertop Underlayment	APA Marine Grade B-B	Group 1

D. Particleboard: ANSI A208.1 and in compliance with max of 0.05 mg/m2/hr in accordance with the South Coast Rule #168 by the South Coast Air Quality Management District.

1. Types

	TYPE	GRADE
a.	Equipment Backerboards	Grade I-M-2 or 2-M-2
b.	Subfloor/underlayment	Grade 1-M-I or 2-M-3
c.	Countertop Underlayment	Comply with ANSI 161.2

2. Fire-Retardant Particleboard: Where shown or required, provide panels complying with ANSI A208.1, grade as appropriate for intended application and that have fire-retardant chemicals bonded to softwood particles at time of panel manufacture to achieve products identical to those tested for flame spread of 20 or less and for smoke developed of 25 or less per ASTM E84 by UL or other testing and inspecting organization acceptable to authorities having jurisdiction. Identify products with appropriate markings of applicable testing and inspecting organization.

3. Subject to compliance with requirements, provide "Dura flake FR" by Dura flake Div.; Willamette Industries, Inc.

E. Anchors and Fasteners: Where rough carpentry is exposed to weather, in contact with concrete, contiguous with roofing systems or in area of high relative humidity, provide fasteners with a hot-dip zinc coating per ASTM A153 or of Type 304 stainless steel.

1. Bolts, Nuts, Studs and Washers: Steel bolts complying with ASTM A307, Grade A; with ASTM A 563 hex nuts and, where indicated or required, flat washers.

2. Expansion Anchors: Anchor bolt and sleeve assembly of material indicated below with capability to sustain, without failure, a load equal to six times the load imposed when installed in unit masonry and equal to four times the load imposed when installed in concrete:

   a. Interior Material: Carbon-steel components zinc-plated to comply with ASTM B633, Class Fe/Zn 5.

3. Lag Screws and Bolts: FS FF-B-561; type and grade best suited for the purpose.

4. Nails: FS FF-N-105; type and size best suited for the purpose.

5. Toggle Bolts: FS FF-B-588; type and class best suited for the purpose.

6. Wood Screws: FS FF-S-111; style best suited for the purpose.

7. Powder-Driven Fasteners: May be used if permitted by code.

F. Steel Plates and Shapes: ASTM A36, hot dipped galvanized for applications in contact with or for embedment in concrete.

G. Paint: Shop primer for ferrous metal; One of the following:

1. "4-55 Versare" (Tnemec Co. Inc.); 2.0 - 3.5 mils d.f.t.

2. "GP-818" (Carboline Co.); 2.0 mils d.f.t.

3. "Amercoat 5105" (Ameron Protective Coatings); 2.0 - 3.0 mils d.f.t.

4. "Dulux 67-Y-834" (DuPont Company); 2.0 mils d.f.t.

H. Fire Retardant Treated Wood

1. Materials: Fire retardant materials shall meet the requirements of AWPA P10.

2. Treatment: Pressure treat to meet building code requirements and requirements of AWPA Cl and C20 for lumber and C27 for plywood. After fire retardant treatment, kiln dry to the moisture content hereinbefore specified. Do not use colorants in solution to distinguish treated lumber from untreated lumber. Guarantee fire retardant materials not to bleed through painted finish or natural finish. Provide the following:

   a. Interior Fire-Retardant Treatment: For interior use where relative humidity is normally below 80%; Low-Hygroscopic Formulation; interior Type A per AWPA C20. Provide fire retardant treatment from one of the following:

      1) "D-Blaze" (J. H. Baxter Co.).

      2) "D-Blaze" (Chemical Specialties, Inc.).

      3) "Pyro-guard" (Continental Wood Preservers, Inc.).

      4) "Dricon" (Hickson Corp.).

3. Fabricate and mill wood before treatment wherever possible, and disassemble for treatment, so that cutting and jointing will not be required after treatment. Apply a heavy brush coat of the same fire-retardant chemicals to any surfaces which are cut after treatment.

4. Kiln-dry woodwork after treatment to levels required for untreated woodwork. Maintain moisture content required by kiln drying before and after treatment.

5. Discard treated lumber that does not comply with requirements of referenced woodworking standard. Do not use twisted, warped, bowed, discolored, or otherwise damaged or defective lumber.

PART 3 – EXECUTION

3.01 CONDITION OF SURFACE

A. Examine substrates, adjoining construction, and conditions under which the Work is to be installed and do not proceed with the Work until unsatisfactory conditions have been corrected.

3.02 INSTALLATION

A. Whenever rough carpentry is fitted to other work, obtain measurements of such other work. Verify dimensions shown, and the shop drawing details.

B. Discard units of material with defects that impair quality of rough carpentry construction and that are too small to use in fabricating rough carpentry with minimum joints or optimum joint arrangement.

C. Set rough carpentry to required levels and lines, with members plumb and true to line and cut and fitted.

D. Fit rough carpentry to other construction; scribe and cope as required for accurate fit. Correlate location of furring, nailers, blocking, grounds, and similar supports to allow attachment of other construction.

E. Securely attach rough carpentry work to substrate by anchoring and fastening as indicated.

F. Countersink nail heads on exposed carpentry work and fill holes.

G. Select fasteners of size that will not penetrate members where opposite side will be exposed to view or will receive finish materials. Make tight connections between members. Install fasteners without splitting of wood; predrill as required.

H. Rough Framing

   1. Framing Standard: Comply with AFPA "Manual for Wood Frame Construction," unless otherwise indicated.

2. Frame to fit closely and set accurately to required lines and levels; secure rigidly in place in accordance with details and good practice.

3. Use shims of slate or steel for leveling wood members on concrete or masonry.

4. Cut and fit to accommodate other work as required and in a neat workmanlike manner.

5. Nail in accordance with "Recommended Nailing Schedule" of referenced framing standard and with NFPA "National Design Specifications for Wood Construction and "Housing and Home Finance Agency, publication "Technique of House Nailing".

I. Blocking and Nailers

1. Install wood nailers and blocking where shown and where required for attachment of other work. Form to shapes as shown and cut as required for true line and level of work to be ttached. Coordinate location with other work involved.

2. Attach to substrates as required to support applied loading. Countersink bolts and nuts flush with surfaces, unless otherwise indicated. Build into masonry during installation of masonry work. Where possible, anchor to formwork before concrete placement.

J. Equipment Backerboards

1. Provide 3/4 in. thick fire-retardant treated plywood or particleboard equipment backerboards in telephone and electrical equipment rooms and other locations as shown or required to mount equipment. Comply with local utility company requirements for equipment backerboards.

2. Secure to wall using proper fastening devices for substrates encountered spaced 12 in. o.c. maximum at perimeter 1/4 in. from corners and three rows of 3 fasteners each in the backerboard field. Countersink fasteners flush with plywood surface. Butt adjacent panels without lapping. Prepare panels for finish painting as specified in Section "Finish Painting".

K. Mirror Backerboards: Furnish 1/2 in. thick fire-retardant treated plywood mirror backerboards in toilet rooms and other locations as shown or required to mount mirrors.

L. Subflooring

1. Plywood subflooring 5/8 in. minimum thickness.

2. Install with long dimension at right angles to bearing members, end joints butted over center line of supports.

3. Nail with 8 penny spiral or annular nails, 6 in. o.c. along ends and bearing edges and 12 in. o.c. along intermediate bearings.

4. Install in two layers laid perpendicular to each other. Touch sand top layer, removing rough edges, fill openings and hollows with wood filler. Prepare substrate for Prime paint as required to accommodate thin set setting bed, waterproofing and ceramic tile specified in Section 09310, "Ceramic Tile".

M. Stone Countertop Underlayment: Stone Countertops underlayment to receive stone surfaces shall be primed and sealed on all surfaces with materials compatible with the stone and stone setting materials.

N. Repair of Treated Wood Surfaces: Apply heavy brush coat of same fire-retardant chemicals to any surfaces which are cut after treatment.

O. Priming

1. Paint rough hardware and ferrous metal with one shop coat of specified paint. Paint fire retardant treated wood with one coat of alkyd type paint or a moisture transmission resistant sealer immediately after installation.

END OF SECTION I-06100

SECTION I-06400

ARCHITECTURAL WOODWORK

PART 1 – GENERAL

1.01 DESCRIPTION

A. General: Provide architectural woodwork in accordance with the Contract Documents. Section includes interior architectural woodwork:

1. Plastic-laminate cabinets.
2. Plastic-laminate countertops.
3. Solid-surfacing material countertops.
4. Stone countertops.
5. Wood cabinets.
6. Wood paneling.
7. Closet and utility shelving.
8. Interior frames and jambs.
9. Interior standing and running trim.
10. Shop priming of interior woodwork to receive painted finish.
11. Shop finishing of cabinets to receive opaque lacquer finish.
12. Shop finishing of cabinets to receive transparent finish.

B. Related Work Specified Elsewhere

1. Ornamental metal not specified in this Section.
2. Rough carpentry.
3. Wood doors not in paneled walls.
4. Casework.
5. Electric and telecommunications wiring, connection to electric power source and building telecommunications lines, provision of outlets.
6. Fabric covered wall system(s).
7. Entrance Doors, Sidelites, Reception Area, Conference Room walls, Corridor/Office Glass Partition, as specified in Section 08400, "Glass Walls and Entrances".
8. Obtaining fabric furnished in Section 09520, "Fabric Covered Wall Systems."

1.02 QUALITY ASSURANCE

A. The Work of this Section shall be provided by a firm having a minimum of 5 years' experience on projects of similar size and quality to that specified and shown.

B. Single-Source Manufacturing and Installation Responsibility: Engage a qualified Manufacturer to assume undivided responsibility for architectural woodwork specified herein, including fabrication, finishing, and installation. Woodworker shall be certified in accordance with Section 01440, "Green Building Specification" to process certified wood veneer and backer material.

1.03 REQUIREMENTS OF REGULATORY AGENCIES

A. Fire Retardant Treated Wood: Treat those items required by applicable codes to be treated and those items shown or specified as "Fire Retardant Treated Wood". Provide lumber, plywood, medium density fiberboard and particleboard with an Underwriters Laboratories (UL) stamp certifying values as specified herein for each type of product.

1.04 STANDARDS

A. Except as modified by governing codes and by the Contract Documents, comply with the applicable provisions and recommendations of the following:

1. AWI "Quality Standards".
2. NAAMM "Metal Finishes Manual".
3. AWPA "Fire Retardant Pressure Treatment".
4. NBGQA "Specifications for Building Granite".
5. MIA "Design Manual".

B. Where the language in any of the documents referred to herein is in the form of a recommendation or suggestion, such recommendations or suggestions shall be deemed to be mandatory under this Contract.

1.05 SUBMITTALS

A. Shop Drawings: Submit shop drawings of architectural woodwork for the fabrication and the installation of the Work. Include the following:

1. Large scale details, dimensioned plans, locations and elevations, attachment devices, and adjacent work of other trades. Locate and specify each piece of cabinet hardware and related accessories.
2. Show locations and sizes of furring, blocking, and hanging strips, including concealed blocking and reinforcing specified elsewhere.
3. Show locations and sizes of cutouts and holes for plumbing fixtures, faucets, soap dispensers, and other items installed in architectural woodwork.
4. Show veneer leaves with dimensions, grain direction, exposed face, and an identification number indicated for each leaf. Identification number shall indicate the flitch and the sequence within the flitch for each leaf.

B. Samples: Submit samples of each of the following items:

1. Plastic laminate, 12 in. square, for each color, pattern, and surface finish. Include sample on specified backer with balancing sheet.
2. Stone: 12 in. square, for each color, pattern, and surface finish.
3. Fabric Wrapped Panels: 12 inches (305 mm) by 12 inches (305 mm) of each fabric wrapped panel product, fabricated from each core product, for each fabric specified and demonstrating the proposed full range of appearance characteristics to be expected in the completed work.
4. Transparent finish for each species of wood veneer laminated to MDF or particleboard, 12 in. x 12 in., for each finish specified or shown consisting of veneer pieces cut from selected flitch samples, laminated to panel product, for each species and cut. Include at least one face veneer seam and finish one-half of face as specified.
5. Five (5) veneer leaves representative of and selected from each flitch to be used for transparent-finish woodwork.
6. Opaque finish for wood veneer laminated to MDF or particleboard, 12 in. x 12 in., for each color, gloss and finish specified or shown.

7. Lumber and panel products with shop-applied opaque finish, for each finish system and color, with exposed surface finished. Furnish lumber in 12 inch (305 mm) lengths; furnish panel samples in 12 inch (305 mm) squares.

8. Each finish type of panel, 24 in. wide x 36 in. high.

9. Each type and finish of each type of metal trim, 8 in. long, finished as specified.

10. Solid-surfacing materials, 6 inches (150 mm) square.

11. Cabinet hardware exposed in the finished work and other type hardware as requested.

12. Submit samples of each type of door specified showing construction and finishes selected. Samples shall be 12-inch (305 mm) by 12 inch (305 mm) corner section.

C. Product Data: Provide manufacturer's product data for each type of product and process specified in this section and incorporated into items of architectural woodwork during fabrication, finishing, and installation. In addition, submit the following:

1. Submit catalog cuts of hardware specified herein.

D. Certifications

1. Certification of Fire Retardant Treatment of Wood: Submit certification, stating name of fire retardant materials used, and compliance with AWPA Specification CI and C20 for lumber and C27 for plywood. Certify that fire retardant materials will not bleed through painted or natural finish surfaces.

2. Certification of Fire Retardant Treatment of Fire Retardant Particleboard: Submit certification that particleboard specified as fire retardant complies with Underwriters' Laboratory Class 1 rating and these Specifications.

3. Certification of Fire Retardant Treatment of Fire Retardant Medium Density Fiberboard: Submit certification that medium density fiberboard specified as fire retardant complies with Underwriters' Laboratory Class 1 rating and these Specifications.

4. Certification for Porcelain Enamel Coating: Submit manufacturer's and fabricator's certification indicating that porcelain enamel coating complies with requirements of the Contract Documents.

5. Recycled Content: Submit certification, including written data and specifications, highlighting percentage of recycled content for all miscellaneous metal items.

6. Low Emitting Materials:

a. Submit certification listing the content of formaldehyde used in the fabrication of particleboard and medium density fiberboard, evidencing compliance with requirements specified.

b. Submit certification that adhesives used in the field for installation of Architectural Woodwork shall have a VOC 150 or less.

7. Certified Wood: Submit certification and documentation from the manufacturer or supplier declaring conformance with Forest Stewardship Guidelines from certified wood building components.

E. Calculations: Submit calculations for items with specified design loads. Calculations shall bear the seal of a Professional Engineer registered in the Applicable State.

1.06 MOCK-UPS

A. Coordinate with Section 08800, "Glazing" as required to obtain glass for mock-ups. Provide mock-ups of the following items consisting of all the specified components of sizes as shown:

1. Glass Partitions

B Locate the mock-up where directed. Provide lighting of similar type and level as that of final installation for viewing. Demonstrate the proposed range of aesthetic effects and workmanship. Alter or revise mock-up, as directed, to obtain the acceptance of the Architect.

C. The accepted mock-up shall serve as a standard of quality for specified item(s) for the project and may remain as a permanent part of the Work if in same condition as new at time of final acceptance. The approval of the mock-up does not relieve the Contractor of it's obligation to perform the work in accordance with the Contract Documents.

1.07 PROJECT CONDITIONS

A. Do not install architectural woodwork in any space until wet work in such space is dry to the satisfaction of the woodwork fabricator and installer, and only when the building's mechanical system can maintain the relative humidity and temperature at occupancy levels during the remainder of the construction period so that the woodwork will not be damaged by excessive changes.

B. Maintain temperature and humidity levels in installation areas as required so as not to cause damage to installed items.

1.08 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.

1.09 PROTECTION

A. Protect architectural woodwork during transit, delivery, storage and handling to prevent damage. Cover and keep covered with non-staining protective wrapping.

B. Store architectural woodwork in a dry, well ventilated space, matching the environmental conditions of the finished installation.

1.10 WARRANTIES AND GUARANTIES

A. Warranties and guaranties specified in this Article shall not deprive the Owner of other rights the Owner may have under other provisions of the Contract Documents and are in addition to and run concurrent with other warranties and guaranties made by the Contractor under requirements of the Contract Documents.

PART 2 – PRODUCTS

2.01 WOOD

A. General

1. Standards: In addition to requirements shown and specified, comply with applicable provisions for grading and workmanship of AWI "Quality Standards".

2. Surfaces and Patterns: Provide lumber surfaced 4 sides (S4S) and worked to profiles shown or required.

3. Moisture Content: Kiln-dry lumber to the moisture content recommended by the AWI Section 100-S-II.

4. Recycled Content: Provide rough carpentry items utilizing a min. 30% recycled content.

5. Certified Wood: Use wood-based materials that are certified in accordance with the Forest Stewardship Council guidelines for wood building components.

B. Lumber: AWI Section 100 with the following requirements:

1. Hardwood for Transparent Finish: AWI Section 100-S-I, Grade 1, select White Oak unless

otherwise shown or specified, and free from catseyes, birdseyes, burls, splits, shakes, sap wood, wind checks, worm holes, resin deposits, mineral discolorations; hand selected to be uniform in color and grain characteristics and to match contiguous wood paneling.

a. Where hardwood is used adjacent to veneered wood, use solid wood of the same species, graining and other characteristics, from the same flitch as the wood veneer selected.

2. Hardwood for Opaque Finish: Any hardwood which, when finished, will not show any grain, imperfection or other surface defects when used with the opaque finish specified.

3. Hardwood for Concealed Framing and Blocking: AWI Section 100-S-I, Grade II or III, any species.

4. Fire Performance Characteristics: Provide materials identical to those tested for the following fire performance characteristics per ASTM test methods indicated by UL or other testing and inspecting organizations acceptable to authorities having jurisdiction. Identify treated lumber with classification marking of inspecting and testing organization in the form of separable paper label or, where required by authorities having jurisdiction, of imprint on lumber surfaces that will be concealed from view after installation.

a. Surface Burning Characteristics: Not exceeding values indicated below, tested per ASTM E84 for 30 minutes with no evidence of significant combustion.

1) Flame Spread: 25.

2) Smoke Developed: 50.

C. Panel Products: AWI Section 200 with the following requirements:

1. Core Types

a. Medium Density Fiberboard: ANSI A208.2 and AWI Section 200, Medium Density, Formaldehyde free

1) Grades: Medium Density: Grade MD

2) Medium Density: "Formaldehyde Free Medite II" (Sierra-Pine Ltd.) or approved equal.

3) Fire-Retardant Medium Density Fiberboard: Where shown or required, provide panels complying with ANSI A208.2, grade as appropriate for intended application and that have fire-retardant chemicals bonded to softwood particles at time of panel manufacture to achieve products identical to those tested for compliance with UL Class 1 surface spread of flame per UL 753 Flame rating Test or other testing and inspecting organization acceptable to authorities having jurisdiction. Identify products with appropriate markings of applicable testing and inspecting organization.

4) Subject to compliance with requirements, provide "Formaldehyde Free Medite FR" (Sierra-Pine Ltd.) or approved equal.

b. Particleboard: ANSI A208.1 and AWI Section 200, Medium Density, Formaldehyde Free.

1) Grades: Medium Density: Grade M-2 or M-3.

2) When used for countertops: Comply with ANSI 161.2. Provide phenolic resin particleboard core for counter tops with sinks or other plumbing fixtures and countertops to receive stone surfaces.

3) Fire-Retardant Particleboard: Where shown or required, provide panels complying with ANSI A208.1, grade as appropriate for intended application

and that have fire-retardant chemicals bonded to softwood particles at time of panel manufacture to achieve products identical to those tested for flame spread of 20 or less and for smoke developed of 25 or less per ASTM E84 by UL or other testing and inspecting organization acceptable to authorities having jurisdiction. Identify products with appropriate markings of applicable testing and inspecting organization.

a) Subject to compliance with requirements, provide "Duraflake FR" (Duraflake Div.; Willamette Industries, Inc.) or approved equal.

c. Plywood: AWI Section 200-G-5 either veneer core plywood or particle core plywood; fire retardant treated where required or shown.

2. Surface Grades of Panels

a. Hardwood: AWI Section 200-S-5, Grade I and ANSI/HPVA-1, Grade AA; face veneers or overlays as shown or specified.

3. Edges: Band edges of plywood and particleboard core panels with face veneer banding in accordance with AWI Section 500A-S-3, Premium Grade, unless hardwood edge banding is shown. Provide special banding where shown.

4. Panel Balancing Veneer: Provide balancing veneer on concealed side of panels, using same species as the face veneer.

5. Panel Fire Performance Characteristics: Provide paneling composed of panels of wood veneer density and fire-retardant plywood or particleboard that are identical in construction to units tested for the following surface burning characteristics per ASTM E84 by UL or other testing and inspecting organization acceptable to authorities having jurisdiction. Identify panels with appropriate markings of applicable testing and inspecting organization on surfaces that will be concealed from view after installation.

a. Flame Spread: 75 or less.

b. Smoke Developed: 450 or less.

6. Core Formaldehyde Emission Levels: Use only formaldehyde free panel materials.

D. Furring, Blocking, Shims, and Hanging Strips: Fire-retardant-treated softwood lumber, kiln dried to less than 15 percent moisture content.

E. Veneers

1. Face Veneers for Transparent Finish: See Finish Plan for specifications.

2. Face Veneers for Opaque Finish: AWI Section 200-S-8, Grade I or II, any hardwood veneer that, when finished, will not show any grain, imperfection or other surface defects when used with the opaque finish specified or phenolic resin impregnated paper, equal to "Forbond Yorkite III" (NVF Co., Primary Products Div..).

F. Shop Finishing (Wood)

1. Transparent Finishes

Refer to Finish Plan for Specifications.

2. Opaque Finishes

a. Field Paint finishes are specified in section 09900, "Painting".

b. Opaque Lacquer Finish for Millwork and Doors (where lacquer is specified)

1) Polish finished substrates to eliminate marks and sander scratches and wipe clean prior to application of undercoater.

2) 1st Coat: Alkyd resin or nitrocellulose lacquer base, 65% solids, opaque undercoater, color best suited to achieve final color appearance of subsequent coats, with a cold check cycle of 16.

3) 2nd Coat: Opaque lacquer, nitrocellulose plasticizer base, 45% solids, color and specular gloss as selected by the Architect, with a cold check of 20.

4) 3rd Coat: Clear catalyzed lacquer, alkyd urea base modified nitrocellulose resin, 26% solids, specular gloss as selected by Architect, with a cold check of 15.

5) Total dry film thickness between 5 and 7 mils.

6) Wet sand to a high gloss finish.

7) Final finish shall be approved by Architect.

3. Unexposed Wood Finish: Alkyd type primer-sealer.

G. Fire Retardant Treated Wood

1. Materials: Fire retardant materials shall meet the requirements of AWPA P10.

2. Treatment: Pressure treat to meet requirements of AWPA Cl and C20 for lumber and C27 for plywood. After fire retardant treatment, kiln dry to the moisture content hereinbefore specified. Do not use colorants in solution to distinguish treated lumber from untreated lumber. Guarantee fire retardant materials not to bleed through painted finish or natural finish. Provide the following:

a. Interior Fire-Retardant Treatment: For interior use where relative humidity is normally below 80%; Low-Hydroscopic Formulation; interior Type A per AWPA C20. Provide fire retardant treatment from one of the following:

1) "D-Blaze" (J. H. Baxter Co.).

2) "D-Blaze" (Chemical Specialties, Inc.).

3) "Pyro-guard" (Continental Wood Preservers, Inc.).

4) "Dricon" (Hickson Corp.).

3. Fabricate and mill wood before treatment wherever possible, and disassemble for treatment, so that cutting and jointing will not be required after treatment. Apply a heavy brush coat of the same fire-retardant chemicals to any surfaces which are cut after treatment.

4. Kiln-dry woodwork after treatment to levels required for untreated woodwork. Maintain moisture content required by kiln drying before and after treatment.

5. Discard treated lumber that does not comply with requirements of referenced woodworking standard. Do not use twisted, warped, bowed, discolored, or otherwise damaged or defective lumber.

H. Stone

1. Provide stone of soundness (hardness and density), texture, graining finish, crystal patterning, color and tone matching the sample in the Architect's office (and subject to the Architect's approval). Stone shall be sound and free from defects that will impair strength durability, finish appearance, and is supplied from a single quarry source with sufficient capacity to satisfy the total requirements of the Project. Waxing and sticking will not be permitted.

2. Specie, Finish, and Thickness:

a. Specie and Finish: As indicated in the finish Schedule on the Drawings. Stone tops shall be sealed on all surfaces with materials compatible with the stone and that do not affect their sheen or color.

b. Thickness: Minimum ¾ inch (19 mm).

I. Countertop Sealer: Provide stone sealing materials as manufactured by HMK Stone Care System, (800) 424-2HMK or (954) 964-1658.

1. Impregnator: Low viscosity, UV resistant, water vapor permeable, silicone-based impregnator specifically formulated to penetrate stone and grout pore structures without changing the color or sheen of the stone to which it is applied and that provides and invisible barrier of protection from water, dirt, oil, grease, lipstick, wine, and hand cream lotion infiltration.

a. S34 Silicone Impregnator

2. Surface Protection Coating: No-rinse type, 100 % natural vegetable soup cleanser, that is pH neutral (pH 7), vapor permeable and compatible with impregnator, and that emulsifies dirt and debris on the stone surface while repelling liquids. Will not change the color or sheen of the stone to which it is applied.

a. P24 Liquid Stone Soap "No Rinse"

3. Prepare countertop surfaces to receive sealer in accordance with the countertop sealer manufacturer's recommendations. Apply sealers and surface protection coatings in accordance with the countertop sealer manufacturer's instructions.

J. Fabric Wrapped Panels and Tackboards (FW): overall ¾ inch (19 mm) thick, fabric wrapped assembly composed of ¼ inch (6.4 mm) thick hardboard backing that can be either laminated or fastened to a mineral fiber tackboard fabricated from industrial board having a minimum 23 pcf (365 kg/m3) density similar to US Gypsum Company, Micore.

1. Fabric: Types as indicated on the Drawings.

2. Assembly: Form backing and tackboard will fill materials to sizes shown with edges eased to a 1/16-inch (1.58 mm) radius. Fabrics shall be shop cut, stitched together (where required), squared and trimmed to appropriate sizes. All sewing (where required) shall be perfectly straight, seams pressed flat and glued into an open position. Provide an appropriate lining on fabrics as required for applications shown. Prestretch designated fabric at room temperature for at least 4 days immediately prior to installation. Stretch fabric around all four edges of panel board with uncut corners and unframed edges, taking care not to distort the weave, and creating a smooth surface free of sags and wrinkles. Fasten fabric to the panel back by securing with staples, or other suitable fasteners, 3-inch (76 mm) maximum on center without rolling board panel edges.

K. Solid-surfacing materials (SS): Provide material that meets or exceeds ISSFA-2-01 performance standards, consisting of reacted monomers and resins, mineral fillers and pigments and manufactured in sheets of specific thicknesses. Solid surfacing material shall be solid, non-porous, homogeneous, hygienic, renewable, and, when applicable, may feature inconspicuous hygienic seams. Solid surfacing material shall be free from conspicuous internal strengthening fibers.

1. Types: As indicated in the Finish Schedule on the Drawings. Provide all assemblies with mirror shine finish.

L. Adhesives, General: Use only low emitting VOC adhesives that leave no glue lines on finished surfaces of architectural woodwork. Do not use adhesives that contain urea formaldehyde.

1. VOC Limits for Installation Adhesives and Glues: Use installation adhesives that comply with the following limits for VOC content when calculated according to 40 CFR 59, Subpart D (EPA Method 24):

a. Wood Glues: 30 g/L.

b. Contact Adhesives: 80 g/L.

2.02 PLASTIC LAMINATE

A. Face Sheets: NEMA Publication LD3, Grade General Purpose Grade HGS, 0.048 in. nominal thickness, satin finish unless otherwise shown. Color as selected.

B. Backing Sheets: Intended for use as a balancing sheet in panel construction; NEMA Publication LD3, Grade BKH, 0.048 + 0.005 in. thick.

C. Cabinet Liner Sheets: Intended for use in cabinet interiors where shown or specified; NEMA Publication LD-3, Grade CL20, 0.020 in. nominal thickness.

D. Edges: Finish edges with plastic laminate to match face sheets and apply before face sheets are applied, unless otherwise shown or specified.

E. Plastic Laminate Schedule (see Finish Plan)

2.04 METAL

A. Steel

1. Structural Steel Shapes and Plates: ASTM A36.

2. Cold-Rolled Carbon Steel Strips: ASTM A109.

3. Cold-Rolled Carbon Steel Sheets: For concealed surfaces, commercial quality, ASTM A366; or structural quality, complying with ASTM A611, Grade A, unless another grade is required by design loads. For all exposed parts, open-hearth, full pickled, annealed, stretcher-leveled furniture steel, free of scale, waves and defects.

4. Hot-Rolled Carbon Steel Sheets: Commercial quality, complying with ASTM A 569; or structural quality, complying with ASTM A570, Grade 30, unless another grade is required by design loads, may be used for concealed parts only.

5. Steel Bars: Cold-finished, carbon steel, ASTM A108, hot-rolled.

6. Rolled Steel Formed Channels: AISI MT-1010, cold-rolled steel, best commercial grade.

7. Steel Tubing: ASTM A500 cold-rolled steel seamless welded, best commercial grade, not less than 0.065 in. thick.

8. Finishing (Steel)

a. Chrome Plating: ASTM B456, Service Condition SC-4, highly polished matching US26 Finish.

b. Lacquer Finish

1) Prepare substrate in accordance with paint manufacturer's directions.

2) One (1) coat Sanding Undercoat "No. 30-237" for light colors and "No. 13-903" for dark colors (FYN Paint & Lacquer Co., Inc.).

3) Sand with 000 stearated paper sandpaper.

4) One (1) coat Sanding Undercoat "No. 30-237" for light colors and "No. 13-903" for dark colors.

5) Sand with 000 stearated paper sandpaper.

6) Two (2) coats gloss lacquer, color as selected.

7) Rub with water and pumice.

8) Two (2) coats water white clear lacquer.

c. Interior Ferrous Metal Primer: Compatible with the finish coats of paint (see Section "Painting" for finish coats of Paint); shop apply primer to the respective dry film mil thickness specified or as recommended by the manufacturer; Provide one of the following:

1) "4-55 Versare" (Tnemec Co. Inc.); 2.0 - 3.5 mils d.f.t.

2) "GP-818" (Carboline Co.); 2.0 mils d.f.t.

3) "Amercoat 5105" (Ameron Protective Coatings); 2.0 - 3.0 mils d.f.t.

B. Aluminum:

1. General: Provide alloy and temper recommended by aluminum producer or finisher for type of use and finish indicated, and with not less than the strength and durability properties of the alloy and temper designated below for each aluminum form required.

a. Extruded Bar and Shapes: ASTM B221, 6063-T6.

b. Plate and Sheet: ASTM B209, 6061-T6.

2. Aluminum Finishes: Remove die markings prior to finishing operations. Where necessary to remove die markings from any part of the work, all members must be finished by the same process, whether or not die markings exist. Perform this work in addition to the finish specified. Scratches, abrasions, dents and similar defects are unacceptable.

a. Clear Brush Anodized Finish: N/A

C. Stainless Steel

AISI Type 302 or 304.

a. Plate and Sheet: ASTM A666, Stretcher leveled sheets.

b. Bar Stock: ASTM A276.

c. Tubing: ASTM A269.

Finishes: As shown for the respective units and matching the Architect's samples. Remove scratches, abrasions, dents, die markings and other defects prior to finishing operations. Perform this work in addition to finish treatment specified.

a. No. 4 bright directional polish.

b. No. 8 non directional mirror polish.

2.05 GLASS

A. Comply with ASTM C1036, unless otherwise specified. Type and thickness as shown or specified. Provide polished edges with arises slightly eased wherever edges are not concealed within a glazing rebate. At sculptural glass walls, provide 1/8 in. thick beveled edges. Bend Glass panels at locations indicated to profiles and dimensions shown.

B. Setting Blocks: Provide neoprene setting blocks, 80 to 90 Shore A durometer hardness.

C. Glass Types: As specified in Section 08800, "Glazing".

2.06 MISCELLANEOUS PRODUCTS

A. Fasteners

1. Screws: Select material, type, size, and finish required for each use. Comply with ASME B18.6.1 for applicable requirements. For metal framing supports, provide screws as recommended by metal-framing manufacturer.

2. Nails: FS FF-N-105, type, size, material and finish as required for the condition of use.

3. Anchors: Type, size, material and finish as required for the condition of use capable of sustaining, without failure, the load imposed within a safety factor of 4 as determined by tested in accordance with ASTM E448. Provide nonferrous metal or hot-dip galvanized anchors and inserts on inside face of exterior walls and elsewhere as required for corrosion resistance. Provide toothed steel or lead expansion bolt devices for drilled-in-place anchors. Furnish

inserts and anchors, as required, to be set into concrete or masonry work for subsequent woodwork anchorage.

4. Staples: Upholstery type staples of sufficient strength to hold fabric taut in place without sagging.

5. Panel Clips: Aluminum interlocking offset panel fasteners; type, size and quantity for the condition of use. Provide one of the following or approved equal:

   a. "Panel Fastening Systems" (Panel Fastening Systems, Inc.).

   b. "Panel "Z" Clips" (Monarch Metal Fabrications Inc.).

   c. "ZC3 Clips" (Doug Mockett & Co., Inc.).

6. Blind Splines and Draw Downs: Specialty devices, as required for tight butt joining, types and size as recommended by woodwork fabricator.

7. Where mortises of fastener heads, or draw downs are exposed (blind holes) in finished work, provide plastic covercaps, color as selected by Architect.

B. Adhesives: Adhesives applied in the field shall have a VOC of less than 150. Provide the following:

1. For Laminating Plastic Laminate Surfaces: Melamine, phenol-resin, or resorcinol-resin complying with FS MMM-A-181; type, grade and class best suited for the purpose.

2. For All Other Uses: Moisture resistant complying with FS MMM-A125, Type II, or MMM-A-188, Type I, II or III; type best suited for the purpose.

C. Silicone Sanitary Rubber (Sealant Type SE09): ASTM C920, provide white color unless otherwise shown or specified. Provide one of the following having a VOC of less than 250:

1. "Silicone Sanitary 1700 Sealant" (General Electric Co.).

2. "786 Mildew Resistant Silicone Sealant" (Dow Corning Corp.)

3. "898 Sanitary Silicone Sealant" (Pecora Corp.).

4. "Tremsil 200" (Tremco).

D. Architectural Woodwork Hardware: Provide architectural woodwork cabinet hardware and accessory materials associated with architectural cabinets, except for items specified in Section "Finish Hardware. Obtain architectural woodwork cabinet hardware for each category from a single manufacturer. Specified manufacturers and their product catalog numbers establish the standard of quality and design required for the various categories, and equivalent products by other manufacturers may be acceptable, subject to Architect's review of their equivalency. Comply with BHMA A156.9 except as otherwise specified; Provide the following items, or their approved equal, as required:

1. Frameless Concealed Cabinet Door Hinges: HAFELE, Duomatic Hinges, 200 Series, Hinge Type 17 or 8 As Required.

   a. Hinge Quantity:

Door Height (Max.)	Door Width (Max.)	Hinges Per Door
30 in.	24 in.	2
30 in.	36 in.	3

   b. Where cabinet doors exceed the dimension in height in the above "Hinge Quantity Schedule," or weight exceeds 20 lbs per door, provide hinge quantity as recommended by hinge manufacturer.

2. Center Pivots for Full Height Doors: "370" (Rixson) Adjustable "walking-beam" top pivot with needle bearing of steel with chrome plated cover. Bottom pivot arm of steel and ball bearing floor plate of satin chrome finish.

3. Offset Pivots: Dorma 75233

4. Pocket Pivot Slide Door Hardware (For doors at Pantry Sink): "Model 1332" (Accuride) applied for 3/4 in. thick doors for a minimum gap of 1/16 in. and a maximum tab of 1/4 in.

5. Catches:

   a. BHMA A156.9, B03071; Roller type, unless otherwise shown. Provide one of the following unless otherwise shown or specified:

      1) "#505NP" (Epco).

      2) "#245.55.973" (Hafele).

5. Latches: Touch activated type; Provide one of the following unless otherwise shown or specified:

   a. "Magna Latch M-559-Round White" (Selby)

   b. "Magnetic Pressure Catches 245.60.736, White" (Hafele)

   c. "7007WH Magnetic Touch Latches, White" (Wood Technologies, Inc.).

6. Surface Mounted Bolts for Cabinet Doors: "No. 40, Concealed Screw Surface Bolt" (H. B. Ives), or approved equal, 6 in. long, furnished with top and bottom mortised strike plates.

7. Felt Silencers: Provide felt silencers on jamb and/or head and sill strike areas of all cabinet doors; 4 for paired doors, 3 for single leaf doors.

8. Pulls: (Where not specified on plans, provide the below)

   a. Finger Pulls: Integral type solid hardwood finger pull, with inside edge routed full length of door and painted to match door face.

   Flush Recessed Pulls: "No. 315" (Builders Brass Works) or approved equal for flush installation; Provide satin chrome finish on all pulls unless otherwise shown or specified.

   Exposed Drawer Pulls: Mockett DP3A 6” Drawer Pull.

   Exposed Pulls at Closet Doors: Mockett DP3/ DR/ 6 Door Pull

   Concealed Edge Pulls: Rockwood; mortised in edge of door.

   Exposed Edge Pulls: Mockett DP3A 3” Drawer Pull

9. Locks: All cabinet doors and drawers to be furnished with locks unless otherwise noted by Architect. Comply with BHMA A156.ll and the following:

   a. Drawer Locks: BHMA A156.11, E07041; Provide 2 keys with each drawer lock, master keyed as directed by Owner; Provide one of the following:

      1) "232.04.622"(Hafele); matte nickel-plated finish having 200 possible key changes. Provide "219.19.675"(Hafele); matte nickel-plated cylinder rosette

      2) # CB-281 Cylinder Body" (Timberline Supply Ltd.).

   b. Cabinet Door Locks: BHMA A156.ll, E07121; Provide 2 keys with each cabinet door lock, masterkeyed as directed by Owner; Provide one of the following:

      1) "235.04.609" (Hafele); matte nickel-plated finish having 200 possible key changes. Provide "219.19.675" (Hafele); matte nickel-plated cylinder rosette.

      2) #CB-231 Type 231 Cylinder Body" (Timberline Supply Ltd.).

10. Drawer Slides: BHMA A156.9, B05091; full-extension, zinc-plated steel drawer slides with steel ball bearings, provide the following:

   a. Pencil Drawer Slides: "Model No.2632" (Accuride) up to 75 lbs., full extension, rail mount, for shallow drawers up to 3 in. deep.

b. Box Drawer Slides: "Model No. 7432" (Accuride) up to 100 lbs.; full extension, progressive movement, rail mount, for drawers up to 24 in. wide.

c. File Drawer Slides: "Model No. 4034 (Accuride) up to 150 lbs and max. 30 in. drawer width; and "Model No. 3640 (Accuride) up to 200 lbs and drawer width 30 in. and up.

11. Grommets: Size and location as shown; plated steel grommet with satin chrome finish, and satin stainless-steel grommets where shown; for flush mounting with adjacent counter tops. Provide one of the following:

"PS Series" (Doug Mockett & Co.).

"Classic Series No. 079" (Hardware Concepts, Inc.).

12. Metal Shelf Supports: BHMA A156.9, B04071; with shelf rests, B04081; BHMA A156.9, B04102; with shelf brackets, B04112.

a. Surface Mounted Standards and Brackets: One of the following as required for loading condition shown, with manufacturer's standard caps at top and bottom where shown, and screw mounted shelf rests as required for condition of use:

1) Heavy Duty: "No. 1204 standards and No. 1284 brackets" (Garcy Corp.) or "No. 87 standards and No. 187 brackets" (Knape & Vogt Mfg. Co.).

b. Flush Mounted Medium Duty Standards: "No. 1747" (Garcy Corp.) or "No. 71" (Knape & Vogt Mfg. Co.).

c. Cabinet Shelf Supports for Concealed Shelving: "No. 256" (Knape & Vogt Mfg. Co.) for use with "No. 255 Flush Mount Standards" (Knape & Vogt Mfg. Co.).

d. Cabinet Shelf Supports (pin-type for cabinets with holes in sides): "No. 282.11.761" (Hafele) or approved equal.

e. Metal Shelf Supports for Exposed Shelving: "Magic Wire" (Selby Furniture Hardware Company). Size as required to support full width of shelf.

f. Finish: Satin Chrome.

13. Hang Rods: Tubing and end flanges to suit diameter of tubing where shown, including accessories. Provide one of the following:

a. "No. B-3395, 1-5/16 in. o.d. bright chrome plated steel tubing" and "No. B-3369" (Garcy Corp.) steel with satin chrome plated finish.

b. "770, 1-5/16 in. o.d. bright chrome plated steel tubing" & "764 end flanges (Knape & Vogt).

14. Architectural Woodwork Hardware Finishes: For exposed architectural woodwork hardware, provide finish that complies with ANSI/BHMA A156.18 for BHMA code number indicated.

a. Satin Chromium Plated, Steel Base: BHMA 652.

b. Satin Chromium Plated, Brass or Bronze Base: BHMA 626.

c. For concealed hardware provide manufacturer's standard finish that complies with product class requirements of ANSI/BHMA A156.9.

15. Under Cabinet Light Fixtures: Approximately 1-1/4 inch (32 mm) high surface mounted continuous under cabinet LED task light, with adjustable rotation of plus or minus 30 degrees. Task lighting shall have end butted, fixture to fixture, ganging with concealed wiring. Provide each ganged section of light fixtures with a single dimmer switch that, when activated, will switch the entire ganged section of light fixtures to either “on” or “off,” and also offers dimming from full capacity to 5% capacity.

a. See Lighting Legend for specifications.

b. All light fixture components shall be UL Approved and Listed for the applications indicated. Housings shall be constructed of recycled aluminum with water-based enamel finish; with transformer to connect to 120 VAC electrical voltage. Provide NEC acceptable wiring, and conduits if required, from light fixtures complete with 3 prong connectors for plugging into outlet strips or power receptacles.

c. Lamp Type and Wattage: Each fixture shall include evenly spaced 1 W LED lamps with a color temperature of 3500 degrees Kelvin and a CRI of 92; length as required to suit applications shown; other manufacturers will be considered subject to Architect's acceptance.

2.07 FABRICATION - GENERAL

A. Provide Premium grade architectural woodwork complying with the referenced AWI quality standard unless otherwise specified.

B. Provide steel framing and lumber framing for architectural woodwork, complete with all bracing and fastening devices as required for a rigid installation, and as required to sustain the imposed loads.

C. Do all fabrication from field measurement with provision for scribing as required to meet built-in conditions.

D. Coordinate the work of this Section with the work of other trades.

E. Fabricate units in largest practicable sections. Assemble in the shop for trial fit, disassemble for shipment and reassemble with concealed fasteners. Where necessary for fitting at site, provide ample allowance for scribing, trimming, and fitting.

F. Comply with requirements of referenced AWI quality standard for wood moisture content in relation to ambient relative humidity during fabrication and in installation areas. Maintain relative humidity and temperature during fabrication, storage and finishing operations matching that of the areas of installation.

G. Details indicate the required type and quality of construction. Modifications to conform to manufacturer's standards will be considered providing they comply with the Contract Documents, maintain the profiles shown and subject to acceptance by the Architect.

H. Reinforcing shown is minimum. Provide additional reinforcing as required to ensure a rigid assembly. Exposed surfaces shall be free from dents, tool marks, warpage, buckle, glue and open joints, or other defects affecting serviceability or appearance. Accurately fit all joints, corners and miters. Conceal all fasteners. Make threaded connections up tight so that threads are entirely concealed.

I. Welding and brazing shall be of adequate strength and durability with joints tight and flush, smooth and clean. All exposed surfaces shall be ground and finished flush, free of weld marks. Welds or brazes on finished surfaces shall be indistinguishable from parent metal.

J. Factory finish all items where possible. Defer final touch-up, cleaning and polishing after delivery and installation.

K. Comply with AWI Section 1500-S-5 and Section 1500-T-I, Premium Grade for sanding, filling countersunk fasteners and other preparations for the finishing of architectural woodwork, as applicable to each unit of work with the following additional requirements for final preparation of wood surfaces for all finishes:

1. Sanding: Use 220 grit for exposed surfaces and 180 grit for semi-exposed surfaces. Sand fire-retardant-treated wood lightly to remove raised grain on exposed surfaces before fabrication.

2. Countersinkages in finished surfaces will not be permitted in the finished work except as specifically directed by the Architect. In such cases countersinkages shall be filled with wood

putty tinted to blend with the adjacent wood veneer.

L. Fabricate woodwork to dimensions, profiles, and details indicated. Ease edges to radius indicated for the following:

1. Corners of cabinets and edges of solid wood (lumber) members less than 1 inch in nominal thickness: 1/16 inch.

2. Edges of rails and similar members more than 1 inch in nominal thickness: 1/8 inch.

M. Provide finishes as shown or specified.

N. Veneers for Transparent Finish

1. The Architect will assign specific flitches for specific elevations.

2. Bond veneers to cores by the hot press method.

3. All full width panels shall be center book matched and end matched.

4. 4-piece book match, butt match, blueprint match, equal number of leaves per panel, allocated in accordance with Architect's direction.

5. Full width veneers of width greater than 40 in. shall have number of leaves in panel assigned on an individual species and flitch basis.

6. Panels shall be blueprint, balanced and sequence matched, and full flitch matched, with all sapwood removed.

7. End match all transom panels and panels taller in height than veneers allocated.

2.08 FABRICATION - SPECIFIC ITEMS

A. Architectural Cabinetwork

1. Provide cabinetwork in accordance with AWI Section 400A, Premium Grade, for wood cabinetwork and AWI Section 400B, Premium Grade, for plastic laminate cabinetwork; For opaque lacquer finishes, provide AWI Section 400A, Custom Grade cabinetry.

a. Provide "Flush Overlay" AWI type cabinet construction unless otherwise noted.

2. Include all preparations for mechanical, electrical, telephone, computer equipment and plumbing work required. Prepare cabinets, which contain computer equipment, to receive cooling fans, air slots for air circulation within the equipment area of sizes as shown or required and wireways for electrical, data and communication wires. Allow for cable conduits entering casework from different directions. In areas where shown or required, provide removable panels and access doors.

3. Provide cabinet hardware as shown or specified.

4. Provide dust panels of % in. plywood or tempered hardboard above compartments in body webs and drawers except where located directly under tops.

5. Semi-Exposed Surfaces

a. Semi-exposed surfaces of wood cabinetwork shall be provided with same finish and species as the face veneer, except they may be of quality, size and leaf width not acceptable for face use. Drawer sides and backs shall be solid hardwood lumber, stained to match species indicated for exposed surfaces, shop finished. Drawer bottoms shall be hardwood plywood, same species indicated for exposed surfaces, shop finished.

b. Semi-exposed surfaces other than the drawer bodies of plastic laminate clad cabinetwork shall be surfaced with high pressure decorative laminate, Grade CL-20. Drawer sides and backs shall be solid hardwood lumber, shop finished. Drawer

bottoms shall be hardwood plywood, shop finished.

6. Provide wood veneers for exposed surfaces of wood veneered cabinetry, as specified hereinbefore.

7. Provide cabinet door panels constructed same as paneling. Hollow core doors will not be permitted.

   a. At cabinet doors, provide wood doors hung on concealed hinges, and held closed with magnetic catches unless otherwise indicated.

   b. Where double cabinet doors are indicated, provide surface mounted flushbolts at back of one leaf, and door lock on the other, unless otherwise indicated.

   c. Provide adjustable shelving fabricated from plywood, finished with plastic laminate at plastic laminate clad cabinets, and clear birch at wood veneered cabinets, unless otherwise shown.

8. Provide matching veneers for edge treatments of case body members where wood veneered cabinetry with transparent finishes is indicated or specified.

9. Provide drawers with slides as specified. Drawers shall not rest on web body frames.

10. Provide wood veneers for transparent finish, of matching and continuing grain, for drawer and door edges at wood veneered cabinetry.

11. Copy Room Cabinetry: Provide plastic laminate clad cabinetry of profiles and dimensions shown, fabricated as specified above for plastic laminate clad cabinetry.

   a. Provide cabinets fabricated from field dimensions, shop finished and delivered to site complete, and ready for installation. Allow for scribing and provide matching finished filler panels as required for a tight fit and uniform elevation between walls.

   b. Provide plastic laminate clad cabinet doors with one-piece face grade laminate applied to both backs and fronts. Cabinets shall have scheduled pulls, magnetic catches, and European hinges. Provide locks for all cabinet doors, except at double doors, provide flush bolts on insides of inactive leafs. Confirm locations with Architect.

   c. Provide plastic laminate clad adjustable shelving within cabinetry, fabricated from min. 3/4 in. wood with plastic laminate finish.

   d. Where shown, provide wall mounted shelving above base cabinets to hold paper, fabricated from plastic laminate clad plywood. Clad all exposed surfaces with plastic laminate. Where shown, provide fluorescent light fixture above and below overhead shelving as shown.

   e. Provide white plastic laminate cladding for interior and semi-exposed surfaces within cabinetry, using cabinet liner grade laminate, except use face grade laminate on backs of cabinet doors.

B. Countertops

1. Fabricate countertops of sizes and profiles shown, not a part of integral casework, in accordance with AWI Section 400C, Premium Grade, and as specified herein.

2. Provide countertops fabricated with either veneer core or particle core plywood cores for all locations, except provide either exterior veneer core or phenolic resin particleboard core plywood cores for counter tops with sinks or other plumbing fixtures and countertops to receive stone surfaces.

3. Where shown, provide countertops fabricated of stone ¾ inches thick, of sized and profiles shown with cutouts where required to accommodate items penetrating the surface. If required use 2 sheets of countertop sheet material laminated together using manufacturer's standard

adhesive to form edges. Laminated sections shall be in close contact throughout. Adhesive stains will not be permitted. Route out backs of all countertops where required to receive, lavatories, faucets and soap dispenser toilet accessories. Provide manufacturer's recommended undermount hardware for bowls and sinks where required. Obtain templates from other trades as required for preparation of cutouts.

a. Install integral sink bowls in countertops in the shop.

4. Provide countertops in longest length possible for each location shown.

5. Provide wood blocking and framing, anchors, clips, splines, supporting and attaching devices.

6. Provide wood blocking and framing, anchors, clips, splines, supporting and attaching devices.

7. Provide cut-outs to receive attachments, supporting substructure, mechanical and electrical work from templates and drawings furnished by other trades. Provide grommets in locations where wiring enters or exits from countertop.

8. Provide balancing face, on concealed side of countertops, of same thickness and material as specified for face, except concealed grade, to equalize pull and prevent warpage, twist or bow.

9. Provide fascias, skirts or backsplashes of profiles and sizes shown, and fabricated the same as countertops.

10. Finish edges of plastic laminate countertops before face sheets in accordance with AWI 400C, Premium Grade.

C. Paneling

1. General

a. Panels shall be in accordance with AWI Section 500, Premium Grade construction; except provide custom grade construction at panels to receive opaque lacquer finish.

b. Panel joints shall be flush type unless otherwise shown or specified.

c. Provide wood blocking and framing, anchors, clips, splines, supporting and attaching devices.

d. Provide cut-outs to receive attachments, mechanical and electrical work as required. Shop-cut openings, to maximum extent possible, to receive hardware, appliances, plumbing fixtures, electrical work, and similar items. Locate openings accurately and use templates or roughing-in diagrams to produce accurately sized and shaped openings. Smooth edges of cutouts.

e. Provide balancing veneer on concealed side of panels, using same species as the face veneer, to equalize pull.

f. Provide panel clips in quantity and spacing to sustain loading and prevent warping and bowing of panels.

g. Fabricate reveals in each panel as required so that lines shall align from panel to panel and railroad across entire elevation.

2. Wood Veneer Paneling

a. Comply with AWI Section 500A, Premium Grade.

b. Provide veneers as specified and as shown, including all matching requirements.

3. Plastic Laminate Paneling: Comply with AWI Section 500B, Premium Grade.

4. Metal Panels

a. Provide panels of the metals and finishes shown or specified.

b. Laminate metal sheets to plywood, particleboard or MDF panels. Provide balancing sheets of same thickness metal laminated to panel backs.

c. Form panels of one-piece seamless faces with corners formed square and true.

D. Closet and Storage Shelving

1. Provide closet and storage shelving in accordance with AWI Section 600, Custom Grade, unless otherwise shown or specified.

2. Shelf Cleats: 3/4 in. x 3-1/2 in. boards with holes to receive clothes rods (if shown or required), of same species and grade indicated above for interior lumber trim for opaque finish.

3. Exposed edges shall have hardwood edge bands.

4. For sizing of shelves and spacing of supports, comply with AWI Section 400-G-5. Shelf deflection shall not be greater than 1/4 in. between supports.

E. Standing and Running Trim: Provide standing and running trim of the sizes, profiles, species and finish as specified or shown and complying with AWI Section 300, Premium Grade; except provide custom grade at standing and running trim to receive opaque lacquer finish. Provide 4 in. high bases unless otherwise indicated.

1. Metal Bases (SSB-1): Provide stainless steel clad wood bases where shown, fabricated from min. 20 ga. finished sheet stainless steel laminated to wood bases, with folded over edges. Fabricate bases in longest lengths possible, with joints aligning with joints of panels above. Finish metal bases with No. 6 Satin long grain finish. Run grain of sheet stainless steel horizontal unless otherwise indicated.

F. Wood Doors: Fabricate wood doors in accordance with the requirements of Section "Wood Doors" and AWI Section 1300, Premium Grade for flush type doors and AWI Section 1400, Premium Grade for stile and rail type doors.

1. Provide veneer species and finish as specified or shown.

2. Provide operable panels and doors, fixed panels and transom panels complying with requirements specified in Paragraphs "Paneling" and "Doors" and the following:

a. Fixed Panels: Provide fixed wood panels secured to slab above and fixed to floor below with concealed fasteners as required to withstand 5 lbs. per sq. ft. inward pressure applied perpendicular to plane of fixed panels at any point.

1) Transom and side panels shall match door construction in every respect.

b. Pocket Pivot Panels: Provide sliding pivoting pocket panels at pantry sinks utilizing hardware specified in Paragraph "Hardware". Utilize fixed inside panels to cover sliding mechanism, finished to match pocket panels. Secure panels to supporting cabinetry as required to support hardware and pocket panels.

c. Closet Doors: Provide closed doors fabricated equal to type I door specified in Section 08210, "Wood Doors" and requirements of this Section. Provide finish indicated and specified in this Section. Mount closet doors on center or offset pivot hardware as indicated. Provide exposed edge pulls, overhead stops and silencers at all closet doors, unless otherwise indicated.

3. Provide a groove in edges of door into which edge of fabric is inserted and secured with continuous hardwood spline matching the finish of the door edge.

a. Hardware: Unless otherwise specified in hardware sets, finish hardware for full height doors within cabinetry hardware shall be indicated.

4. Coordinate with Section "Finish Hardware" to provide hardwood stiles and rails of dimensions

required to provide adequate support for scheduled hardware. Prepare doors and panels for application of hardware from templates supplied in the work of that Section.

5. Fabricate reveals in each panel as required so that lines shall align from panel to panel and railroad across entire elevation.

6. Finish panels with finish system indicated and specified herein.

PART 3 – EXECUTION

3.01 PRE-INSTALLATION MEETING

A. Prior to the installation of architectural woodwork, and at the Contractor's direction, meet at the project site to review the material selections, substrate preparations, installation procedures, coordination with other trades, special details and conditions, standard of workmanship, and other pertinent topics related to the Work. The meeting shall include the Architect, the Contractor, architectural woodwork fabricator, architectural woodwork installer, various manufacturer's representatives, and representatives of other trades or subcontractors affected by the installation.

3.02 CONDITION OF SURFACES

A. Examination: Examine the substrates, adjoining construction and conditions under which the Work is to be installed. Do not proceed with the Work until unsatisfactory conditions have been corrected.

B. Verify locations of concealed framing, blocking, reinforcements, and furring that support woodwork by accurate field measurements before being enclosed. Record measurements on final shop drawings.

C. Condition woodwork to average prevailing humidity conditions in installation areas before installing.

3.03 INSTALLATION

A. Coordination: Coordinate architectural woodwork with the adjacent work of other sections. Provide items to be placed during the installation of other work at the proper time to avoid delays. Coordinate placement of such items, including inserts and anchors, accurately in relation to the final location of architectural woodwork.

B. General: Install architectural woodwork in accordance with AWI Section 1700, Premium Grade.

1. Coordinate installation with the work of other trades to ensure exact fit and perfect alignment. Verify dimensions before proceeding and obtain measurements at job site for work required to be accurately fitted to other construction.

2. Install work plumb, level, true and straight with no distortions. Provide shims as required.

3. Cutting, trimming, fitting and matching of pre-finished work will not be permitted.

4. Where cutting is required, scribe to fit adjoining work so as not to damage finished surfaces.

5. Provide wood blocking to support imposed loads of architectural woodwork. Coordinate with the work of Section 09250 "Gypsum Drywall" as required to install work on drywall partitions. Securely fasten architectural woodwork items to blocking with concealed fasteners only. Where surface nailing is required, countersink and fill flush with the woodwork so that the finished heads are undetectable. Where existing blocking, furring and framing is inadequate, provide supplemental concealed blocking, furring and framing between the partition and architectural woodwork as required to support imposed loads of architectural woodwork.

6. Install materials utilizing materials and methods as recommended by manufacturer unless otherwise specified.

C. Casework: Install cabinets and casework in accordance with AWI Section 1700B. Install and adjust cabinetry and casework so that the doors and drawers are centered, operate smoothly and within the

permissible tolerances. Field adjust plant hinged doors to meet plant tolerances.

1. Provide cabinetry complete with blocking, framing, supports and bracing as required for a safe, rigid assembly. Install cabinets with no more than 1/8 in. in 96 in. sag, bow, or other variation from a straight line.
2. Coordinate with the work of electrical and mechanical trades and other trades as required for a complete installation.
3. Install shelving brackets, standards, and cabinet shelf supports as recommended by manufacturers of these products and as required for intended use.
4. Install doors in required openings as shown in compliance with the requirements of referenced standards.
    a. Apply hardware in accordance with hardware manufacturer's instructions. Adjust door installation to provide uniform clearance at head and jambs, and to contact stops uniformly. Remove and replace doors which are found to be warped, bowed or otherwise damaged and cannot be properly fitted to frames or supporting construction.
    b. Install doors and metal files so that lines and reveals align and railroad throughout each elevation.
    c. Install flush panels with concealed fasteners. Provide pilot holes of proper size for screws into particle board core doors. Use stainless steel sheet metal screws into particle board.
5. Provide wood blocking and reinforcing required to secure fabrications to supporting construction. Provide additional reinforcing within gypsum drywall support structure as required to support all imposed loads.

D. Countertops: Anchor securely by screwing through corner blocks of base cabinets or other supports into underside of countertop. Install countertops with no more than 1/8 in. in 96 in. sag, bow, or other variation from a straight line. If backsplashes are indicated, secure to tops with concealed metal brackets at 16 in. o.c. and to walls with adhesive. Seal space between backsplash and wall with sanitary sealant specified in this Section.

1. Align adjacent solid-surfacing-material countertops and form seams to comply with manufacturer's written recommendations using adhesive in color to match countertop. Carefully dress joints smooth, remove surface scratches, and clean entire surface.
2. Where countertops are to be installed on file cabinets provided by the furniture contractor or the Owner, coordinate as required to install at proper height. Do not install counters until files are in place or provide temporary support for countertops until files are installed. Secure counters to tops of files with fasteners installed from inside of the files to the underside of countertops.
3. Secure countertops which rely on walls for support, with steel framing support to steel supports within walls behind, complete with all bracing and fastening devices as required for a rigid installation and as required to sustain imposed loads. Design and engineer supports to comply with performance criteria specified herein. Coordinate with Section 05500 "Miscellaneous Metal" as required for support steel and a secure installation.

E. Paneling: Install paneling in accordance with AWI Section 1700 and as follows:

1. Provide a system of concealed panel hanger clips and corresponding wall clips in quantity and spacing to sustain loading, to support the panels and prevent warping and bowing of the panels. Face nailing shall not be permitted. Ensure that blocking has been installed in drywall partitions to receive paneling.

2. Hang the panels in the designated locations. Scribe and cut panel work to fit adjoining work, and refinish cut surfaces and repair damaged finish at cuts. Panels shall be straight, level, flat and flush with adjoining panels. Install to a tolerance of 1/8 in. in 96 in. for plumb and level. Install with no more than 1/16 in. in 96 in. vertical cup or bow and 1/8 in. in 96 in. horizontal variation from a true plane.

3. Where reveals are indicated, keep panels spaced so that reveals are parallel and of widths shown, and so that reveals and panels align across entire elevation

4. Cutting, trimming, fitting and matching of prefinished work will not be permitted.

F. Wood Doors and Panels

1. Examine doors and door frames, adjoining construction and the conditions which the Work is to be installed. Do not proceed with the work until unsatisfactory conditions have been corrected. Do not hang doors with an apparent defect.

2. Do not install doors until concrete, masonry, plaster and tile and stone work are completed and dried in the areas to receive doors.

3. Doors shall be conditioned to the average prevailing moisture (humidity) of the locality before hanging. Doors shall not be subjected to abnormal heat, dryness, or humidity. Avoid sudden changes such as forced heat (used to dry out the building).

4. Cutting, trimming, fitting and machining of prefinished doors will not be permitted.

5. Install doors and operable panels in required openings as shown in compliance with requirements of referenced standards. Install flush panels with concealed fasteners. Provide pilot holes of proper size for screws into particle board core doors. Use stainless steel sheet metal screws into particle board.

   a. Install panels so that lines and reveals align and railroad throughout each elevation.

   b. Install fabric wrapped doors so that horizontal lines and patterns in fabric facings align from panel to panel across entire elevation.

6. Apply hardware in accordance with hardware manufacturer's instructions and Section "Finish Hardware". Adjust door installation to provide uniform clearance at head and jambs, and to contact stops uniformly. Remove and replace doors which are found to be warped, bowed or otherwise damaged and cannot be properly fitted in frames.

G. Closet and Storage Shelving: Provide closet and storage shelving at the locations shown. Provide hang rods where shown. Set adjustable center hangers.

H. Standing and Running Trim: Install standing and running trim in accordance with AWI Section 1700A. Install with minimum number of joints possible, using full length pieces for each run.

1. Stagger joints in adjacent and related members. Cope at returns, miter at corners to produce tight fitting joints with full surface contact throughout length of joint. Use scarf joints for end to end joints. Plane backs of casings to provide uniform thickness across joints, if required.

2. Miter cut all running joints, butt joints are prohibited. Cut running joints away from direction of major view.

3. Install trim after gypsum board joint finishing operations are completed.

4. Drill pilot holes in hardwood before fastening to prevent splitting. Fasten to prevent movement or warping. Countersink fastener heads on exposed carpentry work and fill holes.

5. Do not install wood and metal bases until marble installation is complete. Install bases where indicated, utilizing concealed fasteners. Anchor bases to structural substrate as required for a secure installation. Utilize wood shims to level bases and plywood floor panels, so that when files are installed, they shall be level, plumb and in line with each other. Install bases so that

the tops of bases are at the same elevation throughout, and scribe or cut the bottom as required to accommodate irregularities in the floor and finish flooring.

6. Install glass to comply with applicable requirements in Section "Glazing" and in GANA's "Glazing Manual." For glass in wood frames, secure glass with removable stops.

3.04 PROTECTION

A. Damage Prevention: Protect architectural woodwork so that it will be without damage at the time of acceptance.

B. Repairing of Damage: Touch-up marred finishes to match adjacent surfaces perfectly.

1. Architectural woodwork which, in the opinion of the Architect, cannot be satisfactorily refinished in the field shall be removed and replaced, with units to match contiguous architectural woodwork in all respects.

END OF SECTION I-06400

SECTION I-07270

FIRESTOPPING

PART 1 – GENERAL

1.01 DESCRIPTION

A. General: Provide firestopping in accordance with the Contract Documents. The Work of this Section includes, but is not limited to the following:

1. Openings in fire rated walls, floors and roofs both empty and those containing penetrations such as cables, conduits, cable trays, pipes, ducts and similar penetrating items whether new or existing.
2. Voids between fire rated floor slabs and exterior curtain walls.
3. Openings at each floor level in fire rated shafts or stairwells.
4. Gaps between the tops of fire rated walls and structural deck or roof assemblies.
5. Penetrations through smoke barriers and construction enclosing compartmentalized areas involving both empty openings and openings containing penetrating items.
6. Penetrations through Mechanical and IT Room walls and floors.
7. Penetrations through demising walls.

B. Related Work Specified Elsewhere

1. Openings through Floors and Walls
   a. Fire Rated: Metal sleeves for fire rated openings through floors and walls shall be provided under applicable mechanical, electrical, plumbing and fire protection specifications sections.
   b. Non-Rated: Non-rated openings through floors and walls shall be sealed under applicable mechanical and electrical specification sections.
2. Spray-On Fireproofing.

1.02 QUALITY ASSURANCE

A. The firestopping work shall be performed by a firm having a minimum of 3 years' experience in the installation of materials specified herein on projects comparable to this Project. The firm shall have the written approval of the firestopping material manufacturer(s).

B. Provide materials for each firestopping and each through-penetration type as produced by one manufacturer for the entire project.

C. A manufacturer's direct representative (not a distributor or agent) shall be on-site during initial installation of each different firestop systems to train appropriate contractor personnel in proper selection and installation procedures. Installer shall be trained per manufacturer's written recommendations published in their literature and drawing details.

D. For those firestop applications that exist for which no UL tested system is available through any manufacturer, a manufacturer's engineering judgment derived from similar UL system designs or other tests will be submitted to local authorities having drawings must follow requirements set forth by the International Firestop Council.

E. Provide firestopping products containing no detectable asbestos as determined by the method specified in 40 CFR Part 763, Subpart F, Appendix A, Section 1, "Polarized Light Microscopy."

1.03 REQUIREMENTS OF REGULATORY AGENCIES

A. Provide materials, accessories and application procedures which have been listed by UL or tested by a nationally recognized independent testing agency according to ASTM E814/UL 1479 or UL2079 to achieve the rating required.

B. Provide materials that are non-toxic and non-hazardous in accordance with all local requirements regarding toxic and hazardous materials in construction.

1.04 SUBMITTALS

A. Shop Drawings: Submit shop drawings showing typical installation details including reinforcement, anchorage, fastenings and method of installation for each type firestopping condition. Provide a schedule on shop drawings which identify each firestopping type, material and thickness selected for that firestop including applicable UL or FM system numbers.

1. Submit documentation, including illustrations, from a qualified testing and inspecting agency that is applicable to each through-penetration firestop configuration for construction and penetrating items.

2. Where Project conditions require modification of qualified testing and inspecting agency's illustration to suit a particular through-penetration firestop condition, submit illustration approved by firestopping manufacturer's fire protection engineer with modifications marked.

B. Samples: Provide the following:

1. Firestopping Material: Each type, cured, 6 in. long.

2. Damming Materials: 6 in. sq. of each type.

3. Metal Accessories: One representative sample.

C. Product Data: Submit manufacturer's specifications and installation instructions for each material required. Include manufacturer's certification and laboratory test reports as may be required to show compliance with the Contract Documents.

D. Test Reports: Submit certified copies of test reports (conclusions and summary only) from independent testing laboratories showing compliance with the Contract Documents and including current system number per UL Listing for each type of firestop and penetration to be utilized on the project.

E. Contractor's Review: Furnish statement signed by the Contractor and Installer, stating that the Drawings and Specifications, the shop drawings and product data have been reviewed with qualified representatives of the materials manufacturers, and that they are in agreement that the selected materials and systems are proper and adequate for the application shown including compatibility with adjacent systems and materials.

F. Certifications: Submit the following:

1. Submit "Certificate(s) of Conformance" from UL for each system showing that listed systems have been tested to the appropriate standards.

2. Statement from applicator of firestopping system(s) attesting to the fact that each system has been accepted by local governing agencies for each specific condition on Project and that materials were installed in accordance with the manufacturers installation instructions and details.

3. Engineered Deviations: Certification from manufacturer stating which firestopping assemblies deviate from requirements of the corresponding testing agency's assembly and stating that the proposed deviations have been approved by manufacturer's fire protection engineer. Certification shall have identification number, drawing details, project name and contractor's

name who will install firestop system as described in drawing.

1.05 SYSTEM DESCRIPTION

A. General: Provide firestopping system(s) of sufficient thickness, width and density to provide a fire resistance rating at least equal to the floor, wall, ceiling or partition construction in which it is installed. The firestopping material shall be sealant, putty, cementitious or other materials of an incombustible nature successfully tested and evaluated for fire resistance performance per ASTM E814/UL 1479 (under a minimum positive pressure of 0.010 in. of water) when installed in construction assemblies similar to the requirements of the Project. Firestopping materials shall be asbestos-free, emit no toxic or combustible fumes and shall not require hazardous waste disposal of used containers or packages.

1. F-Rated Through-Penetration Firestop Systems: Provide through-penetration firestop systems with "F" ratings indicated, as determined per ASTM E814 or UL2079, but not less than that equaling or exceeding the fire-resistance rating of the constructions in which joints are located or penetrated.

2. T-Rated Through-Penetration Firestop Systems: Provide through-penetration firestop systems with 'T" ratings, in addition to "F" ratings, as determined per ASTM E814, where indicated and where systems protect penetrating items exposed to contact with adjacent materials in occupiable floor areas. T-rated assemblies are required where the following conditions exist:

   a. Where firestop systems protect penetrations located outside of wall cavities.

   b. Where firestop systems protect penetrations located outside fire-resistive shaft enclosures.

   c. Where firestop systems protect penetrations located in construction containing doors required to have a temperature-rise rating.

   d. Where firestop systems protect penetrating items larger than a 4-inch-diameter nominal pipe or 16 sq. in. in overall cross-sectional area.

B. Provide a seal completely filling all annular spaces to prevent the passage of flame, smoke, and toxic gases through the opening in the fire rated construction in which it is installed. When the penetrating items are subject to movement, the firestop systems shall be based upon elastomeric firestop sealant such that movement of the penetrations shall not affect the adhesion or integrity of the firestop system.

C. Design and install the firestopping system(s) so that penetrating items may be removed or inserted after installation of the firestopping system(s) while still maintaining the required fire resistance of the system.

D. Air Seal: In addition to firestopping preventing passage of smoke and gases during and after fire and heat conditions for which they have been tested, the firestopping shall be an effective air seal to prevent passage of smoke and gases in normal service before exposure to heat and fire. Do not use materials intended to function as air seals which are known to shrink with curing or aging.

E. Material Compatibility: Provide materials which are compatible with all materials used in the system including materials used in or on penetrants as well as all construction materials used in conjunction or contiguous with the system. Firestop systems are not intended to support live loads or traffic. Firestop material shall be resistant to moisture, shall not dissolve in water after curing and shall not shrink upon drying as evidenced by cracking or pulling back from contact surfaces.

F. Coordination with Insulation Coverings: Provide firestopping which does not require the removal of insulation coverings integral to the penetrating item. Insulation coverings include thermal and acoustical insulations and their protective jackets and coverings and insulation/coverings for electrified components.

G. Accessories: Provide components for each firestopping system that are needed to install fill materials. Use only components specified by the firestopping manufacturer and approved by the qualified testing and inspecting agency for the designated fire-resistance-rated systems. Accessories include but are not

limited to the following items:

1. Permanent forming/damming/backing materials.
2. Temporary forming materials.
3. Substrate primers.
4. Collars.
5. Steel sleeves.

H. For firestopping exposed to view, traffic, moisture, and physical damage, provide products that do not deteriorate when exposed to these conditions.

1. For piping penetrations for plumbing and wet-pipe sprinkler systems, provide moisture-resistant through-penetration firestop systems.
2. Firestopping used in floors of mechanical, electrical, janitor's rooms or closets and toilet rooms, kitchens, cafeterias, pantries, and walls in such spaces where any portion of the firestopping is 3 in. or less from the floor surface shall be watertight as well as resistant to degradation from moisture during normal service before exposure to heat and fire.
3. For floor penetrations with annular spaces exceeding 4 inches or more in width and exposed to possible loading and traffic, provide firestop systems capable of supporting the floor loads involved either by installing floor plates or by other means.

1.06 MOCK-UPS

A. Following approval of samples, construct mock-ups where directed, consisting of at least one floor penetration of each type, one wall penetration of each type, and one type of all other types of firestopping to simulate final conditions. Construct mock-ups under manufacturer's supervision and alter or revise mock-ups as directed, to the satisfaction of the Architect, at which time they shall remain as the standard of workmanship for the Project. Mock-ups, if approved, may be utilized in the final work.

1.07 PRODUCT DELIVERY, STORAGE AND HANDLING

A. Delivery of Materials: Deliver materials in manufacturer's unopened containers, legible and fully identified with manufacturer's name, trade name, type, grade, batch number, packaging date, lot number, shelf life and appropriate UL logo. Handle and store materials in accordance with manufacturer's instructions. Do not utilize materials that exceed manufacturer recommended maximum storage life.

B. Store and handle firestopping materials to prevent their deterioration or damage due to moisture, temperature changes, contaminants, or other causes. Coordinate delivery and scheduled installation date to allow minimum storage time at site.

C. Material Safety Data Sheets: Submit Material Safety Data Sheets with product delivered to jobsite.

1.08 PROJECT CONDITIONS

A. Do not proceed with the installation of firestopping materials when temperatures or weather conditions exceed the manufacturer's recommended limitations for installation or when substrates are wet due to rain, frost, condensation, or other causes.

B. Ventilate firestopping per firestopping manufacturers' instructions by natural means or, where this is inadequate, forced air circulation.

C. Do not use materials that are beyond manufacturer's recommendations for shelf life.

1.09 COORDINATION AND SCHEDULING

A. General: Do not install firestopping system(s) until Work within opening has been completed. Coordinate with other applicable Sections. Schedule work of other trades so that firestopping applications can be inspected prior to being covered by subsequent construction.

PART 2 – PRODUCTS

2.01 MATERIALS

A. General: Provide a complete system of firestopping and through-penetrations firestopping which has been tested under ASTM E814 (UL1479) and listed by Underwriters Laboratories, Inc. and in addition are approved by the local building department having jurisdiction. In addition, provide systems that are compatible with one another and with substrates and contiguous materials.

1. Primers: Comply with manufacturer's recommendations and written instructions for primers required for various substrates and conditions.

2. Back-Up Materials: Back-up materials, supports and anchoring devices shall be provided as required by UL testing.

B. Firestop Sealant and Putty: For use in small openings 12 in. dia. or less, penetrations subject to movement, in non-combustible pipes, non-combustible conduits, non-combustible ducts, control joints, slab edge and exterior wall voids, as a sealant for smoke barrier construction, fire and smoke dampers, head of wall details and fire doors in masonry or gypsum drywall partitions. Provide one of the following:

1. Silicone Sealants: One part, low modulus, moisture activated silicone capable of withstanding high movement in compression and extension. Provide one of the following for the entire project:

a. "3M Fire Barrier 2000 or 2003" (3M Fire Protection Products)

b. "CP 60IS Elastomeric Firestop Sealant" (Hilti Corporation).

c. "Nelson CLK Adhesive Firestop Sealant" (Hevi-Duty/Nelson).

d. "Fyre-Sil" (Tremco).

e. "Biotherm 100/200 or Metacaulk 835+"(The RectorSeal Corp.)

2. Intumescent Putty: Nonhardening dielectric, one-part water based intumescent putty unaffected by water or moisture when cured containing no solvents, inorganic fibers, or silicone compounds. Provide one of the following for the entire project:

a. "Fire Barrier Moldable Putty" (3M Fire Protection Products).

b. "Flame-Safe FSP1000 Putty" (Grace Construction Products).

c. "Nelson FSP Firestop Putty" (Hevi-Duty/Nelson).

d. "Biostop or Metacaulk Fire Rated Putty and Putty Pads" (The RectorSeal Corp.)

3. Elastomeric Spray and Coatings: Elastomeric water based coatings designed for usage over architectural joints which contain dynamic movement due to seismic, wind sway or thermal expansion conditions. Provide one of the following for the entire project:

a. "FireDam Spray" (3M Fire Protection Products)

b. "CP 672" (Hilti Corporation).

c. "TremStop Acrylic" (Tremco).

C. Firestop Mortars/Compounds: 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, fire and impact resistant, for use in large openings, in static, non-moving, penetrations such as cable trays, electrical and communication bundles, conduit and non-combustible sleeves and pipes. Provide one of the following for the entire project:

1. "FS 635 Trowelable Firestop Compound" (Hilti Corporation).

2. "TREMstop M" (Tremco).

3. "FlameSafe Mortar FSM22B" (Grace Construction Products).

4. "Nelson CMP Firestop Compound" (Hevi-Duty/Nelson).

5. "3M Fire Barrier Mortar" (3M Fire Protection Products).

6. "Bio K-10 & K-2 or Metacaulk Fire Rated Mortars"(The RectorSeal Corp.)

D. Firestopping for Combustible Penetrating Items: For use in openings where either plastic pipe, insulated pipes or insulated cables are installed. Provide one of the following for the entire project:

1. Intumescent Caulks: One part, water based intumescent sealant unaffected by water or moisture when cured.

a. "Biostop 500+ or Metacaulk 950" (The RectorSeal Corp.)

b. "CP-25WB" (3M Fire Protection Products).

c. "TREMstop IA"(Tremco).

d. "FS-One Intumescent Firestop" (Hilti Corporation).

e. "FlameSafe FS1900 Elastomeric Sealant" (Grace Construction Products).

2. Firestop Devices: Prefabricated devices unaffected by humidity, moisture and frost. Provide one of the following for the entire project:

a. "TREMstop FyreCan and FyreCan Sleeve" (Tremco).

b. "Fire Barrier RC-1 Restricting Collar" (3M Fire Protection Products).

c. "Nelson PCS Pipe Choke Device" (Hevi-Duty/Nelson).

d. "FlameSafe FSWS Device" (Grace Construction Products).

e. "Biostop or Metacaulk Fire Rated Pipe Collars" (The RectorSeal Corp.)

f. "CP 642 or CP 643 Firestop Collar" (Hilti Corporation)

3. Intumescent Wrap Strips: Solvent free intumescent wrap strips, unaffected by water, frost or ultraviolet light. Provide one of the following for the entire project:

a. "TREMstop WS" (Tremco).

b. "Fire Barrier FS-195+ Wrap/Strip" (3M Fire Protection Products.).

c. "WRS Wrap Strip" (Hevi-Duty/Nelson).

d. "Biostop or Metacaulk Wrap Strips" (The RectorSeal Corp.)

e. "FlameSafe FSWS 100 & 150 Wrap Strip" (Grace Construction Products).

E. Pillows/Bags: Re-usable, dustless, intumescent heat-expanding pillows/bags composed of glass-fiber cloth cases filled with a combination of mineral-fiber, water-insoluble expansion agents and fire-retardant additives impervious to water, humidity, frost and ultraviolet light. Provide one of the following for the entire project:

1. "TREMstop PS (Tremco).

2. "Flamesafe Bags & Pillows" (Grace Construction Products).

3. "PLW Firestop Pillows" (Hevi-Duty/Nelson).

4. "Biostop or Metacaulk Pillows" (The RectorSeal Corp.)

F. Damming Material/Void Fillers: Non-combustible insulation for use as a damming material and/or void filler for tested and rated firestop system(s) as per manufacturer's recommendation as required by UL System.

1. Mineral Fiber: Mineral fibers combined with thermosetting resins; complying with ASTM 612, Class 1 and 2; minimum density 4 pcf; rated non-combustible when tested in accordance with ASTM E136; thickness and additional density as required to suit conditions and complying with tested and rated firestopping system(s). Provide one of the following:

   a. "Thermafiber Safing" (Thermafiber, LLC)..

   b. "FBX Safing" (Fibrex, Inc.).

G. Firestopping/Safing Insulation: Specifically produced to provide fire containment between floors utilizing mineral fibers combined with thermosetting resins; complying with ASTM 612, Class 1 and 2; density 4 pcf; rated non-combustible when tested in accordance with ASTM E136; manufacturer's standard size. Provide one of the following for the entire project:

1. "Thermafiber Safing" ((Thermafiber, LLC) . . .

2. "FBX Safing" (Fibrex, Inc.).

H. Primer, Cleaner Tape and Sealer: As required by firestopping manufacturer and compatible with selected system and contiguous materials.

I. Masking Tape: Size and type as recommended by firestopping manufacturer and compatible with selected system and contiguous materials.

J. Metal Accessories

1. Galvanized Steel Sheet: ASTM A526, galvanized in accordance with ASTM A525, Coating Designation G90.

K. Adhesively Attached Mechanical Fasteners: Zinc coated steel or nylon fasteners consisting of a perforated plate and prongs or spindles and self-locking washer; length to suit depth of insulation shown; Where spindles will be exposed to human contact after installation, protect ends with capped self-locking washers; Provide one of the following:

1. "Stic-Klips" (Eckel Industries).

2. "Tactoo Insul-Hangers" (AGM Industries, Inc.).

3. "Spindle Type Gemco Hangers" (Gemco).

2.02 MIXING

A. For those products requiring mixing before application, comply with firestop system 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

3.01 CONDITION OF SURFACES

A. Examine substrates, openings, voids, adjoining construction and conditions under which the Work is to be installed. Confirm compatibility of surfaces scheduled to receive firestopping. Verify that penetrating elements are securely fixed and properly located with proper space allowance between penetrations and surfaces of openings. Do not proceed with Work until unsatisfactory conditions have been corrected.

3.02 PREPARATION

A. Surface Preparation: Surfaces to receive firestopping shall be free of dirt, dust, grease, oil, rust, loose materials, form release agents, frost, moisture, or any other matter which would impair the bond of firestopping material to the substrate of penetrating item(s). Prime substrates in accordance with manufacturer's written instructions or recommendations. Confine primers to areas of bond; do not

allow spillage and migration onto exposed surfaces.

B. Do not apply firestopping to surfaces previously painted or treated with sealers, curing compounds, water repellant or other coatings unless tests have been performed to ensure compatibility of materials. Voids and cracks in the substrate shall be filled and unnecessary projections removed prior to installation of the firestopping.

C. All penetrating items shall be permanently installed prior to installation of firestopping.

D. Ensure that anchoring devices, back-up materials, clips, sleeves, supports and other related materials used in the actual fire tests are provided.

E. Bundled and Touching Penetrants: Where penetrants are normally bundled together and where individual penetrants are installed through the same opening, sufficiently separate each penetrant component so as not to be in contact with another penetrant component at its point of passing through the opening to be firestopped, thus allowing firestopping material to completely encapsulate each individual penetrant component resulting in a smoketight and airtight installation.

F. Use masking tape to prevent firestopping materials from contacting adjoining surfaces that will remain exposed upon completion of Work and that would otherwise be permanently stained or damaged by such contact or by cleaning methods used to remove smears from firestopping materials. Remove tape as soon as it is possible to do so without disturbing firestopping's seal with substrates.

3.03 INSTALLATION

A. Manufacturer's Instructions: Comply with UL Listings and manufacturer's instructions for the type of material and condition of opening in each case. Consult with the manufacturer's technical representative to determine proper procedure for conditions not fully covered by printed instructions. Record in writing any oral instructions received, with copy to Owner's Representative and manufacturer.

B. General: Install firestopping with sufficient pressure to properly fill and seal openings to ensure an effective smoke seal. Tool or trowel exposed surfaces. Remove excess firestopping material promptly as the Work progresses and upon completion.

C. Damming

1. General: Provide leakproof dams as required to seal openings and contain liquid sealant, putty or mortar until cured. Install damming as per manufacturer's recommendations.

2. Damming Boards: Install forming/damming materials and other accessories of types required to support fill materials during their application and in the position needed to produce the cross-sectional shapes and depths required to achieve fire ratings of designated through-penetration firestop systems.

a. Combustible Type: For temporary dams only. Remove after fire stopping material has cured.

b. Noncombustible Type: For temporary or permanent dams. Provide noncombustible type where damming material cannot be removed after applying firestopping materials.

D. Void Filler: Use materials recommended by the firestopping manufacturer to seal gaps created by noncombustible type damming boards and to seal around cables, conduits, pipes in small openings and where void filler becomes part of fire-resistant assembly.

1. General: Seal penetrations in accordance with manufacturer's recommendations using materials and/or systems suitable for Project conditions and in compliance with the appropriate tested system listed by UL.

2. Solid Sealant: Install damming materials as required. Apply sealant so air voids are not present and sealant is in full contact with penetrating items. Tool sealant to insure good

substrate contact and to leave a neat appearance. Remove excess sealant in accordance with manufacturers recommendations. Install in accordance with manufacturer's written instructions and UL listing details.

3. Putty: Install damming materials tightly packed in the opening around penetration. Install putty on both sides of damming material depending on installation access and UL listing detail. Pack putty from bottom of opening starting at back and working forward. Push putty into voids. Wall openings shall not have an unsupported space of putty greater than 4 inches. Floor openings shall not have an unsupported space of putty greater than 1-2 inches. Follow manufacturer's recommendations when distances are exceeded. Install in accordance with manufacturer's written instructions and UL listing details.

   a. Mortar: Pump, trowel, or hand pack mortar through openings to minimum thickness as recommended by manufacturer to achieve required rating. Pack firmly to eliminate air pockets. Install in accordance with manufacturer's written instructions and UL listing details.

E. Firestopping/Safing: Solidly compact firestopping/safing into all voids at floor penetrations, penetrations in fire-rated partitions and where shown or as required by the selected UL System. Apply firestopping in sufficient thickness so as to achieve fire resistance rating shown at all floor openings and floor edges. Provide mechanical fasteners and adhesive as required to retain firestopping/safing securely in place. At voids and penetrations on top, bottom or through partitions apply sufficient firestopping/safing so as to achieve a fire resistance rating equal to that of the partitions. Comply with manufacturer's written instruction and UL listings.

F. Top of Partition Firestopping: Where fire rated partitions are installed to underside of fluted metal decking, provide a UL HWD type dynamic tested firestop system. Comply with manufacturer's written instructions, UL Listed details and local authorities having jurisdiction.

G. Intumescent Collar Devices: Provide factory fabricated devices consisting of metal restraining collar encapsulating intumescent material, except where manufacturer's system combines a field installed calk or wrap strip to be used with a restraining collar. Mechanically fasten the restraining collar. Combine and supplement device with calk or sealant to make the installation function as an air seal.

H. Intumescent Wrap Strips: Provide the quantity of wrap strip layers and positioning as required by tested design. Combine wrap strips with use of mechanically fastened metal restraining collars when wrap strips are surface positioned outside of the opening. Support wrap strips using wrapped foil tape or wire. Combine and supplement wrap strips with calk or sealant to make the installation function as an air seal.

I. Pillows: Install pillows in a manner consistent with the manufacturers written instructions and UL Listed details, including all required mechanical restraints, fasteners, wire mesh or other approved methods.

J. Applications at Fire-Rated HVAC Duct Dampers: Do not use intumescent materials in conjunction with fire-rated HVAC duct dampers in a manner that could cause stress and buckling of construction surrounding duct dampers during intumescence of the firestop material thus impairing the operation of the damper.

3.04 FIELD QUALITY CONTROL

A. General: Firestopping materials shall be inspected by manufacturer(s) as required to assure proper mixing and application.

B. The Owner will engage an independent inspection agency to verify that firestopping assemblies have been constructed in compliance with ASTM E814/UL 1479 testing for fire rating required by the Contract Documents and are acceptable to Authorities having jurisdiction The Contractor shall notify the Owner's independent inspection agency of the need for inspection prior to concealing and enclosing an area containing firestopping, and shall also arrange for inspections by authorities having jurisdiction.

C. Inspections shall be made as the work progresses, and shall include the following:

1. Visual inspection of substrates before installation of firestopping to ascertain that preparation has been performed in accordance with the Contract Documents.
2. Visual inspection of completed work including removal of damming materials if used to ensure an adequate and complete fire and smoke seal.
3. Final inspection after other trades have completed Work in contact with firestopping material, but before firestopping material is covered.

3.05 REPAIR

A. Following field quality control inspection, provide all repair as required to ensure compliance with the Contract Documents, regulatory agencies and/or approved firestop submittal drawings.

END OF SECTION I-07270

SECTION 07 92 00

JOINT SEALANTS

PART 1 - GENERAL

1.1 SUMMARY

A. Section includes interior joint sealants.

PART 2 - PRODUCTS

2.1 MATERIALS

A. General:

1. Colors: For fully concealed joints, provide the manufacturer's standard color of sealant which has the best overall performance characteristics for the application shown. For exposed joints, the Architect will select colors from the manufacturer's standard colors.

B. Joint Sealants:

1. Sealants for Contact with Food: Comply with 21 CFR 177.2600, NSF Standard 51, and ASTM C 920.

a. Product: Dow Corning; 786 Mildew Resistant Silicone Sealant.

C. Mildew-Resistant Silicone Sealant (use for joints at plumbing fixtures, toilet room countertops and vanities): Complying with ASTM C 920, Type S (single component), Grade NS (non-sag), class 25, Use NT (non-traffic), Substrate uses G, A, and O; and containing a fungicide for mildew resistance.

1. Products: Provide one of the following:

a. Dow Corning; 786 Mildew Resistant Silicone Sealant.

b. Pecora Corporation; 898 Silicone Sanitary Sealant.

c. Tremco, an RPM Co.; Tremsil 200.

D. Latex Sealant: Complying with ASTM C 834, Type P (opaque sealants), Grade NF:

1. Products: Provide one of the following:

a. Pecora Corporation; AC-20 + Silicone.

b. Sonneborn Building Products Div., ChemRex, Inc.; Sonolastic Sonolac.

c. Tremco, an RPM Co.; Tremflex 834.

PART 3 - EXECUTION

3.1 INSTALLATION

A. Surface Cleaning of Joints: Clean out joints in accordance with sealant manufacturer's written instructions.

B. Installation of Sealants: Install sealants so they directly contact and fully wet joint substrates, completely filling recesses provided for each joint configuration, and providing uniform, cross-sectional shapes and depths that allow optimum sealant movement capability.

C. Tooling of Nonsag Sealants: Immediately after sealant application and before skinning or curing begins, tool sealants to form smooth, uniform, concave shaped beads, to eliminate air pockets, and to ensure contact and adhesion of sealant with sides of joint. Remove excess sealants from surfaces adjacent to joint.

D. Cleaning: Clean excess sealants or sealant smears adjacent to joints as installation progresses by methods and with cleaning materials approved in writing by manufacturers of joint sealants and of products in which joints occur.

3.2 JOINT SEALANT SCHEDULE

A. Interior joints in the following vertical surfaces and horizontal nontraffic surfaces:

1. Control and Expansion Joints on Exposed Interior Surfaces of Exterior Walls: Latex sealant.
2. Perimeter Joints of Exterior Openings Where Indicated: Latex sealant.
3. Perimeter Joints between Interior Wall Surfaces and Frames of Interior Doors, Windows, and Elevator Entrances: Latex sealant.
4. Joints between Plumbing Fixtures and Adjoining Walls, Floors, and Counters: Mildew-resistant silicone sealant.

END OF SECTION 07 90 00

SECTION 08 11 00

HOLLOW METAL DOOR FRAMES

PART 1 - GENERAL

1.1 SUMMARY

A. Section includes hollow metal door frames.

1.2 SUBMITTALS

A. Shop Drawings: Submit shop drawings showing scaled elevations, plans, and sections of the hollow metal framework. Full scale sections shall be prepared and submitted for details of the assemblies that cannot be shown in the elevations or sections. Include with shop drawings glass thicknesses, metal finishes, and all other pertinent information as necessary or requested by the Architect to indicate compliance with the Contract Documents. Details of field connections, anchorage, and their relationship to the work of others shall be clearly indicated for the coordination of the work by other building trades. Details of fastening and sealing methods and product joinery shall be shown to ensure proper performance of the field installation.

1.3 QUALITY ASSURANCE

A. Hollow Metal Door Frame Standard: National Association of Architectural Metal Manufacturers (NAAMM), Hollow Metal Manufacturers Association Division (HMMA) "HMMA 861 Guide Specifications for Commercial Hollow Metal Doors and Frames."

1.4 PROJECT CONDITIONS

A. Field Measurements: Verify hollow metal frame 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. Provide hollow metal frames by one of the following:

1. Ceco Door Products; an Assa Abloy Group Company.
2. Curries Company; an Assa Abloy Group Company.
3. Steelcraft; an Ingersoll-Rand Company.

2.2 HOLLOW METAL DOOR FRAMES

A. Provide combination type knockdown hollow metal door frames to be used as both door buck and trim, formed to profiles shown, of minimum 16 gage thick cold rolled steel. Frames shall be splined, tabbed, and miter fit, knockdown type compatible with adjacent construction conditions.

B. Accurately machine, file, and fit exposed connections with hairline joints.

C. Typical Anchorage: Frames shall be provided with concealed mechanical compression anchors at top of each jamb and each jamb shall be prepared and provided with provision for anchorage at floor line of jamb return face. Miter and anchorage type subject to acceptance of Architect.

D. Mortise, reinforce, drill and tap frames for mortise type hardware. Provide internal reinforcement for

surface type hardware which is to be field drilled and tapped per requirements hereinbefore specified for welded frames and including silencers. Locate hardware in frames to match location specified and in accordance with the hardware schedule and templates.

PART 3 - EXECUTION

3.1 INSTALLATION

A. Comply with hollow metal door frame manufacturer's written installation instructions. Do not install damaged components. Fit frame joints to produce hairline joints free of burrs and distortion. Rigidly secure nonmovement joints.

B. Frame Installation: Install frames plumb and square, shimmed and then securely anchored to substrates with fasteners recommended by frame manufacturer.

C. Wood Door Installation: Refer to Section 08 14 16 "Flush Wood Doors."

D. Install glazing to comply with requirements of Section 08 80 00 "Glazing," unless otherwise indicated.

3.2 PROTECTION

A. Institute protective measures required throughout the remainder of the construction period to ensure that hollow metal door framework will be without damage or deterioration, at time of acceptance.

END OF SECTION 08 11 00

SECTION I-08210

WOOD DOORS

PART 1 – GENERAL

1.01 DESCRIPTION

A. General: Provide wood doors in accordance with the Contract Documents.

B. Related Work Specified Elsewhere

1. Furnishing of finish hardware.

2. Finish painting of factory primed doors.

1.02 REQUIREMENTS OF REGULATORY AGENCIES

A. Comply with the label requirements of NFPA and UL. Fabricate doors in accordance with requirements of NFPA No. 80 and 10B for the class of door opening corresponding to the hourly rating shown, and which have been tested and rated for single point hardware by UL.

1. Provide UL label on each listed labeled door.

2. Provide required labels permanently fastened on each door which is within the size limitations established by the labeling authority having jurisdiction

B. Temperature Rise Rating: Provide doors which have a Temperature Rise Rating of 450 F maximum in 30 minutes of fire exposure.

C. Safety Glazing Materials: Comply with the requirements of 16 CFR 1201 of the Consumer Products Safety Act with respect to glass and glazing provided in conjunction with wood doors. Refer to Section 08800 GLAZING.

1.03 STANDARDS

A. Except as modified by governing codes and by the Contract Documents, comply with the applicable provisions and recommendations of the following:

1. "Quality Standards, Section 1300, Architectural Flush Doors, Premium Grade" (Architectural Woodwork Institute).

2. "Wood Flush Doors Standard NWWDA I.S.1" (National Wood Window & Door Association).

3. "Commercial Standard 171, Hardwood Veneered Doors" (U.S. Department of Commerce).

4. "Standard for Hardwood and Decorative Plywood ANSI/HPMA HP" (American National Standards Institute).

B. Where the language in any of the documents referred to herein is in the form of a recommendation or suggestion, such recommendations or suggestions shall be deemed to be mandatory under this Contract.

1.04 SUBMITTALS

A. Shop Drawings: Submit shop drawings for all wood doors showing 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. Indicate the dimensions and locations of mortises and holes for scheduled hardware, dimensions, and locations of cutouts fire ratings for fire doors, requirements for veneer matching and finish requirements and other pertinent data.

B. Samples: Submit samples of each type of door specified showing construction, finish, color and specular gloss selected. Samples shall be 12 in. x 12 in. corner section. Submit samples of acoustical hardware accessories.

C. Product Data: Submit manufacturer's product data for each type of door. Include details of core and edge construction and trim for openings.

D. Test Reports

1. Submit copies of the following laboratory test results:

a. Cycle/slam tests, stile edge screw withdrawals tests and stile edge split resistance tests for fire rated doors.

b. STC rating for each class specified.

E. Certifications:

1. Submit manufacturer's certification that all wood doors are manufactured to requirements of NWWDA I.S.1 Industry Standard for Wood Flush Doors and that they bear the NWWDA Wood Flush Door Certification Hallmark.

2. Submit manufacturer's certification for each fire rated door which is shown for a labeled opening but is larger than the size limitations established by the labeling authority having jurisdiction. State that the unit has been constructed in accordance with applicable requirements for labeled construction.

F. Recycled Content: Submit certification, including written data and specifications, highlighting percentage of recycled content for all wood doors and frames.

G. Formaldehyde Content: Submit certification listing the content of formaldehyde used in the fabrication of particleboard and medium density fiberboard, evidencing compliance with requirements specified.

H. Certified Wood: Submit certification and documentation from the manufacturer or supplier declaring conformance with Forest Stewardship Guidelines for certified wood building components.

1.05 PRODUCT HANDLING

A. Package prefinished doors and panels in heavy duty cardboard cartons at the factory prior to shipment. Identify each door with individual opening numbers which correlate with designation system used on shop drawings for door, frames, and hardware, using temporary, removable or concealed markings.

B. Protect doors against damage during handling, transit and storage. Store in a dry place, protected from the weather. Stack in accordance with manufacturer's directions.

1.06 PROJECT CONDITIONS

A. Do not deliver or install doors until conditions for temperature and relative humidity have been stabilized and will be maintained in storage and installation areas during remainder of construction period to comply with the referenced AWI quality standard including Section 100-S-3 "Moisture Content".

1.07 WARRANTY

A. Warranty: Submit manufacturer's standard door warranty for the life of the original installation. Warranty shall provide for removal of defective door and replacement and finishing of new door, including installation as originally specified. A representative of the door manufacturer shall inspect the installed doors and shall note on the warranty that no provisions of the warranty have been nullified in the manufacture and/or installation.

PART 2 – PRODUCTS

2.01 MATERIALS

A. Particle Board Core: Single thickness slab of 3 ply particle board complying with ANSI A208.1, Grade 1-L-1,

average density not less than between 28 to 32 pcf, hot pressed with synthetic resin glue. Linear expansion shall not exceed 0.03% in either direction when tested in accordance with ASTM D1037, Sections 76 through 79. Faces of core slab shall be of 0.010 in. thick flakes, with resin content a minimum of 50% higher than core resin content. Face layer density shall be a minimum of 25% higher than core density.

1. Particleboard core shall have a formaldehyde content of less than 0.050 mg/m2/hr
2. Particle board core shall have a recycled content of 20%
3. Particleboard shall be harvested, manufactured and processed in accordance with the Forest Stewardship Council Guidelines for wood building components.

B. Lumber Core: Low density thoroughly kiln dried wood blocks not more than 2-1/2 in. wide, random lengths.

C. Mineral Core: Incombustible mineral composition free of asbestos fiber.

D. Top and Bottom Edge Bands: Thoroughly kiln dried hardwood.

E. Blocking: Manufacturer's standard designed for purpose intended.

F. Side Edge Bands: Thoroughly kiln dried hardwood, matching face veneers for natural finish.

G. Crossbands: Minimum 1/16 in. thick after sanding, properly dried hardwood.

H. Face Veneer (For Interior Painted Finish and Opaque Lacquer Finish): Standard thickness sound grade hardwood veneer conforming to PS-1, overlaid with medium density cellulose fiber sheets impregnated with phenolic resin. Overlay shall weigh 58 lbs. per 1000 sq. ft. and shall have a minimum thickness of 12 mils after pressing and curing.

I. Face Veneer (For Natural Finish): Standard thickness, thoroughly dried conforming to CS35, Premium Grade. Match faces of doors in pairs and end match transoms. Where indicated, provide doors with faces produced from the same flitches as the adjacent wood paneling and arranged to provide the same matching as required for the wood paneling. Face veneer shall be tapeless spliced with grain running vertically, balanced and center matched, belt and polish sanded, of the following species:

J. Glass Types are specified in Section "Glazing".

K. Type I Adhesive: CS35, Type I (fully waterproof bond).

L. Type II Adhesive: CS35, Type II (water-resistant bond).

M. Primer: Alkyd type primer sealer as standard with door manufacturer.

N. Finishes: As hereinafter specified.

O. Coat Hooks: "No. 6232" (Fuller); 7/8 in. diameter x 2-1/4 in. deep; satin chrome No. 852finish, mounted on back sides of doors facing into offices.

2.02 MANUFACTURER

A. Provide wood doors for the entire project from one of the following manufacturers:

1. Algoma Hardwoods Inc.
2. Eggers Industries; Architectural Door Division.
3. Marshfield Door Systems, Inc.

2.03 FABRICATION

A. General: All doors and panels shall be 1-3/4 in. thick unless otherwise shown.

B. Type I Construction: AWI 1300 G-4 Premium Grade, PC-5.

1. Core: Solid particleboard.
2. Vertical Stiles: Minimum 1-3/8 in. wide after trimming, 2 ply construction without finger joints, consisting of 5/8 in. thick outer band (specie matching or compatible with face veneer) and 3/4 in. thick mill option hardwood inner band.

3. Top and Bottom Rails: Minimum 1-3/8 in. wide after trimming, 2 ply construction without finger joints. At Doors to receive surface mounted overhead closers, utilize 5 in. solid wood rails so that doors are not through-bolted.

4. Crossbands: Full width of door with grain running horizontally, tapeless spliced without voids.

5. Face Veneer: As specified, laminated to crossband and edges.

6. Bonding

   a. Core to stiles, rails and blocking: Type II adhesive.

   b. Face veneers and crossbands to core and edges: Type I adhesive by hot plate process.

C. Type II Construction: AWI 1300 G-3 Premium Grade, SLC-5 or SLC-HPDL.

1. Core: Bonded, low density, non-resin, staved lumber wood blocks.

2. Vertical Stiles: Minimum 1/2 in. wide after trimming, 1 ply construction without finger joints, consisting of 1/2 in. thick outer band (specie matching or compatible with face veneer).

3. Top and Bottom Rails: Minimum 1-3/8 in. wide after trimming, 2 ply construction without finger joints utilizing mill option hardwood inner band. Protect edges of exterior doors with flashing to prevent moisture from migrating into core.

4. Crossbands: Full width of door with grain running horizontally, tapeless spliced without voids.

5. Face Veneer: As specified, laminated to crossband and edges.

6. Bonding

   a. Core to stiles, rails and blocking: Type II adhesive; sand prior to assembly of face veneers.

   b. Face veneers and crossbands to core and edges: Type I adhesive by hot plate process.

D. Type III Construction: AWI 1300 Premium Grade, G-4 FD-5. Construct in accordance with requirements of NFPA Standard No. 80 and UL Standard for Safety No. 10B for class of door shown. Doors shall be listed by Underwriters' Laboratories, Inc. Provide UL label on each door. Comply with requirements of Paragraph 1.02 and the following minimum requirements:

1. Core: Incombustible, asbestos-free mineral composition, engineered to meet labeling requirements.

2. Vertical Stiles: Provide balanced construction by furnishing stile edge screw holding reinforcement to both vertical stiles as standard with the manufacturer and complying with the following:

   a. Stile edge screw withdrawals when tested in accordance with ASTM D1037 shall exceed 740 lbs.

   b. Stile edge split resistance when tested in accordance with ASTM D143 (modified) shall exceed 750 lbs.

   c. Cycle/Slam: Not less than 500,000 cycles with no loosening of hinge screws or other visible signs of failure when tested in accordance with the requirements of ANSI A151.1.

3. Top and Bottom Rails: Top rails minimum ½ in. wide after trimming, bottom rails minimum 2 in. wide after trimming with finger joints. Provide additional reinforcing as required by specified hardware. At Doors to receive surface mounted overhead closers, utilize 5 in. solid wood rails so that doors are not through-bolted.

4. Crossbands: Full width of door with grain running horizontally, tapeless spliced without voids.

5. Face Veneer: As specified, laminated to crossband and edges.

6. Bonding: Manufacturer's standard to achieve specified rating.

7. Blocking

a. Provide 5 in. blocking at top rail for surface door closers.

b. Provide 5 in. x 18 in. blocking for locksets and exit devices.

c. Provide blocking for flush bolts and vertical rod exit device latches.

8. At double doors provide stainless steel Astragal with smoke seals.

E. Type IV Construction: AWI 1300 G-5 SR.

1. Core: Manufacturer's standard to provide STC rating shown or specified when tested in accordance with ASTM E90.

2. Vertical Stiles: Minimum 1-3/8 in. wide after trimming, 2 ply construction without finger joints, consisting of 5/8 in. thick outer band (specie matching or compatible with face veneer) and ¾ in. thick mill option hardwood inner band.

3. Bottom Rail: 3 in. minimum mill option hardwood inner band.

4. Top Rail: 3 in. minimum mill option hardwood. Coordinate with Hardware Selection for fitting of integral drop seals where required.

5. Crossbands: Full width of door with grain running horizontally, tapeless spliced without voids.

6. Face Veneer: As specified, laminated to crossband and edges.

7. Bonding

a. Core to stiles, rails and blocking: Type II adhesive; sand prior to assembly of face veneers.

b. Face veneers and crossbands to core and edges: Type I adhesive by hot plate process.

F. Fabrication Tolerances: Comply with NWWDA Industry Standard I.S.1, AWI 1300 and the following.

1. Jambs: 1/8 in. each jamb. Lock edge beveled 1/8 in. in 2 in.

2. Head: 1/8 in.

3. Sill: Cut at time of installation. Cut at time of installation except for any label door that must be machined under label service. Do not exceed clearance as required to meet labeling requirements.

2.04 DOOR TYPES

A. Doors to receive medium density overlay face veneers for painted finish shall be Type I construction.

B. Transom and side panels shall match door construction in every respect.

C. Doors to receive hardwood face veneers for natural finish shall be Type I construction.

D. Doors with vision panels shall be Type I construction, except Stile and Rail Doors and Doors containing 75% glazing, to be Type II construction

E. Doors of the hourly ratings shown shall be Type III construction. Face veneers and finishes shall match adjacent non-rated doors.

F. Doors to be acoustically rated shall be Type IV construction. Face veneers and finishes shall match adjacent non-rated doors. Provide acoustical doors constructed to achieve a sound transmission class (STC) of 39 +/-1 in accordance with ASTM E90 for each door when installed. Unit shall be provided complete with necessary gasketing and sound seals to achieve the rating. Doors shall be designed for use with standard builders' hardware as scheduled and be provided with minimum 3 in. (after fitting) deep top and bottom rails. Through bolting of hardware on acoustical doors shall not be permitted. Provide one of the following:

1. "Algoma Made Acoustical Door - STC 40" (Algoma).

2. "Acoustical STC 40" (Eggers).

2.05 REINFORCEMENT

A. Provide additional hardwood reinforcement (fire retardant treated if required) blocking for all mortise lock and latchset applications, surface mounted closers, panic hardware and as required by hardware manufacturers and authorities having jurisdiction.

2.06 PREFITTING AND PREMACHINING

A. Prefit doors and panels in accordance with tolerance requirements of Commercial Standard CS 171 and AWI 1300-S-6, at the place of manufacture. Provide standard bevel or radius to edges of doors as required by the installation.

B. Machine doors and panels for hardware requiring cutting of the doors at the place of manufacture. Machining shall be in accordance with hardware templates, final hardware schedules and door frame shop drawings.

2.07 PRE-PRIMING

A. Prime door faces, edges and cutouts with one (1) shop coat primer specified, at the place of manufacture. Surfaces shall be clean and dry before priming.

B. Apply primer uniformly without runs, sags or bare spots to a dry film thickness of 1 mil.

2.08 PREFINISHING

A. General: Comply with applicable provisions and requirements of AWI Section 1500, Factory Finishing, Premium Grade.

B. Painted doors shall be finished with an opaque pigmented conversion varnish to a cured film thickness of 1 mil and complying with MIL-V-12954 and AWI 1500 Finish System #3, Premium Grade at the place of manufacture. Color and specular gloss shall be as selected by the Architect. Paint stile and rail edges and cutouts.

1. Doors within lacquer wood frames and doors designated to receive a lacquer finish shall be finished with opaque lacquer finish as specified in Section 06400, "Architectural Woodwork".

2. Painted doors shall be shop finished.

C. Natural veneer doors shall be finished with a transparent finish as specified in Section 06400, "Architectural Woodwork", at the place of manufacture. Prior to application of finish prepare door faces with oil stains or toners as required to match Architect's sample. Apply a compatible finish to stile and rail edges and cutouts.

2.09 LIGHTS

A. Provide openings where shown for lights. Glazing beads shall be to profile shown of hardwood matching face veneers on natural finish doors, or with painted finish matching door finish. Glass shall be as specified in Section "Glazing".

PART 3 – EXECUTION

3.01 INSPECTION

A. Examine doors and door frames, adjoining construction and the conditions which the Work is to be installed. Do not proceed with the work until unsatisfactory conditions have been corrected. Do not hang doors with an apparent defect.

3.02 INSTALLATION

A. Do not install doors until concrete, masonry, plaster, tile and stonework are completed and dried in the areas to receive doors.

B. Doors shall be conditioned to the average prevailing moisture (humidity) of the locality before hanging. Doors shall not be subjected to abnormal heat, dryness, or humidity. Avoid sudden changes such as forced heat (used to dry out the building).

C. Clearances

1. Clearances for Non-Rated Doors: Provide 1/8 in. at jambs and heads; 1/16 in. per leaf at meeting stiles for pairs of doors; and 1/8 in. from bottom of door to top of decorative floor finish or covering. Where threshold is shown or scheduled, provide 1/4 in. clearance from bottom of door to top of threshold. Bevel non-rated doors 1/8 in. in 2 in. at lock and hinge edges.

2. Clearances for Fire-Rated Doors: Complying with NFPA 80. Bevel fire-rated doors 1/8 in. in 2 in. at lock edge; trim stiles and rails only to extent permitted by labeling agency.

3. Clearances for Acoustically Rated Doors: Comply with manufacturer's strict installation instructions as required to maintain acoustical rating required.

D. Cut and trim doors field finished doors to fit required openings with clearances required at head, jambs and sill for construction indicated. Machine doors and panels for hardware using hardware templates. Touch-up prime coat of paint including stile and rail edges and cutouts.

E. Cutting, trimming, fitting and machining of prefinished doors will not be permitted.

F. Install doors in required openings as shown. Install flush panels with concealed fasteners. Provide pilot holes of proper size for screws into particle board core doors. Use stainless steel sheet metal screws into particle board.

G. Install fire-rated doors in corresponding fire-rated frames in accordance with requirements of NFPA No. 80 and local authorities having jurisdiction

H. Apply hardware in accordance with hardware manufacturer's instructions and Section "Finish Hardware". Adjust door installation to provide uniform clearance at head and jambs, and to contact stops uniformly. Remove and replace doors which are found to be warped, bowed, or otherwise damaged and cannot be properly fitted in frames.

3.03 PROTECTION

A. Protect doors and hardware during construction. Marred finishes shall be touched-up to perfectly match adjacent surfaces to the satisfaction of the Architect or unit shall be replaced.

END OF SECTION I-08210

SECTION 08 22 00

FLUSH WOOD DOORS

PART 1 - GENERAL

1.1 SUMMARY

A. Section includes solid core flush wood doors.

1. The integration of a security system into the flush wood door work is required. The Contractor shall be responsible for the total and complete coordination of the security system components into the Work.

1.2 SUBMITTALS

A. Product Data: Submit product data for each type of door required. Include factory-finishing specifications.

1. Submit laboratory test report results of hinge loading, cycle/slam, stile edge screw withdrawals, and stile edge split resistance for fire rated doors.

B. Shop Drawings: Submit shop drawings indicating location, size, thickness, and hand of each door; elevation of each kind of door; construction details not covered in the product data; location and extent of hardware blocking; undercuts, special beveling, and other pertinent data.

1. Indicate dimensions and locations of mortises and holes for hardware of factory machined doors.

1.3 QUALITY ASSURANCE

A. Quality Standard: Comply with the applicable provisions and recommendations of AWI's "Architectural Woodwork Standards," First Edition, Section 1300, where standards and specifications conflict the more stringent shall be required.

1.4 PROJECT CONDITIONS

A. Environmental Limitations: Do not deliver or install doors until wet work, such as concrete, tile, plastering, wallboard joint treatment, is complete and dried, and HVAC system is operating and will maintain temperature and relative humidity at occupancy levels during the remainder of the construction period. Do not expose doors to sudden changes in temperature such as forced heat used to dry out the site.

PART 2 - PRODUCTS

2.1 MANUFACTURERS

A. Subject to compliance to requirements, provide products by one of the following:

1. Algoma Hardwoods, Inc.
2. Eggers Industries, Architectural Door Division.
3. Marshfield Door Systems, Inc.
4. VT Industries, Inc.

2.2 CONSTRUCTION OF DOORS FOR TRANSPARENT FINISH

A. Grade: Premium, with Grade AA faces.

B. Face Veneer Species and Cut:

1. As noted on drawings or to match building standard veneer and cut.

C. Match between Veneer Leaves: Match building standard.

D. Assembly of Veneer Leaves on Door Faces: Balance match.

E. Pair and Set Match: Provide for doors hung in same opening or separated only by mullions.

F. Thickness: 1-3/4 inch (45-mm) unless otherwise indicated.

G. Materials:

1. Particleboard Core Material: Complying with ANSI A208.1, Grade 1-LD-2.

2. Blocking: 5-1/2 inch (138-mm) wide minimum top-rail blocking at doors with closers and bottom rail blocking at doors with kickplates consisting of minimum 1/2 inch (13- mm) wide single length mill option hardwood outer band and single length mill option hardwood or structural composite lumber inner band.

3. Vertical Edges: 1-3/8 inch (35 -mm) wide minimum prior to fitting, 2 ply laminated wood construction consisting of a single piece hardwood outer band, without fingerjoints, and an inner band of mill option hardwood. Outer band to match face veneer for transparent finished veneered-faced doors. Trim non-rated door width equally on both jamb edges.

4. Crossbanding: Minimum 1/16 inch (1.5 -mm) thick, low density hardwood, composite, or high-density hardboard.

H. Construction: AWI Section 1300, PC-5 ME. Stiles, rails, and blocking bonded to core then entire unit abrasive planed before veneering. Crossbanding materials shall extend full width of door with grain running horizontally, tapeless spliced without voids or show through (telegraphing), and directly glued to core and blocking. Sand crossbanding before application of face veneer. Face veneer shall extend full height of door with grain running vertically, tapeless spliced without voids or show through (telegraphing), and directly glued to crossband.

Glue lines between face veneer, crossbanding, and blocking shall be of a type to comply with the specified warranty using the hot plate process.

2.3 CONSTRUCTION OF DOORS FOR OPAQUE FINISH

A. Grade: Custom.

B. Face Veneer: Medium-density overlay.

C. Thickness: 1-3/4 inch (45-mm) unless otherwise indicated.

D. Materials:

1. Particleboard Core Material: Complying with ANSI A208.1, Grade 1-LD-2.

2. Blocking: 5-1/2 inch (138-mm) wide minimum top-rail blocking at doors with closers and bottom rail blocking at doors with kickplates consisting of minimum 1/2 inch (13- mm) wide single length mill option hardwood outer band and single length mill option hardwood or structural composite lumber inner band.

3. Vertical Edges: 1-3/8 inch (35 -mm) wide minimum prior to fitting, 2 ply laminated wood construction consisting of a single piece hardwood outer band, without fingerjoints, and an inner band of mill option hardwood. Trim non-rated door width equally on both jamb edges.

4. Crossbanding: Minimum 1/16 inch (1.5 -mm) thick, low density hardwood, composite, or high-density hardboard.

E. Construction: AWI Section 1300, PC-5 CE. Stiles, rails, and blocking bonded to core then entire unit abrasive planed before veneering. Crossbanding materials shall extend full width of door with grain running horizontally, tapeless spliced without voids or show through (telegraphing), and directly glued to core and blocking. Sand crossbanding before application of face veneer. Face veneer shall

extend full height of door with grain running vertically, tapeless spliced without voids or show through (telegraphing), and directly glued to crossband. Glue lines between face veneer, crossbanding, and blocking shall be of a type to comply with the specified warranty using the hot plate process.

2.4 FABRICATION

A. Fabricate doors in sizes indicated for Project-site fitting.

B. Factory machine doors for hardware that is not surface applied. Locate hardware to comply with DHI-WDHS-3 unless otherwise indicated to match existing frame hardware preparations. Comply with final hardware schedules, door frame Shop Drawings, AWI Section 1300-G-20, DHI A115-W series standards, and hardware templates.

C. Coordinate measurements of hardware mortises in frames to verify dimensions and alignment before factory machining.

D. Openings: Cut and trim openings through doors to comply with applicable requirements of referenced standards for kind(s) of door(s) required. Install light beads with fasteners spaced for opening size and fire rating indicated. Install wood bead moldings with finish nails and countersink without striking bead. Fill countersunk heads with putty matching wood bead color.

2.5 SHOP PRIMING

A. Doors for Opaque Finish: Shop prime faces and edges of doors, including cutouts, with one coat of wood primer/sealer as standard with door manufacturer. Surfaces shall be clean and dry before priming. Apply primer/sealer uniformly without bare spots, runs, or sags.

2.6 FACTORY FINISHING

A. Finish doors at factory that are indicated to receive transparent finish.

B. General: Comply with the referenced quality standard for factory finishing.

C. Transparent Finish:

1. Grade: Premium.

2. Finish: Manufacturer's standard finish with performance meeting or exceeding the performance of either AWI System Conversion Varnish, or AWI System Catalyzed Polyurethane.

3. Staining: Prepare door faces, stiles, rails, and cutouts, with toners, or stains, prior to the application of finish to match building standard.

4. Effect and Sheen: Match building standard.

PART 3 - EXECUTION

3.1 INSTALLATION

A. Hardware: Apply hardware to new doors in accordance with hardware manufacturer's instructions and Section 08 71 00 "Door Hardware." For particleboard core doors, drill pilot holes of proper size for installing hinge screws. Adjust hardware items just prior to final inspection. Leave work in complete and proper operating condition.

B. Factory wrapping shall be maintained on new doors during construction period, and all hardware shall be installed by cutting the factory wrapping at the mounting location of the hardware item.

C. General Door Installation Standards: Install doors in locations indicated to comply with manufacturer's written instructions, referenced quality standard, and as indicated. Where standards conflict, the more stringent shall apply.

D. Job-Fitted Doors: Align and fit doors in frames with uniform clearances and bevels; and to contact stops uniformly, do not trim stiles and rails in excess of limits set by manufacturer or permitted for fire-rated doors. Field cutting, fitting or trimming, shall be executed in a workmanlike manner. Machine doors for hardware. Seal cut and trimmed surfaces immediately after fitting and machining using clear varnish or sealer.

1. Clearances: Provide 1/8 inch (3.2 mm) at heads, jambs, and between pairs of doors.

2. Provide 1/8 inch (3.2 mm) from bottom of door to top of decorative floor finish or covering. Where threshold is shown or scheduled, provide 1/4 inch (6.4 mm) from bottom of door to top of threshold.

E. Factory-Finished Doors: Restore finish before installation if fitting or machining is required at Project site.

F. Field-Finished Doors: Refer to the following for finishing requirements:

1. Section 09900 "Painting."

3.2 ADJUSTING AND PROTECTION

A. Rehang or replace doors that do not swing or operate freely.

B. Protection: Protect wood doors to ensure that the wood door work will be without damage or deterioration at the time of Substantial Completion.

C. Refinish or replace wood doors damaged during installation. Replace any new wood doors that are warped, twisted, demonstrate core show through, are not true in plane, or cannot be refinished to the satisfaction of the Architect.

END OF SECTION 08 22 00

SECTION I-08305

ACCESS DOORS

PART 1 – GENERAL

1.01 DESCRIPTION

A. General: Provide access doors in accordance with the Contract Documents.

B. Related Work Specified Elsewhere

1. Finish painting of prime painted access doors.

2. Finishes to be installed in recessed pan-type access doors.

1.02 QUALITY ASSURANCE

A. Manufacture access doors as a single integral unit with frame, anchors, hardware, accessory parts, fittings and fastenings. Units are to be the standard products, or modifications if required, of one of the listed manufacturers. Provide access doors manufactured by a firm specializing in the production of access door work for not less than 5 years.

B. Single-Source Responsibility: Obtain each type of access door for the entire project from one source from a single manufacturer.

C. Size Variations: Obtain Architect's acceptance of manufacturer's standard size units, which may vary slightly from sizes indicated.

D. Verification: Obtain specific locations and sizes for required access doors from trades requiring access to concealed equipment and indicate on access door schedule submittal.

1.03 STANDARDS

A. Except as modified by governing codes and by the Contract Documents, comply with the applicable provisions and recommendations of the following:

1. NAAMM "Metal Finishes Manual".

2. AWS "Structural Welding Code, D 1.1".

B. Where the language in any document referred to herein is in the form of a recommendation or suggestion, such recommendation or suggestion shall be deemed to be mandatory under this Contract.

1.04 SUBMITTALS

A. Shop Drawings: Submit shop drawings showing fabrication and installation of access doors and frames, including details of each frame type, elevations of door design types, anchorage and accessory items.

B. Setting Drawings: Provide setting drawings and templates for the location of items that are to be embedded in or anchored to concrete or masonry.

C. Access Door Schedule: Submit complete access door schedule, including types, ratings, general locations, sizes, wall and ceiling construction details, finishes, latching or locking provisions, and other data pertinent to installation.

D. Product Data: Submit product data in form of manufacturer's technical data and installation instructions for each type of access door assembly, including instructions, and directions for installation of

anchorage devices. Include maintenance instructions for doors with exposed factory finishes.

1.05 PRODUCT HANDLING

A. Store all access door items and accessories under cover and off the ground. Handle in such a manner so as to protect surfaces and to prevent distortion of, and any other type of damage to, fabricated pieces.

PART 2 – PRODUCTS

2.01 MATERIALS, GENERAL

A. Metal Surfaces, General: For fabrication of access door metal work which will be exposed to view in the finished work, use only materials which are smooth and free of surface blemishes including pitting, seam marks, roller marks, rolled trade names and roughness.

B. Cold Rolled Carbon Steel Sheets: ASTM A366; commercial quality, stretcher leveled, free from scale, pitting or other defects.

C. Steel Angles, Plates, Bars, Rods and Other Steel Accessories: ASTM A36.

D. Stainless Steel: AISI Type 302 or 304.

1. Plate and Sheet: ASTM A666, Stretcher level sheets.

2. Bar Stock: ASTM A276.

E. Finishes

1. Ferrous Metal Finish: Chemically bonded with prime coat of baked-on electrostatically applied primer.

2. Stainless Steel: No. 4 (bright directional polish).

2.02 FABRICATION, GENERAL

A. General: Provide each access door assembly manufactured as an integral unit, complete with all parts, and ready for installation.

B. Form exposed surfaces free from warp, wave and buckle, with all corners square, unless otherwise shown. Form molded members straight and true, with welded joints coped or mitered, well formed, and in true alignment. Dress welded joints on exposed surfaces smooth so they are invisible after finishing and flush with adjacent surfaces. Provide attachment devices and fasteners of type required to secure access doors and frames to contiguous support construction.

C. Reinforce members and joints with structural shapes and plates in concealed locations, as necessary for adequate strength and rigidity. Provide concealed fastenings unless otherwise shown. Locate necessary exposed fastenings in an orderly pattern, in accordance with reviewed shop drawings. Separate dissimilar metals with dielectric separator to prevent galvanic action. Do not extend coatings onto exposed surfaces

D. Access doors, related frames and accessories to be located in exterior areas, areas of high humidity or other locations noted, shall be hot dip galvanized. Factory prime all mild steel not galvanized. Access doors exposed to public view shall be finish painted in color(s) as selected by the Architect.

E. Provide locking devices for access doors in sufficient number for the size door to be installed. Provide six extra keys for all keyed locks and master key all locks for the entire project unless otherwise indicated or specified.

F. Prior to shipment protect finishes on exposed surfaces from damage by application of strippable temporary protective covering or other means

2.03 FABRICATION, ACCESS DOORS

A. Flush Access Door for Installation in Drywall and Veneer Plaster Substrates ADR-3

1. Features: Frame shall be 16 Ga. steel with an integral galvanized steel drywall bead. Door shall be 14 Ga. steel, fitted flush with 22-gauge galvanized steel integral drywall bead.

2. Provide concealed spring hinges permitting 175 opening. Provide flush screwdriver operated cam locks for all access doors except provide flush key operated cylinder locks for access doors in all public areas.

3. Provide the following:

a. “Stealth” (Wind-lock)

b. "Style CTWB" (J. L. Industries).

B. Recessed Pan-Type Access Door for Installation in Drywall Substrates ADR-6

1. Features: 1 in. deep recessed mounting flange shall be 16 Ga. steel with an integral 3 in. galvanized self-furring steel lath. Door shall be 16 Ga. steel, recessed 5/8 in. for drywall installation in door face. Provide concealed pivoting rod type hinges permitting 175 degree opening and flush key operated stainless-steel cam locks with automatic dust shutters and welded sleeves.

2. Provide one of the following:

a. "DW 5015-5010" (Acudor Access Doors).

b. "Type RDW" (Karp Associates, Inc.).

c. " RW Series" (Nystrom, Inc.).

PART 3 – EXECUTION

3.01 CONDITION OF SURFACES

A. Examine the substrates, adjoining construction and the conditions under which the Work is to be installed. Do not proceed with the Work until unsatisfactory conditions have been corrected.

3.02 INSTALLATION

A. Verify dimensions of openings by field measurements so that access doors and related items will be accurately designed, fabricated and fitted to the substrate.

B. Coordinate access doors with the work of other Sections and provide items to be placed during the installation of other work. Coordinate delivery of such items to the project site. Deliver items which are to be built into the work of other Sections in time so as not to delay the progress of the Work.

C. Install access doors and frames in accordance with manufacturer's written instructions in locations shown, plumb, level and in line with adjacent materials where required. Provide fastenings as indicated on the final shop drawings. Fit exposed connections accurately together to form tight hairline joints. Adjust hardware and doors for proper operation.

D. Protect finished surfaces against damage during construction and remove protection at time of substantial completion.

3.03 CLEANING

A. Clean surfaces and leave free from smears. Repair minor scratches and other finish imperfections. Remove and replace panels or frames that are warped, bowed, or otherwise damaged.

END OF SECTION I-08305

SECTION I-08710

FINISH HARDWARE

PART 1 – GENERAL

1.01 DESCRIPTION

A. General: Provide finish hardware in accordance with the Contract Documents.

B. Related Work Specified Elsewhere

1. Division 5 Section “Ornamental Metal”.
2. Division 6 Section “Architectural Woodwork”.
3. Division 8 Section “Wood Doors”.
4. Division 16 Sections for smoke detectors, Class “E” fire control system, and wiring for electromechanical locks, electromagnetic holders and card access, door control and annunciation systems.

1.02 QUALITY ASSURANCE

A. Product Qualification: Obtain finish hardware of each category from a single manufacturer. Specified manufacturers and their product catalog numbers establish the standard of quality and design required for the various categories, and equivalent products by other manufacturers may be acceptable, subject to Architect's review of their equivalency.

1. No names, designs, or labels will be permitted to be exposed on the following items: Face of cylinders, turnpieces or operating trim of lock sets or latch sets, push bars, pull handles, plates, case covers of surface applied closing devices, underside of door holder arms, and exit devices.
2. Provide electrified door hardware from same manufacturer as mechanical door hardware, unless otherwise indicated. Manufacturers that are listed to perform electrical modifications, by a testing and inspecting agency acceptable to authorities having jurisdiction, are acceptable.

B. Hardware Supplier's Qualification: The Company furnishing finish hardware for this project shall have been regularly engaged for 5 years in the sale and distribution of finish hardware for projects of comparable size and scope. The person responsible for overseeing the scheduling, detailing, ordering and coordinating of finish hardware shall be a certified AHC or DAHC of the Doors and Hardware Institute, and shall be available for consultation with the Architect, at no additional cost to the Owner, during progress of construction.

C. Electrified Door Hardware Supplier Qualifications: An experienced door hardware supplier who has completed projects with electrified door hardware similar in material, design, and extent to that indicated for this Project, whose work has resulted in construction with a record of successful in-service performance, and who is acceptable to manufacturer of primary materials. Prepare data for electrified door hardware, including Shop Drawings, based on testing and engineering analysis of manufacturer's standard units in assemblies similar to those indicated for this Project.

D. Requirements of Regulatory Agencies: Where hourly fire ratings are shown for openings, contractor shall be responsible for furnish and finish hardware complying with the requirements of governing codes and regulatory agencies.

1.03 HARDWARE IDENTIFICATION

Each item of finish hardware is specified by manufacturer's name and catalog number in **"PART 2 - PRODUCTS",** and the finish hardware for doors is listed by Sets in the Schedule in **"PART 3 - EXECUTION",** and the Door Schedule indicates a Set number for each door.

A. Abbreviations: The following abbreviations are used in the text:

H.O.	Hold open
S.H.O.	Selective Hold Open
DA	Delayed Action
FS	Fail Safe
EM	Electrified Mortise
EL	Electric Latch Retraction
RX	Request to Exit
SS	Signal Switch
N.H.O	Non-Hold Open
A.H.O	Automatic Hold Open
HC	Handicapped Accessible
FSE	Fail Secure
ERRQEALR	Electrified Rim Request to Exit Alarm/Remote Monitoring

1.04 STANDARDS

A. Except as modified by governing codes and by the Contract Documents, comply with the applicable provisions and recommendations of the following:

1. National Fire Protection Association (NFPA)
   a. "Life Safety Code" - NFPA 101.
   b. "Fire Doors and Windows" - NFPA 80.
2. Door and Hardware Institute (PHI)
   a. "Recommended Format for Schedules".
   b. "Locations for Builders Hardware".
3. American National Standards Institute (ANSI)
   a. "Builders Hardware and Specialties" - ANSI/BHMA A156 (Complete Series).
4. Underwriter's Laboratories (U.L.)
   a. Safety - "UL Accident Equipment List".
   b. Fire Rating - "Building Materials Directory".
5. Federal Laws and Regulations:
   a. "Americans with Disabilities Act of 1990 (ADA).

B. Where the language in any document referred to herein is in the form of a recommendation or suggestion, such recommendations or suggestions shall be deemed to be mandatory under this Contract.

1.05 SUBMITTALS

A. General: Before submitting the Finish Hardware Schedule, arrange a meeting, to be attended by Contractor, Architect, Subcontractor, Manufacturers' representatives, Client Security Consultant and any other subcontractors whose work requires coordination with this Work. At this meeting review product
selections, submittal requirements and coordination of the Work with other trades.

B. Catalog Cuts: Before preparing hardware schedule, submit manufacturers' catalog cuts of each hardware item proposed for use in the Project. Identify each item and include the Architect's hardware set number.

C. Samples: Submit samples of each item of finish hardware used, identified by the Architect's hardware set. Acceptable samples will be delivered to the project site for installation after completion of the review process.

D. Schedule: Submit a detailed finish hardware schedule conforming with DHFs publication "Sequence and Format for Hardware Schedule", include in each door description: a door number consisting of the column grid location to the nearest tenth and drawing sheet number. Schedule the project in an orderly fashion, by floors or building section as defined by the Door and Hardware Schedule. Identify each item of finish hardware by including the Architect's hardware Set, and include the following:

1. Type, style, function, size, label, hand, and finish of each door hardware item.
2. Manufacturer of each item.
3. Fastenings and other pertinent information.
4. Explanation of abbreviations, symbols, and codes contained in schedule.
5. Mounting locations for door hardware.
6. Door and frame sizes and materials.
7. Description of each electrified door hardware function, including location, sequence of operation, and interface with other building control systems.

E. Keying Schedule: After reviewing project requirements with the Owner's representative, submit as part of the final finish hardware schedule a keying schedule conforming to the DHI publication "Keying Procedures, Systems and Nomenclature".

F. Templates: With the supplier's hardware schedule submit manufacturer's templates for each finish hardware item, properly identified and marked with the Architect's Set-in time for installation, furnish complete sets of manufacturer's templates with final finish hardware schedule to trades fabricating products to receive finish hardware.

G. Wiring Diagrams: Furnish wiring diagrams and product data, properly identified and marked with the Architect's identifying set, along with final finish hardware schedule, to the trades providing wiring, preparing products for installation and installing electrical hardware. Furnish a schematic diagram for each door equipped with electrical devices, showing connections, operation and relative locations of hardware and components.

H. Certifications: Submit the following:

1. Documentation of hardware supplier's qualification and certification of scheduling and coordinating personnel.
2. Product certificates signed by manufacturers of electrified door hardware certifying that products furnished comply with requirements.
3. Certifications that door hardware approved for use on types and sizes of labeled fire doors complies with listed fire door assemblies.

I. Operation and Maintenance Data: Submit printed operation instructions and maintenance data for all items in accordance with Section "Project Closeout". Furnish a complete set of specialized tools and maintenance instructions as needed for Owner's continued adjustment, maintenance, and removal and replacement of door hardware.

1.06 PRODUCT DELIVERY, STORAGE AND HANDLING

A. Delivery of Finish Hardware: Deliver finish hardware at the job site in the manufacturer's unopened labeled containers, marked with the opening number and the Architect's identifying Hardware Set.

Inventory door hardware on receipt and provide secure lock-up for door hardware delivered to Project site.

B. Storage of Finish Hardware: Store in a clean, dry, lockable secure space so that hardware will be free of damage at the time of installation.

C. Delivery of Keys

1. Deliver construction master keys with locksets.

2. Place sets of change keys in suitable envelope tagged and marked with the change number and door designation. Deliver change keys in key control cabinet. Send master keys, grand-master keys and great grand-master keys directly to the Owner by registered mail.

D. Maintenance Tools and Instructions: Furnish a complete set of specialized tools and maintenance instructions as needed for Owner's continued adjustment, maintenance, and removal and replacement of door hardware.

1.07 COORDINATION

A. Coordinate layout and installation of recessed pivots and closers with floor construction. Cast anchoring inserts into concrete or masonry.

B. Templates: Obtain and distribute to the parties involved templates for doors, frames, and other work specified to be factory prepared for installing door hardware. 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. Electrical System Roughing-in: Coordinate layout and installation of electrified door hardware with connections to power supplies, fire alarm system and detection devices, access control system, security system, building control system. Contractor to coordinate with Security Vendor. Contractor responsible for all rough in work.

1.08 WARRANTY

A. General Warranty: Special warranties specified in this Article shall not deprive Owner of other rights

Owner may have under other provisions of the Contract Documents and shall be in addition to, and run concurrent with, other warranties made by Contractor under requirements of the Contract Documents.

1. Special Warranty: Submit a (3) three-year written warranty, executed by manufacturer agreeing to repair or replace components of door hardware that fail in materials or workmanship within specified warranty period. Failures include, but are not limited to, the following:

a. Structural failures including excessive deflection, cracking, or breakage.

b. Faulty operation of operators and door hardware.

c. Deterioration of metals, metal finishes, and other materials beyond normal weathering.

2. Warranty Period for Electromagnetic Delayed-Egress Locks: (5) five years from date of Substantial Completion.

3. Warranty Period for Manual Closers: (10) ten years from date of Substantial Completion.

4. Warranty Period for Concealed Floor Closers: (5) Five years from date of Substantial Completion.

PART 2 – PRODUCTS

2.01 MATERIALS

A. General: Adapt hardware to compensate for door under-cutting and special conditions. Furnish installation instructions and special tools, and screws, bolts and other fastening devices needed for installation.

2.02 DOOR HANGING ITEMS

A. General: Furnish door hanging items in quantities and sizes conforming to manufacturer's recommendations for door weight, height, width and thickness, and furnish U.L. listed items for labeled doors.

B. Hinges - Full Mortise Concealed Ball Bearing: BHMA A156.1; Standard and heavy weight template hinges with three-knuckle, concealed vertical and thrust anti-friction type bearing at both joints.

1. Non-rising pins, flat button or flush tips unless otherwise specified. Stainless steel pins in all non-ferrous bearing hinges. Non-removable pins for out-swinging security doors and out-swinging exterior doors.

2. Special swaged hinges where doors are set back in jamb.

3. Furnish fully concealed circuit, tamper-resistant, wired hinges at doors requiring power transfer from jamb to door. Furnish junction box and mortar shield for use with each electric concealed wired hinge and ship directly to the hollow metal manufacturer for installation on frame.

4. Butt Hinge Sizes for 1-¾ in. Door Thickness:

Door Width	Hinge Size (H x W)
36 in. and less	4 ½ in. x 4 in. or 4 ½ in.
37 in. to 41 in	5 in. x 4 in. or 4 ½ in.
42 in. to 47 in.	5 in. x 4 ½ in.

5. Regular Hinges: Stanley CB 168 Fire knuckle concealed heavy weight.

6. Electric Power Transfer Hinges: (Security Vendor)

Finish: USP Finish: USP
Interior (Ferrous)

EEC. Concealed Wiring		Magnetic Monitoring Switch		
Standard Catalog No.	Heavy Catalog No.	Standard Catalog No.	Heavy Catalog No.	Mfg.
"TA714-CC	"TA786-CC"	"TA714-ES"	"TA786-ES"	
"CECB1900"	"CECB1901"	"CSCB1900"	"CSCB1901"	
"BB700-ET"	"BB750-ET"	"BB700-ES"	"BB750-ES"	
"BB8060-ET"	"BB8064-ET"	"BB8060-MON"	"BB8064-MON"	

Exterior/Interior (Non Ferrous)		*Exterior/Interior (Non Ferrous)*		
Finish: US Standard Catalog No.	Heavy Catalog No.	Finish: US Standard Catalog No.	Heavy Catalog No.	Mfg. (McKinney)
"TA314-CC"	"TA386-CC"	"TA386-MM"	"TA386-MM"	
"CECB1960"	"CECB1961"	"CSCB1960"	"CSCB1961"	
"BB800-ET"	"BB850-ET"	"BB800-E-S"	"BB850-E-S"	
"BB8002-ET	"BB8005-ET"	"BB8002-MON"	"BB8005-MON"	

7. Swing Clear Hinges - Heavy Weight:

Finish: US

Catalog Number	Mfg.

"TA-795"	(McKinney)
"CB-1948"	(Stanley)
"BB-7501"	(Hager)
"BB8024 (sq)"	(Bommer)

8. Anchor Hinges - Heavy Weight:

Interior (Ferrous)	Exterior (Non-Ferrous)	
Finish: USP	Finish: US	
Catalog Number	Catalog Number	Mfg.
"TA-792"	"TA-392"	(McKinney)
"CB-1908"	"CB-1968"	(Stanley)
"BB-7506"	"BB8508"	(Hager)
"BB8034"	"BB8035"	(Bommer)

C. Hinges - Miscellaneous

1. Spring Hinges: BHMA A156.17; Full mortise, concealed bearing single acting spring hinge with concealed coil spring in barrel, adjustable closing power, with tamper-resistant locking screws. Template, double acting spring hinge of steel construction. Finish: US (Ferrous).

   a. McKinney 1502

2. Invisible Hinge: Fully concealed hinge where no part is visible in the closed position and operable a full 180 deg., of cast brass of cat brass or bronze. Finish: US

   a. SOSS No. 216,218,220 Series

3. Pocket Pivot Hinge: Brass, bronze, or steel, allowing the door to fully recess into pocket flush with the wall. Finish: US

Catalog Number	Mfg.
"PH-3"	(McKinney)
"91105"	(Dor-O-Matic)
"519"	(Rixson)
"75520"	(Dorma)

D. Sliding Door Track: BHMA A156.14; Provide as a complete set, including track, trolleys, brackets, floor guides, concealed floor sheaves and wheels and all other items required for a complete installation. Hardware: Shown on Plans. Finish: clear anodized aluminum finish.

For bi-parting doors use track system shown on plans. Provide two separate tracks for doors. Provide rubber stops within hanging track to stop movement of panels beyond center point. Finish: clear anodized aluminum

Provide structural support capable of carrying 120% of door load.

Provide structural shop drawings by licensed P.E. detailing structural supports capable of carrying 120% of proposed load.

E. Pivots

1. Description: BHMA A156.1; Sets, weight and quantity to suit manufacturer's recommendations for door weight, height, width and thickness, with extended spindles where to suit door under-cut, floor finish or other special conditions, \-*Vz* in. offset and special pivot layout where condition requires, UL listed pivot sets for labeled doors.

2. Pivot Sets - Offset Hung: Top and bottom standard, heavy and extra heavy weight, bottom arm of steel with plated wrought cover. Full mortise top pivot and floor plate of cast brass or bronze and steel for fire rated doors. Finish: US

Standard Wt.	Heavy Wt.	Ext. Heavy Wt.	Jamb Hung

Catalog No.	Catalog No.	Catalog No.	Catalog No.	Mfg.
"OP440"	"OP440"	"OP800"	"OP450"	(Dorma)

3. Intermediate Pivots - Offset Hung: (For doors 8'-0" and taller) Cast brass or bronze and steel for labeled doors. Screw pattern layout to straddle lead-lining of door. Furnish where required fully concealed circuit, tamper-resistant wired pivots at doors requiring power transfer from jamb to door. Furnish junction box and mortar shield for use with each electric concealed wired hinge and ship directly to the hollow metal manufacturer for installation on frame. Furnish where required intermediate offset pivots as part of set with floor and overhead concealed closer or top and bottom pivot sets. Finish: US

Standard Wt. Catalog No.	Heavy Wt. Catalog No.	Ext. Heavy Wt. Catalog No.	Jamb Hung Catalog No.	Mfg.
"75220"	"75233"	"75240"	"75200"	(Dorma)

4. Pivot Sets- Center Hung: Adjustable "walking-beam" top pivot with needle baring steel with brass or bronze plated cover. Bottom pivot arm of steel and ball bearing floor plate of brass or bronze. Furnish fully concealed circuit, tamper-resistant wired top pivot at doors requiring power transfer from jamb to door. Finish: US

Standard Wt. Catalog No.	Heavy Wt. Catalog No.	Extra Heavy Wt. Catalog No.	Electric Wired Catalog No.	Mfg.
"CP440"	"CP660"	"CP600"	"E8062"	(Dorma)

G. Pivot Floor Closers

1. Description: BHMA A156.4; Shallow or full depth floor closers with full controls, latching, closing speed and hydraulic backcheck with positive stop. Furnish selective hold open (S.H.O.) or automatic hold open (A.H.O.) where called for, with delayed action (DA) and handicapped access requirements (HC). Include appropriate top and intermediate pivot. Size closer to suit manufacturer's recommendations for door weight, height, width and thickness.

   a. Furnish cement case with temporary cover plate of steel or black iron for protection until the completion of all floor finishing. Replace with a permanent heavy gage cover plate matching specified finish or a cover pan for use at areas having travertine, stone and other hard surface floors as detailed.

   b. Furnish extended spindles with floor pan where required for special head and floor conditions. Furnish I-'/2 in. offset and special layout for pivot set where required by detail. Provide concealed fasteners and no-visual adjustment screws. Furnish UL listed pivots for labeled doors. Finish: US

2. Floor Closers - Offset Hung Finish: US

Standard Duty Shallow Depth Catalog No.	Heavy Duty Full Depth Catalog No.	Extra Heavy Duty Full Depth Catalog No.	Mfg.
"5100"	"27"	"L27"	(Rixson)
"BTS-755A"	"BTS 80D"	-----	(Dorma)

3. Floor Closers - Offset Hung Finish: US

Standard Duty Shallow Depth Catalog No.	Heavy Duty Full Depth Catalog No.	Extra Heavy Duty Full Depth Catalog No.	
"5000"	"28-40"	"L28-L0"	(Rixson)
"BTS-755V/B"	"BTS-8H-BTS-80B"	"BTS-80L"	(Dorma)

4. Floor Closers - Independently Hung. For use with pocket pivot hinges. Finish: US

Located in Opening	Located in Pocket		
Catalog No.	Catalog No.	Catalog No.	Mfg.
"5303-5305"	"FM5000"	"L28-L40"	(Rixson)
"BTS-75V/I"	"BTS-75V/P"	"BTS-80L"	(Dorma)

5. Floor Closers -Electromagnetic Hold Open Finish: US

Catalog No.	Catalog No.	Mfg.
"FM5100"	"FM5000"	(Rixson)
"BTS-80EMB"	"BTS-80EMB G/H"	(Dorma)

6. Floor Closers - Pair in one Case: Heavy duty, shallow depth, offset hung, with built-in coordinator. Finish: US

Catalog No.:	Mfg.:
"BTS80"	DORMA

H. Overhead Closers - Concealed: BHMA Al56.4; Center and offset hung door closers with full controls, closing and latching speed for single and double acting and hydraulic backcheck on single acting doors. Hold-open "H.O." where called for. Size closer as recommended by manufacturer.

1. Horizontal narrow profile body design for mounting in a 1-% in. x 4 in. header of hollow metal, wood or aluminum construction. Provide suitable mounting and hanging devices for door, frame, floor and threshold conditions. Furnish cover plate to match specified finish.

2. Use center pivoting arm for center hung conditions and slide channel arm for offset hung. Furnish bottom arm and ball bearing floor pivot plate for center hung closers, furnish extended spindles where required for special head and floor conditions. Furnish special layout for pivot set as required by detail for independently hung closers. Furnish UL listed pivots for labeled doors. Finish: US

Offset Hung

Catalog No.	Catalog No.	Mfg.
"RTS 88/28"	"RTS88/28"	(Dorma)

Center Hung

Catalog No.	Catalog No.	Mfg.
"RTS 88/04"	"RTS 88/04"	(Dorma)

2.03 DOOR LOCKING ITEMS

A. Locks General: All locksets, and latchsets, regardless of trim, shall be listed by UL for labeled doors.

1. Furnish knurled knobs or levers on corridor side of the doors in public areas, accessing mechanical, electrical, telecommunication, and maintenance spaces.

2. Furnish special backsets where lock stiles are too narrow for backset of locks specified. Furnish extended strikes where doors are set back on jambs. Furnish wrought, box type strike plates or standard construction, or curved face strike plates on round edge doors. All locks shall be for door thicknesses shown.

3. Cylinders: Hardware Vendor shall supply housing to receive Building Standard full size interchangeable core. Confirm manufacturer and type with building.

a. Furnish all cylinders by one manufacturer for all locks requiring cylinders.

b. Furnish 6 pin, interchangeable core, high security, brass cylinders. Mortise and rim having a head cap of brass, bronze or stainless steel finished to match the lock trim

c. Furnish mortise, rim and cylindrical type cylinder with proper tail piece.

d. Refer to Article 2.08 "Keying and Key Control System" for keying.

B. Mortise Locksets and Latchsets: BHMA A156.13; Heavy duty type with heavy gage, corrosion resistant steel case, 2-% in. backset, through bolted, adjustable armored front or rabbeted faceplate at rabbeted doors. Conceal fastenings, washers and bushings.

1. Two-piece anti-friction latchbolt of % in. throw with auxiliary deadlatch and a deadbolt of 1 in. throw with hardened steel inserts where scheduled, and at all pairs of doors.

2. Strike plate ANSI Standard Al 15.1 with curved lips of sufficient length to protect frames, include wrought, or black plastic, box. Extended lip strike where doors are set back in jamb, open back strike when required, rabbeted strike at doors with rabbeted stiles.

3. Mortise Lock Trim: With reference to the "Lock Series" described below, the following acceptable manufacturers and their trim designs as noted are acceptable as equivalent to each other:

a. SCHLAGE

4. Lock Series: Provide mortise locksets and latchsets in accordance with Lock Series "L" as listed below.

a. SCHLAGE

B. Mortise Locksets -Electronic Solenoid Operated (By Security): Heavy duty mortise lock with 24 VAC electronic, solenoid operated deadlocking latchbolt, Fail-Safe (FS) or Fail-Secure (FSE) where required by the Architect's Set. Include key override feature. Furnish any necessary power supply, transformers and rectifiers. Finish: US

Fail-Safe Catalog No.	Fail-Secure Catalog No.	Manufacturer
"L9080PEL x Trim"	"L9080PEU x Trim"	(Schalge)

D. Miscellaneous Locks

1. Deadlocks - Mortise: With heavy gage, corrosion resistant steel case, 2-% in. backset, adjustable armored front or rabbeted faceplate and strike at rabbeted doors and stiles. Deadbolt of brass with hardened steel inserts, 1 in. throw. Finish: US

Catalog Numbers	Manufacturer
"L460 Series"	(Schlage)

2. Deadlatch – Mortise: Deadlatch Mortise, cylinder x turnpiece – Finish US

Catalog Numbers	Manufacturer
"7800"	(Accurate)

3. Deadlock, Privacy: Deadlock, mortise, privacy, turnpiece inside, emergency key outside – Finish US

Catalog Numbers	Manufacturer
"154B"	(H.B. Ives)

4. Bottom Rail Deadlock: Mortise type deadlock with round projecting deadbolt for bottom rail. Finish: US

Catalog Numbers	Manufacturer:
777SL Throw Lock	CRL
DRA10PS Mortise Cylinder	CRL
777SPPS Strike Plate	CRL

5. Narrow Stile Deadlock and Deadlatch: Mortise type, for narrow stile doors, with armored face - Finish: US

a. Deadbolt of five-ply laminated steel, turnpiece cylinder inside when required.

b. Latchbolt of bronze with hardened steel inserts, 5/8 in. throw and auxiliary deadlocking bolt. Furnish with latch paddle on inside.

Catalog No.	Manufacturer
MS-1850A"	Adams-Rite)
"2851/2855"	(Yale)
"8506 Series"	(Assa)

Deadlatch, narrow stile - Finish: US

Catalog No.	Manufacturer
"4810 x 4590"	(Adams-Rite)
"2853/ 2856"	(Yale)
"8516 Series"	(Assa)

6. Sliding Door Lock: Mortise type sliding door lock, with a flat brass armored faceplate and a mortise type strike. A throwbolt of % in. throw with stainless steel horizontally expanding dogs. - Finish: US

Catalog No.:	Manufacturer:
"2331"	(Adams-Rite)

7. Roller Latch: Drop forged bronze body with an adjustable rubber roller. Where positive stop is required by Architect's Code, furnish with integral single stop with two rubber silencers. Finish: US

Catalog No.	Manufacturer
593	(Rockwood)
Roller Latch- Positive Stop	Finish: US

8. Electro-Magnetic Powerlocks (By Security): BHMA Al56.23; Electro-magnetic, Fail-Safe (FS), 24 VAC, mortised or surface mounted, to provide 1000 lb. of direct holding force. Furnish lock with built-in voltage spike suppressor, adjustable time delay, built-in electronic sensors and remote signaling and monitoring of door status and holding force. Furnish rectifier and power supply unit as required. For mortise type furnish shear lock, fully concealed mounting, mortised in the frame head, threshold or finish floor with all necessary mounting brackets. For surface mounted type furnish power lock, surface mounted at the head with a full-length low-profile housing. At double doors provide a dual unit with each unit independently controlled. Entire assembly shall be UL listed for use on fire exit doors. Finish: US:

Mortise Mounted Catalog No.	Manufacturer
"SAMSC"	(Securitron)
"SL4100"	(Von Duprin)
"280-MBS"	(Locknetics)
"1560 Series"	(Security Door Controls)

Surface Mounted Finish:

Catalog No.	Manufacturer
"M62SC"	(Securitron)
"DS4010-DD4010"	(Von Duprin)
"LF268 Series"	(Locknetics)
"1700xCLH Series"	(Rixson-Firemark Security)
"1510 Series"	(Security Door Controls)

E. Flushbolts

1. Manual Flushbolts:

BHMA A156.16; Spring loaded snap action lever type with 1 in. wide faceplate of extruded brass or bronze. Faceplate for metal doors fits Standard Al 15 specification and aluminum doors with radius or face as required with rounded corners. Finish: US U.L. Listed

Metal Catalog No.	Wood Catalog No.	Manufacturer
"FB6"	"FB6W"	(Glynn- Johnson)
"458"	"358"	(H.B. Ives)
"1358-UL"	-----	(Quality)
"5021"	"5021"	(Builders Brass Works"

Not U.L. Listed

Metal Catalog No.	Wood Catalog No.	Aluminum Catalog No.	Manufacturer
"FB6"	"FB6W"	"FB5"	(Glynn-Johnson)
"458 ½"	"258"	"C258"	(H.B. Ives)
"5021"	"5021"	"5023"	(Builders Brass Works)

2. Automatic and Self-Latching Flushbolts: BHMA A156.3; with 1 in. wide faceplate of extruded brass or bronze with door fitting ANSI Standard Al 15 specification. Automatic has full engagement or disengagement and automatic latching of bolt. Self-latching with manual disengagement and automatic latching of bolt. UL listed for labeled doors. Finish: US

Automatic Type		Self-Latching Type		
Metal	Wood	Metal	Wood	
Catalog No.	Catalog No.	Catalog No.	Catalog No.	Mfg.
"FB-31P"	"FB-41P"	"FB-51P"	"FB-61P"	(Glynn-Johnson
"559"	"556" "940"	"559x357"	"559x356"	(H.B. Ives)
"840"		"845"	"945"	(Door Controls)

F. Exit Devices - Touch Bar Type: BHMA A156.3, Grade 1; Low profile design, standard series or narrow stile series as required by the Architect's Code, with all devices of one manufacturer. All required rated exit devices shall be UL listed for both accident hazard panic and fire labeled doors. All non-labeled exit devices shall be UL Listed for accident hazard panic only. Furnish cylinder dogging on all non-labeled exit device. Furnish all outside operators with lever trim. Avoid through-bolting of device, if through bolts are visible.

1. Alarmed (ALR) exit devices shall have remote horn or a alarm kit built in to the devices with a signal switch (SS) for activating the remote horn and remote monitoring of latchbolt and touch bar or (RX) for release exit switch. Key switch override and reset inside and out.
2. Electric latch retraction (EL) on rim, mortise and concealed vertical rod devices shall be Fail-Safe (FS). Electric, solenoid operated, mortise (EM) or rim (ER) lock device with outside trim shall be either locked when electrically energized and Fail-Safe (FS) or unlocked when electrically energized and Fail-Secure (FSE). All devices shall be 24VAC.
3. Include power supply booster, electric power transfer unit of suitable voltage for any device that requires electrical power.

4. Provide cylinder dogging on non-labeled devices.

5. Standard Touch Bar Series

a. Rim Type:

Catalog Number	Mfg.
"99 Series x Trim"	(Von Duprin)
"8800 Series x Trim"	(Sargent)
"1100 Series x Trim"	(Precision)

"9300 Series x Trim"	(Dorma)

b. Mortise Type:

Catalog Number	Mfg.
"9975 Series x Trim"	(Von Drupin)
"8900 Series x Trim"	(Sargent)
"1300 Series x Trim"	(Precision)
"9500 Series x Trim"	(Dorma)

c. Concealed Vertical Rod Type Finish: US

Catalog Number	Mfg.
"9947 Series x Trim"	(Von Drupin)
"8600 Series x Trim"	(Sargent)
"1800 Series x Trim"	(Precision)
"9300 Series x Trim"	(Dorma)
"6100 Series x Trim"	(American Device)

6. Narrow Stile Touch Bar Series: Finish: US

a. Rim Type

Catalog Number	Mfg.
"33 Series x Trim"	(Von Duprin)
"8500 Series x Trim"	(Sargent)
"9100 Series x Trim"	(Dorma)

b. Concealed Vertical Rod Type Finish: US

Catalog Number
"3347 Series x Trim"
"8400 Series x Trim"
"5300 Series x Trim"

2.04 ACCESSORIES ITEMS

A. Coordinators: BHMAA156.3. Finish: US

Bar Type Catalog Number	Gravity Arm Type Catalog Number	Mfg.
"COR Series"	"COR-65 Series"	(Glynn-Johnson)
"900 Series"	"469 Series"	(H.B. Ives)
"600 Series"		(Door Controls International)

B. Carry Bars: To protect astragal and other hardware if inactive leaf is opened first. Vertical x mortise lock exit devices only. Finish: US

Catalog Number	Mfg.
"100"	(Glynn-Johnson)
"CB-1"	(H.B. Ives)
"478 Series"	(Door Controls International)

C. Dustproof Strikes: Wrought brass with spring loaded strike cover plate and with round or rectangular hole compatible with the bolt of the device involved. Finish: US

Round Hole Type Catalog No.	Rectangular Hope Type Catalog No.	Mfg.
"DP-2"	-----	(Glynn- Johnson)
"487x489"	-----	(H.B. Ives)
"80"	-----	(Door Control)
-----	"8790"	(Accurate Lock and Hardware)

D. Drywall Strike: Special strike fabricated of brass or bronze with offset mounting flange for mounting on drywall jamb stud with face of strike flush with finished face of jamb. Finish: US

Catalog No.	Mfg.
-------	(Accurate Lock and Hardware)

E. Dummy Trim: Design and finish to match latchset/lockset trim.

F. Flush Concealed Recessed Pulls: Polished S.S. Finish: US

Catalog No.	Mfg.
"7739 x 7740"	(Weber-Knapp)
"8403"	(Accurate Lock)

G. Flush Recessed Pulls: Polished S.S. with concealed fasteners. Finish: US

Catalog No.	Mfg.
"1060"	(Trimco)
"315"	(Builders Brass Works)

H. Concealed Edge Pulls: Polished S.S. mortised in edge of door. Finish: US

Catalog No.	Mfg.
"36"	(Builder Brass Works)
"1062"	(Trimco)

I. Concealed Pulls: Polished S.S. mortised in edge of door. Finish: US

Catalog No.	Mfg.
"230"	(Ives)

J. Edge Pulls: Chrome Finish: US

Catalog No.	Mfg.
"SF x 3/8 in. dia. x 3 in."	(Mockett)

K. Pocket Door Edge Pulls: Polished S.S. Finish: US

Catalog No.	Mfg.
"961"	(DeJong)

L. Push Plates: Stainless steel of .050 in. plate, 4 in. wide and 16 in. height with all edges beveled. Finish: US

Catalog No.	Mfg.
"1001 Series"	(Trimco)
"40 Series"	(Quality)
"47 Series"	(Builders Brass Works)

M. Push Plate Custom: As detailed, of stainless steel. Finish: US

Acceptable Mfg.: (Tice Industries) or (Accurate Lock and Hardware Co.)

N. Wire Pull with Plates: Stainless steel, 1 in. dia., 10 in. c. to c. with concealed mounting, .050 in. plate, 4 in. wide and 16 in. high with all edges beveled. Finish: US

Catalog No.	Mfg.
"47 x 2909 Series"	(Builder Brass Works)
"1001 x 1195-2 Series"	(Trimco)
"40 x 163 Series"	(Quality)

O. Wire Pulls: Stainless steel, 1 in. dia., 10 in. o.c. with concealed mounting. Finish: US

Straight Type Catalog Number	Offset Type Catalog Number	Mfg.

"1195-2"	"1191-3"	(Trimco)
"163"	"521"	(Quality)
"2909"	"2952"	(Builders Brass Works)

P. Exposed Pulls: Mockett DP3/DR/6

Q. Pulls Custom: As detailed, of wrought brass, bronze or stainless steel, with concealed back to back mounting. Finish: US;

Acceptable Mfg.: (Tice Industries), (Accurate Lock and Hardware Co.)

R. Push Pull Bar Set: Brass, bronze or stainless steel, 1 in. dia. bar, each unit consisting of one push bar on inside attached to one 10 in. o.c. offset pull on outside, with concealed back-to-back mounting. Finish: US

Catalog Number	Mfg.
"1741x1191-3"	(Trimco)
"473x521"	(Quality)
"2988" x "2952	(Builders Brass Works)

S. Special Pulls: Elmes – T51 Chrome and Leather 84" H.

2.05 DOOR CLOSERS

A. Overhead Surface Closers: BHMA A156.4; One grade for both interior and exterior doors, by one manufacturer, matched in design with high impact-resistant non-corrosive cover. Finish: US

1. Non-handed with spring power size adjustment from size 1 through size 5 with independent valves regulating sweep and latching speed, fully adjustable backcheck cushioning control. Delayed action (DA) and handicapped access requirements (HC) feature at doors for stretcher and handicap use or where indicated.

2. Standard shoe, soffit plate, brackets and arms suitable for standard, top jamb, parallel arm and track type applications.

3. In the absence of specific instructions detail and mount closer on the side of the door away from the corridor or public space by using a parallel arm application on in swing doors.

Catalog Number	Mfg.
"4041"	(LCN)

B. Fully Concealed Closers: BHMA A156.16; with full controls, two independent valves for latching and closing speed with a third valve for back check adjustment, with (H.O.) where called for, size to suit door size and location.

1. Mortised in the door, with arm and body not visible in the closed position, body capable of being installed in a 1 ¾ in. wood door without the use of reinforcing plates.

Track Slider Arm - N.H.O.	Track Slider Arm - H.O.	
Catalog Number	Catalog Number	Mfg.
"3130"	----------	(LCN)

2. Mortised in the frame head, with arm and body not visible in the closed position, with suitable mounting devices for door and frame, with cover plate to match specified finish.

Track Slider Arm - N.H.O.	Track Slider Arm - H.O.	
Catalog Number	Catalog Number	Mfg.
"2010"	----------	(LCN)
"268"	----------	(Sargent)

2.06 DOOR STOPPING AND HOLDING ITEMS

A. Floor Stops

1. For all doors except where floor stops may create a traffic *hazard,* where 50% of the door width projects beyond the point of contact with adjacent construction or where exterior swing doors open outwards from building.

2. Of cast brass, bronze, or stainless steel, with riser in carpeted areas, and with attachment hardware to suit floor substrate. Finish: US

Dome Stop	
Catalog Number	Mfg.
446	(Rockwood)

B. Roller Stop: Drop-forged brass or cast brass or bronze with a rubber roller. Finish: US

Catalog Number	Mfg.
"71B"	(H.B. Ives)
"WRB4"	(Glynn-Johnson)
"1341"	(Quality)
"456"	(Rockwood)
"W117"	(Builders Brass Works)

C. Angle Head Stops: Drop-forged brass or bronze with two rubber mutes. Finish: US

Single Catalog Number	Double Catalog Number	Mfg.
"84-1"	"84-1"	(Accurate Lock and Hardware Co.)
"SP-18"	"SP-18"	(Glynn- Johnson)
"1217P"	"1217P"	(Trimco)
"1217P"	"1217P"	(Builders Brass Works)

D. Roller Latch and Angle Head Stop: Drop-forged brass or cast brass or bronze with a rubber roller and rubber mute. Finish: US

Catalog Number	Mfg.
"1152-B"	(Glynn-Johnson)
"593"	(Rockwood)
"1195"	(Builder Brass Works)

E. Catches: Aluminum case with natural finish, dual double pole magnetic type door catches with self-aligning magnets, surface mounted on rabbet of door frame as required to hold double doors. Provide the following:

Catalog Number	Mfg.
"Mighty Mite No. 326"	(H.B. Ives)

F. Overhead Stops and Holders: Extruded bronze channel, arm and bracket with tempered steel shock absorber spring. Finish: US

Concealed for Interior and Exterior Use		
Standard Duty Catalog No.	Heavy Duty Catalog No.	Mfg.
"3 Series"	"1 Series"	(Rixson)
"GJ- 410"	"GJ-100"	Glynn-Johnson)
"1530"	"690"	(Sargent)
"300 Series"	"100 Series"	(Yale)

Surface Applied for Interior and Exterior Use		
Standard Duty Catalog No.	Heavy Duty Catalog No.	Mfg.
"33 Series"	"9 Series"	(Rixson)

"GJ-450)	"GJ-90 Series"	(Glynn- Johnson)
"1540"	"590"	(Sargent)
"DH520 0"	-------	(Corbin/ Russwin)

2.07 MISCELLANEOUS ITEMS

A. Protective Plates: BHMA A156.6; For single doors, 2 in. less than the door width on stop side, 1 in. less than the door width on hinge side. For pairs of doors 1 in. less than the leaf width. 0.050 in. thick stainless steel, beveled 4 edges (B4E), drilled and countersunk to receive Phillips flat head screws with heads finished to match plate finish. Finish:

Catalog No.	Mfg.
"48 Series"	(Quality)
"K0050 Series"	(Trimco)
"37 Series"	(Builders Brass Works)

B. Silencers: BHMA A156.16; 3 each for single doors, 2 each for pairs of doors and 4 each for dutch doors, type to suit frame condition.

Metal Frame Catalog No.	Wood Frame Catalog No.	Mfg.
"20"	"21"	(H.B. Ives)
"GJ-64"	"GJ-65"	(Glynn-Johnson)
"W07"	"W06"	(Builders Brass Works)

C. Electromagnetic Holders: BHMAA156.15; Energized at all times unless electric current is interrupted or if magnetic contact is broken by manual pull on door. Provide strike with a universal ball joint for self-aligning both vertically and horizontally. See Section "Fire Protection" for smoke detection and programming specification. Finish: US

Catalog No.	Mfg.
"980-999 Series"	(Rixson)
"7800 Series"	(LCN)
"390, 1501, 1503 Series"	(Sargent)
"DH57900"	(Corbin, Russwin)
"EM504-EM501 Series"	(Dorma)

D. Electronics and Security Items (Security Vendor)

1. Door Position Switch, Concealed: With SPDT switch and end-line resister.

Catalog No.	Mfg.
"MSS-IC Series"	(Securitron)
"MS-700 Series"	(Von Duprin)

2. Power Supplies Controllers: For 4 to 8 locks, with variations of accessories control hook-ups, selective relocking, isolated fail-safe fire panel tie-in, monitoring indicator provisions and battery power back-up for electromagnetic powerlock, electrified mortise and electrically controlled exit devices. At doors requiring special egress controller function, use unit with above features plus 15 or 30 second time delayed opening control. 24 VAC, 1.0-amp output and 120 VAC, 1.0-amp input. 16 gage steel enclosure, baked enamel finish, lockable hinged cover, surface mounted manual reset.

a. Unit to power and control electromagnetic powerlocks, electrified mortise locks and electrified mortise exit devices.

Catalog Number	Mfg.
"BPS-24-1 Series"	(Securitron)
"MPB-840 Series"	(Von Duprin)
"3631/24"	(Rixson)

"500 Series"	(Locknetics)
"5000 Series"	(Security Engineering)
"PS 510"	(Dorma)

b. Unit to power and control electrically controlled exit devices.

Catalog No.	Mfg.
"BPS-24-1 Series"	(Securitron)
"MPB-842 Series"	(Von Duprin)
"PS 501"	(Dorma)

3. Door Release, Motion Detector: Catalog number and acceptable manufacturer:

Catalog Number	Mfg.
"XMS"	(Securitron)

4. Door Release, Push-Button: Manual station control, single gang plate with a mushroom cap of red color.

Catalog Number	Mfg.
"PB Series"	(Securitron)
"9511 Series"	(Rixson)
"PB-710 Series"	(Von Duprin)
"600 Series"	(Locknetics)
"7100-PS Series"	(Security Engineering)
"PM431"	(Dorma)

5. Key Switch: For access control of alarmed exit device or electro-magnetic powerlock, with momentary contact, built-in adjustable time delay, 24 VDC, with signal lights to indicate status of key switch. Finish: US

Catalog Number	Mfg.
"MKxTM-8"	(Securitron)
"SS-903-ISL"	(Von Duprin)
"K702-6 MO SPOT"	(Dorma)

6. Key Switch Delayed Exit: For access control of exit device with an electro-magnetic powerlock with momentary contact, built-in adjustable time delay, 24 VDC, with signal lights to indicate status of key switch. Finish: US

Catalog Number	Mfg.
"MK x TM-8"	(Securitron)
x One Shot Release Hold Timer	
"SS-5200-ISL"	(Von Duprin)

7. Horn: Flush mounted modutone vibrating horn at each alarmed exit device, 24 VAC, 0.4 amps with special circuitry which sounds horn when alarm signal is applied, reset or shunted at door or from central control. Finish: US

Catalog Number	Mfg.
"PZ-1"	(Securitron)
"L1900F"	(VonDuprin)

E. Gasketing: BHMA A156.22; Extrusion or solid block of aluminum alloy 6063-T5 with silicone, neoprene, polypropylene or vinyl bubble or pad. Gasketing shall be UL listed for use on labeled doors.

1. Stop Applied, Type (GA-1): For use on frames with closers and overhead stop. Finish: Clear Anodized Aluminum

Catalog Number	Mfg.
"290AS"	(Pemko)
"700NA"	(National Guard)
"754A"	(Reese)

2. Stop Applied, Type (GA-2): For use on frame stop. Finish: Clear Anodized Aluminum

Catalog Number	Mfg.
"319CR"	(Pemko)
"130NA"	(National Guard)
"DS78C"	(Reese)

3. Full Stop Adjustable, Type (GA-3): For use as stop. Finish: Clear Anodized Aluminum

Catalog Number	Mfg.
"350CSR"	(Pemko)
"103NA"	(National Guard)
"170A"	(Zero)

4. Light Seal Type (GA-4): Applied to frames stop. Finish: Clear Anodized Aluminum

Catalog Number	Mfg.
"319CR"	(Pemko)
"130NA"	(National Guard)
"DS78C"	(Reese)

5. Sound Seal Adjustable, Type (GA-5): Adjustable, with wiper baffles. Finish: Clear Anodized Aluminum

Catalog Number	Mfg.
"350CSR"	(Pemko)
"103NA"	(National Guard)
"170A"	(Zero)

6. Self-adhesive, Type (GA-6): For use at frames and stop.

Catalog Number	Mfg.
"S88D"	(Pemko)
"5050"	(National Guard)
"188N"	(Zero)

7. Leaf Spring, Type (GA-7): For use at frames and stop

   "119 WB" (Zero)

8. Self-Adhesive Door Seals (GA-8):

   "188" (Zero)

9. Brush Seals (GA-1): "#34" (Zero).

F. Door Bottoms: BHMA A156.22; Extrusion of aluminum alloy 6063-T5 with neoprene or vinyl seal. Door bottoms shall be UL listed for use on labeled doors. Finish: Clear anodized aluminum

1. Mortise applied, Type (DB-1):

Catalog Number	Mfg.
"420A"	(Pemko)
"360 Series"	(Zero)
"320N"	(National Guard)
"371A"	(Reese)

2. Surface applied, Type (DB-2):

Catalog No.	Mfg.
"4301CR"	(Pemko)
"361"	(Zero)
"420A"	(National Guard)
"521C"	(Reese)

G. Meeting Stiles: Finish: US

Catalog No.	Mfg.
"355CS"	(Pemko)
"275A"	(Reese)
"158NA"	(National Guard)

H. Saddles and Thresholds: BHMA A156.21; Extrusion of aluminum alloy 6063-T5 with neoprene or vinyl seals when specified. All saddles and thresholds shall be provided with manufacturers' standard slip-resistance surface. Finish: Abrasive coated aluminum

1. Type (SA-l) 5 in. flat.

Catalog No.	Mfg.
"271APemKote"	(Pemko)
"513SIA"	(National Guard)
"545A"	(Zero)

2. Type (SA-2) 6 in. flat.

Catalog No.	Mfg.
"272APemKote"	(Pemko)
"613SIA"	(National Guard)
"546A"	(Zero)

3. Type (SA-3) floor plate for center pivot.

Catalog No.	Mfg.
"Type 1 lPemKote"	(Pemko)
"Type 1SIA"	(National Guard)

4. Type (SA-4) floor plate for offset hung doors.

Catalog No.	Mfg.
"Type 15PemKote"	(Pemko)
"Type 5SIA"	(National Guard)

5. Type (SA-5) panic threshold with silicone or neoprene bumper.

Catalog No.	Mfg.
"2005AS"	(Pemko)
"896"	(National Guard)
"65"	(Zero)

6. Type (SA-6) interlocking threshold with interlocking angle.

Catalog No.	Mfg.
"114Ax67A"	(Pemko)
"442 x 82A"	(National Guard)
"70" x 25A"	(Zero)

7. Type (SA-7) bulkhead door adjustable threshold.

Catalog No.	Mfg.
"Series 77 with Traction Tread Plates x 475 stop"	(Zero)

I. Hardware Attachment Devices: Provide Phillips head type screws and bolts with exposed surface finished to match adjacent surface. Use the following fasteners for application to the substrates shown:

1. Machine screws and bolts for application to metal.
2. Wood screws with full thread for application to wood.
3. Sheet metal screws for application to particle board or plywood. Screws for use in fire retardant particle board or plywood shall be of stainless steel.
4. Machine screws and galvanized tamp-in shields for application to concrete or masonry.
5. Through bolting will not be permitted except in special cases at the Architect's discretion. Provide internal reinforcement to accept bolts concealed from the outer face of door.

2.08 KEYING AND KEY CONTROL SYSTEM

A. System: The Key and Keying Control system shall conform to the building master system. Final keying to determine cylinders, keyed alike sets, level of keying, master key groups, and grandmaster keying system shall be as directed by the Owner.

B. Keying System: Provide (6) pin removable core Schlage high security, restricted keyway with "concealed key control" for all locksets to be stamped with appropriate visual key control keying symbol. Confirm with building for manufacturer and type.

C. Keys: Furnish keys of nickel silver by cylinder manufacturer, stamp with "Visual Key Control" and "Do Not Duplicate" only, keys in the following quantities:

1.	Change keys	4 keys each cylinder
2.	Masterkeys	6 keys each master
3.	Grand masterkeys	6 keys each grandmaster
4.	Great grand-masterkeys	3 total
5.	Change key blanks	500 for each different keyway
6.	Interchangeable Core Attic Stock	25 per keyway

D. Locksets shall be delivered less the interchangeable core.

2.12 FINISHES (BHMA Designations)

A. Standard: Comply with BHMA A156.18.

B. Protect mechanical finishes on exposed surfaces from damage by applying a strippable, temporary protective covering before shipping.

C. Appearance of Finished Work: Variations in appearance of abutting or adjacent pieces are acceptable if they are within one-half of the range of approved Samples. Noticeable variations in the same piece are not acceptable. Variations in appearance of other components are acceptable if they are within the range of approved Samples and are assembled or installed to minimize contrast.

D. Finish equivalences and description: Exposed finish hardware shall be No. 630 - Satin stainless steel (US32D) except where base metal is only available in steel, provide No. 626 - Satin chrome plate (US26D), at fire rated hinges provide 600 - Prime coat (USP); and where base metal is only available in aluminum and the finish is not specified, provide 689 - Sprayed aluminum.

PART 3 – EXECUTION

3.01 GENERAL

A. General: Finish hardware requirements set forth in the "Door and Hardware Schedule" shall not be construed as a complete hardware schedule but only as an indication of the hardware requirements. Hardware shall be suitable and adaptable for its required use and shall fit its designated location. Examine the Drawings and door hardware sets and provide all necessary or additional hardware

required with the same type and quantity as scheduled for similar doors used for similar purposes. Should any specified hardware fail to meet the intended requirements or require modification to suit or fit the designated location, make the necessary correction or modification.

3.02 INSPECTION

A. Provide the service of a qualified hardware consultant to make periodic checks during construction to determine that the finish hardware is properly installed and to check operation and installation of all finish hardware and make any adjustments required for smooth operation.

3.03 HARDWARE INSTALLATION AND APPLICATION

A. Locate certain items as listed below unless otherwise required by governing regulations; mount other items as recommended by the manufacturer or in accordance with DHI standards and/or as required by governing regulations.

1. Hinges: Position top hinge 5 in. below head, bottom hinge 10 in. above finished floor and intermediate hinges equally spaced between top and bottom hinges. For dutch doors position hinges 5 in. above and below split line.
2. Floor Pivots: Install per manufacturer's recommendation. In carpeted areas, set floor pivot flush with substrate under carpet.
3. Floor Closers: Install with cement cases; furnish twin cases at narrow mullions to permit back-to-back installation. In carpeted areas, set floor plate flush with substrate under carpet.
4. Overhead Closer Concealed in Header: Concealed or exposed arm application as specified; surface shoe application for door closers with exposed arms.
5. Locks and Latches: Unless otherwise shown locate center of door levers and/or knobs 38 in. above finished floor.
6. Dead Latches and Locks: Unless otherwise specified or detailed locate center of cylinder 48 in. above finished floor; in access doors, locate at midpoint.
7. Flush Bolts: Locate flush bolts in edge of inactive door; position trip mechanism 72 in. from finished floor for top bolt and 12 in. from floor for bottom bolt.
    a. Strikes: Install dustproof strikes flush with finished flooring material or top of metal threshold. Install other strikes per flush bolt manufacturer's recommendations.
8. Exit Fixtures: Locate cross bar at height so that center of lever trim is 38 in. above finished floor.
9. Pull Plates and Push Plates: Unless otherwise specified or detailed, install with horizontal center line 45 in. above finish floor and with vertical line on center with backset specified for dead lock and latches; mount pull plates on pull side of door; mount push plates on push side of door.
10. Overhead Closers: Verify each head condition prior to furnishing door closers.
    a. Surface Mounted on Door: Surface shoe application for standard operation and soffit plate application for parallel arms, special shoe plates and brackets to suit job conditions. Avoid the use of through bolts.
        1) For hollow metal doors provide templating for internal tapped reinforcement.
        2) For wood doors and Mineral Core Fire Doors provide hardware with machine screw fasteners to an approved reinforcement blocking.
            a) Surface Mounted Over Door: Surface shoe application.
            b) Concealed in Door: Surface shoe and soffit plate application as

specified.

11. Protective Plates

    a. Kick Plates: Mount on push side of door.

    b. Mop Plates: Mount on pull side of door.

    c. Stretcher Plates: Where shown or at 42 in. at center line of plate. Mount plate on push side.

    d. Armor Plates: Where shown, butt bottom edge of push plate to top edge of armor plate.

12. Electro-Mechanical Hardware (Security Vendor)

    a. All wiring for electro-mechanical hardware mounted on the door shall connected through the power transfer and terminated in the interface junction box.

    b. Conductors shall be minimum 18 gage stranded, multicolored. A minimum 12 in. loop of conductors shall be coiled in the interface junction box. Each conductor shall be permanently marked with its function.

    c. If a power supply is specified in the hardware sets, all conductors shall be terminated in the power supply. Make all connections required for proper operation between the power supply and the electro-mechanical hardware. Provide the proper size conductors as specified in the manufacturers technical documentation.

13. All electric door hardware shall be wired to its power supply; from where the Security Contractor can interface for proper operation. Each piece of electric door hardware shall be tested for mechanical and electrical operation prior release to the Security Contractor.

B. Install each hardware item in compliance with the manufacturer's written instructions and recommendations. Where cutting and fitting is required to install hardware onto or into surfaces that are later to be painted or finished in another way, coordinate removal, storage, and reinstallation or application of surface protection with finishing work specified elsewhere. Do not install surface-mounted items until finishes have been completed on the substrates involved.

C. Set units' level, plumb, and true to line and location. Adjust and reinforce the attachment substrate as necessary for proper installation and operation.

D. Drill and countersink units that are not factory prepared for anchorage fasteners. Space fasteners and anchors in accordance with industry standards.

E. Set thresholds for exterior doors in full bed of sealant, type as recommended by the threshold manufacturer.

3.04 PROTECTION, ADJUSTMENT AND CLEANING

A. Provide all items of finish hardware with proper protection from surrounding construction and at final completion, all hardware shall be left clean and free from disfigurement. Make a final adjustment to all door closers and other items of finish hardware. Where hardware is found defective or unable to operate freely and smoothly for the operation intended, repair or replace or otherwise correct as directed.

B. Instruct Owner's personnel in the proper adjustment and maintenance of door hardware and hardware finishes.

3.05 SURPLUS MATERIAL

A. Turn over to the Owner at project completion all surplus material, including but not limited to screws, fasteners and special installation tools furnished with the hardware.

3.06 EXTRA STOCK

A. Hardware: Furnish 2% additional of each of the following items of finish hardware required on the project, but not less than one of each item. Deliver additional hardware directly to the Owner.

1. Hinges Floor
2. Pivots
3. Closers Surface
4. Locksets and Latchets
5. Closers
6. Stops

B. Fasteners: Furnish three dozen additional screws and other fasteners of each type, size and finish used with the hardware items. Deliver additional screws and fasteners directly to the Owner.

3.07 SCHEDULE

See Door Schedule Drawing A-601, A-602 & G-005

END OF SECTION I-08710

SECTION I-08800

GLAZING

PART 1 – GENERAL

1.01 DESCRIPTION

A. General: Provide glazing in accordance with the Contract Documents.

B. Related Work Specified Elsewhere

1. Section 06100 "Rough Carpentry".
2. Section 06400 "Architectural Woodwork" installation of glass and glazing specified in this Section in architectural woodwork fabrications.
3. Section 08400, "Glass Walls and Entrances" for glass partitions.
4. Section 08850, Metal and Glass Partitions" for glass within metal and glass partitions.

1.02 QUALITY ASSURANCE

A. Single Source Responsibility for Glass: To ensure consistent quality of appearance and performance, and to comply with warranty requirements, provide materials produced by a single manufacturer or fabricator for each kind and condition of glass indicated and composed of primary glass obtained from a single source for each type and class required. All glass processes of fabrication including tempering, application of thermal coatings, ceramic enameled coatings and any process of lamination shall be manufactured by and fabricated into insulating units by a single source with the ability to comply with and assume all specified warranty provisions.

B. Glazier Qualifications: Engage an experienced glazier who has completed glazing similar in material, design, and extent to that indicated for this Project and with a record of successful in-service performance.

C. Producer of decorative type coatings for glass shall have a minimum of 10 (ten) years experience in the production of decorative type coatings in quantities similar to quantities required for this project.

1.03 STANDARDS

A. Except as modified by governing codes and by the Contract Documents, comply with the applicable provisions and recommendations of the following:

1. GANA “Sealant Manual" and "Glazing Manual".
2. GANA "Laminated Glass Design Guide."
3. NAMM "National Association of Mirror Manufacturers "Mirrors, Handle with Extreme Care, Tips for the Professional on the Care and Handling of Mirrors."
4. Safety Glazing Standard: Where safety glass is indicated or required by authorities having jurisdiction, provide type of products indicated which comply with ANSI Z97.1 and testing requirements of CPSC 16 CFR Part 1201 for category II materials. Subject to compliance with requirements and local authorities having jurisdiction, provide safety glass with a removable certification label of Safety Glazing Certification Council (SGCC) or other certification agency acceptable to authorities having jurisdiction.
5. Department of Labor and Local State requirements as related to requirements for visual distraction markings. 4” H x ¼” W vertical distraction markings to be installed at 30” AFF and 60”

AFF.

B. Where the language in any of the documents referred to herein is in the form of a recommendation or suggestion, such recommendations or suggestions shall be deemed to be mandatory under this Contract.

1.04 SUBMITTALS

A. Shop Drawings: Submit shop drawings for the complete glass partitions. Show typical details of all conditions for every member, joint, anchorage, relation to adjacent work and glazing system. Provide templates and drawings to locate items set in concrete and masonry.

B. Samples: Submit samples of each type of glass, setting block, face shim, edge block, glazing sealant and gasket. Provide sealant samples 12 in. long installed between samples of the materials to be glazed, fully cured. Samples will be reviewed for color and texture only.

C. Glazing Schedule: Provide a glazing schedule utilizing the same designations shown on Drawings for glazed openings listing glass types and thicknesses for each size opening and location.

D. Product Data: Submit the following information from the manufacturer:

1. Statement that each product to be furnished is recommended for the application shown based on glass thickness, height and width.

2. Product Test Reports: Provide product test reports from a qualified testing agency indicating the following products comply with requirements, based on comprehensive testing of current products:

a. Clear Tempered Glass

b. Clear Laminated Glass

c. Glazing sealants.

d. Glazing gaskets.

3. Complete instructions for handling, storing, mixing, priming, installing, curing and protecting each glazing material.

4. Mirror Product Data

a. Submit product data for mirrors including description of materials and process used to produce mirrored glass, including source of glass, glass coating components, edge sealer, and quality control provisions.

b. Mirror mastic glass coating compatibility test reports from organic protective coating manufacturer indicating that mirror mastic has been tested for compatibility and adhesion with organic protective coating. Include organic coating manufacturers' interpretation of test results relative to performance and recommendations for use of mastics with organic protective coating.

E. Statement of Application: Submit copy of statement signed by the Subcontractor and Contractor, stating that the glazing materials complied with these Specifications and that the installation methods complied with the manufacturer's printed instructions for each condition of use on this Project.

F. Maintenance Instructions: Furnish maintenance instructions for each type of glass for use during construction and for use by the Owner after acceptance of the Work.

G. Preconstruction Mirror Mastic Glass Coating Compatibility Test: Submit mirror mastic products to manufacturer of protective organic coating for testing by coating manufacturer's standard test method to determine compatibility of adhesive with mirrored glass coating.

H. Certification: Submit certification that sealants comply with VOC limits of 100 or less for structural sealants.

1.05 PRODUCT HANDLING

A. Deliver glazing materials to Project site in manufacturers' unopened containers, fully identified with trade name, color, size, hardness, type, class, and grade. Store each item in accordance with manufacturer's instructions.

B. Deliver, store and handle glass in accordance with manufacturer's recommendations; protected from weather, staining and damage. During storage and handling of glass provide cushions at edges to prevent impact damage. Protect glass from scratches and abrasion.

1.06 PROJECT CONDITIONS

A. Do not perform glazing when temperature is below 40 deg. F., unless the manufacturer of the glazing materials specifically recommends application of his materials at lower temperatures. If job progress or other conditions require glazing work when temperatures are below 40 deg. F. (or below the minimum temperature recommended by the manufacturer), consult the manufacturer and establish the minimum provisions required to ensure satisfactory work. Record in writing to the manufacturer, with copy to the Architect, the conditions under which such glazing work was performed, and the provisions made to ensure satisfactory work.

1.07 WARRANTIES

A. Warranties specified in this Article shall not deprive the Owner of other rights the Owner may have under other provisions of the Contract Documents and are in addition to and run concurrent with other warranties made by the Contractor under requirements of the Contract Documents.

B. Warranty, Laminated Glass: Provide a (5) five-year written warranty, directly to the Owner, warranting against deterioration of laminated glass. Deterioration of laminated glass is defined as the development of manufacturing defects including edge separation or delamination which materially obstructs vision through glass and blemishes exceeding those allowed by referenced laminated-glass standard. Upon notification of such defect, within the warranty period, make the necessary replacements at the convenience of the Owner.

C. Warranty: Provide a written warranty, directly to the Owner, agreeing to repair or replace silicone sealant compounds which appear to have failed in adhesion, cohesion, abrasion-resistance, migration-resistance, stain-resistance, general durability or any other form of apparent deterioration (excluding inherent qualities and limitations clearly specified in the manufacturer's data which was submitted). Period of warranty shall be twenty (20) years, and warranty shall be signed by the Manufacturer, the installer and the Contractor. Comply with these Specifications for repair or replacement of work.

D. Warranty, Mirror: Provide a 5-year written warranty, directly to the Owner, warranting against any evidence of silver spoilage. Upon notification of such defects, within the warranty period, make the necessary replacements at the convenience of the Owner.

E. Warranty, Sandblasted Glass Sealer: Provide a 5-year written warranty signed by the fabricator and sealer manufacturer, directly to the Owner, agreeing to repair or replace glass which has yellowed, stained, or discolored.

PART 2 – PRODUCTS

2.01 GLASS

A. General: Comply with ASTM C1036 unless otherwise specified. Type and thickness as shown or specified.

B. Float Glass: Type I, Class 1, Quality q^3.

C. Heat Treated Glass: Comply with ASTM C1048, unless otherwise specified. Type and thickness as shown or specified.

1. Glass for Heat Treating: Float, Type I, Class 1, Quality q^3.

2. Sizes and Cutting: Prior to heat treating, cut glass to required sizes as determined by accurate measurement of openings to be glazed, making allowance for required edge clearances. Cut and process edges in accordance with glass manufacturer's recommendations. Do not cut or treat edges in the field.

3. General: For glass which has been heat treated horizontally, maintain roller marks running horizontally in the final installation, wherever possible. For glass which has been heat treated vertically, locate long marks along an edge which will be concealed in the glazing system.

   a. Overall Bow and Warp Tolerances: Heat treated glass shall be examined by the glass manufacturer to detect and discard any lights which exceed one half (50%) the maximum bow and warp tolerances in any direction as listed in ASTM C1048 Table

   b. Roll Ripple Tolerances: Where the heat treatment process results in essentially parallel ripples or waves, the deviation from flatness at any peak (peak to valley deviation) shall not exceed 0.005 in. or the average rollerwave distortion shall be certified not to exceed 0.05 mm, with a maximum sag at the leading and trailing edge of 0.25 mm. (The more stringent requirement A site inspection if required for roller wave and bow tolerances should be from a minimum distance of 3 meters.

4. Fully Tempered Glass: Comply with ASTM C1048, Kind FT, and meeting the requirements of ANSI Z97.1. Surface compression shall be 10,000 psi minimum.

5. Heat-Strengthened Glass: Comply with ASTM C1048, Kind HS. Strengthen by manufacturer's standard heat-treatment process to increase the flexural strength to not less than 2 times the strength before treatment and having a surface compression stress of 5000 psi +/- 1500 psi.

D. Laminated Glass: ASTM Cl 172, two sheets of glass permanently factory laminated under heat and pressure with an interlayer of 0.060 in. thick clear, translucent, photographically patterned or colored, plasticized polyvinyl butyral made specifically for laminating glass.

1. Provide type and thickness of glass sheets as shown or specified. Fabricate laminated glass to produce glass free of foreign substances and air or glass pockets in an autoclave utilizing heat plus pressure.

2. Prior to laminating, cut glass to required sizes and profiles as determined by accurate measurement of openings to be glazed, making allowance for required edge clearances. Cut and process edges in accordance with glass manufacturer's recommendations. Do not cut or treat edges in the field.

E. Mirror Glass

1. ASTM C1036, Type 1, Class 1, Quality q[1].

2. Provide silvering, copper backing and protective heat catalyzed paint coating on entire back surface of mirror.

3. Exposed edges of all mirrors shall have a flat polished (eased) profile. Perform edge treatment and sealing in factory immediately after cutting to final sizes. Do not cut or treat edges in the field.

2.02 GLAZING MATERIALS

A. Silicone Rubber (Sealant Type SE01): ASTM C920, class and use as best suited for the intended purpose; Provide one of the following having a VOC content of 100 or less:

1. "Silpruf 2000 " (General Electric Co.).

2. "795 Building Sealant" or "790 Silicone Building Sealant"(Dow Corning Corp.).

B. Butyl Glazing Tape Reinforced: A pre-formed, non-sagging, non-oxidizing, non-staining butyl rubber

tape with core reinforcement, one of the following:

1. "Extra-Seal Butyl Rubber Tape" (Pecora Corp.).
    a. "No. 166.6 Elastic Butyl Tape" (Presstite Div.).
    b. "Pre-Shimmed Tremco 440 Tape" (Tremco).

C. Butyl Glazing Tape: A vulcanized butyl, self-adhesive, non-staining tape, one of the following:

1. "Duribbon 1082" (National Adhesives; National Starch & Chemical Corp.)
    a. "606 Architectural Sealant Tape" (Protective Treatments, Inc.).

D. Glazing Gaskets: Continuous neoprene or polyvinyl chloride extrusions, of 50 Shore A durometer hardness plus or minus 5.

E. Setting Blocks: ASTM C864; neoprene blocks, 80 to 90 Shore A durometer hardness.

F. Face Shims: ASTM C864; neoprene blocks, 40 to 50 Shore A durometer hardness, self-adhesive on one face only.

G. Edge Blocks: ASTM C864; neoprene blocks, 60 to 70 Shore A durometer hardness.

H. Mirror Mastic: An adhesive setting compound, manufactured specifically for setting mirrors by spot application, certified as compatible with back of mirror coating by organic protective coating manufacturer, scheduled mirror substrate and approved by mirror manufacturer. Comply with mirror mastic manufacturer's written instructions for size, number and pattern of mastic spots required for installation. Subject to compliance with requirements, provide products by one of the following:

1. Gunther Mirror Mastics.
2. Palmer Products Corporation.
3. Glazers Choice, Inc.

I. Mirror Edge Sealer: A mirror edge sealer manufactured specifically for sealing mirror edges and that has proven to be compatible with mirror coating and approved by mirrored glass manufacturer for use in protecting against silver deterioration at mirror edges; Provide one of the following:

1. "Seal-Kwik" (C. Gunther Co.).
2. "No. 209 Mirror Edge Sealant" (Sprayway, Inc.).

J. Sealer for Sandblasted Glass: Manufacturer's proprietary non-stick, clear coating; chemically bonds with sandblasted glass surfaces, formulated specifically to seal sandblasted surface and prevent finger marking and to provide low-maintenance protection of sandblasted surfaces.

K. Stainless Steel Angle Mirror Support and Frame: AISI Type 302 or 304; hot or cold rolled angle; ¾ in. x 3/4 in. x 1/16 in. thick; polish edge of exposed portion of angle to bright finish.

L. Joint Cleaner, Primer and Sealer: The products recommended by the manufacturer. Never apply or allow primers to come into contact with glass surfaces.

M. Glass Window Film Frosted Film: "Scotchcal 7725-314, Dusted Crystal Film" (3M Commercial Graphics); film with satin etch look, with self adhesive backing for frosted glass. (by client vendor)

N. Glass Window Patterned Film: Full Height “3M Fasara Shutie” applied to both sides of glass. (by client vendor)

2.03 FABRICATION

A. Sizes: Fabricate glass to sizes required for glazing openings indicated, with edge clearances and tolerances complying with recommendations of glass manufacturer. Provide thicknesses indicated or, if not otherwise indicated, as recommended by glass manufacturer for application indicated.

B. Cutting: Obtain sizes from shop drawings or by field measurement. Cut glass to fit each opening with

edge clearances and bite on glass as recommended by glass manufacturer. Do not nip glass edges. Factory cut heavy float glass *(Vz* in. and above). Edges may be wheel cut or sawed and seamed at manufacturer's option. For glass to be cut at site, provide glass larger than required so as to obtain, clean-cut edges without seaming or nipping. Do not cut, seam, nip or abrade glass after heat-tempering.

C. Edgework for Butt Glazing: Where glass is to be butt joined with silicone sealant, provide flat ground butting glass edges having a satin finished flat edge with eased arise corners.

D. Edgework for Exposed Edges: Where edges of glass are to be exposed in the finish work, provide ground and polished edges and slightly eased arises and eased corners.

E. Sandblasting: Following treatment required for tempering glass, perform sandblasting process in accordance with fabricator's and manufacturer's recommendations.

1. Sandblast glass to produce design indicated using the greatest care to create plates to mask image areas required to be clear, produce tight register between sandblasted and clear areas, as well as to produce uniform sandblasting at other areas.

2. Following sandblast treatment specified sealer shall be spray applied by licensed applicators to seal surfaces of sandblasted glass.

F. Acid Etching: Following treatment required for tempering glass perform acid etching process in accordance with fabricator's and manufacturer's recommendations.

1. Acid etch glass to produce design indicated using the greatest care to create plates to mask image areas required to be clear, produce tight register between etched and clear areas, as well as to produce uniform etching at other areas. Neutralize and passivate glass surfaces exposed to acid etching process.

2. Use processes required to recapture acid used to etch glass. Comply with environmental regulations required to control and clean air exposed to acid solutions. Neutralize acid waste and acid solutions that are inadequate for reuse.

G. Window Film: Apply window film to glass panels in the shop. Prior to application, clean glass as recommended by window film manufacturer to remove dust, fingerprints and other items which would impair the bond of window film. Apply film starting with one corner, smoothing out film across entire surface and burnish to glass as required to eliminate gaps, holes, fish-mouths, wrinkles, and other surface imperfections. Apply film with full contact to glass substrate.

2.04 GLASS SCHEDULE

A. See Finish Legend, Finish Plans and Partition Types for locations and glass types.

PART 3 – EXECUTION

3.01 PRE-INSTALLATION MEETING

A. Prior to the start of the Work, and at the Contractor's direction, meet at the Project site to review material selections, methods and sequence of installation, glazing procedures standard of workmanship, quality control requirements, evaluation of suitability of specified compounds and sealants for anticipated weather conditions, coordination with other trades, and other pertinent topics related to the Work. The meeting shall include the Architect, the Contractor, the Contractor's project superintendent, subcontractor's superintendent, primary component materials suppliers, and any other subcontractors whose work requires coordination with this Work.

3.02 CONDITION OF SURFACE

A. Examine substrates, adjoining construction and conditions under which the Work is to be installed. Do not proceed with the Work until unsatisfactory conditions have been corrected.

3.03 PREPARATION

A. Clean glazing channels, stops and rabbets to receive glazing materials of obstructions and deleterious substances which might impair the work. Remove protective coatings which might interfere with bond of sealants. Comply with manufacturer's instructions for final wiping of surfaces immediately before application of primer and glazing compounds or tapes.

B. Prime surfaces to receive glazing compounds, except where manufacturer provides written reports of tests conducted by an independent testing agency which demonstrates that primer or sealer is not required for the conditions of use and the substrates involved. When priming, comply with manufacturer's recommendations.

3.04 INSTALLATION

A. Standards: Unless otherwise shown or specified, comply with recommendations and requirements of the GANA “Glazing Sealing Systems Manual" and "Glazing Manual".

B. Inspect each piece of glass immediately before installation. Do not install any pieces which are improperly sized or have damaged edges, scratches or abrasion or other evidence of damage. Remove labels from glass immediately after installation.

C. Locate setting blocks at sill one-quarter of the width in from each end of the glass, unless otherwise recommended by the glass manufacturer. Use blocks of sized 1/8 in. wider than the glass thickness and 1/16 in. to 1/8 in. less than the width of the glazing channel to support the glass and in accordance with manufacturer's recommendations.

D. Provide face shims for all glass sizes larger than 50 united in., to separate glass from stops, except where continuous glazing gaskets or felts are provided. Locate face shims opposite each other and no farther than 24 in. apart and no closer than 12 in. to a corner. Make bite of spacer on glass a nominal % in. or greater.

E. Provide edge blocks, located in glazing rebate as recommended by the glass manufacturer, to insure against displacement of the glass and against metal to glass contact within the rebate and to ensure permanently adequate bite of the glass within the glazing system.

F. Set glass in a manner which produces greatest possible degree of uniformity in appearance. Where safety glazing is scheduled or required, install glass after detaching removable safety glazing label unless otherwise required by authorities having jurisdiction. If local authorities require permanent labeling, install glass with permanent safety glazing label in concealed or inconspicuous locations subject to selection by the Architect.

G. Do not use 2 different glazing materials in the same joint system unless the manufacturer of each material has stated in writing that his material is fully compatible with the other material.

H. Use suitable protection to limit coverage of glazing materials to the surfaces intended for sealants.

I. Miter-cut and seal joints of glazing gaskets in accordance with manufacturer's instructions to provide a continuous watertight and airtight seal at corners and other locations where joints are required. Vulcanize corner joints where compatible with installation procedure. Where wedge-shaped gaskets are driven into one side of channel to pressurize gasket on opposite side, provide adequate anchorage so gasket cannot walk out when installation is subjected to movement. Do not exceed edge pressures stipulated by glass manufacturers for installing glass lights.

J. Butt or lap ends of tapes in accordance with manufacturer's recommendations.

K. Tool exposed surfaces of glazing materials to provide a slight wash away from the glass. Install exposed tapes and gaskets with a slight protrusion above stops in the final compressed condition.

L. Mirror Glazing (Where Applicable)

1. Adhesive Mounting of Mirrors

a. Identify and examine surfaces over which mirror is to be mounted. Comply with manufacturer's printed installation directions for preparation of mounting surfaces including coating surfaces with mastic manufacturer's special bond coating where applicable or priming and sealing substrate as recommended.

b. Paint back of mirror with an additional coat of moisture-resistant paint of the type recommended by the mirror manufacturer and compatible with mirror mastic and substrate. Apply mirror edge sealer to all edges of mirror in accordance with manufacturers instructions and recommendations.

c. Provide *¾"* in. thick fire-retardant treated plywood mirror backerboards as specified in Section "Rough Carpentry". Provide 1 in. x 1 in. x 1/8 in. thick stainless-steel angle frame with mitered corners and bright polished finished exposed edges. Secure angle frame to wall construction with fastening devices appropriate for substrates encountered spaced 16 in. o.c. maximum. Secure plywood backerboard to wall using fastening devices appropriate for substrates encountered spaced 12 in. o.c. maximum at perimeter *Vz* in. from corners and three rows of 3 fasteners each in the backerboard field. Countersink fasteners flush with plywood surface. Butt adjacent panels without lapping. Prepare panels for priming as required by manufacturer of mirror mastic.

d. Support mirror with stainless steel satin finished angle frame with bottom support designed to withstand mirror weight. Provide 1/8 in. thick by 4 in. long x % in wide setting blocks at quarter points. Apply mirror mastic in accordance with mastic manufacturer's instructions utilizing mastic manufacturer's special tool to assure complete and accurate coverage. Do not cover more than 25% of mirror back unless otherwise recommended by the mastic manufacture. Provide neoprene shims, double face tape or other type compatible material to allow for minimum clearances for mastic. Apply mirror to substrate so that areas not covered with mastic will remain open for ventilation, with minimum clearance from substrate as recommended by mastic manufacturer. Provide temporary rigid support until adhesive has set.

e. Fill 1/8 in. wide joint between stainless steel angle and face of mirror with continuous backer rod and clear silicone sealant (Sealant Type SE01).

2. Channel Glazing of Mirrors: Use interior glazing system specified herein and comply with mirror manufacturer's instructions and recommendations.

M. Glass to Glass Glazing: Apply "crystal clear" silicone rubber sealant to abutting surfaces of glass in accordance with manufacturer's recommendations.

N. Frameless Glass, Glass Doors, Sidelites, and Demountable Wall Systems/Visual Distraction Marks: Apply window and door distraction markings on glass surfaces, in colors, uniform patterns and spacings shown and as required to comply with the requirements specified in Paragraph "Standards". Provide one of the following methods:

1. Provide decals (specifically manufactured for application to glass) minimum ¼" TH. X 4" H at 4" O.C.. Installed horizontally at 30" + 60" AFF. Applied to the glass to provide uniform characters with sharp edges and tightly registered patterns, free from blemishes or other defects which, in the Architect's opinion, will impair the finished work. (by client vendor)

3.06 CLEANING AND PROTECTION

A. Clean excess sealant or compound from glass and framing members immediately after application using solvents or cleaners recommended by manufacturers.

B. Protect glass from breakage immediately upon installation. Use streamers or ribbons suitably attached to framing and held free of the glass. Do not apply warning markings directly to the glass. Do not permit edges of glass to be exposed to standing water.

C. Protect glass and glazing materials during the construction period so that they will be without any indication of damage or deterioration at the time of acceptance by the Owner. Cover glass to protect it from activities that might abrade the surfaces.

D. Replace glass during the construction period which is broken, cracked, chipped or damaged in any way and from any source, including weather, vandalism or accidents.

E. Maintain glass in a reasonably clean condition during construction so that it will not become stained and will not contribute to the deterioration of glazing materials. Conduct a systematic inspection program not less than once a month for glass. Clean to meet above requirements.

F. Wash glass on both faces not more than 4 days prior to acceptance by the Owner. Comply with instructions and recommendations of the glass manufacturer and glazing materials manufacturer for cleaning in each case.

END OF SECTION I-08800

SECTION 08 88 10

DECORATIVE GLASS GLAZING

PART 1 - GENERAL

1.1 SUMMARY

A. Section includes laminated glass with decorative interlayers, acid-etched glass, and back-painted glass for interior locations.

B. Related Sections:

1. Section 08 80 00 "Glazing" for monolithic glass products and glazing requirements.

1.2 DEFINITIONS

A. Manufacturer is used in this Section to refer to a firm that produces primary glass or fabricated glass as defined in the referenced glazing standard.

B. Deterioration of Laminated Glass: Defects developed from normal use that are attributed to the manufacturing process and not to causes other than glass breakage and practices for maintaining and cleaning laminated glass contrary to manufacturer's directions. Defects include edge separation, delamination materially obstructing vision through glass, and blemishes exceeding those allowed by referenced laminated glass standard.

1.3 ACTION SUBMITTALS

A. Product Data: For each product specified.

B. Shop Drawings: Include design and pattern location for each decorative glass unit, plans, elevations, sections, details and details of installation. Include size and location of penetrations and glazing method.

C. Samples: For each type of decorative glass and in each color and texture required. Prepare samples from same material to be used for the Work.

1.4 INFORMATIONAL SUBMITTALS

A. Product certificates signed by manufacturers of decorative glass certifying that their products comply with specified requirements.

1. Separate certifications are not required for glazing materials bearing manufacturer's permanent labels designating type and thickness of glass, provided labels represent a quality-control program of a recognized certification agency or an independent testing agency acceptable to authorities having jurisdiction.

B. Sealant compatibility and adhesion test reports from sealant manufacturer indicating that glazing materials have been tested for compatibility and adhesion with glazing sealants; include sealant manufacturer's interpretation of test results relative to sealant performance and recommendations for primers and substrate preparation needed to obtain adhesion.

C. Product test reports for each type of glazing sealant indicated, evidencing compliance with requirements specified.

D. Warranty: Special warranty specified in this Section.

1.5 QUALITY ASSURANCE

A. Glazing Publications: Comply with published recommendations of product manufacturers and organizations below, except where more stringent requirements are indicated.

1. FGMA Publication: "FGMA Glazing Manual."
2. FGMA Publication: "FGMA Sealant Manual."
3. LSGA Publication: "LSGA Design Guide."

B. Safety Glass: Products complying with testing requirements of CPSC 16 CFR, Part 1201 for Category I and II materials.

C. Mockups: Before installing decorative glass, install mockups to demonstrate aesthetic affects and qualities of materials and workmanship.

1. Approved mockups may become part of the completed Work if undisturbed at time of Substantial Completion.

1.6 WARRANTY

A. Special Warranty: Written warranty, executed by manufacturer agreeing to repair or replace decorative glass units that fail in materials and workmanship or deteriorate within five years from date of Substantial Completion. Warranty covers only deterioration due to normal conditions of use and not to handling, installing, and cleaning practices contrary to decorative glass manufacturer's published instructions.

B. Back-Painted Glass Warranty: Provide a minimum 10-year manufacturer's limited warranty to cover color-coating against peeling, cracking, delamination or discoloration.

1.7 EXTRA MATERIALS

A. Furnish extra materials that match products installed and that are packaged with protective covering for storage and identified with labels describing contents. Provide full size units equal to 5 percent of amount installed.

PART 2 - PRODUCTS

2.1 MANUFACTURERS

A. Manufacturers: Subject to compliance with requirements, provide products by one of the following:

1. Laminated Glass:
   - AFG Inc.
   - Cesar Color Inc.
   - Creative Central.
2. Acid-Etched Glass:
   - Skyline Design
   - Carvart Glass
3. Back-Painted Glass:
   - Skyline Design
   - Carvart Glass

2.2 SYSTEM PERFORMANCE REQUIREMENTS

A. General: Provide glazing systems that are produced, fabricated, and installed to withstand normal thermal movement and impact loading (where applicable), without failure, including loss or glass breakage attributable to the following: defective manufacture, fabrication, and installation; deterioration of glazing materials; or other defects in construction.

B. Glass Design: Glass thicknesses indicated on Drawings are for detailing only. Confirm glass

thicknesses by analyzing in-service conditions.

C. Back-Painted Glass:

1. Chemical Makeup: Color coating must be free of chemical isocyanates (e.g., traditional isocyanate based two-part urethanes are prohibited).

2. Chemical Resistance: Coating must be tested using ASTM D 1308 to withstand 24-hour contact testing with the following chemicals: ethyl alcohol, mineral spirits, 5 percent sodium hydroxide solution, 5 percent hydrochloric acid solution, household glass cleaner (e.g., Windex), household surface cleaner (e.g., Fantastic), cold water immersion.

   Coating must show no visible degradation when viewed through the glass including blistering, cracking, peeling, or discoloration after such tests.

3. Coating Adhesion: Coating must be tested for adhesion using ASTM D 3359 Method A and B and show a 4A/4B rating or better. In addition, coating must be tested to show pull-off adhesion strength (ASTM D 4541) of at least 2,000 psi.

4. Coating Hardness: Coating must be tested using ASTM D 3363 and yield a pencil hardness result of at least 2H.

2.3 PRIMARY FLOAT-GLASS PRODUCTS

A. Float Glass: ASTM C 1036, Type I (transparent glass, flat), Class 1 (clear), unless otherwise indicated, and Quality q3 (glazing select).

2.4 HEAT-TREATED FLOAT GLASS

A. Uncoated, Clear, Heat-Treated Float Glass: ASTM C 1048, Condition A (uncoated surfaces), Type I (transparent glass, flat), Class 1 (clear), unless otherwise indicated, Quality q3 (glazing select), Kind FT (fully tempered) where indicated.

2.5 LAMINATED-GLASS PRODUCTS

A. Laminated Glass: Comply with ASTM C 1172 for Kind LT (2 lites of fully tempered Type I glass).

B. Refer to primary and heat-treated glass requirements relating to properties of glass comprising laminated-glass products.

C. Interlayer: Polyvinyl butyral (PVB) sheets or urethane acrylate resin of thickness indicated with a proven record of no tendency to bubble, discolor, or lose physical and mechanical properties after laminating glass lites and installation.

1. Thickness of Plastic Interlayer: 0.060 inch (1.52 mm).

2. Interlayer Material Color or Pattern: Match colors, textures, and patterns indicated by referencing manufacturer's standard designations for these characteristics.

2.6 ACID-ETCHED GLASS

A. Refer to primary and heat-treated glass requirements relating to properties of glass comprising acid-etched-glass products.

B. Textures and Patterns: Where manufacturer's standard products are indicated, provide acid-etched glass to match patterns indicated by reference to manufacturer's standard designations.

C. Acid-Etching Process: Fabricate acid-etched glass with hydrofluoric and hydrochloric acid according to manufacturer's standard process.

2.7 BACK-PAINTED GLASS

A. Monolithic wall cladding glass shall be 1/4-inch-thick, low-iron float glass with the color coating on the number two (inboard) surface. Glass shall be annealed with vinyl safety backing and be of the sizes shown in the project drawings including holes, cutouts and edge treatment as specified.

B. Refer to primary and heat-treated glass requirements relating to properties of glass comprising back-painted glass products.

C. Glass: Low-iron as specified in Section 08 80 00 "Glazing."

D. Coating: Isocyanate-free two-part urethane specifically recommended and warranted for glass application and meeting all performance requirements specified in "Performance Requirements" Article The coating shall have a minimum dry-film thickness of 1.5 mils.

2.8 GLAZING SEALANTS

A. General: Provide manufacturer's standard sealant of formulation indicated that is recommended for exposed interior applications, complying with the following requirements:

1. Compatibility: Select glazing sealants of proven compatibility with other materials they will contact, including glass products and glazing channel substrates, under conditions of installation and service, as demonstrated by testing and field experience.

2. Suitability: Comply with sealant and glass manufacturer's recommendations for selecting glazing sealants that are suitable for applications indicated and conditions existing at time of installation.

3. Colors: Provide color of exposed joint sealants as selected by Architect from manufacturer's full range of standard colors.

B. Latex Sealant: One-part, nonsag, mildew-resistant, paintable latex sealant complying with ASTM C 834.

C. Silicone Sealant: One-Part, Medium Modulus, Neutral-Curing Silicone: ASTM C 920; Type S; Grade NS; Class 25, Use NT, translucent color. Provide one of the following:

1. 756 H.P.; Dow Corning.

2. Silglaze II; GE Silicones.

3. 898; Pecora Corporation.

D. Silicone Adhesive for Back-Painted Glass: Decorative color-coated glass may be mounted using an alxocy neutral cure silicone adhesive. Acetoxy cure silicones must not be utilized. Approved products are:

1. Dow Corning 995.

2. Dow Corning 795.

3. GE Siliglaze II.

4. GE Silpruf.

E. Silicone Seam Sealant for Back-Painted Glass: Approved products are:

1. CRL 408RTV (Neutral Cure Silicone).

2. Somaca 55NC.

3. Boss 399.

2.9 MISCELLANEOUS GLAZING MATERIALS

A. General: Provide products of material, size, and shape complying with referenced glazing standard, requirements of manufacturers of glass and other glazing materials involved for glazing application indicated, and with a proven record of compatibility with surfaces contacted in installation.

B. Cleaners, Primers, and Sealers: Type recommended by sealant or gasket manufacturer.

C. Setting Blocks: Elastomeric material complying with ASTM C 864 with a Shore A durometer hardness of 85 plus or minus 5.

D. Spacers: Elastomeric blocks or continuous extrusions complying with ASTM C 864 with a Shore A durometer 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.

F. Plastic-Foam Joint Fillers: Preformed, compressible, resilient, non-staining, non-extruding, non-outgassing strips of closed-cell plastic foam of density, size, and shape to control sealant depth and otherwise contribute to produce optimum sealant performance.

G. Top and Bottom Aluminum J Channels: Aluminum extrusions with a return deep enough to produce a glazing channel to accommodate 6 mm thick mirrors and heavy bodied mirror mastic specified and in lengths required to cover bottom and top edges of each mirror in a single piece. The ends of the back lips of all channels shall be factory snipped and filed so that they will not be seen after installation. The bottom channel shall be drilled with a minimum of 2 -1/4-inch (6.35 mm) diameter weep holes located between the setting blocks.

1. Bottom Trim: J-channels formed with front leg and back leg not less than 3/8 inch and 7/8 inch (9.52 and 22.22 mm) in height, respectively. CRL Polished Finish 1/4-inch Standard "J" Channel (Part Number D636P); C. R. Laurence Co., Inc.

2. Top Trim: J-channels formed with front leg and back leg not less than 5/8 inch and

1-3/16 inch (15.87 mm and 30.16 mm) in height, respectively. CRL Polished Finish 1/4-Inch-Deep Nose "J" Channel (Part Number D645P); C. R. Laurence Co., Inc.

2.10 FABRICATION OF GLASS AND OTHER GLAZING PRODUCTS

A. Fabricate decorative glass and other glazing products in sizes required to glaze openings indicated for Project, with edge and face clearances, edge and surface conditions, and bite complying with recommendations of product manufacturer and referenced glazing standard.

B. Clean cut or flat grind vertical edges of butt-glazed lites in a manner that produces square edges with slight kerfs.

PART 3 - EXECUTION

3.1 GLAZING, GENERAL

A. Examine glass framing, with glazier present, for compliance with the following:

1. Manufacturing and installation tolerances, including those for size, squareness, and offsets at corners.

2. Minimum required face or edge clearances.

B. Do not proceed with glazing until unsatisfactory conditions have been corrected.

C. Clean glazing channels and other framing members receiving glass immediately before glazing. Remove coatings that are not firmly bonded to substrates.

D. Comply with combined recommendations of manufacturers of glass, sealants, and other glazing materials, except where more stringent requirements are indicated, including those in referenced glazing publications.

E. Glazing channel dimensions as indicated on Drawings provide necessary bite on glass, minimum edge and face clearances, and adequate sealant thicknesses, with reasonable tolerances. Adjust as required by Project conditions during installation.

F. Protect glass from edge damage during handling and installation as follows:

1. Use a rolling block in rotating glass units to prevent damage to glass corners. Do not impact glass with metal framing. Use suction cups to shift glass units within openings; do not raise or drift glass with a pry bar.

2. Remove damaged glass from Project site and legally dispose of off-site. Damaged glass is glass with edge damage or other imperfections that, when installed, weaken glass and impair performance and appearance.

G. Provide spacers as follows:

1. Locate spacers inside, outside, and directly opposite each other. Install correct size and spacing to preserve required face clearances.

2. Provide not less than 1/8-inch (3 mm) bite of spacers on glass and use thickness equal to sealant width.

H. Set decorative glass lites in each series with uniform pattern, draw, bow, and similar characteristics.

3.2 SEALANT GLAZING

A. Install continuous spacers between glass lites and glazing stops to maintain glass-face clearance. Secure spacers 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 smooth.

3.3 CLEANING AND PROTECTION

A. Protect glass from breakage immediately after installation by attaching crossed streamers to framing held away from glass. Do not apply markers to glass surface. Remove nonpermanent labels, and clean surfaces.

B. Protect glass from contact with contaminating substances resulting from construction operations. If, despite such protection, contaminating substances do come into contact with glass, remove them immediately as recommended by glass manufacturer.

C. Remove and replace glass that is broken, chipped, cracked, abraded, or damaged in any way, including by natural causes, accidents, and vandalism, during construction period.

D. Wash glass on both faces in each area of Project not more than 4 days prior to date scheduled for inspections that establish date of Substantial Completion. Wash glass as recommended by glass manufacturer.

END OF SECTION 08 88 10

SECTION 09 22 00

NON-STRUCTURAL METAL FRAMING

PART 1 - GENERAL

1.01 SUMMARY

A. Section includes non-load-bearing steel framing members for non-fire-rated wallboard partitions, bulkheads, soffits, ceiling transitions, ledges and coves and suspension systems for wallboard ceilings.

1.02 PERFORMANCE REQUIREMENTS

A. System Deflections:

1. Typical Walls: Wall assemblies shall be constructed for deflection not to exceed 1/240 of the wall height when subjected to a positive and negative pressure of 5 psf.

2. Walls with Tile Finish: Wall assemblies to receive tile finishes shall be constructed for deflection not to exceed 1/360 of the wall height when subjected to a positive and negative pressure of 5 psf.

3. Ceilings, bulkheads, soffits, ceiling transitions, ledges, and coves shall be constructed for a deflection not to exceed 1/360 of the distance between supports.

4. In areas where top of partitions is dependent on ceiling system for lateral support, coordinate design and installation to comply with the above deflection limitation.

1.03 PROJECT CONDITIONS

A. Comply with ASTM C 840 requirements or wallboard material manufacturer's written recommendations, whichever are more stringent.

PART 2 - PRODUCTS

2.01 METAL FRAMING

A. Framing Members, General: Comply with ASTM C 754 for conditions indicated.

B. Steel Sheet Components: Comply with ASTM C 645 requirements for metal, unless otherwise indicated.

C. Protective Coating: ASTM A 653/A 653M, G40 (Z120), hot-dip galvanized, unless otherwise indicated.

D. Grid Suspension System for Ceilings: ASTM C 645, direct-hung system composed of main beams and cross-furring members that interlock.

1. Product Reference: Armstrong World Industries, Inc.; Drywall Grid Systems.

E. Steel Studs and Runners: ASTM C 645, in minimum depth indicated in partition type details.

F. Minimum Base Metal Thickness:

1. Typical: As required to comply with deflection criteria.

G. Partitions Supporting Wall Mounted Casework: 16 gage minimum.

1. Depth: As indicated.

H. Single Long-Leg Runner Deflection Track System: ASTM C 645 top runner with 2-inch-deep flanges in thickness not less than indicated for studs, installed with studs friction fit into top runner and with continuous bridging located within 12 inches of the top of studs to provide lateral bracing.

I. Flat Strap and Backing Plate: 36-inch-wide steel sheet, with minimum base metal thickness of 0.0312

inch, used for blocking and bracing required for the attachment of surface mounted items and accessories indicated. Locate to span a minimum of 2 studs.

J. Cold-Rolled Channel Bridging: For channel bridging for fixture attachment or lateral bracing provide 0.0538-inch bare steel thickness, with minimum 1/2-inch-wide flange:

1. Depth: 1-1/2 inches.

2. Clip Angle: 1-1/2 by 1-1/2 inch, 0.068-inch-thick, galvanized steel.

K. Hat-Shaped, Rigid Furring Channels: ASTM C 645, 0.0179-inch minimum base metal thickness; 7/8 inch deep.

L. Fasteners for Metal Framing: Of type, material, size, corrosion resistance, holding power, and other properties required to fasten steel members securely to substrates involved; complying with the recommendations of the gypsum board manufacturers for applications indicated.

M. Tie Wire: ASTM A 641/A 641M, Class 1 zinc coating, soft temper, 0.0625-inch diameter wire, or double strand of 0.0475-inch diameter wire.

N. Hanger Attachments to Overhead Decks: Suitable for application indicated, fabricated from corrosion-resistant materials, with eyepins, clips or other devices for attaching hangers and capable of sustaining, without failure, a load equal to 10 times that imposed by the complete ceiling system.

O. Hangers: Wire hangers; ASTM A 641/A 641M, Class 1 zinc coating, soft temper, 0.162-inch diameter.

P. Wood Blocking and Plywood Concealed in Partition Construction: Fire-retardant-treated, refer to Section 06 10 53 "Miscellaneous Rough Carpentry."

Q. Isolation Strip at Exterior Walls: Adhesive-backed, closed-cell, compressible, non-extruding, sound transmission reducing, vinyl foam tape strips with approximately 13 Shore 00 hardness that allow fastener penetration without foam displacement, 1-inch-thick, in width 1/2 inch less than window mullion width.

1. Product Reference: V730 Norton Sealant Tape; gray color.

PART 3 - EXECUTION

3.01 INSTALLING STEEL FRAMING, GENERAL

A. General: Install steel framing to comply with GA-600, ASTM C 754, ASTM C 840 and the gypsum board manufacturer's recommendations, where standards conflict the more stringent shall apply.

B. Install supplementary framing, blocking, backer plates and bracing at locations in gypsum board assemblies which are indicated to support fixtures, equipment services, heavy trim, grab bars, toilet accessories, furnishings, or similar construction. Comply with details indicated and with gypsum board manufacturer's written recommendations or, if none available, with United States Gypsum's "Gypsum Construction Handbook."

C. Install bracing at terminations in assemblies.

D. Do not bridge building control and expansion joints with non-load-bearing steel framing members. Frame both sides of joints independently.

3.02 INSTALLING STEEL SUSPENDED CEILING FRAMING

A. Suspend ceiling hangers plumb and free from contact with insulation or other objects within ceiling plenum that are not part of supporting structural or ceiling suspension system. Splay hangers only where required to miss obstructions and offset resulting horizontal forces by bracing, countersplaying, or other equally effective means.

B. Installation Tolerances: Install steel framing components for suspended ceilings so members for panel attachment are level to within 1/8 inch in 12 feet measured lengthwise on each member and transversely between parallel members.

3.03 INSTALLING STEEL PARTITION AND SOFFIT FRAMING

A. Install continuous runners (tracks) sized to match studs at floors, ceilings, and structural walls and columns where gypsum board stud assemblies abut other construction. Secure runners to substrates with fasteners spaced a maximum of 24 inches o.c. unless closer spacing is recommended by the framing manufacturer for the floor and ceiling construction involved. Provide fasteners at all corners and ends of runner tracks.

B. Where studs are installed directly against exterior walls, install foam gasket isolation strip between studs and wall.

C. Installation Tolerance: Install each steel framing and furring member so fastening surfaces vary not more than 1/8 inch from the plane formed by the faces of adjacent framing.

D. Frame door openings to comply with GA-600 and with gypsum board manufacturer's applicable written recommendations, unless otherwise indicated. 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.

END OF SECTION 09 22 00

SECTION I-09250

GYPSUM DRYWALL

PART 1 – GENERAL

1.01 DESCRIPTION

A. General: Provide gypsum drywall in accordance with the Contract Documents.

B. Related Work Specified Elsewhere

1. Finish Painting of gypsum assemblies. Section 09900
2. Access Doors – Section 08305
3. Section "Access Flooring" for provision of acoustically rated wall closures below access flooring at acoustically rated partitions.

1.02 QUALITY ASSURANCE

A. Single-Source Responsibility for Steel Framing: Obtain steel framing members for gypsum board assemblies from a single manufacturer.

B. Single-Source Responsibility for Panel Products: Obtain each type of gypsum board and other panel products from a single manufacturer.

C. Single-Source Responsibility for Finishing Materials: Obtain finishing materials from either the same manufacturer that supplies gypsum board and other panel products or from a manufacturer acceptable to gypsum board manufacturer.

D. Single-Source Responsibility for Plastic Sanitary Panel Materials: Provide panels and molding only from one manufacturer to ensure warranty and color harmonization of accessories.

1.03 REQUIREMENTS OF REGULATORY AGENCIES

A. Wherever a fire resistance classification is shown involving drywall (3-hr., 2-hr, and similar designations), provide materials, accessories and application procedures which have been listed by UL or tested according to ASTM El 19 to achieve the rating required.

1.04 SUBMITTALS

A. Shop Drawings: Submit detailed shop drawings as follows:

1. Details of all unusual conditions in connection with gypsum drywall construction.
2. Proposed locations of control joints that are required but not shown.
3. Locations of access doors occurring in gypsum drywall construction.
4. Details of attachment to primary ceiling supports.
5. Details of rated assemblies with copies of their respective approvals. Coordinate with Section "Firestopping" to provide combined submittals for partition head details and penetration details at rated partitions.
6. Details of sanitary panels with gypsum drywall assemblies including the locations and dimensions of joints and fastener attachments.

B. Samples: Submit the following samples:

1. in. long sample of each type of metal trim and control joints.

2. 6 in. long sample of partition end cap.

3. 12 in. sq. sample of sanitary panels complete with accessories.

C. Product Data: Submit manufacturer's technical data for each component of gypsum drywall system, including all related accessories.

D. Certifications: Submit the following:

1. Certification signed by manufacturer of gypsum board assembly components certifying that their products comply with specified requirements, comply with UL designations shown and is approved for use by local authorities having jurisdiction.

2. Panel Adhesives: Submit certification that adhesives used in the field for installation of Gypsum Drywall panels shall have a VOC 200 or less.

3. Recycled Content: Submit certification, including written data and specifications, highlighting percentage of recycled content for all miscellaneous metal items.

1.05 PERFORMANCE CRITERIA

A. Design and install gypsum drywall components so that the completed partition will withstand a minimum inward and outward pressure of 5 psf normal to the plane of the wall.

B. When subjected to the specified minimum positive and negative pressures, deflection of support framing for gypsum drywall systems shall be limited to 1/240 of the span in height, except as otherwise shown or specified.

C. In areas where top of partitions is dependent on ceiling system for lateral support, coordinate design and installation to comply with Paragraph 1.04 A and 1.04 B.

D. Deflection of all shaftwall systems shall be limited to 1/240 of the span in height. In areas where room side finish is veneer plaster or ceramic tile, deflection of all shaftwall systems shall be limited to 1/360 of the span in height.

E. All gypsum interior drywall suspended ceilings shall be designed for deflection not to exceed 1/360 of the distance between supports.

1.06 PRODUCT HANDLING

A. Delivery: Deliver materials to project site in manufacturer's unopened bundles and containers with manufacturer's name, brand, type and grade clearly indicated thereon. Handle gypsum board to prevent damage to edges, ends, and surfaces. Do not bend or otherwise damage metal corner beads and trim.

B. Material Protection: Avoid exposure of material to the weather by using protective covers. Handle materials to avoid damage. Neatly stack gypsum panels flat to prevent sagging.

C. Storage: Store materials inside, above grade in a dry, ventilated space, under cover and in accordance with manufacturer's instructions. Protect from soiling or damage.

1.07 PROJECT CONDITIONS

A. Installation of wallboard joint treatments shall not start when outside temperature is below 55°F, unless building is enclosed and heated to maintain a continuous and uniform temperature of not less than 55°F, from one week prior to beginning of joint treatment until joint treatment is completed and thoroughly dry. Ventilation, either natural or supplied by fans, circulators or air conditioning systems shall be provided to remove excess moisture during joint treatment. Temperature requirements may be waived only on recommendation of wallboard materials manufacturer.

1.08 PROTECTION

A. Protect and maintain the work through the construction period so that it will be without any indication of damage at the time of acceptance by the Owner.

B. Protect all fixtures, frames, inserts and other contiguous work from rusting, soiling or clogging due to

gypsum drywall installation.

C. Provide ventilation in areas where plastic sanitary panels are scheduled for installation to disperse fumes during application of adhesive as recommended by the adhesive manufacturer.

PART 2 – PRODUCTS

2.01 MATERIALS

A. General: Gypsum board products specified herein by proprietary designation are as manufactured by U.S. Gypsum Company and establish the quality standards required. Equivalent products of G-P Gypsum Corp., National Gypsum Company and other manufacturers will be considered provided they meet those established standards. For fire rated assemblies, provide materials, including accessories and fasteners produced by one manufacturer, or, when products of more than one manufacturer are used in a rated system, they shall be acceptable to all authorities having jurisdiction.

B. Recycled Content: Provide gypsum drywall panels utilizing a min. 10% recycled content, and 100% recycled paper face.

C. Gypsum Wallboard: 5/8 in. thick, "Firecode-C Type X", unless otherwise shown. Where fire resistive ratings are shown use thickness required to comply with assembly fire testing of drywall partitions for fire rating required. Comply with following requirements:

1. Face Layer: ASTM C36, with tapered edges and either rounded or beveled returns for prefilling.
2. Base Layer: ASTM C36.
3. Water Resistant: ASTM C630.
4. Liner Board: "USG Gypsum Liner Panel", 1 in. thick with moisture-resistant paper faces.

D. Cementitious Backer Board: Provide cementitious backer units complying with ANSI Al 18.9, of thickness indicated below, and in maximum lengths available to minimize end-to-end butt joints; Provide one of the following:

1. "Durock" (U.S. Gypsum Co.); *Vz* in. thick.
2. "Wonder-Board" (Glasscrete Inc.); 7/16 in. thick.
3. "Util-A-Crete" (FinPan, Inc.); *Vz* in. thick.
4. "DomCrete Cementitious Tile Backer Board" (Domtar Gypsum); *Vz* in. thick.
5. "Cemroc Panels (Eternit, Inc.); *Vz* in. thick.

E. Fasteners

1. For securing to concrete or masonry use hardened steel concrete stub nails of sufficient length to provide permanent fastening.
2. For all other applications involving gypsum drywall comply with wallboard manufacturer's printed recommendations.
3. For fastening cementitious backer units use corrosion resistant coated steel drill screws of size and type recommended by board manufacturer.

F. Joint Treatment Materials: Provide joint treatment materials complying with ASTM C475 and the recommendations of both the manufacturers of sheet products and of joint treatment materials for each application shown.

1. Joint Tape for Gypsum Board: Paper reinforcing tape, unless otherwise shown. Use pressure-sensitive or staple-attached open-weave glass-fiber reinforcing tape with compatible joint compound where recommended by manufacturer of gypsum board and joint treatment

materials for application indicated.

2. Joint Tape for Cementitious Backer Units: Polymer-coated, open glass-fiber mesh.

3. Drying Type Joint Compounds for Gypsum Board: Factory packaged and mixed vinyl based ready mix formulation.

4. Joint Compound for Cementitious Backer Unit: Material recommended by cementitious backer unit manufacturer.

G. Laminating Adhesive: Special adhesive or joint compound recommended for laminating gypsum panels, with a maximum VOC of 200.

H. Spot Grout: ASTM C475, setting-type joint compound recommended for spot grouting hollow metal door frames.

I. Acoustical Sealant: One of the following:

1. "SHEETROCK Acoustical Sealant" (United States Gypsum Co.).

2. "AC-20 FTR Acoustical and Insulation Sealant" (Pecora Corp.).

J. Trim Accessories: Accessories specified herein by proprietary designation are as manufactured by Unimast Inc. and establish the quality standards required. Equivalent products of other manufacturers will be considered provided they meet those established standards. For fire rated assemblies, provide materials, including accessories and fasteners produced by one manufacturer, or, when products of more than one manufacturer are used in a rated system, they shall be acceptable to authorities having jurisdiction.

1. Corner Reinforcement: "Dur-A-Bead 103" galvanized. Install in one piece when manufactured in length required.

2. Metal Trim: Galvanized steel, the following types:

a. "No. 200-A", channel type, sized for ½ in. or 5/8 in. wallboard; install in one piece when manufactured in length required.

b. "No. 200-B", angle type, sized for ½ *in*. or 5/8 in. wallboard; install in one piece when manufactured in length required.

c. "Reveal type trim; No. 400 Series" channel type; install in one piece when manufactured in length required.

3. Control Joint: "No. 093", roll-formed zinc.

K. Specialty Accessories

1. Partition End Caps: 0.020 in. thick, hot dipped galvanized, bonderized and primed sheet steel, sizes as noted; "DWC Wall Cap" (Milgo/Bufkin) or approved equal.

2. Aluminum Trim: Extruded or formed aluminum trim with ¼ in. dia. holes in fins for attachment to drywall, staggered ½ o.c.; longest lengths available; primed for finish painting; provide one of the following for each type specified:

a. Jamb Reveal for 1/2 in x 1/2 in. reveals

1) "STR-050-050" (Pittcon Industries)

2) "DRMZ-50-50" (Fry Reglet Corp.).

3) "Series 300 312-1/2" (Gordon Inc.).

b. Jamb Reveals for other reveals:

1) for 1/4 in. wide use "SWR-U-025-063" (Pittcon Industries)

2) for 3/8 in. wide use "SWR-U-025-063" (Pittcon Industries)

c. Channel Wall Reveal

1) "SWR-050-050" (Pittcon Industries)

2) "DRM-50-50" (Fry Reglet Corp.).

3) "Series 500 512-1/2" (Gordon Inc.).

d. Rounded Outside Corner

1) "SO-9-200" (Pittcon Industries).

2) "DRMC-OS-100" (Fry Reglet Corp.).

3) "Series 110-90" (Gordon Inc.).

e. Perimeter Relief: "P-I" (USG or equivalent from Pittcon Industries, Fry Reglet Corp or Gordon Inc. Vinyl trim for use at perimeter of 50 ft. x50 ft. ceiling areas.

3. Partition Attachment Clips: Coordinate with the requirements of Section "Acoustical Ceilings" as required to provide partition attachment clips recommended by the exposed mechanical suspension system manufacturer for securing gypsum drywall partitions to ceiling suspension system. Provide a complete system with all components including fasteners and other items in sufficient quantity to perform the Work.

4. Stainless Steel Edge Trim: Provide stainless steel edge trim fabricated from AISI type 304 stainless steel, ASTM A276 bar stock, t/S 1/4 in. thick unless otherwise shown, with all surfaces ground, edges arrised, and corners slightly eased, finish to match MTL 200 (No. 6 Satin Long grain finish) in Section 06400, "Architectural Woodwork". Provide protective finish over trim to protect it from damage during construction.

L. Structural Accessories: Accessories specified herein by proprietary designation are as manufactured by Unimast Inc. and United States Gypsum Co. and establish the quality standards required. Equivalent products of other manufacturers will be considered provided they meet those established standards. For fire rated assemblies, provide materials, including accessories and fasteners produced by one manufacturer, or, when products of more than one manufacturer are used in a rated system, they shall be acceptable to authorities having jurisdiction.

1. Runners: ASTM C645, roll formed galvanized steel, channel or angle shape, type, size and gage as recommended by the drywall manufacturer for the wall system indicated.

2. Metal Studs: ASTM C645, roll-formed galvanized steel, size and gage as recommended by the drywall manufacturer for the wall system and height indicated; the following types:

a. "ST" and "CWS" (Unimast Corp.), for interior partitions, ceilings and column fireproofing.

b. Steel "C-H Stud" or "E-Stud" (United Gypsum Co.) for cavity shaftwall construction.

3. Furring Channels: "Rigid Furring Channel"; ASTM C645, roll-formed galvanized steel, flanged channel type, 7/8 in. deep; for wall furring and ceiling attachment.

4. Furring Brackets: Serrated-arm type, adjustable, fabricated from corrosion-resistant steel sheet complying with ASTM C645, minimum thickness of base (uncoated) metal of 0.0329 inch, designed for screw attachment to steel studs and steel rigid furring channels used for furring.

M. Sheet Metal Grounds: 16 gage galvanized sheet metal fastened to studs; where shown or required for attachment of other work; size as required for each individual item.

N. Corner Angles and Elevator Jamb Struts: Formed galvanized steel sheet angles, size and gauge as recommended by the wallboard manufacturer for the wall system indicated.

O. Ties: Comply with the requirements of Underwriters' Laboratories, Inc., and the wallboard manufacturer for the following types:

1. ASTM C754, 18 gage tie wire.

2. 1/2 in. x 0.015 in. steel strapping.

P. Sound Attenuation Blankets: Unfaced mineral-fiber blanket insulation produced by combining mineral fibers of glass, slag wool, or rock wool type with thermosetting resins to comply with ASTM C665 for Type I (blankets without membrane facing).

Q. Water: Clean and free of deleterious material.

R. Primary Suspension Members for Ceilings

1. General: Size and provide ceiling support components to comply with ASTM C754 and California seismic requirements.

2. Wire Hanger Inserts: No. 6 galvanized wire loop and 26 gage galvanized shell or 14 gage galvanized steel strap with 5/16 in. hole.

3. Strap Iron Hanger Inserts: Mild steel flats, 1 in. x 3/16 in. with 7/16 in. holes punched on center line and lower ends, designed to develop the full strength of hangers.

4. Hanger Anchorage Devices: Screws, clips, bolts or other devices applicable to the indicated method of structural anchorage for ceiling hangers. Provide anchorage devices sized for five (5) times the calculated load supported.

5. Hangers: Galvanized, one of the following:

   a. 3/16 in. x 1 in. steel straps.

   b. % in. diameter steel rods.

   c. 9 ga. soft steel wire.

6. Carrying Channels: ASTM C754, cold rolled steel channels, 1-1/2 in., 475 lbs. per 1000 linear ft.

7. Clips: Provide support clips, clamps, fasteners, and other attachment devices as required to connect components and transfer imposed loads of primary suspension system.

S. Partition End Closures: Continuous closed cell neoprene compressible filler complying with ASTM D1056; with pressure sensitive temporary positioning adhesive on both sides; thickness and width as shown, or as required to provide a complete sound seal at window wall mullions and glass window walls.

1. Wall and Ceiling Panels: 0.075" (2.3mm) thick "Glasbord-FSI Class "A" Fire Rated"; color: 85 White; with smooth gloss finish.

   a. Underwriters Laboratories (U.L.) Listed.

   b. Fire Performance when tested in accordance with ASTM E84:

      1) Class A Flame Spread than 25,

      2) Smoke Developed less than 450.

         a) Barcol Hardness (scratch resistance) of 55 as per ASTM D-2583.

         b) Panels will exhibit no more than a 0.038% weight loss after a 25-cycle Taber
         Abrasion Test.

         c) Gardner Impact Strength of 22 in./lbs. (25.6 cm/kg) per ASTM D-3029.

2. Division Bars, Corner Trim: Panel manufacturer's standard length extruded vinyl pieces; longest length possible to eliminate end joints.

3. Adhesive and Fasteners: As recommended by the manufacturer of the plastic sanitary panel system.

T. Shaft Wall: Components as required to provide fireproof assemblies for the hourly rating shown or required and complying with UL listing.

1.02 MIXES

A. Mix joint compound in the proportions recommended by the approved wallboard manufacturer.

Retempering of mix will not be permitted, nor will the use of partially set joint compound be permitted. Allow complete breakdown of binder before use. Mix in batches that can be used within period of recommended pot life of compound.

PART 3 – EXECUTION

3.01 CONDITION OF SURFACES

A. Examine the substrates and adjoining construction and the conditions under which the work is to be installed. Do not proceed with the Work until unsatisfactory conditions have been corrected.

3.02 INSTALLATION

A. Install gypsum wallboard and accessories in accordance with ASTM C840, unless otherwise shown or specified. Install gypsum panels with face side out. Do not install imperfect, damaged, or damp panels.

B. Install metal stud components in accordance with ASTM C754, unless otherwise shown or specified. Space metal studs maximum of 16 in. o.c., unless otherwise shown. At door frames install special studs, as recommended by wallboard manufacturer. Install steel studs so flanges point in the same direction and leading edge or end of each gypsum board panel can be attached to open (unsupported) edges of stud flanges first.

C. If sprayed-on fireproofing has been applied, remove only as much fireproofing as needed to complete installation of drywall construction. Protect fireproofing that remains from damage.

D. Isolate framing from building structure to prevent transfer of loading imposed by structural movement both horizontally and vertically, at the following locations:

1. Where edges of suspended ceilings abut building structure horizontally at ceiling perimeters or penetration of structural elements. At ceilings up to 50 ft. x 50 ft. without control joints, provide perimeter relief trim as required to isolate ceilings from wall construction.

2. Where partition and wall framing abut overhead structure. Provide slip or cushioned type joints to attain lateral support and avoid axial loading.

E. Do not bridge building expansion and control joints with steel framing or furring members; independently frame both sides of joints with framing or furring members.

F. Install runner tracks at floors, ceilings and structural walls and columns where stud system abuts other work, except as otherwise indicated. Install fasteners a maximum of 2 in. from each corner and end of tracks.

G. Terminate partition stud system at structure above except where otherwise indicated.

H. Provide steel studs at door openings in accordance with the following schedule:

Door Width	Studs
Single doors to 2 ft.-8 in.	Two 25 ga. studs or one 20 ga. stud at each jamb and one additional stud no more than 6 in. from stud. At fire rated openings, use one 20 ga. stud only.
Single doors greater than 2 ft.- 8 in. to 4 ft.	One 20 ga. stud at each jamb and one additional stud no more than 6 in. from jamb studs.
Single doors greater	Two 20 ga. studs at each jamb and one additional stud

than 4 ft. and all pairs of doors. no more than 6 in. from jamb studs,

1. Provide runner track and typical studs above door openings with studs spaced not more than 24 in. o.c.
2. At all welded frames with fixed anchor clips secure stud reinforcing to jamb anchor clips with not less than two self tapping screws per clip.

I. Provide additional framing, reinforcing and blocking as required to support wallboard at openings and cutouts and to support built-in anchorage, support fixtures, equipment services, heavy trim, grab bars, toilet accessories, furnishings, or similar construction and attachment devices for other work.

1. At fire rated partitions, where items are recessed mounted in the partition (including but not limited to metal toilet accessories and water fountains), comply with manufacturer's written installation instructions required to maintain partition rating.
2. Provide miscellaneous metal reinforcing and wood blocking as required to support imposed loads. Coordinate with Sections "Architectural Woodwork" and "Miscellaneous Metals", for provision of support steel within drywall partitions to comply with performance criteria specified in that section for support of handrails on drywall partitions. Provide 16 ga. min. sheet metal grounds within drywall partitions for attachment of studs, toilet partitions, grab bars, toilet accessories and other items. Clearly identify location of grounds on face layer of drywall as required for installation of work by other trades specified in other sections of these Specifications.

J. Butt wallboard joints loosely together. 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 place butt ends against recessed or tapered edges. Allow a maximum gap of % in. at end joints.

K. Install maximum practical lengths of wallboard to span walls with minimum number of end butt joints. Where butt joints are necessary, stagger joints and locate as far as possible from center of walls.

L. Locate both edge or end joints over supports, except in ceiling applications where intermediate supports or gypsum board back-blocking is provided behind end joints. Position adjoining panels so that tapered edges abut tapered edges, and field-cut edges abut field-cut edges and ends. Do not place tapered edges against cut edges or ends. Stagger vertical joints over different studs on opposite sides of partitions. Avoid joints at corners of framed openings where possible. Attach gypsum panels to steel studs so that the leading edge or end of each panel is attached to open (unsupported) edges of stud flanges first.

M. Install control joints as shown and in areas as recommended by drywall manufacturer. Obtain Architect's approval for all locations. In fire rated partitions, install control joints in accordance with manufacturer's recommendations and so as not to compromise specified ratings.

N. Install trim accessories and specialty trim accessories where shown and where recommended by U.S. Gypsum Co. Inc.'s "Good Design Practices". Install metal trim at all exposed edges, frames and other locations as shown. Install corner reinforcement at all external corners, at intersections of gypsum board ceilings and soffits, and other locations as shown. Fasten trim securely through face of gypsum drywall into metal studs behind with appropriate fasteners.

O. At hollow metal door frames, cut boards to fit around hardware reinforcement or mortar boxes. Spot grout frames with a quick setting grout or compound at each jamb anchor clip just prior to inserting of boards into frame at tenant entry doors and base building doors. Insert boards into frame so that its edge is fully bedded against inside surface of the frame. Butter the edge of boards with joint compound if necessary, to achieve full bedding.

P. Form curved wallboard surfaces in accordance with manufacturer's recommendation to provide a finish surface which is a smooth, even curve without flat faces or other imperfections.

Q. Cut openings in wallboard for electrical outlets, piping and other penetrations. Maintain close tolerances so that edges will be covered by plates and escutcheons. Cut both face and back paper. Do not install electrical outlets back-to-back on opposing sides of partitions.

R. Install fasteners not less than 3/8 in. from ends or edges of wallboard sheets, spacing fasteners opposite each other on adjacent ends or edges. Begin fastening from center of wallboard and proceed toward edges and corners. Apply pressure on surface of wallboard adjacent to fasteners being driven to ensure that wallboard will be secured tightly to supporting members. Drive fastener with shank perpendicular to face of board. Drive screws with a power screwdriver as recommended by wallboard manufacturer. Set heads of screws slightly below surface of paper without cutting paper. Space fasteners in gypsum panels according to referenced gypsum board application and finishing standard and manufacturer's recommendations.

S. Partition Attachment Clips: Install partition attachment clips recommended by the exposed mechanical suspension system manufacturer to comply with performance requirements specified herein and in Section 09510 "Acoustical Ceilings" and as follows:

1. Install a minimum of 2 ft. o.c.; alternating direction of each clip, along entire length of runner for each partition which is dependent on the ceiling system for lateral support.

T. Provide acoustical sealant at perimeter of wallboard areas as follows unless otherwise shown or noted:

1. At partition walls, provide continuous beads of acoustical sealant at juncture of both faces of runners or plates with floor and ceiling construction, and wherever wallboard abuts dissimilar materials (i.e., doors and windows). Apply prior to installation of wallboard.

2. At ceilings, provide continuous beads of acoustical sealant wherever wallboard abuts dissimilar materials.

3. Provide continuous bead of acoustical sealant behind faces of all control joints. Apply prior to installation of surface-applied control joint accessories and locate at proper depth in joint to allow for insertion of expansion portion of control joint accessory.

4. At openings and cutouts, fill open spaces between wallboard and fixtures, cabinets, ducts and other flush or penetrating items, with continuous bead of acoustical sealant.

5. Provide acoustical sealant at sides and backs of electrical boxes to completely seal all openings and joints.

6. Sound Flanking Paths: Where sound-rated partition walls intersect non-rated wallboard partition walls, extend sound-rated construction to completely close sound flanking paths through non-rated construction. Provide acoustical sealant at joints between face layers at vertical interior angles of intersecting partitions.

U. Partition End Fillers: Install compressible filler continuously between window wall mullion and gypsum drywall partition end filler panels, maintaining a min. of 3/4 in. spacing to allow for window wall deflection. Utilize self adhesive to position end fillers on window wall mullion. Adhesively apply compressible filler continuously from floor to ceiling including underside of soffit. Do not penetrate aluminum window wall mullion with any type of fastenings. Prior to installing partition studs or vertical support members, apply manufacturer's recommended adhesive to side facing partition to allow for two-sided adhesion and a continuous seal.

3.03 SINGLE LAYER APPLICATION

A. Walls: Apply wallboard on walls horizontally for ceiling heights less than 8 ft. 1 in. Where ceiling heights are over 8 ft. 1 in. or wall is 4 ft. wide or less apply wallboard vertically. Where horizontal application is used on walls, apply top panel first and butt tight to ceiling. Where vertical application is used apply wallboard from ceiling to floor by single length of wallboard. Hold joints back at least 8 in. from corners of door frames. Space nails not more than 8 in. o.c., and space screws not more than 16 in. o.c.

B. Ceilings: On ceilings, apply gypsum panels prior to wall/partition board application to the greatest extent possible and at right angles to framing, unless otherwise indicated.

3.04 DOUBLE LAYER APPLICATION

A. Walls

1. Base Layer: Apply on walls vertically with long joints on framing members. Space nails not more than 8 in. o.c., and space screws not more than 16 in. o.c.

2. Face Layer: Laminate face layer to base layer with laminating adhesive, with joints on surface spaced 10 in. from the parallel joints in the base layer. Cut and fit boards before applying adhesive. For fire-rated construction provide screw attachment or apply adhesive uniformly over entire back surface to comply with UL listing for the rating shown. For non-rated construction apply adhesive in 3/8 in. x *Vz* in. beads and support as recommended by the wallboard manufacturer until proper bond is developed. Remove temporary bracing and supports.

B. Ceilings: Apply base layer prior to applying base layer on walls/partitions; apply face layers in same sequence. Offset face-layer joints at least 10 in. from parallel base-layer joints. Apply base layers at right angles to framing members unless otherwise indicated.

3.05 SOUND CONTROLLED PARTITIONS (Conference Rooms and Powder Room)

A. Provide the combination of wallboards and framing as shown. Apply acoustical sealant in beads under wallboard each side of partitions at perimeters and at intersections. Size and place beads as recommended by the sealant manufacturer to ensure the STC rating of the wall system. Provide acoustical sealant beads in back of control joints, around outlet boxes, and at perimeter of all cutouts to completely seal all openings and joints.

B. Install acoustical insulation where shown. Form continuous layer for full height of partition and tightly abutting web of studs. Fit carefully behind electrical outlets and other penetrations. Attach to back face of wallboard in accordance with manufacturer's instructions.

C. Sound Flanking Paths: Where sound-rated partition walls intersect non-rated wallboard partition walls, extend sound-rated construction to completely close sound flanking paths through non-rated construction. Caulk joints between face layers at vertical interior angles of intersecting partitions.

D. At sound-controlled partitions on access flooring, provide batt insulation laid 6 inches beyond wall on both sides of partition beneath the access floor to substrate below. Pack insulation as required to prevent slippage and provide a sound barrier.

E. At sound rated partitions, where cable trays and conduit banks and duct banks above suspended ceiling prohibit or impede a direct continuation of the partition to the substrate above, provide custom fabricated detailing to offset partition with full stud overlap and reinforced plate connections of offset partitions as required to bypass obstructions, while maintaining the acoustical rating as well as the structural integrity of the partition. Where offset is deep, provide additional metal stud bridging and diagonal bracing to structure above. Provide additional reinforcing and blocking where required to support other imposed items, including but not limited to projection screens.

3.06 WATER RESISTANT DRYWALL

A. Use as a substrate for ceramic tile and elsewhere as shown.

B. Pre-cut panels to required size and make necessary cut-outs. Treat cut or exposed panel edges before installation in accordance with manufacturer's written instructions. Maintain factory made paper edge at bottom of panels.

C. In areas to receive ceramic tile finish, treat all joints, penetrations, and fastener heads with specified joint treatment in accordance with manufacturer's written instructions.

3.07 CEILINGS

A. Provide hangers and inserts necessary to support suspended ceilings below concrete slab before concrete is cast and in time to avoid delay in work. Give particular attention to the correct location and alignment of hangers and inserts. Frame openings with furring strips so that recessed items finish flush, unless shown.

B. Provide sufficient hangers for runner channels on each side of light fixtures, ceiling diffusers and grilles, access panels and other items penetrating the ceiling.

C. Where ceilings are suspended below ductwork, piping or other building elements which are not suitable for ceiling attachment due to strength limitations, or restrictions of local authorities having jurisdiction, provide additional supplemental framing, supports and related work as required to span beneath these elements from suitable support locations. Keep hangers and braces 2 in. clear of ducts, pipes and conduits.

D. Secure furring channels to primary carrying channels by clips or wire ties. Space furring channels on centers recommended by wallboard manufacturer.

E. Fasten wallboard with screws to furring channels on 12 in. o.c.

F. Fascia/Soffits: At fascia/soffits with light coves, provide lighting closure as shown composed of 12 ga. sheet steel enclosure with 12 ga. stabilizing gusset plates secured 12 in. o.c., wood blocking and miscellaneous steel reinforcement and supports as required for a secure substrate for installation of drywall, free from warpage, racking, or any other movement which could cause cracking in the finish work. Install gypsum drywall system, including protective edge trim over lighting closure as specified herein.

3.08 CEMENTITIOUS BACKER BOARD

A. Install cementitious backer board in accordance with manufacturer's printed recommendations.

B. Pre-cut board to required sizes, making necessary cut-outs. Fasten boards to studs with screws spaced not more than 8 in. center to center.

C. Apply 2 in. wide fiberglass reinforcement tape over joints and corners; embed with mortar or adhesive used to set tile.

3.09 CHASES

A. Align two parallel rows of floor and ceiling runners and secure as hereinbefore specified for partitions.

B. Position metal studs vertically in runners, 16 in. o.c. and secure to runners with screws.

C. Brace studs with 2-1/2 in. metal studs installed horizontally at 48 in. o.c.

D. Install wallboard as hereinbefore specified for partitions.

3.10 SHAFT WALL INSTALLATIONS

A. Provide "Cavity Shaft Wall" (U.S. Gypsum Company) or approved equal, as shown consisting of metal runners, studs, gypsum wallboard and fasteners erected and applied in accordance with the wallboard manufacturer's printed instructions. Provide fireproof assemblies for the hourly rating shown or required and complying with UL listing.

B. Do not bridge building expansion joints with shaft wall system, frame both sides of joints with furring and other support as indicated.

C. Install supplementary framing, blocking, and bracing to support gravity and pullout loads of fixtures, equipment, services, heavy trim, furnishings and similar work which cannot be adequately supported directly by regular framing of gypsum board shaft wall system.

D. Coordinate gypsum board shaft wall construction with sprayed-on fireproofing of the structure, so that both remain complete and undamaged. Patch or replace sprayed-on fireproofing removed or damaged during the installation of the shaft wall system.

1. Before sprayed fire-resistive materials are applied, attach offset anchor plates or ceiling runners (tracks) to surfaces indicated to receive sprayed fire-resistive materials. Where offset anchor plates are required, provide continuous plates fastened to building structure not more than 24 in.o.c.

2. After sprayed fire-resistive materials are applied, remove them only to extent necessary for installation of gypsum board assemblies and without reducing the fire-resistive material thickness below that which is required to obtain fire-resistance rating indicated. Protect remaining fire-resistive materials from damage.

E. At penetrations in shaft wall, maintain fire resistance rating of entire shaft wall assembly by installing supplementary fire protection behind boxes containing wiring devices, elevator call buttons, elevator floor indicators, and similar items.

1. Isolate shaft wall system from transfer of structural loading to system, both horizontally and vertically. Provide slip or cushioned type joints to attain lateral support and avoid axial loading. Comply with details shown and with manufacturer's instructions.

F. Seal gypsum board shaft walls at perimeter of each section which abuts other work and at joints and penetrations within each section. Install acoustical sealant to withstand dislocation by air pressure differential between shaft and external spaces; comply with manufacturer's instructions and ASTM C919.

3.11 GENERAL FINISHING REQUIREMENTS

A. In all areas exposed to view, finish gypsum drywall in accordance with ASTM C840, Level 5, unless otherwise shown or specified. Level 5 consists of embedding the tape in joint compound at joints and angles and applying (3) three separate coats of joint compound over joints, angles, fastener heads, and flanges of trim accessories. Panel surfaces and joint compound must be smooth and free of tool marks and ridges apply a skim coat of joint compound over entire surface. Surfaces must be smooth and free of tool marks and ridges.

1. At base building walls, or walls created in the base building contract, the Contractor shall verify in the field the suitability and acceptability of substrates provided in the base building Contract for application of Level 5 finish in the work of this Contract. Where substrates are deficient, provide corrections, including but not limited to cutting, patching, sanding, priming, and other items recommended by the manufacturer to make the substrate suitable and acceptable for application of Level 5 finish in the work of this Section.

B. Under wall covering, in mechanical equipment rooms, elevator machine rooms, electrical closets, utility rooms and other similar type rooms not exposed to view, finish gypsum drywall in accordance with ASTM C840, Level 4, unless otherwise shown or specified. Level 4 consists of embedding the tape in joint compound at joints and angles and applying (3) three separate coats of joint compound over joints, angles, fastener heads, and flanges of trim accessories. Panel surfaces and joint compound must be smooth and free of tool marks and ridges.

C. Fill openings around cutouts, penetrations and other openings with acoustical sealant as recommended by manufacturer.

D. Reinforce all joints at tapered edges and interior corners with joint reinforcing tape set in joint compound in accordance with manufacturer's printed instructions and ASTM C840, levels of finish as specified. In areas where water resistant gypsum wallboard is utilized as a substrate for ceramic tile, follow manufacturer's written instructions.

E. Installation of Metal Trim: Install metal trim and accessories in accordance with manufacturer's written instructions and recommendations. For trim accessories with back flanges, fasten to framing with the same fasteners used to fasten gypsum board. Otherwise, fasten trim accessories according to accessory
manufacturer's directions for type, length, and spacing of fasteners.

3.12 FIELD QUALITY CONTROL

A. Tolerances

1. Light gauge framing within 1/8 in. in 10 ft. (non-cumulative) for plumbness and level., +/- 1/8 in. for fastening surfaces of adjacent framing members and for deviation from specified spacing.
2. Finish board surfaces within % in. in 10 ft. (non-cumulative) for plumb, level, warp and bow.
3. Finish board surfaces within+/- % in. from plan location.
4. Finish board surfaces within 1/16 in. between planes of board faces.

END OF SECTION I-09250

SECTION I-09310

TILING

PART 1 – GENERAL

1.01 DESCRIPTION

A. General: Provide ceramic tile in accordance with the Contract Documents.

B. Related Work Specified Elsewhere

1. Provide Ardex Self-Leveler as specified in Section 035400.

1.02 QUALITY ASSURANCE

A. Single-Source Responsibility for Tile: Obtain each color, grade, finish, type, composition, and variety of tile from a single source with resources to provide products of consistent quality in appearance and physical properties without delaying progress of the Work.

B. Single-Source Responsibility for Setting and Grouting Materials: Obtain ingredients of a uniform quality from one manufacturer for each cementitious and admixture component and from one source or producer for each aggregate.

C. Single-Source Responsibility for Waterproofing Materials: Obtain waterproofing materials and associated accessories from one manufacturer for each type waterproofing system.

D. Installer Qualifications: Engage an experienced Installer who has successfully completed tile installations similar in material, design, and extent to that indicated for Project.

1.03 STANDARDS

A. Except as modified by governing codes and by the Contract Documents, comply with the applicable provisions and recommendations of the following:

1. TCA "Handbook for Ceramic Tile Installation".

2. ANSI A137.1 "Standard Specifications for Ceramic Tile."

3. ANSI A108/A118/A136 "Standard Specifications for the Installation of Ceramic Tile."

B. Where the language in any of the documents referred to herein is in the form of a recommendation or suggestion, such recommendations or suggestions shall be deemed to be mandatory under this Contract.

1.04 SUBMITTALS

A. Shop Drawings: Provide shop drawings for the following:

1. Tile patterns and locations. Base and corner details.

2. Widths, details, and locations of expansion, contraction, control, and isolation joints in tile substrates and finished tile surfaces.

B. Samples: Submit samples of each type, class and color of tile, not less than 12 in. square on plywood backing and grouted as required. Sample submittal and Architect's acceptance shall be for color, pattern and texture only. Compliance with all other requirements is the responsibility of the Contractor.

C. Product Data: Submit manufacturer's technical information, specifications and installation instructions for each material required.

D. Certification

1. Submit a Certificate of Compliance to ANSI A137.1 prior to submission of samples for review.

2. Furnish a "Master Grade Certificate" in the form approved in ANSI 137.1 for each type of tile, signed by the manufacturer, certifying to the grade, type and quantity of tile, together with satisfactory information for identification of the containers to which they apply. These certificates shall be supplied promptly after material has been shipped from the factory.

3. Submit certification from the manufacturers of dry-set mortar and grouts that their products conform to the appropriate ANSI "Materials" specifications.

4. Adhesives: Submit certification that adhesives used in the field for installation of Ceramic Tiles shall have a VOC 130 or less.

E. Substrate Acceptability: Submit a certified statement issued by the manufacturers of tile setting materials and countersigned by the tile installer, attesting that all areas and surfaces designated to receive ceramic tiles have been inspected and found satisfactory for the reception of the tile, and are not in conflict with the referenced standards requirements. Application of tile will be construed as acceptance of surfaces.

1.05 MOCK-UP(S)

A. Following approval of ceramic tile and colored grout sample(s), construct a visual mock-up, extent as shown, consisting of specified ceramic tile placed on setting bed to simulate final condition, tile pattern and grouting. Alter or revise mock-up(s) as directed, to the complete satisfaction of the Architect, at which time they shall remain as the standard of workmanship for the Project. Mock-up(s), if approved, may be utilized in the final work.

1.06 PRODUCT HANDLING

A. Deliver materials, other than bulk materials, in manufacturer's unopened containers fully identified with grade labels as specified in TCA 137.1, and with name, brand, type, class, size, color and pattern. Store all materials above grade and protect from weather and damage from any source. Store in accordance with manufacturer's instructions.

B. Prevent damage or contamination to materials by water, freezing, foreign matter, and other causes.

C. Handle tile with temporary protective coating on exposed surfaces to prevent coated surfaces from contacting backs or edges of other units. If despite these precautions coating does contact bonding surfaces of tile, remove coating from bonding surfaces before setting tile.

D. Material Safety Data Sheets: Submit Material Safety Data Sheets with products delivered to jobsite.

1.07 PROJECT CONDITIONS

A. Maintain project conditions and protect the Work during and after installation as required to comply with referenced standards, manufacturer's written recommendations and instructions.

B. Vent temporary heaters to exterior to prevent damage to tile work from carbon dioxide buildup.

C. Maintain temperatures at 50 deg. F. or more in tiled areas during installation and for 7 days after completion, unless higher temperatures and/or longer cure times are required by referenced installation standard or manufacturer's instructions.

1.08 EXTRA STOCK

A. Furnish to the Owner, at the job site, a quantity of tile, grout and trim units equal to 2 percent of amount installed, but not less than one unopened box, for each type, composition, color, pattern and size properly packaged and identified with labels clearly describing contents.

PART 2 – PRODUCTS

2.01 MATERIALS

A. Tile Products

1. General: Provide tile “Standard Grade", complying with ANSI A137.1. Tile shall match samples accepted by the Architect. Obtain each material required for any one type and color of tile work from a single source, so as to minimize variations in appearance and quality.

a. Slip Resistance (COF) Values: All tile indicated to be used on floor surfaces, as manufactured, shall bear a coefficient of friction of not less than .6 when tested in accordance with ASTM C1028 under a wet and dry condition.

b. Ceramic Wall Tile: Non-vitreous white body with matte or gloss finish, cushion edged, spacer lugs on all four sides; 4-% in. sq., 5/16 in. thick unless otherwise shown or specified; Colors as specified in the Tile Schedule. (Architect reserves the right to use 16 tile sheets pre-grouted with white silicone sealant).

c. Unglazed Ceramic Mosaic Tile: Porcelain impervious body with through body color, cushion-edged and PVC-mounted into 12 in. x 24 in. sheets. (Flat tile mounted onto mesh, perforated paper or other sheet material is unacceptable when such material is to remain in place after installation) 2 in. sq., % in thick unless otherwise shown or specified. Colors as specified in the Tile Schedule.

d. Glazed Ceramic Mosaic Tile: Porcelain impervious body, cushion-edged and PVC-mounted into 12 in. x 24 in. sheets. (Flat tile mounted onto mesh, perforated paper or other sheet material is unacceptable when such material is to remain in place after installation) 2 in. sq., % in thick unless otherwise shown or specified. Colors as specified in the Tile Schedule.

e. Quarry Tile: Vitreous body, unglazed, square or cushion edged; 6 in. square, *Vz* in. thick unless otherwise shown or specified. Where slip-resistance quarry tile is shown or specified, surface shall include embedded aggregate. Provide a 6 in. high sanitary cove in areas shown, specified or required by code authorities having jurisdiction. Colors as specified in the Tile Schedule.

f. Glass Tile: Solid cast glass tile of types listed in the schedule, manufactured specifically as a decorative wall and floor tile for toilet.

2. Trim Shapes: Shaped as shown for typical conditions and as required to make a complete installation at all conditions including all required cove type bases, bull-nosed round external corners and square internal corners. Wainscots shall be topped with bullnose trim. Provide ceramic base at all walls and floors with ceramic tile, except where otherwise noted. Match type, class, color and edge of adjoining field units and coordinate sizes with field units.

2.02 MORTARS AND GROUTS

A. Basic Setting Materials

1. Portland Cement: ASTM C150, Type I; white where required to match Architect's sample.

2. Hydrated Lime: ASTM C206, Type S, or ASTM C207, Type S.

3. Sand: ASTM C144.

B. Thick-Bed Leveling Mortar: Proprietary mortar for leveling beds, factory proportioned in dry blend to be mixed with specified manufacturer's liquid additive. Suitable for mortar bed up to 2 in. thickness. Provide one of the following:

1. "Custom-Float Bedding Mortar" with "Acrylic Mortar Admix" (Custom Building Products)

2. "Laticrete 226 Thick Bed Mortar" with "Laticrete 3701 Admix" (Laticrete International, Inc.).

3. "Mapecem" with "Planicrete 50" additive (Mapei).

C. Epoxy Mortar or Adhesive: 100% solids, minimum compressive strength of 3500 psi, chemical

resistant, water cleanable and complying with ANSI Al 18.3. Provide one of the following with a maximum VOC of 130:

1. "Hydroment Color-Poxy" (Bostik).
2. "100% Solids Epoxy Mortar" (Custom Building Products).
3. "Latapoxy 300 Epoxy Adhesive" (Laticrete International, Inc.).
4. "Kerapoxy 410 Mortar" (Mapei).
5. "100% Solids Epoxy Mortar and Grout" (TEC Incorporated).

D. Epoxy Grout: ANSI Al 18.3 chemical-resistant and water cleanable epoxy grout with 100% solids content; color as shown or as required to match Architect's sample; Provide one of the following:

1. "100% Solids Epoxy Grout" (Custom Building Products).
2. "Laticrete 2000 Industrial Epoxy Grout" (Laticrete International, Inc.).
3. "KER 400 Series Kerapoxy Grout" (Mapei).
4. "100% Solids Epoxy Mortar and Grout" (TEC Incorporated).

E. Silicone Setting Bed: "No. 795 Silicone" (Dow Corning).

2.03 AUXILIARY MATERIALS

A. Stone Thresholds

1. Marble Saddles: Fabricate from highest grade Alabama or Georgia marble to match adjacent floor tile, having a minimum abrasion hardness (Ha) of 10.0 when tested in accordance with ASTM C241, thickness as shown with chamfered corners and eased edges, cut from sound stock, uniform in color, free from cracks, and spalled edges. Honed finish on exposed surfaces.

B. Miscellaneous Materials

1. Water: Clear, potable, and without deleterious substances which would impair the work.
2. Pigments: Pure mineral pigments, resistant to alkalies, non-fading and weatherproof, colors as required to match Architect's sample.
3. Reinforcement: ASTM A185, 2 in. x 2 in. x 14 ga. welded wire mesh, galvanized.
4. Primer or Slurry Bond Coat (for Substrate): As recommended by manufacturer of setting bed.
5. Metal Edge Strip: Shape, metal, finish and anchorage system as shown. If not shown, provide zinc alloy or stainless-steel terrazzo strips, 1/8 in. wide at top edge with integral provision for anchorage to mortar bed or substrate.
6. Cementitious Backer Board: One of the following:
    a. "Durock" (U.S. Gypsum Co.); Vz in. thick.
    b. "WonderBoard" (Modulars Inc.); 7/16 in. thick.
    c. "Util-A-Crete" (FinPan, Inc.); Vz in. thick.
    d. "DomCrete Cementitious Tile Backer Board" (Domtar Gypsum); Vz in. thick.
    e. "Cemroc Panels (Eternit, Inc.); Vz in. thick.

C. Waterproofing Materials – Pantries, Coffee Bars, Powder Rooms and Restrooms

1. Polyethylene Sheet Membrane Waterproofing: Manufacturer's standard proprietary product complying with ANSI Al 18.10 and consisting of composite sheets, 60 inches wide by a nominal thickness of 0.030 in. minimum, composed of an inner layer of chlorinated polyethylene (CPE) sheet faced on both sides with laminated high-strength nonwoven polyester material. Provide preformed outside and inside corners, pipe protrusion collars, cap strips, seaming adhesive

and other accessories as required for a complete waterproof installation. Provide one of the following:

2. "NobleSeal TS" (The Noble Co.).

3. "NobleSeal TS" (American Olean).

4. "Dai-Seal TS" (Dai-Tile).

2.04 CERAMIC TILE SCHEDULE: See Drawing G.005

2.05 GLASS TILE SCHEDULE: See Drawing G.005

PART 3 – EXECUTION

3.01 PRE-INSTALLATION MEETING

A. Prior to the installation of tile, and at the Contractor's direction, meet at the project site to review the material selections, substrate preparations, installation procedures, coordination with other trades, special details and conditions, standard of workmanship, and other pertinent topics related to the Work. The meeting shall include the Architect, the Contractor, ceramic tile installer, ceramic tile and setting material manufacturer's representatives, and representatives of other trades or subcontractors affected by the installation. Examine sample installations which have been prepared and determine and record whether everyone present is in agreement that the proposed installations are likely to perform as required.

3.02 CONDITION OF SURFACES

A. Examine the substrates, adjoining construction and the conditions under which the Work is to be installed. Do not proceed with the Work until unsatisfactory conditions have been corrected. Verify that substrates for setting tile are firm, dry, clean, and free from oil laitance, waxy films and curing compounds. Confirm that installation of grounds, anchors, recessed frames, electrical, plumbing and mechanical elements, and similar items located in or behind tile has been completed prior to beginning the Work.

B. Allowable Variations in Substrate Levels

1. Mortar Set Floors: +/- % in. in 10 ft. distance and 3/8 in. total maximum variation from levels shown.

2. Thin-Set Work: Same as allowable variations in finished work.

C. Grind or fill concrete, masonry and plaster substrates as required to comply with allowable variations.

3.03 PREPARATION

A. Mechanically scarify concrete substrate by sandblasting, grinding or a portable shot blast cleaning system as may be required to provide a proper surface or to remove curing compounds or other surface contaminants that would interfere with proper bond of mortar, waterproofing membrane, or adhesive for tile.

B. Seal substrate with sealer if and as recommended by manufacturer of mortar or adhesive.

C. Blending: For tile exhibiting color variations within the ranges selected during sample submittals, verify that tile has been blended in factory and packaged accordingly so that tile units taken from one package show the same range in 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.

3.04 INSTALLATION

A. Unless otherwise shown or specified comply with the referenced standards and the manufacturer's instructions.

B. Mix mortars and grouts to comply with requirements of referenced standards and manufacturers including those for accurate proportioning of materials, water, or additive content; type of mixing equipment, selection of mixer speeds, mixing containers, mixing time, and other procedures needed to produce mortars and grouts of uniform quality with optimum performance characteristics for application indicated.

C. Allowable Variations in Finished Work: Do not exceed the following deviations from level and plumb, and from elevations, locations, slopes and alignments shown:

1. Floors: 1/8 in. in 10 ft. run, any direction; +/- 1/8 in. at any location; 1/32 in. offset at any location.

2. Walls: 1/8 in. in 8 ft. run, any direction; +/- 1/8 in. at any location; 1/32 in. offset at any location.

3. Joints: +/- 1/32 in. joint width variation at any location; 1/16 in. in 3 ft. run for deviation from plumb and true, and for other variations in alignment of joints.

D. Lay out tile work in pattern shown using field tile and trim shapes as shown or required. Center tile fields both directions in each space or on each wall area and adjust to minimize tile cutting. Use uniform joint widths of 1/16 in. for ceramic tile and % in. for quarry tile unless otherwise shown. Align joints when adjoining tiles on floor, base, walls, and trim are same size. Adjust to minimize tile cutting. Cut field tile, not trim shapes, unless otherwise shown. 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 that plates, collars or covers overlap tile. For tile mounted in sheets, make joints between tile sheets same width as joints within tile sheets so that extent of each sheet is not apparent in finished work.

E. Extend tile work into recesses and under equipment and fixtures in the spaces shown or scheduled to receive tile. Form a complete covering without interruptions except for control and expansion joints as shown and as required to comply with requirements. Terminate work neatly at obstructions, edges and corners without disruption of pattern or joint alignments.

F. Sheet Membrane Waterproofing Installation: In areas shown, install sheet membrane waterproofing as per recommendations and written instructions of the manufacturer. Bond to substrates with full bed of adhesive. Position seams so that water would flow over and not against laps in direction toward drains. Turn up sheet membrane waterproofing onto vertical surfaces so that top edge of membrane is not less than 6 in. above the completed tile floor surface and neatly fasten. Seal all corners and seams, penetrations of pipes, conduits, fixtures and drains watertight in accordance with manufacturer's written instruction using recommended materials.

G. Install reinforcement in all horizontal mortar setting beds over membrane waterproofing.

H. Setting Tile on Portland Cement Mortar Setting Bed: Use latex modified dryset mortar to set tile on Portland cement mortar setting bed. Compact and level the Portland cement mortar setting bed accurately and allow it to cure before installing tile. Comply with TCA Method F i l l , ANSI A108.1B and ANSI A108.5 for installation of tile by the dry-set method.

I. Epoxy Installation (Thin-Set): Where an epoxy bond coat is shown use epoxy mortar for thin-set tile work. Comply with TCA Method F131 and ANSI A108.6 for installation of tile.

J. Epoxy Grout Installation: Use epoxy grout where shown. Comply with the following for grouting: ANSI 108.6.

K. Glass Tile Installation: Install in strict compliance with the manufacturer's written recommendations, as follows:

1. Install silicone setting bed with a notched trowel to a depth of 3/8 in., floating consistently and evenly onto dryset substrate. Make sure there are no holes or bubbles in the silicone, once it is troweled onto the substrate.

2. Press tiles evenly and completely into the silicone. Silicone setting bed bust completely cover the entire back and perimeter of the tile in order to keep completely out of direct contact with the tiles colored backing paint.

3. Do not allow silicone to dry or skin over before setting the tile. Do not float more than 3 sq. feet at a time. Install tile with a 1/8 in. joint unless otherwise shown. Remove silicone from tile faces utilizing manufacturer recommended cleaners.

4. Allow a minimum of 72 hours for tile to set before grouting. Fill grout joints thoroughly with silicone grout.

L. Installation of Tile in Pantries: Coordinate with the work of Section 06100, "Rough Carpentry" for installation of plywood subflooring (over access flooring only). Apply two layers of plywood, with top layer installed perpendicular to bottom layer. Secure to access flooring with flush mounted fasteners. Sand top layer to remove rough edges, and burrs, apply fiberglass tape over joints between the top layer of plywood panels. Apply waterproofing system to top of plywood as specified in Paragraph "Membrane Waterproofing". Apply full mudset system specified in this Section and install finish tile as specified in this Section.

M. Control and Expansion Joints: TCA Method EJ171. Where shown as "Control Joint" or "Expansion Joint", and also where required by ANSI Standard for proper workmanship, install removable divider strips of the width shown or of the proper width. Provide strips of same depth as the work, including setting bed. Remove strips after grouting tile and properly curing the work. Install joint fillers and sealants, in control and expansion joints of type as recommended by manufacturer of tile.

N. Metal Edge Strip Installation: Install a continuous metal edge strip adequately anchored into the substrate as follows:

1. Where shown.

2. Where ceramic tile flooring meets other floor covering.

3. Where exposed edge is raised above base flooring to meet "future floor covering".

O. Marble Saddles: Install in one piece, fit neatly to door jambs and set in same type of setting bed as abutting field tile unless otherwise indicated. Set thresholds in latex-portland cement mortar for locations where mortar bed would otherwise be exposed above adjacent non-tile floor finish. Comply with TCA Method TH611.

3.05 CLEANING

A. In addition to the initial cleaning procedure required, and not more than 2 days before occupancy or preliminary acceptance by the Owner, clean ceramic tile work as recommended by the tile manufacturer and TCA.

B. Protect tile work during the construction period so that it will be without any indication of use or damage at the time of acceptance.

C. Upon final cleaning, Contractor to provide sealant at all tile installations as recommended by manufacturer.

END OF SECTION I-09310

SECTION I-09510

ACOUSTICAL CEILINGS

PART 1 – GENERAL

1.01 DESCRIPTION

A. General: Provide acoustical ceilings in accordance with the Contract Documents.

B. Related Work Specified Elsewhere

1. Support clips for gypsum drywall partitions scheduled to be attached to underside of acoustical ceiling system.

2. Division 15 Sections for Air handling components; Fire Protection Systems; Sprinkler heads suspended in ceiling.

3. Division 16 Sections for Lighting fixtures, electrical wiring and related electrical equipment and supports, except support of lighting fixtures where shown.

1.02 QUALITY ASSURANCE

A. The acoustical ceiling work shall be performed by a firm having 5 years' experience in the installation of materials specified herein on projects comparable to this Project. The firm shall have the approval of the acoustical materials manufacturer.

B. Single-Source Responsibility: Obtain each type of acoustical ceiling system from a single source with resources to provide products of consistent quality in appearance and physical properties without delaying progress of the Work.

1.03 PERFORMANCE CRITERIA

A. In areas where gypsum drywall partitions are dependent on the ceiling suspension system for lateral support, design and install suspension system components to sustain the imposed load from the completed partition system including a minimum inward and outward pressure of 5 psf normal to the plane of the wall.

B. Fire-Performance Characteristics: Provide acoustical ceilings that are identical to those tested for the following fire-performance characteristics, per ASTM test method indicated below, by UL or other testing and inspecting organizations acceptable to authorities having jurisdiction. Identify acoustical ceiling components with appropriate markings of applicable testing and inspecting organization.

1. Surface Burning Characteristics: As follows, tested per ASTM E 84 and complying with ASTM E 1264 for Class A products.

a. Flame Spread: 75 or less.

b. Smoke Developed: 100 or less.

1.04 SUBMITTALS

A. Shop Drawings: Submit details and reflected ceiling plans of acoustical ceilings before proceeding with Work. Provide coordination drawings for reflected ceiling plans drawn accurately to large scale and coordinating penetrations and ceiling-mounted items. Show the following:

1. Joint pattern.
2. Ceiling suspension members.
3. Method of attaching hangers to building structure.
4. Ceiling-mounted items including light fixtures; air outlets and inlets; speakers; sprinkler heads; access panels; and special moldings at walls, column penetrations, and other junctures with adjoining construction.

B. Samples: Submit samples of each acoustical material specified. Each set of samples shall show the full range of texture and color to be expected in the completed work. Sample submittal and Architect's acceptance will be for color and texture only. Compliance with all other requirements is the responsibility of the Contractor.

1. Acoustic board: 12 in. sq.
2. Exposed tees and moldings and Axion trim (one of each type): 1 ft. lengths.
3. Accessories: one of each type.

C. Product Data: Submit manufacturer's specifications and installation instructions for each acoustical material, suspension system and other products required, including certified laboratory test reports and other data as may be required to show compliance with the Contract Documents.

D. Test Data: Measure volume of air delivered by installed ventilating ceilings. Submit results and calculations showing that the amount of air supplied to the plenum will be delivered through the ventilating ceiling in accordance with the design requirements and that the plenum pressures developed will not exceed the safe load limits for the ventilating ceiling and the system.

E. Recycled Content: Submit certification, including written data and specifications, highlighting percentage of recycled content for all acoustical panel ceilings and for suspension systems.

1.05 PRODUCT HANDLING

A. Deliver materials to the Project site in manufacturer's unopened containers, clearly indicating manufacturer's name, brand, type, style, size, color, texture and other identifying information.

B. Store materials in a dry location, off the ground and in a manner to prevent damage, deterioration and intrusion of foreign matter. Replace materials which have been damaged or are otherwise unfit for use.

C. Before installing acoustical ceiling units, permit them to reach room temperature and a stabilized moisture content.

1.06 PROJECT CONDITIONS

A. Do not install acoustical materials unless temperature and humidity conditions closely approximate the interior conditions which will exist when the building is occupied. Maintain temperature and humidity conditions before, during, and after installation. Plastering, concrete and stone work (including grinding) shall be complete and dry. Windows and doors shall be in place and glazed.

1.07 COORDINATION

A. Coordinate layout and installation of acoustical ceiling systems with other construction that penetrates ceilings or is supported by them, including light fixtures, HVAC equipment, fire-suppression system, and partition assemblies.

1.08 WARRANTY

A. Warranty specified in this Article shall not deprive the Owner of other rights the Owner may have under

other provisions of the Contract Documents and are in addition to and run concurrent with other warranties made by the Contractor under requirements of the Contract Documents.

B. Warranty: Provide a written warranty, directly to the Owner, for a period of fifteen (15) years warranting Acoustic Board against warping or sagging resulting from defects of materials or factory workmanship and against the occurrence of 50% red dust. Upon notification of such defects, within the warranty period, make the necessary repairs and replacements, at the convenience of the Owner.

1.09 EXTRA STOCK

A. Furnish to the Owner and store at the site where directed, 2% of each type of acoustic tile and acoustic board installed in the Project, packaged in manufacturer's unopened cartons and identified as to contents.

B. Furnish quantity of each exposed component of suspension systems equal to 2% of amount installed in the Project.

PART 2 – PRODUCTS

2.01 MATERIALS

A. Acoustic Materials

1. Provide acoustical materials complying with the following performance requirements, unless otherwise specified:

a. Light Reflectance: ASTM C523, 0.75 or more.

b. Flame Spread: ASTM E84, Flame Spread 25 or less.

c. Sound Absorption: ASTM C423, NRC not less than 0.65.

d. Sound Transmission Class: ASTM E90, not less than 35.

e. Recycled Content: Provide acoustical ceiling panels fabricated utilizing 25% recycled content.

2. Acoustic Ceiling Tile: “Ultima High NRC” by Armstrong World Industries; beveled tegular edged panels with DuraBrite (Armstrong) acoustically transparent membrane lay-in panels for 1/8 in. wide center regress exposed mechanical suspension system; 24 in. x 24 in. x 1 in. and 30 in x 30 in x 1”; Color White (WH), with NRC .80 and CAC MIN. of 35; with HumiGuard Plus (Armstrong) performance to inhibit panel sag; Class A flamespread rated.

B. Primary Suspension Members

1. Provide ceiling support components complying with ASTM C635 Classification "Heavy Duty", unless otherwise specified. Utilize primary suspension systems fabricated utilizing 60% recycled components.

2. Provide primary suspension members of suitable design and adequate strength to support the acoustic materials, light fixtures, diffusers and other items occurring in or on the ceiling.

3. Finish to lines and levels shown, with maximum deflection not to exceed 1/360 of the span between supports.

4. Wire Hanger Inserts: No. 6 galvanized wire loop and 26 ga. galvanized shell or 14 ga. galvanized steel strap with 5/16 in. hole.

5. Strap Iron Hanger Inserts: Galvanized, mild steel flats, 1 in. x 3/16 in. x 3 in. with 7/16 in. holes punched on center line and both ends, designed to develop the full strength of hangers and bent at 90 deg. to permit anchor bolt attachment to existing slab.

6. Hanger Anchorage Devices: Screws, clips, bolts or other devices applicable to the indicated method of structural anchorage for ceiling hangers. Provide anchorage devices sized for five

(5) times the calculated load supported.

7. Hangers: Galvanized, one of the following:
   a. 3/16 in. x 1 in. steel straps.
   b. 1/4 in. diameter steel rods.
   c. (9) ga. soft steel wire.
8. Carrying Channels: ASTM C754, cold rolled steel channels, 1-1/2 in., 475 lbs. per 1000 linear ft.
9. Clips: Provide support clips, clamps, fasteners, and other attachment devices as required to connect components and transfer imposed loads of primary suspension system.

C. Metal Wall Moldings: Electro-galvanized roll formed steel with manufacturer's standard baked-on white enamel coating to match finish of acoustical material and that fit type of edge detail and suspension system indicated.
   1. For lay-in panels with reveal edge details, provide stepped edge molding that forms reveal of same depth and width as that formed between edge of panel and flange at exposed suspension member.
   2. For circular penetrations of ceiling, provide edge moldings fabricated to diameter required to fit penetration exactly.
   3. For narrow faced suspension systems, provide suspension system manufacturer's standard edge moldings that match width and configuration of exposed runners.
   4. Edge Trim: "Axiom Perimeter Trim" (Armstrong World Industries); exposed edge "Knife Edge" closure for edge of acoustical ceilings at change in ceiling plane.

D. Exposed Mechanical Suspension System with Recessed Reveal: Manufacturer's standard design complying with ASTM C635 Classification "Heavy Duty"; complete with hangers, main tees, cross tees, splices, stepped angle molding, and accessories.
Provide partition attachment clips for areas where partition ceiling runners are secured to the ceiling suspension system. Provide components as follows:
   1. Primary Suspension Members
   2. Main Tees and Cross Tees: 1-5/8 in. high with a 9/16 in. face with 1/8 in. center regress fabricated from commercial grade galvanized cold-rolled steel sections; notched and mitered at all intersections.
   3. Metal Wall Moldings: Commercial grade galvanized cold-rolled steel, stepped to provide same reveal as main tees and cross tees.
   4. Accessories: Galvanized steel, specifically designed for use with the main components.
   5. Exposed Finish: Chemically clean, electro-galvanize and bonderize all rolled formed parts. Finish with a white baked-on enamel coating, to match finish of acoustic boards unless otherwise shown.
   6. Provide one of the following:
      a. "Silhouette 1/8" (Armstrong World Industries).
      b. "Fineline DXFF 1/8" (USG Interiors).
      c. "Ultraline 3600" (Chicago Metallic Corp.)

E. Miscellaneous Materials
   1. Round Column Collar Molding: 0.050 in thick extruded aluminum edge molding with adjustable band clamp and PVC spacer; "Column Collar" (Fry Reglet Corp.). Finish exposed portions with baked enamel, color to match other exposed trim.

2. Hold-Down Clips: Concealed, spring loaded, 100% fully accessible, easily removed without special tools; as manufactured by the mechanical suspension system manufacturer.

3. Stabilizer Bars: Provide manufacturer's standard stabilizer bars at perimeter of ceilings, to provide tension to edge of grid as required for grid to retain acoustic tile.

4. Concealed Acoustical Sealant: Nondrying, nonhardening, non-skinning, non-staining, nonbleeding, gunnable sealant.

PART 3 – EXECUTION

3.01 PRE-INSTALLATION MEETING

A. Prior to installation of acoustical ceilings, meet at the Project site to review the material selections, installation procedures and coordination of the Work with other trades. Meeting shall include the Architect, the Contractor, the acoustical ceiling subcontractor, manufacturer's representatives, and any other subcontractors whose work requires coordination with this Work.

3.02 CONDITION OF SURFACES

A. Examine substrates and structural framing to which ceiling system attaches or abuts, with Installer present, for compliance with requirements specified in this and other sections that affect installation and anchorage of ceiling system. Do not proceed with installation until unsatisfactory conditions have been corrected.

B. Review existing structure for anchorage of specified hangers. Anchor hangers to existing structural concrete or existing structural steel or provide supplemental steel members for support of system.

C. Coordination: Furnish layouts for preset inserts, clips, and other ceiling anchors whose installation is specified in other sections. Furnish concrete inserts and similar devices to other trades for installation well in advance of time needed for coordination of other work.

3.03 INSTALLATION - GENERAL

A. Verify all measurements and dimensions at the Project site and coordinate the Work with the work of other trades, with particular attention given to the work of mechanical and electrical trades.

B. Install all materials and systems in accordance with manufacturer's printed instructions and ASTM C636 and ASTM E580 unless otherwise shown or specified.

C. Make all exposed surfaces of acoustical units level and flush with all joints straight and true. Neatly cut and fit units around light fixtures and around other items protruding through acoustical ceilings. Install all exposed members with flush hairline joints.

D. Install edge moldings of type indicated at perimeter of acoustical ceiling area and at locations where necessary to conceal edges of acoustical units. Apply continuous ribbon of acoustical sealant on back of vertical leg before fastening to vertical surface. Locate so that sealant will be concealed after installation. Screw attach moldings to substrate 16 in. o.c. maximum, and not more than 3 in. from ends, leveling with ceiling suspension system to a tolerance of 1/8 in. in 12 ft. Miter corners accurately to provide hairline joints and connect securely.

E. Factory drill acoustic tile occurring at hidden loudspeakers and fire alarm gongs.

F. Center tile or board pattern both directions in each major space or room as shown or directed and, where possible, adjust pattern so that edge pieces will be not less than 2 units in width.

G. Run grain of units in one direction, as shown or directed, and align joints in both directions unless otherwise shown.

H. Use procedures that will minimize damage or soiling of the units during installation. Replace units which are damaged or cannot be adequately cleaned as directed.

3.04 INSTALLATION OF MECHANICAL SUSPENSION SYSTEM, GENERAL

A. Install primary suspension members and mechanical suspension system in accordance with ASTM C636 and manufacturer's written instructions to support required loads and to prevent deflection in excess of 1/360 of the span between supports. Water or laser level accurately in both directions, leveling to a tolerance of 1/8 in. in 12 ft.

B. Seismic Bracing: Comply with ASTM E580 "Standard Practice for Application of Ceiling Suspension Systems for Acoustical Tile and Lay-In Panels in areas requiring Seismic Restraint".

C. Install suspension systems with hangers supported only from building structural members. Locate hangers not less than 6 in. from each end and spaced 4 ft. maximum along each carrying channel or runner. Coordinate spacing of hangers, carrying channels, runners and molding with the location of electrical fixtures, sprinkler heads, and other items occurring in or on the ceiling. Splay hangers only where required to miss obstructions and offset horizontal force by bracing or other approved methods.

D. Where ceilings are suspended below ductwork, piping or other building elements which are not suitable for ceiling attachment due to strength limitations, restrictions of local authorities having jurisdiction, or ceiling system manufacturer's limitations, provide additional supplemental framing, supports and related work as required to span beneath these elements from suitable support locations. Design supplemental framing and supports to accommodate the spans and loads to be sustained and to limit maximum deflections to the criteria specified and to finish to the lines and levels shown.

E. Where ceilings provide lateral support for tops of partitions, coordinate with Section "Gypsum Drywall" for provision of attachment clips required to secure partition to exposed mechanical suspension system. Utilize hold down clips to secure acoustical panels on each side of partition, and provide diagonal bracing of mechanical suspension system above partition utilizing min. 2-1/2 in. metal studs secured to mechanical suspension system at max 4 ft.-O in. o.c. and diagonally braced to structural slab above.

3.05 INSTALLATION OF ACOUSTIC BOARD, EXPOSED SYSTEM

A. Install board with edges resting on flanges of tees. Cut and fit board neatly against abutting surfaces and penetrations. Support edges by wall moldings.

B. Install hold-down clips in areas shown and in areas where required by governing regulations or for fire-resistance ratings; spacing as recommended by panel manufacturer.

C. Install stabilizer bars at perimeter of acoustic grid and elsewhere as recommended by manufacturer to comply with requirements of local seismic code.

3.06 INSTALLATION OF ACOUSTIC BOARD, CONCEALED SYSTEM

A. Install ACT in accordance with manufacturer's installation instructions and as required to install panels in full alignment, with spacing between panels uniform throughout ceiling. Apply manufacturer's recommended holding clips above the ceiling as required to hold acoustic panels in place and prevent lateral movement.

3.05 CLEANING AND PROTECTION

A. Clean and repair surfaces that have been stained, marred, or otherwise damaged. Comply with manufacturer's instructions for cleaning and touch-up of minor finish damage. Remove and replace work that cannot be successfully cleaned and repaired to permanently eliminate evidence of damage.

B. Protect acoustical ceilings during the construction period so that they will be without any indication of deterioration or damage at the time of acceptance by the Owner.

END OF SECTION I-09510

SECTION 1-09520

FABRIC COVERED WALL SYSTEM(S)

PART 1 – GENERAL

1.01 DESCRIPTION

A. General: Provide fabric covered wall system(s) in accordance with the Contract Documents.

B. Related Work Specified Elsewhere

1. Rough carpentry.

2. Architectural woodwork.

1.02 STANDARDS

A. Except as modified by governing codes and by this Specification, comply with the applicable provisions and recommendations of the following:

1. AATCC "Technical Manual".

B. Where the language in any of the documents referred to herein is in the form of a recommendation or suggestion, such recommendations or suggestions shall be deemed to be mandatory under this Contract.

1.03 REQUIREMENTS OF REGULATORY AGENCIES

A. Fire Retardant Treated Wood: Treat those items required by applicable codes to be treated and those items shown or specified as "Fire Retardant Treated Wood".

1.04 QUALITY CONTROL

A. Manufacturer: Provide each type of fabric covered wall system complete with all required accessories as produced by a single manufacturer. This single manufacturer shall be responsible for coordination, testing and procurement of selected fabric and other related materials.

B. Installer: Fabric covered wall system(s) shall be installed by a firm having not less than 3 years' experience in the installation of systems specified herein in projects of similar size and scope and shall have the approval of the manufacturer of the system.

1.05 PERFORMANCE REQUIREMENTS

A. Fire Resistance Ratings: Provide materials and assemblies that have been tested and comply with the following fire test performance criteria as determined by an independent testing laboratory acceptable to the authorities having jurisdiction. Tests shall include backing materials.

1. Fabric panel assembly when tested in accordance with ASTM E84, Unadhered Method (fully exposed to burn chamber of testing equipment) shall comply with the following:

a. Flame Spread: 76 to 200.

b. Smoke Developed: 450 or less.

B. Flame Resistance of Fabrics: Fabrics utilized in system(s) shall be inherently flame resistant, or shall be treated to render them flame resistant, as defined in NFPA-701, Small Scale Test. Fabrics that are treated shall retain their flame-resistant properties after having been subjected to the exposure cycles for accelerated cleaning or accelerated laundering specified in NFPA-701.

C. Colorfastness to Light: Fabrics utilized shall be rated colorfast to light when tested in accordance

ASTM D3691 16A or 16E, Class 4 minimum at 40 hours.

D. Colorfastness to Wet and Dry Crocking: Fabrics utilized shall be rated colorfast to wet and dry crocking (rubbing off of color) when tested in accordance AATCC-8, Class 3 Minimum.

E. Acoustical Rating: Fabric covered wall system when tested in accordance with ASTM C423 shall result in the Noise Reduction Coefficient (NRC) specified.

F. Fabric Repeat: Vendor to confirm fabric pattern repeat and coordinate required lengths of materials.

1.06 SUBMITTALS

A. Shop Drawings: Submit shop drawings of fabric covered wall system(s) for the fabrication and the installation of the Work noting frame and core materials. Include large scale details, dimensioned plans and elevations, and adjacent work of other trades. Show details at all corners, penetrations, reveals, intersections at door or window jambs and heads, shelves, countertops, electrical outlets, switches, thermostats and other related construction. In addition, submit the following:

1. Submit seaming diagrams of fabrics.

2. Panel identification numbers relating to installation.

B. Samples: Submit following listed samples:

1. Fabric: One sample of each type of fabric specified: 3 yds. long by full width from selvage to selvage from dye lot used for the Work with specified fabric treatments applied. Mark top and face of fabric.

a. For each fabric required to be flame retardant treated to comply with NFPA 701, and for each fabric to be scotch guarded, submit sample of fabric fully treated to Architect and obtain acceptance of finish prior to purchase or treatment of fabrics.

2. Core: One sample of each type of core infill material: 12 in square.

3. Site Installed Fabric Covered Wall: 24 in. x 24 in., showing locking channels, edging profile, fabric, backing, infills and reveals all mounted to a hardboard substrate. Show joints at seams.

4. Accessories: One of each type; 24 in. long.

C. Product Data: Submit manufacturer's technical data, including specifications, sample details, performance data, physical properties and installation instructions for each type of fabric covered wall and accessory. Include information relating to the amount of time for fabric acclimatization to minimize sagging and distortion when stretched in place.

D. Certifications

1. Certification of Flame Resistance of Fabric: Submit certification attesting that the fabrics are inherently flame resistant, or have been treated to render them flame resistant, as defined in NFPA-701, Small Scale Test, and that the treated materials have retained their flame resistant properties after having been subjected to the exposure cycles for accelerated cleaning or accelerated laundering specified in NFPA-701 and that the treated materials will not stain or cause staining under the conditions of use in this Project.

2. Certification of Fire Retardant Treatment of Wood: Submit certification, stating name of fire retardant materials used, and compliance with AWPA Specification Cl and C20 for lumber and C27 for plywood.

3. Certification of Application: Submit one copy of certification in an approved form, stating that the completed fabric covered wall system(s) complies with these Specifications, that the component parts were properly designed or selected for the application made, and that installation methods complied with manufacturer's printed instructions and their field representatives' verbal instructions, and were proper and adequate for the condition of

installation and use in each case, and that the specified warranty will be provided without restriction.

E. Test Reports: Submit the following test reports from an independent testing laboratory:

1. NRC rating for each fabric covered wall.

2. Flame Spread and Smoke Developed Ratings for fabric wrapped panel and fabric covered wall.

F. Maintenance Instructions: Submit manufacturer's written maintenance and cleaning instructions and recommended cleaning materials to be utilized in maintaining and cleaning fabric covered wall system(s). Include instructions for removing and replacing fabrics from substrate for the purposes of cleaning or retensioning.

1.07 PRODUCT HANDLING

A. Delivery and Storage: Deliver materials to job site in manufacturer's unopened packaging clearly marked with manufacturer's name. Schedule delivery of material to prevent delays of the Work and to minimize on-site storage. Store materials as per manufacturer's recommendations. Store fabric horizontally.

1.08 PROJECT CONDITIONS

A. General: Maintain ambient temperature in spaces receiving fabric covered wall system(s) between 60 deg. F. and 85 deg. F. with a relative humidity between 20% and 50% at least 48 hours before, during, and after installation.

B. Install fabric covered wall system(s) and accessories after other finishing operations and adjacent construction, including architectural woodwork, wall covering ceiling systems, electrical and HVAC work and painting, have been completed.

1.09 EXTRA STOCK

A. Deliver the following extra stock to Owner, at job site from same manufactured dye lot as materials installed, enclosed in protective packaging and labeled as to contents complete with instructions for installation:

1. Fabric: Furnish quantity of fabric equal to 15% of the amount installed.

2. Track: Furnish length of track complete with accessories for installation equal to 15% of the amount installed.

1.10 PROTECTION

A. Protect fabric covered wall system(s) during transit, delivery, storage and handling to prevent damage. Cover and keep covered with non-staining protective wrapping.

B. Store fabric covered wall system(s) in a dry, well ventilated space, matching the environmental conditions of the finished installation. Do not store fabric rolls in upright position.

1.11 WARRANTIES

A. Warranties specified in this Article shall not deprive the Owner of other rights the Owner may have under other provisions of the Contract Documents and are in addition to and run concurrent with other warranties made by the Contractor under requirements of the Contract Documents.

B. Warranty of Fabric Covered Wall System(s): Submit a written warranty directly to the Owner, stating that the fabric covered wall system(s) will remain dimensionally stable and will not warp, sag or distort for a period of three (3) years from the date of final acceptance and agreeing to correct or replace, complete with materials and installation, at the Owner's convenience.

PART 2 – PRODUCTS

1.01 MATERIALS

A. Fabric

1. Provide fabrics with construction utilizing only non-recycled fibers.

2. Hold fabric defects, as listed in ASTM D3990 to the minimum. No defects will be permitted on exposed faces of panels.

3. Provide uniformity of color, within the limits of the natural quality of the fiber and design of the weave, from selvage to selvage and end to end. Maintain such uniformity within each dye lot. Keep variation from one dye lot to another to a minimum. Install fabric with warp (vertical) and weft (horizontal) threads plumb, level and true. Pattern (if any), texture and grain of fabric shall be perfectly aligned at the seams and throughout the entire seam jointed system without distortion to the geometry of the fabric and pattern.

4. Treat all fabrics which are not inherently flame resistant so as to comply with Paragraph 1.04 B. "Flame Resistance of Fabrics" and the "Certification" requirements specified in Paragraph 1.05 D.

5. Schedule of Fabrics: See Finish Schedule on G-005.00.

B. Core Materials

1. Acoustically Absorbent Core: ASTM C612, Class 1 and 2; inert, compressible, unfaced, fire retardant, non-combustible, stable, 6 lb.- 7 lb. per cubic ft. density, semi-rigid fiberglass board.

2. Tackable Impact Resistant Core: Inorganic mineral fiberboard, 24 lbs. per cu. ft. density, prime coated with white latex coating one side; Thickness as shown. Provide one of the following:

a. "Micore 300 Board" (USG Interiors, Inc.);

b. "AP-421 Board" (Apache).

3. Fabric Lining: 1/8 in. thick, fire retardant, white polyester sheet under lining.

4. Plywood: APA Interior Grade A-B, with exterior glue, sanded both sides, fire retardant treated as per AWPA C27. Identify products with appropriate markings of applicable testing and inspecting organization.

5. Particleboard: ANSI A208.1 and in compliance with NPA 8 for allowable formaldehyde emissions; Grade l-M-2 or 2-M-2 and that have fire-retardant chemicals bonded to softwood particles at time of panel manufacture to achieve products identical to those tested for flame spread of 20 or less and for smoke developed of 25 or less per ASTM E84 by UL or other testing and inspecting organization acceptable to authorities having jurisdiction. Identify products with appropriate markings of applicable testing and inspecting organization. Subject to compliance with requirements, provide "Duraflake FR" by Duraflake Div.; Willamette Industries, Inc.

C. Framing Materials: Provide frames of dimensions and profiles shown or as required to comply with design intent.

1. Plastic: Rigid extruded PVC frame with hinged mounting or crimping system and edge profile as standard with the manufacturer. All corners shall be mitered and reinforced to provide solid framework to receive fabric.

2. Wood: Kiln dried ash, birch or popular (fire retardant treated as required).

D. Miscellaneous Materials

1. Wood Screws: FS FF-S-111, type, size, material and finish as required for the condition of use.
2. Nails: FS FF-N-105, type, size, material and finish as required for the condition of use.
3. Staples: Upholstery type staples of sufficient strength to hold fabric taut in place without sagging.
4. Adhesives: As recommended by the system manufacturer.

E. Fire Retardant Treated Wood

1. Materials: Fire retardant materials shall meet the requirements of AWPA P10.
2. Treatment: Pressure treat to meet requirements of AWPA CI and C20 for lumber and C27 for plywood. After fire retardant treatment, kiln dry to the moisture content hereinbefore specified. Do not use colorants in solution to distinguish treated lumber from untreated lumber. Guarantee fire retardant materials not to bleed through finish of wood or affect detrimentally fabric covering. Provide the following:
   a. Interior Fire Retardant Treatment: For interior use where relative humidity is normally below 80%; Low-Hygroscopic Formulation; interior Type A per AWPA C20. Provide fire retardant treatment from one of the following:
      1) "Dricon" (Koppers Co., Inc.)
      2) "Flameproof LHC" (Osmose Wood Preserving, Inc.)
      3) "Pyro-Guard" (Hoover Treated Wood Products, Inc.)
3. Fabricate and mill wood before treatment wherever possible, and disassemble for treatment, so that cutting and jointing will not be required after treatment. Apply a heavy brush coat of the same fire-retardant chemicals to any surfaces which are cut after treatment.
4. Kiln-dry woodwork after treatment to levels required for untreated woodwork. Maintain moisture content required by kiln drying before and after treatment.
5. Discard treated lumber that does not comply with requirements of referenced woodworking standard. Do not use twisted, warped, bowed, discolored, or otherwise damaged or defective lumber.

2.02 FABRICATION - GENERAL

A. General: Provide wood blocking and framing, anchors, clips, splines, supporting and fastening devices as required for a rigid installation, and as required to sustain the imposed loads. Provide cut-outs to receive attachments, mechanical and electrical work as required.

B. Do all fabrication from field measurement with provision for scribbing as required to meet built-in conditions?

C. Coordinate the work of this Section with the work of other trades.

D. Maintain relative humidity and temperature during fabrication, storage and finishing operations matching that of the areas of installation.

E. Details indicate the required type and quality of construction. Modifications to conform to manufacturer's standards will be considered providing they comply with the Contract Documents, maintain the profiles shown and subject to acceptance by the Architect.

F. Reinforcing shown is minimum. Provide additional reinforcing as required to ensure a rigid assembly. Exposed surfaces shall be free from dents, tool marks, warpage, buckle, glue and open joints, or other

defects affecting serviceability or appearance. Accurately fit all joints, corners and miters. Conceal all fasteners. Make threaded connections up tight so that threads are entirely concealed.

2.03 PROPRIETARY SITE INSTALLED FABRIC COVERED WALL SYSTEM

A. General

1. Provide a proprietary system site installed fabric covered walls permanently fastened to substrate; complete with custom fabric, concealed perimeter anchor tracks, panel infill materials, and all miscellaneous items shown or required for the installation of the system in the locations and for the uses shown.

2. Provide a fabric covered wall panel system comprised of a fire-retardant UL approved rigid vinyl locking channel framework / fire retardant treated wood applied to the perimeter of the wall and elsewhere as shown, with various types of infill and stretched fabric.

B. Acceptable Manufacturers Utilizing Rigid Vinyl Locking Channel System: Provide one of the following for entire project:

1. "Track-Tex" (Track-Tex/Div. of DFB Sales, Inc.).

2. "Accutrack" (Sound-Tek Inc.).

3. "SnapLoc" (StretchWall Products, Inc.).

4. "Fabri-Trak" (Unique Concepts, Inc.).

C. Acceptable Manufacturers Utilizing Wood Framing System: Provide one of the following for entire project:

1. "Flip-Tex" (Track-Tex/Div. of DFB Sales, Inc.).

2. "Classic StretchWall" (StretchWall Products, Inc.).

3. "Stretch-Tex" (Kenny Draperies).

D. Non-Tackable System: Provide acoustical fabric covered walls as follows:

1. Acoustic Infill: 1/2 in. thick to 1 in. thick, as required to match existing system thickness in each location, 6-7 lb./cu. ft. density fiberglass.

2. Trim Edges: Vinyl perimeter channel of profiles shown.

3. Lining: Utilize sheet fiberglass lining specified applied over surface of acoustic infill and around trim edges to prevent "read through" of yellow fiberglass and white trim in finish fabric layer.

4. Fabric Facing: Provide the custom fabric, as specified in Paragraph "Schedule of Fabric", attached as per manufacturer's recommended system.

E. Tackable System: Provide tackable fabric covered walls as follows:

1. Tackable Infill: "Micore CV-230" (United States Gypsum Corp.), 3/8 in. thick, 23 lb. density, fire retardant tackable surface.

2. Trim Edges: Vinyl perimeter channel of profiles shown.

3. Lining: Utilize sheet fiberglass lining specified applied over surface of acoustic infill and around trim edges to prevent "read through" of yellow fiberglass and white trim in finish fabric layer.

4. Tape: Apply white tape over perimeter edges of vinyl channel and micoreboard, to prevent read-through.

5. Fabric Facing: Provide the custom fabric, as specified in Paragraph "Schedule of Fabric", attached as per manufacturer's recommended system.

PART 3 – EXECUTION

3.01 CONDITION OF SURFACES

A. Examination: Examine the substrates, adjoining construction and conditions under which the Work is to be installed. Do not proceed with the Work until unsatisfactory conditions have been corrected.

B. Condition system(s) to average prevailing humidity conditions in installation areas before installing.

3.02 INSTALLATION

A. Coordination: Coordinate fabric covered wall system(s) with the adjacent work of other sections. Provide items to be placed during the installation of other work at the proper time to avoid delays. Coordinate placement of such items, accurately in relation to the final location of fabric covered wall system(s).

B. General: Install fabric covered wall system(s) in accordance with manufacturer's written instructions and recommendations.

1. Coordinate installation with the work of other trades to ensure exact fit and perfect alignment. Verify dimensions before proceeding and obtain measurements at job site for work required to be accurately fitted to other construction.

2. Install fabric covered wall system(s) in locations shown with vertical surfaces and edges plumb, top edges level, and in alignment with other work, scribed to fit adjoining work accurately at borders and at penetrations. Comply with manufacturer's printed instructions for installation of system using type of mounting accessories indicated or, if none indicated, as recommended by manufacturer. Maintain straight seams vertical and plumb. Horizontal seams will not be permitted unless shown or specified otherwise. Match and level fabric pattern and grain.

3. Install core materials flush with face of stretched fabric system track. Bond or fasten core material to substrate utilizing materials and methods as recommended by system manufacturer.
Cutting, trimming, fitting and matching of prefinished work will not be permitted.

4. Install materials utilizing materials and methods as recommended by manufacturer unless otherwise specified.

C. Site Installed Fabric Covered Panel Wall System

1. Set fabric covered panel wall system in the designated locations. Fabric shall be straight, level, flat and flush with adjoining panels.

2. Install perimeter edging in accordance with manufacturer's printed instructions and recommendations.

3. Pre-stretch, square and align fabric in place to cure at room temperature prior to final stretching and installation of fabric. Cure for period of time recommended by system manufacturer. Stretch fabric tight and square without puckers, ripples or distortions. Securely fasten fabric covered wall system items to blocking with concealed fasteners only. Where surface nailing is required, countersink and fill flush with the work so that the finished heads are undetectable.

4. Within perimeter edging, insert the infill materials as shown or required.

5. Apply tape between perimeter edging and core board to prevent telegraphing of substrates.

6. Stretch fabric and lining fabric around all four edges of panel board with uncut corners and un-frayed edges, taking care not to distort the weave, and creating a smooth surface free of sags

or wrinkles.

7. Fasten fabric to the perimeter with special tool specifically made to lock fabric to channels.
8. Where horizontal lines or patterns are used, apply fabric horizontally to mask seaming (railroading) such that lines and patterns align from panel to panel.
9. Wall plates and other obstructions shall be shimmed to the same plane as the finished system.
10. For fabric installed using vinyl track framing, tuck and miter corners of fabric wrapped panels as required so that no vinyl clips, fasteners or blocking is visible in the finish work.

3.03 PROTECTION AND CLEANING

A. Damage Prevention: Protect fabric covered wall system(s) so that it will be without damage at the time of acceptance.

B. Repairing of Damage: Fabric covered wall system(s) which, in the opinion of the Architect, cannot be satisfactorily refinished in the field shall be removed and replaced, with units to match contiguous fabric covered wall system(s) in all respects.

C. Clean fabric covered wall system(s) upon completion of installation, to remove dust and other foreign materials from the facing, using a dry brush or a vacuum or both.

END OF SECTION 1-09520

SECTION I-09682

CARPET INSTALLATION

PART 1 – GENERAL

1.01 DESCRIPTION

A. General: Carpeting shall be furnished and installed by Client Vendor, in accordance with the Contract Documents.

1.02 QUALITY ASSURANCE

A. Installer: Carpeting shall be installed by a firm having not less than 5 years' experience in the installation of commercial carpeting in projects of similar size and scope specified herein.

B. Fire Resistance Ratings: Carpet when used without cushion, and carpet and carpet cushion tested as an assembly shall comply with all of the following performance criteria:

1. CPSC 16 CFR, Part 1630 with a passing rating (DOC FF 1-70 or ASTM D2859, Methenamine Pill Test).

2. A minimum radiant flux of 0.50 watts'/sq. cm in corridors and 0.40 watts/sq.cm. in general, areas of at least 15 minutes' duration when tested in accordance with ASTM E648, based on the average of three replicate tests.

3. A specific optical density in either the flaming or non-flaming mode not exceeding 300 within the first 4 minutes of the test when tested in accordance with ASTM E662.

1.03 STANDARDS

A. Except as modified by governing codes and by the Contract Documents, comply with the applicable provisions and recommendations of the following:

1. The Carpet and Rug Institute (CRI) "The Carpet Specifier's Handbook".

2. The Carpet and Rug Institute CRI 104 "Standard Installation of Commercial Textile Floor Covering Materials" excluding references not specified herein.

B. Where the language in any of the documents referred to herein is in the form of a recommendation or suggestion, such recommendations or suggestions shall be deemed to be mandatory under this Contract.

1.04 SUBMITTALS

A. Shop Drawings: Submit shop drawings showing carpet layout, start points, seam locations, cushion type and edge strip types and locations. Include on shop drawings dimensions which verify field conditions and information as to type of subfloor. Indicate direction of pattern and lay of pile. Show details of cutouts. Indicate columns, doorways, enclosing walls or partitions, built-in cabinets, and locations where cutouts are required in carpet. Indicate transition details to other flooring materials and type, color, and location of edge, transition, and other accessory strips. Provide information as to which areas require a total glue down installation for carpet tiles.

B. Samples: Submit the following samples showing full range of color, texture, and pattern variations expected. Where piece dyed, submit sample from actual dye lot for approval prior to shipping finish carpeting to the site. Prepare samples from same material to be used for the Work:

1. Carpet Edge Strip: 6 in. long sample of each type and color.

C. Product Data: Submit manufacturer's printed literature, specifications and installation instructions for

materials specified herein and other data as may be required to show compliance with the Contract Documents including written data on physical characteristics, durability, resistance to fading, and flame resistance characteristics.

1. Obtain certification from manufacturer of Owner purchased carpeting to show compliance with flammability, CRI Green Seal and LEED requirements, including carpet manufacturer's recommended carpet adhesive and carpet pad adhesives that comply with these requirements.

D. Maintenance Instructions: Submit 2 copies of instructions for care, cleaning, maintenance and repair of carpeting. Include the following:

1. Manufacturer's recommended frequency for maintaining carpet.

2. Precautions for cleaning materials and methods that could be detrimental to finishes and performance. Include cleaning and stain-removal products and procedures.

1.05 MOCK-UPS

A. Before installing carpet, install mockups for each type of carpet installation required to demonstrate aesthetic effects and qualities of materials and execution. Install mockups to comply with the specified requirements, using materials indicated for the completed Work.

B. Install mockups in the location and of the size indicated or, if not indicated, as directed by Architect. Notify Architect seven days in advance of dates and times when mockups will be installed.

C. Demonstrate the proposed range of aesthetic effects and workmanship. Obtain approval of mockups before starting work. Maintain mockups during construction in an undisturbed condition as a standard for judging the completed Work.

D. Approved mockups may become part of the completed Work if undamaged at time of Substantial Completion.

1.06 PRODUCT HANDLING

A. Carpeting will be delivered in original mill protective wrapping with mill register numbers and tags attached. Comply with CRI 104 Section 5.2 for handling requirements.

B. Deliver other materials in manufacturer's unopened containers identified with name, brand type, grade, class and all other qualifying information.

C. Store materials in a dry location, in such a manner as to prevent damage. Comply with CRI 104 Section 5.1 for storage requirements.

1.07 PROJECT CONDITIONS

A. Comply with CRI 104, Section 6.1, "Site Conditions; Temperature and Humidity." Do not install carpet until wet work in spaces 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. Do not install carpet over concrete substrate until concrete has cured and is sufficiently dry to bond with adhesive and concrete slabs have pH range recommended by carpet manufacturer.

C. Where "demountable" office front partitions or other items are indicated for installation on top of carpet, install carpet before installing these items.

1.08 EXTRA STOCK

A. Deliver all unused cartons (partially unused or completely unused cartons) of carpet tile must be secured on site under lock and key for return to Owner. All unused broadloom carpet of a significant size for potential reuse, and large scraps (over 2 sq. ft. in area and over 12 in. wide) shall be rolled and secured on site under lock and key for return to the Owner. Store where directed on the Site.

PART 2 – PRODUCTS

2.01 MATERIALS

A. Carpet Designation: "CPT-XX" Carpet bearing the Architect's identifying symbol for coordination with the location Drawings shall be installed in the work of this section. The Owner will provide the specifications and pricing to the GC. The General Contractor shall procure the carpet and coordinate with the manufacturer for delivery to the site. In compliance with LEEDS requirements, the carpet material and it's manufacturing process purchased shall meet the current CRI Green Seal requirements for VOC's.

B. Flash Patching: Latex modified Portland cement type as recommended by the carpet manufacturer. Gypsum based products are prohibited.

C. Carpet Adhesive: Odorless, formaldehyde-free, release-type as recommended by the carpet manufacturer for carpet to comply with the following performance criteria when tested as an assembly and to provide a maximum VOC of 10/mg/m2/hr or less

D. Edge Strip: Extruded or molded heavy duty vinyl or rubber, of sizes, shapes and colors as shown and best suited for the respective purposes intended; one of the following manufacturers:

1. Burke Mercer Floor Products
2. Roppe Rubber Corp.
3. Johnsonite.
4. Flexco.

E. Seaming Tape: Hot-Melt adhesive tape specifically manufactured for taping seams and butting cut edges at backing to form secure seams and to prevent pile loss at seams. Provide "Super GT No. 50-330 Heat Bond Tape or Premium GT Heat Bond Tape No. 50-360" (Roberts Consolidated Industries, Inc.) or equal.

F. All Other Materials: Manufacturer's standard for the product specified.

PART 3 – EXECUTION

3.01 PRE-INSTALLATION MEETING

A. Prior to the installation, and at the Contractor's direction, meet at the project site to review the material selections, substrate preparations, installation procedures, coordination with other trades, special details and conditions, standard of workmanship, and other pertinent topics related to the Work. The meeting shall include the Architect, the Contractor, the installer, material manufacturer's representatives, and representatives of other trades or subcontractors affected by the installation. Examine sample installations which have been prepared and determine if installation is proper and direction of pattern is correct and record whether everyone present is in agreement that the proposed installations are likely to perform as required.

1. All patterns shall appear monolithic and shall be seamed to continue pattern from panel to panel throughout. Direction of pattern shall run east to west in elevator lobby and open plan, unless otherwise directed.

3.02 PREPARATION

A. Coordinate the installation of carpet so as not to delay the occupancy of the building or interfere with the completion of construction.

B. Examine the substrates, adjoining construction and the conditions under which the Work is to be installed. Verify recommended limits for moisture content and alkalinity of concrete substrate with carpet and cushion manufacturer(s). Do not proceed with the Work until unsatisfactory conditions have

been corrected.

C. Verify that concrete slabs comply with ASTM F710, that slab substrates are dry and free of curing compounds, sealers, hardeners, and other materials that may interfere with adhesive bond substrate are free of cracks, ridges, depressions, scale, and foreign deposits. Comply with CRI 104 Section 6.1.1 and 6.2 for preparation requirements as related to concrete substrates.

1. Test concrete floors for moisture and alkalinity in accordance with CRI 104 Section 6.3 to ensure that the floor does not exceed the limits required by manufacturers of adhesives and other floor covering products.

D. Clear away debris, broom clean or vacuum surfaces to be covered, and inspect subfloor.

E. Use leveling and patching compounds recommended by flooring manufacturer for filling cracks, holes and depressions in the substrate. Surface shall be smooth, level and at proper elevation. Remove roughness and protrusions from concrete surfaces by grinding.

3.03 INSTALLATION

A. Comply with the manufacturer's instructions and recommendations. Place seams at locations indicated on accepted shop drawings. Maintain direction of pattern, texture and lay of pile.

B. Extend carpet into closets, alcoves and offsets, and under movable equipment movable flanges and furnishings of the rooms and spaces shown or scheduled to receive carpet, including recessed covers within those spaces.

C. Provide cutouts as required for removable access covers in substrates except do not cutout for floor closer cover plates. Bind edges neatly where not concealed by protective edge guards or overlapping flanges, secure to substrate and maintain close tolerances so that edges of carpet will be covered by plates and escutcheons. Cut only 3 sides wherever it is feasible to provide carpet flap in lieu of fully removable cutout.

D. At doorways, center seams under door in closed position; do not place seams perpendicular to door frame in direction of traffic through doorway. Do not bridge building expansion joints with continuous carpet.

E. Cut openings in carpet for electrical outlets, piping and other penetrations. Maintain close tolerances so that edges of carpet will be covered by plates and escutcheons.

F. Install edge strip at every location where edge of carpet is exposed to traffic, unless otherwise indicated. Install in single lengths wherever possible, secured in accordance with manufacturer's directions.

G. Glue-Down Installation: Comply with CRI 104, Section 8 "Direct Glue-Down" and as follows:

1. Install a test sample to demonstrate proper adhesion and removal capability of bonding system. Cut and fit sections of carpet prior to application of adhesive.

2. Apply adhesive in accordance with manufacturer's directions, complying with procedure demonstrated to be satisfactory by test sample.

3. Butt carpet seams and edges tightly together and cement edges of backing together with continuous bead of latex cement in accordance with manufacturer's directions.

4. Eliminate air pockets and roll to ensure uniform bond over the entire area.

5. Promptly remove adhesive from carpet face.

H. Carpet Tile Installation: Comply with CRI 104, Section 13 "Carpet Modules (Tiles)" and as follows:

1. Install a test sample to demonstrate proper adhesion and removal capability of bonding system. Cut and dry-fit sections of carpet prior to application of adhesive.

2. Apply adhesive in accordance with manufacturer's directions, complying with procedure

demonstrated to be satisfactory by test sample.

3. Butt carpet tightly together to form seams without gaps and align adjoining tiles. Ensure uniform bond over the entire area. Lay carpet tiles with texture running in one direction.

4. Adhere perimeter tiles and partial tiles with a full spread of adhesive. Dry-fit cut tiles and apply adhesive to tile back after tile has been cut. In corridor areas, use full tiles down the center and cut perimeter tile borders.

5. In traffic areas use a total glue-down method and not perimeter bond method. In non-traffic areas use a perimeter bond method unless otherwise shown.

6. Promptly remove adhesive from carpet face.

3.04 CLEANING AND PROTECTION

A. Vacuum carpet with a commercial vacuum, with rotating agitator or beater in the nozzle. Remove soil spots in accordance with the carpet manufacturer's recommendations.

B. Protect carpet from damage and soiling. Use non-staining cover material for protection. Tape joints in protective covering. Comply with CRI 104, Section 15 "Protection of Indoor Installation."

C. Remove and dispose of debris and unusable scraps.

3.05 CARPET SCHEDULE: See Finish Plan and Schedule

END OF SECTION I-09682

SECTION I-09900

PAINTING

PART 1 – GENERAL

1.01 DESCRIPTION

A. General: Provide painting in accordance with the Contract Documents.

1. Examine the requirements of the other technical Sections as to the location, extent and nature of painting work specified therein and include such items to be painted under this Section as are not included in the other Sections.

2. In general, paint all exposed surfaces except surfaces noted as pre-finished or not to be painted. Where items or surfaces are not specifically mentioned, paint the same as adjacent materials or areas. Specifically, "Paint" includes coating systems materials, primers, emulsions, enamels, stains, sealers and fillers, and other applied materials whether used as prime, intermediate, or finish coats.

B. Related Work Specified Elsewhere

1. Factory finished items.

2. Priming of miscellaneous metals and structural steel.

1.02 QUALITY ASSURANCE

A. Provide painting Work from an experienced firm that has specialized in such Work for at least 5 years, who is experienced in applying paints and coatings 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 shall have undivided responsibility for the Work.

B. Single-Source Responsibility: Provide primers, fillers and undercoat paint produced by the same manufacturer as the finish coats.

C. Material Quality: Provide the manufacturer's best quality trade sale paint material of the various coating types specified. Paint material containers not displaying manufacturer's product identification will not be acceptable. Proprietary names used to designate colors or materials are not intended to imply that products named are required or to exclude equal products of other manufacturers.

1.03 STANDARDS

A. Except as modified by governing codes and by the Contract Documents, comply with the applicable provisions and recommendations of the following:

1. SSPC Volume 1 "Good Painting Practice".

2. SSPC Volume 2 "Systems and Specifications".

1.04 SUBMITTALS

A. Color Samples: Submit two (2) labeled 12 in. x 12 in. samples on hardboard substrate, for each color, sheen and texture duplicated to simulate final conditions. Show various stages of finish on displays.

B. Detailed Painting Schedule: Submit a "Detailed Painting Schedule" for review by the Architect. Prepare this schedule on the basis of the surfaces, types of paint materials, number of coats required, and list the brand name of the product of the manufacturer proposed for each use. Indicate each material and cross-reference specific coating, finish system, and application with identification related by

manufacturer's catalog number and general classification.

C. Product Data: Submit product data for each paint system specified, including block fillers and primers. Provide the manufacturer's technical information including label analysis and instructions for handling, storage, and application of each material proposed for use. List each material and cross-reference the specific coating, finish system, and application. Identify each material by either by the actual formula or the manufacturer's catalog and/or code number and general classification as suitable for duplication and replacement purposes.

D. Certifications: Submit the following:

1. Certification signed by manufacturer of fire retardant treated paint components certifying that their products comply with specified requirements, has been tested and certified by UL and meets the specified requirements.

2. Submit certification, that paint system specified for access floor concrete slab sealer is compatible with proposed access floor pedestal adhesive and has been tested and complies with bond strength requirements of the Ceiling and Integrated Systems Contractor's Association (CISCA) "Recommended Test Procedures for Access Floors; Section 6, Pedestal Overturning Moment Test".

3. Submit certification that paints and coatings used have a max VOC of 50 for flat paint and 150 for all other paint.

1.05 MOCK-UP

A. Prepare sample panels, after approval of paint displays, totaling approximately 100 sq. ft. in spaces designated by the Architect for his final review.

1.06 PRODUCT HANDLING

A. Deliver paint materials to the job site in original containers and packages, bearing the manufacturer's labels, indicating name, type, brand, color name and number, application instructions, contents by volume, for pigment, vehicle and volatile constituents. Unless otherwise directed by the Architect, deliver paints ready-mixed. Order in advance in large enough quantities and in ample time to facilitate the Work.

B. Store materials and equipment in a designated storage space on the site. Protect paint and associated materials from freezing. Keep storage space neat, clean and accessible at all times. Protect floors from paint spillage. Remove oily rags and waste daily. Take necessary measures to ensure that workers and work areas are protected from fire and health hazards resulting from handling, mixing, and application.

1.07 PROJECT CONDITIONS

A. Do not paint when the air is dust-laden nor when weather and temperature conditions are unsuitable. Maintain temperatures within the building at a minimum of 60 deg. F. during the painting and drying periods.

B. Apply paint only when the temperature of surfaces to be painted and surrounding air temperatures are between 50 deg. F. and 90 deg. F. Comply with manufacturer's recommendation when they are more stringent with respect to application temperatures.

C. Do not apply paint in snow, rain, fog, or mist; or when the relative humidity exceeds 85%; or at temperatures less than 5 deg. above the dew point; or to damp or wet surfaces. Comply with manufacturer's recommendation when they are more stringent with respect to application temperatures.

D. Painting may continue during inclement weather if surfaces and areas to be painted are enclosed and heated within temperature limits specified by the manufacturer during application and drying periods.

1.08 PROTECTION

A. Place paint or solvent soaked rags, waste or other materials which might constitute a fire hazard in

metal containers and remove from premises at the close of each day's work. Take every precaution to avoid damage by fire.

B. Provide suitable coverings to protect surfaces not requiring painting. Protect work of other trades, whether to be painted or not, against damage by painting operations. Correct damage by cleaning, repairing or replacing, and repainting, as required and acceptable to Owner. Comply with paint manufacturer's recommendations regarding materials and methods to be utilized.

C. Remove or protect items such as hardware, hardware accessories, plates, lighting fixtures and similar items placed prior to painting. Reposition or remove protection upon completion of each space. Disconnect equipment adjacent to walls by workmen skilled in these trades to permit painting of wall surfaces; replace and reconnect after completion of painting.

D. Maintain wrappings or other factory applied protection furnished with finish hardware (or other items provided by other trades) installed in areas where painting is required. If such protection is displaced or removed, replace before painting work continues and maintain for the duration of painting work.

E. Provide "wet paint" signs to protect newly painted finishes. Remove temporary protective wrappings provided by others for protection of their work after completion of painting operations. At completion of construction activities of other trades, touch up and restore damaged or defaced painted surfaces.

PART 2 – PRODUCTS

2.01 MATERIALS

A. Material Compatibility: Provide block fillers, primers, finish coat materials, and related materials that are compatible with one another and the substrates indicated under conditions of service and application, as demonstrated by the manufacturer based on testing and field experience.

B. Paint Materials: Subject to compliance with requirements, provide materials of the following manufacturers:

Exterior		Interior	
Carboline Co.	Tnemec	Pittsburgh Paints	Martin Senor Paints
Ameron	DuPont	Benjamin Moore	Sherwin-Williams
		ICI Dulux Paints	Pratt & Lambert
		Glidden	Carboline Co.
		MAB Paints	Fuller O'Brien Paints
		Devoe Paint	Duron Inc.

C. Use products of the same manufacturer for succeeding coats. Where primer is shop applied to steel, subsequent coats may be the product of another manufacturer provided the coatings are mutually compatible. Review other sections in which primers are provided to ensure compatibility of the total systems for various substrates.

1. Use products complying with requirements of Section 1440, "Green Building Specification", having a max. VOC of 50 for flat and 150 for all other paints.

D. Colors, textures and degree of luster will be as selected by the Architect. Tint prime and undercoats approximately to the shade of the final coat but with sufficient variation to distinguish them from the preceding coat. Proprietary names used to designate colors or materials are not intended to imply that products named are required or to exclude equal products of other manufacturers.

E. Standard Coating Terms and Specular Gloss Range: Standard coating terms and gloss ranges as defined in ASTM D16 apply to this Section.

1. Flat refers to a lusterless or matte finish with a gloss range below 15 when measured at an 8 5-degree meter.

2. Eggshell refers to low-sheen finish with a gloss range between 20 and 35 when measured at a 60-degree meter.

3. Semigloss refers to medium-sheen finish with a gloss range between 35 and 70 when measured at a 60-degree meter.

4. Full gloss refers to high-sheen finish with a gloss range more than 70 when measured at a 60-degree meter.

F. In locations where ambient temperature-humidity conditions encourage the ready formation of mildew, use paints with additional mildew inhibitive agent incorporated during the manufacturing process, of type and in concentration recommended by the paint manufacturer to withstand such mildew formation.

PART 3 – EXECUTION

3.01 PRE-INSTALLATION MEETING

A. Prior to the start of the Work, and at the Contractor's direction, meet at the Project site to review methods and sequence of Work, special details and conditions, standard of workmanship, and other pertinent topics related to the Work. The meeting shall include the Architect, the Contractor, Contractor's project superintendent, painting subcontractor's superintendent, painting manufacturer's representative, and any other subcontractors whose work requires coordination with this work.

B. Review other areas of the Work in which primers are provided to ensure compatibility of the total systems for various substrates.

3.02 CONDITION OF SURFACES

A. Examine the substrates, adjoining construction and the conditions under which the Work is to be installed. Do not proceed with the Work until unsatisfactory conditions have been corrected. Start of painting Work will be construed as the Applicator's acceptance of surfaces and conditions within a particular area.

1.03 PREPARATION

A. Surface Preparation, General

1. Prepare surfaces to receive paint; thoroughly clean of grime, grease, dirt, loose material and other substances that may interfere with proper adhesion of paint. Provide barrier coats over incompatible primers or remove and reprime. Paint dry surfaces only.

2. Remove or protect hardware, hardware accessories, plates, signs, trim for mechanical work, machined surfaces, lighting fixtures and similar items in place and not to be finish painted. Disconnect and move equipment adjacent to areas scheduled to be painted. Reposition and reconnect items and remove protection upon completion of each space.

3. Cleaning: Before applying paint or other surface treatments, clean the substrates of substances that could impair the bond of the various coatings. Remove oil and grease prior to cleaning. Schedule cleaning and painting so dust and other contaminants from the cleaning process will not fall on wet, newly painted surfaces.

4. Fill dents, cracks, hollow places, open joints and other irregularities with a filler suitable for the purpose and, after setting, sand to a smooth finish.

5. Prime surfaces not more than 8 hours after cleaning except as otherwise specified by the prime paint manufacturer.

B. Metals

1. General: Clean bare metal surfaces thoroughly of foreign matter such as mortar, plaster, grease, rust, scale and dirt before priming coat is applied. Remove oil, grease and similar

contaminants in accordance with SSPC SP-1 "Solvent Cleaning", prior to any additional surface preparation specified. Remove rust and mill scale in accordance with SSPC SP-3 "Power Tool Cleaning". Where solder flux has been used, clean surface with solvent, or use mechanical tools to remove. Immediately after surface preparation, apply primer in accordance with manufacturer's instructions. Use painting methods which will result in full coverage and dry film thickness specified. After erection is completed, touch-up heads of bolts, welded surfaces and other field connections with specified primer.

2. Shop Primed Ferrous Metal Surfaces: Remove grease and oil with a cleaner recommended for the purpose. Exercise care to prevent damage to shop coat. Touch-up abraded or marred shop coats with paint used for priming or "universal primer" compatible with primer, topcoat, and field surface preparation.

3. Zinc Coated (Galvanized), Aluminum and Stainless-Steel Surfaces: Remove grease and oil with a cleaner recommended for the purpose. Treat and roughen surfaces using either mechanical or chemical means in accordance with recommendations of prime paint manufacturer. When chemical compound is used rinse the chemical compound completely with clean, fresh water.

C. Concrete and Masonry Surfaces: Delay painting on concrete or masonry surfaces as long as practicable within the limits of the Contract. Test surfaces for presence of alkali and neutralize as required. Test surfaces for moisture content and do not paint surfaces which exceed manufacture's printed instructions. Remove grease, oil, form release agents and efflorescence. Patch cracks and other blemishes to be covered by paint. Neutralize concrete surfaces which have received capillary waterproofing, utilizing materials and methods as recommended by the manufacturer and applicator of the capillary waterproofing.

1. Block Fillers: Apply block fillers to concrete masonry block at a rate to ensure complete coverage with pores filled in accordance with manufacturer's instructions.

2. Clean concrete floors to be painted with a 5 percent solution of muriatic acid or other etching cleaner. Flush the floor with clean water to remove acid, neutralize with ammonia, rinse, allow to dry, and vacuum before painting.

D. Plaster Work

1. Test plaster surfaces with a moisture meter and do not proceed with painting until the moisture content satisfies the recommendation of the respective paint manufacturer.

2. Remove grit and loose particles and repair surface irregularities before paint is applied. Repair cracks and holes with patching plaster, properly keyed to the existing plaster, and sandpaper smooth. Patching plaster must be compatible with finish paint system.

3. Prime plaster surfaces with an approved alkali-resistant primer. Spackle imperfections in the plaster that become visible after the prime coat is applied. Make flush with adjoining surface, and spot prime with the prime coat material. If the prime coat does not dry to a uniform sheen over the entire surface, the areas that indicate suction shall also be spot primed before applying succeeding coats.

E. Gypsum Drywall and Fiberglass Reinforced Gypsum:

1. Repair minor cracks and holes with finishing compound, and sand smooth after drying.

F. Woodwork

1. Sandpaper woodwork to remove roughness, loose edges, slivers or splinters and then brush to remove dust. Wash off grease or dirt with an approved cleaner.

2. Clean knots, pitch streaks or visible sap spots of residue and treat with two coats of "Formula WP-578 Knot Sealer" (Western Pine Association). Allow at least two hours between the application of the first and second coats. Prime millwork on all sides before installation.

Treat surfaces of open-grained woods with paste filler. Thin paste filler to brushing consistency with turpentine and apply in two coats, with stiff, short-bristled brushes. Allow filler to dry for one hour, then rub surfaces across the grain with coarse burlap or pads of excelsior until the surplus filler is removed. After the primer or paste filler has dried, fill nail holes and other indentations with putty, flush with the adjacent surfaces. Sand wood surfaces smooth with No. 00 sandpaper and remove dust.

G. Pipe Covering and Insulation: Clean surfaces of pipe, duct and equipment insulation (such as canvas jackets and troweled-on insulation), of loose, foreign and objectionable material prior to priming or sealing.

3.04 WORKMANSHIP

A. General: Apply paint in accordance with manufacturer's written instructions. Use applicator and techniques best suited for substrates and type of material being applied. Apply materials at not less than manufacturer's recommended spreading rate to establish a total dry film thickness as indicated or, if not indicated, as recommended by the manufacturer.

B. Mix materials thoroughly before application to produce a mixture of uniform density; strain if necessary, before using. Do not mix surface film into material. If necessary, remove surface film and re-strain material before using. Do not adulterate ready-mixed materials except in accordance with the manufacturer's printed instructions. If no printed instructions appear on the container, obtain this information in writing from the manufacturer. Use only thinners approved by the paint manufacturer and only within recommended limits.

C. Tinting: Tint each undercoat a lighter shade to facilitate identification of each coat where multiple coats of the same material are applied. Tint undercoats to match the color of the finish coat, but provide sufficient differences in shade of undercoats to distinguish each separate coat.

D. Apply materials with care to a uniform and proper film thickness, showing no runs, holidays, sags, crawls or other defects. Apply with a minimum of brush marks. Finish surfaces shall be uniform in sheen, color and texture.

E. Application Procedures: Apply paints and coatings by brush, roller, spray, or other applicators according to the manufacturer's directions.

1. Brushes: Use brushes best suited for the material applied.

2. Rollers: Use rollers of carpet, velvet back, or high-pile sheep's wool as recommended by the manufacturer for the material and texture required.

3. Spray Equipment: Use airless spray equipment with orifice size as recommended by the manufacturer for the material and texture required.

F. The number of coats and the film thickness required are the same regardless of the application method. Do not apply succeeding coats until the previous coat has cured as recommended by the manufacturer. Sand between applications where sanding is required to produce a smooth even surface according to the manufacturer's directions. Apply additional coats if undercoats, stains, or other conditions show through final coat of paint until paint film is of uniform finish, color, and appearance. Give special attention to ensure that surfaces, including edges, corners, crevices, welds, and exposed fasteners, receive a dry film thickness equivalent to that of flat surfaces.

G. Apply two thin coats of paint to bare wood surfaces in sliding contact so as not to interfere with proper operation. Do not paint other materials in sliding contact. Remove paint applied to such surfaces.

H. Paint access doors, plates, panel boxes, steel grilles, louvers, convector covers, registers, exposed prime painted hardware and the like in colors as selected. Paint back sides of access panels and removable or hinged covers to match exposed surfaces. Paint interior surfaces of ducts or piping where visible through registers or grilles with a flat, non-specular paint type appropriate to surface to be painted. Finish paint doors on tops, bottoms, and side edges the same as exterior faces. Do not paint

nameplates on equipment or over Underwriter's Laboratories, Factory Mutual or other code-required labels or equipment name, identification, performance rating, or nomenclature plates.

I. Do not paint heating elements and pipes while they contain heat. Keep them cold until after the final coat has thoroughly dried.

J. Mechanical and Electrical Work: Painting of mechanical and electrical work is limited to items exposed in equipment rooms and occupied spaces.

1. Mechanical items to be painted include, but are not limited to uninsulated metal piping, uninsulated plastic piping, pipe hangers and supports, tanks that do not have factory-applied final finishes, visible portions of internal surfaces of metal ducts, without liner, behind air inlets and outlets, duct, equipment, and pipe insulation having "all-service jacket" or other paintable jacket material, and mechanical equipment that is indicated to have a factory-primed finish for field painting.

2. Electrical items to be painted include, but are not limited to, switchgear, panelboards and electrical equipment that is indicated to have a factory-primed finish for field painting.

K. Allow coats to dry and cure thoroughly before succeeding coats are applied; allow a minimum of 24 hours between applications on any one surface unless otherwise specified by the manufacturer.

L. Sandpaper undercoats on interior metal thoroughly and uniformly to provide a smooth, even surface for finish coats.

M. Surfaces given a prime or body coat of paint under other Sections of these Specifications will not require such coats of paint under this Section. Repair existing prime coatings with same primer or undercoat unless otherwise specified.

N. Furnish competent technical assistance by the paint manufacturer on the job to ensure proper application of his material.

O. When using paint with additional mildew inhibitive formulation, observe the procedures and precautions in the paint manufacturer's printed instructions for the use of this product.

3.05 SCHEDULE OF INTERIOR PAINTING

A. General: Paint interior surfaces exposed to view in accordance with this Schedule of Interior Painting, except as specifically shown or specified.

B. Ferrous Metal

1. Shop-Primed

1st coat - Enamel Undercoater
2nd coat - Alkyd Eggshell Enamel

2. Galvanized

1st coat - Water Based Acrylic Primer
2nd coat - Alkyd Eggshell Enamel

3. Semi-Gloss Epoxy Finish: One of the following systems:

a. Pittsburgh Paints

1st coat - "Speedhide Primer 6-712"; 2.0 mils d.f.t.
2nd coat - "Pitt-Glaze Acrylic Epoxy"; 3.0 - 4.0 mils d.f.t.(PPG)
3rd coat - "Pitt-Glaze Acrylic Epoxy"; 3.0 - 4.0 mils d.f.t.(PPG)

b. DuPont Company

1st coat - "Tufcote 72P"; 2.0 - 3.0 mils d.f.t.
2nd coat - "Corlar 76P"; 2.0 - 3.0 mils d.f.t.
3rd coat - "Corlar 76P"; 2.0 - 3.0 mils d.f.t.

c. Devoe Paints

1st coat - "Mirrulac No. 13101 "; 2.0 - 2.5 mils d.f.t.
2nd coat - "Gardcote-WB No. 25U8xx "; 2.0 - 3.0 mils d.f.t.
3rd coat - "Gardcote-WB No. 25U8xx "; 2.0 - 3.0 mils d.f.t.

d. Carboline

1st coat - "Multibond 120"; 1.2-1.5 mils d.f.t.
2nd coat - "Sanitile 250 WB"; 2.0 - 3.0 mils d.f.t.
3rd coat - "Sanitile 250 WB"; 2.0 - 3.0 mils d.f.t.

4. Opaque Metallic Finish for Elevator Doors and Frames: Provide Polyurethane / acrylic finish system "Scuffmaster Smooth Finish System" by Master Coating Technologies Inc., distributed locally through Wolf Gordon Inc.

a. Base Coat: Scuffmaster Master Coat 100, with subsequent second base as recommended by manufacturer.

b. Metallic Coat: One coat of Scuffmaster Metallic applied in 2 to 3 light passes.

c. Clear Cleat: 2 coats Scuffmaster Ultra-Clear Satin finish.

d. Final finish shall match color in the finish schedule.

C. Plaster, Drywall and Fiberglass Reinforced Gypsum

1. Flat Finish- Benjamin Moore Regal Wall Satin

1st coat - Latex Primer
2nd coat - Latex Flat
3rd coat - Latex Flat

2. Eggshell Finish- Benjamin Moore Regal Aqua Velvet

1st coat - Latex Primer
2nd coat - Latex Eggshell
3rd coat - Latex Eggshell

3. Satin Impervo Finish- Benjamin Moore Satin Impervo Enamel

1st coat - Latex Primer
2nd coat - Enamel Undercoater
3rd coat - Alkyd low lustre Enamel

D. Concrete, Concrete Masonry Units

1. Enamel Finish

1st coat - Latex Block Filler
2nd coat - Enamel Undercoater
3rd coat - Alkyd Eggshell Enamel

2. Epoxy Finish

a. Pittsburgh Paints

1st coat - "Pitt-Glaze Latex Block Filler 16-90"; 12.5 mils d.f.t.
2nd coat - "Pitt-Glaze Acrylic Epoxy"; 3.0 - 4.0 mils d.f.t.
3rd coat - "Pitt-Glaze Acrylic Epoxy"; 3.0 - 4.0 mils d.f.t.

b. DuPont Company

1st coat - "300P Acrylic Block Filler"; Apply to fill
2nd coat - "Corlar 76P"; 2.0 - 3.0 mils d.f.t.

3rd coat - “Corlar 76P"; 2.0 - 3.0 mils d.f.t.

c. Carboline

1st coat - “Flexxide Masonry Block Filler"; Apply to fill
2nd coat - “Sanitile 250 WB"; 2.0 - 3.0 mils d.f.t.
3rd coat - “Sanitile 250 WB"; 2.0 - 3.0 mils d.f.t.

d. Devoe Paints

1st coat - "No. 52903 Block Filler"; Apply to fill
2nd coat - "Gardcote-WB No. 25U8xx"; 2.0 - 3.0 mils d.f.t.
3rd coat - "Gardcote-WB No. 25U8xx”; 2.0 - 3.0 mils d.f.t.

Wood, Except Shop Finished

1st coat - Alkyd Primer Sealer 2nd coat - Enamel Undercoater 3rd coat - Alkyd low lustre Enamel

Piping and Mechanical Equipment: Paint piping, pipe hangers and supports, heat exchangers, tanks, ductwork, insulation, motors, electrical conduits, switchgear and other mechanical and electrical equipment except equipment which is non-ferrous metal, plated, finished by manufacturers, permanently concealed or noted to be painted under other Sections. Properly clean, prepare and finish as specified. Paint materials shall be heat-resisting type when applied to heating lines and equipment.

1. Uninsulated Piping Ductwork, Fittings and Equipment

   1st coat - Enamel Undercoater 2nd coat - Alkyd Eggshell Enamel

2. Insulated Piping, Ductwork, Fittings and Equipment

   1st coat - Latex Flat
   2nd coat - Alkyd Semi Gloss

3. Machinery and Equipment

   1st coat - Epoxy Type Machinery Enamel
   2nd coat - Epoxy Type Machinery Enamel

3.07 PAINT COLOR TYPES

A. Reference to a particular manufacturer's number or color name is used only as a convenience for the Architect in order to establish the Project color requirements. These references are not intended to describe the required generic paint systems. For generic paint systems requirements, refer to the "Schedule of Interior Painting" as applicable to the respective conditions of use.

B. Except as otherwise noted, use flat finish on ceilings and soffits, eggshell finish on walls and fascias, satin or semi-gloss finish on doors and frames, semi-gloss finish on convector covers and metal trim, and epoxy finish on ceilings and walls in wet spaces where shown or specified.

C. Samples showing color and sheen selected by the Architect for specific items or areas specified to receive paint finishes are available for examination in the Architect's office.

D. Color Schedule: The following schedule shall be considered as a guide only to color requirements, subject to the Architect's modification or approval:

See Finish Schedule on Plans for Paint Colors

3.08 CLEANING

A. At the end of each workday, remove empty cans, rags, rubbish, and other discarded paint materials from the site.

B. Remove paint spots, oil or stains upon adjacent surfaces not requiring painting and leave entire job clean.

C. Upon completion of painting, clean glass and paint-spattered surfaces. Remove spattered paint by

washing and scraping, using care not to scratch or damage adjacent finished surfaces.

END OF SECTION I-09900

SECTION I-09950

WALL COVERINGS

PART 1 – GENERAL

1.01 DESCRIPTION

A. General: Provide wall coverings in accordance with the Contract Documents.

1.02 QUALITY ASSURANCE

A. Installer Qualifications: Engage an experienced Installer who has specialized in the installation of wall coverings similar to that required for this project.

1.03 SUBMITTALS

A. Samples: Submit 3 lineal yards of full width material of each type, color and pattern of wall covering required.

B. Schedule: Provide a schedule of wall coverings using same room designations indicated on Drawings.

C. Product Data: Submit manufacturer's specifications, installation and maintenance instructions and other data and maintenance necessary to properly install, clean and maintain wall coverings (include precautions for use of cleaning materials and methods which could be detrimental to finishes and performance or might damage wall covering material). Include data on physical characteristics, durability, fade resistance and flame resistance characteristics and manufacturer's recommendations for maximum permissible moisture content of substrates.

D. Manufacturer's Certification: Submit the wall covering manufacturer's written certification that wall coverings comply with the requirements specified. Include certified test reports stating compliance with requirements for fire performance and physical properties specified.

E. Adhesives: Submit certification that adhesives used in the field for installation of Wall Covering shall have a VOC 200 or less.

1.04 PERFORMANCE CRITERIA

A. Provide wall covering materials that have been tested and bear UL label indicating the following fire resistance rating when tested in accordance with ASTM E84:

1. Flame Spread: 25 or less

2. Smoke Development: 25 or less in corridors and exits, and 100 or less in rooms in which the net area per occupant is ten square feet or less.

1.05 MOCK-UPS

A. Prior to installing wall covering, construct mockups for each type of wall covering to demonstrate aesthetic effects as well as qualities of materials and execution. Provide mockups using materials indicated for final unit of Work under finished Project lighting conditions complete with all the specified components and including typical penetrations such as wall outlets and light switches.

B. Alter or revise mock-ups, as directed, to obtain the acceptance of the Architect.

C. The approved mock-ups shall serve as a standard of quality for specified items for the project and may remain as a permanent part of the Work if in same condition as new at time of final acceptance.

1.06 PRODUCT HANDLING

A. Deliver materials in manufacturer's unopened containers identified with name, brand type, grade, class and all other qualifying information.

B. Store materials inside in original undamaged packaging, in a well- ventilated area protected from weather, moisture, soiling, extreme temperatures and humidity. Do not store rolled goods upright; lay flat, blocked off the ground to prevent sagging and warping. Maintain temperature in storage area above 40 deg F.

1.07 PROJECT CONDITIONS

A. Do not install wall covering until space is enclosed and weatherproof, wet-work in space is completed and nominally dry, work above ceilings is complete, and ambient temperature and humidity conditions are and will be continuously maintained at values near those indicated for final occupancy. Provide continuous ventilation during installation and for not less than the time recommended by the wall covering manufacturer for full drying or curing.

B. Illuminate installation areas using the building's permanent lighting system; temporary lighting alone will not be acceptable.

1.08 EXTRA STOCK

A. Furnish 6 lineal yards min. of each wall covering type to Owner and store in area as directed. Furnish replacement materials from same production run as materials installed.

B. Package replacement materials with protective covering or wrapping, clearly identified with appropriate labels as replacement material. Furnish accessory components as required.

PART 2 – PRODUCTS

2.01 MATERIALS

A. Vinyl Wall Covering: Complying with ASTM F793, Category II, decorative with medium serviceability; consisting of a mildew and fungus resisting cotton fabric base with a multi-layer coating of pigmented polyvinyl chloride resin fused to the fabric.

B. Fabric Wall Covering: Complying with ASTM F793, Category, II, decorative with medium serviceability, treated for stain and mildew resistance

C. Wall Covering Schedule: Wall Coverings specified below by proprietary designation are for colors, patterns, textures, weaves and designs as selected by the Architect for the Project. Equivalent products by Knoll, DesignTex, and Maharam shall be reviewed provided they match the color, pattern, texture, weave and designs selected. Provide the following in areas as shown:

See Finish Schedule on Drawing.

D. Adhesive: A mildew and fungus resistant, non-staining, removable type as recommended and provided by the approved wall covering manufacturer, and as required by manufacturer submitted test reports to meet specified performance criteria. Starch or wheat paste type adhesives will not be permitted. Adhesive shall permit the removal of the wall covering at a future date without damaging substrate.

1. Adhesives used in the Project shall comply with requirements of Section 1440, "Green Building Specification", and have a max. VOC of 200.

E. Primer and Sealer: As recommended by the approved wall covering manufacturer for each type of substrate.

PART 3 – EXECUTION

3.01 CONDITION OF SUBSTRATE

A. General: Examine the substrate and the conditions under which the work is to be installed. Do not proceed with installation until unsatisfactory conditions have been corrected.

B. Moisture: Surfaces to receive wall covering shall be thoroughly dry and free of active lime. A moisture indicating meter shall indicate not more than 0.2 at the time the wall covering is applied.

3.02 PREPARATIONS

A. General: Remove switch plates, wall plates, and surface-mounted fixtures, where wall covering is to be applied. Remove all loose/peeling plaster (if existing). Prime all walls complete. Skim walls smooth. Sand and prime ready for substrate to be covered.

B. Storage: Acclimatize wall covering materials by removing them from packaging in the installation area not less than 24 hours before application and keeping area at 70 deg. F. for 24 hours prior to installation.

C. Prepare substrates to achieve a smooth, dry, clean surface free of flaking, unsound coatings, cracks, and defects.

1. Painted Surfaces: Treat areas susceptible to pigment bleeding.
2. Metals: If not factory primed, clean and apply rust-inhibitive zinc primer.
3. Moisture Content: Maximum of 5 percent on new plaster, concrete, and concrete masonry units when tested with an electronic moisture meter.
4. Prime new gypsum board with primer recommended by wall covering manufacturer.
5. Allow new plaster to cure. Treat areas of high alkalinity.

D. Check painted surfaces for pigment bleeding. Sand gloss, semi-gloss, and eggshell finishes with fine sandpaper. At all walls scheduled for white or light-colored wall covering, prime with flat white mixture for a pure white substrate. No stains shall be visible.

E. Acclimatize wall covering materials by removing them from packaging in the installation areas not less than 24 hours before installation.

3.03 INSTALLATION

A. Vinyl Wall Covering: Apply wall covering in accordance with the manufacturer's instructions and as follows:

1. Install wall covering with an intimate substrate bond, smooth, clean, without wrinkles, gaps, overlaps, and other defects.,
2. Install seams vertically and plumb, continuously over internal and external corners, and at least 6 in. away from any corner. Horizontal seams will be permitted only where specifically indicated.
3. Overlap seams a minimum of two inches, and double-cut to assure tight closure. Cut wall covering evenly at edges. Trim salvages as required to assure color uniformity and pattern match at seams. Roll, brush or use a broad knife to remove air bubbles, wrinkles, blisters, and other defects.
4. Remove excess adhesive along finished seams using warm water and a clean sponge and wipe dry.
5. Replace removed plates and fixtures so that cut edges of wall covering are completely concealed.

B. Fabric Wall Covering: Apply wall covering in accordance with the manufacturer's instructions and as follows:

1. Hang in sequence, without reversing strips. Do not use sections of material with defects.
2. Apply adhesive to the wall and place in accordance with the manufacturer's instructions. Avoid adhesive on the face of wall covering fabric.
3. Pre-trim edges carefully so that seams butt tightly.
4. Roll or brush covering to assure bond and remove air bubbles, blisters, wrinkles and other defects. Smooth edges with felt-covered dry seam roller.
5. Allow adhesive that appears through seams to dry; when dry, remove with a dry brush. If additional adhesive removal is required, use only the method recommended by the manufacturer for this expressed purpose. Do not wet textile fabric. When removing excess adhesive from surfaces adjacent to wall covering, provide protection for the wall covering.

C. Cleanup: Upon completion of work, remove surplus materials, rubbish, and debris resulting from wall covering installation and leave areas of work in a neat, clean condition.

END OF SECTION I-09950

SECTION I-10520

FIRE EXTINGUISHERS, CABINETS AND ACCESSORIES

PART 1 – GENERAL

1.01 DESCRIPTION

A. General: Provide fire extinguisher cabinets, and mounting brackets in accordance with the Contract Documents. Install Owner purchased fire extinguishers in fire extinguisher cabinets provided in the work of this Section.

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

1. Section "Gypsum Drywall".
2. Section "Painting".
3. Section "Fire Protection" for fire protection systems.
4. Section "Architectural Woodwork".
5. Graphics Package for lettering and signage on Fire Extinguisher Cabinets.

1.02 QUALITY ASSURANCE

A. Single Source Responsibility: Obtain each type of fire extinguisher cabinet from single manufacturers.

B. Coordination: Coordinate with the Owner as required to provide fire extinguisher cabinets adequately sized for fire extinguishers supplied by the Owner.

C. Award the Work of this Section to single firm specializing in this type of work so that there will be undivided responsibility for such work. The firm shall have a minimum of 5 years successful experience in the fabrication and erection of similar systems as used for this Project.

D. UL Listed Products: Fire extinguishers UL listed and bear UL "Listing Mark" for type, rating, and classification of extinguisher.

E. Regulatory Requirements: Provide fire extinguisher cabinets and accessories that are approved for use by local jurisdiction.

1.03 SUBMITTALS

A. Product Data: Submit manufacturer's data for each type of product specified. For fire extinguisher cabinets include rough-in dimensions, details showing mounting methods, relationships of box and trim to surrounding construction, door hardware, cabinet type and materials, trim style, door construction, panel style, and materials.

B. Samples: Submit samples of each type of metal finish required, prepared on metal samples of same thickness and alloy specified for final unit of Work. Where finishes involve normal color and texture variations, include sample sets showing full range of variations expected.

C. Listed Products: Submit copies of UL, FM, and MEA approvals for type, rating, and classification of extinguisher cabinets and accessories.

1.04 PRODUCT DELIVERY, STORAGE AND HANDLING

A. Delivery: Provide protective covering or crating as recommended by the manufacturer to protect components and surfaces against damage during transportation, delivery, and storage.

B. Handle cabinets carefully to prevent damage.

PART 2 – PRODUCTS

2.01 MANUFACTURERS

A. Manufacturers: Products specified herein by proprietary designation are as manufactured by Larsen's Manufacturing Co. and shall serve as the standard by which other products may be judged. Equivalent products by manufacturers listed below shall be considered provided they comply with the requirements specified and the Contract Documents.

1. J.L. Industries.
2. Potter-Roemer, Inc.
3. Walter Kidde, Division of Kidde, Inc.

2.02 MOUNTING BRACKETS

A. Brackets: Provide brackets designed to prevent accidental dislodgement of extinguisher, of sizes required for type and capacity of extinguisher specified in plated finish.

1. Provide brackets for extinguishers not located in cabinets; for those located in cabinets, provide brackets where shown or required.

B. Identify bracket mounted extinguishers with red letter decals spelling "FIRE EXTINGUISHER" applied to wall surface; letter size, style, and location as selected by the Architect.

2.03 FIRE EXTINGUISHER CABINETS

A. Construction: Manufacturer's standard enameled steel box, with trim, frame, and hardware to suit cabinet type, trim style, and door style shown. Weld all joints and grind smooth. Miter and weld perimeter door frames.

B. Fire-Rated Cabinets: UL listed with UL listing mark with fire-resistance rating of wall where it is installed.

1. Recessed: Cabinet box (tub) fully recessed in walls of sufficient depth to suit style of trim shown.

C. Cabinet Type: Suitable for mounting conditions shown, of the following types:

D. Trim Style: Fabricate trim in one piece with corners mitered, welded, and ground smooth.

E. Cabinet and Door Material and Construction: Manufacturer's standard cabinet and door construction, of material shown, coordinated with cabinet types and trim styles specified.

1. Stainless Steel: ASTM A 666, Type 302 or Type 304 alloy.
2. Cold-Rolled Steel Sheet: ASTM A 1008/A 1008M, Commercial Steel (CS), Type B.

F. Door Hardware: Provide manufacturer's standard door operating hardware of proper type for cabinet type, trim style, and door material and style shown. Provide door pull, concealed, and friction latch. Provide concealed type hinge permitting door to open 180 deg.

G. Product Types:

1. Fully Recessed Non-Fire Rated Cabinet (FEC-1): Sonoma Series (Strike First USA) Fire Extinguisher Cabinet; Stainless steel Vertical Duo door, without handle, with No. 4 brushed finish.

2.04 FINISHES FOR FIRE EXTINGUISHER CABINETS

A. General: Comply with NAAMM "Metal Finishes Manual" for recommendations relative to application and designations of finishes. Protect mechanical finishes on exposed surfaces from damage by application of strippable, temporary protective covering prior to shipment.

B. Surface Preparation: Solvent clean surfaces in compliance with SSPS-SP 1 to remove dirt, oil, grease, and other contaminants that could impair paint bond. Remove mill scale and rust, if present, from uncoated steel in compliance with SSPC-SP 5 (White Metal Blast Cleaning) or SSPC-SP 8 (Pickling).

C. Factory Priming for Field Painted Finish (for unexposed portions of cabinet): Apply shop primer specified below immediately following surface preparation and pretreatment.

1. Shop Primer: Manufacturer's or Fabricator's standard, fast curing, lead free, "universal" primer, selected for resistance to normal atmospheric corrosion, for compatibility with substrate and field applied finish paint system indicated, and for capability to provide a sound foundation for field applied topcoats, despite prolonged exposure.

D. Baked Enamel Finish (for exposed, and semi-exposed interior of cabinet): Immediately after cleaning and pretreatment, apply manufacturer's standard 2 coat baked enamel finish consisting of prime coat and thermosetting topcoat. Comply with paint manufacturer instructions for application and baking to achieve a min. dry film thickness of 2.0 mils. Provide custom color to match paint color PC-107 as specified in Section "Painting".

E. Stainless Steel Finish (For Doors): Remove or blend tool and die marks and stretch lines into finish. Grind and polish surfaces to produce uniform-directional, textured polished finish indicated, free of cross scratches. Run grain with long dimension of each piece.

1. Directional Polish: AISI No. 4 finish.

2. Passivate and rinse surfaces after polishing. Remove embedded foreign matter and leave surfaces chemically clean.

PART 3 – EXECUTION

3.01 EXAMINATION

A. Examine substrates, adjoining construction, and conditions under which the Work will be installed. Examine walls and partitions for thickness, and framing for cabinets, to verify cabinet depth and mounting prior to cabinet installation.

B. Do not proceed with the Work until unsatisfactory conditions have been corrected.

3.02 INSTALLATION

A. Install cabinets level, plumb, in line with adjacent materials, and at the mounting heights shown in accordance with the manufacturer instructions, and to comply with applicable regulations of governing authorities. If mounting heights are not shown, install at heights to comply with applicable regulations of governing authorities.

B. For recessed mounted units, prepare recesses in walls for fire extinguisher cabinets as required by type and size of cabinet and style of trim, and to comply with manufacturer instructions.

C. Fasten mounting brackets and cabinets to structure, square and plumb. Coordinate with Sections "Miscellaneous Metals", "Rough Carpentry" and "Gypsum Drywall", for provision of miscellaneous framing, roughing, supporting and attachment devices required for installation.

D. Securely fasten mounting brackets and fire extinguisher cabinets to structure, square and plumb, to comply with manufacturer instructions. Provide fastenings as required to sustain imposed loads and for a rigid, secure installation.

E. Separate dissimilar metals with dielectric separator to prevent galvanic action. Do not extend coatings onto exposed surfaces.

3.03 CLEANING AND PROTECTION

A. At completion of the installation, clean soiled surfaces in accordance with the manufacturer instructions. Protect units from damage until acceptance by the Owner.

END OF SECTION I-10520

SECTION I-122413

MOTORIZED SHADES

PART 1 – GENERAL

1.01 SECTION INCLUDES

A. Shades

1. Motorized interior solar and/or privacy roller shades
2. Motorized interior room darkening roller shades
3. Motorized interior dual solar and/or privacy and/or room darkening roller shades
4. Motorized interior roller shad accessories
5. Motorized interior roller shade control systems

B. Related Sections:

1. Rough Carpentry Blocking for support of window shade brackets or pocket assemblies
2. Gypsum Board Assemblies Substrate for window shade systems and installation of shade pockets, pocket closure, and/or accessories supplied only under this section.
3. Acoustical Ceilings Installations of shade pockets, pocket closure, and/or accessories supplied only under this section.
4. Basic Electrical Methods and Materials Installation of and connections to electrical motor system and lighting control system components supplied only by this section. See Engineering Drawings.
5. Lighting Control Systems as it relates to the controls used to operate the window treatments. See Engineering Drawings.

1.02 REFERENCES

A. National Fire Protection Association (NFPA)

B. 1989 NFPA 701 small scale Vertical Burn Test and rated “PASS”.

C. 1996 NFPA 701 small scale Vertical Burn (telephone booth test) and rated “PASS”.

D. Morton International Laboratory.

E. Report #93-125 for PVC coated fabrics and bacterial / mildew resistance.

F. Toxicity: Provide shade fabrics tested in accordance with the University of Pittsburgh Toxicity Protocol including LC50 analysis and toxicity characteristics.

G. ASTM International (ASTM)

H. ASTM G-22-80 results for ATCC6538 (Staphyloccus aureus) and ATCC13388 (Pseudomonas aeruginosa) indicating minimum 5mm (0.19 inches) “No Growth Contact Area”.

I. ASTM G-21-85 – Standard Practice for Determining Resistance of Synthetic Polymeric Materials to Fungi results for ATCC9642, ATCC9348 and ATCC9645 indicating “No Growth”.

J. American National Standards Institute/Institute of Electrical and Electronic Engineers (ANSI/IEEE)

1. C62.41-1991 – Recommended Practice for Surge Voltages in Low-Voltage SC Power Circuits.

2. D4674-02a Standard Test Method for Accelerated Testing for Color Stability of Plastics Exposed to Indoor Fluorescent Lighting and Window-Filtered Daylight.

K. Underwriter Laboratories, Inc. (UL)

L. Electrical: Integrated motor control systems and components approved AS A SYSTEM by either Underwriter Laboratories (UL) or Electronic Testing Laboratories (ETL).

M. European Commission (CE) – Harmonized European Standard

N. Norma Official Mexicana (NOM)

1.03 SUBMITTALS

A. Submit under provisions of Section 01300.

B. Specification Conformance Document: Indicate whether the submitted equipment:

1. Meets specification exactly as stated.

2. Meets specification via an alternate means and indicate the specific methodology used.

C. Product Data: Manufacturer's data sheets with performance specifications demonstrating compliance with specified requirements including:

1. Preparation instructions and recommendations.

2. Storage and handling requirements and recommendations.

D. Submit manufacturers descriptive literature and details for each product type specified. Details indicate materials, finishes, construction, and dimensions of individual components, profiles, and mounting requirements.

E. Submit wiring diagrams, details on integration to lighting control systems, AV systems, and building management systems, installation instructions, and operating instructions.

F. Submit current certificates demonstrating all line voltage components of the system are wither UL Listed or UL recognized. All low voltage components within the system shall be powered by UL listed transformer or UL recognized class 2 transformers or power supplies and wired as NEC Class 2 circuits.

G. Submit test reports indicating compliance with fabric properties specified.

H. Shop drawings – Include:

1. Provide head, jamb and sill details, and relevant dimensions for mounting requirements for each product type and mounting condition.

2. Provide shade schedule indicating room number, opening size(s), quantities and key to details.

3. Provide one-line wiring system diagrams including connection details and overall arrangement of shade and control locations supplied by this section for installation and connection under division 16.

I. Selection Samples – For each product specified, provide:

1. Portfolio of shade fabric swatches for initial fabric color selection from manufactures full range of available fabrics.

2. Material samples for color and finish selection of controls.

J. Verification Samples – For each finish product specified:

1. One fully operational window shade sample of each type required complete with selected shade fabric including sample of seam/ batten when applicable. Location of sample to be determined by Architect.

2. One complete set of all shade components demonstrating compliance with project requirements when applicable.

1.04 QUALITY ASSURANCE

A. Manufactures Qualifications:

1. The responsibility for the design, engineering, installation, and performance of motorized window shade systems specified will be assigned to a single manufacturer and their qualified dealers/installers.

2. Minimum 5 years' experience in manufacture of precision-engineers, low-voltage motorized shading systems.

B. Furnish shading system and electrical control equipment for a complete installation and single source responsibility of shading and lighting control where applicable.

C. The manufacture, subsidiary, or licensed agent will be qualified to supply the products specified and to honor any claims against the product presented in accordance with the warranty.

D. Provide 24-Hour / 7-Day technical support to troubleshoot system wiring and aid in system programming.

E. Installer Qualifications:

1. Installer shall be qualified to install and commission the specified products by prior factory training, experience, demonstrated performance, and acceptance of any requirement of the manufacturer, subsidiary of the manufacturer, or licensed agent.

2. Mock-Up: Provide a mock-up for evaluation of preparation techniques and application workmanship.

3. Install shade in areas designated by the Architect.

4. Do not proceed with remaining work until the Architect approves workmanship and operation.

5. Rework mock-up as required to produce acceptable work.

1.05 DELIVERY, STORAGE AND HANDLING

A. Store products in manufacturer's unopened packaging until ready for installation.

B. Do not deliver shades to the project until all concrete, masonry, plaster, painting, and other wet work has been completed and is dry.

C. Deliver shades to project in protective packaging, uniquely labeled to identify each shade for each opening. Schedule delivery to prevent delays to completion of work, but to minimize on-site storage time.

D. Store materials in a dry, secure space. Protect from weather, surface contaminants, corrosion, construction traffic, and all other potential damage.

1.06 PROJECT CONDITIONS

A. Maintain environmental conditions within recommended limits.

1. Ambient operating temperature: 32-°F (0-40 °C)

2. Humidity: 0-90%, non-condensing

3. Do not install products under environmental conditions outside manufacturer's absolute limits.

4. Products are intended for indoor use only.

B. Shade system shall not be installed until the building is operating at ambient temperature and humidity ranges that are consistent with those intended for the buildings ultimate use.

1.07 COORDINATION

A. The Contactor shall coordinate installation of the following items with the window shade contactor for the window treatment systems:

1. Metal shade pockets recessed into celling system and ceiling trim (closure flap) or assembly.

B. The contactor shall provide the following materials and services to the window shade contractor for electronically powered window treatments:

1. Power wiring in accordance with requirements provided by the window shade contactor or electrical contractor.

2. Low voltage wring as necessary for operation of shade control system with requirements provided by the window shade or electrical contractor.

C. Scheduling:

1. Fabricate shades after obtaining field dimensions for each opening.

2. Coordinate construction of surrounding conditions to allow for timely field dimension verification.

3. Manufacturer's standard lead times apply. Reference submittal and schedule accordingly for project timeline.

1.08 WARRANTY

A. Provide manufacturer's standard warranty covering 2-year parts and labor and 8 years limited parts warranty to repair and replace defective equipment.

B. Provide manufacturers upgraded [10] year warranty to repair and replace defective equipment.

1.09 MAINTENANCE

A. Make ordering of new equipment for expansions, replacements, and spare parts available to a qualified dealer or installer.

B. Make replacement parts available for a minimum of ten years from date of manufacture.

C. Provide factory direct technical support hotline 24 hours per day, 7 days per week.

D. Provide on-site service support within 24 hours anywhere in continental United States and within 72 hours worldwide except where special visas are required.

E. Offer renewable service contract on yearly basis to include parts, factory labor, and annual training visits. Make service contacts available up to ten years after the date of system commissioning.

PART 2 – PRODUCTS

2.01 MANUFACTURERS

A. Acceptable Manufacturer: Lutron Electronics Co., Inc. – 7200 Suter Road, Coopersburg, PA 18036-1299. Telephone (800) 523-9466 http://www.lutron.com.

B. Lutron Sivoia QED or subject to compliance and prior approval with specified requirements of this section, one of the following:

1. Lutron

C. Substitutions: [Not Permitted].

1. All proposed substitutions (clearly delineated as such) must be submitted in writing for approval by the design professional a minimum of 10 working days prior to the bid date and must be made available to all bidders. Proposed substitutes must be accompanied by a review of the specification noting compliance on a line-by-line basis.

2. By using pre-approved substitutions, the contractor accepts responsibility and associated costs for all required modifications to circuitry, devices, and wiring. The contractor shall provide complete engineered shop drawings (including power wiring) with deviations for the

original design highlighted in an alternate color to the engineer for review and approval prior to rough-in.

2.02 APPLICATION/SCOPE

A. Roller shade schedule:

1. Shade Type 1: Motorized interior solar roller shade utilizing quiet, low-voltage, precision controlled Electronic Drive Unit.

B. See Finish Plan, Legend, and RCP for specification and locations.

2.03 SYSTEM REQUIREMENTS

A. Aesthetics

1. Symmetrical light gaps of no more than 0.75 inch typical or 0.625-inch (20mm) minimum.
2. Shade mounting position can be adjusted while the shade is installed to ensure perfect shade centering.

B. Operation – Shade utilizes Electronic Drive Unit with the following requirements:

1. Operates without exceeding a 44dBA Sound Pressure Level (SPL) measured three (3) feet or one (1) meter from the motor. **NOTE TO SPECIFIER** Sivoia QED shades use a communications bus for system configuration and control. Shades can be grouped to work together or configured to work independently without the use of group controllers, relays, or line-voltage wiring between shades. Traditional AC motors require group controllers which must be hard-wired to allow multiple shades to work together in a group, making changes to system operation after installation difficult and expensive. The Sivoia QED communications bus allows the user to easily configure the shading system to meet the needs in the space and reconfigure the system as their needs change without re-wiring.
2. Operates independently, without the use of external group controllers.
3. Makes no audible clicks when the motor starts or stops. **NOTE TO SPECIFIER** Many installations use multiple shades along a single wall of windows. Sivoia QED shades utilize digital technology to ensure that multiple, independently operated shades across multiple windows start, stop, and track together, as if they were one shade. This makes certain that shades will always be in alignment with each other over the lifetime of the installation.
4. Precisely controls roller shade speed for accurate shade tracking within +/- 0.0625 inch (mm) throughout the entire shade travel.
5. Includes power failure memory for preset stop points, open and closed limits, shade grouping, shade sub-grouping, and system configuration.
6. Integrates directly without interfaces with Roman shades and draperies that utilize Electronic Drive Units.
7. Systems with multiple Electronic Drive Units are electronically synchronized and start, stop and move smoothly in unison at all times.

C. Capacity:

1. System allows 96 devices per communication link including electronic drive units, wall stations, and interfaces. Refer to drawings for logic schematic.
2. System integrates with central lighting control system to control over 4000 electronic drive units, wall stations, and interfaces.

D. Grouping:

1. System groups and subgroups are reconfigured at the point of control without rewiring or access to the Electronic Drive Unit.

2. System wall stations control any Electronic Drive Unit, group, or subgroup without requiring Group Controllers.

E. Presets and Open and Close Limits

1. Electronically precision-set and locked into a 10-year power-failure memory.
2. Programmable and adjustable from the Electronic Drive Unit and/or wall mounted wall stations and/or had held system remote controls.
3. Electronic Drive Unit stores over 250 configurable pre-set stop points which can be located at any point between open and closed limits and are recalled with the press of a button on a wall station, infrared control or a contact closure triggered by an external system.
4. Preset positions are recalled by wall stations, contact closure inputs, infrared receivers, and lighting control system interfaces.
5. Each wall station in the system can select up to 5 unique preset positions.
6. Preset positions are user-adjustable with a 5-second button "press and hold" from wall stations, infrared transmitters, or contact closure boards. The user-adjustment feature can be disabled at the wall station location.

F. Protection

1. System components provide appropriate (spike and brownout) over voltage protection (+/- 10% of line voltage) for all devices in the system.
2. The Electronic Drive Unit is powered via a UL Listed or UL Recognized Class 2 Power Supply.
3. System components provide stall protection so that in case that the motor stalls, there is no damage to fabric or drive motor.
4. System components provide over-heat protection to prevent overheating which could damage the motor drive.

G. Integration

1. Roller shade system integrates directly with Lutron lighting control system.
2. Roller shade system integrates with A/V equipment, time clocks and security systems through contact closure inputs. Refer to drawings.
3. Electronic Drive Units are capable of receiving infrared (IR) from hand-held transmitters through infrared receivers on a wall station, contact closure interface, and/or through an IR receiver wired directly to the Electronic Drive Unit without an external interface.
4. Electronic Drive Units communicate directly to Lutron lighting control processor through radio frequency communication with no additional communications wiring.

2.04 ROLLER SHADES

A. Mounting:

1. Roller shade brackets provide symmetrical light gaps of 0.75 inch (20 mm) on each side of the shade.
2. Universal mounting brackets can be used for wall, ceiling, and jamb mount.
3. Two-piece mounting bracket provides level, projection, and shade centering adjustments from mounting bracket.
4. System shall have a roller shade levelling adjustment that allows level adjustment while the roller shades are mounted to the brackets.
5. System shall allow a side-to-side adjustment of up to +/- 0.375 inch (9 mm) on each side while the shade is mounted to the bracket to properly center shade over the window.

6. System shall have a projection adjustment of up to 0.50 inch (12 mm) allowing the shade to clear the trim or move the shade closer to the widow in order to have a tighter seal between the fabric and the window.

7. System dual brackets shall be provided to permit two shades rollers to be mounted in the same opening.

B. Coupling:

1. A single EDU shall be capable of driving multiple shades with a coupling pin.

2. This pin allows for precision adjustment of the bottom bar levels without removing the roller from its installed point or removing fabric from the roller tube.

C. Shade Tube:

1. Fabric shall be connected to the tube with double-sided adhesive strip applied for exact and firm mounting of the fabric and for easy adjustment of fabric to prevent telescoping.

2. A minimum of one turn of the fabric shall be placed on the roller before the working section of the fabric starts to protect the fabric and smooth out the starting seam.

D. Fabrics

1. Qualifications

a. Fire – Provide shade fabrics tested in accordance with:

1) 1989 NFPA 701 large scale Vertical Burn Test and rated “PASS”.

2) 1999 NFPA 701 small scale Vertical Burn (telephone booth test) and rated “PASS”.

2. Manufacturing

a. Where applicable, shade fabric is sealed to minimize fraying.

b. Shade Fabric panels are 100 percent visually inspected for defects using a light box integrated into the manufacturing line.

c. 100 percent visual inspections are performed on each shade seam and bottom bar welds and compared to strict aesthetic standards.

d. Shade Fabric panels are 100 percent checked for squareness within +/- 1/16 inch (1.5 mm) diagonally.

e. Shade Fabric panels are 100 percent visually inspected to ensure there are no frayed edges or defects in the cut.

f. Shades are tested to verify that shade fabric telescopes no more than 3/16 inch prior to shipment.

g. PVC-coated Fabric panels, which cannot be cut ultrasonically, must be treated so that the edges do not fray over time.

2.05 FABRIC SELECTION (SEE FINISH PLAN)

A. Light-filtering Fabrics

B. Privacy and/or Solar Fabrics

C. Custom Printing – N/A

2.06 BOTTOM BAR

4. Architectural Bottom Bar **NOTE TO SPECIFIER** The Sivoia QED system utilizes an elegant architectural bottom bar which can be customized based on the project.

1. Utilizes endcaps to coordinate with fabric selection in white, bronze, gray or black
2. Contains a spline groove at the top to receive and secure the fabric to the bar
3. Available in three options:
    a. Full wrap, where roller shade fabric wraps around the bottom bar
    b. Half wrap, where roller shade fabric wraps around the interior room side of the bottom bar only. Bottom bar extrusion shall be [white] [bronze] [anodized aluminum] so that the non-wrapped side coordinates with dual-sided fabrics or mullions
    c. Exposed, typically used for black out applications. Bottom bar extrusion shall be [white] [bronze] [anodized aluminum] to coordinate with mullions and/or side channels
    d. Provide “T” slot at the bottom for wool-pile light seal, if desired
4. Standard Sealed Bottom Bar shall be a 10 inch (24 mm) wide by 0.1875 inch (4.75 mm) thick extruded aluminum bar enclosed on all sides in a thermally sealed pocket across the bottom of the shading fabric.

2.07 CONTROLS

A. Wall Mounted Controls

1. Low voltage wall stations are available to electronically set and reconfigure shade open and close limits, shade preset positions, system groups, and system subgroups at the control without rewiring and without access to the Electronic Drive Unit.
2. Faceplates attach using no visible means of attachment.
3. Low voltage wall stations fit into a standard backbox.
4. Engraved artwork scheduled for controls, such as borders and loos, are applied in a method designed to resist removal by scratching, cleaning, etc.
5. Manufacturer ensures the following items regarding product color:
    a. Product color matches NEMA standard WD1, Section 2, and the maximum color deviation from this standard shall not exceed E=1, CIE L*a*b color space units. For non-NEMA colors, color match coordination shall be provided on request.
    b. Color variations of any control in the same product family shall not exceed E=1, CIE L*a*b color units.
    c. Visible parts shall exhibit ultraviolet color stability when test with multiple actinic light sources as defined in ASTM D4674-89. Manufacturer to submit proof of testing upon request.
    d. Wall stations are laser engraved with appropriate description. Silk-screen borders, logos, and graduations use a graphic process that chemically bonds to faceplate, resistant to removal by scratching and cleaning.
6. Wall station(s) provide an immediate local LED response upon button activation to indicate that a system command has been sent from the wall station. LED remains lit contingent upon receiving system confirmation of the successful completion of the command.
7. Wall station(s) have removable button assemblies that can be replaced in the field to change colors, button configurations, and engraving.
8. Wall station buttons are backlit.
9. Wall stations are capable of simultaneously controlling one or more shades, up to the maximum number of shades in the system.

10. Wall stations are of type: Refer to Drawing E-6 for operation requirements.

B. IR Transmitters and Receivers

1. IR Receivers are available on system wall station, as an attachment to the Electronic Drive Unit, or on the system contact closure input board. Refer to drawing for schedule of operation.
2. IR Receivers connect directly to the Electronic Drive Unit and do not require additional tools or interfaces.
3. IR Receivers include circuitry to reduce degraded performance from ambient interference such as electronic ballast noise or sunlight.
4. Color: [White IR Receiver with white wiring] [Royal Plum IR Receiver with black wiring]
5. Through the use or IR extensions, the receiver may be mounted on any flat surface up to 50 feet from the Electronic Drive Unit.
6. Remote Controls electronically set and reconfigure shade open and close limits, shade preset points, system groups, and system subgroups at the control without rewiring and without access to the Electronic Drive Unit.
7. System Remote Controls are Lutron Sivoia QED Hand-held Infrared Transmitters. Refer to drawing for schedule of operation.
    a. IR Transmitters are of type: Refer to control schedule for operation requirements
8. Open/close infrared hand-held transmitter provides OPEN/CLOSE and momentary raise and lower functions.
9. 3-preset, infrared hand-held transmitter provides OPEN/CLOSE, three preset stop points and momentary raise/lower functionality.
10. Control operates up to 4 shades or groups of shades.
11. Control operates both light filtering and blackout shades on the same window.
12. Multifunction light and window treatment hand-held infrared transmitter provides individual control of up to 2 shades or 2 groups of shades and preset lighting from the same remote.
13. Shade operation allows for open, close, and momentary raise/lower functionality.
14. Lighting functions include presets 1,2,3,4, and off.

C. Interfaces: (WHERE APPLICABLE)

1. Interface via Contact Closure Inputs
2. Shade system interfaces to control system by others via dry contact closure input (CCI) device.
    a. CCI can control any or all shades in the system via the communications link.
    b. CCI grouping and control functions can be re-configured without rewiring.
    c. CCI can be configured to control up to four individual groups of shades.
3. CCI accepts up to eight dry contact closure inputs which can be configured to provide the following functionality:
    a. OPEN/CLOSE, three preset stop points, STOP and momentary raise and lower shade functions for one group of shades.
    b. OPEN, preset, CLOSE and STOP shade functions for two groups of shades.
    c. OPEN/CLOSE, momentary raise and lower shade functions for two groups of shades.

d. OPEN/CLOSE shade functions for four groups of shades.

4. CCI inputs configured to accept momentary or maintained closures.

5. CCI has the capacity to operate as an IR receiver.

6. CCI has diagnostic LED indicators to verify input contact closures have been received.

7. CCI has manual override test buttons to ensure that received closures initiate the correct function.

8. Interface with Lutron Grafik Eye System:

a. Shade system interfaces to Lutron Grafik Eye lighting system to provide single system control of daylight and electric light in the space.

b. Interface(s) provides buttons for selecting the following for one group of shades: full-open, full-closed, three programmable preset buttons, and raise/lower.

c. Interface(s) provides an immediate local LED response upon button activation to indicate that a system command has been sent from interface.

d. Interface(s) is capable of simultaneously controlling one or more shades, up to the maximum number of shades in the system, without affecting the lighting control system.

e. Interface(s) faceplate attaches using no visual means of attachment.

f. Interface(s) faceplate has removable button assemblies that can be replaced in the field to change colors, button configurations, and engraving.

g. Interface(s) functions are configured through the lighting control system.

h. Interface buttons have backlighting.

2.08 TRANSFORMER

A. The Electronic Drive Unit is powered with 24 VAC transformer.

B. Each Electronic Drive Unit requires a [individual transformer] [power panel including 10 individual transformers].

C. Power Panel:

1. Panels are [120V UL Listed] 230V CE Listed].

2. Panels accept [120VAC] [230VAC] hardwired connections and provide centralized power and communication landing terminals for up to 10 Electronic Drive Units.

3. Panels provide protection for each Electronic Drive Unit with an independent circuit breaker or fuse.

4. Panels provide diagnostic LED status indicators to indicate that power and control wiring for Electronic Drive Unit is correct and functioning.

D. Individual transformers are [120V UL Listed Class 2 power supply] [230V CE Listed].

E. J-Box Mounted Transformer:

1. Transformer accepts 120VAC hardwired connections and provides power for one Electronic Drive Unit.

2. Electronic Drive Unit is protected by an integral circuit breaker.

3. Transformer provides power to one Electronic Drive Unit.

F. Plug-in Transformer 100va:

1. Transformer provides line cord to connect directly to standard [120VAC] [230VAC] grounded

outlets.

2. Electronic Drive Unit is protected by an integral circuit breaker.

3. Transformer provides power to one Electronic Drive Unit.

G. Plug-in Transformer 50va:

1. Transformer provides integral 3 prong connector to mount directly to a standard 120VAC outlet.

2. Electronic Drive Unit is protected by an integral fuse.

3. Transformer provides power to one Electronic Drive Unit.

2.09 SOURCE QUALITY CONTROL

A. Perform full-function testing on all completed assemblies at end of production line prior to shipment.

PART 3 – EXECUTION

3.01 EXAMINATION

A. Begin installation after substrates have been properly prepared.

B. If substrate preparation is the responsibility of another installer, notify Architect of unsatisfactory preparation before proceeding.

3.02 PREPARATION

A. Clean surfaces thoroughly prior to installation.

B. Prepare surfaces using the methods recommended by the manufacturer for achieving the best result for the substrate under the project conditions.

3.03 INSTALLATION

A. Install in accordance with manufacturer's instructions.

B. Install shades in windows level and plumb to provide smooth operation.

C. Install in accordance with manufacturer's product data and approved shop drawings.

D. A factory-qualified technician shall perform field measurement and installation.

E. Separate dissimilar metals with dielectric separator to prevent galvanic action. Do not extend coatings onto exposed surfaces.

3.04 ADJUSTING

A. Adjust level, projection, and shade centering directly from mounting bracket.

B. Adjust fabric on tube if visibly telescoping.

3.05 CLEANING

A. Touch up damaged finishes and repair minor damage in order to eliminate evidence of repair. Remove and replace work that cannot be satisfactorily repaired.

B. Clean exposed surfaces, including metal and shade fabric, using non-abrasive materials and methods recommended by the shade fabric manufacturer. Remove and replace work that cannot be satisfactorily cleaned.

3.06 DEMONSTRATION

A. Demonstrate operation method and instruct owner's personnel in the proper operation and maintenance of the window shade system.

B. Manufacturer's Instructions:

1. Installation, Programming, and Maintenance instructions to be included in product packaging.
2. 24-Hour / 7-Day Factory Technical Support shall be available to aid with unforeseen installation difficulties.

3.07 PROTECTION

A. Protect installed products until completion of project.

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

END OF SECTION I-122413