

**TAX COLLECTORS' OFFICE
CLAY COUNTY**

**115 NE COMMERCIAL CIRCLE
KEYSTONE HEIGHTS, FLORIDA**

Permit Set

Architect

Bhide & Hall Architects, P. A.
1329-C Kingsley Avenue
Orange Park, Florida 32073
(904)264-1919
AR-0011549

Structural Engineer

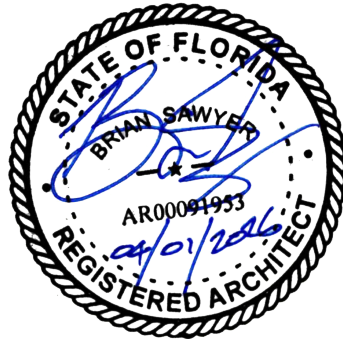
Structures International, LLC
7563 Philips Highway
Building 600
Jacksonville, Florida 32256
(904)296-2646

MEP Engineer

1409 Kingsley Avenue
Building 12 A
Orange Park, Florida 32073
(904)264-5570

BHA No. 202347

October 14, 2024



TAX COLLECTORS' OFFICE

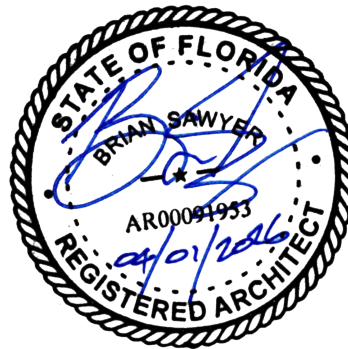
For

CLAY COUNTY

PERMIT SET

Bhide & Hall Architects, P.A.
BH No. 202347

October 14, 2024



TAX COLLECTORS' OFFICE
CLAY COUNTY

TABLE OF CONTENTS

DIVISION 0

00 00 00	COVER
00 01 00	COVER PAGE-INSIDE
00 01 01	TABLE OF CONTENTS
00 01 03	PROJECT DIRECTORY

DIVISION 1

01 00 00	<u>GENERAL REQUIREMENTS</u>
01 04 00	COORDINATION
01 10 00	SUMMARY
01 21 00	ALLOWANCE PROCEDURES
01 23 00	ADD ALTERNATES
01 25 00	SUBSTITUTION PROCEDURES
01 26 00	CONTRACT MODIFICATIONS PROCEDURES
01 26 13	REQUESTS FOR INTERPRETATION
01 27 00	INCLUSIVE REQUIREMENTS
01 29 00	PAYMENT PROCEDURES
01 30 00	SUBMITTALS
01 31 00	PROJECT MANAGEMENT AND COORDINATION
01 32 00	CONSTRUCTION PROGRESS DOCUMENTATION
01 33 00	SUBMITAL PROCEDURES
01 40 00	QUALITYL REQUIREMENTS
01 50 00	TEMPORARY FACILITIES AND CONTROLS
01 60 00	PRODUCT REQUIREMENTS
01 70 00	CONTRACT CLOSEOUT
01 72 00	PROJECT RECORD DOCUMENTS
01 73 00	EXECUTION
01 73 29	CUTTING AND PATCHING
01 74 19	CONSTRUCTION WASTE MANAGEMENT AND DISPOSAL
01 77 00	CLOSEOUT PROCEDURES
01 78 23	OPERATION AND MAINTENANCE DATA
01 78 39	PROJECT RECORD DOCUMENTS

DIVISION 2

02 41 14	<u>EXISTING CONDITIONS</u>
02 41 19	ELECTRICAL - DEMOLITION
02 95 00	SELECTIVE DEMOLITION
	TERMITE CONTROL

DIVISION 3

03 00 00	<u>CONCRETE</u>
03 01 30	REFER TO STRUCTURAL DRAWINGS
	REHABILITATION OF CAST-IN-PLACE CONCRETE

DIVISION 4

04 00 00	<u>MASONRY</u>
	REFER TO STRUCTURAL DRAWINGS



TAX COLLECTORS' OFFICE
CLAY COUNTY

DIVISION 5

05 40 00
05 52 00

METALS

METAL STUDS
PIPE AND TUBE RAILINGS

DIVISION 6

06 10 00
06 16 00
06 22 00
06 40 23

WOOD & PLASTIC

ROUGH CARPENTRY
SHEATHING
MILLWORK
INTERIOR ARCHITECTURAL WOODWORK

DIVISION 7

07 31 13
07 84 00
07 92 00

THERMAL AND MOISTURE PROTECTION

ASPHALT SHINGLES
FIRESTOPPING
JOINT SEALANTS

DIVISION 8

08 10 00
08 41 13
08 56 00
08 80 00

DOORS AND WINDOWS

HOLLOW METAL DOORS AND FRAMES
ALUMINUM FRAMED STOREFRONTS
TRANSACTION DRAWER AND FIXED GLASS PANEL
GLAZING

DIVISION 9

09 21 16
09 30 00
09 51 13
09 65 00
09 65 13
09 68 00
09 91 00

FINISHES

GYPSUM BOARD ASSEMBLES
CERAMIC TILE
ACOUSTICAL PANEL CEILINGS
RESILIENT FLOOR TILE
RESILIENT BASE AND ACCESSORIES
CARPETING
PAINTING

DIVISION 10

10 14 00
10 28 00
10 52 00

SPECIALTIES

SIGNAGE
TOILET ACCESSORIES
FIRE EXTINGUISHERS AND CABINETS

DIVISION 11

11 31 00

EQUIPMENT

RESIDENTIAL APPLIANCES

DIVISION 12

12 93 00

FURNISHINGS

SITE FURNISHINGS

DIVISION 22

22 00 00

PLUMBING

PLUMBING

DIVISION 23

23 00 00

HEATING, VENTILATING, AND AIR CONDITIONING (HVAC)

HEATING, VENTILATING & AIR CONDITIONING

TAX COLLECTORS' OFFICE
CLAY COUNTY

DIVISION 26
26 00 00

ELECTRICAL
ELECTRICAL

DIVISION 27
27 00 00

COMMUNICATIONS
COMMUNICATIONS CABLING

DIVISION 32
32 12 16

EXTERIOR IMPROVEMENTS
HOT-MIX ASPHALT

END OF TABLE OF CONTENTS

DOCUMENT 00 00 30

PROJECT DIRECTORY

Title	Organization	Name/Title	Telephone Number	E-mail Address
Owner	Clay County Florida 477 Houston Street Green Cove Springs Florida, 32043			
Tenant	NA			
Architect	Bhide & Hall Architects, PA 1329-C Kingsley Avenue Orange Park, Florida 32073 Primary contact during Construction	Brian Sawyer President Pat Smith Sr Project Architect	(904) 264-1919	bsawyer@bhide-hall.com psmith@bhide-hall.com
Civil Engineer	NA			
Structural Engineer	Structures International, LLC 7563 Philips Highway Building 600 Jacksonville, Florida 32256	Dan Charletta	(904) 296-2646	info@structuresintl.com
Title	Organization	Name/Title	Telephone Number	E-mail Address
MEP Engineer	Powell & Hinkle Engineering 1409 Kingsley Avenue Building 12 A Orange Park, Florida 32073	Kevin Wood	(904) 264-5570	office@powellandhinkle.com

END OF DOCUMENT

SECTION 01 00 00

GENERAL REQUIREMENTS

1.01. PROJECT INFORMATION

- A. The project consists of renovations and remodeling for the Clay County Tax Collectors' Office. The facility is single story and un-sprinklered.
- B. The existing construction is FBC Type VB, un-sprinklered.
- C. Project Location: 115 NE Commercial Circle, Keystone Heights, Florida 32656
- D. Rules and Regulations Governing this Project 2023 8th Edition:

- Florida Building Code
- Florida Building Code Existing Buildings
- Florida Accessibility Code
- Florida Plumbing Code
- Florida Mechanical Code
- Florida Energy Conservation
- Florida Fuel Gas
- Florida Fire Prevention Code
 - NFPA 1: Fire Code
 - NFPA 101: Life Safety Code

CONSTRUCTION MANAGEMENT

- A. This project will be constructed by a General Contractor providing services for Clay County.
- B. Construction Manager's responsibilities:
 - 1. The Contractor shall be responsible for all work indicated in the contract documents in accordance with the contract. Work includes, but not limited to the following:
 - a. Concurrence with the project scope.
 - b. Preconstruction phase services including a formal bid.
 - c. Direct Purchase of Materials and coordination.
 - d. Scheduling of the work.
 - e. All required construction services.
 - f. Project clean-up and close out.
- C. The instructions to bidders, instructions to the Contractor, general conditions of the contract, special conditions, if any, and specific contracts, are included in the Construction Manager's agreement with Clay County.

1.03. STANDARD BASIS FOR BIDDING

- A. Proprietary Products
 - 1. In these Specifications where one certain kind, type or brand of manufacturer of materials is named, it shall be regarded as the required minimum standard of quality. Substitutions lowering the performance, quality, method of assembly or installation, or in general, not in keeping with the Drawings and Specifications will not be permitted. It is understood that when a bid is submitted, the Bidder is aware of these requirements and that the materials within his bid are "equal to" or "better than" such items and that prior approval of any

substitutions has been obtained from the Architect Engineer and acknowledged by written Addenda. Refer to Section 01 25 00 Substitution Procedures.

2. Extension of the Bid Opening Date will not be permitted in order to substitute a product.
3. Since time is of essence, the Owner cannot be expected to delay the Bid Opening Date. In addition to the Specifications, it shall be understood that the details supplied with proprietary products shall become part of these Specifications as if contained herein. If a conflict should occur between the details and the Drawings and Architect Engineer prior to submitting a Bid proposal.

B. Nonproprietary Products

1. Where materials, etc., are referred to in the Specifications as "equivalent to", or words of similar meaning, the Architect Engineer with Owner approval will decide as to their "equivalency." In addition to data required under paragraphs entitled "Shop Drawings" or "Manufacturer's Description Data," the Bidder shall furnish other detailed data as required by the Design Professional for comparison if the product is mentioned by name. All data shall be submitted at least ten (10) days prior to the scheduled bid opening date. No extra time will be allowed because of such substitution, if permitted, either for the article substituted or for revisions in other work affected by the substitution.

C. Substitutions

1. Where a particular system, product or material is specified by one or more trade names without the "equivalent" qualification, it shall be considered as a standard basis for bidding and is most satisfactory for its particular purpose in the work. Substitutions for the named systems, products or materials and substitutions for any other product or material or modification of the specified material which the Bidder considered pertinent will be considered under the following conditions only:
 2. All data shall be submitted at least ten (10) days prior to the scheduled bid opening date. No extra time will be allowed because of such substitution, if permitted, either for the article substituted or for revisions in other work affected by the substitution.
 3. To ensure a uniform basis for bidding, the Bidder shall base his Proposal on the particular system, product or material named in the Drawings and Specifications or Addendum.
 4. The Bidder shall attach to his Form of Proposal, at the time of submission, a separate sheet upon which he shall list the particular system, product or material that he wishes to substitute. Documents shall be uploaded on-line in the Submittal section of the Clay County E-Procurement Portal (<https://procurement.openov.com/portal/claycounty>). Directly opposite each item he wishes to substitute, he shall indicate the amount of money that he will add to or deduct from his Base Bid, if such substitution is approved by the Owner and the Architect Engineer prior to the signing of the Contract.
 5. If no addition or deduction to the Base Bid is allowed by the Bidder for such substitutions, it shall be so stated opposite the item involved on the sheet attached. Include with the pricing proposal and include with the up-load as directed in Item 4 above. Substitutions so submitted shall include any and all adjustments of that or any other work affected by the

substitution. Such substitutions shall be permitted and adopted only upon the written approval of the Architect Engineer and the Owner.

6. Any Proposal submitted that does not conform to the above requirements shall be considered as informal and unfair to other Bidders and will not be accepted.
7. The Bidder shall not use or install any material containing asbestos in the construction of this project or in the substitution of any product or material used in the construction.

D. Adjustments Because of Substitutions

In general, the Drawings and Specifications, of necessity, have been prepared based upon sizes, loads and requirements of specific items of equipment, products or materials.

In the event the Bidder elects to use other equipment, products or materials than those for which designs have been prepared and included in the Drawings and Specifications, and if because of such substitutions or changes from those shown, the Architect Engineer is required to revise the Drawings or is caused added expense, the Owner shall be equitably reimbursed by the Bidder for such costs.

1. Price variance resulting from substitution in accordance with Sub-paragraph 1.03C is allowed, but it shall not be a consideration in the award of this Contract.
2. No changes in the bid amount appearing on the outside of the bid envelope will be considered. Only the amount shown inside the envelope will be considered. All changes, corrections and erasures must be initialed by the person signing the bid.
3. Bidder recommending substitution shall be responsible for all associated costs to the project.
4. Nonconformance of Bid with Specifications

The Bidder shall be responsible for providing all items specifically called for in the Specifications, and the Owner shall not be responsible for any costs associated with the removal of nonconforming work and the substitution of work as called for in the Specifications.

1.04. Interpretation of Drawings and Specifications

Should a bidder find discrepancies, ambiguities or conflicts in, or omissions from the Drawings and Specifications, or should he be in doubt as to their meaning, the Bidder shall inquire for clarification with Clay County Purchasing Department.

END OF SECTION

SECTION 01 04 00

COORDINATION

- 1.01. Architect/Engineer Control
- A. The ARCHITECT/ENGINEER will render all interpretations of the Construction Documents upon request by the Owner or Contractor.
 - B. The ARCHITECT/ENGINEER will provide assistance for and approve solutions of construction problems.
 - C. Decisions relating to quality shall be approved by the ARCHITECT/ENGINEER.
 - D. Prior approval of the ARCHITECT/ENGINEER shall be obtained unless the approval of others is specifically required. Contractor is not to assume that approval has been given.
 - E. Product or System Approvals:
 - 1. Where products or systems are specified by manufacturer's name and noted as approved, subsequent approval is not required if utilized exactly as specified.
 - 2. The ARCHITECT/ENGINEER's approval implies only that a system is acceptable as it directly relates to the requirements of the Contract Documents. ARCHITECT / ENGINEER approval neither implies endorsement nor absence of fault.
 - F. Requests for changes shall be in writing. ARCHITECT/ENGINEER approval shall be in writing and obtained prior to work being performed.
 - G. Contract sum and/or time changes (Change Orders) shall require Owner's written approval prior to proceeding.
- 1.02. Contractor's Control
- A. The Contractor shall be responsible for coordinating the entire project.
 - B. The Contractor shall insure that work is performed according to the Contract Documents.
 - C. The Contractor shall:
 - 1. Assign work to subcontractors as required by:
 - a. Labor and trade jurisdictions.
 - b. Government regulations.
 - c. Contract Documents.
 - D. The Project Manual (PM) is organized according to types of work effort. However, additional work of similar type may be called for in more than one section. The Contractor is responsible for the total, overall coordination of work effort and shall insure the distribution and accomplishment of the total work effort regardless of PM organization.
 - E. The Contractor shall insure the distribution of all documents, correspondence, instructions, etc., to affected parties, subcontractors, material suppliers, etc.

- F. The Contractor shall ensure that all Subcontractors are informed of the requirements of the Contract Documents with specific emphasis to Division 1 of the Project Manual.
 - G. The Contractor shall cooperate with individuals authorized to visit the Work and ensure that they conform to all safety and security requirements.
 - 1. The Contractor shall notify the ARCHITECT/ENGINEER immediately of any condition, which will cause a delay, hindrance, or disruption in the construction process.
 - 2. The Contractor shall coordinate the scheduling of work to be performed under other Separate Owner contracts. The Contractor shall inform the Owner of work observed to be improperly executed and shall also reflect it on its daily reports.
- 1.03. Contractor/Subcontractor Joint Control Responsibilities.
- A. The Contractor shall coordinate with Subcontractors, suppliers, etc. for the timely:
 - 1. Submittal of Product Data
 - 2. Samples
 - 3. Product orders
 - 4. Material deliveries
 - 5. Installations
 - B. The Contractor shall not expect nor receive time extensions or product substitutions as a result of improper administration. However, delays beyond the control of the Contractor and his agent may be legitimate reasons for time extensions.
 - C. The Contractor shall determine that material deliveries do not overload the structure and cause permanent deformation.
 - D. The Contractor shall be responsible for the protection of all work completed and in progress.
 - E. The Contractor shall educate his Superintendent of the importance of protecting completed work. The Superintendent will ensure that Subcontractors protect work by other trades and thereby minimize damage to other work as well as their own. The Superintendent will insure that completed work is protected from the weather.
 - F. The Contractor shall coordinate the efforts of different trades for the building-in or connection of devices, equipment or services necessary for the installation of work.
 - G. The Contractor shall be responsible for receiving, storing and accounting for all deliveries of materials and equipment for the Work.
- 1.04. Installation of Products
- A. Contractor shall install products in complete compliance with Contract Documents. This shall include the preparation or provision to receive the installation of a product, the preparation of a product for installation or application, the application or installation of a product or the adjustment and protection of a product.
 - B. Normally, Contract Documents require compliance with the manufacturer's instructions. In some cases, requirements greater than the manufacturer's are imposed. However, under no circumstances should Contract Documents

reduce those imposed by the manufacturers. The Contractor shall review both; where doubt exists, seek ARCHITECT/ENGINEER clarification prior to proceeding.

- 1.05. Adjustment and Cleaning
- A. As work progresses, clean and protect completed work from the subsequent work of other trades.
 - B. Protect work until commencing preparations for final inspection.
 - C. The Contractor shall review the work to determine that:
 - 1. The installation is a sound, structurally adequate assembly.
 - 2. The assembly is correctly installed and operates or functions as intended.
 - 3. Assembly is adjusted for smooth operation and performance.
 - 4. No debris shall be buried on the site. All debris shall be hauled from site and disposed of in compliance with governmental regulations.
- 1.06. Protection of Completed Work: The Contractor shall make certain all portions or trades of work are protected as completed from subsequent work, traffic, etc. Such protection shall include but not be limited to:
- A. Finish Flooring: Install 30# rosin-sized paper in traffic and storage paths. Tape all joints. Allow no traffic, storage or work in or above unprotected surfaces.

END OF SECTION 01040

SECTION 01 10 00

SUMMARY

PART 1 - GENERAL

1.1 SUMMARY

- A. Section Includes:
1. Project description.
 2. Type of Contract.
 3. Use of premises.
 4. Utility Interruptions.
 5. Specification Formats and Conventions.

1.2 PROJECT DESCRIPTION

- A. Project Identification: **CLAY COUNTY TAX COLLECTORS OFFICE, KEYSTONE HEIGHTS**
1. Project Location: 115 NE Commercial Circle, Keystone Heights, Florida 32656
- B. Owner Clay County
1. Owners Representative: Anthony "Tony" Stimac – PM Facilities, Phone: 904-541-5885
- C. Architect of Record: The Construction Documents, dated April 16, 2024, were prepared for the Project by Bhide and Hall Architects, PA, 1329 Kingsley Avenue, Suite C, Orange Park, Florida 32073
1. Architect's Representative: Brian Sawyer, Phone: 904-264-1919.
- D. Scope of Work:
1. Demolition of existing roofing system components to facilitate installation of new asphalt shingle roofing system as noted on the Drawings. Demolition of existing entrance and window system. Demolition of selective windows and associated portions of exterior walls. Selective demolition of portions of existing exterior walks. Selective demolition of interior floors, walls, ceilings, fixtures and cabinets including pipes, ducts, and electrical fixtures and outlets, Removal of existing damaged/rotten wood siding, fascia, soffit and trim.
 2. Removal and replacement of existing roof flashing, curbs, metal trim, wood trim, soffit and fascia, etc.
 3. Remodel exterior as denoted on drawings, provide new exterior slabs and railings, provide new customer entrance and employee entrance, provide new exterior customer service window, repaint exterior siding, soffit and trims. Remodel interior and provide (5) new customer service stations. Refer to plans for full extent of work.

1.3 TYPE OF CONTRACT

- A. Project will be constructed under a single prime contract.

1.4 USE OF PREMISES

- A. During the construction period, the Contractor shall have full use of the designated area of the work. The Contractor's use of the premises is limited by the Owner's right to perform work or to retain other contractors on portions of the Project. Consult with Owner prior to start of construction.

1.5 UTILITY INTERRUPTIONS

- A. Existing Utility Interruptions: Do not interrupt utilities serving facilities occupied by Building Owner and Tenants or others unless permitted under the following conditions and then only after arranging to provide temporary utility services according to requirements indicated:
 - 1. Notify Owner not less than two (2) days in advance of proposed utility interruptions.
 - 2. Do not proceed with utility interruptions without Owner's written permission.

1.6 PERMITS, LICENSES AND FEES

- A. Permits: For Work included in the Contract, Contractor will obtain all permits from authorities having jurisdiction and from serving utility companies and agencies.
- B. Licenses: Contractor shall obtain and pay all licenses associated with construction activities, such as business licenses, contractors' licenses and vehicle and equipment licenses, all costs for licenses shall be included in the Contract Sum.
- C. Assessments: Costs of assessments and connection fees shall not be included in the Contract Sum. Owner will pay all assessments and utility service connection fees.
- D. Test and Inspection Fees: Contractor shall pay all fees charged by authorities having jurisdiction and from serving utility companies and agencies, for tests and inspections conducted by those authorities, companies and agencies, Owner will reimburse Contractor for actual amount of such fees, without mark-up. Include costs in BID.

1.7 SPECIFICATION FORMATS AND CONVENTIONS

- A. Specification Format: The Specifications are organized into Divisions and Sections using the 50-division format in accordance with CSI's "MasterFormat-2004" edition.
 - 1. Division 01: Sections in Division 01 govern the execution of the Work of all Sections in the Specifications.
- B. Specification Content: The Specifications use certain conventions for the style of language and the intended meaning of certain terms, words, and phrases when used in particular situations. These conventions are as follows:
 - 1. Abbreviated Language: Language used in the Specifications and other Contract Documents is abbreviated. Words and meanings shall be interpreted as appropriate. Words implied, but not stated, shall be inferred as the sense requires. Singular words shall be interpreted as plural, and plural words shall be interpreted as singular where applicable as the context of the Contract Documents indicates.
 - 2. Imperative Mood: The imperative mood and streamlined language are generally used in the Specifications. Requirements expressed in the imperative mood are to be performed by Contractor. Occasionally, the indicative or subjunctive mood may be used in the

Section Text for clarity to describe responsibilities that must be fulfilled indirectly by Contractor or by others when so noted.

- a. The words "shall," "shall be," or "shall comply with," depending on the context, are implied where a colon (:) is used within a sentence or phrase.

PART 2 - PRODUCTS (Not Used)

PART 3 - EXECUTION (Not Used)

END OF SECTION

SECTION 01 21 00

ALLOWANCE PROCEDURES

PART 1 - GENERAL

- 1.01. Allowance Procedures
- A. Allowance amounts below are for materials only. Include all other costs including installation in Contract Sum.
 - B. Coordinate allowances with requirements for related and adjacent Work.
 - C. Notify Owner and Architect of date when final decision on allowance items is required to avoid delays in the Work.
 - D. Furnish certification that quantities needed with reasonable allowance for cutting or installation losses, tolerances, mixing waste and similar margins.
 - E. Submit invoices or delivery slips to indicate actual quantities of materials delivered and costs. Indicate amounts of applicable trade discounts.
- 1.02. Allowances
- A. Lump Sum Allowance:
 - 1. Landscaping: \$10,000.

PART 2 – PRODUCTS (Not Used)

PART 3 – EXECUTION (Not Used)

END OF SECTION 01 21 00

SECTION 01 23 00

ADD ALTERNATES

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

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

1.2 SUMMARY

- A. Section includes administrative and procedural requirements for alternates.

1.3 DEFINITIONS

- A. Add Alternate: An amount proposed by bidders and stated on the Bid Form for certain work defined in the bidding requirements that may be added to or deducted from the base bid amount if District decides to accept a corresponding change either in the amount of construction to be completed or in the products, materials, equipment, systems, or installation methods described in the Contract Documents.
 - 1. Add Alternates described in this Section are part of the Work only if enumerated in the Agreement.
 - 2. The cost for each Add Alternate is the net addition to the Contract Sum to incorporate alternate into the Work. No other adjustments are made to the Contract Sum.

1.4 PROCEDURES

- A. Coordination: Revise or adjust affected adjacent work as necessary to completely integrate work of the add alternate into Project.
 - 1. Include as part of each add alternate, miscellaneous devices, accessory objects, and similar items incidental to or required for a complete installation whether or not indicated as part of add alternate.
- B. Notification: Immediately following receipt of Notice to Proceed, notify each party involved, in writing, of the status of each add alternate. Indicate if add alternates have been accepted, rejected, or deferred for later consideration.
- C. Execute accepted add alternates under the same conditions as other work of the Contract.
- D. Schedule: A schedule of add alternates is included at the end of this Section. Specification Sections referenced in schedule contain requirements for materials necessary to achieve the work described under each add alternate.

BHIDE & HALL, ARCHITECTS, PA
Clay County Tax Collectors' Office
Keystone Heights, Florida

Project No. 202347

ADD ALTERNATES
01 23 00 - 1

SPECIFICATIONS

NO. XX-XX-XXX-XX

PART 2 - PRODUCTS (Not Used)

PART 3 - EXECUTION

3.1 SCHEDULE OF ADD ALTERNATES

A. Add Alternate No. 1: Patch, repair, re-surface, and stripe existing asphalt parking lot at 125 Commercial Circle, Keystone Heights (adjacent property).

END OF SECTION 01 23 00

ADD ALTERNATES
01 23 00

SECTION 01 25 00
SUBSTITUTION PROCEDURES

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

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

1.2 SUMMARY

- A. Section includes administrative and procedural requirements for substitutions.
- B. Related Requirements:
 - 1. Section 01 23 00 "Alternates" for products selected under an alternate.
 - 2. Section 01 60 00 "Product Requirements" for requirements for submitting comparable product submittals for products by listed manufacturers.

1.3 DEFINITIONS

- A. Substitutions: Changes in products, materials, equipment, and methods of construction from those required by the Contract Documents and proposed by Contractor.
 - 1. Substitutions for Convenience: Changes proposed by Contractor or Owner that are not required in order to meet other Project requirements but may offer advantage to Contractor or Owner.

1.4 ACTION SUBMITTALS

- A. Substitution Requests: Submit three copies of each request for consideration. Identify product or fabrication or installation method to be replaced. Include Specification Section number and title and Drawing numbers and titles.
 - 1. Documentation: Show compliance with requirements for substitutions and the following, as applicable:
 - a. Statement indicating why specified product or fabrication, or installation method cannot be provided, if applicable.
 - b. Coordination of information, including a list of changes or revisions needed to other parts of the Work and to construction performed by Owner and separate contractors that will be necessary to accommodate proposed substitution.
 - c. Detailed comparison of significant qualities of proposed substitutions with those of the Work specified. Include annotated copy of applicable Specification Section. Significant qualities may include attributes, such as performance, weight, size,

durability, visual effect, sustainable design characteristics, warranties, and specific features and requirements indicated. Indicate deviations, if any, from the Work specified.

- d. Product Data, including drawings and descriptions of products and fabrication and installation procedures.
 - e. Samples, where applicable or requested.
 - f. Certificates and qualification data, where applicable or requested.
 - g. List of similar installations for completed projects, with project names and addresses as well as names and addresses of Architects and owners.
 - h. Material test reports from a qualified testing agency, indicating and interpreting test results for compliance with requirements indicated.
 - i. Research reports evidencing compliance with building code in effect for Project, from Florida Building Code.
 - j. Detailed comparison of Contractor's construction schedule using proposed substitutions with products specified for the Work, including effect on the overall Contract Time. If specified product or method of construction cannot be provided within the Contract Time, include letter from manufacturer, on manufacturer's letterhead, stating date of receipt of purchase order, lack of availability, or delays in delivery.
 - k. Cost information, including a proposal of change, if any, in the Contract Sum.
 - l. Contractor's certification that proposed substitution complies with requirements in the Contract Documents, except as indicated in substitution request, is compatible with related materials and is appropriate for applications indicated.
 - m. Contractor's waiver of rights to additional payment or time that may subsequently become necessary because of failure of proposed substitution to produce indicated results.
2. Architect's Action: If necessary, Architect will request additional information or documentation for evaluation within seven days of receipt of a request for substitution. Architect will submit documentation to County Manager or Board and request approval. Architect will notify Contractor of acceptance or rejection of proposed substitution within 7 days of receipt from County Manager or Board review.
- a. Forms of Acceptance: Construction Change Directive, or Architect's Supplemental Instructions for minor changes in the Work.
 - b. If substitution substantially exceeds original cost and/or affects duration of project, follow change order procedures.
 - c. Use product specified if Architect does not issue a decision on use of a proposed substitution within time allocated.

1.5 QUALITY ASSURANCE

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

1.6 PROCEDURES

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

1.7 SUBSTITUTIONS

- A. Substitutions for Convenience: Architect will consider requests for substitution if received within 45 days after the Notice of Award. Requests received after that time may be considered or rejected at discretion of Architect.
1. Conditions: Architect will consider Contractor's request for substitution when the following conditions are satisfied. If the following conditions are not satisfied, Architect will return requests without action, except to record noncompliance with these requirements:
- a. Requested substitution offers Owner a substantial advantage in cost, time, energy conservation, or other considerations, after deducting additional responsibilities Owner must assume. Owner's additional responsibilities may include compensation to Architect for redesign and evaluation services, increased cost of other construction by Owner, and similar considerations.
 - b. Requested substitution does not require extensive revisions to the Contract Documents.
 - c. Requested substitution is consistent with the Contract Documents and will produce indicated results.
 - d. Substitution request is fully documented and properly submitted.
 - e. Requested substitution will not adversely affect Contractor's construction schedule.
 - f. Requested substitution has received necessary approvals of authorities having jurisdiction.
 - g. Requested substitution is compatible with other portions of the Work.
 - h. Requested substitution has been coordinated with other portions of the Work.
 - i. Requested substitution provides specified warranty.
 - j. If requested substitution involves more than one contractor, requested substitution has been coordinated with other portions of the Work, is uniform and consistent, is compatible with other products, and is acceptable to all contractors involved.

PART 2 - PRODUCTS (Not Used)

PART 3 - EXECUTION (Not Used)

END OF SECTION

THIS PAGE INTENTIONALLY
LEFT BLANK FOR PRINTING

SECTION 01 26 00
CONTRACT MODIFICATION PROCEDURES

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

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

1.2 SUMMARY

- A. Section includes administrative and procedural requirements for handling and processing Contract modifications.
- B. Related Requirements:
 - 1. Section 01 25 00 "Substitution Procedures" for administrative procedures for handling requests for substitutions made after the Contract award.

1.3 MINOR CHANGES IN THE WORK

- A. Architect will issue supplemental instructions authorizing minor changes in the Work, not involving adjustment to the Contract Sum or the Contract Time.

1.4 PROPOSAL REQUESTS

- A. Owner-Initiated Proposal Requests: Engineer will issue a detailed description of proposed changes in the Work that may require adjustment to the Contract Sum or the Contract Time. If necessary, the description will include supplemental or revised Drawings and Specifications.
 - 1. Work Change Proposal Requests issued by Engineer are not instructions either to stop work in progress or to execute the proposed change.
 - 2. Within 21 days, when not otherwise specified, after receipt of Proposal Request, submit a quotation estimating cost adjustments to the Contract Sum and the Contract Time necessary to execute the change.
 - a. 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.
 - b. Indicate applicable taxes, delivery charges, equipment rental, and amounts of trade discounts.

- c. Include costs of labor and supervision directly attributable to the change.
- d. Include and 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. Quotation Form: Use forms provided by Owner. Sample copies are included in Project Manual.

PART 2 - PRODUCTS (Not Used)

PART 3 - EXECUTION (Not Used)

END OF SECTION

SECTION 01 26 13

REQUESTS FOR INTERPRETATION (RFI)

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

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

1.2 SECTION INCLUDES

- A. Procedures for submitting requests for interpretation (RFI).
- B. Limitations on use of RFI to obtain interpretation and clarification.

1.3 RELATED SECTIONS

- A. Omitted
- B. Section 01 33 00 - Submittal Procedures: Restriction on use of submittals for changes in materials, products, equipment and systems.
- C. Section 01 60 00 – Product Requirements: Procedures for requesting substitutions of materials, products, equipment, and systems.

1.4 DEFINITIONS

- A. Request for Interpretation: A document submitted by the Contractor requesting clarification of a portion of the Contract Documents, hereinafter referred to as an RFI.

1.5 CONTRACTOR'S REQUESTS FOR INTERPRETATION (RFIs)

- A. Contractor's Requests for Interpretation (RFIs): Should Contractor be unable to determine from the Contract Documents the exact material, process, or system to be installed; or when the elements of construction are required to occupy the same space (interference); or when an item of Work is described differently at more than one place in the Contract Documents; the Contractor shall request that the Architect make an interpretation of the requirements of the Contract Documents to resolve such matters. Contractor shall comply with procedures specified herein to make Requests for Interpretation (RFIs).
- B. Submission of RFIs: RFIs shall be prepared and submitted electronically on a form provided by the Contractor and approved by the Architect.
 - 1. Forms shall be completely filled in and submitted via an Electronic Project Management (EPM) System agreed upon by the Architect.

2. Each RFI shall be given a discrete, consecutive number.
 3. Each page of the RFI and each attachment to the RFI shall bear the project name, project number, date, RFI number and a descriptive title.
 4. Contractor shall sign all RFIs attesting to good faith effort to determine from the Contract Documents the information requested for interpretation. Electronic signatures are acceptable and subject to authentication.
- C. Subcontractor-Initiated and Supplier-Initiated RFIs: RFIs from subcontractors and material suppliers shall be submitted through, be reviewed by and be attached to an RFI prepared, signed and submitted by Contractor. RFIs submitted directly by subcontractors or material suppliers will be returned unanswered to the Contractor.
1. Contractor shall review all subcontractor- and supplier-initiated RFIs and take actions to resolve issues of coordination, sequencing, and layout of the Work.
 2. RFIs submitted to request clarification of issues related to means, methods, techniques and sequences of construction or for establishing trade jurisdictions and scopes of subcontracts will be returned without interpretation. Such issues are solely the Contractor's responsibility.
 3. Contractor shall be responsible for delays resulting from the necessity to resubmit an RFI due to insufficient or incorrect information presented in the RFI.
- D. Requested Information: Contractor shall carefully study the Contract Documents, in particular, the Contract General Conditions, to ensure that information sufficient for interpretation of requirements of the Contract Documents is not included. RFIs that request interpretation of requirements clearly indicated in the Contract Documents will be returned without interpretation.
1. In all cases in which RFIs are issued to request clarification of issues related to means, methods, techniques and sequences of construction, for example, pipe and duct routing, clearances, specific locations of Work shown diagrammatically, apparent interferences and similar items, the Contractor shall furnish all information required for the Architect to analyze and/or understand the circumstances causing the RFI and prepare a clarification or direction as to how the Contractor shall proceed.
 2. If information included with this type RFI by the Contractor is insufficient, the RFI will be returned unanswered.
- E. Unacceptable Uses for RFIs: RFIs shall not be used to request the following:
1. Approval of submittals (use procedure specified in Section 01 33 00 - Submittals Procedures)
 2. Approval of substitutions (refer to Section 01 60 00 - Product Requirements)
 3. Changes that entail change in Contract Time and Contract Sum (comply with provisions of the Contract General Conditions)

4. Different methods of performing Work than those indicated in the Contract Drawings and Specifications (comply with provisions of the Contract General Conditions).
- F. Disputed Requirements: In the event the Contractor believes that a clarification by the Architect results in additional cost or time, Contractor shall comply with the Contract General Conditions.
- G. RFI Log: Contractor shall prepare, maintain, and submit a tabular log of RFI's organized by the FRI number. Submit log monthly. Include the following:
1. Project name
 2. Name and address of Contractor.
 3. Name and address of Architect.
 4. RFI number including RFI's that were returned without action or withdrawn.
 5. RFI description
 6. State the FRI was submitted.
 7. Date Architect's response was received.
 8. Identification of related Minor Change in the Work, Construction Change Directive, and Proposal Request, as appropriate.
 9. Identification of related Field Order, Work Change Directive, and Proposal Request, as appropriate

On receipt of Architect's action, update the RFI log and immediately distribute the RFI response to affected parties. Review response and notify Architect within seven days if Contractor disagrees with response.

- H. Review Time: Architect will return RFIs to Contractor and within seven calendar days of receipt. RFIs received after 5:00 pm shall be considered received on the next regular working day for the purpose of establishing the start of the seven-calendar day response period.

PART 2 - PRODUCTS

Not Applicable to this Section.

PART 3 - EXECUTION

Not Applicable to this Section.

END OF SECTION

SECTION 01 27 00

INCLUSIVE REQUIREMENTS

1. GENERAL:

- 1.1 The general provision of the Contract, General Conditions, Supplementary Conditions, Special Conditions (if any) along with the General Requirements, apply to all work specified in every section of the Project Manual.
- 1.2 Subcontractors shall examine all drawings and all other Sections of the Specifications for requirements therein affecting the work of their trade. Some tasks and work items may not be shown on the drawings in locations expected by the subcontractor. Regardless, such work remains a requirement of the project.
- 1.3 Responsibility: The General Contractor shall be responsible to inform all subcontractors and vendors of this requirement, and to enforce compliance.
- 1.4 It is not realistic to expect every item or component needed for each system and subcontract to be described on the drawings or to be specified. The Owner expects a complete and thorough job. The Contractor and his subcontractors and suppliers shall be held responsible to furnish and install all items and components that are usual and customarily needed to complete the work whether or not each item or component has been specified as shown. By submitting a bid to supply materials and/or to perform work on the project a supplier and/or sub-contractor is acknowledging his full awareness of its implications, agrees to perform accordingly with diligence and good cheer all aspects of his work that are usual and customary. In cases of dispute, the Architect shall be the sole judge and shall decide on what constitutes usual and customary.

END OF SECTION

SECTION 01 29 00

PAYMENT PROCEDURES

PART 1 - GENERAL

1.1 SUMMARY

- A. Section Includes: Administrative and procedural requirements necessary to prepare and process Applications for Payment.
- B. Related Sections:
 - 1. Section 01 26 00 - Contract Modification Procedures: Administrative procedures for handling changes to the Contract.
 - 2. Section 01 32 00 - Construction Progress Documentation: Administrative requirements governing preparation and submittal of Contractor's Construction Schedule and Submittals Schedule.

1.2 DEFINITIONS

- A. Schedule of Values: A statement furnished by Contractor allocation portions of the Contract Sum to various portions of the Work and used as the basis for reviewing Contractor's Applications for Payment.

1.3 SCHEDULE OF VALUES

- A. Coordination: Coordinate preparation of the Schedule of Values with preparation of Contractor's Construction Schedule. Cost-loaded CPM Schedule may serve to satisfy requirements for the Schedule of Values.
 - 1. Correlate line items in the Schedule of Values with other required administrative forms and schedules, including the following:
 - a. Application for Payment forms with Continuation Sheets.
 - b. Submittals Schedule.
 - c. List of Subcontractors.
 - d. List of Products.
 - e. List of principal suppliers and fabricators.
 - f. Contractor's Construction Schedule.
 - 2. Submit the Schedule of Values to Architect at earliest possible date but no later than seven (7) days before the date scheduled for submittal of initial Applications for Payment.
 - 3. Sub-schedules: Where Work is separated into phases requiring separately phased payments, provide sub-schedules showing values correlated with each phase of payment.
- B. Format and Content: Use the Project Manual table of contents as a guide to establish line items for the Schedule of Values. Provide at least one line item for each Specification Section.
 - 1. Identification: Include the following Project identification on the Schedule of Values:
 - a. Project name and location.
 - b. Name of Architect.
 - c. Architect's project number.
 - d. Contractor's name and address.

- e. Date of submittal.
2. Arrange the Schedule of Values in tabular form with separate columns to indicate the following for each item listed:
 - a. Related Specification Section or Division.
 - b. Description of the Work.
 - c. Name of subcontractor.
 - d. Name of manufacturer or fabricator.
 - e. Name of supplier.
 - f. Change Orders (numbers) that affect value.
 - g. Dollar value: Percentage of the Contract Sum to nearest one-hundredth percent, adjusted to total 100 percent.
3. Provide a breakdown of the Contract Sum in enough detail to facilitate continued evaluation of Applications for Payment and progress reports. Coordinate with the Project Manual table of contents. Provide several line items for principal subcontract amounts, where appropriate.
4. Round amounts to nearest whole dollar; total shall equal the Contract Sum.
5. Provide a separate line item in the Schedule of Values for each part of the Work where Applications for Payment may include materials or equipment purchased or fabricated and stored, but not yet installed.
 - a. Differentiate between items stored on-site and items stored off-site. If specified, include evidence of insurance or bonded warehousing.
6. Provide separate line items in the Schedule of Values for initial cost of materials, for each subsequent stage of completion, and for total installed value of that part of the Work.
7. Allowances (if applicable): Provide a separate line item in the Schedule of Values for each allowance. Show line-item value of unit-cost allowances, as a product of the unit cost, multiplied by measured quantity. Use information indicated in the Contract Documents to determine quantities.
8. Margins of Cost: Show line items for indirect costs and margins on actual costs only when such items are listed individually in Applications for Payment. Each item in the Schedule of Values and Applications for Payment shall be complete. Include the total cost and proportionate share of general overhead and profit margin for each item.
 - a. Temporary facilities and other major cost items that are not direct cost of actual work-in-place may be shown either as separate line items in the Schedule of Values or distributed as general overhead expense, at Contractor's option.
9. Schedule Updating: Update and resubmit the Schedule of Values before the next Applications for Payment when Change Orders or Construction Change Directives result in a change in the Contract Sum.

1.4 APPLICATIONS FOR PAYMENT

- A. Each Application for Payment shall be consistent with previous applications and payments as certified by Architect and paid for by Owner.
 1. Initial Application for Payment, Application for Payment at time of Substantial Completion, and final Application for Payment involve additional requirements.
- B. Payment Application Times: Refer to General Conditions, Article 28.
- C. Payment Application Forms. Use forms provided by Owner, sample copy included in the Project Manual, as "Contractor's Request for Partial Payment.

- D. Application Preparation: Complete every entry on form. Notarize and execute by a person authorized to sign legal documents on behalf of Contractor. Architect will return incomplete applications without action.
1. Entries shall match data on the Schedule of Values and Contractor's Construction Schedule. Use updated schedules if revisions were made.
 2. Include amounts of Change Orders and Construction Change Directives issued before last day of construction period covered by application.
- E. Transmittal: Submit three (3) signed and notarized original copies of each Application for Payment to Architect by a method ensuring receipt within 24 hours. One copy shall include waivers of lien and similar attachments if required.
1. Transmit each copy with a transmittal form listing attachments and recording appropriate information about application.
- F. Waivers of Mechanic's Lien: With each Application for Payment, submit waivers of mechanic's lien from every entity who is lawfully entitled to file a mechanic's lien arising out of the Contract and related to the Work covered by the payment.
1. Submit partial waivers on each item for amount requested in previous application, after deduction for retainage, on each item.
 2. When an application shows completion of an item, submit final or full waivers.
 3. Owner reserves the right to designate which entities involved in the Work must submit waivers.
 4. Waiver Forms: Submit waivers of lien on forms, executed in a manner acceptable to Owner.
 5. Waiver Delays: Submit each Application for Payment with the Contractor's waiver of mechanics lien for the period of construction covered by the application.
 - a. Submit final Application for Payment with or preceded by final waivers from every entity involved with performance of the Work covered by the application who is lawfully entitled to a lien.
- G. Initial Application for Payment: Administrative actions and submittals that must precede or coincide with submittal of first Application for Payment include the following:
1. List of subcontractors.
 2. Schedule of Values.
 3. Contractor's Construction Schedule (preliminary if not final).
 4. Products list.
 5. Schedule of unit prices.
 6. Submittals Schedule (preliminary if not final).
 7. List of Contractor's staff assignments.
 8. List of Contractor's principal consultants (suppliers and fabricators).
 9. Copies of building permits.
 10. Copies of authorizations and licenses from authorities having jurisdiction for performance of the Work.
 11. Initial progress report.
 12. Report of preconstruction conference.
 13. Certificates of insurance and insurance policies.
- H. Application for Payment at Substantial Completion: Following issuance of the Certificate of Substantial Completion, submit an Application for Payment.
1. This application shall reflect Certificates of Partial Substantial Completion issued previously for Owner occupancy of designated portions of the Work.

2. Administrative actions and submittals that shall precede or coincide with this application include:
 - a. Occupancy permits and similar approvals.
 - b. Warranties (guarantees) and maintenance agreements.
 - c. Test/adjust/balance records.
 - d. Maintenance instructions.
 - e. Meter readings.
 - f. Startup performance reports.
 - g. Changeover information related to Owner's occupancy, use, operation, and maintenance.
 - h. Final cleaning.
 - i. Application for reduction of retainage and consent of surety.
 - j. Advice on shifting insurance coverages.
 - k. List of incomplete Work, recognized as exceptions to Architect's Certificate of Substantial Completion.
 - l. Change of door locks to Owner's access.

- I. Final Payment Application: Administrative actions and submittals that must precede or coincide with submittal of the final Application for Payment include the following:
 1. Completion of Project closeout requirements.
 2. Completion of items specified for completion after Substantial Completion.
 3. Ensure that unsettled claims will be settled.
 4. Ensure that incomplete Work is not accepted and will be completed without undue delay.
 5. Transmittal of required Project construction records to the Owner.
 6. Proof that taxes, fees, and similar obligations were paid.
 7. Removal of temporary facilities and services.
 8. Removal of surplus materials, rubbish, and similar elements.

PART 2 - PRODUCTS (Not Used)

PART 3 - EXECUTION (Not Used)

END OF SECTION

SECTION 01 30 00

SUBMITTALS

- 1.01. Submittals
- A. The following submittals are required by the Contract Documents and are briefly explained herein:
 - 1. Construction Schedule
 - 2. Schedule of Values
 - 3. Product Data
 - B. Information regarding submittal administration is also included herein.
- 1.02. Construction Schedule
- A. The Contractor shall submit to the Owner and the Architect/Engineer two (2) copies of his Construction Schedule.
 - B. Upon acceptance by the Owner and ARCHITECT/ENGINEER, the Contractor shall post a copy of the Schedule within the Field Office where it can be readily referenced.
- 1.03. Schedule of Values
- A. The Contractor shall submit to the Owner and the Architect/Engineer, two (2) copies of his Schedule of Values within ten (10) days of the Notice to Proceed.
 - B. The Schedule shall be in an outline format divided into major categories of construction as established by the Table of Contents. A value (amount) for each category shall be assigned thereto.
 - C. Submit on AIA Form G703, Continuation Sheet for the Application and Certificate for Payment, AIA Form G702.
- 1.04. Product Data
- A. Product Data includes:
 - 1. Shop drawings
 - 2. Descriptive data
 - 3. Samples
 - 4. Schedules
 - 5. Certificates
 - 6. Guarantees
 - 7. Warranties
 - 8. Maintenance manuals

- B. Submittal requirements for Product Data are listed in the technical sections of the Project Manual. The ARCHITECT/ENGINEER may, at his option, request additional Product Data.

1.05. Submittal Routing

- A. Submittals shall be routed in the following manner:

- 1. Subcontractors, suppliers and others shall route to the Contractor.
- 2. The Contractor shall route to the ARCHITECT/ENGINEER.
- 3. The ARCHITECT/ENGINEER shall route to the Owner (certain approved Product Data only).

- B. Return shall be in the reverse order.

- C. The Contractor shall furnish copies of approved Submittals to governmental agencies as may be required or requested.

1.06. Review Procedures

- A. Contractor's Review: The Contractor shall thoroughly review data submitted for compliance with the Contract Documents.

- 1. Data found not to be in accordance with the CD's shall be returned for compliance.
- 2. Data found to be acceptable shall be:
 - a. Noted as required.
 - b. Stamped indicating action taken.
 - c. Forwarded to ARCHITECT/ENGINEER.

- B. ARCHITECT/ENGINEER Review: The ARCHITECT/ENGINEER will review submittals and advise of his findings.

- 1. ARCHITECT/ENGINEER will not accept material for review that has not been reviewed and approved by the Contractor, and he will return data immediately.
- 2. The ARCHITECT/ENGINEER will review data which has been properly approved by the Contractor and will either mark it "NET (No Exceptions Taken)", "MCAN (Make Corrections as Noted)", "RAR (Revise and Resubmit)", "SSI (Submit Specified Item)", or "R (Rejected)".
- 3. Items marked "RAR (Revise and Resubmit)", "SSI (Submit Specified Item)", or "R (Rejected)". shall be resubmitted by the Contractor after making any required corrections or additions.

4. Items marked "NET (No Exceptions Taken)" or "MCAN (Make Corrections as Noted)" may be resubmitted for further clarification.

5. ARCHITECT/ENGINEER approval does not relieve the Contractor of his responsibility for deviations from the Construction Documents unless he has notified the ARCHITECT/ENGINEER in writing of these deviations at the time of submittal.

C. ARCHITECT/ENGINEER Review Time Limit: Submittals shall be processed by the ARCHITECT/ENGINEER and returned to the Contractor within fourteen (14) days of receipt. The ARCHITECT/ENGINEER will make every effort to expedite review. The Owner shall not be liable to the Contractor for any delay in processing the submittals.

D. No work for which submittals are required (with the exception of test certificates for completed work, final guarantees and maintenance manuals) shall be performed until submittals are approved by the ARCHITECT/ENGINEER except at the Contractor's risk.

1.07. Definitions

A. Shop Drawings:

1. Fabrication drawings for custom products.
2. Modified catalog data annotated for a specific condition of service.
3. Installation drawings for product assemblies or systems.

B. Description Data: Manufacturer's catalog data, literature, etc., on product or system.

C. Samples: Physical examples of products proposed for use.

D. Schedules: Itemized listing of products and proposed locations.

E. Certificates: Notarized statements made and signed by authorized company representatives attesting to their product having met CD requirements

F. Guarantee or Warranty: Specific guarantees required in Project Manual in addition to the completed work guarantee required of Contractor. See Section 01 70 00, Contract Closeout.

G. Maintenance Manuals:

1. Three-ring (minimum) 8-1/2" x 11" hardback, vinyl-covered binder for Owner's permanent record.
2. Contents to include reproductions of shop drawings, descriptive data, schedules, etc., corrected through final approval, plus operation, maintenance, parts listing, service availability, cleaning instructions, etc.
3. Permanently mark edge of binder to indicate contents and project title.

1.08. Required Information to be Included with all Submittals

- A. Date of Submittal
- B. Name of Project
- C. Name of Contractor
- D. Reference to a specific section, drawing or detail
- E. Manufacturer's or fabricator's name
- F. Owner's name
- G. Installer's name

1.09. Required Information to be Included with Shop Drawings and Descriptive Data

- A. Factory or shop applied finish or protective coating.
- B. Installation requirements and recommendations.
- C. Product protection requirements.
- D. Cleaning precautions and/or requirements.
- E. Applicable activation requirements or procedures.

1.010. Quantities (Minimum)

- A. Shop Drawings
 - 1. Generally, E-mail submittals are acceptable. For large drawings such as custom fabrications or assemblies, provide 2 full size sheets for review.
- B. Physical Samples/Examples: Two copies
- C. Mockups: One site constructed example
- D. Certificates: Four copies
- E. Guarantees or Warranties
 - 1. Examples for initial review and approval: Two copies.
 - 2. After approval, actual construction completion documents: Two copies

BHIDE & HALL, ARCHITECTS, PAProject No. 202347

Clay County Tax Collectors' Office

Keystone Heights, Florida

F. Maintenance Manual: Two copies (in 3 ring binders)

G. Guarantees or Warranties

1. Examples for initial review and approval: Two copies.

2. After approval, actual construction completion documents: Two copies

H. Maintenance Manual: Two copies

1.011. Off-Site Shop Fabrication Facilities

A. The Contractor shall provide the Architect/Engineer and the Owner a list of all off-site shop fabricated items so that the Architect/Engineer and/or the Owner may visit the Shop Fabrication facilities to inspect the work if so desired. The list shall include the item or product being fabricated, the name, street address, telephone number and person to contact to arrange a visit.

END OF SECTION 01300

SECTION 01 31 00

PROJECT MANAGEMENT AND COORDINATION

PART 1 - GENERAL

1.1 SUMMARY

- A. Section Includes: Administrative provisions for coordinating construction operations on Project including, but not limited to, the following:
 - 1. Coordination Drawings.
 - 2. Administrative and supervisory personnel.
 - 3. Project meetings.
- B. Related Sections:
 - 1. Section 01 32 00 - Construction Progress Documentation: Preparing and submitting Contractor's Construction Schedule.
 - 2. Section 01 70 00 - Execution Requirements: Procedures for coordinating general installation and field-engineering services, including establishment of benchmarks and control points.
 - 3. Section 01 77 00 - Closeout Procedures: Coordinating Contract closeout.

1.2 COORDINATION

- A. Coordination: Coordinate construction operations included in different Sections of the Specifications to ensure efficient and orderly installation of each part of the Work. Coordinate construction operations, included in different Sections, that depend on each other for proper installation, connection, and operation.
 - 1. Schedule construction operations in the sequence required to obtain the best results where installation of one part of the Work depends on installation of other components, before or after its own installation.
 - 2. Coordinate installation of different components to assure maximum accessibility for required maintenance, service, and repair.
 - 3. Make provisions to accommodate items scheduled for later installation.
- B. Where necessary, prepare memoranda for distribution to each party involved, outlining special procedures required for coordination. Include such items as required notices, reports, and attendance at meetings.
 - 1. Prepare similar memoranda for the Owner and separate contractors where coordination of their work is required.
- C. Administrative Procedures: Coordinate scheduling and timing of required administrative procedures with other construction activities and activities of other contractors to avoid conflicts and to ensure orderly progress of the Work. Such administrative activities include, but are not limited to, the following:
 - 1. Preparation of Contractor's Construction Schedule.
 - 2. Preparation of the Schedule of Values.
 - 3. Installation and removal of temporary facilities and controls.
 - 4. Delivery and processing of submittals.
 - 5. Progress meetings.
 - 6. Preinstallation conferences.

7. Project closeout activities.

- D. Conservation: Coordinate construction activities to ensure that operations are carried out with consideration given to conservation of energy, water, and materials.
1. Salvage materials and equipment involved in performance of, but not actually incorporated into, the Work. Refer to other Sections for disposition of salvaged materials that are designated as Owner's property.

1.3 SUBMITTALS

- A. Coordination Drawings: Prepare Coordination Drawings if limited space availability necessitates maximum utilization of space for efficient installation of different components or if coordination is required for installation of products and materials fabricated by separate entities.
1. Content: Project-specific information, drawn accurately to scale. Do not base Coordination Drawings on reproductions of the Contract Documents or standard printed data. Include the following information, as applicable:
 - a. Indicate functional and spatial relationships of components of architectural, structural, civil, mechanical, and electrical systems.
 - b. Indicate dimensions shown on the Contract Drawings and make specific note of dimensions that appear to be in conflict with submitted equipment and minimum clearance requirements. Provide alternate sketches to Architect for resolution of such conflicts. Minor dimension changes and difficult installations will not be considered changes to the Contract.
 2. Sheet Size: At least 8-1/2 by 11 inches but no larger than 30 by 40 inches.
 3. Number of Copies: Submit two opaque copies of each submittal. Architect will return one copy.
 4. Refer to individual Sections for Coordination Drawing requirements for Work in those Sections.
- B. Subcontract List: Prepare a written summary identifying individuals or firms proposed for each portion of the Work, including those who are to furnish products or equipment fabricated to a special design, Include the following information in tabular form:
1. Name, address, telephone number, and email address of entity performing subcontract or supplying products.
 2. Number and title of related Specification Section(s) covered by subcontract.
 3. Drawing number and detail references, as appropriate, covered by subcontract.
- C. Staff Names: Within 15 days of commencement of construction operations, submit a list of the Contractor's principal staff assignments, including the superintendent and other personnel in attendance at the Project Site. Identify individuals and their duties and responsibilities. List their addresses and cellular telephone numbers.
1. Post copies of the list in the Project meeting room, the temporary field office, and each temporary telephone.

1.4 PROJECT MEETINGS

- A. General: Contractor will schedule and conduct meetings and conferences at Project site, unless otherwise indicated.

1. Attendees: Architect will inform participants and others involved, and individuals whose presence is required, of date and time of each meeting. Architect will notify Owner and Contractor of scheduled meeting dates and times.
 2. Agenda: Architect will prepare and distribute the meeting agenda to all invited attendees.
 - a. Contractor shall provide Architect with agenda items 48 hours before the Project Meeting.
 3. Minutes: Architect will record significant discussions and agreements achieved. Meeting minutes will be distributed to everyone concerned, including Owner and Contractor, within three (3) days of the meeting.
- B. Preconstruction Conference: Contractor will schedule a preconstruction conference before starting construction, at a time convenient to Owner and Contractor, but no later than 15 days after execution of the Agreement. Hold the conference at Project site or another convenient location. Conduct the meeting to review responsibilities and personnel assignments.
1. Attendees: Authorized representatives of Owner, Architect, and their consultants; Contractor and its superintendent; major subcontractors; suppliers; and other concerned parties shall attend the conference. All participants at the conference shall be familiar with Project and authorized to conclude matters relating to the Work.
 2. Agenda: Discuss items of significance that could affect progress, including the following:
 - a. Tentative construction schedule.
 - b. Critical work sequencing and long-lead items.
 - c. Designation of key personnel and their duties.
 - d. Procedures for processing field decisions and Change Orders.
 - e. Procedures for requests for interpretations (RFIs).
 - f. Procedures for testing and inspecting.
 - g. Procedures for processing Applications for Payment.
 - h. Distribution of the Contract Documents.
 - i. Submittal procedures.
 - j. LEED requirements (if applicable).
 - k. Preparation of Record Documents.
 - l. Use of the premises and existing building.
 - m. Work restrictions.
 - n. Owner's occupancy requirements.
 - o. Responsibility for temporary facilities and controls.
 - p. Construction waste management and recycling.
 - q. Parking availability.
 - r. Office, work, and storage areas.
 - s. Equipment deliveries and priorities.
 - t. First aid.
 - u. Security.
 - v. Progress cleaning.
 - w. Working hours.
 3. Minutes: Record and distribute meeting minutes.
- C. Preinstallation Conferences: Conduct a preinstallation conference at Project site before each construction activity that requires coordination with other construction.
1. Attendees: Installer and representatives of manufacturers and fabricators involved in or affected by the installation and its coordination or integration with other materials and installations that have preceded or will follow, shall attend the meeting. Advise Architect of scheduled meeting dates.

2. Agenda: Review progress of other construction activities and preparations for the particular activity under consideration, including requirements for the following:
 - a. The Contract Documents.
 - b. Options.
 - c. Related requests for interpretations (RFIs).
 - d. Related Change Orders.
 - e. Purchases.
 - f. Deliveries.
 - g. Submittals.
 - h. Review of mockups.
 - i. Possible conflicts.
 - j. Compatibility problems.
 - k. Time schedules.
 - l. Weather limitations.
 - m. Manufacturer's written recommendations.
 - n. Warranty requirements.
 - o. Compatibility of materials.
 - p. Acceptability of substrates.
 - q. Temporary facilities and controls.
 - r. Space and access limitations.
 - s. Regulations of authorities having jurisdiction.
 - t. Testing and inspecting requirements.
 - u. Installation procedures.
 - v. Coordination with other work.
 - w. Required performance results.
 - x. Protection of adjacent work.
 - y. Protection of construction and personnel.
 3. Record significant conference discussions, agreements, and disagreements, including required corrective measures and actions.
 4. Reporting: Distribute minutes of the meeting to each party present and to parties who should have been present.
 5. Do not proceed with installation if the conference cannot be successfully concluded. Initiate whatever actions are necessary to resolve impediments to performance of the Work and reconvene the conference at earliest feasible date.
- D. Progress Meetings: Conduct progress meetings at regular intervals. Coordinate dates of meetings with preparation of payment requests.
1. Attendees: In addition to representatives of Owner and Architect, each contractor, subcontractor, supplier, and other entity concerned with current progress or involved in planning, coordination, or performance of future activities shall be represented at these meetings. All participants at the conference shall be familiar with Project and authorized to conclude matters relating to the Work.
 2. Agenda: Review and correct or approve minutes of previous progress meeting. Review other items of significance that could affect progress. Include topics for discussion as appropriate to status of Project.
 - a. Contractor's Construction Schedule: Review progress since the last meeting. Determine whether each activity is on time, ahead of schedule, or behind schedule, in relation to Contractor's Construction Schedule. Determine how construction behind schedule will be expedited; secure commitments from parties involved to do so. Discuss whether schedule revisions are required to ensure that current and subsequent activities will be completed within the Contract Time.

- 1) Review schedule for next period.
- b. Review present and future needs of each entity present, including the following:
 - 1) Interface requirements.
 - 2) Sequence of operations.
 - 3) Status of submittals.
 - 4) Deliveries.
 - 5) Off-site fabrication.
 - 6) Access.
 - 7) Site utilization.
 - 8) Temporary facilities and controls.
 - 9) Work hours.
 - 10) Hazards and risks.
 - 11) Progress cleaning.
 - 12) Quality and work standards.
 - 13) Status of correction of deficient items.
 - 14) Field observations.
 - 15) Requests for interpretations (RFIs).
 - 16) Status of proposal requests.
 - 17) Pending changes.
 - 18) Status of Change Orders.
 - 19) Pending claims and disputes.
 - 20) Documentation of information for payment requests.
3. Minutes: Architect will record the meeting minutes.
4. Reporting: Not later than 3 days after each meeting, distribute minutes of the meeting to each party present and to parties who should have been present. Include a brief summary, in narrative form, of progress since the previous meeting and report.
 - a. Schedule Updating: Revise Contractor's Construction Schedule after each progress meeting where revisions to the schedule have been made or recognized. Issue revised schedule concurrently with the report of each meeting.

PART 2 - PRODUCTS (Not Used)

PART 3 - EXECUTION (Not Used)

END OF SECTION

SECTION 01 32 00

CONSTRUCTION PROGRESS DOCUMENTATION

PART 1 - GENERAL

1.1 SUMMARY

- A. Section Includes: Administrative and procedural requirements for documenting the progress of construction during performance of the Work, including the following:
 - 1. Contractor's Construction Schedule.
 - 2. Submittals Schedule.
 - 3. Daily construction reports.
 - 4. Field condition reports.

- B. Related Sections:
 - 1. Section 01 29 00 - Payment Procedures: Submitting the Schedule of Values.
 - 2. Section 01 31 00 - Project Management and Coordination: Submitting and distributing meeting and conference minutes.
 - 3. Section 01 33 00 - Submittal Procedures: Submitting schedules and reports.
 - 4. Section 01 40 00 - Quality Requirements: Submitting a schedule of tests and inspections.

1.2 DEFINITIONS

- A. Activity: A discrete part of a project that can be identified for planning, scheduling, monitoring, and controlling the construction project. Activities included in a construction schedule consume time and resources.
 - 1. Critical activities are activities on the critical path. They must start and finish on the planned early start and finish times.
 - 2. Predecessor Activity: An activity that precedes another activity in the network.
 - 3. Successor Activity: An activity that follows another activity in the network.

- B. Fragnet: A partial or fragmentary network that breaks down activities into smaller activities for greater detail.

- C. Major Area: A story of construction, a separate building, or a similar significant construction element.

1.3 SUBMITTALS

- A. Submittals Schedule: Submit three (3) copies of schedule. Arrange the following information in a tabular format:
 - 1. Scheduled date for first submittal.
 - 2. Specification Section number and title.
 - 3. Submittal category (action or informational).
 - 4. Name of subcontractor.
 - 5. Description of the Work covered.
 - 6. Scheduled date for Architect's final release or approval.

- B. Contractor's Construction Schedule: Submit two (2) opaque copies of initial schedule, large enough to show entire schedule for entire construction period.

- C. Field Condition Reports: Submit two (2) copies at time of discovery of differing conditions.

1.4 COORDINATION

- A. Coordinate preparation and processing of schedules and reports with performance of construction activities and with scheduling and reporting of separate contractors.
- B. Coordinate Contractor's Construction Schedule with the Schedule of Values, list of subcontracts, Submittals Schedule, progress reports, payment requests, and other required schedules and reports.
 - 1. Secure time commitments for performing critical elements of the Work from parties involved.
 - 2. Coordinate each construction activity in the network with other activities and schedule them in proper sequence.

PART 2 - PRODUCTS

2.1 SUBMITTALS SCHEDULE

- A. Preparation: Submit a schedule of submittals, arranged in chronological order by dates required by construction schedule. Include time required for review, resubmittal, ordering, manufacturing, fabrication, and delivery when establishing dates.
 - 1. Coordinate Submittals Schedule with list of subcontracts, the Schedule of Values, and Contractor's Construction Schedule.
 - 2. Submit concurrently with the first complete submittal of Contractor's Construction Schedule.

2.2 CONTRACTOR'S CONSTRUCTION SCHEDULE, GENERAL

- A. Time Frame: Extend schedule from date established for the Notice of Award to date of Final Completion.
 - 1. Contract completion date shall not be changed by submission of a schedule that shows an early completion date, unless specifically authorized by Change Order.
- B. Activities: Treat each story or separate area as a separate numbered activity for each principal element of the Work. Comply with the following:
 - 1. Activity Duration: Define activities so no activity is longer than 20 days, unless specifically allowed by Architect.
 - 2. Procurement Activities: Include procurement process activities for the following long lead items and major items, requiring a cycle of more than 60 days, as separate activities in schedule. Procurement cycle activities include, but are not limited to, submittals, approvals, purchasing, fabrication, and delivery.
 - 3. Submittal Review Time: Include review and resubmittal times indicated in Section 01 33 00 - Submittal Procedures in schedule. Coordinate submittal review times in Contractor's Construction Schedule with Submittals Schedule.
 - 4. Startup and Testing Time: Include not less than three (3) days for startup and testing.
 - 5. Substantial Completion: Indicate completion in advance of date established for Substantial Completion and allow time for Architect's administrative procedures necessary for certification of Substantial Completion.

- C. Constraints: Include constraints and work restrictions indicated in the Contract Documents and as follows in schedule and show how the sequence of the Work is affected.
 - 1. Phasing: Arrange list of activities on schedule by phase.
 - 2. Work by Owner: Include a separate activity for each portion of the Work performed by Owner.
 - 3. Work Restrictions: Show the effect of the following items on the schedule:
 - a. Coordination with existing construction.
 - b. Limitations of continued occupancies.
 - c. Uninterruptible services.
 - d. Partial occupancy before Substantial Completion.
 - e. Use of premises restrictions.
 - f. Provisions for future construction.
 - g. Seasonal variations.
 - h. Environmental control.
 - 4. Work Stages: Indicate important stages of construction for each major portion of the Work.
- D. Milestones: Include milestones indicated in the Contract Documents in schedule, including, but not limited to, the Notice to Proceed, Substantial Completion, and Final Completion.
- E. Contract Modifications: For each proposed contract modification and concurrent with its submission, prepare a time-impact analysis using fragnets to demonstrate the effect of the proposed change on the overall project schedule.

2.3 CONTRACTOR'S CONSTRUCTION SCHEDULE (CPM SCHEDULE)

- A. General: Prepare network diagrams using AON (activity-on-node) format.
- B. CPM Schedule: Submit Contractor's Construction Schedule using a computerized, time-scaled CPM network analysis diagram for the Work in accordance with General Conditions, Article 9.
 - a. Failure to include any work item required for performance of this Contract shall not excuse Contractor from completing all work within applicable completion dates, regardless of Architect's approval of the schedule.
 - 2. Establish procedures for monitoring and updating CPM schedule and for reporting progress. Coordinate procedures with progress meeting and payment request dates.
 - 3. Use "one workday" as the unit of time. Include list of nonworking days and holidays incorporated into the schedule.
- C. CPM Schedule Preparation: Prepare a list of all activities required to complete the Work. Using the preliminary network diagram, prepare a skeleton network to identify probable critical paths.
 - 1. Activities: Indicate the estimated time duration, sequence requirements, and relationship of each activity in relation to other activities. Include estimated time frames for the following activities:
 - a. Preparation and processing of submittals.
 - b. Mobilization and demobilization.
 - c. Purchase of materials.
 - d. Delivery.
 - e. Fabrication.
 - f. Utility interruptions.
 - g. Installation.

- h. Work by Owner that may affect or be affected by Contractor's activities.
- i. Testing and commissioning.
- 2. Critical Path Activities: Identify critical path activities, including those for interim completion dates. Scheduled start and completion dates shall be consistent with Contract milestone dates.
- 3. Processing: Process data to produce output data on a computer-drawn, time-scaled network. Revise data, reorganize activity sequences, and reproduce as often as necessary to produce the CPM schedule within the limitations of the Contract Time.
- 4. Format: Mark the critical path. Locate the critical path near center of network; locate paths with most float near the edges.
 - a. Subnetworks on separate sheets are permissible for activities clearly off the critical path.
- D. Initial Issue of Schedule: Prepare initial network diagram from a list of straight "early start-total float" sort. Identify critical activities. Prepare tabulated reports showing the following:
 - 1. Contractor or subcontractor and the Work or activity.
 - 2. Description of activity.
 - 3. Principal events of activity.
 - 4. Immediately preceding and succeeding activities.
 - 5. Early and late start dates.
 - 6. Early and late finish dates.
 - 7. Activity duration in workdays.
 - 8. Total float or slack time.
 - 9. Average size of workforce.
- E. Schedule Updating: Concurrent with making revisions to schedule, prepare tabulated reports showing the following:
 - 1. Identification of activities that have changed.
 - 2. Changes in early and late start dates.
 - 3. Changes in early and late finish dates.
 - 4. Changes in activity durations in workdays.
 - 5. Changes in the critical path.
 - 6. Changes in total float or slack time.
 - 7. Changes in the Contract Time.

2.4 REPORTS

- A. Daily Construction Reports: Prepare a daily construction report recording the following information concerning events at Project site:
 - 1. List of subcontractors at Project site.
 - 2. Equipment at Project site.
 - 3. Material deliveries.
 - 4. High and low temperatures and general weather conditions.
 - 5. Accidents.
 - 6. Stoppages, delays, shortages, and losses.
 - 7. Meter readings and similar recordings.
 - 8. Orders and requests of authorities having jurisdiction.
 - 9. Services connected and disconnected.
 - 10. Equipment or system tests and startups.

- B. Field Condition Reports: Immediately on discovery of a difference between field conditions and the Contract Documents, prepare and submit a detailed report. Submit with a request for interpretation. Include a detailed description of the differing conditions, together with recommendations for changing the Contract Documents.

PART 3 - EXECUTION

3.1 CONTRACTOR'S CONSTRUCTION SCHEDULE

- A. Contractor's Construction Schedule Updating: At monthly intervals, update schedule to reflect actual construction progress and activities. Issue schedule one week before each regularly scheduled progress meeting.
 - 1. Revise schedule immediately after each meeting or other activity where revisions have been recognized or made. Issue updated schedule concurrently with the report of each such meeting.
 - 2. Include a report with updated schedule that indicates every change, including, but not limited to, changes in logic, durations, actual starts and finishes, and activity durations.
 - 3. As the Work progresses, indicate Actual Completion percentage for each activity.
- B. Distribution: Distribute copies of approved schedule to Architect, Owner, separate contractors, testing and inspecting agencies, and other parties identified by Contractor with a need-to-know schedule responsibility.
 - 1. Post copies in Project meeting rooms and temporary field offices.
 - 2. When revisions are made, distribute updated schedules to the same parties and post in the same locations. Delete parties from distribution when they have completed their assigned portion of the Work and are no longer involved in performance of construction activities.

END OF SECTION

SECTION 01 33 00

SUBMITTAL PROCEDURES

PART 1 - GENERAL

1.1 SUMMARY

A. Section Includes:

1. Miscellaneous UA Requirements.
2. Administrative and procedural requirements for submitting Shop Drawings, Product Data, Samples, and other miscellaneous submittals.

B. Related Sections:

1. Section 01 29 00 - Payment Procedures: Submitting Applications for Payment and the Schedule of Values.
2. Section 01 31 00 - Project Management and Coordination: Submitting and distributing meeting and conference minutes and for submitting Coordination Drawings.
3. Section 01 32 00 - Construction Progress Documentation: Submitting schedules and reports, including Contractor's Construction Schedule and the Submittals Schedule.
4. Section 01 40 00 - Quality Requirements: Submitting test and inspection reports.
5. Section 01 77 00 - Closeout Procedures: Submitting warranties, project record documents and operation and maintenance manuals.
6. Divisions 2 through 33 Sections: Specific requirements for submittals in those Sections.

1.2 MISCELLANEOUS UA REQUIREMENTS:

- A. Brand Names: Submit for review a list of brand name materials proposed for use under Section before any work under that Section is begun.
- B. Progress Schedule: Submit per General Conditions.
- C. Schedule of Values: Submit on AIA Document G703. Furnish additional breakdowns as requested.
- D. Closeout Submittals: Refer to Section 01 77 00.
- E. List of Subcontractors: Submit for approval as indicated in Section 01 312 00 Project Management and Coordination.
- F. Evidence of Insurance: Submit as indicated in Supplementary General Conditions.

1.3 DEFINITIONS

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

1.4 SHOP DRAWINGS, SAMPLES AND MANUFACTURER'S DATA:

- A. General: Submit for review as required in detail specifications, but only after affixing signature of approval thereof; otherwise, material will be returned disapproved. Contractor's approval stamp must represent that the item(s) complies with specifications criteria and has been checked and coordinated with all parts of the Work. Revise and resubmit until Architect's/Engineer's release is secured.
 - 1. Architect/Engineer will review submittals for design only, and will assume no responsibility for dimensions, quantities or erection procedures indicated. Contractor's responsibility for indicated deviations from contract requirements will not be relieved by Architect's/Engineer's review of shop drawings, etc. unless the deviation is specifically noted in the letter of transmittal, and express written approval is returned. Review of a separate item will not constitute review of an assembly in which the item functions. Submit data on all related items simultaneously so as to facilitate logical review of all items in that section are released. One copy of each submittal bearing the final review stamp of Architect/Engineer shall be kept at the project office and shall be maintained in good condition. No submittal other than those stamped "Approval as Noted" shall be on the job for any purpose.
- B. Samples: Where required, submit two of each item clearly labeled as to manufacturer, quality and job. The Architect/Engineer will retain one sample for comparison with bulk shipments and may procure certain test samples from stockpiles at the job site. Failure of any item to meet specified requirements will be cause to reject for use under this contract any further materials of the same brand or make. Rejected material already incorporated shall be subject to removal and replacement, or at the Owner's option may be left in place and Contract price adjusted.
- C. Samples for Color Selection: Unless the precise color and pattern is specified, wherever a choice exists, submit accurate color and all items well in advance of the need for the first selection (not later than 30 days after award). With very minor exceptions no color selections will be made until samples for all items requiring selection have been submitted.

1.5 SUBMITTAL PROCEDURES

- A. Electronic File Transfer of Contract Documents: At Contractor's written request, electronic copies of Architect's CAD Files of the Contract Drawings will be provided for Contractor's use in preparing submittals.
- B. Coordination: Coordinate preparation and processing of submittals with performance of construction activities.
 - 1. Coordinate each submittal with fabrication, purchasing, testing, delivery, other submittals, and related activities that require sequential activity.
 - 2. Coordinate transmittal of different types of submittals for related parts of the Work so processing will not be delayed because of need to review submittals concurrently for coordination.
 - a. Architect reserves the right to withhold action on a submittal requiring coordination with other submittals until related submittals are received.
- C. Submittals Schedule: Comply with requirements in Section 01 32 00 - Construction Progress Documentation for list of submittals and time requirements for scheduled performance of related construction activities.

- D. Processing Time: Allow enough time for submittal review, including time for resubmittals, as follows. Time for review shall commence on Architect's receipt of submittal. No extension of the Contract Time will be authorized because of failure to transmit submittals enough in advance of the Work to permit processing.
1. Initial Review: Allow 15 days for initial review of each submittal. Allow additional time if processing must be delayed to permit coordination with subsequent submittals. Architect will advise Contractor when a submittal being processed must be delayed for coordination.
 2. Intermediate Review: If intermediate submittal is necessary, process it in same manner as initial submittal.
 3. Resubmittal Review: Allow 15 days for processing each resubmittal.
 4. Sequential Review: Where sequential review of submittals by Architect's consultants, Owner, or other parties is indicated, allow 21 days for initial review of each submittal.
 5. Concurrent Consultant Review: Where the Contract Documents indicate that submittals may be transmitted simultaneously to Architect and to Architect's consultants, allow 15 days for review of each submittal. Submittal will be returned to Architect before being returned to Contractor.
- E. Identification: Place a permanent label or title block on each submittal for identification.
1. Indicate name of firm or entity that prepared each submittal on label or title block.
 2. Provide a space approximately 6 by 8 inches on label or beside title block to record Contractor's review and approval markings and action taken by Architect.
 3. Include the following information on label for processing and recording action taken:
 - a. Project name.
 - b. Date.
 - c. Name and address of Architect.
 - d. Name and address of Contractor.
 - e. Name and address of subcontractor.
 - f. Name and address of supplier.
 - g. Name of manufacturer.
 - h. Submittal number or other unique identifier, including revision identifier.
 - 1) Submittal number shall use Specification Section number followed by a decimal point and then a sequential number (e.g., 06 10 00.01). Resubmittals shall include an alphabetic suffix after another decimal point (e.g., 06 10 00.01.A).
 - i. Unique identifier, including revision number.
 - j. Number and title of appropriate Specification Section.
 - k. Drawing number and detail references, as appropriate.
 - l. Location(s) where product is to be installed, as appropriate.
 - m. Other necessary identification.
- F. Deviations: Highlight, encircle, or otherwise identify deviations from the Contract Documents on submittals.
- G. Additional Copies: Unless additional copies are required for final submittal, and unless Architect observes noncompliance with provisions of the Contract Documents, initial submittal may serve as final submittal.
1. Additional copies submitted for maintenance manuals will not be marked with action taken and will be returned.

- H. Transmittal: Package each submittal individually and appropriately for transmittal and handling. Transmit each submittal using a transmittal form. Architect will return submittals, without review, received from sources other than Contractor.
 - 1. Include Contractor's certification stating that information submitted complies with requirements of the Contract Documents.
 - 2. Transmittal Form: Use AIA Document G810, CSI Form 12.1A or the Contractor's standard form of transmittal with equivalent data entry format.
- I. Distribution: Furnish copies of final submittals to manufacturers, subcontractors, suppliers, fabricators, installers, authorities having jurisdiction, and others as necessary for performance of construction activities. Show distribution on transmittal forms.
- J. Use for Construction: Use only final submittals with mark indicating action taken by Architect in connection with construction.

PART 2 - PRODUCTS

2.1 ACTION SUBMITTALS

- A. General: Prepare and submit Action Submittals required by individual Specification Sections.
- B. Product Data: Collect information into a single submittal for each element of construction and type of product or equipment.
 - 1. If information must be specially prepared for submittal because standard printed data are not suitable for use, submit as Shop Drawings, not as Product Data.
 - 2. Mark each copy of each submittal to show which products and options are applicable.
 - 3. Include the following information, as applicable:
 - a. Manufacturer's written recommendations.
 - b. Manufacturer's product specifications.
 - c. Manufacturer's installation instructions.
 - d. Manufacturer's catalog cuts.
 - e. Wiring diagrams showing factory-installed wiring.
 - f. Printed performance curves.
 - g. Mill reports.
 - h. Standard product operation and maintenance manuals.
 - i. Compliance with specified referenced standards.
 - j. Testing by recognized testing agency.
 - k. Application of testing agency labels and seals.
 - l. Notation of coordination requirements
 - 4. Submit Product Data before or concurrent with Samples.
 - 5. Number of Copies: Submit three copies of Product Data, unless otherwise indicated. Architect will return two copies. Mark up and retain one returned copy as a Project Record Document.
- C. Shop Drawings: Prepare Project-specific information, drawn accurately to scale. Do not base Shop Drawings on reproductions of the Contract Documents or standard printed data unless submittal of Architect's CAD Drawings is otherwise permitted.
 - 1. Preparation: Fully illustrate requirements in the Contract Documents. Include the following information, as applicable:
 - a. Dimensions.
 - b. Identification of products.

- c. Fabrication and installation drawings.
 - d. Roughing-in and setting diagrams.
 - e. Wiring diagrams showing field-installed wiring, including power, signal, and control wiring.
 - f. Shopwork manufacturing instructions.
 - g. Templates and patterns.
 - h. Schedules.
 - i. Design calculations.
 - j. Compliance with specified standards.
 - k. Notation of coordination requirements.
 - l. Notation of dimensions established by field measurement.
 - m. Relationship to adjoining construction clearly indicated.
 - n. Seal and signature of professional engineer if specified.
 - o. Wiring Diagrams: Differentiate between manufacturer-installed and field-installed wiring.
2. Sheet Size: Except for templates, patterns, and similar full-size drawings, submit Shop Drawings on sheets at least 8-1/2 by 11 inches but no larger than 30 by 40 inches.
 3. Number of Copies: Submit three opaque copies of each submittal, unless copies are required for operation and maintenance manuals. Submit five copies where copies are required for operation and maintenance manuals. Architect will retain two copies; remainder will be returned.
- D. Samples: Submit Samples for review of kind, color, pattern, and texture for a check of these characteristics with other elements and for a comparison of these characteristics between submittal and actual component as delivered and installed.
1. Transmit Samples that contain multiple, related components such as accessories together in one submittal package.
 2. Identification: Attach label on unexposed side of Samples that includes the following:
 - a. Generic description of Sample.
 - b. Product name and name of manufacturer.
 - c. Sample source.
 - d. Number and title of appropriate Specification Section.
 3. Disposition: Maintain sets of approved Samples at Project site, available for quality-control comparisons throughout the course of construction activity. Sample sets may be used to determine final acceptance of construction associated with each set.
 - a. Samples that may be incorporated into the Work are indicated in individual Specification Sections. Such Samples must be in an undamaged condition at time of use.
 - b. Samples not incorporated into the Work, or otherwise designated as Owner's property, are the property of Contractor.
 4. Samples for Initial Selection: If colors are not specified, submit manufacturer's color charts consisting of units or sections of units showing the full range of colors, textures, and patterns available.
 - a. Number of Samples: Submit one full set of available choices where color, pattern, texture, or similar characteristics are required to be selected from manufacturer's product line. Architect will return submittal with options selected.
 - b. Samples for Verification: Submit full-size units or Samples of size indicated, prepared from same material to be used for the Work, cured and finished in manner specified, and physically identical with material or product proposed for use, and that show full range of color and texture variations expected.
 - c. Number of Samples: Submit three sets of Samples. Architect will retain two Sample sets; remainder will be returned.

- E. Product Schedule or List: As required in individual Specification Sections, prepare a written summary indicating types of products required for the Work and their intended location. Include the following information in tabular form:
 - 1. Type of product. Include unique identifier for each product.
 - 2. Number and name of room or space.
 - 3. Location within room or space.
 - 4. Number of Copies: Submit three copies of product schedule or list, unless otherwise indicated. Architect will return two copies.
- F. Submittals Schedule: Comply with requirements specified in Section 01 32 00 - Construction Progress Documentation.
- G. Application for Payment: Comply with requirements specified in Section 01 29 00 - Payment Procedures.
- H. Schedule of Values: Comply with requirements specified in Section 01 29 00 - Payment Procedures.
- I. Subcontract List: Prepare a written summary identifying individuals or firms proposed for each portion of the Work, including those who are to furnish products or equipment fabricated to a special design. Include the following information in tabular form:
 - 1. Name, address, and telephone number of entity performing subcontract or supplying products.
 - 2. Number and title of related Specification Section(s) covered by subcontract.
 - 3. Drawing number and detail references, as appropriate, covered by subcontract.
 - 4. Number of Copies: Submit three copies of subcontractor list, unless otherwise indicated. Architect will return two copies.

2.2 INFORMATIONAL SUBMITTALS

- A. General: Prepare and submit Informational Submittals required by other Specification Sections.
 - 1. Number of Copies: Submit two copies of each submittal, unless otherwise indicated. Architect will not return copies.
 - 2. Certificates and Certifications: Provide a notarized statement that includes signature of entity responsible for preparing certification. Certificates and certifications shall be signed by an officer or other individual authorized to sign documents on behalf of that entity.
 - 3. Test and Inspection Reports: Comply with requirements specified in Section 01 40 00 - Quality Requirements.
- B. Coordination Drawings: Comply with requirements specified in Section 01 31 00 - Project Management and Coordination.
- C. Qualification Data: Prepare written information that demonstrates capabilities and experience of firm or person. Include lists of completed projects with project names and addresses, names and addresses of architects and owners, and other information specified.
- D. Welding Certificates: Prepare written certification that welding procedures and personnel comply with requirements in the Contract Documents. Submit record of Welding Procedure Specification (WPS) and Procedure Qualification Record (PQR) on AWS forms. Include names of firms and personnel certified.

- E. Installer Certificates: Prepare written statements on manufacturer's letterhead certifying that Installer complies with requirements in the Contract Documents and, where required, is authorized by manufacturer for this specific Project.
- F. Manufacturer Certificates: Prepare written statements on manufacturer's letterhead certifying that manufacturer complies with requirements in the Contract Documents. Include evidence of manufacturing experience where required.
- G. Product Certificates: Prepare written statements on manufacturer's letterhead certifying that product complies with requirements in the Contract Documents.
- H. Material Certificates: Prepare written statements on manufacturer's letterhead certifying that material complies with requirements in the Contract Documents.
- I. Material Test Reports: Prepare reports written by a qualified testing agency, on testing agency's standard form, indicating and interpreting test results of material for compliance with requirements in the Contract Documents.
- J. Product Test Reports: Prepare written reports indicating current product produced by manufacturer complies with requirements in the Contract Documents. Base reports on evaluation of tests performed by manufacturer and witnessed by a qualified testing agency, or on comprehensive tests performed by a qualified testing agency.
 - 1. Research/Evaluation Reports: Prepare written evidence, from a model code organization acceptable to authorities having jurisdiction, that product complies with building code in effect for Project.
- K. Schedule of Tests and Inspections: Comply with requirements specified in Section 01 40 00 - Quality Requirements.
- L. Preconstruction Test Reports: Prepare reports written by a qualified testing agency, on testing agency's standard form, indicating and interpreting results of tests performed before installation of product, for compliance with performance requirements in the Contract Documents.
- M. Compatibility Test Reports: Prepare reports written by a qualified testing agency, on testing agency's standard form, indicating and interpreting results of compatibility tests performed before installation of product. Include written recommendations for primers and substrate preparation needed for adhesion.
- N. Field Test Reports: Prepare reports written by a qualified testing agency, on testing agency's standard form, indicating and interpreting results of field tests performed either during installation of product or after product is installed in its final location, for compliance with requirements in the Contract Documents.
- O. Maintenance Data: Prepare written and graphic instructions and procedures for operation and normal maintenance of products and equipment. Comply with requirements specified in Section 01 77 00 - Closeout Procedures.
- P. Design Data: Prepare written and graphic information, including, but not limited to, performance and design criteria, list of applicable codes and regulations, and calculations. Include list of assumptions and other performance and design criteria and a summary of loads. Include load diagrams if applicable. Provide name and version of software, if any, used for calculations. Include page numbers.

- Q. **Manufacturer's Instructions:** Prepare written or published information that documents manufacturer's recommendations, guidelines, and procedures for installing or operating a product or equipment. Include name of product and name, address, and telephone number of manufacturer. Include the following, as applicable:
- R. **Manufacturer's Field Reports:** Prepare written information documenting factory-authorized service representative's tests and inspections. Include the following, as applicable:
- S. **Insurance Certificates and Bonds:** Prepare written information indicating current status of insurance or bonding coverage. Include name of entity covered by insurance or bond, limits of coverage, amounts of deductibles, if any, and term of the coverage.

PART 3 - EXECUTION

3.1 CONTRACTOR'S REVIEW

- A. Review each submittal and check for coordination with other Work of the Contract and for compliance with the Contract Documents. Note corrections and field dimensions. Mark with approval stamp before submitting to Architect.
- B. **Approval Stamp:** Stamp each submittal with a uniform, approval stamp. Include Project name and location, submittal number, Specification Section title and number, name of reviewer, date of Contractor's approval, and statement certifying that submittal has been reviewed, checked, and approved for compliance with the Contract Documents.

3.2 ARCHITECT'S ACTION

- A. **General:** Architect will not review submittals that do not bear Contractor's approval stamp and will return them without action.
- B. **Action Submittals:** Architect will review each submittal, make marks to indicate corrections or modifications required, and return it. Architect will stamp each submittal with an action stamp and will mark stamp appropriately to indicate action taken, as follows:

APPROVED: The work covered by the submittal may proceed provided that it complies with the Contract Documents.

APPROVED AS NOTED: Same as above plus comply with Architect's notes on submittal.

NOT APPROVED CORRECT & RESUBMIT: Do not proceed. Revise submittal and re-submit.

ACTION NOT REQUIRED: Submittal is for information purposes only and no action required.

- C. **Informational Submittals:** Architect will review each submittal and will not return it or will return it if it does not comply with requirements. Architect will forward each submittal to appropriate party.

- D. Partial submittals are not acceptable, will be considered nonresponsive, and will be returned without review.
- E. Submittals not required by the Contract Documents may not be reviewed and may be discarded.

END OF SECTION

SECTION 01 40 00

QUALITY REQUIREMENTS

PART 1 - GENERAL

1.1 SUMMARY

A. Section Includes:

1. Quality Control Requirements.
2. Administrative and procedural requirements for quality assurance and quality control.

B. Related Sections:

1. Section 01 32 0 - Construction Progress Documentation: Developing a schedule of required tests and inspections.
2. Section 01 73 29 - Cutting and Patching: Repair and restoration of construction disturbed by testing and inspecting activities.
3. Divisions 2 through 33 Sections: Specific test and inspection requirements.

1.2 QUALITY CONTROL REQUIREMENTS

A. General: The Contractor shall establish a system of inspections and tests of his work and that of his subcontractors to insure that all applicable requirements of the specifications are met.

1. The Contractor shall be diligent to insure that the quality of workmanship is satisfactory, that dimensional requirements are met, that defective materials are not used and that all required control and laboratory testing procedures are effected.
2. Where specific testing procedures are not stipulated, the Contractor shall establish and conduct a test procedure to insure adherence to specified quality.
3. The Contractor shall make an initial inspection of each phase of work as soon as a representative portion has been completed, and the Contractor shall make daily follow-up inspections, to insure that an acceptable quality of work is established and maintained.
4. The Contractor shall perform a pre-final inspection and work off all punch list items prior to A/E inspection.

1.3 DEFINITIONS

A. Conventional Inspections: Inspections, not specifically required by Code, which are considered essential to the proper performance of the building systems.

B. Inspections: Evaluation of systems, primarily requiring observation and engineering judgment.

C. Quality-Control Services: Conventional inspections, special inspections, tests, and related actions, including reports performed by Contractor, by independent agencies, and by governing authorities. Services do not include contract enforcement activities performed by Architect.

D. Special Inspections: Inspections, required by Code, which monitor the quality of materials and workmanship critical to the structural integrity of the building.

E. Quality-Assurance Services: Activities, actions, and procedures performed before and during execution of the Work to guard against defects and deficiencies and substantiate that proposed construction will comply with requirements.

- F. Quality-Control Services: Conventional inspection, special inspections, tests, procedures, and related actions during and after execution of the Work to evaluate that actual products incorporated into the Work and completed construction comply with requirements. Services do not include contract enforcement activities performed by Architect.
- G. Mockups: Full-size, physical assemblies that are constructed on-site. Mockups are used to verify selections made under sample submittals, to demonstrate aesthetic effects and, where indicated, qualities of materials and execution, and to review construction, coordination, testing, or operation; they are not Samples. Approved mockups establish the standard by which the Work will be judged.
- H. Laboratory Mockups: Full-size, physical assemblies that are constructed at testing facilities to verify performance characteristics.
- I. Preconstruction Testing: Tests and inspections that are performed specifically for the Project before products and materials are incorporated into the Work to verify performance or compliance with specified criteria.
- J. Product Testing: Tests and inspections that are performed by an NRTL, an NVLAP, or a testing agency qualified to conduct product testing and acceptable to authorities having jurisdiction, to establish product performance and compliance with industry standards.
- K. Source Quality-Control Testing: Tests and inspections that are performed at the source, i.e., plant, mill, factory, or shop.
- L. Field Quality-Control Testing: Tests and inspections that are performed on-site for installation of the Work and for completed Work.
- M. Testing Agency: An entity engaged to perform specific tests, inspections, or both. Testing laboratory shall mean the same as testing agency.
- N. Installer/Applicator/Erector: Contractor or another entity engaged by Contractor as an employee, Subcontractor, or Sub-subcontractor, to perform a particular construction operation, including installation, erection, application, and similar operations.
 - 1. Using a term such as "carpentry" does not 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 tradespeople of the corresponding generic name.
- O. Experienced: When used with an entity, "experienced" means having successfully completed a minimum of five previous projects similar in size and scope to this Project; being familiar with special requirements indicated; and having complied with requirements of authorities having jurisdiction.

1.4 QUALITY ASSURANCE AND CONTROL SERVICES REQUIREMENTS

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

1. Specific quality-assurance and -control requirements for individual construction activities are specified in the Sections that specify those activities. Requirements in those Sections may also cover production of standard products.
2. Specified tests, inspections, and related actions do not limit Contractor's other quality-assurance and -control procedures that facilitate compliance with the Contract Document requirements.

B. Requirements for Contractor to provide quality-assurance and -control services required by Architect, Owner or authorities having jurisdiction are not limited by provisions of this Section.

1.5 CONFLICTING REQUIREMENTS

A. General: If compliance with two or more standards is specified and the standards establish different or conflicting requirements for minimum quantities or quality levels, comply with the most stringent requirement. Refer uncertainties and requirements that are different, but apparently equal, to Architect for a decision before proceeding.

B. 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 requirements. Refer uncertainties to Architect for a decision before proceeding.

1.6 SUBMITTALS

A. Qualification Data: For testing agencies specified in "Quality Assurance" Article to demonstrate their capabilities and experience. Include proof of qualifications in the form of a recent report on the inspection of the testing agency by a recognized authority.

B. Reports: Prepare and submit certified written reports that include the following:

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

C. Permits, Licenses, and Certificates: For Owner's records, submit copies of permits, licenses, certifications, inspection reports, releases, jurisdictional settlements, notices, receipts for fee payments, judgments, correspondence, records, and similar documents, established for compliance with standards and regulations bearing on performance of the Work.

1.7 QUALITY ASSURANCE

- A. General: Qualifications paragraphs in this Article establish the minimum qualification levels required; individual Specification Sections specify additional requirements.
- B. Installer Qualifications: A firm or individual experienced in installing, erecting, or assembling work similar in material, design, and extent to that indicated for this Project, whose work has resulted in construction with a record of successful in-service performance.
- C. Manufacturer Qualifications: A firm experienced in manufacturing products or systems similar to those indicated for this Project and with a record of successful in-service performance, as well as sufficient production capacity to produce required units.
- D. Fabricator Qualifications: A firm experienced in producing products similar to those indicated for this Project and with a record of successful in-service performance, as well as sufficient production capacity to produce required units.
- E. Professional Engineer Qualifications: A professional engineer who is legally qualified to practice in jurisdiction where Project is located and who is experienced in providing engineering services of the kind indicated. Engineering services are defined as those performed for installations of the system, assembly, or product that are similar to those indicated for this Project in material, design, and extent.
- F. Testing Agency Qualifications: An NRTL, an NVLAP, or an independent agency with the experience and capability to conduct testing and inspecting indicated, as documented according to ASTM E 548; and with additional qualifications specified in individual Sections; and where required by authorities having jurisdiction, that is acceptable to authorities.
 - 1. NRTL: A nationally recognized testing laboratory according to 29 CFR 1910.7.
 - 2. NVLAP: A testing agency accredited according to NIST's National Voluntary Laboratory Accreditation Program.
- G. Factory-Authorized Service Representative Qualifications: An authorized representative of manufacturer who is trained and approved by manufacturer to inspect installation of manufacturer's products that are similar in material, design, and extent to those indicated for this Project.
- H. Mockups: Before installing portions of the Work requiring mockups, build mockups for each form of construction and finish required to comply with the following requirements, using materials indicated for the completed Work:
 - 1. Build mockups in location and of size indicated or, if not indicated, as directed by Architect.
 - 2. Notify Architect seven days in advance of dates and times when mockups will be constructed.
 - 3. Demonstrate the proposed range of aesthetic effects and workmanship.
 - 4. Obtain Architect's approval of mockups before starting work, fabrication, or construction.
 - 5. Maintain mockups during construction in an undisturbed condition as a standard for judging the completed Work.
 - 6. Demolish and remove mockups when directed, unless otherwise indicated.

1.8 QUALITY CONTROL

- A. Owner Responsibilities: Where quality-control services are indicated as Owner's responsibility, Owner will engage a qualified testing agency to perform these services.
1. Owner will furnish Contractor with names, addresses, and telephone numbers of testing agencies engaged and a description of types of testing and inspecting they are engaged to perform.
 2. Payment for these services will be made from testing and inspecting allowances, as authorized by Change Orders.
 3. Costs for retesting and reinspecting construction that replaces or is necessitated by work that failed to comply with the Contract Documents will be charged to Contractor, and the Contract Sum will be adjusted by Change Order.
- B. Tests and inspections not explicitly assigned to Owner are Contractor's responsibility. Unless otherwise indicated, provide quality-control services specified and those required by authorities having jurisdiction. Perform quality-control services required of Contractor by authorities having jurisdiction, whether specified or not.
1. Where services are indicated as Contractor's responsibility, engage a qualified testing agency to perform these quality-control services.
 - a. Contractor shall not employ same entity engaged by Owner, unless agreed to in writing by Owner.
 2. Notify testing agencies at least 24 hours in advance of time when Work that requires testing or inspecting will be performed.
 3. Where quality-control services are indicated as Contractor's responsibility, submit a certified written report, in duplicate, of each quality-control service.
 4. Testing and inspecting requested by Contractor and not required by the Contract Documents are Contractor's responsibility.
 5. Submit additional copies of each written report directly to authorities having jurisdiction when they so direct.
- C. Manufacturer's Field Services: Where indicated, engage a factory-authorized service representative to inspect field-assembled components and equipment installation, including service connections. Report results in writing as specified in Section 01 33 00 - Submittal Procedures.
- D. Retesting/Reinspecting: Regardless of whether original tests or inspections were Contractor's responsibility, provide quality-control services, including retesting and reinspecting, for construction that replaced Work that failed to comply with the Contract Documents.
- E. Testing Agency Responsibilities: Cooperate with Architect and Contractor in performance of duties. Provide qualified personnel to perform required tests and inspections.
1. Notify Architect and Contractor promptly of irregularities or deficiencies observed in the Work during performance of its services.
 2. Determine the location from which test samples will be taken and in which in-situ tests are conducted.
 3. Conduct and interpret tests and inspections and state in each report whether tested and inspected work complies with or deviates from requirements.
 4. Submit a certified written report, in duplicate, of each test, inspection, and similar quality-control service through Contractor.
 5. Do not release, revoke, alter, or increase the Contract Document requirements or approve or accept any portion of the Work.

6. Do not perform any duties of Contractor.
- F. Associated Services: Cooperate with agencies performing required tests, inspections, and similar quality-control services, and provide reasonable auxiliary services as requested. Notify agency sufficiently in advance of operations to permit assignment of personnel. Provide the following:
1. Access to the Work.
 2. Incidental labor and facilities necessary to facilitate tests and inspections.
 3. Adequate quantities of representative samples of materials that require testing and inspecting. Assist agency in obtaining samples.
 4. Facilities for storage and field curing of test samples.
 5. Delivery of samples to testing agencies.
 6. Preliminary design mix proposed for use for material mixes that require control by testing agency.
 7. Security and protection for samples and for testing and inspecting equipment at Project site.
- G. Coordination: Coordinate sequence of activities to accommodate required quality-assurance and -control services with a minimum of delay and to avoid necessity of removing and replacing construction to accommodate testing and inspecting.
1. Schedule times for tests, inspections, obtaining samples, and similar activities.

PART 2 - PRODUCTS (Not Used)

PART 3 - EXECUTION

3.1 REPAIR AND PROTECTION

- A. General: On completion of testing, inspecting, sample taking, and similar services, repair damaged construction and restore substrates and finishes.
1. Comply with the Contract Document requirements for Section 01 73 29 - Cutting and Patching.
- B. Protect construction exposed by or for quality-control service activities.
- C. Repair and protection are Contractor's responsibility, regardless of the assignment of responsibility for quality-control services.

END OF SECTION

SECTION 01 50 00
TEMPORARY FACILITIES AND CONTROLS

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

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

1.2 SUMMARY

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

1.3 USE CHARGES

- A. General: Installation and removal of and use charges for temporary facilities shall be included in the General Conditions cost unless otherwise indicated. Allow other entities to use temporary services and facilities without cost, including, but not limited to, Owner's construction forces, Architect, occupants of Project, testing agencies, and authorities having jurisdiction. Does not apply to other occupants of building.
 - a Sewer Service: Owner will pay sewer-service use charges for sewer usage by all entities for construction operations.
 - b Water Service: Owner will pay water-service use charges for water used by all entities for construction operations.
 - c Electric Power Service: Owner will pay electric-power-service use charges for electricity used by all entities for construction operations.

1.4 INFORMATIONAL SUBMITTALS

- A. Site Plan: Show temporary facilities, utility hookups, staging areas, and parking areas for construction personnel.
- B. Fire-Safety Program: Show compliance with requirements of NFPA 241 and authorities having jurisdiction. Indicate Contractor personnel responsible for management of fire-prevention program.

- C. Moisture-Protection Plan: Describe procedures and controls for protecting materials and construction from water absorption and damage.
 - 1. Describe delivery, handling, and storage provisions for materials subject to water absorption or water damage.
 - 2. Indicate procedures for discarding water-damaged materials, protocols for mitigating water intrusion into completed Work, and replacing water-damaged Work.
 - 3. Indicate sequencing of work that requires water, such as sprayed fire-resistive materials, plastering, and terrazzo grinding, and describe plans for dealing with water from these operations. Show procedures for verifying that wet construction has dried sufficiently to permit installation of finish materials.
 - D. Dust- and HVAC-Control Plan: Submit coordination drawing and narrative that indicates the dust- and HVAC-control measures proposed for use, proposed locations, and proposed time frame for their operation. Identify further options if proposed measures are later determined to be inadequate. Include the following:
 - 1. Locations of dust-control partitions at each phase of work.
 - 2. HVAC system isolation schematic drawing.
 - 3. Location of proposed air-filtration system discharge.
 - 4. Waste handling procedures.
 - 5. Other dust-control measures.
- 1.5 QUALITY ASSURANCE
- A. Electric Service: Comply with NECA, NEMA, and UL standards and regulations for temporary electric service. Install service to comply with NFPA 70.
 - B. Tests and Inspections: Arrange for authorities having jurisdiction to test and inspect each temporary utility before use. Obtain required certifications and permits.
 - C. Accessible Temporary Egress: Comply with applicable provisions in the Florida Accessibility Standards.

PART 2 - PRODUCTS

2.1 MATERIALS

- A. Dust-Control Adhesive-Surface Walk-off Mats: Provide mats minimum 36 by 60 inches (914 by 1624 mm).

2.2 TEMPORARY FACILITIES

- A. Field Offices, General: Prefabricated or mobile units with serviceable finishes, temperature controls, and foundations adequate for normal loading.
- B. Common-Use Field Office: Area to be of sufficient size to accommodate needs of Owner, Architect, and construction personnel office activities and to accommodate Project meetings specified in other Division 01 Sections. Keep office clean and orderly. Furnish and equip offices as follows:
 - 1. Furniture required for Project-site documents including file cabinets, plan tables, plan racks, and bookcases.
 - 2. Conference room of sufficient size to accommodate meetings of 10 individuals. Provide electrical power service and 120-V ac duplex receptacles, with no fewer than one receptacle on each wall. Furnish room with conference table, chairs, and 4-foot- (1.2-m) square tack and marker boards.
 - 3. Drinking water and private toilet.
 - 4. Heating and cooling equipment necessary to maintain a uniform indoor temperature of 68 to 72 deg F (20 to 22 deg C).
 - 5. Lighting fixtures capable of maintaining average illumination of 20 fc (215 lx) at desk height.
- C. Storage and Fabrication Sheds: Coordinate with building Owner to provide interior building space or a location to provide sheds sized, furnished, and equipped to accommodate materials and equipment for construction operations.
 - 1. Store combustible materials apart from building.

2.3 EQUIPMENT

- A. Fire Extinguishers: Portable, UL rated; with class and extinguishing agent as required by locations and classes of fire exposures.
- B. Air-Filtration Units: Primary and secondary HEPA-filter-equipped portable units with four stage filtration. Provide single switch for emergency shutoff. Configure to run continuously during construction operations.

PART 3 - EXECUTION

3.1 INSTALLATION, GENERAL

- A. Locate facilities where they will serve Project adequately and result in minimum interference with performance of the Work. Relocate and modify facilities as required by progress of the Work.
 - 1. Locate facilities to limit site disturbance as specified in Section 01 10 00 "Summary."

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

3.2 TEMPORARY UTILITY INSTALLATION

- A. General: Install temporary service or connect to existing service.
 - 1. Arrange with utility company, Owner, and existing users for time when service can be interrupted, if necessary, to make connections for temporary services.
- B. Sewers and Drainage: Provide temporary utilities to remove effluent lawfully.
 - 1. Connect temporary sewers to municipal system as directed by authorities having jurisdiction.
- C. Water Service: Connect to Owner's existing water service facilities. Clean and maintain water service facilities in a condition acceptable to Owner. At Substantial Completion, restore these facilities to condition existing before initial use.
- D. Sanitary Facilities: Provide temporary toilets, wash facilities, and drinking water for use of construction personnel. Comply with requirements of authorities having jurisdiction for type, number, location, operation, and maintenance of fixtures and facilities.
- E. Heating and Cooling: Provide temporary heating and cooling required by construction activities for curing or drying of completed installations or for protecting installed construction from adverse effects of low temperatures or high humidity. Select equipment that will not have a harmful effect on completed installations or elements being installed.
- F. Isolation of Work Areas in Occupied Facilities: Prevent dust, fumes, and odors from entering occupied areas.
 - 1. Prior to commencing work, isolate the HVAC system in area where work is to be performed according to coordination drawings.
 - a. Disconnect supply and return ductwork in work area from HVAC systems servicing occupied areas.
 - b. Maintain negative air pressure within work area using HEPA-equipped air filtration units, starting with commencement of temporary partition construction, and continuing until removal of temporary partitions is complete.
 - 2. Maintain dust partitions during the Work. Use vacuum collection attachments on dustproducing equipment. Isolate limited work within occupied areas using portable dustcontainment devices.
 - 3. Perform daily construction cleanup and final cleanup using approved, HEPA-filter equipped vacuum equipment.

- G. Ventilation and Humidity Control: Provide temporary ventilation required by construction activities for curing or drying of completed installations or for protecting installed construction from adverse effects of high humidity. Select equipment that will not have a harmful effect on completed installations or elements being installed. Coordinate ventilation requirements to produce ambient condition required and minimize energy consumption.
 - 1. Provide dehumidification systems when required to reduce substrate moisture levels to level required to allow installation or application of finishes.
- H. Electric Power Service: Connect to Owner's existing electric power service. Maintain equipment in a condition acceptable to Owner.
- I. Lighting: Provide temporary lighting with local switching that provides adequate illumination for construction operations, observations, inspections, and traffic conditions.
 - 1. Install and operate temporary lighting that fulfills security and protection requirements without operating entire system.
 - 2. Install lighting for Project identification sign.
- J. Telephone Service: Provide temporary telephone service in common-use facilities for use by all construction personnel. Install one telephone line(s) for each field office.
 - 1. Provide additional telephone lines for the following:
 - a. Provide a dedicated telephone line for each facsimile machine in each field office.
 - 2. At each telephone, post a list of important telephone numbers.
 - a. Police and fire departments.
 - b. Ambulance service.
 - c. Contractor's home office.
 - d. Contractor's emergency after-hours telephone number.
 - e. Architect's office.
 - f. Engineers' offices.
 - g. Owner's office.
 - h. Principal subcontractors' field and home offices.
 - 3. Provide superintendent with cellular telephone or portable two-way radio for use when away from field office.

3.3 SUPPORT FACILITIES INSTALLATION

- A. General: Comply with the following:

1. Provide construction for temporary offices, shops, and sheds located within construction area or within **30 feet (9 m)** of building lines that is noncombustible according to ASTM E 136. Comply with NFPA 241.
 2. Maintain support facilities until Architect schedules Substantial Completion inspection. Remove before Substantial Completion. Personnel remaining after Substantial Completion will be permitted to use permanent facilities, under conditions acceptable to Owner.
- B. Parking: Consult with building Owner for designated parking and laydown areas for construction personnel.
- C. ~~Project Signs: Provide Project signs as indicated. Unauthorized signs are not permitted.~~
1. ~~Identification Signs: Provide Project identification signs as indicated on Drawings.~~
 2. ~~Temporary Signs: Provide other signs as indicated and as required to inform public and individuals seeking entrance to Project.~~
 - a. ~~Provide temporary, directional signs for construction personnel and visitors.~~
 3. ~~Maintain and touchup signs so they are legible at all times.~~
- D. Waste Disposal Facilities: Comply with requirements specified in Section 01 74 19 "Construction Waste Management and Disposal."

3.4 SECURITY AND PROTECTION FACILITIES INSTALLATION

- A. Protection of Existing Facilities: Protect existing vegetation, equipment, structures, utilities, and other improvements at Project site and on adjacent properties, except those indicated to be removed or altered. Repair damage to existing facilities.
- B. Environmental Protection: Provide protection, operate temporary facilities, and conduct construction as required to comply with environmental regulations and that minimize possible air, waterway, and subsoil contamination or pollution or other undesirable effects.
- C. ~~Temporary Erosion and Sedimentation Control: Provide measures to prevent soil erosion and discharge of soil-bearing water runoff and airborne dust to undisturbed areas and to adjacent properties and walkways, according to erosion and sedimentation control Drawings, requirements of 2003 EPA Construction General Permit, or authorities having jurisdiction, whichever is more stringent.~~
 1. ~~Verify that flows of water redirected from construction areas or generated by construction activity do not enter or cross tree or plant protection zones.~~
 2. ~~Inspect, repair, and maintain erosion and sedimentation control measures during construction until permanent vegetation has been established.~~
 3. ~~Clean, repair, and restore adjoining properties and roads affected by erosion and sedimentation from Project site during the course of Project.~~

- ~~4. Remove erosion and sedimentation controls and restore and stabilize areas disturbed during removal.~~
- D. ~~Stormwater Control: Comply with requirements of authorities having jurisdiction. Provide barriers in and around excavations and subgrade construction to prevent flooding by runoff of stormwater from heavy rains.~~
- E. ~~Tree and Plant Protection: Install temporary fencing located as indicated or outside Tree Protection Zones (TPZ) to protect vegetation from damage from construction operations. Protect tree root systems from damage, flooding, and erosion. TPZ is 1.50 feet away in radial distance from the trunk for every inch in stem diameter.~~
- F. ~~Pest Control: Engage pest-control service to recommend practices to minimize attraction and harboring of rodents, roaches, and other pests and to perform extermination and control procedures at regular intervals so Project will be free of pests and their residues at Substantial Completion. Perform control operations lawfully, using environmentally safe materials.~~
- G. ~~Site Enclosure Fence: Before construction operations begin, furnish and install site enclosure fence in a manner that will prevent people and animals from easily entering site except by entrance gates.~~
 1. ~~Extent of Fence: As required to enclose entire Project site or portion determined sufficient to accommodate construction operations.~~
 2. ~~Maintain security by limiting number of keys and restricting distribution to authorized personnel. Furnish one set of keys to Owner.~~
- H. ~~Security Enclosure and Lockup: Install temporary enclosure around partially completed areas of construction. Provide lockable entrances to prevent unauthorized entrance, vandalism, theft, and similar violations of security. Lock entrances at end of each workday.~~
- I. ~~Barricades, Warning Signs, and Lights: Comply with requirements of authorities having jurisdiction for erecting structurally adequate barricades, including warning signs and lighting.~~
- J. ~~Temporary Egress: Maintain temporary egress from existing occupied facilities as indicated and as required by authorities having jurisdiction.~~
- K. ~~Temporary Enclosures: Provide temporary enclosures for protection of construction, in progress and completed, from exposure, foul weather, other construction operations, and similar activities. Provide temporary weathertight enclosure for building exterior.~~
 1. ~~Where heating or cooling is needed and permanent enclosure is incomplete, insulate temporary enclosures.~~
- L. ~~Temporary Partitions: Provide floor-to-ceiling dustproof partitions to limit dust and dirt migration and to separate areas occupied by Owner from fumes and noise.~~

1. Construct dustproof partitions with gypsum wallboard with joints taped on occupied side, and fire-retardant-treated plywood on construction operations side.
 2. Where fire-resistance-rated temporary partitions are indicated or are required by authorities having jurisdiction, construct partitions according to the rated assemblies.
 3. Insulate partitions to control noise transmission to occupied areas.
 4. Seal joints and perimeter. Equip partitions with gasketed dustproof doors and security locks where openings are required.
 5. Protect air-handling equipment.
 6. Provide walk-off mats at each entrance through temporary partition.
- M. Temporary Fire Protection: Install and maintain temporary fire-protection facilities of types needed to protect against reasonably predictable and controllable fire losses. Comply with NFPA 241; manage fire-prevention program.
1. Prohibit smoking in construction areas.
 2. Supervise welding operations, combustion-type temporary heating units, and similar sources of fire ignition according to requirements of authorities having jurisdiction.
 3. Develop and supervise an overall fire-prevention and -protection program for personnel at Project site. Review needs with local fire department and establish procedures to be followed. Instruct personnel in methods and procedures. Post warnings and information.
 4. Provide portable fire extinguishers as required for fire protection.
- 3.5 MOISTURE AND MOLD CONTROL
- A. Contractor's Moisture-Protection Plan: Avoid trapping water in finished work. Document visible signs of mold that may appear during construction.
- B. Exposed Construction Phase: Before installation of weather barriers, when materials are subject to wetting and exposure and to airborne mold spores, protect as follows:
1. Protect porous materials from water damage.
 2. Protect stored and installed material from flowing or standing water.
 3. Keep porous and organic materials from coming into prolonged contact with concrete.
 4. Remove standing water.
- C. Partially Enclosed Construction Phase: After installation of weather barriers but before full enclosure and conditioning of building, when installed materials are still subject to infiltration of moisture and ambient mold spores, protect as follows:
1. Do not load or install drywall or other porous materials or components, or items with high organic content, into partially enclosed building.
 2. Keep interior spaces reasonably clean and protected from water damage.
 3. Periodically collect and remove waste containing cellulose or other organic matter.

4. Discard or replace water-damaged material.
 5. Do not install material that is wet.
 6. Discard, replace, or clean stored or installed material that begins to grow mold.
 7. Perform work in a sequence that allows any wet materials adequate time to dry before enclosing the material in drywall or other interior finishes.
- D. Controlled Construction Phase of Construction: After completing and sealing of the building enclosure but prior to the full operation of permanent HVAC systems, maintain as follows:
1. Control moisture and humidity inside building by maintaining effective dry-in conditions.
 2. Use permanent HVAC system to control humidity.
 3. Comply with manufacturer's written instructions for temperature, relative humidity, and exposure to water limits.
 - a. Hygroscopic materials that may support mold growth, including wood and gypsum-based products, that become wet during the course of construction and remain wet for 48 hours are considered defective.
 - b. Measure moisture content of materials that have been exposed to moisture during construction operations or after installation. Record readings beginning at time of exposure and continuing daily for 48 hours. Identify materials containing moisture levels higher than allowed. Report findings in writing to Architect.
 - c. Remove materials that cannot be completely restored to their manufactured moisture level within 48 hours.
- 3.6 OPERATION, TERMINATION, AND REMOVAL
- A. Supervision: Enforce strict discipline in use of temporary facilities. To minimize waste and abuse, limit availability of temporary facilities to essential and intended uses. B. Maintenance: Maintain facilities in good operating condition until removal.
1. Maintain operation of temporary enclosures, heating, cooling, humidity control, ventilation, and similar facilities on a 24-hour basis where required to achieve indicated results and to avoid possibility of damage.
- C. Temporary Facility Changeover: Do not change over from using temporary security and protection facilities to permanent facilities until Substantial Completion.
- D. Termination and Removal: Remove each temporary facility when need for its service has ended, when it has been replaced by authorized use of a permanent facility, or no later than Substantial Completion. Complete or, if necessary, restore permanent construction that may have been delayed because of interference with temporary facility. Repair damaged Work, clean exposed surfaces, and replace construction that cannot be satisfactorily repaired.

1. Materials and facilities that constitute temporary facilities are property of Contractor. Owner reserves right to take possession of Project identification signs.
2. At Substantial Completion, repair, renovate, and clean permanent facilities used during construction period. Comply with final cleaning requirements specified in Section 01 77 00 "Closeout Procedures."

END OF SECTION 01 50 00

**SECTION 01 60 00
PRODUCT REQUIREMENTS**

PART 1 GENERAL

1.1 RELATED DOCUMENTS

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

1.2 SUMMARY

- A. This Section includes administrative and procedural requirements for selection of products for use in Project; product delivery, storage, and handling; manufacturers' standard warranties on products; special warranties; and comparable products.

1.3 DEFINITIONS

- A. Products: Items obtained for incorporating into the Work, whether purchased for Project or taken from previously purchased stock. The term "product" includes the terms "material," "equipment," "system," and terms of similar intent.
1. Named Products: Items identified by manufacturer's product name, including make or model number or other designation shown or listed in manufacturer's published product literature, that is current as of date of the Contract Documents.
 2. New Products: Items that have not previously been incorporated into another project or facility. Products salvaged or recycled from other projects are not considered new products.
 3. Comparable Product: Product that is demonstrated and approved through submittal process to have the indicated qualities related to type, function, dimension, in-service performance, physical properties, appearance, and other characteristics that equal or exceed those of specified product.
- B. Basis-of-Design Product Specification: A specification in which a specific manufacturer's product is named and accompanied by the words "basis-of-design product," including make or model number or other designation, to establish the significant qualities related to type, function, dimension, in-service performance, physical properties, appearance, and other characteristics for purposes of evaluating comparable products of additional manufacturers named in the specification.

1.4 QUALITY ASSURANCE

- A. Compatibility of Options: If Contractor is given option of selecting between two or more products for use on Project, select product compatible with products previously selected, even if previously selected products were also options.
- B. Nameplates: Except for required labels and operating data, do not attach or imprint manufacturer's or producer's nameplates or trademarks on exposed surfaces of products which will be exposed to view in occupied spaces or on the exterior.

1. Evidence that manufacturer's nameplates or marks have been removed and patched on surfaces exposed to view is not acceptable.
2. Labels: Locate required product labels and stamps on concealed surfaces or, where required for observation after installation, on accessible surfaces that are not conspicuous.
3. Equipment Nameplates: Provide a permanent nameplate on each item of service-connected or power operated equipment.
 - a. Locate on easily accessible surfaces that are inconspicuous in occupied spaces.
 - b. The nameplate shall contain the following information and other essential operating data:
 - 1) Name of product and manufacturer.
 - 2) Model and serial number.
 - 3) Capacity.
 - 4) Speed.
 - 5) Ratings.
 - 6) Power requirements.

1.5 SUBMITTALS

- A. Product List: Submit a list, in tabular form, showing specified products. Include generic names of products required. Include manufacturer's name and proprietary product names for each product.
 1. Coordinate product list with Contractor's Construction Schedule and the Submittals Schedule.
 2. Form: Tabulate information for each product under the following column headings:
 - a. Specification Section number and title.
 - b. Generic name used in the Contract Documents.
 - c. Proprietary name, model number, and similar designations.
 - d. Manufacturer's name and address.
 - e. Supplier's name and address.
 - f. Installer's name and address.
 - g. Projected delivery date or time span of delivery period.
 - h. Identification of items that require early submittal approval for scheduled delivery date.
 3. Initial Submittal: Within 30 days after date of commencement of the Work, submit 3 copies of initial product list. Include a written explanation for omissions of data and for variations from Contract requirements.
 - a. At Contractor's option, initial submittal may be limited to product selections and designations that must be established early in Contract period.
 4. Completed List: At a time as approved by Owner, submit 3 copies of completed product list. Include a written explanation for omissions of data and for variations from Contract requirements.
 5. Architect's Action: Architect will respond in writing to Contractor within 15 days of receipt of completed product list.
 - a. Architect's response will include a list of unacceptable product selections and a brief explanation of reasons for this action.
 - b. Architect's response, or lack of response, does not constitute a waiver of requirement to comply with the Contract Documents.

- B. Substitution Requests: Comply with General Conditions. Submit three copies of each request for consideration. Identify product or fabrication or installation method to be replaced. Include Specification Section number and title and Drawing numbers and titles.
 - 1. Substitution Request Form: Comply with General Conditions. Use form in Division 1 Section "Substitution Request Form".
 - 2. Use product specified if Owner cannot make a decision on use of a proposed substitution within time allocated.
- C. Basis-of-Design Product Specification Submittal: Comply with requirements in General Conditions. Show compliance with requirements.

1.6 DELIVERY, STORAGE, AND HANDLING

- A. Comply with General Conditions and Division 1 Section "Product Requirements".
- B. Deliver, store, and handle products using means and methods that will prevent damage, deterioration, and loss, including theft and vandalism. Comply with manufacturer's written instructions.
- C. Delivery and Handling:
 - 1. Schedule delivery to minimize long-term storage at Project site and to prevent overcrowding of construction spaces.
 - 2. Coordinate delivery with installation time to ensure minimum holding time for items that are flammable, hazardous, easily damaged, or sensitive to deterioration, theft, and other losses.
 - 3. Deliver products to Project site in an undamaged condition in manufacturer's original sealed container or other packaging system, complete with labels and instructions for handling, storing, unpacking, protecting, and installing.
 - 4. Inspect products on delivery to determine compliance with the Contract Documents and to determine that products are undamaged and properly protected.
- D. Storage:
 - 1. Store products to allow for inspection and measurement of quantity or counting of units.
 - 2. Store materials in a manner that will not endanger Project structure.
 - 3. Store products that are subject to damage by the elements, under cover in a weathertight enclosure above ground, with ventilation adequate to prevent condensation.
 - 4. Protect foam plastic from exposure to sunlight, except to extent necessary for period of installation and concealment.
 - 5. Comply with product manufacturer's written instructions for temperature, humidity, ventilation, and weather protection requirements for storage.
 - 6. Protect stored products from damage and liquids from freezing.
- E. Packaging for Construction and Maintenance Materials:
 - 1. Provide reusable or recyclable packaging for site delivered items such as construction materials, operations, and maintenance materials, furniture, equipment and other large objects.
 - 2. Requirements apply to items over 75 pounds or larger than 120 cubic feet.
 - a. Polystyrene "peanuts" shall not be used.

- 1) Use products with natural or recycled content.
 - b. Plastic sheets or films will be allowed only if labeled with recycling symbol indicated type of plastic.
 - c. Reusable Packaging Items such as blankets, skids and crates that shall be returned to the manufacturer or transportation company for future reuse as packaging materials
 - d. Recyclable Packaging: Items such as boxes, cardboard and paper that shall be delivered to a recycling center.

1.7 WARRANTY

- A. Warranties specified in other Sections shall be in addition to, and run concurrent with, other warranties required by the Contract Documents. Manufacturer's disclaimers and limitations on product warranties do not relieve Contractor of obligations under requirements of the Contract Documents.
 1. Manufacturer's Warranty: Written warranty furnished by individual manufacturer for a particular product and specifically endorsed by manufacturer to Owner. Minimum (2) year warranty required.
 2. Special Warranty: Written warranty required by the Contract Documents to provide specific rights for Owner or to extend time limit provided by manufacturer's warranty. Minimum (2) year warranty required.
- B. Special Warranties: Prepare a written document that contains appropriate terms and identification, ready for execution. Submit a draft for approval before final execution.
 1. Manufacturer's Standard Form: Modified to include Project-specific information and properly executed.
 2. Specified Form: When specified forms are included with the Specifications, prepare a written document using indicated form properly executed.
 3. See Divisions 2 through 33 Sections for specific content requirements and particular requirements for submitting special warranties.
- C. Submittal Time: Comply with requirements in Division 1 Section "Closeout Procedures".

PART 2 PRODUCTS

2.1 UNAUTHORIZED MATERIALS

- A. Materials and products required for work of this section shall not contain asbestos, polychlorinated biphenyls (PCB) or other hazardous materials identified by the Owner.

2.2 PRODUCT SELECTION PROCEDURES

- A. General Product Requirements: Provide products that comply with the Contract Documents, are undamaged and, unless otherwise indicated, are new at time of installation.
 1. Provide products complete with accessories, trim, finish, fasteners, and other items needed for a complete installation and indicated use and effect.

2. Standard Products: If available, and unless custom products or nonstandard options are specified, provide standard products of types that have been produced and used successfully in similar situations on other projects.
3. Owner reserves the right to limit selection to products with warranties not in conflict with requirements of the Contract Documents.
4. Where products are accompanied by the term "as selected," Architect will make selection.
5. Where products are accompanied by the term "match sample," sample to be matched is Architect's.
6. Descriptive, performance, and reference standard requirements in the Specifications establish salient characteristics of products.

B. Product Selection Procedures:

1. Product: Where Specifications name a single manufacturer and product, provide the named product that complies with requirements. Comparable products or substitutions for Contractor's convenience will not be considered.
2. Manufacturer/Source: Where Specifications name a single manufacturer or source, provide a product by the named manufacturer or source that complies with requirements. Comparable products or substitutions for Contractor's convenience will not be considered.
3. Products: Where Specifications include a list of names of both manufacturers and products, provide one of the products listed that complies with requirements.
4. Manufacturers: Where Specifications include a list of manufacturers' names, provide a product by one of the manufacturers listed that complies with requirements.
5. Product Options: Where Specifications indicate that sizes, profiles, and dimensional requirements on Drawings are based on a specific product or system, provide the specified product or system. Comply with provisions in Part 2 "Product Substitutions" Article for consideration of an unnamed product or system.
6. Basis-of-Design Product: Where Specifications name a product, or refer to a product indicated on Drawings, and include a list of manufacturers, provide the specified or indicated product or a comparable product by one of the other named manufacturers. Drawings and Specifications indicate sizes, profiles, dimensions, and other characteristics that are based on the product named. Comply with requirements in "Comparable Products" Article for consideration of an unnamed product by one of the other named manufacturers.

C. Visual Matching Specification: Where Specifications require "match Architect's sample", provide a product that complies with requirements and matches Architect's sample. Architect's decision will be final on whether a proposed product matches.

1. If no product available within specified category matches and complies with other specified requirements, comply with requirements in Part 2 "Product Substitutions" for proposal of product.
2. Visual Selection Specification: Where Specifications include the phrase "as selected from manufacturer's colors, patterns, textures" or a similar phrase, select a product that complies with other specified requirements.
- a. Standard Range: Where Specifications include the phrase "standard range of colors, patterns, textures" or similar phrase, Architect will select color, pattern, density, or texture from manufacturer's product line that does not include premium items.

- b. Full Range: Where Specifications include the phrase "full range of colors, patterns, textures" or similar phrase, Architect will select color, pattern, density, or texture from manufacturer's product line that includes both standard and premium items.

2.3 PRODUCT SUBSTITUTIONS

- A. Timing: Owner will consider requests for substitution if received within 60 days after the execution of Change Order. Requests received after that time may be considered or rejected at discretion of Owner.
- B. Conditions: Owner will consider Contractor's request for substitution when the following conditions are satisfied. If the following conditions are not satisfied, Owner will return requests without action, except to record noncompliance with these requirements:
 - 1. Requested substitution offers Owner a substantial advantage in cost, time, energy conservation, or other considerations, after deducting additional responsibilities Owner must assume. Owner's additional responsibilities may include compensation to Architect for redesign and evaluation services, increased cost of other construction by Owner, and similar considerations.
 - 2. Requested substitution does not require extensive revisions to the Contract Documents.
 - 3. Requested substitution is consistent with the Contract Documents and will produce indicated results.
 - 4. Substitution request is fully documented and properly submitted.
 - 5. Requested substitution will not adversely affect Contractor's Construction Schedule.
 - 6. Requested substitution has received necessary approvals of authorities having jurisdiction.
 - 7. Requested substitution is compatible with other portions of the Work.
 - 8. Requested substitution has been coordinated with other portions of the Work.
 - 9. Requested substitution provides specified warranty.
 - 10. If requested substitution involves more than one contractor, requested substitution has been coordinated with other portions of the Work, is uniform and consistent, is compatible with other products, and is acceptable to all contractors involved.
 - 11. Requested substitution of products with sustainable qualities will not be substituted without review by Architect.

PART 3 EXECUTION (NOT USED)

END OF SECTION

SECTION 01 70 00

CONTRACT CLOSEOUT

1.01. Purpose

This section generally outlines Contractor responsibilities for the Project or Contract closeout, including:

- A. Adjustment and Cleaning.
- B. Record Drawings and Maintenance Manuals.
- C. Substantial Completion.
- D. Release of Lien.
- E. Consent of Surety to Final Payment
- F. Inspection Certificates.
- G. Bonds and Guarantees.
- H. Application for Final Payment

1.02. Adjustment and Cleaning

- A. Prior to the final inspection, the Contractor shall perform and complete the following:
 - 1. Repair or replace defective products or areas damaged by the Contractor.
 - 2. Clean all exposed or semi-exposed surfaces which have been soiled as a result of the work effort (even though previously cleaned).
 - 3. Remove all stains, spots, marks and dirt from finished surfaces. Clean in accordance with the manufacturer's written instructions.
 - 4. Replace mechanical equipment filters, adjust all finish hardware and schedule service instruction conferences with the Owner just prior to final inspection.
- B. Cleaning shall include, but not be limited to, the following:
 - 1. Removal of product protective coverings and labels. Do not remove UL, FM or other permanent labels or placards necessary for life-safety operations or to establish Construction Documents compliance.
 - 2. Removal of all debris from the site. Debris shall not be buried on the site. Debris shall be disposed of according to government requirements.

3. Other cleaning as required:
 - a. Dry or wet vacuum cleaning.
 - b. Dusting of all new and existing surfaces.
 - c. Carpet shampooing.
 - d. Cleaning of inside glazed surfaces and outside glazed surfaces if new or soiled by the work of this contract.
 - e. Cleaning required by various specification sections with particular attention to instructions and specific requirements.
 - C. Adjustment shall include, but not be limited to, the following:
 1. Adjustment of products, assemblies, equipment, hardware, components, etc., to achieve an installation, which operates smoothly, correctly, and as intended.
 2. Adjustment as required by various sections of the Specifications.
- 1.03. Record Documents and Maintenance Manuals
- A. Maintenance Manuals shall be submitted to the ARCHITECT/ENGINEER for approval.
 1. Manuals shall contain maintenance and record documents as provided for by the Specifications.
 2. Upon ARCHITECT/ENGINEER approval, manuals shall be forwarded to the Owner.
 3. Final Payment shall be withheld until approved manuals are received by the Owner.
 - B. The Contractor shall submit his Field Notes on "as-built" conditions to the ARCHITECT/ENGINEER and shall have ARCHITECT/ENGINEER approval before Final Payment will be released by the Owner. See Section 01720, Project Record Documents.
 - C. The ARCHITECT/ENGINEER shall provide Record Documents which identify "as-built" conditions of the work. These documents shall be based on the Contractor's Field Notes maintained throughout the life of the project. See Section 01720, Project Record Documents.
 - D. Deviations from the above requirements will not be accepted without prior written approval. Failure to comply shall result in Final Payment being withheld. The Contractor waives any claim associated with withholding of retainage by Clay County if it fails to provide the above referenced materials and comply with all closeout requirements.
- 1.04. Substantial Completion
- A. Inspection: The Contractor shall provide the ARCHITECT/ENGINEER with a written notification of project completion, a punch list of items to be completed, and request an inspection tour of the project.

- B. The Contractor, ARCHITECT/ENGINEER and Owner shall be present for the inspection.
- C. The ARCHITECT/ENGINEER will prepare a Certificate of Substantial Completion, AIA Form 9704, based on the results of the inspection. Attached thereto will be a list of items, "punch list," requiring additional Contractor attention and/or resolution. The Certificate shall be executed by all parties. The Owner signing after Board approval.
- D. At the end of the allotted time for punch list work to be completed, a final inspection shall be held. Failure to identify all items shall not be deemed a waiver of those discrepancies, and Contractor shall have seven (7) days to remedy items identified after notice of the deficiency. Any items remaining incomplete will be completed by the Owner and the cost of the work charged against the Contractor's retainage.

1.05. Release of Lien or Claim

- A. Along with his Application for Final Payment, the Contractor shall submit a sworn statement that all work has been completed and that all bills for labor, materials and Subcontractor's work have been paid in full.
- B. Additionally, the Contractor shall submit statements from each of his Subcontractors, material or labor suppliers that they too have completed all work and that all bills for labor, materials and their Subcontractor's work have been paid in full.
- C. Sworn statements shall be made on the Owner's standard Release of Lien form.
- D. Owner shall have no obligation or responsibility to make any payments to any subcontractor or supplier.
- E. Upon request by the Contractor and a subcontractor or supplier together with the written consent of surety, the Owner may at its sole discretion issue joint checks. Failure of the Owner to elect this option should not give rise to any cause of action by any party.

1.06. Consent of Surety to Final Payment

- A. Along with his Application for Final Payment, the Contractor shall provide a Consent of Surety to Final Payment.
- B. Consent of Surety may be made on AIA Standard Form G707 or on a letter from the bonding company.

1.07. Inspection Certificates

- A. Upon completion of the Project and before applying for Final Payment, the Contractor shall have the electrical, plumbing and mechanical work (and any other work) as

applicable, inspected and approved by, Clay County.

- B. The Contractor shall submit all inspection certificates to the Owner with his Application for Final Payment.

1.08. Bonds and Guarantees

- A. The Contractor shall submit copies of all Bonds and Guarantees as required.
- B. The Contractor's "two year" Guarantee shall commence on the date of Substantial Completion.
- C. The Contractor shall submit all Bonds and Guarantees with his Application for Final Payment.
- D. This unconditional guarantee shall not replace or supersede any cause of action that may exist pursuant to the Contractor or law which has a limitation period in excess of two (2) years.

1.09. Application for Final Payment

- A. The Final Certificate and Application for Payment shall be submitted with the required Release of Lien statements, Contractor's Guarantee and Consent of Surety to Final Payment.
- B. The Application shall be marked "FINAL" and shall account for all Change Orders, including any liquidated and actual damages that may have been assessed for late completion.
- C. Clay County Project Close out checklist.
 - a. The contractor shall provide all applicable items on the Clay County's 'Project Closeout Checklist' with submission of the Final Certificate of Payment.

END OF SECTION 01700

SECTION 01 72 00

PROJECT RECORD DOCUMENTS

1.01 Purpose

This section provides Contractor guidance for the creation, preparation, and maintenance of:

- A. "Job Set" Record Documents (RD's)
- B. Final Record Documents
- C. Visitor's Log

1.02 Quality Assurance

- A. The Contractor shall delegate the responsibility for the maintenance of Record Documents and the Visitor's Log to one person on his staff as approved by the ARCHITECT/ENGINEER.
- B. The contractor shall ensure the accuracy of RD's and shall:
 - a. Thoroughly coordinate all changes.
 - b. Make adequate and proper entries.
- C. Timeliness of Entries: The Contractor shall make all entries within a reasonable amount of time (24 hours) after receipt of information or the need for an entry arises.

1.03 Submittals

- A. The ARCHITECT/ENGINEER's approval of current Job Set RD's will be a prerequisite to his approval of the Contractor's monthly Applications for Payment.
- B. The ARCHITECT/ENGINEER's approval of the Final RD's will be a prerequisite to his approval of the Contractor's Application for Final Payment.
- C. The Contractor shall submit his Visitor's Log for the inspection of the ARCHITECT/ENGINEER or Owner as may be requested.
- D. The Contractor shall submit a copy of his prior month's Visitor's Log with each Application for Payment. He shall indicate the name of the project and the period covered by the log.

1.04 Protection of RD's

Take precautions to protect RD's from deterioration, loss or damage. Conserve, as necessary, the "Job Set" until the completion of work and the transfer of information from the "Job Set" to the "Final Record Documents."

1.05 "Job Set" Record Documents

A. Identification

Upon receipt of the set of documents to be used as the job set, identify each of the documents with the title, "Record Documents - Job Set."

B. Preservation

1. Devise a suitable method for protecting the "Job Set" from anticipated user wear.
2. Use the "Job Set" only for the entry of new data and the ARCHITECT/ENGINEER's review.
3. Maintain the "Job Set" at the project work site designated by the ARCHITECT/ENGINEER.

C. Making Entries

1. Use an erasable colored pencil.
2. Clearly describe the change by note or by graphic line.
3. Date all entries.
4. Highlight the change by the use of a "cloud" around the area(s) affected.
5. Use different colors for overlapping changes.

D. Other Entries

1. Indicate any ARCHITECT/ENGINEER directed changes by note, i.e., "ARCHITECT/ENGINEER directed change."
2. Contractor originated changes and inadvertent errors which are approved by the ARCHITECT/ENGINEER shall be clearly indicated by note.

E. Schematic Layout Conversion

1. General Background: Most mechanical, electrical, and plumbing drawings are schematic in nature and not intended to portray precise physical layout or location.
 - a. Final physical layout is determined by the Contractor and may be different from that shown on the Drawings.
 - b. Future modifications or maintenance will require accurate, final, physical arrangement information.
2. "Job Set" RD's: The Contractor shall annotate the "Job Set" RD's to show:
 - a. Plan Location: Dimension layout of mechanical/electrical runs to within 1" of the centerline of each run.

- b. Identification: Identify the item by accurate note showing size, material and function, i.e., "4" cast iron drain," "1/2" copper water," etc.
- c. Show the vertical (height) location by symbol or note, i.e., "in ceiling plenum," "exposed ceiling mounted," "under slab," etc.
- d. Make identifications sufficiently descriptive so that they may be easily related to the Specifications.

1.06 Final Record Documents

- A. General: The Contractor shall furnish Final Record Drawings that provide factual reference information of a permanent nature, enabling future modifications and maintenance to proceed without expensive site investigation. As-Built markups shall include markups from all Sub-Contractors, ASI's, RFI's, etc.
- B. Contractor, at his own expense, shall obtain a set of the latest Drawings in AUTOCAD format from the ARCHITECT/ENGINEER, including ASI's, RFI's, etc., as applicable, to be used for Final Record Drawings.
- C. Prior to the transfer of information from the "Job Set" to the Final RD's, the Contractor shall obtain a review by the ARCHITECT/ENGINEER of all recorded data on the Job Set and the Sub-Contractor Markups. Make all required revisions.
- D. Transfer of Data to Drawings
 1. Carefully transfer all changed data from the approved "Job Set" and Sub-Contractor Markups to AUTOCAD.
 2. Coordinate all changes as required. Clearly indicate changes to all drawings affected, i.e., plans, sections, details, etc. Give the full description of changes to provide a comprehensive record. Show actual locations, dimensions, notes, etc.
 3. Call attention to each entry by drawing a "cloud" around it.
 4. Make changes neatly and consistently. Line quality shall be crisp, consistent, and equal to the original.
 5. Each sheet of the Final Record Drawings shall be dated, marked "Record Drawings" with the Contractor's name.
 6. Final Record Drawings shall be delivered in AutoCAD Release 24 DWGS and in pdfs. File names shall not exceed 100 characters, including dashes and spaces.
 - a. Bind all x-references into each drawing file sheet.
 - b. Provide files in folders by discipline, see examples below.
 7. Files shall then be placed into separate folders, organized by discipline. Under each discipline's folder, create two subfolders. One shall be named "PDF" and the other "DWG". Combined all PDF files into a single, consolidated file and

place under the main "Record Drawings" folder.

Examples:

//Record Drawings	/Arch Files	/PDF
		/DWG
	/Strl Files	/PDF
		/DWG
	/Mech Files	/PDF
		/DWG
	/Plumb Files	/PDF
		/DWG
	/Fire Spr Files	/PDF
		/DWG
	/Elec Files	/PDF
		/DWG

8. On CD format, provide:
 - a. Final Record Drawings in AutoCAD, including the As-Built Survey.
 - b. Final Record Drawings in PDF.
 - c. Job Set, Sub-Contractors markups, ASIs, RFIs, etc. scanned into PDF format (color).
- E. The cost of transfer of Data to the Final Record Drawings to AutoCAD and to pdf shall be paid by the Contractor.
- F. Review and Approval: Submit the complete set of Record Documents to the ARCHITECT/ENGINEER for his approval. Revise as necessary.

1.07 Changes Subsequent to Acceptance

The Contractor's responsibility for recording change ends upon acceptance of the Work by the Owner. However, changes resulting from replacements, repairs, and alterations required as a result of the Contractor guarantee work shall be recorded.

1.08 Visitor's Log

1. The Contractor shall maintain a log in the Field Office to record visits by the ARCHITECT/ENGINEER, his consultants, and all visitors, including Owner's representatives and inspectors.
2. This log shall become the official record of all job visits and shall show:
 - a. Date
 - b. Time of Arrival

- c. Time of Departure
- d. Person's Name
- e. Entity Represented

3. The Contractor shall furnish a copy of the log to the Architect/Engineer or Owner.

1.09 Contractors' Project Related Documents

All documents shall be made available to the Owner upon request.

END OF SECTION 01 72 00

SECTION 01 73 00

EXECUTION

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

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

1.2 SUMMARY

- A. Section includes general administrative and procedural requirements governing execution of the Work including, but not limited to, the following:
 - 1. Installation of the Work.
 - 2. Cutting and patching.
 - 3. Progress cleaning.
 - 4. Starting and adjusting.
 - 5. Protection of installed construction.
- B. Related Requirements:
 - 1. Section 01 10 00 "Summary" for limits on use of Project site.
 - 2. Section 01 33 00 "Submittal Procedures" for submitting surveys.
 - 3. Section 01 77 00 "Closeout Procedures" for submitting final property survey with Project Record Documents, recording of Owner-accepted deviations from indicated lines and levels, replacing defective work, and final cleaning.

1.3 DEFINITIONS

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

1.4 QUALITY ASSURANCE

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

PART 2 - PRODUCTS

2.1 MATERIALS

- A. General: Comply with requirements specified in other Sections.
 - 1. For projects requiring compliance with sustainable design and construction practices and procedures, use products for patching that comply with sustainable design requirements.
- B. In-Place Materials: Use materials for patching identical to in-place materials. For exposed surfaces, use materials that visually match in-place adjacent surfaces to the fullest extent possible.
 - 1. If identical materials are unavailable or cannot be used, use materials that, when installed, will provide a match acceptable to Engineer for the visual and functional performance of in-place materials.

PART 3 - EXECUTION

3.1 EXAMINATION

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

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

3.2 PREPARATION

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

3.3 INSTALLATION

- A. General: Locate the Work and components of the Work accurately, in correct alignment and elevation, as indicated.
 - 1. Make vertical work plumb and make horizontal work level.
 - 2. Where space is limited, install components to maximize space available for maintenance and ease of removal for replacement.
 - 3. Conceal pipes, ducts, and wiring in finished areas unless otherwise indicated.
- B. Comply with manufacturer's written instructions and recommendations for installing products in applications indicated.
- C. Install products at the time and under conditions that will ensure the best possible results. Maintain conditions required for product performance until Substantial Completion.
- D. Conduct construction operations so no part of the Work is subjected to damaging operations or loading in excess of that expected during normal conditions of occupancy.
- E. Sequence the Work and allow adequate clearances to accommodate movement of construction items on site and placement in permanent locations.
- F. Tools and Equipment: Where possible, select tools or equipment that minimize production of excessive noise levels.
- G. Templates: Obtain and distribute to the parties involved templates for work specified to be factory prepared and field installed. Check Shop Drawings of other portions of the Work to confirm that adequate provisions are made for locating and installing products to comply with indicated requirements.
- H. Attachment: Provide blocking and attachment plates and anchors and fasteners of adequate size and number to securely anchor each component in place, accurately located and aligned with other portions of the Work. Where size and type of attachments are not indicated, verify size and type required for load conditions.
 - 1. Mounting Heights: Where mounting heights are not indicated, mount components at heights directed by Engineer.
 - 2. Allow for building movement, including thermal expansion and contraction.

3. Coordinate installation of anchorages. Furnish setting drawings, templates, and directions for installing anchorages, including sleeves, concrete inserts, anchor bolts, and items with integral anchors, that are to be embedded in concrete or masonry. Deliver such items to Project site in time for installation.
- l. Joints: Make joints of uniform width. Where joint locations in exposed work are not indicated, arrange joints for the best visual effect. Fit exposed connections together to form hairline joints.
- J. Repair or remove and replace damaged, defective, or nonconforming Work.
 1. Comply with Section 01 77 00 "Closeout Procedures" for repairing or removing and replacing defective Work.

3.4 CUTTING AND PATCHING

- A. Cutting and Patching, General: Employ skilled workers to perform cutting and patching. Proceed with cutting and patching at the earliest feasible time, and complete without delay.
 1. Cut in-place construction to provide for installation of other components or performance of other construction, and subsequently patch as required to restore surfaces to their original condition.
- B. Existing Warranties: Remove, replace, patch, and repair materials and surfaces cut or damaged during installation or cutting and patching operations, by methods and with materials so as not to void existing warranties.
- C. Temporary Support: Provide temporary support of work to be cut.
- D. Protection: Protect in-place construction during cutting and patching to prevent damage. Provide protection from adverse weather conditions for portions of Project that might be exposed during cutting and patching operations.
- E. Adjacent Occupied Areas: Where interference with use of adjoining areas or interruption of free passage to adjoining areas is unavoidable, coordinate cutting and patching according to requirements in Section 01 10 00 "Summary."
- F. Existing Utility Services and Mechanical/Electrical Systems: Where existing services/systems are required to be removed, relocated, or abandoned, bypass such services/systems before cutting to prevent interruption to occupied areas.
- G. Cutting: Cut in-place construction by sawing, drilling, breaking, chipping, grinding, and similar operations, including excavation, using methods least likely to damage elements retained or adjoining construction. If possible, review proposed procedures with original Installer; comply with original Installer's written recommendations.
 1. In general, use hand or small power tools designed for sawing and grinding, not hammering and chopping. Cut holes and slots neatly to minimum size required, and with minimum disturbance of adjacent surfaces. Temporarily cover openings when not in use.
 2. Finished Surfaces: Cut or drill from the exposed or finished side into concealed surfaces.

3. Concrete and Masonry: Cut using a cutting machine, such as an abrasive saw or a diamond-core drill.
 4. Excavating and Backfilling: Comply with requirements in applicable Sections where required by cutting and patching operations.
 5. Mechanical and Electrical Services: Cut off pipe or conduit in walls or partitions to be removed. Cap, valve, or plug and seal remaining portion of pipe or conduit to prevent entrance of moisture or other foreign matter after cutting.
 6. Proceed with patching after construction operations requiring cutting are complete.
- H. Patching: Patch construction by filling, repairing, refinishing, closing up, and similar operations following performance of other work. Patch with durable seams that are as invisible as practicable. Provide materials and comply with installation requirements specified in other Sections, where applicable.
1. Inspection: Where feasible, test and inspect patched areas after completion to demonstrate physical integrity of installation.
 2. Exposed Finishes: Restore exposed finishes of patched areas and extend finish restoration into retained adjoining construction in a manner that will minimize evidence of patching and refinishing.
 - a. Clean piping, conduit, and similar features before applying paint or other finishing materials.
 - b. Restore damaged pipe covering to its original condition.
 3. Floors and Walls: Where walls or partitions that are removed extend one finished area into another, patch and repair floor and wall surfaces in the new space. Provide an even surface of uniform finish, color, texture, and appearance. Remove in-place floor and wall coverings and replace with new materials, if necessary, to achieve uniform color and appearance.
 - a. Where patching occurs in a painted surface, prepare substrate and apply primer and intermediate paint coats appropriate for substrate over the patch, and apply final paint coat over entire unbroken surface containing the patch. Provide additional coats until patch blends with adjacent surfaces.
 4. Ceilings: Patch, repair, or rehang in-place ceilings as necessary to provide an even-plane surface of uniform appearance.
 5. Exterior Building Enclosure: Patch components in a manner that restores enclosure to a weathertight condition and ensures thermal and moisture integrity of building enclosure.
- l. Cleaning: Clean areas and spaces where cutting and patching are performed. Remove paint, mortar, oils, putty, and similar materials from adjacent finished surfaces.

3.5 PROGRESS CLEANING

- A. General: Clean Project site and work areas daily, including common areas. Enforce requirements strictly. Dispose of materials lawfully.

1. Comply with requirements in NFPA 241 for removal of combustible waste materials and debris.
 2. Do not hold waste materials for more than seven days during normal weather or three days if the temperature is expected to rise above 80 deg F.
 3. Containerize hazardous and unsanitary waste materials separately from other waste. Mark containers appropriately and dispose of legally, according to regulations.
 - a. Use containers intended for holding waste materials of type to be stored.
 4. Coordinate progress cleaning for joint-use areas where Contractor and other contractors are working concurrently.
- B. Site: Maintain Project site free of waste materials and debris.
- C. Work Areas: Clean areas where work is in progress to the level of cleanliness necessary for proper execution of the Work.
1. Remove liquid spills promptly.
 2. Where dust would impair proper execution of the Work, broom-clean or vacuum the entire work area, as appropriate.
- D. Installed Work: Keep installed work clean. Clean installed surfaces according to written instructions of manufacturer or fabricator of product installed, using only cleaning materials specifically recommended. If specific cleaning materials are not recommended, use cleaning materials that are not hazardous to health or property and that will not damage exposed surfaces.
- E. Concealed Spaces: Remove debris from concealed spaces before enclosing the space.
- F. Exposed Surfaces in Finished Areas: Clean exposed surfaces and protect as necessary to ensure freedom from damage and deterioration at time of Substantial Completion.
- G. Waste Disposal: Do not bury or burn waste materials on-site. Do not wash waste materials down sewers or into waterways. Comply with waste disposal requirements in Section 01 74 19 "Construction Waste Management and Disposal."
- H. During handling and installation, clean and protect construction in progress and adjoining materials already in place. Apply protective covering where required to ensure protection from damage or deterioration at Substantial Completion.
- I. Clean and provide maintenance on completed construction as frequently as necessary through the remainder of the construction period. Adjust and lubricate operable components to ensure operability without damaging effects.
- J. Limiting Exposures: Supervise construction operations to ensure that no part of the construction, completed or in progress, is subject to harmful, dangerous, damaging, or otherwise deleterious exposure during the construction period.

3.6 STARTING AND ADJUSTING

- A. Start equipment and operating components to confirm proper operation. Remove malfunctioning units, replace with new units, and retest.
- B. Adjust equipment for proper operation. Adjust operating components for proper operation without binding.
- C. Test each piece of equipment to verify proper operation. Test and adjust controls and safeties. Replace damaged and malfunctioning controls and equipment.

3.7 PROTECTION OF INSTALLED CONSTRUCTION

- A. Provide final protection and maintain conditions that ensure installed Work is without damage or deterioration at time of Substantial Completion.
- B. Protection of Existing Items: Provide protection and ensure that existing items to remain undisturbed by construction are maintained in condition that existed at commencement of the Work.
- C. Comply with manufacturer's written instructions for temperature and relative humidity.

END OF SECTION

THIS PAGE INTENTIONALLY
LEFT BLANK FOR PRINTING

SECTION 01 73 29

CUTTING AND PATCHING

1. DESCRIPTION OF REQUIREMENTS:

1.1. Definition: Cutting and patching includes cutting into existing construction to provide for the installation or performance of other work and subsequent fitting and patching required to restore surfaces to their original condition.

1.1.1. Cutting and patching is performed for coordination of the work, to uncover work for access or inspection, to obtain samples for testing, to permit alterations to be performed or for other similar purposes.

1.1.2. Cutting and patching performed during the manufacture of products, or during the initial fabrication, erection or installation processes is not considered to be cutting and patching under this definition. Drilling holes to install fasteners and similar operations are also not considered to be cutting and patching. Core-drilling of holes larger than 1" requires approval of the project structural engineer.

1.2. Quality Assurance:

1.2.1. Requirements for Structural Work: Do not cut and patch structural work in a manner that would result in a reduction of load-carrying capacity or of load-deflection ratio.

1.2.2. Before cutting and patching the following categories of work, obtain the Structural Engineer's approval to proceed with cutting and patching:

a. Miscellaneous structural metals, including lintels, equipment supports, and similar categories of work.

b. Masonry bearing walls.

c. Structural concrete including floor slabs.

d. Exterior wall construction.

e. Roof deck

f. Roof trusses or structural roof members.

1.2.3. Operational and Safety Limitations: Do not cut and patch operational elements or safety related components in a manner intended, including energy performance, or that would result in increased maintenance, or decreased operational life or decreased safety.

1.2.4. Visual Requirements: Do not cut and patch work exposed on the building's exterior or in its occupied spaces, in a manner that would, in the Design Professional's opinion, result in lessening the building's aesthetic substantial visual evidence of cut and patch work. Remove and replace work judged by the Design Professional to be cut and patched in a visually unsatisfactory manner.

2. PRODUCTS:

- 2.1. General: Except as otherwise indicated, or as directed by the Design Professional, use materials for cutting and patching that are identical to existing materials. If identical materials are not available, or cannot be used, use materials that match existing adjacent surfaces to the fullest extent possible with regard to visual effect. Use materials for cutting and patching that will result in equal-or-better performance characteristics.

3. EXECUTION:

- 3.1. Inspection: Before cutting, examine the surfaces to be cut and patched and the conditions under which the work is to be performed. Examination should include a study of the existing drawings for the building. If unsafe or otherwise unsatisfactory conditions are encountered, take corrective action before proceeding with the work.

- 3.1.1. Before the start of cutting work, meet at the work site with all parties involved in cutting and patching, including mechanical and electrical trades. Review areas of potential interference and conflict between the various trades. Coordinate layout of the work and resolve potential conflicts before proceeding with the work.

- 3.2. Preparation:

- 3.2.1. Temporary Support: To prevent failure, provide temporary support of work to be cut. Provide shoring, bracing and support as required to maintain structural integrity of the work.

- 3.2.2. Protection: Protect other work during cutting and patching to prevent damage. Provide protection from adverse weather conditions for that part of the project that may be exposed during cutting and patching operations. Avoid interference with use of adjoining areas or interruption of free passage to adjoining areas.

- 3.2.3. Take precautions not to cut existing pipe, conduit or duct serving the building but scheduled to be relocated until provisions have been made to bypass them.

- 3.3. Performance:

- 3.3.1. Employ skilled workmen to perform cutting and patching work. Except as otherwise indicated or as approved by the Design Professional, proceed with cutting and patching at the earliest feasible time and complete work without delay.

- 3.3.2. Cutting: Cut the work using methods that are least likely to damage work to be retained or adjoining work. Where possible review proposed procedures with the original installer; comply with original installers recommendations.

- a. In general, where cutting is required, use hand or small power tools designed for sawing or grinding, not hammering and chopping. Cut through concrete and masonry using a cutting machine or core drill to insure a neat hole. Cut holes and slots neatly to size required with minimum disturbance of adjacent work. To avoid marring existing finished surfaces, cut or drill from the exposed or finished side into concealed surfaces. Temporarily cover openings when not in use.

- b. By-pass utility services such as pipe and conduit, before cutting, where such utility services are shown or required to be removed, relocated or abandoned. Cut-off conduit and pipe in walls or partitions to be removed. After by-pass and cutting, cap, valve, or plug and seal tight remaining portion of pipe and conduit to prevent entrance of moisture or other foreign matter.
- 3.3.3. Patching: Patch with seams which are durable and as invisible as possible. Comply with specified tolerances for the work.
- a. Where feasible, inspect and test patched areas to demonstrate integrity of work.
 - b. Restore exposed finishes of patched areas and where necessary extend finish restoration into retained adjoining work in a manner which will eliminate evidence of patching and refinishing.
 - c. Patch and repair floor and wall surfaces to provide an even surface of uniform color and appearance remove existing floor and wall coverings and replace with new materials, if required by the Architect.
- 3.4. Cleaning:
- 3.4.1. Thoroughly clean areas and spaces where work is performed or used as access to work. Remove completely point, mortar, oils, putty, and items of similar nature. Thoroughly clean piping, conduit and similar features before painting or other finishing is applied. Restore damaged pipe covering to its original condition.

END OF SECTION

SECTION 01 74 19
CONSTRUCTION WASTE MANAGEMENT AND DISPOSAL

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

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

1.2 SUMMARY

- A. Section includes administrative and procedural requirements for the following:
 - 1. Salvaging nonhazardous demolition and construction waste.
 - 2. Recycling nonhazardous demolition and construction waste.
 - 3. Disposing of nonhazardous demolition and construction waste.
- B. Related Requirements:
 - 1. Section 02 41 19 "Selective Demolition" for disposition of waste resulting from partial demolition of site improvements.

1.3 DEFINITIONS

- A. Source Separated Recycling Facility (SSRF): A facility that exclusively accepts separated individual commodities for the purpose of recycling; such as metals, paper, wood, and/or inerts such as asphalt and concrete.
- B. Mixed Debris: Includes solid items such as building materials, packaging, and rubble resulting from construction, remodeling, repair, and demolition operations
- C. Class III Landfill: A landfill that accepts non-hazardous waste such as household, commercial, and industrial waste.
- D. Administrative Recycling Program: Separation and recovery of paper and beverage containers from both permanent administrative offices and construction site office(s).
- E. Construction Waste: Building and site improvement materials and other solid waste resulting from construction, remodeling, renovation, or repair operations. Construction waste includes packaging.
- F. Demolition Waste: Building and site improvement materials resulting from demolition or selective demolition operations.

- G. Disposal: Removal off-site of demolition and construction waste and subsequent sale, recycling, reuse, or deposit in landfill or incinerator acceptable to authorities having jurisdiction.
- H. Recycle: Recovery of demolition or construction waste for subsequent processing in preparation for reuse.
- I. Salvage: Recovery of demolition or construction waste and subsequent sale or reuse in another facility.
- J. Salvage and Reuse: Recovery of demolition or construction waste and subsequent incorporation into the Work.

1.4 PERFORMANCE REQUIREMENTS

- A. General: Achieve end-of-Project rates for salvage/recycling of 75 percent by weight of total nonhazardous solid waste generated by the Work. Practice efficient waste management in the use of materials in the course of the Work. Use all reasonable means to divert construction and demolition waste from landfills and incinerators. Clearly label all recycling containers and list acceptable and unacceptable materials. Deliver recyclable materials to source separated recycling facilities. Facilitate recycling and salvage of materials, including the following as applicable:

- 1. Demolition Waste:
 - a. Asphalt paving.
 - b. Concrete.
 - c. Concrete reinforcing steel.
 - d. Brick.
 - e. Concrete masonry units.
 - f. Wood studs.
 - g. Wood joists.
 - h. Plywood and oriented strand board.
 - i. Wood paneling.
 - j. Wood trim.
 - k. Structural and miscellaneous steel.
 - l. Rough hardware.
 - m. Roofing.
 - n. Insulation.
 - o. Doors and frames.
 - p. Door hardware.
 - q. Windows.
 - r. Glazing.
 - s. Metal studs.
 - t. Gypsum board.
 - u. Acoustical tile and panels.
 - v. Carpet.
 - w. Carpet pad.

- x. Demountable partitions.
 - y. Equipment.
 - z. Cabinets. aa. Plumbing fixtures.
 - bb. Piping.
 - cc. Supports and hangers.
 - dd. Valves.
 - ee. Sprinklers.
 - ff. Mechanical equipment.
 - gg. Refrigerants. hh. Electrical conduit.
 - ii. Copper wiring. jj. Lighting fixtures. kk. Lamps. ll. Ballasts. mm. Electrical devices.
 - mn. Switchgear and panelboards. oo. Transformers.
 - 2. Construction Waste:
 - a. Lumber.
 - b. Wood sheet materials.
 - c. Metals.
 - d. Roofing.
 - e. Piping.
 - f. Electrical conduit.
 - g. Packaging: Regardless of salvage/recycle goal indicated in "General" Paragraph above, salvage or recycle 100 percent of the following uncontaminated packaging materials:
 - 1) Paper.
 - 2) Cardboard.
 - 3) Boxes.
 - 4) Plastic sheet and film.
 - 5) Polystyrene packaging.
 - 6) Wood crates.
 - 7) Plastic pails.
 - B. Co-mingled Debris: Direct all co-mingled site tonnage to the EDCO Mixed Debris Processing Facility.
- 1.5 ACTION SUBMITTALS
- A. Waste Management Plan: Submit plan within 10 days of date established for the Notice to Proceed.

1.6 INFORMATIONAL SUBMITTALS

- A. Waste Reduction Calculations: Before request for Substantial Completion, submit calculated end-of-Project rates for salvage, recycling, and disposal as a percentage of total waste generated by the Work.
- B. Records of Donations: Indicate receipt and acceptance of salvageable waste donated to individuals and organizations.
- C. Records of Sales: Indicate receipt and acceptance of salvageable waste sold to individuals and organizations.
- D. Recycling and Processing Facility Records: Indicate receipt and acceptance of recyclable waste by recycling and processing facilities licensed to accept them. Include manifests, weight tickets, receipts, and invoices.
- E. Landfill and Incinerator Disposal Records: Indicate receipt and acceptance of waste by landfills and incinerator facilities licensed to accept them. Include manifests, weight tickets, receipts, and invoices.

1.7 QUALITY ASSURANCE

- A. Regulatory Requirements: Comply with hauling and disposal regulations of authorities having jurisdiction.
- B. Waste Management Conference: Prior to commencement of work, conduct conference at Project site. Attendees shall include Construction Manager, Waste Management Coordinator, and appropriate personnel involved in demolition and waste handling. Review methods and procedures related to waste management including, but not limited to, the following:
 - 1. Review and discuss waste management plan including responsibilities of Waste Management Coordinator.
 - 2. Review requirements for documenting quantities of each type of waste and its disposition.
 - 3. Review and finalize procedures for materials separation and verify availability of containers and bins needed to avoid delays.
 - 4. Review procedures for periodic waste collection and transportation to recycling and disposal facilities.
 - 5. Review waste management requirements for each trade.

1.8 SITE DEBRIS MANAGEMENT PLAN

- A. General: Develop a site debris management plan.
- B. Post approved plan in a prominent location at the Project site and distribute copies to superintendent and all subcontractors.

1.9 MATERIALS OWNERSHIP

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

PART 2 - PRODUCTS (Not Used)

PART 3 - EXECUTION

3.1 PLAN IMPLEMENTATION

- A. General: Implement approved waste management plan. Provide handling, containers, storage, signage, transportation, and other items as required to implement waste management plan during the entire duration of the Contract.
1. Comply with operation, termination, and removal requirements in Section 01 50 00 "Temporary Facilities and Controls."
- B. Waste Management Coordinator: Engage a waste management coordinator to be responsible for implementing, monitoring, and reporting status of waste management work plan.
- C. Training: Train workers, subcontractors, and suppliers on proper waste management procedures, as appropriate for the Work.
1. Distribute waste management plan to everyone concerned within three days of submittal return.
 2. Distribute waste management plan to entities when they first begin work on-site. Review plan procedures and locations established for salvage, recycling, and disposal.
- D. Site Access and Temporary Controls: Conduct waste management operations to ensure minimum interference with roads, streets, walks, walkways, and other adjacent occupied and used facilities.
1. Designate and label specific areas on Project site necessary for separating materials that are to be salvaged, recycled, reused, donated, and sold.
 2. Comply with Section 01 50 00 "Temporary Facilities and Controls" for controlling dust and dirt, environmental protection, and noise control.

END OF SECTION 01 74 19

BHIDE & HALL, ARCHITECTS, PA Project No. 202347
Clay County Tax Collectors' Office
Keystone Heights, Florida

Clay County Tax Collectors' Office
Keystone Heights, Florida

SECTION 01 77 00

CLOSEOUT PROCEDURES

PART 1 - GENERAL

1.1 SUMMARY

- A. Section Includes: Administrative and procedural requirements for contract closeout, including, but not limited to, the following:
 - 1. Project Closeout
 - 2. Inspection procedures.
 - 3. Project record documents.
 - 4. Operation and maintenance manuals.
 - 5. Warranties.
 - 6. Instruction of Owner's personnel.
 - 7. Final cleaning.
- B. Related Sections:
 - 1. Section 01 29 00 - Payment Procedures: Requirements for Applications for Payment for Substantial and Final Completion.
 - 2. Section 01 70 00 - Execution Requirements: Progress cleaning of Project site.
 - 3. Divisions 2 through 33 Sections: Specific closeout and special cleaning requirements for products of those Sections.

1.2 GENERAL REQUIREMENTS

- A. When project construction reaches 95% complete, a 95% Closeout Meeting is required to discuss in detail all requirements for completing and closing out the project.
- B. All required warranties and guarantees will commence upon date of Certificate of Substantial Completion.

1.3 PROJECT CLOSEOUT

- A. General: Except as noted, delivery of items listed hereunder are prerequisites of final payment. Determine duration of all guarantees, etc. from established date of substantial completion. Submit written material bound in a 3-ring loose-leaf binder. Submit in triplicate.
- B. General Contractor's Warranty: Furnish as required.
- C. Subcontractors Warranties: Forward guarantees from subcontractors covering work described under respective Sections.
- D. Clean-up: Clean all metal, exposed finished surfaces, etc. Remove all rubbish, surplus material and temporary facilities from site.
- E. Miscellaneous Items: Furnish the following items which, among others, are indicated elsewhere in specifications and Contract Documents:

Clay County Tax Collectors' Office
Keystone Heights, Florida

- Proof of Advertisement of Completion
 - Evidence that all bills are paid
 - ❖ "As Built" Drawings to be furnished on hard copy and disk
 - Release of Liens from General Contractor and all subcontractors
 - ❖ Certificate of Occupancy from City
 - Warrantees from General Contractor, all subcontractors and extended Manufacturer's Warrantees
 - ❖ O & M Manuals
 - ❖ Safety Meeting Minutes
 - ❖ Certification that required training was conducted (date, topics, attendees, etc.)
 - Delivery of required "attic stock"
 - Receipt for return of all keys
 - ❖ Test and Balance Reports
 - ❖ Control Drawings - on hard copy and disk
 - Termite Bonds
 - ❖ Carpet Certifications
 - Consent of Surety for Final Payment
 - ❖ Fire Alarm Certification
 - Fully Executed Certification of Substantial Completion
 - Execution of Final Change Order
 - Certification from A/E or that final punchlists items have been completed
 - ❖ *Items noted thus are required to be submitted and reviewed by Architect/Engineer and in order prior to final inspection.*
- F. Final Inspection: To be conducted by the Architect, Engineers and appropriate Public Officials upon notification by Contractor and concurrence by Architect, Engineer that project is complete. Punch lists prepared at inspections shall be worked off.
- G. Year-End Inspection: To be conducted jointly by Architect, Engineer and appropriate Public Officials approximately 1 year after completion and upon notice by Architect, Engineer and Public Officials. Remedy all defects noted.

1.4 SUBSTANTIAL COMPLETION

- A. Preliminary Procedures: Before requesting inspection for determining date of Substantial Completion, complete the following. List items below that are incomplete in request.
1. Prepare a list of items to be completed and corrected (punch list), the value of items on the list, and reasons why the Work is not complete.
 2. Advise Owner of pending insurance changeover requirements.
 3. Submit specific warranties, workmanship bonds, maintenance service agreements, final certifications, and similar documents.
 4. Obtain and submit releases permitting Owner unrestricted use of the Work and access to services and utilities. Include occupancy permits, operating certificates, and similar releases.
 5. Prepare and submit Project Record Documents, operation and maintenance manuals, Final Completion construction photographs, damage or settlement surveys, property surveys, and similar final record information.
 6. Deliver tools, spare parts, extra materials, and similar items to location designated by Owner. Label with manufacturer's name and model number where applicable.

Clay County Tax Collectors' Office
Keystone Heights, Florida

7. Make final changeover of permanent locks and deliver keys to Owner. Advise Owner's personnel of changeover in security provisions.
8. Complete startup testing of systems.
9. Submit test/adjust/balance records.
10. Terminate and remove temporary facilities from Project site, along with mockups, construction tools, and similar elements.
11. Advise Owner of changeover in heat and other utilities.
12. Submit changeover information related to Owner's occupancy, use, operation, and maintenance.
13. Complete final cleaning requirements, including touchup painting.
14. Touch up and otherwise repair and restore marred exposed finishes to eliminate visual defects.

- B. Inspection: Submit a written request for inspection for Substantial Completion. On receipt of request, Architect will either proceed with inspection or notify Contractor of unfulfilled requirements. Architect will prepare the Certificate of Substantial Completion after inspection or will notify Contractor of items, either on Contractor's list or additional items identified by Architect, that must be completed or corrected before certificate will be issued.
1. Reinspection: Request reinspection when the Work identified in previous inspections as incomplete is completed or corrected.
 2. Results of completed inspection will form the basis of requirements for Final Completion.

1.5 FINAL COMPLETION

- A. Preliminary Procedures: Before requesting final inspection for determining date of Final Completion, complete the following:
1. Submit a final Application for Payment according to Division 1 Section "Payment Procedures."
 2. Submit certified copy of Architect's Substantial Completion inspection list of items to be completed or corrected (punch list), endorsed and dated by Architect. The certified copy of the list shall state that each item has been completed or otherwise resolved for acceptance.
 3. Submit evidence of final, continuing insurance coverage complying with insurance requirements.
 4. Submit pest-control final inspection report and warranty.
 5. Instruct Owner's personnel in operation, adjustment, and maintenance of products, equipment, and systems.
- B. Inspection: Submit a written request for final inspection for acceptance. On receipt of request, Architect will either proceed with inspection or notify Contractor of unfulfilled requirements. Architect will prepare a final Certificate for Payment after inspection or will notify Contractor of construction that must be completed or corrected before certificate will be issued.
1. Reinspection: Request reinspection when the Work identified in previous inspections as incomplete is completed or corrected.

1.6 LIST OF INCOMPLETE ITEMS (PUNCH LIST)

Clay County Tax Collectors' Office
Keystone Heights, Florida

- A. Preparation: Submit two copies of list. Include name and identification of each space and area affected by construction operations for incomplete items and items needing correction including, if necessary, areas disturbed by Contractor that are outside the limits of construction.
 - 1. Organize list of spaces in sequential order, starting with exterior areas first and proceeding from lowest floor to highest floor.
 - 2. Organize items applying to each space by major element, including categories for ceiling, individual walls, floors, equipment, and building systems.

1.7 PROJECT RECORD DOCUMENTS

- A. General: Do not use Project Record Documents for construction purposes. Protect Project Record Documents from deterioration and loss. Provide access to Project Record Documents for Architect's reference during normal working hours.
- B. Record Drawings: Maintain and submit one set of blue- or black-line white prints of Contract Drawings and Shop Drawings.
 - 1. Mark Record Prints to show the actual installation where installation varies from that shown originally. Require individual or entity who obtained record data, whether individual or entity is Installer, subcontractor, or similar entity, to prepare the marked-up Record Prints.
 - a. Give particular attention to information on concealed elements that cannot be readily identified and recorded later.
 - b. Record data as soon as possible after obtaining it. Record and check the markup before enclosing concealed installations.
 - 2. Mark record sets with erasable, red-colored pencil. Use other colors to distinguish between changes for different categories of the Work at the same location.
 - 3. Note Construction Change Directive numbers, Change Order numbers, alternate numbers, and similar identification where applicable.
 - 4. Identify and date each Record Drawing; include the designation "PROJECT RECORD DRAWING" in a prominent location. Organize into manageable sets; bind each set with durable paper cover sheets. Include identification on cover sheets.
- C. Record Specifications: Submit one copy of Project's Specifications, including addenda and contract modifications. Mark copy to indicate the actual product installation where installation varies from that indicated in Specifications, addenda, and contract modifications.
 - 1. Give particular attention to information on concealed products and installations that cannot be readily identified and recorded later.
 - 2. Mark copy with the proprietary name and model number of products, materials, and equipment furnished, including substitutions and product options selected.
 - 3. Note related Change Orders and Record Drawings, where applicable.
- D. Miscellaneous Record Submittals: Assemble miscellaneous records required by other Specification Sections for miscellaneous record keeping and submittal in connection with actual performance of the Work. Bind or file miscellaneous records and identify each, ready for continued use and reference.

1.8 OPERATION AND MAINTENANCE MANUALS

- A. Assemble a complete set of operation and maintenance data indicating the operation and maintenance of each system, subsystem, and piece of equipment not part of a system. Include operation and maintenance data required in individual Specification Sections and as follows:

Clay County Tax Collectors' Office
Keystone Heights, Florida

1. Operation Data: Include emergency instructions and procedures, system and equipment descriptions, operating procedures, and sequence of operations.
 2. Maintenance Data: Include manufacturer's information, list of spare parts, maintenance procedures, maintenance and service schedules for preventive and routine maintenance, and copies of warranties and bonds.
- B. Organize operation and maintenance manuals into suitable sets of manageable size. Bind and index data in heavy-duty, three-ring, vinyl-covered, loose-leaf binders, in thickness necessary to accommodate contents, with pocket inside the covers to receive folded oversized sheets. Identify each binder on front and spine with the printed title "OPERATION AND MAINTENANCE MANUAL," Project name, and subject matter of contents.

1.9 WARRANTIES

- A. Submittal Time: Submit written warranties on request of Architect for designated portions of the Work where commencement of warranties other than date of Substantial Completion is indicated.
- B. Organize warranty documents into an orderly sequence based on the table of contents of the Project Manual.
1. Bind warranties and bonds in heavy-duty, 3-ring, vinyl-covered, loose-leaf binders, thickness as necessary to accommodate contents, and sized to receive 8-1/2-by-11-inch paper.
 2. Provide heavy paper dividers with plastic-covered tabs for each separate warranty. Mark tab to identify the product or installation. Provide a typed description of the product or installation, including the name of the product and the name, address, and telephone number of Installer.
 3. Identify each binder on the front and spine with the typed or printed title "WARRANTIES," Project name, and name of Contractor.
- C. Provide additional copies of each warranty to include in operation and maintenance manuals.

PART 2 - PRODUCTS

2.1 MATERIALS

- A. Cleaning Agents: Use cleaning materials and agents recommended by manufacturer or fabricator of the surface to be cleaned. Do not use cleaning agents that are potentially hazardous to health or property or that might damage finished surfaces.

PART 3 - EXECUTION

3.1 DEMONSTRATION AND TRAINING

- A. Instruction: Instruct Owner's personnel to adjust, operate, and maintain systems, subsystems, and equipment not part of a system.
1. Provide instructors experienced in operation and maintenance procedures.

Clay County Tax Collectors' Office
Keystone Heights, Florida

2. Provide instruction at mutually agreed-on times. For equipment that requires seasonal operation, provide similar instruction at the start of each season.
3. Schedule training with Owner, through Architect, with at least seven days' advance notice.
4. Coordinate instructors, including providing notification of dates, times, length of instruction, and course content.

- B. Program Structure: Develop an instruction program that includes individual training modules for each system and equipment not part of a system, as required by individual Specification Sections. For each training module, develop a learning objective and teaching outline.
1. Include instruction for system design and operational philosophy, review of documentation, operations, adjustments, troubleshooting, maintenance, and repair.

3.2 FINAL CLEANING

- A. General: Provide final cleaning. Conduct cleaning and waste-removal operations to comply with local laws and ordinances and Federal and local environmental and antipollution regulations.
- B. Cleaning: Employ experienced workers or professional cleaners for final cleaning. Clean each surface or unit to condition expected in an average commercial building cleaning and maintenance program. Comply with manufacturer's written instructions.
1. Complete the following cleaning operations before requesting inspection for certification of Substantial Completion for entire Project or for a portion of Project:
 - a. Clean Project site, yard, and grounds, in areas disturbed by construction activities, including landscape development areas, of rubbish, waste material, litter, and other foreign substances.
 - b. Sweep paved areas broom clean. Remove petrochemical spills, stains, and other foreign deposits.
 - c. Rake grounds that are neither planted nor paved to a smooth, even-textured surface.
 - d. Remove tools, construction equipment, machinery, and surplus material from Project site.
 - e. Clean exposed exterior and interior hard-surfaced finishes to a dirt-free condition, free of stains, films, and similar foreign substances. Avoid disturbing natural weathering of exterior surfaces. Restore reflective surfaces to their original condition.
 - f. Remove debris and surface dust from limited access spaces, including roofs, plenums, shafts, trenches, equipment vaults, manholes, attics, and similar spaces.
 - g. Sweep concrete floors broom-clean in unoccupied spaces.
 - h. Vacuum carpet and similar soft surfaces, removing debris and excess nap; shampoo if visible soil or stains remain.
 - i. Clean transparent materials, including mirrors and glass in doors and windows. Remove glazing compounds and other noticeable, vision-obscuring materials. Replace chipped or broken glass and other damaged transparent materials. Polish mirrors and glass, taking care not to scratch surfaces.
 - j. Remove labels that are not permanent.
 - k. Touch up and otherwise repair and restore marred, exposed finishes and surfaces. Replace finishes and surfaces that cannot be satisfactorily repaired or restored or that already show evidence of repair or restoration.

Clay County Tax Collectors' Office
Keystone Heights, Florida

- 1) Do not paint over "UL" and similar labels, including mechanical and electrical nameplates.
 - l. Wipe surfaces of mechanical and electrical equipment, elevator equipment, and similar equipment. Remove excess lubrication, paint and mortar droppings, and other foreign substances.
 - m. Replace parts subject to unusual operating conditions.
 - n. Clean plumbing fixtures to a sanitary condition, free of stains, including stains resulting from water exposure.
 - o. Replace disposable air filters and clean permanent air filters. Clean exposed surfaces of diffusers, registers, and grills.
 - p. Clean light fixtures, lamps, globes, and reflectors to function with full efficiency. Replace burned-out bulbs, and those noticeably dimmed by hours of use, and defective and noisy starters in fluorescent and mercury vapor fixtures to comply with requirements for new fixtures.
 - q. Leave Project clean and ready for occupancy.
- C. Pest Control: Engage an experienced, licensed exterminator to make a final inspection and rid Project of rodents, insects, and other pests. Prepare a report.
- D. Comply with safety standards for cleaning. Do not burn waste materials. Do not bury debris or excess materials on Owner's property. Do not discharge volatile, harmful, or dangerous materials into drainage systems. Remove waste materials from Project site and dispose of lawfully.

END OF SECTION

SECTION 01 78 23
OPERATION AND MAINTENANCE DATA

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

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

1.2 SUMMARY

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

1.3 DEFINITIONS

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

1.4 CLOSEOUT SUBMITTALS

- A. Submit operation and maintenance manuals indicated. Provide content for each manual as specified in individual Specification Sections, and as reviewed and approved at the time of Section submittals. Submit reviewed manual content formatted and organized as required by this Section.
 - 1. Architect will comment on whether content of operation and maintenance submittals is acceptable.
 - 2. Where applicable, clarify and update reviewed manual content to correspond to revisions and field conditions.

BHIDE & HALL, ARCHITECTS, PA Project No. 202347
Clay County Tax Collectors' Office
Keystone Heights, Florida

- B. Format: Submit operation and maintenance manuals in the following format:
 - 1. Submit two paper copies and three CDs.
- C. Initial Manual Submittal: Submit draft copy of each manual at least 30 days before commencing demonstration and training. Architect will comment on whether general scope and content of manual are acceptable.
- D. Final Manual Submittal: Submit each manual in final form prior to requesting inspection for Substantial Completion and at least 15 days before commencing demonstration and training. Architect will return copy with comments.
 - 1. Correct or revise each manual to comply with Architect's comments. Submit copies of each corrected manual within 15 days of receipt of Architect's comments and prior to commencing demonstration and training.
- E. Comply with Section 01 77 00 "Closeout Procedures" for schedule for submitting operation and maintenance documentation.

1.5 FORMAT OF OPERATION AND MAINTENANCE MANUALS

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

BHIDE & HALL, ARCHITECTS, PA Project No. 202347
Clay County Tax Collectors' Office
Keystone Heights, Florida

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

1.6 REQUIREMENTS FOR OPERATION AND MAINTENANCE MANUALS

- A. Organization of Manuals: Unless otherwise indicated, organize each manual into a separate section for each system and subsystem, and a separate section for each piece of equipment not part of a system. Each manual shall contain the following materials, in the order listed:
 1. Title page.
 2. Table of contents.
 3. Manual contents.
- B. Title Page: Include the following information:
 1. Subject matter included in manual.
 2. Name and address of Project.
 3. Name and address of Owner.
 4. Date of submittal.
 5. Name and contact information for Contractor.
 6. Name and contact information for Architect.
 7. Names and contact information for major consultants to the Architect that designed the systems contained in the manuals.
 8. Cross-reference to related systems in other operation and maintenance manuals.
- C. Table of Contents: List each product included in manual, identified by product name, indexed to the content of the volume, and cross-referenced to Specification Section number in Project Manual.
 1. If operation or maintenance documentation requires more than one volume to accommodate data, include comprehensive table of contents for all volumes in each volume of the set.

BHIDE & HALL, ARCHITECTS, PA Project No. 202347
Clay County Tax Collectors' Office
Keystone Heights, Florida

- D. Manual Contents: Organize into sets of manageable size. Arrange contents alphabetically by system, subsystem, and equipment. If possible, assemble instructions for subsystems, equipment, and components of one system into a single binder.
- E. Identification: In the documentation directory and in each operation and maintenance manual, identify each system, subsystem, and piece of equipment with same designation used in the Contract Documents. If no designation exists, assign a designation according to ASHRAE Guideline 4, "Preparation of Operating and Maintenance Documentation for Building Systems."

1.7 OPERATION AND MAINTENANCE DOCUMENTATION DIRECTORY MANUAL

- A. Operation and Maintenance Documentation Directory: Prepare a separate manual that provides an organized reference to emergency, operation, and maintenance manuals. List items and their location to facilitate ready access to desired information. Include the following:
 - 1. List of Systems and Subsystems: List systems alphabetically. Include references to operation and maintenance manuals that contain information about each system.
 - 2. List of Equipment: List equipment for each system, organized alphabetically by system. For pieces of equipment not part of system, list alphabetically in separate list.
 - 3. Tables of Contents: Include a table of contents for each emergency, operation, and maintenance manual.

1.8 SYSTEMS AND EQUIPMENT OPERATION MANUALS

- A. Systems and Equipment Operation Manual: Assemble a complete set of data indicating operation of each system, subsystem, and piece of equipment not part of a system. Include information required for daily operation and management, operating standards, and routine and special operating procedures.
 - 1. Prepare a separate manual for each system and subsystem, in the form of an instructional manual for use by Owner's operating personnel.
- B. Content: In addition to requirements in this Section, include operation data required in individual Specification Sections and the following information:
 - 1. System, subsystem, and equipment descriptions. Use designations for systems and equipment indicated on Contract Documents.
 - 2. Performance and design criteria if Contractor has delegated design responsibility.
 - 3. Operating standards.
 - 4. Operating procedures.
 - 5. Operating logs.
 - 6. Wiring diagrams.
 - 7. Control diagrams.
 - 8. Piped system diagrams.
 - 9. Precautions against improper use.
 - 10. License requirements including inspection and renewal dates.

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

- D. Operating Procedures: Include the following, as applicable:
 - 1. Startup procedures.
 - 2. Equipment or system break-in procedures.
 - 3. Routine and normal operating instructions.
 - 4. Regulation and control procedures.
 - 5. Instructions on stopping.
 - 6. Normal shutdown instructions.
 - 7. Seasonal and weekend operating instructions.
 - 8. Required sequences for electric or electronic systems.
 - 9. Special operating instructions and procedures.

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

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

1.9 SYSTEMS AND EQUIPMENT MAINTENANCE MANUALS

- A. Systems and Equipment Maintenance Manuals: Assemble a complete set of data indicating maintenance of each system, subsystem, and piece of equipment not part of a system. Include manufacturers' maintenance documentation, preventive maintenance procedures and frequency, repair procedures, wiring and systems diagrams, lists of spare parts, and warranty information.
 - 1. Engage a factory-authorized service representative to assemble and prepare information for each system, subsystem, and piece of equipment not part of a system.
 - 2. Prepare a separate manual for each system and subsystem, in the form of an instructional manual for use by Owner's operating personnel.

- B. Content: For each system, subsystem, and piece of equipment not part of a system, include source information, manufacturers' maintenance documentation, maintenance procedures, maintenance and service schedules, spare parts list and source information, maintenance service contracts, and warranties and bonds as described below.

BHIDE & HALL, ARCHITECTS, PA Project No. 202347
Clay County Tax Collectors' Office
Keystone Heights, Florida

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

BHIDE & HALL, ARCHITECTS, PA Project No. 202347
Clay County Tax Collectors' Office
Keystone Heights, Florida

- I. Warranties and Bonds: Include copies of warranties and bonds and lists of circumstances and conditions that would affect validity of warranties or bonds.
 - 1. Include procedures to follow and required notifications for warranty claims.
- J. Drawings: Prepare drawings supplementing manufacturers' printed data to illustrate the relationship of component parts of equipment and systems and to illustrate control sequence and flow diagrams. Coordinate these drawings with information contained in record Drawings to ensure correct illustration of completed installation.
 - 1. Do not use original project record documents as part of maintenance manuals.

1.10 PRODUCT MAINTENANCE MANUALS

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

BHIDE & HALL, ARCHITECTS, PA Project No. 202347
Clay County Tax Collectors' Office
Keystone Heights, Florida

1. Include procedures to follow and required notifications for warranty claims.

PART 2 - PRODUCTS (Not Used)

PART 3 - EXECUTION (Not Used)

END OF SECTION

SECTION 01 78 39
PROJECT RECORD DOCUMENTS

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

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

1.2 SUMMARY

- A. Section includes administrative and procedural requirements for project record documents, including the following:
 - 1. Record Drawings.
 - 2. Miscellaneous record submittals.
- B. Related Requirements:
 - 1. Section 01 73 00 "Execution" for final property survey.
 - 2. Section 01 77 00 "Closeout Procedures" for general closeout procedures.

1.3 CLOSEOUT SUBMITTALS

- A. Record Drawings: Comply with the following:
 - 1. Number of Copies: Submit copies of record Drawings as follows:
 - a. Final Submittal:
 - 1) Submit two paper-copy set(s) of marked-up record prints.
 - 2) Submit two CD-ROMs each containing one (1) set of AutoCAD 2006 (or newer) by Autodesk and one set in PDF format.
 - 3) Print each drawing, whether or not changes and additional information were recorded.

1.4 RECORD DRAWINGS

- A. Record Prints: Maintain one set of marked-up paper copies of the Contract Drawings and Shop Drawings, incorporating new and revised drawings as modifications are issued.

BHIDE & HALL, ARCHITECTS, PA Project No. 202347
Clay County Tax Collectors' Office
Keystone Heights, Florida

1. Preparation: Mark record prints to show the actual installation where installation varies from that shown originally. Require individual or entity who obtained record data, whether individual or entity is Installer, subcontractor, or similar entity, to provide information for preparation of corresponding marked-up record prints.
 - a. Give particular attention to information on concealed elements that would be difficult to identify or measure and record later.
 - b. Accurately record information in an acceptable drawing technique.
 - c. Record data as soon as possible after obtaining it.
 - d. Record and check the markup before enclosing concealed installations.
 - e. Cross-reference record prints to corresponding photographic documentation.
 2. Content: Types of items requiring marking include, but are not limited to, the following:
 - a. Dimensional changes to Drawings.
 - b. Revisions to details shown on Drawings.
 - c. Depths of foundations.
 - d. Locations and depths of underground utilities.
 - e. Revisions to routing of piping and conduits.
 - f. Revisions to electrical circuitry.
 - g. Actual equipment locations.
 - h. Duct size and routing.
 - i. Locations of concealed internal utilities.
 - j. Changes made by Change Order or Construction Change Directive.
 - k. Changes made following Architect's written orders.
 - l. Details not on the original Contract Drawings.
 - m. Field records for variable and concealed conditions.
 - n. Record information on the Work that is shown only schematically.
 3. Mark the Contract Drawings and Shop Drawings completely and accurately. Use personnel proficient at recording graphic information in production of marked-up record prints.
 4. Mark record sets with erasable, red-colored pencil. Use other colors to distinguish between changes for different categories of the Work at same location.
 5. Mark important additional information that was either shown schematically or omitted from original Drawings.
 6. Note Construction Change Directive numbers, alternate numbers, Change Order numbers, and similar identification, where applicable.
- B. Record Digital Data Files: Immediately before inspection for Certificate of Substantial Completion, review marked-up record prints with Architect. When authorized, prepare a full set of corrected digital data files of the Contract Drawings, as follows:
1. Format: DWG, Version AutoCAD 2006, Microsoft Windows operating system.
 2. Format: Annotated PDF electronic file.
 3. Incorporate changes and additional information previously marked on record prints. Delete, redraw, and add details and notations where applicable.
 4. Refer instances of uncertainty to Architect for resolution.
 5. Architect will furnish Contractor with one set of digital data files of the Contract Drawings for use in recording information.

BHIDE & HALL, ARCHITECTS, PA Project No. 202347
Clay County Tax Collectors' Office
Keystone Heights, Florida

- C. Format: Identify and date each record Drawing; include the designation "AS-BUILT" in a prominent location.
 - 1. Record Prints: Organize record prints into manageable sets. Bind each set with durable paper cover sheets. Include identification on cover sheets.
 - 2. Format: Annotated PDF electronic file.
 - 3. Record Digital Data Files: Organize digital data information into separate electronic files that correspond to each sheet of the Contract Drawings. Name each file with the sheet identification. Include identification in each digital data file.
 - 4. Identification: As follows:
 - a. Project name.
 - b. Date.
 - c. Designation "AS-BUILTS."
 - d. Name of Architect.
 - e. Name of Contractor.

PART 2 – PRODUCTS (NOT USED)

PART 3 - EXECUTION (NOT USED)

END OF SECTION

THIS PAGE INTENTIONALLY
LEFT BLANK FOR PRINTING

SECTION 02 41 14

DEMOLITION - ELECTRICAL

PART 1 - GENERAL

1.1 SCOPE

- A. The electrical contractor shall visit the site to determine the extent of demolition work as required by the drawings and specifications.
- B. All electrical conduit, wiring, devices, fixtures, etc. required to be removed to allow for new construction, abandoned as a result of new construction, or currently not in service shall be removed as part of this contract. Exposed conduits and conduits in accessible areas shall be removed completely; conduits concealed in floors, walls and above non-accessible ceilings may be capped and abandoned after removal of all conductors.
- C. Existing floor outlets found to not be located to coordinate with new furniture and/or partition layouts shall be removed completely or removed and reinstalled in new locations as directed by the Architect/Engineer. All floor penetrations shall be sealed to maintain fire rating of the floor and to ensure structural integrity.
- D. Existing electrical equipment and circuitry not being removed or reworked under this contract but located so as to be affected by the work under this contract, shall remain in service. Such circuits, equipment, etc., shall be extended, relocated or removed and reinstalled as required to accommodate new construction.
- E. Where new HVAC and Plumbing work requires relocation of existing electrical work such relocation shall be provided.
- F. All active devices, wiring and feeders shall remain in service.

PART 2 - PRODUCTS

2.1 NEW MATERIALS

- A. Where existing electrical conduits, junction boxes and wiring are required to be relocated, new materials used shall match existing. Furnish and install conduits, wiring, hardware, boxes, disconnect switches, etc. as required for extension of existing circuits and/or relocation of existing electrical equipment. New cable splices, if required, shall be made with insulated compression type butt splices.

2.2 MATERIALS REMOVED

- A. All materials removed, unless otherwise specified, shall be removed from the site and disposed of by the contractor. Lighting fixtures, panelboards, and circuit breakers shall, at the Owner's option, be disposed of by the contractor or retained for spare parts by the Owner.
- B. Materials retained by the Owner shall be delivered to the Owner at his designated facility.

- C. All materials removed, unless otherwise specified, shall be removed from the site and disposed of by the contractor.

2.3 MATERIALS REMOVED AND REINSTALLED

- A. Any equipment or materials shown on the drawings or specified to be removed and reinstalled shall be cleaned and, if necessary, repaired to first class condition prior to reinstallation.
- B. Lighting fixtures shall, in addition to work in paragraph "A", be equipped with new lamps in accordance with
Section 26 50 00 - LIGHTING.

PART 3 - EXECUTION

3.1 WORKMANSHIP

- A. The contractor shall take care not to damage adjacent equipment, structure, etc. not to be demolished. Where existing devices or equipment are removed, existing finishes shall be repaired where such repair is not shown under new work.

3.2 AS-BUILT DRAWINGS

- A. The contractor shall trace and identify all existing circuits within the project area and so note on his
submittal drawings. The drawings shall clearly identify service panelboards, circuit numbers and conduit routings.

END OF SECTION

SECTION 02 41 19

SELECTIVE DEMOLITION

PART 1 - GENERAL

1.1 SUMMARY

- A. Section Includes: Demolition and removal of the following:
 - 1. Selected portions of building or structure as indicated on Drawings.
 - 2. Repair procedures for selective demolition operations.
- B. Related Sections:
 - 1. Section 01 50 00 - Temporary Facilities and Controls: Temporary construction and environmental-protection measures for selective demolition operations.
 - 2. Section 01 73 29 - Cutting and Patching: Cutting and patching procedures.

1.2 DEFINITIONS

- A. Remove: Detach items from existing construction and legally dispose of them off-site, unless indicated to be removed and salvaged or removed and reinstalled.
- B. Remove and Salvage: Detach items from existing construction and deliver them to Owner ready for reuse.
- C. Remove and Reinstall: Detach items from existing construction, prepare them for reuse, and reinstall them where indicated.
- D. Existing to Remain: Existing items of construction that are not to be removed and that are not otherwise indicated to be removed, removed and salvaged, or removed and reinstalled.

1.3 MATERIALS OWNERSHIP

- A. Except for items or materials indicated to be reused, salvaged, reinstalled, or otherwise indicated to remain Owner's property, demolished materials shall become Contractor's property and shall be removed from Project site.

1.4 SUBMITTALS

- A. Proposed Control Measures: Submit a statement or drawing that indicates the measures proposed for use, proposed locations, and proposed time frame for their operation. Identify options if proposed measures are later determined to be inadequate. Include measures for the following:
 - 1. Dust control.
 - 2. Noise control.
- B. Schedule of Selective Demolition Activities: Indicate detailed sequence of selective demolition and removal work, with starting and ending dates for each activity, interruption of utility services, use of elevator and stairs, and locations of temporary partitions and means of egress.
- C. Landfill Records: Indicate receipt and acceptance of hazardous wastes by a landfill facility licensed to accept hazardous wastes.

1.5 QUALITY ASSURANCE

- A. Demolition Firm Qualifications: Experienced firm or personnel, experienced in demolition work similar in material and extent to that indicated for this Project.
- B. Regulatory Requirements: Comply with governing EPA notification regulations before beginning selective demolition. Comply with hauling and disposal regulations of authorities having jurisdiction.
- C. Standards: Comply with ANSI A10.6 and NFPA 241.
- D. Pre-demolition Conference: Conduct conference at Project site.

1.6 PROJECT CONDITIONS

- A. Owner will occupy portions of building immediately adjacent to selective demolition area. Conduct selective demolition so Owner's operations will not be disrupted. Provide not less than 72 hours' notice to Owner of activities that will affect Owner's operations.
- B. Maintain access to existing walkways, corridors, and other adjacent occupied or used facilities.
 - 1. Do not close or obstruct walkways, corridors, or other occupied or used facilities without written permission from authorities having jurisdiction.
- C. Owner assumes no responsibility for condition of areas to be selectively demolished.
 - 1. Conditions existing at time of inspection for bidding purpose will be maintained by Owner as far as practical.
 - 2. Hazardous Materials: It is not expected that hazardous materials will be encountered in the Work. If materials suspected of containing hazardous materials are encountered, do not disturb; immediately notify Architect and Owner. Hazardous materials will be removed by Owner under a separate contract.
- D. Storage or sale of removed items or materials on-site will not be permitted.
- E. Utility Service: Maintain existing utilities indicated to remain in service and protect them against damage during selective demolition operations.
 - 1. Maintain fire-protection facilities in service during selective demolition operations.

1.7 WARRANTY

- A. Existing Warranties: Where applicable, remove, replace, patch, and repair materials and surfaces cut or damaged during selective demolition, by methods and with materials so as not to void existing warranties.

PART 2 - PRODUCTS

2.1 REPAIR MATERIALS

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

3.1 EXAMINATION

- A. Survey existing conditions and correlate with requirements indicated to determine extent of selective demolition required.
- B. Inventory and record the condition of items to be removed and reinstalled and items to be removed and salvaged.
- C. When unanticipated mechanical, electrical, or structural elements that conflict with intended function or design are encountered, investigate, and measure the nature and extent of conflict. Promptly submit a written report to Architect.
- D. Engage a professional engineer to survey condition of building to determine whether removing any element might result in structural deficiency or unplanned collapse of any portion of structure or adjacent structures during selective demolition operations.

3.2 UTILITY SERVICES

- A. Existing Utilities: Maintain services indicated to remain and protect them against damage during selective demolition operations.
- B. Do not interrupt existing utilities serving occupied or operating facilities unless authorized in writing by Owner and authorities having jurisdiction. Provide temporary services during interruptions to existing utilities, as acceptable to Owner and to authorities having jurisdiction.
 - 1. Provide at least two (2) days notice to Owner if shutdown of service is required during changeover.
 - 2. If utility services are required to be removed, relocated, or abandoned, provide temporary utilities before proceeding with selective demolition that bypass area of selective demolition and that maintain continuity of service to other parts of building.
 - 3. Cut off pipe or conduit in walls or partitions to be removed. Cap, valve, or plug and seal remaining portion of pipe or conduit after bypassing.
- C. Utility Requirements: Refer to Division 23 and 26 Sections for shutting off, disconnecting, removing, and sealing or capping utilities. Do not start selective demolition work until utility disconnecting and sealing have been completed and verified in writing.

3.3 PREPARATION

- A. Site Access and Temporary Controls: Conduct selective demolition and debris-removal operations to ensure minimum interference with roads, streets, walks, walkways, and other adjacent occupied and used facilities.
 - 1. Do not close or obstruct streets, walks, walkways, or other adjacent occupied or used facilities without permission from Owner and authorities having jurisdiction. Provide alternate routes around closed or obstructed traffic ways if required by governing regulations.
 - 2. Erect temporary protection, such as walks, fences, railings, canopies, and covered passageways, where required by authorities having jurisdiction.
 - 3. Protect existing site improvements, appurtenances, and landscaping to remain.

- B. Temporary Facilities: Provide temporary barricades and other protection required to prevent injury to people and damage to adjacent buildings and facilities to remain.
- C. Temporary Enclosures: Provide temporary enclosures for protection of existing buildings and construction, in progress and completed, from exposure, foul weather, other construction operations, and similar activities. Provide temporary weathertight enclosure for building exterior.
- D. Temporary Partitions: Erect and maintain dustproof partitions and temporary enclosures to limit dust and dirt migration and to separate areas from fumes and noise.
- E. Temporary Shoring: Provide and maintain shoring, bracing, or structural support to preserve stability and prevent movement, settlement, or collapse of construction to remain, and to prevent unexpected or uncontrolled movement or collapse of construction being demolished.

3.4 POLLUTION CONTROLS

- A. Dust Control: Use water mist, temporary enclosures, and other suitable methods to limit spread of dust and dirt. Comply with governing environmental-protection regulations.
 - 1. Wet mop floors to eliminate trackable dirt and wipe down walls and doors of demolition enclosure. Vacuum carpeted areas.
- B. Disposal: Remove and transport debris in a manner that will prevent spillage on adjacent surfaces and areas.
 - 1. Remove debris from elevated portions of building by chute, hoist, or other device that will convey debris to grade level in a controlled descent.
- C. Cleaning: Clean adjacent structures and improvements of dust, dirt, and debris caused by selective demolition operations. Return adjacent areas to condition existing before selective demolition operations began.

3.5 SELECTIVE DEMOLITION

- A. General: Demolish and remove existing construction only to the extent required by new construction and as indicated. Use methods required to complete the Work within limitations of governing regulations.
 - 1. Neatly cut openings and holes plumb, square, and true to dimensions required. Use cutting methods least likely to damage construction to remain or adjoining construction.
 - 2. Cut or drill from the exposed or finished side into concealed surfaces to avoid marring existing finished surfaces.
 - 3. Do not use cutting torches until work area is cleared of flammable materials. At concealed spaces, such as duct and pipe interiors, verify condition and contents of hidden space before starting flame-cutting operations. Maintain fire watch and portable fire-suppression devices during flame-cutting operations.
 - 4. Locate selective demolition equipment and remove debris and materials so as not to impose excessive loads on supporting walls, floors, or framing.
- B. Existing Facilities: Comply with building manager's requirements for using and protecting elevators, stairs, walkways, building entries, and other building facilities during selective demolition operations.
- C. Removed and Salvaged Items:

1. Clean salvaged items.
2. Pack or crate items after cleaning. Identify contents of containers.
3. Store items in a secure area until delivery to Owner.
4. Transport items to Owner's storage area designated by Owner.
5. Protect items from damage during transport and storage.

D. Removed and Reinstalled Items:

1. Clean and repair items to functional condition adequate for intended reuse. Paint equipment to match new equipment.
2. Pack or crate items after cleaning and repairing. Identify contents of containers.
3. Protect items from damage during transport and storage.
4. Reinstall items in locations indicated. Comply with installation requirements for new materials and equipment. Provide connections, supports, and miscellaneous materials necessary to make item functional for use indicated.

- E. Existing Items to Remain: Protect construction indicated to remain against damage and soiling during selective demolition. When permitted by Architect, items may be removed to a suitable, protected storage location during selective demolition and cleaned and reinstalled in their original locations after selective demolition operations are complete.

3.6 PATCHING AND REPAIRS

- A. General: Promptly repair damage to adjacent construction caused by selective demolition operations.
- B. Patching: Comply with Section 01 73 29 - Cutting and Patching.
- C. Repairs: Where repairs to existing surfaces are required, patch to produce surfaces suitable for new materials.
1. Completely fill holes and depressions in existing masonry walls that are to remain with an approved masonry patching material applied according to manufacturer's written recommendations.
- D. Finishes: Restore exposed finishes of patched areas and extend restoration into adjoining construction in a manner that eliminates evidence of patching and refinishing.

3.7 DISPOSAL OF DEMOLISHED MATERIALS

- A. General: Promptly dispose of demolished materials. Do not allow demolished materials to accumulate on-site.
- B. Burning: Do not burn demolished materials.
- C. Disposal: Transport demolished materials off Owner's property and legally dispose of them.

END OF SECTION

SECTION 02 95 00

TERMITE CONTROL

1. GENERAL:

- 1.1. Related Documents: The requirements of Division 1 are hereby made a part of this section as if fully repeated herein.
 - 1.1.1. DIRECT PURCHASING: This Section is subject to the terms and procedures of Direct Purchasing, whereby the Owner reserves the right to recover the sales tax on materials by purchasing directly the materials required for this Section. Issuance of Purchase Orders by the Owner shall not relieve the Contractor of any of his responsibilities regarding material purchases or installations, with the exception of the payments for the materials as purchased.
- 1.2. Summary: Provide soil treatment for termite control as herein specified. Chemically treat the compacted soil under all concrete floor slabs prior to the installation of the vapor barrier. Initial termite treatment (Termador) is required for each building.
- 1.3. Submittals
 - 1.3.1. Product Data: Submit manufacturer's technical data and application instructions.
- 1.4. Quality Assurance
 - 1.4.1. In addition to requirements of these specifications, comply with manufacturer's instructions and recommendations for work, including preparation of substrate and application.
 - 1.4.2. Engage a professional pest control operator, licensed in accordance with regulations of governing authorities for application of soil treatment solution.
 - 1.4.3. Use only termiticides, which bear a Federal registration number of the U.S. Environmental Protection Agency.
- 1.5. Job Conditions
 - 1.5.1. Restrictions: Do not apply soil treatment solution until excavating, filling and grading operations are completed, except as otherwise required in construction operations.
 - 1.5.2. To ensure penetration, do not apply soil treatment to frozen or excessively wet soils or during inclement weather. Comply with handling and application instructions of the soil toxicant manufacturer.
- 1.6. Specific Product Warranty
 - 1.6.1. The Subcontractor for the initial soil poisoning must furnish a service agreement stating the Work performed will be guaranteed for a period of 10 years from the date of Substantial Completion and that the structure will be inspected yearly for infestation

and treatment provided as necessary. The Subcontractor shall offer an Optional renewal of the Service on the same terms. The Service Agreement shall state that in the event of damage during the Guarantee Period, the Subcontractor shall make repairs to structurally damaged surfaces to a dollar value based on the size of the building. An Independent Testing Laboratory shall certify that the treatment meets the requirements of the Specifications.

2. PRODUCTS

2.1. Soil treatment solution

2.1.1. Use an emulsible concentrate termiticide for dilution with water, specially formulated to prevent infestation by termites. Fuel oil will not be permitted as a diluent. Provide a solution consisting of one of following chemical elements and concentrations:

- a. Chlorpyrifos ("Dursban TC"); 1.0 percent in water emulsion.
- b. Permethrin (Dragnet", "Torpedo"); 0.5 percent in water emulsion.

2.1.2. Other solutions may be used as recommended by Applicator if also acceptable to Architect and approved for intended application by jurisdictional authorities. Use only soil treatment solutions, which are not injurious to planting.

3. EXECUTION

3.1. Application

3.1.1. Surface Preparation: Remove foreign matter, which could decrease effectiveness of treatment on areas to be treated.

- a. Loosen, rake and level soil to be treated, except previously compacted areas under slabs and foundations.
- b. Toxicants may be applied before placement of compacted fill under slabs if recommended by toxicant manufacturer.

3.1.2. Application Rates: Apply soil treatment solution as follows:

- a. Under slab-on-grade structures, treat soil before concrete slabs are placed, using the following rates of application
 1. Apply 4 gallons of chemical solution per 10 lin. ft. to soil in critical areas under slab, including entire inside perimeter inside of foundation walls, along both sides of interior partition walls, around plumbing pipes and electric conduit penetrating slab, and around interior column footers.
 2. Apply one gallon of chemical solution per 10 sq. ft. as an overall treatment under slab and attached slab areas where fill is soil or unwashed gravel. Apply 1-1.2 gallons of chemical solution to areas where fill is washed gravel or other coarse absorbent material.

- b. Apply 4 gallons of chemical solution per 10 lin. ft. of trench, for each foot of depth from grade to footing, along outside edge of building.
 - 1. Dig a trench 6" to 8" wide along outside of foundation to a depth of not less than 12".
 - 2. Punch holes to top of footing at not more than 12" o.c. and apply chemical solution.
 - 3. Mix chemical solution with the soil as it is being replaced in trench.
- c. At hollow masonry foundations or grade beams, treat voids at rate of 2 gal. Per 10 lin. ft. poured directly into the hollow spaces.
 - 3.1.3. Post signs in areas of application to warn workers that soil termiticide treatment has been applied. Remove signs when areas are covered by other construction.
 - 3.1.4. Reapply soil treatment solution to areas disturbed by subsequent excavation, landscape grading, or other construction activities following application.

END OF SECTION

BHIDE & HALL, ARCHITECTS, PA
Clay County Tax Collectors' Office
Keystone Heights, Florida

Project No. 202347

DIVISION 03 - CONCRETE

Refer to Structural drawings for Division 3

SECTION 03 01 30

REHABILITATION OF CAST-IN-PLACE CONCRETE

PART 1 - GENERAL

1.1 GENERAL DESCRIPTION OF WORK

- A. Provide all labor, products and equipment required to properly install semi-rigid filler in interior concrete floor slab joints and cracks.

1.2 SUMMARY

- A. Purpose: This Section includes materials and methods to repair deteriorated floor joints in interior concrete slabs on ground that meet the following:
 - 1. Slab is at least one year old, and significant slab shrinkage is not anticipated in the future
 - 2. Slab is fully supported by subgrade, and not rocking. Where rocking or slab deflection exists, utilize Slab Stabilizations procedures prior to commencement of joint, crack, or spall repair.
- B. Work includes the following activities:
 - 1. Removing deteriorated concrete and foreign material so surfaces are clean and ready for repair and rebuilding.
 - 2. Repairing deteriorated floor joints and fillers,
 - 3. Repairing uncontrolled floor cracks,
 - 4. Repairing spalled floor areas.
 - 5. Cleaning and preparing floor for new finish

1.3 APPLICABLE STANDARDS

- A. Products and installation shall be in compliance with or exceed the joint filling criteria established in the latest ACI 302 and ACI 360 Committee published documents.

1.4 DEFINITIONS

- A. Floor Slab Joints: Joints deliberately created in regular, grid pattern intervals during construction, or added to weaken the slab.
 - 1. Construction Joints (C.J.) and Closure Strip Joints (C.S.J.): Formed joints between adjacent slab panels, where panels are separate concrete pours.

2. Shrinkage Joints (S.J.): Also called control or contraction joints, are saw-cut after slab troweling to control slab breaks caused by concrete shrinkage and keep cracks in straight lines under the saw-cuts.

B. Cracks in Floor Slab: Random, uncontrolled breaks in the floor slab.

1. Shrinkage Cracks: Caused by overall concrete shrinking beyond the capacity of shrinkage or construction joints to contain.
2. Slab Curl Cracks: Caused by concrete shrinking faster at the slab top than the bottom, with resulting curl at pour edges, breaking may be from wheeled vehicle impact.

C. Slab Spalls: Locations where slab surface has delaminated, chipped or broken off, exposing aggregate in the mix.

1.5 CONTRACTOR QUALIFICATIONS

- A. Installer shall have a minimum of three (3) year's experience in performing the types of work covered by this Section and shall be an Approved Applicator of the material manufacturer.
- B. Approved Applicator shall use tools and equipment specifically designed for the preparation and placement of industrial joint fillers.

1.6 SUBMITTALS

- A. Product Data: Include material descriptions, chemical composition, physical properties, test data, and mixing and application instructions.
- B. Source Limitations: Obtain materials through one source from a single manufacturer.

1.7 DELIVERY, STORAGE, AND HANDLING

- A. Deliver materials to Project site in manufacturer's original and unopened containers, labeled with type and name of products and manufacturers.
- B. Comply with manufacturer's written instructions for minimum and maximum temperature requirements and other conditions for storage.

- C. Store aggregates covered and in a dry location, where grading and other required characteristics can be maintained and contamination avoided.

PART 2 - PRODUCTS

2.1 JOINT FILLER AND SMALL CRACK REPAIR MATERIAL

- A. Provide a semi-rigid polymer resin manufactured and distributed for use as a floor joint and crack filler material to protect concrete joint edges. Use a rapid set, cold applied, gray colored, self-leveling, two-part filling system composed of 100% solids.
- B. Utilize products with physical properties meeting the following minimum values:

<u>PROPERTY</u>	<u>TEST METHOD</u>	<u>PROPERTY VALUE</u>
Shore A Hardness	ASTM D2240	95 (-5, +5)
Compressive Yield	ASTM D695	>1300 psi
Solids Content		100% Acceptable

for use in USDA regulated facilities

- C. Available Products: Subject to compliance with requirements, basis of design, utilize products manufactured by Metzger/McGuire Co. Concord NH 800-223-6680.
 - 1. Metzger/McGuire: “**MM-80/MM-80P Semi-Rigid Epoxy Joint Filler**”
 - 2. Metzger/McGuire: “**Spal-Pro 2000 Semi-Rigid Repair Polyurea**”
 - 3. Metzger/McGuire: “**Edge-Pro 90 Semi-Rigid Polyurea Joint Filler**”

2.2 LARGE JOINT SPALL REPAIR MATERIAL

- A. Provide a high strength polymer resin material that is manufactured to repair and rebuild large openings and spalled concrete floor areas. Use a two-part, 100% solids, liquid system with high tensile strength, intended to be used alone or to be combined with aggregate to create a mortar.
- B. Use a product with the following physical properties before mixing with aggregate:

<u>PROPERTY</u>	<u>TEST METHOD</u>	<u>PROPERTY VALUE</u>
Shore D Hardness	ASTM D 2240	75 (+/- 5)
Compressive Strength	ASTM D 790	10,500 PSI
Tensile Strength	ASTM D 638	1,400 PSI
Adhesive Strength		Concrete Breaks Acceptable

for use in USDA regulated facilities

- C. Available Repair Resin Products: Subject to compliance with requirements, basis of design, utilize products manufactured by Metzger/McGuire Co. Concord NH 800-223-6680.
 - 1. Metzger /McGuire: “**Armor-Hard / Armor-Hard Extreme Early Set Structural Epoxy**”.
- D. Sand Aggregate for Crack, Spall, and Joint Repair: Use fine, oven-dried, washed silica sand ranging from 20 to 40 or mortar pre-packaged with Armor-Hard Kit

- E. Spall and Crack Repair Mortar: Mix Polymer Repair Resin with sand aggregate, following manufacturer's instructions. The mortar mix will be approximately 3 to 6 parts aggregate to one part repair resin.

2.3 SMALL SURFACE SPALL REPAIR MATERIAL

- A. Provide a low viscosity, high strength polyurea/polyurethane repair polymer resin material that is manufactured to repair and repair and resurface spalled concrete floor areas. Use a two-part, 100% solids, liquid system with high tensile strength.
- B. Use a product with the following physical properties before mixing with aggregate:

<u>PROPERTY.....</u>	<u>TEST METHOD.....</u>	<u>PROPERTY VALUE</u>
Shore D Hardness	ASTM D 2240	70-75
Compressive Strength.....	ASTM D 790.....	4000
PSI Tensile Strength	ASTM D 638	5,500 PSI
Adhesive Strength	Concrete
Breaks Acceptable for use in USDA regulated facilities		

- C. Available Repair Resin Products: Subject to compliance with requirements, basis of design, utilize products manufactured by Metzger/McGuire Co. Concord NH 800-223-6680.
 1. Metzger/McGuire: **“Rapid Refloor”**
 2. Metzger/McGuire: **“Rapid Refloor XP”**
 3. Metzger/McGuire: **“SRG”**

2.4 FULL PANEL RESURFACING REPAIR MATERIAL

- A. Provide a trowelable, high strength epoxy flooring system manufactured to repair and repair and resurface spalled concrete floor areas. Use a two-part, 100% solids, liquid system with high tensile strength.
- B. Use a product with the following physical properties before mixing with aggregate:

<u>PROPERTY.....</u>	<u>TEST METHOD.....</u>	<u>PROPERTY VALUE</u>
Shore D Hardness	ASTM D 2240	86
Compressive Strength.....	ASTM D 790.....	10,500
PSI Tensile Strength	ASTM D 638	1,400
PSI	
Adhesive Strength	Concrete
Fails Acceptable for use in USDA regulated facilities		

- C. Available Repair Resin Products: Subject to compliance with requirements, basis of design, utilize products manufactured by Metzger/McGuire Co. Concord NH 800-223-6680.
 1. Metzger/McGuire: **“Armor-Hard HDR Resurfacer”**
 2. Metzger/McGuire: **“Armor-Hard HDR Primer”**

3. Metzger/McGuire: "Armor-Hard HDR Sealer"

2.5 DUST FREE PREPARATION EQUIPMENT

A. Subject to compliance with project requirements, provide equipment manufactured by the following:

1. US Saws
2. Gorilla Concrete Tools
3. Pulman-Ermator

4. Diamatic
5. Husqvarna
7. HTC
8. Perfect-Trac

B. DUST EXTRACTION SYSTEM FOR GRINDING/SAWING:

1. HEPA filtration vacuum, designed for use with all hand tools when grinding sawing concrete (minimum 125CFM air flow).
2. Provide one of the following:
 - a. S26/S36, by Pullman-Ermator
 - b. D30/D60, by HTC
 - c. Approved equal

C. JOINT FILLER REMOVAL AND PREPARATION

1. Dust Buggy (MKIII or Standard) by U.S. Saws
2. GCT-10/X Tank by Gorilla Concrete Tools
3. JS-130/JS-100E by U.S. Saws
4. Perfect-Trac Saw by Perfect-Trac.
5. Approved equal

D. CRACK REPAIR:

1. GCT-4.5/GCT-9 by Gorilla Concrete Tools
2. CC-100 by U.S. Saws
3. 5" Premium Handheld Crack Chaser by U.S. Saws
4. Approved equal

E. SURFACE GRINDER: Handheld 5"-7" electric surface grinder with dustless shroud/housing:

1. 5" Pro GC Metabo with Shroud by U.S. Saws
2. Approved equal

PART 3 - EXECUTION

3.1 FLOOR SURVEY

- A. Remove all floor finishes in their entirety down to the original top surface of the concrete slab, including but not limited to ceramic tile, vinyl composition tile, sheet flooring, mastic, adhesives, and underlayment. Remove all foreign materials, grease, oil, and dirt from surface. Clean concrete surfaces, cracks and voids of dirt or other contamination using the most appropriate method for proper preparation. Ensure methods are in compliance with material manufacturer's recommendations.
- B. Mechanically cut away damaged portions of concrete, roughen surfaces and remove all loose, unsound, contaminated material.
- C. Bonding surfaces must be clean, sound, and free from any materials that may inhibit bond such as oil, dirt, asphalt, sealing compounds, acids, wax and loose dust and debris.
- D. Repair floor joints and cracks in the concrete floor slab where indicated on the drawings, where identified by Owner's Representative at specific locations, or generally identified by existing crack or joint conditions.
- E. Visually examine the floor joints and cracks in the slab observing the following -

1. Where semi-rigid joint filler is most appropriate material.
2. Where spall and crack repair mortar is most appropriate material.
3. Notify the Owner's Representative where other defective areas are observed and not indicated for repair work, but where repair is appropriate.

3.2 FLOOR SLAB REPAIRS AT JOINTS AND CRACKS

A. Shrinkage and Construction Joint Repairs

1. Joints where overall width of joint and edge spall is 1/2" or less -
 - a. Where narrow joint conditions exist with little to no edge spalling, clean both joint sidewalls to full original depth utilizing a diamond blade equipped dust free saw.
 - b. Where minor edge raveling or spalling exists, prepare joint by making 1/2" minimum depth (3/4" preferred) vertical sawcuts at spall edges, then remove material to provide a channel to accept repair material.
 - c. Where necessary, clean dry silica sand can be placed at the bottom of the joint (1/4" maximum layer) to seal off any opening and prevent excessive filler seepage or run through.
 - c. Following Manufacturer's mixing and installation instructions fill the joint with Polymer Filler Resin, "MM-80/MM-80P Epoxy" so top of resin is slightly crowned above floor surface. Monitor top to assure fill remains crowned.
 - d. After resin has cured, trim the overfill using a stiff, sharp razor so top of Filler Resin is flush with concrete floor on both sides. Heating of "MM- 80/MM-80P Epoxy" prior to shaving may be necessary to provide a smooth, flush finish profile.

2. Joints where overall width of joint and edge spall is 1/2" to 1" -
 - a. Prepare joint by making 1/2" minimum depth (3/4" preferred) vertical sawcuts at spall edges, then remove material to provide a channel to accept repair material.
 - b. Where necessary, clean dry silica sand can be placed at the bottom of the joint (1/4" maximum layer) to seal off any opening and prevent excessive filler seepage or run through.
 - c. Following Manufacturer's mixing and installation instructions fill the joint with Polymer Filler Resin, "MM-80/MM-80P Epoxy" sand modified with clean, dry bagged silica sand at approximately 1:1 by volume so top of resin is slightly crowned above floor surface. Monitor top to assure fill remains crowned.
 - d. After resin has cured, grind the surface of the overfilled joint flush to the slab surface utilizing an appropriate abrasive blade equipped right angle grinder to provide a smooth, flush finished profile.

3. Joints where overall width of joint and edge spall is more than 1" -
 - a. Prepare joint by making straight, vertical sawcuts at spall edges, then remove delaminated material and deteriorated concrete surface material.
 - b. Where necessary, clean dry silica sand can be placed at the bottom of the joint (1/4" maximum layer) to seal off any opening and prevent excessive filler seepage or run through.
 - c. Prime sides and bottom of repair area using brush applied Polymer

Repair Resin, "Armor-Hard / Armor-Hard Extreme", liquid
(without aggregate).

- d. Blend "Armor-Hard / Armor-Hard Extreme" liquid with aggregate creating a mortar. Fill area with the Repair Mortar: Trowel top of repair mortar to be flush with concrete surfaces on both sides.

- e. After Repair Mortar has cured, grind top and edges to be flush and smooth with concrete floor on both sides.
- f. Create a RELIEF cut through the center of the repair mortar by re-sawcutting so as not to structurally bond both sides of a moving joint or crack together. The relief cut should extend down through the structural mortar repair.
- g. Following Manufacturer's mixing and installation instructions re-fill the relief cut with Polymer Filler Resin, "MM-80/MM-80P Epoxy" so top of resin is slightly crowned above floor surface. Monitor top to assure fill remains crowned.
- h. After resin has cured, trim the overfill using a stiff, sharp razor so top of Filler Resin is flush with concrete floor on both sides. Heating of "MM- 80/MM-80P Epoxy" prior to shaving may be necessary to provide a smooth, flush finish profile.

B. Floor Slab Random Crack Repairs:

- 1. Random cracks less than 1/4" wide, not subject to movement, which are specifically identified to be repaired:
 - a. Utilizing a soft wire wheel on a right angle grinder chase crack with wire wheel to remove debris and any islands concrete which is not structurally sound. Vacuum clean after chasing with wire wheel.
 - b. Following Manufacturer's installation instructions and fill crack with low viscosity structural resin "Rapid Refloor," so top of resin is slightly crowned above floor surface. Monitor top to assure fill remains crowned.
 - c. After resin has cured, grind off overfill using dustless shrouded grinder equipped with medium grit abrasive finishing pad (Gator Grit Medium Stripping Pad, Norton Rapid Strip Pad or =).
- 2. Random cracks greater than 1/4" wide, subject to movement, which are specifically identified to be repaired:
 - a. Utilizing dust-free cleanout and crack chasing saws as outlined in Section 2.3, cut along the crack to a depth of approximately 3/4" (1/2" minimum) creating a straight, clean vertical edge. Ensure that this defining cut has removed all previously adhered fillers, concrete "islands", and any loose or weak concrete from the crack edge.
 - b. Following Manufacturer's mixing and installation instructions fill the joint with Polymer Filler Resin, "MM-80/MM-80P Epoxy" so top of resin is slightly crowned above floor surface. Monitor top to assure fill remains crowned.
 - c. After resin has cured, trim the overfill using a stiff, sharp razor so top of Filler Resin is flush with concrete floor on both sides. Heating of "MM- 80/MM-80P Epoxy" prior to shaving may be necessary to provide a smooth, flush finish profile.

3.3 WIDE AREA SPALL REPAIR (Greater than 4" Diameter)

- A. Surface Preparation for Wide Area Spall Repair.
 - 1. Clean surfaces free of oil, grease, coatings, sealers, paint, rust, etc. Verify surfaces are dry, and structurally sound.
 - 2. Remove delaminated material and deteriorated concrete surface material. Roughen surface of concrete by sand blasting, shot blasting, scarifying, or milling. Sweep and vacuum roughened surface to remove debris.
 - 3. Prevent feather edging by making vertical cuts at the spall outer edges.
- B. Spall Repair Mortar Installation:
 - 1. Mix Polymer Repair Resin, "Armor-Hard / Armor-Hard Extreme", per manufacturer's recommendations thoroughly blending Part A & Part B components.
 - 2. Prime spalled area with brush-applied "Armor-Hard / Armor-Hard Extreme" liquid (without aggregate).
 - 3. Blend "Armor-Hard / Armor-Hard Extreme" liquid with aggregate creating a mortar. Fill area with the Repair Mortar: Trowel top of repair mortar to be flush with concrete surfaces on both sides.
 - 4. After Repair Mortar has cured, grind top and edges of mortar and the adjacent concrete to ensure flush, smooth surfaces on both sides.
- C. Where WIDE AREA SPALL REPAIR is adjacent to existing joints or cracks:
 - 1. Create a RELIEF cut through the center of the repair mortar by re-sawcutting so as not to structurally bond both sides of a moving joint or crack together. The relief cut should extend down through the structural mortar repair.
 - 2. Following Manufacturer's mixing and installation instructions re-fill the relief cut with Semi-Rigid Filler, so top of resin is slightly crowned above floor surface. Monitor top to assure fill remains crowned.
 - 3. After resin has cured, trim the overfill using a stiff, sharp razor so top of Filler Resin is flush with concrete floor on both sides. If using "MM-80/MM-80P Epoxy" heating prior to shaving may be necessary to provide a smooth, flush finish profile.

3.4 SMALL AREA SPALL REPAIR (Less than 4" Diameter)

- A. Surface Preparation for Wide Area Spall Repair.
 - 1. Clean surfaces free of oil, grease, coatings, sealers, paint, rust, etc. Verify surfaces are dry, and structurally sound.
 - 2. Remove delaminated material and deteriorated concrete surface material. Roughen/clean surface of concrete using a right angle grinder with soft wire wheel (brass or soft steel).
 - 3. Sweep and vacuum roughened surface to remove debris.

B. Spall Repair Installation:

1. Dispense Polymer Repair Resin, "Rapid Refloor or Rapid Refloor XP or SRG", per manufacturer's recommendations using dual cartridge kit or 2 gallon kit.
2. Slightly overfill defect and allow to cure.

3. Use medium grit abrasive finishing pad (Gator Grit Medium Stripping Pad, Norton Rapid Strip Pad or =) to grind off overfill and restore flush surface profile.

3.4 REPLACING UNSATISFACTORY JOINT FILLER

- A. Remove and replace the existing filler where the following unsatisfactory conditions are present at existing joints -
 1. Lost Adhesive Bond: Previous filler installation failed because adhesion is lost on both sides of the joint walls. Usually caused by inadequate cleaning or placement of original filler.
 2. Filler Push-Down: Previous filler placement was not full joint depth, adhesion to concrete sidewalls has failed, and filler has dropped below the joint surface.
 3. Missing Joint Filler: Filler is altogether absent in the joint.
 4. Unsuitable Filler Resin Mix; Previous filler had improper ratio of "A" and "B" mix and has not cured to meet the physical properties specified.
- B. After completely removing existing filler, prepare opening for new filler installation following procedures specified given the specific joint conditions (width, repair type, etc.) outlined in this specification.

3.5 FULL PANEL RESURFACING/REPAIR

- A. Surface Preparation for Full Panel Resurfacing/Repair
 1. Clean surfaces free of oil, grease, coatings, sealers, paint, rust, etc. Verify surfaces are dry, and structurally sound. Use warm (120-140F) caustic detergents or a chemical cleaner/degreaser if needed.
 2. Remove delaminated material and deteriorated concrete surface material. Roughen surface of concrete by sand blasting, shot blasting, scarifying, or milling. Sweep and vacuum roughened surface to remove debris.
 3. Prevent feather edging by making vertical cuts at the spall outer edges.
- B. Armor-Hard HDR Primer Application:
 1. Mix Epoxy Repair Resin, "Armor-Hard HDR Primer", per manufacturer's recommendations thoroughly blending Part A & Part B components.
 2. Apply "Armor-Hard HDR Primer" using a brush or short nap roller. A thin uniform coat is preferred.
- C. Armor-Hard HDR Mortar Installation:
 1. Mix Epoxy Repair Resin, "Armor-Hard HDR", per manufacturer's recommendations thoroughly blending Part A & Part B

components.

2. Add half of the troweling aggregate, let mix for 1-2 minutes, then add remaining troweling aggregate and mix for an additional 3 minutes.
3. Immediately pour out the mixed kit onto the floor in 7-10" wide strips. Spread evenly with a clean trowel.
4. After Repair Mortar has cured, grind top and edges of mortar and the adjacent concrete to ensure flush, smooth surfaces on both sides.

3.6 CLEAN-UP

- A. Remove and legally dispose of concrete repair and resurfacing debris material from job site.
- B. Clean excess material from surrounding areas and all tools immediately, before material cures. If materials have cured, remove using mechanical methods that will not damage the substrate.
- C. Clean adjacent surfaces as needed using materials and methods recommended by the manufacturer of the material being cleaned. Remove and replace work that cannot be cleaned to the satisfaction of the Architect/Owner.

END OF SECTION 03 01 30

BHIDE & HALL, ARCHITECTS, PA
Clay County Tax Collectors' Office
Keystone Heights, Florida

Project No. 202347

DIVISION 04 - MASONRY

Refer to Structural drawings for Division 4

SECTION 05 40 00

METAL STUDS

1. GENERAL:

- 1.1. Related Documents: The requirements of Division 1 are hereby made a part of this section as if fully repeated herein.
 - 1.1.1. DIRECT PURCHASING: This Section is subject to the terms and procedures of Direct Purchasing, whereby the Owner reserves the right to recover the sales tax on materials by purchasing directly the materials required for this Section. Issuance of Purchase Orders by the Owner shall not relieve the Contractor of any of his responsibilities regarding material purchases or installations, with the exception of the payments for the materials as purchased.
- 1.2. All materials and products specified in this section are manufactured by:
 - 1.2.1. Approved Manufacturers:
 - a. ClarkDietrich
 - b. Marion\Ware, Inc
 - c. NuconSteel Commercial Corp., a Nucor Company
 - d. Unimast, Inc
 - 1.2.2. Equivalent products from other manufacturers are acceptable.
- 1.3. Submittals:
 - 1.3.1. Provide submittals for metal studs and for shaftwall studs. Provide documentation of shaftwall spans for vertical height required.

2. MATERIALS:

- 2.1. Metal Studs (complete stud/framing systems including matching top and bottom tracks).
 - 2.1.1. Metal Studs/ Framing:
SSMA Standard Nos.
3-5/8 inch studs 362 S 125 – 27
6 inch studs 600 S 125 - 27
 - 2.1.2. Note: Minimum uncoated metal thickness shall be not less than .027 inch (22 gauge).
 - 2.1.3. Shaftwall framing and infill: provide products having fire-rating approvals for the type and rating indicated.
- 2.2. Fasteners: Self-tapping, Type S, Bugle Head, 1-1/8 inch minimum length. (Where gypsum board is required to be laminated to gypsum board provide Type G screws, Bugle Head, 1-1/2 inch length minimum.)
- 2.3. Metal Furring Strips: Galvanized, standard gauge hat channels, or similar shape suitable to support wall finish scheduled. Effective depth of 1 inch
- 2.4. Submittals: submit manufacturer's product data including fasteners, and fire-rating testing or UL documentation.

3. ERECTION:

- 3.1. Bottom track and all studs shown to install against concrete masonry shall be set in two (2) continuous beads of sealant prior to securing in place. Sealant shall be as specified in Section 07920, "Sealants and Caulking."
- 3.2. Fasten top and bottom track to structural elements and as shown with suitable fasteners. Fasteners shall be located 2" from each end and spaced 24" on center unless indicated otherwise on the drawings.
- 3.3. Provide metal stud framing within ¼ inch on all sides of ductwork where it penetrates any partition. Provide metal stud each side of structural member for securing gypsum board where partition runs perpendicular to structural orientation.
- 3.4. Position studs vertically, engaging top and bottom track. Stud spacing shall be 16" on center unless indicated otherwise. Provide bracing between roof purling or diagonal bracing of vertical studs as required.
 - 3.4.1. Secure stud plumb with two (2) screws to top track and two (2) screws to bottom track.
 - 3.4.2. Provide diagonal bracing above the ceiling at 4'-0" o.c. or as recommended by the manufacturer. Bracing penetrating gypsum board shall be sealed with joint compound.
- 3.5. All joints or splices in top and/or bottom track shall be lapped 8" minimum.
- 3.6. No joints or splices shall be permitted in full length of stud.
- 3.7. Installation, bridging, etc., not specifically indicated to the contrary shall be in accordance with manufacturer's suggested and recommended details.
- 3.8. Provide double studs boxed and rigidly anchored at all discontinuous ends of partitions, and at all door jambs.
 - 3.8.1. To prevent flexing and breaking of the wall along the door frames, a nest of metal studs shall be provided around each door installation to accommodate the weight of the door and the shock caused by the closing of the door at drywall installation.

END OF SECTION

SECTION 05 52 00

PIPE AND TUBE RAILINGS

PART 1 - GENERAL

1.1 SUMMARY

- A. Section Includes: Steel pipe railings, field-painted.
- B. Related Sections:
 - 1. Section 09 91 00 - Painting: Paint finish for railings.

1.2 PERFORMANCE REQUIREMENTS

- A. Control of Corrosion: Prevent galvanic action and other forms of corrosion by insulating metals and other materials from direct contact with incompatible materials.

1.3 SUBMITTALS

- A. Product Data: For grout, anchoring cement, and paint products.
- B. Shop Drawings: Include plans, elevations, sections, details, and attachments to other work.

PART 2 - PRODUCTS

2.1 MANUFACTURERS

- A. Available Manufacturers: Subject to compliance with requirements, manufacturers offering products that may be incorporated into the Work include, but are not limited to, the following:
 - 1. Steel Pipe and Tube Railings:
 - a. Pisor Industries, Inc.
 - b. Sharpe Products.
 - c. Wagner, R & B, Inc.; a division of the Wagner Companies.

2.2 METALS

- A. Brackets, Flanges, and Anchors: Cast or formed metal of same type of material and finish as supported rails, unless otherwise indicated.
- B. Steel and Iron:
 - 1. Tubing: ASTM A 500 (cold formed) or ASTM A 513, Type 5 (mandrel drawn).
 - 2. Pipe: ASTM A 53, Type F or Type S, Grade A, Standard Weight (Schedule 40), unless another grade and weight are required by structural loads.
 - 3. Plates, Shapes, and Bars: ASTM A 36.
 - 4. Castings: Either gray or malleable iron, unless otherwise indicated.
 - a. Gray Iron: ASTM A 48, Class 30, unless another class is indicated or required by structural loads.
 - b. Malleable Iron: ASTM A 47.

2.3 MISCELLANEOUS MATERIALS

- A. Fasteners: Provide concealed fasteners, unless unavoidable or standard for railings indicated.
 - 1. Steel Railings: Plated steel fasteners complying with ASTM B 633, Class Fe/Zn 25 for electrodeposited zinc coating.
- B. Anchors: Provide torque-controlled expansion anchors, fabricated from corrosion-resistant materials 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 E 488.
- C. Welding Rods and Bare Electrodes: Select according to AWS specifications for metal alloy welded.
- D. Shop Primers: Provide primers that comply with Section 09 91 00 - Painting.
- E. Universal Shop Primer: Fast-curing, lead- and chromate-free, universal modified-alkyd primer complying with MPI#79.
- F. Shop Primer for Galvanized Steel: Zinc-dust, zinc-oxide primer compatible with finish paint systems indicated, and complying with SSPC-Paint 5.
- G. Grout and Anchoring Cement: Factory-packaged, nonshrink, nonmetallic grout complying with ASTM C 1107; or water-resistant, nonshrink anchoring cement; recommended by manufacturer for exterior use.

2.4 FABRICATION

- A. General: Fabricate railings to comply with design, dimensions, and details indicated, but not less than that required to support structural loads.
- B. Welded Connections: Cope components at connections to provide close fit, or use fittings designed for this purpose. Weld all around at connections, including at fittings.
- C. Nonwelded Connections: Connect members with concealed mechanical fasteners and fittings.
- D. Form curves by bending in jigs to produce uniform curvature; maintain cross section of member throughout bend without cracking or otherwise deforming exposed surfaces.
- E. Close exposed ends of railing members with prefabricated end fittings.
- F. Provide wall returns at ends of wall-mounted handrails, unless otherwise indicated.
- G. Brackets, Flanges, Fittings, and Anchors: Provide wall brackets, flanges, miscellaneous fittings, and anchors to interconnect railing members to other work, unless otherwise indicated.

2.5 FINISHES

- A. Steel and Iron:
 - 1. Shop-Primed Steel Finish: Prepare to comply with SSPC-SP 7/NACE No. 4, "Brush-off Blast Cleaning" and apply primer to comply with SSPC-PA 1.

PART 3 - EXECUTION

3.1 INSTALLATION

- A. General: Perform cutting, drilling, and fitting required for installing railings. Set railings accurately in location, alignment, and elevation.
 - 1. Set posts plumb within a tolerance of 1/16 inch in 3 feet.
 - 2. Align rails so variations from level for horizontal members and variations from parallel with rake of steps and ramps for sloping members do not exceed 1/4 inch in 12 feet.
- B. Anchor posts to concrete slab with steel base plates by drilling and inserting threaded bolts into drilled holes with epoxy and grouting annular space.
- C. Adjusting and Cleaning:
 - 1. Immediately after erection, clean field welds, bolted connections, and abraded areas of shop paint, and paint exposed areas with the same material as used for shop painting.
 - 2. Galvanized Surfaces: Clean field welds, bolted connections, and abraded areas and repair galvanizing to comply with ASTM A 780.

END OF SECTION

SECTION 06 10 00

ROUGH CARPENTRY

PART 1 - GENERAL

1.1 SUMMARY

- A. Related Documents: The requirements of Division 1 are hereby made a part of this section as if fully repeated herein.
 - 1. **DIRECT PURCHASING:** This Section is subject to the terms and procedures of Direct Purchasing, whereby the Owner reserves the right to recover the sales tax on materials by purchasing directly the materials required for this Section. Issuance of Purchase Orders by the Owner shall not relieve the Contractor of any of his responsibilities regarding material purchases or installations, with the exception of the payments for the materials as purchased.

- B. Section Includes:
 - 1. Wood blocking and nailers.
 - 2. Wood furring and grounds.
 - 3. Wall Sheathing.
 - 4. Plywood backing panels.

1.2 SUBMITTALS

- A. Product Data: For each type of process and factory-fabricated product indicated.
 - 1. Include data for wood-preservative and fire-retardant treatment from chemical treatment manufacturer and certification by treating plant that materials comply with requirements.

- B. Material Certificates: For dimension lumber specified to comply with minimum allowable unit stresses.

- C. Research/Evaluation Reports: For the following:
 - 1. Treated wood.
 - 2. Power-driven fasteners.
 - 3. Powder-actuated fasteners.
 - 4. Expansion anchors.
 - 5. Metal framing anchors.

1.3 QUALITY ASSURANCE

- A. Forest Certification: For the following wood products, provide materials produced from wood obtained from forests certified by an FSC-accredited certification body to comply with FSC 1.2, "Principles and Criteria":
 - 1. Dimension lumber.
 - 2. Plywood.

2.1 WOOD PRODUCTS, GENERAL

- A. Lumber: DOC PS 20 and applicable rules of lumber grading agencies certified by the American Lumber Standards Committee Board of Review.
 - 1. Factory mark each piece of lumber with grade stamp of grading agency.
 - 2. Provide dressed lumber, S4S, unless otherwise indicated.
 - 3. Provide dry lumber with 19 percent maximum moisture content at time of dressing for 2-inch nominal thickness or less, unless otherwise indicated.
- B. Wood Structural Panels:
 - 1. Plywood: DOC PS 1 or DOC PS 2,
 - 2. Comply with "Code Plus" provisions in APA Form No. E30K, "APA Design/Construction Guide: Residential & Commercial."

2.2 WOOD-PRESERVATIVE-TREATED MATERIALS

- A. Preservative Treatment by Pressure Process: AWWA C2 (lumber) and AWWA C9 (plywood), except that lumber that is not in contact with the ground and is continuously protected from liquid water may be treated according to AWWA C31 with inorganic boron (SBX).
- B. Kiln-dry material after treatment to maximum moisture content of 19 percent for lumber and 15 percent for plywood.
- C. Mark each treated item with treatment quality mark of an inspection agency approved by the American Lumber Standards Committee Board of Review.
- D. Application: Treat items indicated on Drawings, and the following:
 - 1. Wood cants, nailers, curbs, equipment support bases, blocking, stripping, and similar members in connection with roofing, flashing, vapor barriers, and waterproofing.
 - 2. Wood sills, sleepers, blocking, furring, stripping, and similar concealed members in contact with masonry or concrete.
 - 3. Wood framing members less than 18 inches above grade.
 - 4. Wood floor plates that are installed over concrete slabs directly in contact with earth.

2.3 FIRE-RETARDANT-TREATED MATERIALS

- A. General: Where fire-retardant-treated materials are indicated, provide materials that comply with performance requirements in AWWA C20 (lumber) and AWWA C27 (plywood). Identify fire-retardant-treated wood with appropriate classification marking of UL, U.S. Testing, Timber Products Inspection, or another testing and inspecting agency acceptable to authorities having jurisdiction.
 - 1. Use treatment for which chemical manufacturer publishes physical properties of treated wood after exposure to elevated temperatures, when tested by a qualified independent testing agency according to ASTM D 5664, for lumber and ASTM D 5516, for plywood.
 - 2. Use treatment that does not promote corrosion of metal fasteners.
 - 3. Use Exterior type for exterior locations and where indicated.
 - 4. Use Interior Type A High Temperature (HT), unless otherwise indicated.

2.4 DIMENSION LUMBER

- A. General: Of grades indicated according to the American Lumber Standards Committee National Grading Rule provisions of the grading agency indicated.
- B. Miscellaneous Non-Load-Bearing Lumber: Construction or No. 2 grade and any of the following species:
 - 1. Mixed southern pine; SPIB.
 - 2. Eastern softwoods; NELMA.
 - 3. Northern species; NLGA.
 - 4. Western woods; WCLIB or WWPA.

2.5 SHEATHING

- A. Plywood Wall Sheathing: Exterior, Structural I sheathing, 5/8" thick minimum.
- B. Glass-Mat Gypsum Wall Sheathing: ASTM C 1177.
 - 1. Approved Products/Manufacturers:
 - a. Fiberrock Brand Sheathing with Aqua Tough; USG Co.
 - b. Glasrock Sheathing; BPB, Tampa, FL.
 - c. (Note: "Dens-Glass Gold" by G-P Gypsum Corp. is Not Acceptable)
 - 2. Type and Thickness: Type X, 5/8 inch thick.

2.6 PLYWOOD BACKING PANELS

- A. Telephone and Electrical Equipment Backing Panels: DOC PS 1, Exposure 1, C-D Plugged, fire-retardant treated, in thickness indicated or, if not indicated, not less than 1/2 inch thick.

2.7 MISCELLANEOUS MATERIALS

- A. Fasteners:
 - 1. For all treated wood and where rough carpentry is exposed to weather, in ground contact, or in area of high relative humidity, provide fasteners with hot-dip zinc coating complying with ASTM A 153/A.
 - 2. Power-Driven Fasteners: CABO NER-272.
 - 3. Bolts: Steel bolts complying with ASTM A 307, Grade A (ASTM F 568M, Property Class 4.6); with ASTM A 563 hex nuts and, where indicated, flat washers.
- B. Building Paper: Asphalt-saturated organic felt complying with ASTM D 226, Type I, unperforated.

PART 3 - EXECUTION

3.1 INSTALLATION

- A. Set rough carpentry to required levels and lines, with members plumb, true to line, cut, and fitted. Fit rough carpentry to other construction; scribe and cope as needed for accurate fit. Locate furring, nailers, blocking, grounds, and similar supports to comply with requirements for attaching other construction.

- B. Apply field treatment complying with AWWPA M4 to cut surfaces of preservative-treated lumber and plywood.
- C. Securely attach rough carpentry work to substrate by anchoring and fastening as indicated, complying with the following:
 - 1. CABO NER-272 for power-driven fasteners.
 - 2. Published requirements of metal framing anchor manufacturer.
 - 3. Applicable building codes.
- D. Framing Standard: Comply with AFPA's "Manual for Wood Frame Construction," unless otherwise indicated.
- E. Comply with applicable recommendations contained in APA Form No. E30K, "APA Design/Construction Guide: Residential & Commercial," for types of structural-use panels and applications indicated.
- F. Fastening Methods:
 - 1. Wall Sheathing: Screw to metal framing.
 - 2. Plywood Backing Panels: Nail or screw to supports.
- G. Apply weather-resistive barrier horizontally with 2-inch overlap and 6-inch end lap; fasten to sheathing with galvanized staples or roofing nails. Cover upstanding flashing with 4-inch overlap.
- H. Apply sheathing tape to joints between sheathing panels and at items penetrating sheathing. Apply at upstanding flashing to overlap both flashing and sheathing.

END OF SECTION

SECTION 06 16 00

SHEATHING

PART 1 - GENERAL

1.1 SUMMARY

- A. Section Includes:
 - 1. Wall sheathing.
 - 2. Sheathing joint and penetration treatment.
- B. Related Requirements:
 - 1. Section 06 10 00 - Rough Carpentry: Plywood backing panels.

1.2 ACTION SUBMITTALS

- A. Product Data: For each type of process and factory-fabricated product. Indicate component materials and dimensions and include construction and application details.
 - 1. Include data for wood-preservative treatment from chemical treatment manufacturer and certification by treating plant that treated plywood complies with requirements. Indicate type of preservative used and net amount of preservative retained.
 - 2. Include data for fire-retardant treatment from chemical treatment manufacturer and certification by treating plant that treated plywood complies with requirements. Include physical properties of treated materials.
 - 3. For fire-retardant treatments, include physical properties of treated plywood both before and after exposure to elevated temperatures, based on testing by a qualified independent testing agency according to ASTM D 5516.
 - 4. For products receiving a waterborne treatment, include statement that moisture content of treated materials was reduced to levels specified before shipment to Project site.
 - 5. Include copies of warranties from chemical treatment manufacturers for each type of treatment.

1.3 INFORMATIONAL SUBMITTALS

- A. Evaluation Reports: For following products, from ICC-ES:
 - 1. Preservative-treated plywood.
 - 2. Fire-retardant-treated plywood.

1.4 QUALITY ASSURANCE

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

1.5 DELIVERY, STORAGE, AND HANDLING

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

2.1 PERFORMANCE REQUIREMENTS

- A. Fire-Test-Response Characteristics: For assemblies with fire-resistance ratings, provide materials and construction identical to those of assemblies tested for fire resistance per ASTM E 119 by a testing and inspecting agency acceptable to authorities having jurisdiction.
 - 1. Fire-Resistance Ratings: Indicated by design designations from UL's "Fire Resistance Directory" or GA-600, "Fire Resistance Design Manual."

2.2 WOOD PANEL PRODUCTS

- A. Plywood: Either DOC PS 1 or DOC PS 2 unless otherwise indicated.
- B. Thickness: As needed to comply with requirements specified, but not less than thickness indicated.
- C. Factory mark panels to indicate compliance with applicable standard.

2.3 PRESERVATIVE-TREATED PLYWOOD

- A. Preservative Treatment by Pressure Process: AWWPA U1; Use Category UC3b for exterior construction not in contact with the ground, and Use Category UC4a for items in contact with the ground].
 - 1. Preservative Chemicals: Acceptable to authorities having jurisdiction and containing no arsenic or chromium.
- B. Mark plywood with appropriate classification marking of an inspection agency acceptable to authorities having jurisdiction.
- C. Application: Treat all plywood unless otherwise indicated.

2.4 FIRE-RETARDANT-TREATED PLYWOOD

- A. General: Where fire-retardant-treated materials are indicated, use materials complying with requirements in this article that are acceptable to authorities having jurisdiction and with fire-test-response characteristics specified as determined by testing identical products per test method indicated by a qualified testing agency.
- B. Fire-Retardant-Treated Plywood by Pressure Process: Products with a flame-spread index of 25 or less when tested according to ASTM E 84, and with no evidence of significant progressive combustion when the test is extended an additional 20 minutes, and with the flame front not extending more than 10.5 feet beyond the centerline of the burners at any time during the test.
 - 1. Use treatment that does not promote corrosion of metal fasteners.
 - 2. Exterior Type: Treated materials shall comply with requirements specified above for fire-retardant-treated plywood by pressure process after being subjected to accelerated weathering according to ASTM D 2898. Use for exterior locations and where indicated.
 - 3. Design Value Adjustment Factors: Treated lumber plywood shall be tested according to ASTM D 5516 and design value adjustment factors shall be calculated according to ASTM D 6305. Span ratings after treatment shall be not less than span ratings specified.

- a. For roof sheathing and where high-temperature fire-retardant treatment is indicated, span ratings for temperatures up to 170 deg F shall be not less than span ratings specified.
- C. Kiln-dry material after treatment to a maximum moisture content of 15 percent. Do not use material that is warped or does not comply with requirements for untreated material.
- D. Identify fire-retardant-treated plywood with appropriate classification marking of qualified testing agency.
- E. Application: Treat plywood indicated on Drawings, and the following:
 1. Roof and wall sheathing within 48 inches of fire/party walls.
 2. Roof sheathing.

2.5 WALL SHEATHING

- A. Plywood Wall Sheathing: Exterior, Structural I or Exterior sheathing.
 1. Span Rating: Not less than 24/0.
 2. Nominal Thickness: Not less than 3/4 inch..
- B. Glass-Mat Gypsum Wall Sheathing: ASTM C 1177/1177M.
 1. Products: Subject to compliance with requirements, provide one of the following:
 - a. CertainTeed Corporation; GlasRoc.
 - b. G-P Gypsum Corporation; Dens-Glass Gold.
 - c. Lafarge North America Inc.; Weather Defense Platinum.
 - d. National Gypsum Company; Gold Bond e(2)XP.
 - e. Temple-Inland Inc.; GreenGlass
 - f. United States Gypsum Co.; Securock.
 2. Type and Thickness: Type X, 5/8 inch thick.
 3. Size: 48 by 96 inches, unless otherwise indicated.
- C. Cellulose Fiber-Reinforced Gypsum Sheathing: ASTM C 1278/C 1278M, gypsum sheathing.
 1. Product: Subject to compliance with requirements
 - a. "Fiberock Sheathing with Aqua-Tough" by United States Gypsum Co.
 2. Type and Thickness: Type X, 5/8 inch thick.
 3. Size: 48 by 96 inches or larger.
- D. Extruded-Polystyrene-Foam Wall Sheathing (If Required): ASTM C 578, Type IV, in manufacturer's standard lengths and widths with tongue-and-groove or shiplap long edges as standard with manufacturer.
 1. Manufacturers: Subject to compliance with requirements, provide products by one of the following:
 - a. DiversiFoam Products.
 - b. Dow Chemical Company (The).
 - c. Owens Corning.
 - d. Pactiv, Inc.
 2. Thickness: As indicated.

2.6 ROOF SHEATHING (Not Applicable)

- A. Plywood Roof Sheathing: Exterior, Structural I or Exterior sheathing.
 1. Span Rating: Not less than 24/0.

2. Nominal Thickness: Not less than 3/4 inch.

2.7 FASTENERS

- A. General: Provide fasteners of size and type indicated that comply with requirements specified in this article for material and manufacture.
 1. For roof and wall sheathing, provide fasteners with hot-dip zinc coating complying with ASTM A 153/A 153M of Type 304 stainless steel.
- B. Nails, Brads, and Staples: ASTM F 1667.
- C. Power-Driven Fasteners: NES NER-272.
- D. Wood Screws: ASME B18.6.1.
- E. Screws for Fastening Wood Structural Panels to Cold-Formed Metal Framing: ASTM C 954, except with wafer heads and reamer wings, length as recommended by screw manufacturer for material being fastened.
 1. For wall and roof sheathing panels, provide screws with organic-polymer or other corrosion-protective coating having a salt-spray resistance of more than 800 hours according to ASTM B 117.
- F. Screws for Fastening Gypsum Sheathing to Cold-Formed Metal Framing: Steel drill screws, in length recommended by sheathing manufacturer for thickness of sheathing to be attached, with organic-polymer or other corrosion-protective coating having a salt-spray resistance of more than 800 hours according to ASTM B 117.
 1. For steel framing less than 0.0329 inch thick, use screws that comply with ASTM C 1002.
 2. For steel framing from 0.033 to 0.112 inch thick, use screws that comply with ASTM C 954.

2.8 SHEATHING JOINT-AND-PENETRATION TREATMENT MATERIALS

- A. Sealant for Glass-Mat Gypsum Sheathing: Silicone emulsion sealant complying with ASTM C 834, compatible with sheathing tape and sheathing and recommended by tape and sheathing manufacturers for use with glass-fiber sheathing tape and for covering exposed fasteners.
 1. Sheathing Tape: Self-adhering glass-fiber tape, minimum 2 inches wide, 10 by 10 or 10 by 20 threads/inch, of type recommended by sheathing and tape manufacturers for use with silicone emulsion sealant in sealing joints in glass-mat gypsum sheathing and with a history of successful in-service use.
- B. Sheathing Tape for Foam-Plastic Sheathing (If required): Pressure-sensitive plastic tape recommended by sheathing manufacturer for sealing joints and penetrations in sheathing.

2.9 MISCELLANEOUS MATERIALS

- A. Adhesives for Field Gluing Panels to Framing: Formulation complying with APA AFG-01 or ASTM D 3498 that is approved for use with type of construction panel indicated by manufacturers of both adhesives and panels.
 1. Adhesives shall have a VOC content of 50 g/L or less when calculated according to 40 CFR 59, Subpart D (EPA Method 24).

3.1 INSTALLATION, GENERAL

- A. Do not use materials with defects that impair quality of sheathing or pieces that are too small to use with minimum number of joints or optimum joint arrangement. Arrange joints so that pieces do not span between fewer than three support members.
- B. Cut panels at penetrations, edges, and other obstructions of work; fit tightly against abutting construction unless otherwise indicated.
- C. Securely attach to substrate by fastening as indicated, complying with the following:
 - 1. NES NER-272 for power-driven fasteners.
 - 2. Table 2304.9.1, "Fastening Schedule," in ICC's "International Building Code."
- D. Wood Framing: Use hot-dip galvanized nails or screws. Select fasteners of size that will not fully penetrate members where opposite side will be exposed to view or will receive finish materials. Make tight connections. Install fasteners without splitting wood.
- E. Coordinate wall and roof sheathing installation with flashing and joint-sealant installation so these materials are installed in sequence and manner that prevent exterior moisture from passing through completed assembly.
- F. Do not bridge building expansion joints; cut and space edges of panels to match spacing of structural support elements.
- G. Coordinate sheathing installation with installation of materials installed over sheathing so sheathing is not exposed to precipitation or left exposed at end of the workday when rain is forecast.

3.2 GYPSUM SHEATHING INSTALLATION

- A. Comply with GA-253 and with manufacturer's written instructions.
 - 1. Fasten gypsum sheathing to wood framing with nails or screws.
 - 2. Fasten gypsum sheathing to cold-formed metal framing with screws.
 - 3. Install boards with a 3/8-inch gap where non-load-bearing construction abuts structural elements.
 - 4. Install boards with a 1/4-inch gap where they abut masonry or similar materials that might retain moisture, to prevent wicking.
- B. Apply fasteners so heads bear tightly against face of sheathing, but do not cut into facing.
- C. Horizontal Installation: Install sheathing with V-grooved edge down and tongue edge up. Interlock tongue with groove to bring long edges in contact with edges of adjacent boards without forcing. Abut ends of boards over centers of studs, and stagger end joints of adjacent boards not less than one stud spacing. Attach boards at perimeter and within field of board to each steel stud.
 - 1. Space fasteners approximately 8 inches o.c. and set back a minimum of 3/8 inch from edges and ends of boards.
 - 2. For sheathing under stucco cladding, boards may be initially tacked in place with screws if overlying self-furring metal lath is screw-attached through sheathing to studs immediately after sheathing is installed.

- D. Vertical Installation: Install board vertical edges centered over studs. Abut ends and edges of each board with those of adjacent boards. Attach boards at perimeter and within field of board to each stud.
 - 1. Space fasteners approximately 8 inches o.c. and set back a minimum of 3/8 inch from edges and ends of boards.
 - 2. For sheathing under stucco cladding, boards may be initially tacked in place with screws if overlying self-furring metal lath is screw-attached through sheathing to studs immediately after sheathing is installed.

- E. Seal sheathing joints according to sheathing manufacturer's written instructions.
 - 1. Apply elastomeric sealant to joints and fasteners and trowel flat. Apply sufficient amount of sealant to completely cover joints and fasteners after troweling. Seal other penetrations and openings.
 - 2. Apply glass-fiber sheathing tape to glass-mat gypsum sheathing joints and apply and trowel silicone emulsion sealant to embed entire face of tape in sealant. Apply sealant to exposed fasteners with a trowel so fasteners are completely covered. Seal other penetrations and openings.

3.3 FOAM-PLASTIC SHEATHING INSTALLATION

- A. Comply with manufacturer's written instructions.
- B. Foam-Plastic Wall Sheathing: Install vapor-relief strips or equivalent for permitting escape of moisture vapor that otherwise would be trapped in stud cavity behind sheathing.
- C. Apply sheathing tape to joints between foam-plastic sheathing panels and at items penetrating sheathing. Apply at upstanding flashing to overlap both flashing and sheathing.

END OF SECTION

SECTION 06 22 00

MILLWORK

PART 1: GENERAL

1.1 SUMMARY

A. Section Includes:

1. Wood and wood veneer cabinetwork, including base cabinets, wall cabinets, wall shelving with standards and brackets.
2. Plastic laminate casework/cabinets and shelves, storage units and doors.
3. Plastic laminate countertops with let-in hardwood edge or bullnose edge as indicated.
4. Cabinet hardware. Shelf standards and brackets. Coat rods.
5. Preparation of cabinetwork for site finishing and for utilities.

B. Related Sections:

1. ~~Metal Fabrications: Section 05500.~~
2. Carpentry: Section 06 10 00.
3. ~~Laboratory Casework: Section 06221.~~
4. ~~Solid Polymer Fabrications: Section 06650.~~
5. ~~Wood Doors: Section 08210.~~
6. Door Hardware: Section 08 71 00.
7. Vinyl Base: Section 09 65 10.
8. Painting and Finishing: Section 09 91 00.

1.2 REFERENCES

- A. Architectural Woodwork Institute AWI Quality Standards, current edition.
- B. ANSI/BHMA A156.9 – Cabinet hardware
- C. NEMA LD3 – High pressure decorative laminate

1.3 QUALITY ASSURANCE

- A. Quality Standards: Comply with 1997 Architectural Woodwork Quality Standards and Guide Specifications by Architectural Woodwork Institute, not less than Premium Grade.
- B. Competence: Millwork shall be manufactured by well-established and experienced firm, with satisfactory record of similar size and quality installations. Owner reserves the right to reject any millwork subcontractor, if it is the Owners' opinion that (1) shop capacity, experience of workmen, equipment or supply of material will not result in required quality within time required for completion, or (2) previous performance by manufacturer has been unsatisfactory.

1.4 SUBMITTALS

- A. Shop Drawings: Submit in accordance with Section 01 30 00. Details shall be scaled large enough to show required detail.
 - 1. Indicate materials and wood species, component profiles, fastening, jointing, details, finishes, and accessories.
- B. Samples: Submit samples of wood veneer and solid wood to receive transparent finish. Submit samples of plastic laminate for color section and texture and finish acceptance.
 - 1. Submit sample millwork wood or plastic laminate cabinet unit for conformance review. Unit may be used as part of work if approved.

1.5 DELIVERY, STORAGE, AND HANDLING

- A. Deliver millwork under protective cover. Do not permit delivery until project conditions, including humidity, are suitable. Store millwork materials in a dry, ventilated place, protected from weather, and complying with temperature and humidity condition specified by standards and as recommended by millwork manufacturer. Minimum relative humidity shall be less than 50 percent and in cold weather, heat shall have been provided for at least ten (10) days prior to delivery.

1.6 COORDINATION

- A. Coordinate work directly with other subcontractors as necessary to insure proper fitting, joining or to clearances of other work. Obtain templates as required to insure proper fitting. If required do not install or close up areas of cabinet work until utilities have been installed. Verify electrical and mechanical characteristics with other subcontractors, and exchange shop drawings.

PART 2: PRODUCTS

2.1 MANUFACTURERS

- A. The Owner reserves the right to select and approve all fabricators for each project.

2.2 WOOD MATERIALS

- A. Interior Work for Transparent Finish:
 - 1. Species of solid hardwood: See 2.12 - Material Schedule by Building.
 - 2. Species for veneered wood: See 2.12 - Material Schedule by Building.
 - 3. Species for semi-exposed wood veneer: Fir plywood with hardwood edge.
 - 4. Hardwood Lumber: AWI Lumber Grade required for quality grade indicated, moisture content of 6-8 percent. Surface grain and coloration suitable for transparent finish.
 - a. Use clear vertical grain No. 1 White Maple in conjunction with veneers where solid material is required by detailing or fabrication.
 - 5. Hardwood Veneer: HPVA Grade AA, unless otherwise indicated. Surface grain and coloration suitable for transparent finish.
 - a. Veneer Match: Book match face veneers, balance match panel faces.
 - b. Fitch selection shall match existing building products.

6. Finish: Pre-finish in compliance with AQI Section 1500-G-7, catalyzed polyurethane or catalyzed varnish finish with satin sheen, exceeding performance characteristics of AWI System TR-4 and TR-6.
 - a. Stain color and sheen: To match existing building products.

B. Interior Work for Paint Finish:

1. Species for solid hardwood for paint finish: Natural Birch
2. Species for veneered wood for paint finish: Medium density overlay or rotary Natural Birch

C. Exterior Work for Paint Finish:

1. Western Pine water repellent preservative treated with prime paint finish.

2.3 WOOD MILLWORK FABRICATIONS

A. Grade: AWI Premium Grade for transparent finish.

1. Face Construction: Provide flush overlay cabinet construction, unless indicated otherwise.
2. Provide dust panels above compartments and drawers, except when located directly below countertops.
3. Hardboard: ANSI/AHA A135.4; tempered both sides by Masonite or Weyerhaeuser. (Prefinished wood fiber hardboard with smooth faces, tempered both sides with putty color opaque polyester overlay).
4. Shelving: Hardwood veneer plywood with let-in hardwood edge.

B. Wood species and finish per schedule, see 2.10 Materials Schedule by Building.

2.4 CORE MATERIALS

A. Coreboard: Medium density particleboard, conforming to ANSI A208.1, type 1, grade 1-M-2 or 1-M-3.

B. Fire Rated Coreboard: Fire rated particle board or fire rated medium density fiberboard, conforming to ANSI A208.1, type 1, grade 1-M-1, and tested to comply with UL 723 to achieve the following flame spread and smoke developed properties:

1. Flame spread: 20
2. Smoke developed: 25
3. Acceptable manufacturer and product: As recommended by millwork supplier.

C. Water-resistant Coreboard: Water-resistant medium density fiberboard, conforming to ANSI A208.1, type 2, grade 2-M02 or 2-M-3, and to ASTM D1037-87.

1. Acceptable manufacturer and product: Medite Corp.; Exterior Medix.
2. Clarification: Provide water-resistant coreboard at countertop with sink units set within them.

2.5 LAMINATE MATERIALS

A. High Pressure Decorative Plastic Laminate: High pressure plastic laminate conforming to NEMA LD-3, of the following grades:

1. Horizontal grade plastic laminate: Conforming to NEMA Grade HGS, 0.048 inch nominal thickness.
 2. Postforming grade plastic laminate: Conforming to NEMA Grade HGP, 0.042 inch nominal thickness.
 3. Vertical grade plastic laminate: Conforming to NEMA VGS, 0.028 inch nominal thickness.
 4. Color: See Section 2.12
- B. Chemical-Resistant Plastic Laminate: Chemical-resistant high pressure plastic laminate conforming to performance requirements of NEMA LD-3 Grade PF30, 0.030 nominal thickness, and providing a chemical resistance to acids, bases, solvents, reagents and indicators.
1. Color: See Section 2.12
- C. Backing Grade Plastic Laminate: Conforming to NEMA Grade BK50, same thickness as laminate on exposed side.
1. Color: Fabricator's option to use black, brown, or undecorated.
- D. Melamine Laminate: PermaLam thermally fused melamine conforming to requirements of ALA 1988.
1. Color: Selected from manufacturer's standard colors.
- E. Polyvinyl Chloride (PVC) Edge Banding: Manufacturer primed PVC edging.
1. Color: Match laminate color.

2.6 PLASTIC LAMINATE MILLWORK FABRICATIONS

- A. Plastic Laminate Quality Grade: Comply with Premium Grade requirements of AWI Quality Standards.
1. Face Construction: Provide flush overlay cabinet construction unless indicated otherwise on drawings.
- B. Acceptable Manufacturers: Formica, Nevamar, Pionite, Wilsonart, Lamin-Art, Westinghouse, Aborite, or approved alternates.
- C. Door and Drawer Edge: Molded 3 mm PVC edges to match plastic laminate color.
- D. Shelving Edge:
1. Molded 3mm PVC edges to match plastic laminate color unless noted otherwise.
 2. Hardwood Edge: $\frac{3}{4}$ " x $\frac{3}{4}$ " hardwood edge band with tongue and groove joint to shelf.
- E. Countertop Edge: Self-edge or vinyl bullnose molding if noted on drawings.
1. Vinyl Bullnose Edge: 1" Black bumper molding standard.
#303-100 Bk by: Outwater Plastics Industries, Inc.
4 Passaic Street
Wood-Ridge, NJ 07075
(800) 543-3217
 2. Alternate 1" Bullnose edge colors:
 - a. Brown.
 - b. White.
 - c. Almond.
 - d. Dove Gray.

- F. Adhesive: FS MMM-A-130A Type as recommended by laminate manufacturer and adhesive manufacturer for intended use.

~~2.7 ACCESSORIES~~

- ~~A. Cork Insert: Plastic impregnated cork, seamless sheet, 1/4 inch thick with washable vinyl finish, or ground natural cork compressed with resinous binder and integral color throughout entire thickness and laminated to burlap backing with dark brown plastic tee edging at all exposed edges by W.E. Neal Slate, Claridge Products or Mirawal size for use at back of easework.~~

2.8 CABINET HARDWARE

- A. General: Cabinetwork shall be complete with all hardware required including the following:
1. Shelf adjustment clips shall be twin pin non-rotating shelf clip. Furnish four additional shelf clips for each wall cabinet for owner stock.
 2. Rear supported adjustable shelves.
 - a. Standard shelving (12" deep): K & V No. 83 ANO standards and No. 183R ANO right hand flange brackets.
 - b. Heavy duty or wide shelving (14" to 18" deep): K & V No. 87 A standards and No. 187 LL A brackets 12", 14", 16", or 18" long with lock lugs. Provide one K & V No. 211 shelf rest per bracket.
 - c. Unistrut shelving: Unistrut channel P4100 and P2490 series brackets.
 3. Drawer Slides: Full extension three piece telescoping slide with a load carrying capacity of 100 lbs.
 - a. KV: 8400 series
 - b. Approved alternates
 4. File Drawer Slides: Lateral and vertical file drawer slides to be full extension three piece telescoping slides with a load carrying capacity of 150 lbs. and steel ball bearings.
 - a. KV: 8500.
 - b. Accuride: 4032.
 - c. Approved alternates.
 5. Door and Drawer Pulls: 5/16" X 3 1/2" or 5/16" x 4" wire pull, US26D dull chrome, mount on drawers horizontally; on doors and tall cabinets vertically.
 6. Cabinet hinges: Fixed pin, five knuckle, dull chrome, 2 1/2 inch fastened with 4 screws each let into faces, no edge fastening allowed. 2 3/4 inch overlay hinges Model Series IHB 376-26D by Rockford Process Control, Inc., Rockford, Illinois, are acceptable.
 - ~~7. Closet Rods: 1 1/4" stainless steel.~~
 - ~~8. Coat Hooks: Halmack HM681 and HM682.~~
 9. Locks: Furnished by contractor, installed by contractor.
 10. Adjustable Shelf Clips:
 - a. Intrinsic Shelf Rest: 5mm double pin to fit 3/4" or 1" shelves.
 - b. Halver (Steve Halverson) Inc.: Double pin shelf dip. Specify 3/4" shelf thickness. (Available through Bear Supply - Chicago, IL)
 - c. LSI: Double pin shelf clips.
 11. Ceiling type hook, magnetic catches, and other required hardware, as recommended by fabricator for intended use.
 12. Storage unit magnetic catches: Ives 327 - 1 per pair of leaves - mount on underside of fixed middle-shelf.
 13. Storage unit pulls: Stanley 4484 1 5/16" x 4" CTC.

- 14. Silencers: Glynn-Johnson #65; two at each door and drawer.
- 15. Pivot Door Slide: Knappe & Vogt #8080.

B. Existing or Special Hardware: See 2.12 Existing Material Schedule by Building.

2.9 MILLWORK FABRICATION - GENERAL

- A. Intent: It is intent of drawings and specifications to provide durable, serviceable millwork meeting highest standards and materials. Methods, construction and assembly shall meet these standards.
 - 1. Fabricate millwork in accordance with reviewed shop drawings.
- B. Provisions for Work of Others: Make cutouts of proper size to accommodate other work as required by drawings or as furnished by others. Provide, where not otherwise indicated or concealed, moldings to cover exposed core of veneered work. Provide proper mountings for hardware, including snuggers, catches.
- C. Provide cutouts and holes for items such as sinks, fittings, risers, ducts, and other features furnished into work of this section. Sinks by Mechanical, Division 15. Where it may not be practical to precut holes and where coordination with field features may be uncertain or difficult, holes and openings shall be field cut and sealed. Seal edges and unfinished faces of particle board to minimize formaldehyde evaporation.
- D. Provide radius corners on all outside corners of countertops.
- E. Scribe strips: Black high density overlay finish.
- F. Millwork/Cabinetwork Assembly: Assemble work in mill so far as possible. If necessary to ensure best results, complete units shall be assembled in mill and then partially disassembled into workable sections for shipping and project installation. Necessary joints for shipping shall be approved type. When installing items that are not shop assembled, distribute defects to best overall advantage allowed by specifications.
- G. Provide plastic laminate or wood finished faces to match cabinet surfaces at all knee spaces under drawers, aprons or counters.
- H. Gluing: Glue joints on surfaces. Use highest grade glue in strict accordance with Manufacturer's recommendations. Use Type 1 waterproof glue for work exposed in any part of exterior, around sinks and at other locations where work is exposed to moisture or dampness that might affect glue bond. Use water-resistant glue equal to urea-formaldehyde resin glue at other locations.

2.10 PLASTIC LAMINATE MILLWORK FABRICATION

- A. Quality Grade: Workmanship of high-pressure laminate shall conform to Premium Grade requirements of AWI Quality Standard.
- B. Laminate Fabrication: Apply laminate finish in fully interrupted sheets consistent with manufactured sizes. Use cabinet lines at non-exposed surfaces, behind doors or in drawers. Glue joints in shop, using hardwood spline, except where field joints are necessary for shipping or placing in work. Prepare counterfield joints in shop using bolt-up Tite-Joint fasteners at

spacing recommended by fastener manufacturer. Unless specifically shown otherwise, apply matching laminate to exposed edges (including back edge not tight to wall) and provide approved bevel edge at joint with face or top. Seal core surfaces not laminate-faced with clear synthetic resin sealer recommended by laminate manufacturer.

2.11 FABRICATION OF CABINETWORK DOORS

- A. Fabrication of Cabinetwork Doors: Trim square and factory-size to nominal size less approximately 1/16 inch in width and 1/8 inch in height (unless otherwise required) for final fitting.
- B. Quality Grade: Except as otherwise specified herein, provide Premium Grade as defined in AWI Quality Standards.
- C. Door Guarantee: Guarantee cabinetwork doors for three (3) years. Guarantee shall cover faulty workmanship, materials, de-lamination or splitting of veneers, or warp in excess of 1/4 inch. Replace doors completely including fitting, hanging, and finishing.

2.12 OMITTED

PART 3: EXECUTION

3.1 INSTALLATION

- A. Installation of Millwork/Cabinetwork shall be in accordance with AWI Quality Standards Section 1700 - Installation of Architectural Woodwork.
- B. Install in neat and workmanlike manner, free from hammer or tool marks, open joints, or slivers.
- C. Set plum, level, square and true. Scribe to floors and walls as required. Miter corners, countersink nails, drill holes for nails in hardwood. Install work after building humidity is at acceptable level.
- D. Ensure that mechanical and electrical items affecting this section are properly placed, complete, and have been inspected by architect prior to commencement of installation.
- E. Install trim with butt joints and use finishing nails for exposed work. Finished work shall be free of hammer marks or open joints.
- F. Adjust doors, drawers, hardware, fixtures and other moving or operating parts to function smoothly and correctly.
- G. Clean cabinetwork, counters, shelves, hardware, fittings, and fixtures.

SECTION 06 40 23

INTERIOR ARCHITECTURAL WOODWORK

PART 1 - GENERAL

1.1 Related Documents: The requirements of Division 1 are hereby made a part of this section as if fully repeated herein.

1. **DIRECT PURCHASING:** This Section is subject to the terms and procedures of Direct Purchasing, whereby the Owner reserves the right to recover the sales tax on materials by purchasing directly the materials required for this Section. Issuance of Purchase Orders by the Owner shall not relieve the Contractor of any of his responsibilities regarding material purchases or installations, with the exception of the payments for the materials as purchased.

1.2 **SUMMARY**

A. Section Includes:

1. Laminate-clad cabinets.
2. Solid-surfacing-material countertops.
3. Cabinet hardware.
4. Shop finishing of interior woodwork

B. Related Sections:

1. Section 06 10 00 - Rough Carpentry: Exposed framing, furring, blocking, and other carpentry work concealed in the wall.
2. Section 08 14 16 - Flush Wood Doors: Doors specified by reference to architectural woodwork standards.
3. Section 09 91 00 - Painting: Field-applied finishes for architectural woodwork.

1.3 **DEFINITIONS**

- A. Interior architectural woodwork includes wood furring, blocking, shims, and hanging strips for installing woodwork items unless concealed within other construction prior to woodwork.

1.4 **SUBMITTALS**

- A. Product data for each type of product and process specified and incorporated into items of architectural woodwork during fabrication, finishing, and installation.

- B. Shop drawings showing location of each item, dimensioned plans and elevations, large-scale details, attachment devices, and other components.

1. Show locations and sizes of furring, blocking, and hanging strips, including concealed blocking and reinforcing specified in other Sections.
2. Show locations and sizes of cutouts and holes for plumbing fixtures, faucets, soap dispensers, and other items installed in architectural woodwork.

- C. Samples for verification of the following:

1. Laminate-clad panel products, 8 by 10 inches, for each type, color, pattern, and surface finish, with separate samples of unfaced panel product used for core.

2. Thermoset decorative-overlay surfaced panel products, 8" x 10", for each type, color, pattern, and surface finish, with separate samples of unfaced panel product used for core.
3. Solid-surfacing materials, 6" square.
4. Corner pieces as follows:
 - a. Cabinet front frame joints between stiles and rail, as well as exposed end pieces, 18 inches high by 18 inches wide by 6 inches deep.
5. Exposed cabinet hardware, one unit for each type and finish.

- D. Product certificates signed by woodwork fabricator certifying that products comply with specified requirements.

1.5 QUALITY ASSURANCE

- A. Single-Source Responsibility for Fabrication and Installation: Engage a qualified woodworking firm to assume undivided responsibility for fabricating, finishing, and installing woodwork specified in this Section.
- B. Quality Standard: Except as otherwise indicated, comply with the following standard:
1. AWI Quality Standard: "Architectural Woodwork Quality Standards" of the Architectural Woodwork Institute for grades of interior architectural woodwork, construction, finishes, and other requirements.

1.6 DELIVERY, STORAGE, AND HANDLING

- A. Protect woodwork during transit, delivery, storage, and handling to prevent damage, soilage, and deterioration.
- B. Do not deliver woodwork until painting and similar operations that could damage, soil, or deteriorate woodwork have been completed in installation areas.
- C. Store items at project site in installation spaces where possible. If woodwork must be stored in other than installation areas, store only in areas whose environmental conditions meet requirements specified in "Project Conditions."

1.7 PROJECT CONDITIONS

- A. Environmental Limitations: Do not deliver or install woodwork until building is enclosed, wet-work is completed, and HVAC system is operating and will maintain temperature and relative humidity at occupancy levels during the remainder of the construction period.
- B. Field Measurements: Where woodwork is indicated to be fitted to other construction, check actual dimensions of other construction by accurate field measurements before fabrication, and show recorded measurements on final shop drawings. Coordinate fabrication schedule with construction progress to avoid delaying the Work.
1. 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.
 2. Where field measurements cannot be made without delaying the Work, guarantee dimensions and proceed with fabricating woodwork without field measurements. Provide allowance for trimming at site and coordinate construction to ensure that actual dimensions correspond to guaranteed dimensions.

1.8 COORDINATION

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

PART 2 - PRODUCTS

2.1 MATERIALS

- A. Wood Species for Opaque Finish: Any closed grain hardwood.
- B. Wood Products:
 - 1. Hardboard: AHA A135.4.
 - 2. Medium-Density Fiberboard: ANSI A208.2.
 - 3. Particleboard: Not permitted.
 - 4. Softwood Plywood: PS 1.
 - 5. Veneer-Faced Panel Products (Hardwood Plywood): HPVA HP-1, made with adhesive containing no urea formaldehyde.
- C. Formaldehyde Emission Level for Medium-Density Fiberboard: Comply with requirements of NPA 9.
- D. Thermoset Decorative Panels: Particleboard or medium-density fiberboard finished with thermally fused, melamine-impregnated decorative paper complying with LMA SAT-1.
- E. High-Pressure Decorative Laminate: NEMA LD 3, grades as indicated, or if not indicated, as required by woodwork quality standard.
 - 1. Manufacturer: Subject to compliance with requirements, provide high-pressure decorative laminates by one of the following:
 - a. Formica Corporation.
 - b. Nevamar Corp.
 - c. Ralph Wilson Plastics Co.
- F. Adhesive for Bonding Plastic Laminate: Contact cement.
- G. Thermoset Decorative Overlay: Decorative surface of thermally fused polyester or melamine-impregnated web, bonded to specified substrate and complying with ALA 1992.
 - 1. Substrate: Medium-density particleboard.
- H. Solid Polymer Fabrications: Homogeneous filled acrylic; not coated, laminated or of composite construction; meeting ANSI Z124.3 & .6, Type Six, and Fed. Spec. WW-P-541E/GEN.
 - 1. Product: Refer to Finish Schedule.
 - 2. Thickness: ¾" thick, edge details as indicated.
 - 3. Colors: Match Architect's control samples.
 - 4. Joint adhesive: Manufacturer's standard two-part adhesive kit to create inconspicuous, nonporous joints, with a chemical bond.
 - 5. Sealant: Manufacturer's standard mildew-resistant, FDA/UL recognized silicone sealant in color-matching or clear formulations.

2.2 CABINET HARDWARE AND ACCESSORY MATERIALS

- A. General: Provide cabinet hardware and accessory materials associated with architectural cabinets.
- B. Cabinet Hardware Items: Provide cabinet hardware as indicated on the Drawings.
- C. Exposed Hardware Finishes: Provide cabinet hardware finishes as indicated on the Drawings. Finishes shall comply with BHMA A156.18 for BHMA.
- D. For concealed hardware provide manufacturer's standard finish that complies with product class requirements of BHMA A156.9.

2.3 INSTALLATION MATERIALS

- A. Furring, Blocking, Shims, and Hanging Strips: Softwood or hardwood lumber, kiln dried to less than 15 percent moisture content.
- B. Screws: Select material, type, size, and finish required for each use. Comply with ASME B18.6.1 for applicable requirements.
 - 1. For metal framing supports, provide screws as recommended by metal-framing manufacturer.
- C. Nails: Select material, type, size, and finish required for each use. Comply with FS FF-N-105 for applicable requirements.
- D. Anchors: Select material, type, size, and finish required for each substrate for secure anchorage. 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.

2.4 FABRICATION, GENERAL

- A. General: Complete fabrication to maximum extent possible before shipment to Project site. Where necessary for fitting at site, provide allowance for scribing, trimming, and fitting.
 - 1. Interior Woodwork Grade: Custom Grade.
 - 2. Shop cut openings to maximum extent possible.
 - 3. Sand edges of cutouts to remove splinters and burrs.
 - 4. Seal edges of openings in countertops with a coat of varnish.
- B. Assemble casings in plant except where limitations of access to place of installation require field assembly.
- C. Wood Moisture Content: Comply with requirements of referenced quality standard for wood moisture content in relation to relative humidity conditions existing during time of fabrication and in installation areas.
- D. 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 3/4 inch thick or less: 1/16 inch.
 2. Edges of rails and similar members more than 3/4 inch thick: 1/8 inch.
- E. Complete fabrication, including assembly, finishing, and hardware application, before shipment to Project site to maximum extent possible. Disassemble components only as necessary for shipment and installation. Where necessary for fitting at site, provide ample allowance for scribing, trimming, and fitting.
- F. 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 and, where located in countertops and similar exposures, seal edges with a water-resistant coating.

2.5 LAMINATE-CLAD CABINETS

- A. Quality Standard: Comply with AWI Section 400 requirements for laminate-clad cabinets.
1. Grade: Custom.
- B. AWI Type of Cabinet Construction: Flush Overlay unless otherwise indicated.
- C. Laminate Cladding for Exposed Surfaces: High-pressure decorative laminate complying with the following requirements:
1. Horizontal Surfaces Other than Tops: HGS.
 2. Postformed Surfaces: HGP.
 3. Vertical Surfaces: HGS.
 4. Edges: HGS.
- D. Materials for Semi-exposed Surfaces:
1. Surfaces Other than Drawer Bodies: Thermoset decorative overlay.
 2. Drawer Sides and Backs: Thermoset decorative overlay.
 3. Drawer Bottoms: Thermoset decorative overlay.
- E. Concealed Backs of Panels with Exposed Plastic Laminate Surfaces: High-pressure decorative laminate, Grade BKL.
- F. Colors, Patterns, and Finishes: Provide materials and products as indicated on the Drawings.

2.6 SOLID-SURFACING-MATERIAL COUNTERTOPS

- A. Grade: Custom.
- B. Solid-Surfacing-Material Thickness: 3/4 inch.
- C. Colors, Patterns, and Finishes: Provide materials and products that result in colors of solid-surfacing material complying with the following requirements:
1. Match Architect's sample.
- D. Fabricate tops in one piece, unless otherwise indicated. Comply with solid-surfacing-material manufacturer's written recommendations for adhesives, sealers, fabrication, and finishing.

- E. Install integral sink bowls in countertops in shop.
- F. Drill holes in countertops for plumbing fittings and soap dispensers in shop.

PART 3 - EXECUTION

3.1 PREPARATION

- A. Condition woodwork to average prevailing humidity conditions in installation areas before installing.
- B. Before installing architectural woodwork, examine shop-fabricated work for completion and complete work as required, including back priming and removal of packing.

3.2 INSTALLATION

- A. Quality Standard: Install woodwork to comply with AWI Section 1700 for the same grade specified in Part 2 of this Section for type of woodwork involved.
- B. Install woodwork plumb, level, true, and straight with no distortions. Shim as required with concealed shims. Install to a tolerance of 1/8 inch in 96 inches for plumb and level (including tops).
- C. Scribe and cut woodwork to fit adjoining work and refinish cut surfaces or repair damaged finish at cuts.
- D. Anchor woodwork to anchors or blocking built in or directly attached to substrates. Secure to grounds, stripping and blocking with countersunk, concealed fasteners and blind nailing as required for complete installation. Use fine finishing nails for exposed nailing, countersunk and filled flush with woodwork and matching final finish where transparent finish is indicated.
- E. Cabinets: Install without distortion so that doors and drawers fit openings properly and are accurately aligned. Adjust hardware to center doors and drawers in openings and to provide unencumbered operation. Complete the installation of hardware and accessory items as indicated.
 - 1. Install cabinets with no more than 1/8 inch in 96-inch sag, bow, or other variation from a straight line.
- F. Countertops: Anchor securely to base units and other support systems as indicated. Caulk space between backsplash and wall with specified sealant.
 - 1. Install countertops with no more than 1/8 inch in 96-inch sag, bow, or other variation from a straight line.
 - 2. 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.

3.3 ADJUSTING AND CLEANING

- A. Repair damaged and defective woodwork where possible to eliminate functional and visual defects; where not possible to repair, replace woodwork. Adjust joinery for uniform appearance.

- B. Clean, lubricate, and adjust hardware.
- C. Clean woodwork on exposed and semi-exposed surfaces. Touch up shop-applied finishes to restore damaged or soiled areas.

3.4 PROTECTION

- A. Provide final protection and maintain conditions in a manner acceptable to fabricator and Installer that ensures that woodwork is without damage or deterioration at the time of Substantial Completion.

END OF SECTION

ASECTION 07 31 13

ASPHALT SHINGLES (Roof Replacement)

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

- A. All work performed under this section of the specifications shall be subject to the General Conditions of the Contract, and Division 1 General Requirements.

1.2 SUMMARY

- A. Section includes granular surfaced asphalt shingle roofing, including but not limited to the following:
 1. Moisture shedding underlayment.
 2. Eave, rake and ridge protection.
 3. Associated metal flashings and accessories.
 4. Removal of existing roofing materials.
 5. Replacement of wood fascia.
- B. It is not the intent to herein describe all of the details for asphalt roofing and flashing. Ensure that all items and details not otherwise specified, but shown on the drawings, or as otherwise required to achieve a complete watertight roofing installation, shall be provided under this Section at no additional cost to the Owner.

1.3 DEFINITION

- A. Roofing Terminology: See ASTM D1079 and glossary of NRCA's "The NRCA Roofing and Waterproofing Manual" for definitions of terms related to roofing work in this Section.

1.4 SUBMITTALS

- A. Submittals shall be in accordance with Section 01300.
- B. Product Data: Submit manufacturer's product data indicating material characteristics, performance criteria, and limitations.
- C. Samples: Submit two of each type shingle selected; two 12" x 12" of metal flashing indicating finish; two samples of 12" x 12" underlayment and water shield; and three samples of each type nail required for asphalt shingle and flashing.
- D. Manufacturer's Installation Instructions: Submit installation criteria and procedures.
- E. Manufacturer's Certificate: Certify that products meet or exceed specified requirements.
- F. Warranties: Special warranties specified in this Section.

1.5 SUBSTITUTIONS

- A. Substitutions shall be in accordance with Section 01 25 00.

1.6 PERFORMANCE REQUIREMENTS

- A. Shingles shall comply with ASTM D3462 and meet the following requirements:
 - 1. ASTM E108, Class A, fire exposure-test requirements.
 - 2. Pass ASTM D3161 wind-resistance-test requirements of 60 mpg.

1.7 ENVIRONMENTAL REQUIREMENTS

- A. Weather Limitations: Proceed with installation only when existing and forecasted weather conditions permit asphalt shingle roofing to be performed according to manufacturer's written instructions and warranty requirements.
 - 1. Install self-adhering ice and water dam protection sheet underlayment within the range of ambient and substrate temperatures recommended by manufacturer.
- B. Do not apply roofing membrane to damp or frozen deck surfaces.

1.8 DELIVERY, STORAGE, AND HANDLING

- A. Store roofing materials in a dry, well-ventilated, weathertight location according to asphalt shingle manufacturer's written instructions. Store underlayment rolls on end on pallets or other raised surfaces. Do not double-stack rolls.
- B. Handle, store, and place roofing materials in a manner to avoid significant or permanent damage to roof deck or structural supporting members.

1.9 WARRANTY

- A. Shingle Material Warranty: Manufacturer's standard form in which manufacturer agrees to repair or replace asphalt shingles that fail in materials within specified warranty period. Materials failures include manufacturing defects and failure of asphalt shingles to self-seal after a reasonable time.
 - 1. Material Warranty Period: 25 years from date of Substantial Completion, prorated, with first 5 years nonprorated.
- B. Workmanship and Product Warranty: In addition to the manufacturer's product warranty, provide a two (2) year written guarantee commencing from date of Architect's acceptance for the replacement of all defective work related to the roofing, including but not limited to asphalt shingle installation, felts, watershield, metal work and other related installed work.
- C. Wind-Speed Warranty: Asphalt shingles will resist blow-off or damage caused by wind speeds up to 60 mph.

PART 2 - PRODUCTS

2.1 GLASS-FIBER-REINFORCED ASPHALT SHINGLES

- A. Laminated-Strip Asphalt Shingles: ASTM D3462, laminated, multi-ply overlay construction, glass-fiber reinforced, mineral-granule surfaced, and self-sealing.
 - 1. Manufacturers: Subject to compliance with requirements, available manufacturers offering products that may be incorporated into the Work include, but are not limited to, the following:
 - a. Bird Roofing Company.
 - b. Celotex.
 - c. Atlas Roofing Corporation.
 - d. CertainTeed Corporation.
 - e. Elk Premium Building Products, Inc.; an ElkCorp company.
 - f. Emco Building Products Corp.
 - g. GAF Materials Corporation.
 - h. Owens Corning.
 - 2. Shingle size shall be square cut, three-tab and approximately 36" x 12" with 5" exposure. Use of larger metric sizes is prohibited.
 - 3. Color: As selected by Architect.

2.2 UNDERLAYMENT

- A. Felts: ASTM D226, Type I, No. 15 (minimum) asphalt-saturated organic felts, nonperforated.
- B. Ice-and Water Dam Protection Underlayment: Self-Adhering Sheet Underlayment, Polyethylene Faced: ASTM D1970, minimum of 40-mil-thick, slip-resisting, polyethylene-film-reinforced top surface laminated to SBS-modified asphalt adhesive, with release paper backing; cold applied
 - 1. "Ice and Water Shield" by W.R. Grace.
 - 2. "CCW WIP 400 Roofing Underlayment", manufactured by Carlisle Coatings & Waterproofing, Div. of Carlisle Companies Inc.

2.3 RIDGE VENT (ADD ALERNATE #1)

- A. "Vent-A-Ridge", product code: VAR, aluminum .019" thick with end caps by Alcoa Building Products. Color shall be as selected by Architect.

2.4 ACCESSORIES

- A. Fasteners:
 - 1. Shingle nails shall be hot-dipped galvanized or aluminum, 11- or 12-gage, barbed shank, 5/8" head, sharp pointed roofing nails of sufficient length to penetrate at least 3/4" into plywood sheathing or wood substrate.
 - a. Staples to secure asphalt shingles will not be permitted.
 - 2. Felt underlayment nails shall be aluminum, stainless-steel, or hot-dip galvanized steel wire with low profile capped heads or disc caps, 1-inch minimum diameter.
 - 3. Nails used for fastening aluminum flashings shall be approved and compatible nails of the stronghold type, with large, flat heads, annular threads

and needle points. They shall not be smaller than No. 12 Stubbs gage, and of sufficient length to penetrate wood blocking not less than 1".

- B. Plastic Cement: ASTM D4586, Type II asphalt type with mineral fiber components, free of asbestos and toxic solvents, capable of setting within 24 hours at temperatures of 75 degrees F and 50 percent RH.
- C. Bituminous Paint: Acid and alkali resistant type; black color.

2.5 FLASHING, GUTTERS, LEADERS AND TRIM

- A. General: All miscellaneous formed aluminum flashings and items required for the project in various thicknesses and profiles as indicated on the drawings or required to suit conditions shall be as applicable to SMACNA details and as approved by the Architect. In absence of thicknesses shown, provide minimum .040" thick flashings and members.
- B. Gutter and Rain Leader: Gutter shall be fabricated using minimum .050" aluminum sheet stock to profiles 5" x 6" using Style B rectangular design as described in SMACNA. Gutter shall be fabricated in long lengths as practical provided with expansion joint covers and end closures, and shall include 3/32" x 1-1/4" wide aluminum gutter spacers equal to Alcoa, located 2'-6" on centers. Provide 3" diameter .050" aluminum rain leader including basket strainer and all required brackets and elbows. Provide discharge outlet and precast concrete splash block at each rain leader.
- C. Aluminum Eaves Strip: Shall be standard profile with roof flange forming projected edge with fascia and drip, as approved by the Architect. Members shall be profiles in 10'-0" lengths formed of .030" thick aluminum.

2.6 PRECAST CONCRETE SPLASH BLOCKS

- A. Precast concrete splash blocks located at roof leaders shall be 12" x 12" x 2" thick. Concrete shall have a twenty-eight day compressive strength of 2500 psi. Concrete shall be air entrained with smooth troweled surfaces and edges.

2.7 EXTERIOR TRIM

- A. Wood Trim and Fascia:
 - 1. All exterior wood trims shall be thoroughly seasoned kiln dried Northern or Western White Pine, C Select Grade, free from all knots, (except that small, sound knots that can be covered with a five-cent piece may appear on the face), pitch or pitch pockets, shakes, pitch, checks, wane and excess of sap.
 - 2. Do not use plain-sawn lumber with exposed, flat surfaces more than 3 inches wide.
 - 3. Backout or groove backs of flat trim members and kerf backs of other wide, flat members, except for members with ends exposed in finished work.
 - 4. Back-prime all exterior wood finish carpentry.
- B. Plastic Trimboard (Simulated Wood): (ADD ALTERNATE #2)

1. Acceptable Product: AZEK Trimboards manufactured by Vycom Corporation, Moosic, PA, (866) 549-6900.
2. Material: Free foam cellular PVC material with a small cell microstructure and density of .55 grams/cm³.
3. Sealants: Use urethane polyurethane or acrylic based sealants without silicone.

2.8 FINISH:

- A. All aluminum items specified and referred to as stated above shall have exposed surfaces finished with a factory applied fluoropolymer coating equal to "Kynar 500" meeting AAMA 2605 specifications. Coating shall consist of a pre-treatment and multi-coat thermo-cured system; primer and color coating.
Color: White

2.9 FABRICATION

- A. Form flashings to profiles indicated on Drawings, and to protect roofing materials from physical damage and shed water.
- B. Form flashing sections square and accurate to profile, in maximum possible lengths, free from distortion or defects detrimental to appearance or performance.
- C. Hem exposed edges of flashings minimum 1/4-inch on underside.
- D. Apply bituminous paint on concealed surfaces of flashings.

PART 3 - EXECUTION

3.1 FOREIGN OBJECT DAMAGE (FOD)

- A. Aircraft and aircraft engines are subject to FOD from debris and waste material lying on airfield pavements. Remove all such materials that may appear on operational aircraft pavements due to the Contractor's operations. If necessary, the Airport Authority may require the Contractor to install a temporary barricade at the Contractor's expense to control the spread of FOD potential debris. The barricade shall include a fence covered with a fabric designed to stop the spread of debris. Anchor the fence and fabric to prevent displacement by wind, jet, or prop blasts. Remove barricade when no longer required.

3.2 REMOVAL OF EXISTING WORK

- A. Work to be removed to make ready for new asphalt shingle work include but not limited to the removal of all existing asphalt shingles and related flashings, gutters and leaders.
- B. Removal work shall include the examination of the existing wood deck, fascia and trim to determine the scope of replacement necessary to provide an acceptable

surface and trim as approved by the Architect. Replacement work shall be done under the scope of this section, and shall include removal of all unacceptable wood sheathing, fascias and wood trim, replaced with exterior grade plywood, wood strips, and boarding depending on the field conditions for roof; and No. 1 pine for fascia and trim replacement. All wood thicknesses shall match existing conditions.

- B. In addition to the work outlined above, include re-nailing all loose nails and or replacing with additional nails to make the sheathing tight and properly secured to the structural framing.
- C. All existing asphalt shingle work to be removed which is located at adjacent surface to remain shall be removed with special care to prevent damage of the remaining adjacent work.
- D. It is the responsibility of this trade to make watertight all areas and after the removal operation as specified herein. Any damage resulting from the work performed by this trade shall be paid for, without cost to the Owner.
- E. Attention is directed not to disturb or attempt removal of any discovered hazardous materials or contaminated substances. Immediately notify both the Owner and the Architect upon discovery of such conditions. Removal or containment of the hazardous materials or contaminated substances shall be performed by an abatement specialist under separate contract with the Owner.
- F. Remove any unused or abandoned vent pipes through roof. Terminate below line of roof and repair holes with sheathing to match existing.
- G. Disposal of material shall be by tripod type hoist with suitable containers and/or enclosed chutes. Material shall not be thrown off the roof. Materials to be placed in covered containers or dumpsters. Take all necessary measure to ensure materials or other debris cannot blow onto Airport secure area. Keep work area clean and clear of all debris.
- H. Dispose of all materials in accordance with State, Local and Environmental regulations.

3.3 EXAMINATION

- A. Examine substrates, areas, and conditions, with Installer present, for compliance with requirements for installation tolerances and other conditions affecting performance of work.
- B. Verify that substrate is sound, dry, smooth, free of ridges, warps or voids, clean, sloped for drainage, and completely anchored; and that provision has been made for flashings and penetrations through asphalt shingles.
- C. Verify roof penetrations and plumbing stacks are in place and flashed to deck surface.

3.4 UNDERLAYMENT INSTALLATION

- A. Ice and Water Dam Underlayment: Shall be installed continuously at eaves, rake and both sides of ridge, 36" wide in single sheet, installed in compliance with manufacturer's recommendations.
- B. Single-Layer Felt Underlayment: Install single layer of felt underlayment on roof deck perpendicular to roof slope in parallel courses. Lap sides a minimum of 2 inches over underlying course. Lap ends a minimum of 4 inches. Stagger end laps between succeeding courses at least 72 inches.
 - 1. Fasten with felt underlayment nails.
 - 2. Nailing pattern shall comply with shingle manufacturer's recommendation.
- C. Protect unused underlayment from weather, sunlight, and moisture when left overnight or when roofing work is not in progress.

3.5 METAL FLASHING AND ACCESSORIES INSTALLATION

- A. Workmanship shall be in accordance with SMACNA publication specifications. All flashing shall be done in accordance with the recommended practice and standards set forth in the industry and shall be placed without use of exposed nails on face.
- B. Provide continuous eaves flashing with fascia drip extending onto roof a minimum of 5". Include flashings at eave returns at building ends. Provide and install continuous gutters in profiles shown including straps, baskets, rain leaders with elbows and leader straps to complete the work. Include installation of all other metal trim work indicated or necessary to complete the work in accordance with project conditions as approved by the Architect.
- C. Sheet metal work shall be adequate to provide water and weathertight work. Lines, arises, and angles shall be sharp and true. Plane surfaces shall be free from waves and buckles. Seams shall overlap in the direction of the flow. Joints and seams in plane surfaces shall be avoided as far as possible. Provide all profiles and dimensions indicated or inferred on the drawings to complete the flashing work.
- D. Ample provision shall be made for expansion and contraction. All exposed surfaces shall be cleaned as each section of the work is completed. Care shall be exercised to prevent staining or discoloring exposed surrounding surfaces. Work so damaged shall be cleaned, repaired or replaced.
- E. Except as otherwise indicated or specified, gutters, fascias, trim eaves strip and simiarmembers shall be made from 10'-0" long sections. Indicate spacings and locations and detail proposed slip joints on shop drawings. Provide other expansion joints as required.
- F. Exposed edges at all condition shall be doubled back ½" in such a manner as to conceal them and to provide stiffness. Expose no nails in face of finished work; providing receiver strips, cleats and the like to secure fascias, trim, etc.

- G. Flashings shall be installed in such a manner as will prevent galvanic action with other dissimilar adjacent metals, by priming with bituminous paint or other approved methods.
- H. Install gutters along entire length of front of building. Pitch gutters at 1/8" per foot or as required by code to slope towards rain leaders located at piers between doors. Install gutters and leaders with all necessary brackets, spacers and fasteners. Seal joints with sealant. Install splash block at each rain leader location.

3.6 ASPHALT SHINGLE INSTALLATION

- A. Install starter strip along lowest roof edge, consisting of an inverted asphalt shingle strip and at least 9 inches wide with self-sealing strip face up at roof edge.
 - 1. Extend asphalt shingles 3/4 inch over fascia at eaves and rakes.
 - 2. Install starter strip along rake edge.
- B. Fasten asphalt shingle strips with a minimum of four roofing nails located according to manufacturer's written instructions.
- C. At valleys, lay a 24" wide valley liner of Carlisle EPDM membrane conforming to roofing manufacturer's details, flashing nailed at outer edges and set in adhesive. Apply valley shingles by weaving each course in turn over the valley, extending it along the adjoining roof deck at least 12". Install shingles using the alignment notches provided (see application instructions) alternately weaving the valley shingles over each other.
- D. Ridge Vents: (ADD ALTERNATE 1) Install continuous ridge vents over asphalt shingles according to manufacturer's written instructions. Fasten with roofing nails of sufficient length to penetrate sheathing.
- E. Ridge Cap Shingles: Maintain same exposure of cap shingles as roofing shingle exposure. Lap cap shingles at ridges to shed water away from direction of prevailing winds. Fasten with roofing nails of sufficient length to penetrate sheathing.
- F. Install shingles to provide uniform distribution of color blend.
- G. Coordinate installation of roof mounted components or work projecting through roof with weather tight placement of Counterflashings.
- H. Complete installation to provide weather tight service.

3.7 RIDGE VENT INSTALLATION (ADD ALTERNATE 1)

- A. Remove existing ridge cap shingles
- B. Snap chalk lines on both sides of the ridgeline to allow 1 1/2" horizontal dimension between.
- C. Cut out ventilation opening along the ridge at the chalk lines stopping 12" short of outside walls.

- D. Remove cut out portion of sheathing and shingles leaving a clean open slot. .
- E. Install vent on ridge starting ½” from the gable end. Align center of vent with center of ridge.
- F. Attach vent to roof every 8” on center. Slide lock next piece into first piece, align and attach to roof. Continue to end. Cut last piece to suit. Install end caps.

3.8 FASCIA INSTALLATION (BASE BID)

- A. Remove existing wood fascia at rear of building.
- B. Install new wood fascia board to match existing. Fascia shall be back primed.
- C. Install the work plumb, level, true and straight with no distortions. Shim as required using concealed shims. Install to a tolerance of 1/8-inch in 8'-0” for plumb and level (including countertops); and with 1/16-inch maximum offset in flush adjoining surface, 1/8-inch maximum offsets in revealed adjoining surfaces.
- D. Scribe and cut work to fit adjoining work, refinish cut surfaces and repair damaged finish at cuts.
- E. Anchor woodwork to anchor or blocking built-in or directly attached to substrates. Secure to grounds, stripping and blocking with countersunk, concealed fasteners and blind nailing as required for a complete installation. Fasteners to be punched or countersunk and filled flush with woodwork.
- F. Miter inside and outside corners. Scarf joints.
- G. Install continuous pieces in longest possible lengths.
- H. Carefully scribe work that is against other building materials, leaving gaps of 1/16-inch maximum.
- I. Prime paint new fascia board and bare patches on existing trim boards. Thoroughly prep and paint fascia and rake boards on entire building with two coats exterior grade semi-gloss paint compatible with existing finish.

3.9 FASCIA INSTALLATION (ADD ALTERNATE #2)

- A. Remove existing wood fascia and rake boards on entire building.
- B. Install new plastic wood (simulated wood) trim boards to match existing sizes and in accordance with manufacturer's recommendations.
- C. Install the work plumb, level, true and straight with no distortions. Shim as required using concealed shims. Install to a tolerance of 1/8-inch in 8'-0” for plumb and level (including countertops); and with 1/16-inch maximum offset in flush adjoining surface, 1/8-inch maximum offsets in revealed adjoining surfaces.

- D. Scribe and cut work to fit adjoining work, refinish cut surfaces and repair damaged finish at cuts.
- E. Anchor woodwork to anchor or blocking built-in or directly attached to substrates. Secure to grounds, stripping and blocking with countersunk, concealed fasteners and blind nailing as required for a complete installation. Fasteners to be punched or countersunk and filled flush with woodwork.
- F. Miter inside and outside corners. Scarf joints.
- G. Install continuous pieces in longest possible lengths. Glue joints with manufacturer's adhesive and clamp pieces until set. Allow for expansion of 1/8" per 18 linear feet of continuous run and seal gaps with compatible sealant.
- H. Carefully scribe work that is against other building materials, leaving gaps of 1/16-inch maximum.
- I. Paint fascia with two coats 100% exterior grade semi-gloss acrylic latex paint in accordance with manufacturer's recommendations.

3.10 PROTECTION OF INSTALLED CONSTRUCTION

- A. Do not permit traffic over finished roof surface.

END OF SECTION

SECTION 07 84 00

FIRESTOPPING

PART 1 - GENERAL

1.1 Related Documents: The requirements of Division 1 are hereby made a part of this section as if fully repeated herein.

1. DIRECT PURCHASING: This Section is subject to the terms and procedures of Direct Purchasing, whereby the Owner reserves the right to recover the sales tax on materials by purchasing directly the materials required for this Section. Issuance of Purchase Orders by the Owner shall not relieve the Contractor of any of his responsibilities regarding material purchases or installations, with the exception of the payments for the materials as purchased.

1.2 SUMMARY

A. Section Includes:

1. Firestopping: Labor, materials, products, equipment, and services to supply and install fire stopping and smoke seal work for the entire project. Products include sealants, mortars, intumescent caulk, pillows, collars, and firestop devices for the following:
 - a. 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.
 - b. Gaps between fire-rated floor slabs and exterior walls.
 - c. Gaps located within expansion joints.
 - d. Openings at each floor level in fire-rated shafts or stairwells.
 - e. Gaps between the tops of fire rated walls and underside of fire rated floor or roof assemblies.
2. Smokestopping: Smokestopping of penetrations through non-fire-rated smoke barriers and construction enclosing compartmentalized areas involving both empty openings and openings containing penetrating items.

B. Related Sections:

1. Section 07 92 00 - Joint Sealants: Sealants for non-fire-rated openings.
2. Section 09 21 16 - Gypsum Board Assemblies: Acoustical sealant.

1.3 REFERENCES

A. Reference Standards:

1. ANSI/UL 1479 - Fire Tests of Through-Penetration Firestops; 1994.
2. ANSI/UL 2079 - Tests for Fire Resistance of Building Joint Systems; 1998.
3. ASTM E 814 - Test Method of Fire Tests of Through Penetration Firestops; 2000.
4. ASTM E 1966 - Standard Test Method for Fire-Resistive Joint Systems; 2001.
5. ULC-S115 - Fire Tests of Firestop Systems; 1995 (R2001).

1.4 SUBMITTALS

A. Product Data: Manufacturer's data sheets on each product to be used, including:

1. Tested systems or design for each different firestopping condition.

2. Product data for specified products indicating product characteristics, performance, and limitation criteria.
 3. Preparation instructions and recommendations.
 4. Storage and handling requirements and recommendations.
 5. Installation instructions and methods.
 6. Manufacturer's certification, if requested.
- B. Shop Drawings: Submit shop drawings showing typical installation details including reinforcement, anchorage, fastenings and method of installation for each type of firestopping condition.
- C. Samples: If requested, submit samples of each type of firestopping systems, smoke seals and accessories, indicating installation locations.

1.5 QUALITY ASSURANCE

- A. Manufacturer Qualifications:
1. Company specializing in manufacturing products of this Section with minimum 3 years documented experience.
 2. Company quality management system registered in accordance with the requirements of ISO 9001:1994.
- B. Installer Qualifications:
1. Company with minimum 3 years experience in the installation of specified materials on comparable projects.
 2. Written approval of firestopping material manufacturer(s).

1.6 DELIVERY, STORAGE, AND HANDLING

- A. Deliver materials in manufacturer's sealed and labeled containers. Handle and store materials in accordance with manufacturer's instructions.
- B. Store and dispose of solvent-based materials, and materials used with solvent-based materials, in accordance with requirements of local authorities having jurisdiction.

1.7 PROJECT CONDITIONS

- A. Comply with manufacturer's recommended requirements for temperature, relative humidity, and substrate moisture content during application and curing of materials.
- B. Ventilate solvent based materials in accordance with manufacturer's instructions by natural means or, if necessary, by forced air circulation.

PART 2 - PRODUCTS

2.1 MANUFACTURERS

- A. Basis of Design Product: Firestopping products are based on products as manufactured by A/D Fire Protection Systems.
1. Subject to compliance with requirements, manufacturers offering products that may be incorporated into the work include, but are not limited to the following:

- a. Hilti, Inc.
- b. 3M Company.
- c. STI Specified Technologies, Inc.
- d. Tremco.
- e. USG.

2.2 SYSTEM REQUIREMENTS

- A. Firestopping - General: Provide complete systems of asbestos-free firestopping capable of maintaining an effective barrier against flame, smoke and gases, listed by UL, WH, ULC, or FM, or other independent testing agency, and acceptable to authorities having jurisdiction.
1. Fire Resistance Ratings: As required to maintain fire resistance of fire rated assemblies; ratings of assemblies are indicated on drawings.
 2. Materials: Provide materials of type, thickness, width and density to provide and maintain fire resistance rating.
 3. Through Penetrations: Provide systems meeting ANSI/UL 1479, ULC-S115 or ASTM E 814, completely filling annular spaces to prevent the passage of flame, smoke and gases through the opening in the fire separation in which it is installed.
 4. Building Joints: Provide systems meeting ANSI/UL 2079 or ASTM E 1966.
 5. 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.

2.3 MATERIALS

- A. Non-Sagging Firestopping Sealant: Silicone-based single component sealant, curing to durable, flexible, watertight, silicone rubber; A/D FIREBARRIER Silicone.
1. VOC Content: Less than 0.69 pounds/gallon (0.08 kg/L), when tested in accordance with ASTM D 3960.
 2. Hardness: 12, when tested in accordance with ASTM D 2240, Type A durometer.
 3. Tear Strength: 20 pounds/inch (3.5 kN/m), when tested in accordance with ASTM D 624, Die B.
 4. Elongation at Break: 600 percent, when tested in accordance with ASTM D 412.
 5. ASTM C 920 Classification: Type S, Grade NS, Class 25, Uses NT, G, A, and M.
 6. Application Temperature Range: 0 to 120 degrees F (minus 18 to 50 degrees C).
 7. Performance Temperature Range: Minus 50 to 300 degrees F (minus 45 to 149 degrees C).
 8. Color: Red.
- B. Pourable, Self-Leveling Firestopping Sealant: Silicone-based single component sealant, self leveling, curing to durable, flexible, watertight, silicone rubber; A/D FIREBARRIER Silicone SL.
1. VOC Content: Less than 0.50 pounds/gallon (0.06 kg/L)), when tested in accordance with ASTM D 3960.
 2. Hardness: 5, when tested in accordance with ASTM D 2240, Type A durometer.
 3. Elongation at Break: 600 percent, when tested in accordance with ASTM D 412.
 4. Tensile Strength: 140 psi (965 kPa) , when tested in accordance with ASTM D 412.
 5. Movement Capability: Plus 100 / minus 50 percent, when tested in accordance with ASTM C 719.

6. Adhesion in Peel: 15.7 pounds (7.1 kg), when tested in accordance with ASTM C 794, 180, 2 inches/minute, mortar, cohesive failure.
 7. Application Temperature Range: 0 to 120 degrees F (minus 18 to 50 degrees C).
 8. Performance Temperature Range: Minus 50 to 300 degrees F (minus 45 to 149 degrees C).
 9. Color: Red.
- C. Firestopping Mortar: Fiber reinforced, foamed cement mortar; A/D FIREBARRIER Mortar.
1. Compressive Strength: 430 psi (2965 kPa), minimum.
 2. Shrinkage: None.
 3. Color: Charcoal gray.
- D. Intumescent Firestopping Caulk: Water based, single component elastomeric sealant; A/D FIREBARRIER Intumescent Caulk.
1. VOC Content: 1.2 pounds/gallon (138 g/L), when tested in accordance with ASTM D 3960.
 2. Hardness: 45, when tested in accordance with ASTM D 2240, Type A durometer.
 3. Elongation at Break: 110 percent, when tested in accordance with ASTM D 412.
 4. Tensile Strength: 160 psi (1103 kPa), when tested in accordance with ASTM D 412.
 5. Effects of Accelerated Weathering, UV or Cold: No cracking, when tested in accordance with ASTM C 920.
 6. Color: Orange.
- E. Firestopping Collars: Steel collar with intumescent silicone strip for penetration protection; A/D FIREBARRIER Collars.
- F. Firestopping Pillows: Intumescent layer between non-combustible insulation, sealed together in polyethylene shell; A/D FIREBARRIER Pillows.
- 2.4 ACCESSORIES
- A. Accessories: Provide components needed to install each firestopping system. Use only components specified by the firestopping manufacturer and listed in the design for the fire resistance rated system.
- B. Damming and Backup Materials, Supports and Anchoring Devices: Non-combustible, to manufacturer's recommendations and in accordance with the tested system being installed as acceptable to jurisdictional authorities.
- C. Primers: As required by firestopping manufacturer and compatible with selected system and contiguous materials.
- D. Water: Potable.
- E. Tape: Pressure sensitive masking tape as recommended by the firestopping manufacturer.

PART 3 - EXECUTION

3.1 EXAMINATION

- A. Examine substrates, openings, voids, adjoining construction and project conditions. Confirm compatibility of surfaces scheduled to receive firestopping.
- B. Verify that work within opening has been completed before installing firestopping. Coordinate with work of other trades so that firestopping applications can be inspected prior to being covered by subsequent construction.
- C. Verify that penetrating elements are securely fixed and properly located with the proper space allowance between penetrations and surfaces of openings.
- D. Do not proceed until substrate and project conditions are satisfactory.

3.2 PREPARATION

- A. Clean surfaces to receive firestopping thoroughly. Verify that surfaces are 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.
- B. Prime substrates in accordance with manufacturer's written instructions or recommendations. Confine primers to areas of bond; do not allow spillage or migration onto exposed surfaces.
- C. Do not apply firestopping and smoke seals to surfaces previously painted or treated with sealers, curing compounds, water repellent or other coatings unless tests have been performed to ensure compatibility of materials. Remove coatings as required.
- D. Provide anchoring devices, back-up materials, clips, sleeves, supports and other related materials used in the actual fire tests.
- E. Mask where necessary to prevent firestopping materials from contacting adjoining surfaces that will remain exposed upon completion of work. Remove tape as soon as it is possible to do so without disturbing firestopping's seal with substrates.
- F. Verify that submittals have been completed before starting installation.

3.3 INSTALLATION

- A. Install in strict accordance with manufacturer's instructions for the specified or selected designs for the type of assembly being firestopped, the type of penetrant, and the condition of the opening in each case.
 - 1. Obtain the manufacturer's instructions for conditions not fully covered by printed instructions.
 - 2. Record in writing all oral instructions received.
- B. Install firestopping with sufficient pressure to properly fill and seal openings for effective smoke seal.
- C. Remove excess firestopping material promptly.

- D. Damming Boards: Install forming or damming materials and other accessories required to support fill materials during their application; position to produce the shapes and depths required to achieve fire ratings of through-penetration firestop systems.
 - 1. Combustible Type: For temporary dams only, remove after firestopping material has cured, unless permitted as permanent by design and by code.
 - 2. Non-Combustible Type: For temporary or permanent dams. Provide non-combustible type wherever damming material cannot be removed after applying firestopping materials.
- E. Fill, Void, and Cavity Materials: Use materials recommended by the firestopping manufacturer to seal gaps created by non-combustible type damming boards and to seal around cables, conduits, pipes, and where void filler material becomes part of the fire rated assembly.
- F. Sealant: Use non-sagging type where void cannot be dammed sufficiently to contain sealant until cured.
 - 1. Install damming material or mineral wool as required.
 - 2. Apply sealant to minimize air voids and to ensure sealant is in full contact with penetrating items and surrounding surfaces.
 - 3. Tool sealant to ensure substrate contact if required.
 - 4. Remove excess sealant in accordance with manufacturer's recommendations. Do not exceed minimum system or design thickness by more than 25 percent.
- G. Mortar: Install damming material as required. Mix mortar in strict accordance with manufacturers instructions. Fill openings to minimum thickness as recommended by manufacturer and by tested system or selected design to achieve required fire rating.
- H. Firestopping Mineral Wool: Install by compressing material to the minimum compression required tested system or selected design. Apply firestopping in sufficient thickness, depth and density so as to achieve the required fire resistance rating.
- I. Firestopping Devices, Collars, and Pillows: Install in accordance with manufacturer's instructions, to achieve specified fire resistance.

3.4 FIELD QUALITY CONTROL

- A. Inspect completed installations prior to concealing or enclosing an area containing firestopping materials.
- B. Notify Owner and authorities having jurisdiction prior to concealing or enclosing an area containing firestopping materials.
- C. Repair defective and damaged work as required to ensure compliance with the Contract Documents.

3.5 CLEANING AND PROTECTION

- A. Upon completion of this work, remove all unused materials, equipment and debris from the site.
- B. Protect installed work from damage or contamination until Substantial Completion.

END OF SECTION

SECTION 07 92 00

JOINT SEALANTS

PART 1 - GENERAL

1.1 Related Documents: The requirements of Division 1 are hereby made a part of this section as if fully repeated herein.

1. **DIRECT PURCHASING:** This Section is subject to the terms and procedures of Direct Purchasing, whereby the Owner reserves the right to recover the sales tax on materials by purchasing directly the materials required for this Section. Issuance of Purchase Orders by the Owner shall not relieve the Contractor of any of his responsibilities regarding material purchases or installations, with the exception of the payments for the materials as purchased.

1.2 SUMMARY

- A. Section Includes: Joint sealants for the following applications:
 1. Exterior joints in vertical surfaces and horizontal nontraffic surfaces.
 2. Exterior joints in horizontal traffic surfaces.
 3. Interior joints in vertical surfaces and horizontal nontraffic surfaces.
- B. Related Sections:
 1. Section 07 84 00 - Firestopping: Sealants for fire-rated joint applications.
 2. Section 08 80 00 - Glazing: Glazing sealants.

1.3 PERFORMANCE REQUIREMENTS

- A. Provide elastomeric joint sealants that establish and maintain watertight and airtight continuous joint seals without staining or deteriorating joint substrates.
- B. Provide joint sealants for interior applications that establish and maintain airtight and water-resistant continuous joint seals without staining or deteriorating joint substrates.

1.4 SUBMITTALS

- A. Product Data: For each joint-sealant product indicated.
- B. Samples for Initial Selection: Manufacturer's color charts consisting of strips of cured sealants showing the full range of colors available for each product exposed to view.
- C. Samples for Verification: For each type and color of joint sealant required, provide Samples with joint sealants in 1/2-inch-wide joints formed between two 6-inch- long strips of material matching the appearance of exposed surfaces adjacent to joint sealants.
- D. Product Certificates: For each type of joint sealant and accessory, signed by product manufacturer.
- E. SWRI Validation Certificate: For each elastomeric sealant specified to be validated by SWRI's Sealant Validation Program.

- F. Qualification Data: For Installer and testing agency.
- G. Preconstruction Field Test Reports: Indicate which sealants and joint preparation methods resulted in optimum adhesion to joint substrates based on preconstruction testing specified in "Quality Assurance" Article.
- H. Compatibility and Adhesion Test Reports: From sealant manufacturer, indicating the following:
 - 1. Materials forming joint substrates and joint-sealant backings have been tested for compatibility and adhesion with joint sealants.
 - 2. Interpretation of test results and written recommendations for primers and substrate preparation needed for adhesion.
- I. Field Test Report Log: For each elastomeric sealant application.
- J. Product Test Reports: Based on comprehensive testing of product formulations performed by a qualified testing agency, indicating that sealants comply with requirements.
- K. Warranties: Special warranties specified in this Section.

1.5 QUALITY ASSURANCE

- A. Installer Qualifications: Manufacturer's authorized Installer who is approved or licensed for installation of elastomeric sealants required for this Project.
- B. Source Limitations: Obtain each type of joint sealant through one source from a single manufacturer.
- C. Preconstruction Compatibility and Adhesion Testing: Submit to joint-sealant manufacturers, for testing indicated below, samples of materials that will contact or affect joint sealants.
 - 1. Use ASTM C 1087 or manufacturer's standard test method to determine whether priming and other specific joint preparation techniques are required to obtain rapid, optimum adhesion of joint sealants to joint substrates.
 - 2. Submit not fewer than eight pieces of each type of material, including joint substrates, shims, joint-sealant backings, secondary seals, and miscellaneous materials.
 - 3. Schedule sufficient time for testing and analyzing results to prevent delaying the Work.
 - 4. For materials failing tests, obtain joint-sealant manufacturer's written instructions for corrective measures including use of specially formulated primers.
- D. Product Testing: Obtain test results for "Product Test Reports" Paragraph in "Submittals" Article from a qualified testing agency based on testing current sealant formulations within a 36-month period preceding the commencement of the Work.
 - 1. Testing Agency Qualifications: An independent testing agency qualified according to ASTM C 1021 to conduct the testing indicated, as documented according to ASTM E 548.
 - 2. Test elastomeric joint sealants for compliance with requirements specified by reference to ASTM C 920, and where applicable, to other standard test methods.
 - 3. Test elastomeric joint sealants according to SWRI's Sealant Validation Program for compliance with requirements specified by reference to ASTM C 920 for adhesion and cohesion under cyclic movement, adhesion-in-peel, and indentation hardness.
- E. Test other joint sealants for compliance with requirements indicated by referencing standard specifications and test methods.

- F. Preconstruction Field-Adhesion Testing: Before installing elastomeric sealants, field test their adhesion to Project joint substrates as follows:
1. Locate test joints where indicated on Project or, if not indicated, as directed by Architect.
 2. Conduct field tests for each application indicated below:
 - a. Each type of elastomeric sealant and joint substrate indicated.
 - b. Each type of nonelastomeric sealant and joint substrate indicated.
 3. Notify Architect seven days in advance of dates and times when test joints will be erected.
 4. Arrange for tests to take place with joint-sealant manufacturer's technical representative present.
 - a. Test Method: Test joint sealants according to Method A, Field-Applied Sealant Joint Hand Pull Tab, in Appendix X1 in ASTM C 1193.
 - 1) For joints with dissimilar substrates, verify adhesion to each substrate separately; extend cut along one side, verifying adhesion to opposite side. Repeat procedure for opposite side.
 5. Report whether sealant in joint connected to pulled-out portion failed to adhere to joint substrates or tore cohesively. Include data on pull distance used to test each type of product and joint substrate. For sealants that fail adhesively, retest until satisfactory adhesion is obtained.
 6. Evaluation of Preconstruction Field-Adhesion-Test Results: Sealants not evidencing adhesive failure from testing, in absence of other indications of noncompliance with requirements, will be considered satisfactory. Do not use sealants that fail to adhere to joint substrates during testing.
- G. Preinstallation Conference: Conduct conference at Project site to comply with requirements in Section 01 31 00 - Project Management and Coordination.

1.6 PROJECT CONDITIONS

- A. Do not proceed with installation of joint sealants under the following conditions:
1. When ambient and substrate temperature conditions are outside limits permitted by joint-sealant manufacturer or are below 40 deg F.
 2. When joint substrates are wet.
 3. Where joint widths are less than those allowed by joint-sealant manufacturer for applications indicated.
 4. Contaminants capable of interfering with adhesion have not yet been removed from joint substrates.

1.7 WARRANTY

- A. Special Installer's Warranty: Installer's standard form in which Installer agrees to repair or replace elastomeric joint sealants that do not comply with performance and other requirements specified in this Section within specified warranty period.
1. Warranty Period: Two (2) years from date of Substantial Completion.
- B. Special Manufacturer's Warranty: Manufacturer's standard form in which elastomeric sealant manufacturer agrees to furnish elastomeric joint sealants to repair or replace those that do not comply with performance and other requirements specified in this Section within specified warranty period.

1. Warranty Period: Twenty (20) years from date of Substantial Completion.
- C. Special warranties specified in this Article exclude deterioration or failure of elastomeric joint sealants from the following:
1. Movement of the structure resulting in stresses on the sealant exceeding sealant manufacturer's written specifications for sealant elongation and compression caused by structural settlement or errors attributable to design or construction.
 2. Disintegration of joint substrates from natural causes exceeding design specifications.
 3. Mechanical damage caused by individuals, tools, or other outside agents.
 4. Changes in sealant appearance caused by accumulation of dirt or other atmospheric contaminants.

PART 2 - PRODUCTS

2.1 MATERIALS, GENERAL

- A. Compatibility: Provide joint sealants, backings, and other related materials that are compatible with one another and with joint substrates under conditions of service and application, as demonstrated by sealant manufacturer, based on testing and field experience.
- B. Colors of Exposed Joint Sealants: As selected by Architect from manufacturer's full range.

2.2 ELASTOMERIC JOINT SEALANTS

- A. Elastomeric Sealants: Comply with ASTM C 920 and other requirements indicated for each liquid-applied chemically curing sealant specified, including those referencing ASTM C 920 classifications for type, grade, class, and uses related to exposure and joint substrates.
- B. Stain-Test-Response Characteristics: Where elastomeric sealants are specified to be nonstaining to porous substrates, provide products that have undergone testing according to ASTM C 1248 and have not stained porous joint substrates indicated for Project.

2.3 LATEX JOINT SEALANTS

- A. Latex Sealant LS-1: Comply with ASTM C 834, Type P, Grade NF (No silicone additives, mildew resistant).

2.4 ACOUSTICAL JOINT SEALANTS

- A. Acoustical Sealant for Exposed and Concealed Joints AS-1: Manufacturer's standard nonsag, paintable, nonstaining latex sealant complying with ASTM C 834 that effectively reduces airborne sound transmission through perimeter joints and openings in building construction as demonstrated by testing representative assemblies according to ASTM E 90.

2.5 JOINT-SEALANT BACKING

- A. General: Provide sealant backings of material and type that are nonstaining; are compatible with joint substrates, sealants, primers, and other joint fillers; and are approved for applications indicated by sealant manufacturer based on field experience and laboratory testing. Provide backer of dimension 25% larger than opening width.

- B. Cylindrical Sealant Backings: ASTM C 1330, Type C (closed-cell material with a surface skin) O (open-cell material) B (bicellular material with a surface skin) or any of the preceding types, as approved in writing by joint-sealant manufacturer for joint application indicated, and of size and density to control sealant depth and otherwise contribute to producing optimum sealant performance:
- C. Bond-Breaker Tape: Polyethylene tape or other plastic tape recommended by sealant manufacturer for preventing sealant from adhering to rigid, inflexible joint-filler materials or joint surfaces at back of joint where such adhesion would result in sealant failure. Provide self-adhesive tape where applicable.

2.6 MISCELLANEOUS MATERIALS

- A. Primer: Material recommended by joint-sealant manufacturer where required for adhesion of sealant to joint substrates indicated, as determined from preconstruction joint-sealant-substrate tests and field tests.
- B. Cleaners for Nonporous Surfaces: Chemical cleaners acceptable to manufacturers of sealants and sealant backing materials, free of oily residues or other substances capable of staining or harming joint substrates and adjacent nonporous surfaces in any way, and formulated to promote optimum adhesion of sealants to joint substrates.
- C. Masking Tape: Nonstaining, nonabsorbent material compatible with joint sealants and surfaces adjacent to joints.

PART 3 - EXECUTION

3.1 EXAMINATION

- A. Examine joints indicated to receive joint sealants, with Installer present, for compliance with requirements for joint configuration, installation tolerances, and other conditions affecting joint-sealant performance.
- B. Proceed with installation only after unsatisfactory conditions have been corrected.

3.2 PREPARATION

- A. Surface Cleaning of Joints: Clean out joints immediately before installing joint sealants.
 - 1. Remove all foreign material from joint substrates that could interfere with adhesion of joint sealant.
 - a. Clean porous joint substrate surfaces by brushing, grinding, blast cleaning, mechanical abrading, or a combination of these methods to produce a clean, sound substrate capable of developing optimum bond with joint sealants. Remove loose particles remaining after cleaning operations above by vacuuming or blowing out joints with oil-free compressed air.
 - 2. Remove laitance and form-release agents from concrete.
 - a. Clean nonporous surfaces with chemical cleaners or other means that do not stain, harm substrates, or leave residues capable of interfering with adhesion of joint sealants.
- B. Joint Priming: Prime joint substrates, where recommended in writing by joint-sealant manufacturer, based on preconstruction joint-sealant-substrate tests or prior experience. Apply

primer to comply with joint-sealant manufacturer's written instructions. Confine primers to areas of joint-sealant bond; do not allow spillage or migration onto adjoining surfaces.

- C. Masking Tape: Use masking tape where required to prevent contact of sealant with adjoining surfaces that otherwise would be permanently stained or damaged by such contact or by cleaning methods required to remove sealant smears. Remove tape immediately after tooling without disturbing joint seal.

3.3 INSTALLATION

- A. General: Comply with joint-sealant manufacturer's written installation instructions for products and applications indicated, unless more stringent requirements apply.
- B. Sealant Installation Standard: Comply with recommendations in ASTM C 1193 for use of joint sealants as applicable to materials, applications, and conditions indicated.
- C. Acoustical Sealant Application Standard: Comply with recommendations in ASTM C 919 for use of joint sealants in acoustical applications as applicable to materials, applications, and conditions indicated.
- D. Install sealant backings of type indicated to support sealants during application and at position required to produce cross-sectional shapes and depths of installed sealants relative to joint widths that allow optimum sealant movement capability.
 - 1. Do not leave gaps between ends of sealant backings.
 - 2. Do not stretch, twist, puncture, or tear sealant backings.
 - 3. Remove absorbent sealant backings that have become wet before sealant application and replace them with dry materials.
- E. Install bond-breaker tape behind sealants where sealant backings are not used between sealants and backs of joints.
- F. Install sealants using proven techniques that comply with the following and at the same time backings are installed:
 - 1. Place sealants so they directly contact and fully wet joint substrates.
 - 2. Completely fill recesses in each joint configuration.
 - 3. Produce uniform, cross-sectional shapes and depths relative to joint widths that allow optimum sealant movement capability.
- G. Tooling of Nonsag Sealants: Immediately after sealant application and before skinning or curing begins, tool sealants according to requirements specified below to form smooth, uniform beads of configuration indicated; to eliminate air pockets; and to ensure contact and adhesion of sealant with sides of joint.
 - 1. Remove excess sealant from surfaces adjacent to joints.
 - 2. Use tooling agents that are approved in writing by sealant manufacturer and that do not discolor sealants or adjacent surfaces.
 - 3. Provide concave joint configuration per Figure 5A in ASTM C 1193, unless otherwise indicated.

3.4 FIELD QUALITY CONTROL

- A. Field-Adhesion Testing: Field test joint-sealant adhesion to joint substrates as follows:
 - 1. Extent of Testing: Test completed elastomeric sealant joints as follows:

- a. Perform 10 tests for the first 1000 feet of joint length for each type of elastomeric sealant and joint substrate.
 - b. Perform 1 test for each 1000 feet of joint length thereafter or 1 test per each floor per elevation.
 2. Test Method: Test joint sealants according to Method A, Field-Applied Sealant Joint Hand Pull Tab in Appendix X1 in ASTM C 1193, as appropriate for type of joint-sealant application indicated.
 - a. For joints with dissimilar substrates, verify adhesion to each substrate separately; do this by extending cut along one side, verifying adhesion to opposite side. Repeat procedure for opposite side.
 3. Inspect joints for complete fill, for absence of voids, and for joint configuration complying with specified requirements. Record results in a field-adhesion-test log.
 4. Inspect tested joints and report on the following:
 - a. Whether sealants in joints connected to pulled-out portion failed to adhere to joint substrates or tore cohesively. Include data on pull distance used to test each type of product and joint substrate. Compare these results to determine if adhesion passes sealant manufacturer's field-adhesion hand-pull test criteria.
 - b. Whether sealants filled joint cavities and are free of voids.
 - c. Whether sealant dimensions and configurations comply with specified requirements.
 5. Record test results in a field-adhesion-test log. Include dates when sealants were installed, names of persons who installed sealants, test dates, test locations, whether joints were primed, adhesion results and percent elongations, sealant fill, sealant configuration, and sealant dimensions.
 6. Repair sealants pulled from test area by applying new sealants following same procedures used originally to seal joints. Ensure that original sealant surfaces are clean and that new sealant contacts original sealant.
- B. Evaluation of Field Test Results: Sealants not evidencing adhesive failure from testing or noncompliance with other indicated requirements will be considered satisfactory. Remove sealants that fail to adhere to joint substrates during testing or to comply with other requirements. Retest failed applications until test results prove sealants comply with indicated requirements.

3.5 CLEANING

- A. Clean off excess sealant or sealant smears adjacent to joints as the Work progresses by methods and with cleaning materials approved in writing by manufacturers of joint sealants and of products in which joints occur.

3.6 PROTECTION

- A. Protect joint sealants during and after curing period from contact with contaminating substances and from damage resulting from construction operations or other causes so sealants are without deterioration or damage at time of Substantial Completion. If, despite such protection, damage or deterioration occurs, cut out and remove damaged or deteriorated joint sealants immediately so installations with repaired areas are indistinguishable from original work.

3.7 JOINT-SEALANT SCHEDULE

A. ES-1 - Single-Component Pourable Neutral-Curing Silicone Sealant:

1. Joint Sealant Applications: Exterior/Interior horizontal joints in concrete slabs or masonry pavers.
2. Approved Products:
 - a. Dow Corning Corporation; 890-SL.
 - b. Pecora Corporation; 300 Pavement Sealant (Self Leveling).
3. Type and Grade: S (single component) and P (pourable).
4. Class: 100/50.
5. Uses Related to Exposure: NT and T (traffic).
6. Uses Related to Joint Substrates: M A and O, as applicable to joint substrates indicated.

B. ES-2 - Single-Component Neutral-Curing Silicone Sealant:

1. Joint Sealant Applications:
 - a. Exterior: Roof work, glass, precast concrete, masonry, expansion & control joints, EIFS, curtainwall, stone, ceramics, granite, wood, steel, aluminum & plastics.
 - b. Interior: Interior perimeter joints of openings in exterior walls
2. Approved Products:
 - a. Dow Corning Corporation; 790.
 - b. Dow Corning Corporation; 791.
 - c. Dow Corning Corporation; 795
 - d. GE Silicones; SilPruf LM SCS2700.
 - e. GE Silicones; SilPruf NB SCS9000.
 - f. GE Silicones; UltraPruf II SCS2900.
 - g. Pecora Corporation; 865.
 - h. Pecora Corporation; 895.
 - i. Pecora Corporation; 898.
3. Type and Grade: S (single component) and NS (nonsag).
4. Class: 100/50.
5. Use Related to Exposure: NT (nontraffic).
6. Uses Related to Joint Substrates: M, G, A, and, as applicable to joint substrates indicated, O.
7. Stain-Test-Response Characteristics: Nonstaining to porous substrates per ASTM C 1248.

C. ES-3 - Single-Component Mildew-Resistant Acid-Curing Silicone Sealant:

1. Joint Sealant Applications: Interior joints between plumbing fixtures and adjoining walls, floors & counters
2. Approved Products:
 - a. Dow Corning Corporation; 786 Mildew-Resistant.
 - b. GE Silicones; Sanitary SCS1700.
3. Type and Grade: S (single component) and NS (nonsag).
4. Class: 25.
5. Use Related to Exposure: NT (nontraffic).
6. Uses Related to Joint Substrates: G, A, and, as applicable to joint substrates indicated, O.

D. LS-1 - Latex Sealant:

1. Joint Sealant Applications: Interior joints at horizontal and vertical surfaces including perimeter of openings. (Excludes interior perimeter joints of openings in exterior walls)
2. Approved Products:
 - a. Bostik Findley; Chem-Calk 600.
 - b. Pecora Corporation; AC-20+.
 - c. Schnee-Morehead, Inc.; SM 8200.
 - d. Sonneborn, Division of ChemRex Inc.; Sonolac.
 - e. Tremco; Tremflex 834.

E. AS-1 - Acoustical Sealant:

1. Joint Sealant Applications: Exposed and concealed joints and openings in building construction to reduce airborne sound transmission.
2. Approved Products:
 - a. Pecora Corporation; AC-20 FTR Acoustical and Insulation Sealant.
 - b. United States Gypsum Co.; SHEETROCK Acoustical Sealant.

END OF SECTION

SECTION 08 10 00

HOLLOW METAL DOORS AND FRAMES

1. GENERAL:

1.1. Related Documents: The requirements of Division 1 are hereby made a part of this section as if fully repeated herein.

1.1.1. DIRECT PURCHASING: This Section is subject to the terms and procedures of Direct Purchasing, whereby the Owner reserves the right to recover the sales tax on materials by purchasing directly the materials required for this Section. Issuance of Purchase Orders by the Owner shall not relieve the Contractor of any of his responsibilities regarding material purchases or installations, with the exception of the payments for the materials as purchased.

1.2. Doors and frames shall be products of one manufacturer regularly engaged in manufacturing steel doors and frames of types specified.

1.3. Labeled Assemblies: Provide UL labeled door and frame assemblies with the time ratings scheduled.

1.4. Related Work:

1.4.1. Finish Hardware, Section 08 71 00.

1.4.2. Glass and Glazing, Section 08 80 00.

1.4.3. Painting, Section 09 91 00.

1.5. Submittals:

1.5.1. Submit shop drawings covering door, frame, and complete anchorage details for doors and frames.

1.5.2. Wind Loads: there are no new exterior doors.

1.5.3. Submittals shall include door and frame elevations, internal reinforcements, finish hardware and installation instructions.

2. MATERIALS:

2.1. A minimum gauge of materials for doors, frames, and anchorage is specified herein.

2.2. FRAMES: Exterior frames shall be minimum of 14-gauge steel, mitered corners, pre prepped to receive required recess mounted security devices and seamless. Interior door frames shall be minimum 16-gauge steel (exception being frames over 3'-6", they shall be 14-gauge steel). All frames shall be hot dipped galvanized steel seamless with mitered corners. Minimum hinge reinforcement at both doors and frames shall be 7-gauge steel (at all locations).

2.2.1. Minimum standard for fire resistance: All hollow metal frames shall be labeled for a

minimum of 3-hour fire rating.

- 2.2.2. Frames shall be prepped for security contacts as indicted in the electrical drawings.
- 2.3. Hardware Preparation: Mortise, reinforce, drill and tap as necessary for installation of finish hardware.
- 2.4. Closer Reinforcements: All doors shall be reinforced to receive door closers.
- 2.5. Silencers: Conical rubber insert 3 per jamb.
- 2.6. Metal Doors: Shall be 16 gauge, minimum, as scheduled. Exterior doors shall be urethane-foam filled to provide a thermal barrier.
 - 2.6.1. Provide 7-gauge hinge reinforcing, 16-gauge lock reinforcing, and 12-gauge closer reinforcing. All doors Physical Performance level shall be Level A (extra heavy duty) and shall be Model 2 (seamless). Exterior doors shall be G90 galvanized and interior doors G60 galvanized.
 - 2.6.2. The latch edge of the door shall be beveled 7/64 inch. All labeled doors shall bear an embossed metal label. Mylar or similar labels are not acceptable. Close top and bottom edges of doors flush as an integral part of door construction or by addition of .053 thick, metallic-coated steel channels with channel webs placed even with top and bottom edges.
- 2.7. Frames for vision panels in doors shall be 16- gauge steel; clamp-on type; suitable for use in rated assemblies. Paint screws to match frame. All screws shall be firmly in place.
- 2.8. Frames for fixed interior windows (borrowed light) shall be of similar construction as door frames.
- 2.9. SHOP FINISH:
 - 2.9.1. After assembly, clean steel thoroughly of rust, oil and grease, apply one coat of lead-free primer paint; baked on 20 minutes at 325 degrees F to dry film thickness of 3 mils.
- 3. INSTALLATION:
 - 3.1. Frames shall be erected plumb; properly braced, be rigid and in true alignment. Secure door frames to floor construction with two (2) fastenings at each jamb.
 - 3.2. Hang doors so as to swing easily and freely on their hinges and close accurately against silencers on frame without binding. Doors shall remain stationary in any position without independent motion. Clearance at bottom max. 3/4 inch above concrete where carpet will be installed; 1/2 inch" elsewhere; jambs and head, 1/8 inch; meeting style in pair of doors, 1/8-inch total maximum
 - 3.3. Silencers: furnish and install three (3) silencers per jamb in predrilled holes within door stop. Installation of silencers shall not occur until frames are completely painted and dry.

END OF SECTION

SECTION 08 41 13

ALUMINUM FRAMED STOREFRONTS

PART 1 - GENERAL

1.1 Related Documents: The requirements of Division 1 are hereby made a part of this section as if fully repeated herein.

1. DIRECT PURCHASING: This Section is subject to the terms and procedures of Direct Purchasing, whereby the Owner reserves the right to recover the sales tax on materials by purchasing directly the materials required for this Section. Issuance of Purchase Orders by the Owner shall not relieve the Contractor of any of his responsibilities regarding material purchases or installations, with the exception of the payments for the materials as purchased.

1.2 SUMMARY

- A. Section Includes: Exterior aluminum storefront framing system.
- B. Related Sections:
 1. Section 07 92 00 - Joint Sealants: Perimeter sealants.
 2. Section 08 80 00 - Glazing: Glazing requirements for aluminum storefront.

1.3 SYSTEM PERFORMANCE REQUIREMENTS

- A. General: Provide aluminum-framed systems, including anchorage, capable of withstanding, without failure, the effects of the following:
 1. Structural loads.
 2. Thermal movements.
 3. Movements of supporting structure indicated on Drawings including, but not limited to, story drift and deflection from uniformly distributed and concentrated live loads.
 4. Dimensional tolerances of building frame and other adjacent construction.
 5. Failure includes the following:
 - a. Deflection exceeding specified limits.
 - b. Thermal stresses transferred to building structure.
 - c. Framing members transferring stresses, including those caused by thermal and structural movements, to glazing.
 - d. Glazing-to-glazing contact.
 - e. Noise or vibration created by wind and thermal and structural movements.
 - f. Loosening or weakening of fasteners, attachments, and other components.
 - g. Sealant failure.
 - h. Failure of operating units to function properly.
- B. Structural-Sealant Joints: Designed to produce tensile or shear stress in structural-sealant joints of less than 20 psi.
- C. Structural Loads:
 1. Wind Loads: Comply with applicable Building Code.
 2. Seismic Loads: Comply with applicable Building Code.

- D. Deflection of Framing Members Normal to Wall Plane: Limited to 1/175 of clear span for spans up to 13 feet 6 inches and to 1/240 of clear span plus 1/4 inch for spans greater than 13 feet 6 inches or an amount that restricts edge deflection of individual glazing lites to 3/4 inch, whichever is less.
- E. Structural-Test Performance: Systems tested according to ASTM E 330 as follows:
 - 1. When tested at positive and negative wind-load design pressures, systems do not evidence deflection exceeding specified limits.
 - 2. When tested at 150 percent of positive and negative wind-load design pressures, systems, including anchorage, do not evidence material failures, structural distress, and permanent deformation of main framing members exceeding 0.2 percent of span.
 - 3. Test Durations: As required by design wind velocity but not less than 10 seconds.
- F. Temperature Change (Range): Systems accommodate 120 deg F, ambient; 180 deg F, material surfaces.
- G. Air Infiltration: Maximum air leakage through fixed glazing and framing areas of systems of 0.06 cfm/sq. ft. of fixed wall area when tested according to ASTM E 283 at a minimum static-air-pressure difference of 6.24 lbf/sq. ft.
- H. Water Penetration Under Static Pressure: Systems do not evidence water penetration through fixed glazing and framing areas when tested according to ASTM E 331 at a minimum static-air-pressure difference of 20 percent of positive wind-load design pressure, but not less than 6.24 lbf/sq. ft.
- I. Condensation Resistance: Fixed glazing and framing areas of systems have condensation-resistance factor (CRF) of not less than 53 when tested according to AAMA 1503.
- J. Average Thermal Conductance: Fixed glazing and framing areas of systems have average U-factor of not more than 0.69 Btu/sq. ft. x h x deg F when tested according to AAMA 1503.

1.4 SUBMITTALS

- A. Product Data: Submit the following for each aluminum entrance and storefront system required:
 - 1. Manufacturer's standard details and fabrication methods.
 - 2. Data on finishing, hardware and accessories.
 - 3. Recommendations for maintenance and cleaning of exterior surfaces.
- B. Shop Drawings: Submit the following for each aluminum entrance and storefront system required:
 - 1. Layout and installation details, including relationship to adjacent work.
 - 2. Elevations at 1/4-inch scale.
 - 3. Detail sections of typical composite members.
 - 4. Anchors and reinforcement.
 - 5. Hardware mounting heights.
 - 6. Provisions for expansion and contraction.
 - 7. Glazing details.

- C. Test Reports: Provide certified test reports from a qualified independent testing laboratory showing that aluminum entrance and storefront systems have been tested in accordance with specified test procedures and comply with performance characteristics indicated.

1.5 QUALITY ASSURANCE

- A. Installer Qualifications: Engage an experienced Installer who has completed installations of aluminum storefront similar in design and extent to those required for the project and whose work has resulted in construction with a record of successful in-service performance.
- B. Manufacturer's Qualifications: Provide aluminum storefront systems produced by a firm experienced in manufacturing systems that are similar to those indicated for this project and that have a record of successful in-service performance.
- C. Design Criteria: The drawings indicate the size, profile, and dimensional requirements of aluminum storefront work required and are based on the specific types and models indicated. Aluminum storefront by other manufacturers may be considered, provided deviations in dimensions and profiles are minor and do not change the design concept as judged by the Architect. The burden of proof of equality is on the proposer.

1.6 DELIVERY, STORAGE, AND HANDLING

- A. Delivery: Deliver aluminum storefront components in the manufacturer's original protective packaging.
- B. Storage: Store aluminum components in a clean dry location away from uncured masonry or concrete. Cover components with waterproof paper, tarpaulin or polyethylene sheeting in a manner to permit circulation of air.
 - 1. Stack framing components in a manner that will prevent bending and avoid significant or permanent damage.

1.7 PROJECT CONDITIONS

- A. Field Measurements: Check openings by accurate field measurement before fabrication. Show recorded measurements on shop drawings. Coordinate fabrication schedule with construction progress to avoid delay of the work.
 - 1. Where necessary, proceed with fabrication without field measurements, and coordinate fabrication tolerances to ensure proper fit.

1.8 WARRANTY

- A. Manufacturer's Warranty: Submit, for the Owner's acceptance, manufacturer's standard warranty document executed by authorized company official. Manufacturer's warranty is in addition to, and not a limitation of, other rights the Owner may have under the Contract Documents.
 - 1. Warranty: Include coverage for complete system for failure to meet specified requirements.
 - 2. Warranty Period: 3 years from Date of Substantial Completion.

PART 2 - PRODUCTS

2.1 MANUFACTURERS

- A. Basis-of-Design Manufacturer: Drawings and Specifications are based upon storefront and framing systems as manufactured by the KAWNEER COMPANY, INC.
 - 1. Exterior Framing:
 - a. KAWNEER "TRI-FAB VG 451T"; 2" x 4 1/2" for 1" glazing, thermally broken.
- B. Substitutions: The following manufacturers are acceptable only after strict compliance with the requirements of this Section:
 - 1. VISTAWALL ARCHITECTURAL PRODUCTS
 - 2. YKK
 - 3. TRACO

2.2 MATERIALS

- A. Aluminum Members: Alloy and temper recommended by the manufacturer for strength, corrosion resistance, and application of required finish; comply with ASTM B 221 for aluminum extrusions, ASTM B 209 for aluminum sheet or plate, and ASTM B 211 for aluminum bars, rods and wire.
- B. Reinforcement: Carbon steel reinforcement of aluminum framing members shall comply with ASTM A 36 for structural shapes, plates and bars, ASTM A 611 for cold rolled sheet and strip, or ASTM A 570 for hot rolled sheet and strip.
- C. Fasteners: Provide fasteners of aluminum, nonmagnetic stainless steel, zinc plated steel, or other material warranted by the manufacturer to be noncorrosive and compatible with aluminum components, hardware, anchors and other components.
 - 1. Reinforcement: Where fasteners screw-anchor into aluminum members less than 0.125 inches thick, reinforce the interior with aluminum or nonmagnetic stainless steel to receive screw threads, or provide standard noncorrosive pressed-in splined grommet nuts.
- D. Brackets and Reinforcements: Provide high-strength aluminum brackets and reinforcements; where use of aluminum is not feasible provide nonmagnetic stainless steel or hot-dip galvanized steel complying with ASTM A 123.

2.3 ACCESSORY MATERIALS

- A. Joint Sealants: For installation at perimeter of aluminum-framed systems, as specified in Section 07 92 00 - Joint Sealants.
- B. Bituminous Paint: Cold-applied asphalt-mastic paint complying with SSPC-Paint 12 requirements except containing no asbestos, formulated for 30-mil (0.762-mm) thickness per coat.

2.4 FABRICATION

- A. Fabricate components with minimum clearances and shim spacing around perimeter of assembly, yet enabling installation and dynamic movement of perimeter seal.

- B. Accurately fit and secure joints and corners. Make joints flush, hairline, and weatherproof.
- C. Prepare components to receive anchor devices. Fabricate anchors.
- D. Arrange fasteners and attachments to conceal from view.
- E. Prepare components with internal reinforcement for door hardware and door operator hinge hardware.
- F. Reinforce framing members for imposed loads.

2.5 FINISHES

- A. High- Performance Organic Finish (3-Coat Fluoropolymer): AA-C12C40R1x (Chemical Finish: cleaned with inhibited chemicals; Chemical Finish: conversion coating; Organic Coating: manufacturer's standard 3-coat thermocured system consisting of specially formulated inhibitive primer, fluoropolymer color coat, and clear fluoropolymer topcoat, with both color coat and clear topcoat containing not less than 70 percent polyvinylidene fluoride resin by weight). Prepare, pretreat, and apply coating to exposed metal surfaces to comply with AAMA 2605 and with coating and resin manufacturer's written instructions.
 - 1. Color and Gloss: To match existing storefront frames.

PART 3 - EXECUTION

3.1 EXAMINATION

- A. Verify dimensions, tolerances, and method of attachment with other work.

3.2 INSTALLATION

- A. Install window system in accordance with manufacturer's instructions and AAMA - Metal Curtain Wall, Window, Storefront and Entrance - Guide Specifications Manual.
- B. Attach to structure to permit sufficient adjustment to accommodate construction tolerances and other irregularities.
- C. Provide alignment attachments and shims to permanently fasten system to building structure.
- D. Align assembly plumb and level, free of warp or twist. Maintain assembly dimensional tolerances, aligning with adjacent work.
- E. Provide thermal isolation where components penetrate or disrupt building insulation.
- F. Vapor Barrier: Coordinate attachment and seal of perimeter air and vapor barrier materials.
- G. Install glass in accordance with Section 08 80 00 - Glazing, to glazing method required to achieve performance criteria.
- H. Perimeter Sealants: Install perimeter sealant to method required to achieve performance criteria with backing materials and installation criteria in accordance with Section 07 92 00 - Joint Sealants.

3.3 CLEANING

- A. Remove protective material from pre-finished aluminum surfaces.
- B. Wash down surfaces with a solution of mild detergent in warm water, applied with soft, clean wiping cloths. Take care to remove dirt from corners. Wipe surfaces clean.
- C. Remove excess sealant by method acceptable to sealant manufacturer.

3.4 PROTECTION OF FINISHED WORK

- A. Protect finished Work from damage.

END OF SECTION

SECTION 08 56 19

TRANSACTION DRAWER AND FIXED GLASS PANEL

PART 1 GENERAL

1.1 SECTION INCLUDES

- A. Transaction Drawer and Fixed Glass Panel Combination Unit

1.2 RELATED SECTIONS

- A. Section 07 92 00 – Joint Sealants

1.3 REFERENCES

- A. ASTM A 240 – Heat-Resisting Chromium and Chromium-Nickel Stainless Steel Plate, Sheet, and Strip for Pressure Vessels.
- B. ASTM A 653 – Steel Sheet, Zinc-Coated (Galvanized) or Zinc-Iron Alloy-Coated (Galvannealed) by the Hot-Dip Process.
- C. ASTM B 209 – Aluminum and Aluminum-Alloy Sheet and Plate.
- D. ASTM B 221 – Aluminum and Aluminum-Alloy Extruded Bars, Rods, Wire, Profiles, and Tubes.
- E. ASTM C 1048 – Heat-Treated Flat Glass--Kind HS, Kind FT Coated and Uncoated Glass.

1.4 SUBMITTALS

- A. Comply with Section 01 33 00 Submittal Procedures.
- B. Product Data: Submit manufacturer's product data, including materials, components, fabrication, finish, and installation instructions.
- C. Shop Drawings: Submit manufacturer's shop drawings, including plans, elevations, sections, and details, indicating dimensions, tolerances, materials, fabrication, glazing, fasteners, hardware, finish, electrical wiring diagrams, options, and accessories.
- D. Samples: Submit manufacturer's samples of standard finishes.
- E. Manufacturer's Certification: Submit manufacturer's certification that materials comply with specified requirements and are suitable for intended application.

- F. Warranty: Submit manufacturer's standard warranty. Minimum (2) year warranty required.

1.5 DELIVERY, STORAGE, AND HANDLING

- A. Delivery: Deliver materials to site in manufacturer's original, unopened containers and packaging, with labels clearly identifying product name and manufacturer.
- B. Storage: Store materials in clean, dry area indoors in accordance with manufacturer's instructions.
- C. Handling: Protect materials and finish from damage during handling and installation.

PART 2 PRODUCTS

2.1 MANUFACTURER

- A. Quikserv Inc, 11441 Brittmoore Park Dr. Houston TX 77041, 1-866-739-1540

2.2 TRANSACTION DRAWER AND FIXED GLASS PANEL COMBO

- A. Fixed glass panel and transaction drawer combination unit – Model QSP-713S Mini Combo (32 ¼” W x 49 ¼” H), with bullet-resistant glass, Manual Version, Dade County Approved (NOA – 21-0601.09)

2.3 FABRICATION

- A. Assembly: Factory assembled; factory glazed.

PART 3 EXECUTION

3.1 EXAMINATION

- A. Examine areas to receive Transaction Drawer and Fixed Glass Panel. Notify Architect of conditions that would adversely affect installation or subsequent use. Do not proceed with installation until unsatisfactory conditions are corrected.

3.2 PREPARATION

- A. Ensure openings to receive Transaction Drawer and Fixed Glass Panel plumb, level, square, accurately aligned, correctly located, and in tolerance.

3.3 INSTALLATION

- A. Install Transaction Drawer and Fixed Glass Panel in accordance with manufacturer's instructions.
- B. Install Transaction Drawer and Fixed Glass Panel plumb, level, square, true to line, and without warp or rack.
- C. Install Transaction Drawer and Fixed Glass Panel components weathertight.

- D. Anchor Transaction Drawer and Fixed Glass Panel securely in place to supports. Use attachment methods permitting adjustment for construction tolerances, irregularities, alignment, and expansion and contraction.
- E. Separate aluminum from other metal surfaces with bituminous coatings or other means approved by Architect.
- F. Sheet Metal Flashing: Install sheet metal flashing as specified in Section (07 62 00).
- G. Joint Sealants: Install joint sealants as specified in Section (07 92 00).
- I. Repair minor damages to finish in accordance with manufacturer's instructions and as approved by Architect.
- J. Remove and replace damaged components that cannot be successfully repaired as determined by Architect.

3.4 ADJUSTING

- A. Adjust doors to be weathertight in closed position.
- B. Adjust doors and operating hardware to function properly and for smooth operation without binding.

3.5 CLEANING

- A. Clean Transaction Drawer and Fixed Glass Panel promptly after installation in accordance with manufacturer's instructions.
- B. Remove excess joint sealant in accordance with sealant manufacturer's instructions.
- C. Do not use harsh cleaning materials or methods that would damage glazing or finish.

3.6 PROTECTION

- A. Protect installed Transaction Drawer and Fixed Glass Panel to ensure that, except for normal weathering, pass-thru windows will be without damage or deterioration at time of substantial completion.

END OF SECTION

SECTION 08 71 00

FINISH HARDWARE

1. GENERAL:

1.1. Related Documents: The requirements of Division 1 are hereby made a part of this section as if fully repeated herein.

1.1.1. DIRECT PURCHASING: This Section is subject to the terms and procedures of Direct Purchasing, whereby the Owner reserves the right to recover the sales tax on materials by purchasing directly the materials required for this Section. Issuance of Purchase Orders by the Owner shall not relieve the Contractor of any of his responsibilities regarding material purchases or installations, with the exception of the payments for the materials as purchased.

1.2. Description of Work

1.2.1. Work under this section consist of furnishing and installing items known commercially as builder's hardware as specified in this section and noted on the drawings for a complete and operational system.

1.2.2. Items include but are not limited to the following:

- a. Hinges
- b. Flush Bolts
- c. Coordinators
- d. Locks
- e. Exit Devices
- f. Door Closers
- g. Push Plates
- h. Door Pulls
- i. Protective Plates
- j. Door Stops and Holders
- k. Thresholds and Weather-stripping
- l. Silencers

1.3. RELATED WORK

1.3.1. Section 08100: Hollow Metal Doors and Steel Frames

1.3.2. Section 08800: Glazing

1.3.3. Section 09900: Painting

1.3.4. Division 16: Electrical

1.4. Quality Assurance

1.4.1. Manufacturers and model numbers listed in Part 2 of this section have been set to establish a standard of quality, design and function. Obtain each type of hardware (Hinges, Locks, Exit Devices, Closers, etc.) from a single manufacturer, although several may be listed as acceptable.

- 1.4.2. Substitutions: Refer to Section 01100 for procedures for product substitution. Substitutions will not be accepted unless a request is made in writing 7 days, prior to the published bid date and approved by addendum accepting the product substitution. Any manufacturer submitting for approval on Locksets, Exit Devices, Mullions, Hinges, Flush and Surface Bolts, Weather strip and Thresholds must include Certified Testing Reports or NOA numbers specific to the door and frame elevations that meet the FLORIDA BUILDING CODE wind load requirements and have been tested as an assembly with the listed approved manufacturers. Submit certified independent lab test or NOA report on each type of exterior opening specified. Only those manufacturers that have tested with this project's door and frame profile, elevations and hardware requirements will be considered.
 - 1.4.3. The Hardware supplier is to be a qualified direct distributor of the products to be furnished and is to regularly engage in furnishing products on projects of similar size and requirements. In addition, the supplier is to have in their regular employment a Certified Architectural Hardware Consultant who will be made available at reasonable times to consult with the Architect, General Contractor and/or the owner's representative regarding any matters that affect the project, inspect and direct detailing, applying, and adjusting of all hardware. No person shall be engaged in the installation of finish hardware without the prior approval of the Owner based on the acceptance of written certification.
 - 1.4.4. Furnish Hardware for fire rated openings that meet NFPA 80 and the local building codes. Furnish only hardware that has been tested and listed by UL or FM for fire rated openings. All labeled doors to have ball bearing steel hinges, a door closer and a lockset to meet the requirements of NFPA 80. Where exit devices are specified or required on Fire Rated Doors furnish only those devices that have been tested and listed "FIRE EXIT HARDWARE."
 - 1.4.5. Provide hardware that meets the hurricane and wind load test requirements in accordance with the Florida Building code and are in compliance with the local authority having jurisdiction. All openings required to meet either the impact test or wind load test as indicated by the architect shall be tested as systems with the finish hardware, hollow metal doors and frames and installed in accordance with the applicable tests. These requirements take precedence over other requirements for such hardware.
- 1.5. References:
- 1.5.1. NFPA 80 Fire Doors and Windows 2006 Edition
 - 1.5.2. NFPA 101 Life Safety Code 1994 Edition
 - 1.5.3. NFPA 105 Installation of Smoke-Control Door Assemblies
 - 1.5.4. ADA The Americans with Disabilities Act: Title III Public Accommodations
 - 1.5.5. ANSI A117.1: American National Standards Institute: Accessible and Usable Buildings and Facilities.
 - 1.5.6. ANSI : American National Standards Institute
 - 1.5.7. UFAS: Uniform Federal Accessibility Standards
 - 1.5.8. UL: Underwriter's Laboratories

- 1.5.9. WHI: Warnock Hersey International
 - 1.5.10. DHI: Door and Hardware Institute
 - 1.5.11. BOCA: Basic Building Code
 - 1.5.12. NBC: National Building Code
 - 1.5.13. SBS: Southern Building Code
 - 1.5.14. UBC: Uniform Building Code
 - 1.5.15. FBC: Florida Building Code
- 1.6. Submittals
- 1.6.1. Submit schedules in accordance with General Requirements and Contract Documents.
 - a. Submit an electronic copy of the Hardware Schedule and Door Schedule in Microsoft Word or Excel. Copy must be in an editable.
 - 1.6.2. Schedules: Provide Finish Hardware Schedules detailing each opening individually. Use the Vertical format scheduling method as outlined in the DHI brochure "Sequence and Format for the Hardware Schedule". The horizontal format will not be allowed. Schedule each building separately. Separate fire rated doors and non-rated doors using different headings. Separate doors of different sizes in headings that have all doors of the same size and like hardware. Provide 6 copies.
 - 1.6.3. Samples: Provide samples of the products listed in the Schedule as required by the Architect. Furnish 1 item that is representative of the manufacturers' series that is being supplied.
 - 1.6.4. Templates: After Hardware Schedule provide template information to prepare for the installation of mortise hardware and reinforcement of surface mounted hardware. Provide 3 copies for distribution.
 - 1.6.5. Product Data: Together with the Finish Hardware Schedule provide catalog cuts highlighting each item that is being proposed, including appropriate ANSI/BHMA criteria and special mounting instructions. Provide 6 copies.
 - 1.6.6. Keying Schedule: Schedule a meeting with the Architect, General Contractor and/or the owner's representative for keying information. Incorporate the keying information as outlined in DHI's manual "Keying Procedures, Systems and Nomenclature". Provide 6 copies.
 - 1.6.7. Cycle Testing: Submit independent lab test verifying the minimum cycle test requirements listed with this specification for locksets, door closers and exit devices. Provide 6 copies.
 - 1.6.8. -NOT USED-
 - 1.6.9. Final Hardware Schedule Content: Based on finish hardware indicated, organize Hardware Schedule into "hardware sets" indicating complete designations of every item required for each door or opening. Include the following information:
 - a. Type, style, function, size and finish of each hardware item.

- b. Name and Manufacturer of each item.
- c. Fastenings and other pertinent information.
- d. Location of hardware set cross-referenced to indications on drawings both on floor plans and in door and frame schedule.
- e. Explanation of all abbreviations, symbols, codes, etc., contained in Schedule”
- f. Mounting locations for hardware.
- g. Door and frame sizes and materials.
- h. Keying information

1.7. Delivery, Storage and Handling

- 1.7.1. Delivery: Deliver hardware to the jobsite in the manufacturer's original packages. Tag and mark each item of package to correspond with the door and heading number on the finish hardware schedule. Inventory hardware jointly with a representative of the General contractor and the Hardware supplier until both are satisfied with the count.
- 1.7.2. Storage: Store material in a dry, secured area, within the building, free from dust and dirt within a controlled environment.
- 1.7.3. Handling: Provide strict control over access to the storage area so that completion of the work will not be delayed due to hardware losses.

1.8. Warranty

- 1.8.1. Submit warranties in accordance with General Requirements and Contract Documents. This warranty shall cover defects in materials and workmanship, commencing with substantial completion of the project.
 - a. All Finish Hardware: 2 Years
 - b. Locks: 5 Years
 - c. Exit Devices: 3 Years
 - d. Door Closers: 10 Years

2. PRODUCTS:

2.1. Materials:

- 2.1.1. Screws and Fasteners: Provide all necessary screws, bolts and fasteners of suitable size and type to anchor the hardware properly. Fasteners are to match the finish and the base metal of the applied item. Provide the manufacturers standard and recommended fasteners to template. Furnish fasteners where required with expansion shields, toggle bolts, and other anchors designated by the Architect according to the hardware requirements. All door closers and exit devices applied to labeled wood doors shall be thru bolted. Thresholds are to be secured with machine screws and set with an adjustable sill anchor. All hardware applied to exterior doors shall be of non-ferrous material matching the finish of the hardware specified for interior openings or as specified in 3.6 of this section.
 - a. The Installation Subcontractor use the Manufacturer's full thread machine and /or wood screws as furnished and recommended. Tek screws shall be permitted only if

furnished as the Manufacturer's standard fastener and will not negatively impact Product Warranty or fire door rating.

- 2.1.2. Hinges: Provide hinges as specified in 3.6 of this section. Furnish five-knuckle, heavy duty, button tip, full mortise template type hinges with non-rising loose pins at exterior doors, interior openings with exit devices and high frequency openings. Provide five-knuckle, standard duty, button tip, full mortise template hinges with non-rising loose pins at all other interior openings. At exterior locations and reverse bevel openings provide with non-removable pins.
 - a. Furnish 1 hinge for every 30 inches in door height or fraction thereof with a minimum of 2 hinges per leaf. For doors 3'-0" and wider use heavy weight four ball bearing hinges. All exterior hinges shall be stainless steel ball bearing type with non-removable pins. Hinges at wet rooms and chemical rooms shall be stainless steel. For doors up to 36 inches in width provide hinges 4.5 inches in height; for doors over 36 inches and up to 48 inches in width provide hinges 5.0 inches in height. The width of the hinges is to be sufficient to clear all trim and allow the door to swing 180 degrees.
 - b. Exterior doors and secured reverse bevel doors are to be furnished with non-removable pins or security stud. Use ball bearing steel hinges on labeled door openings and non-ferrous hinges on exterior doors or doors located in high humidity areas.
 - c. Available manufacturers: Subject to compliance with requirements, and complete assembly testing for the Florida Building Code wind load requirements, manufacturers offering products that may be incorporated into the work include the following:
 1. IVES, HAGER, STANLEY
- 2.1.3. Flush Bolts: Provide flush bolts of the type listed in 3. 6 of this section. Manual flush bolts are to have a length that will position the lever at no more than 6 feet above the finished floor. Automatic flush bolts are to be applied at labeled pairs of doors. Furnish a Dust Proof Strike at each set of flush bolts specified.
 - a. Available manufacturers: Subject to compliance with requirements, and complete assembly testing for the Florida Building Code wind load requirements, manufacturers offering products that may be incorporated into the work include the following:
 1. IVES, ROCKWOOD
- 2.1.4. Locks: Provide locks of the type and function listed in 3.06 of this section. Provide heavy-duty commercial mortise locks that exceed ANSI A156.13, Series 1000, Grade 1 Operational and Grade 1 Security and have been cycle tested to 6,000,000 cycles. Provide certification of cycle testing by independent lab testing organization with complete documentation. Provide lock body that can be rehanded on site without disassembling the lock case. High strength steel alloy cylinder retainer and a replaceable breakaway spindle preventing damage to lever trim and internal lock case

components as standard. On locks with an interior turnpiece provide with an oversized turn that provides an easy grip.

2.1.5. The latchbolt is to be a 2-piece anti-friction stainless steel mechanism, with ¾-inch throw. Deadbolts are to have a 1-inch throw. Provide manufacturer's standard wrought box strike for each latchset, with curved lip extended to protect the frame. Provide wrought levers-cast levers are not acceptable.

a- Manufacturers are subject to compliance with requirements, and complete assembly testing for the Florida Building Code wind load requirements. ~~Acceptable Lock Manufacturers, Models and Trims~~ **No other substitutions are acceptable nor will be considered:**

1. Manufacturer – Corbin/Ruswin; Model- ML2000; Physically Handicap Trim – LWM
2. Manufacturer – Yale (with Corbin/Ruswin permanent cylinders); Model – 8700SL; Physically Handicap Trim – Augusta ASL

2.1.6. Door Closers: Furnish door closers of the type listed in 3.06 of this section. Closers are to exceed ANSI A156.4 Grade 1 and have been cycle tested to 10,000,000 cycles. Provide certification of cycle testing by independent lab testing organization with complete documentation. Provide fully hydraulic, rack and pinion action with high strength cast iron cylinders and one-piece forged steel pistons, aluminum closers are not acceptable. The pinion shaft to have a minimum diameter of 11/16". Hydraulic regulation controlled by tamper proof non-critical valves with separate adjustments for backcheck, latch and closing speed. Door closers shall not have pressure relief valves (PRV's); these valves are not acceptable. Arms are to be heavy duty, constructed of forged steel; stamped steel is not acceptable. Door closers shall utilize temperature stable fluid capable of withstanding temperature ranges of 120 degrees Fahrenheit to -30 degrees Fahrenheit, without requiring seasonal adjustment of closer speed to properly close the door. Closers for fire-rated doors shall be provided with temperature stabilizing fluid that complies with the standards UBC 7-2 (1997) and UL 10C. Provide closers with regular arm, parallel arm or top jamb mount as required to keep corridors clear and for proper installation. Provide all brackets, arms and plates as necessary for complete installation. Size closers according to the manufacturer's recommendations for the size and location of the door. Where multi-sized closers are required size closers to the proper setting at the factory. Provide adjustable units complying with ANSI A117.1 provisions for door opening force and delayed action closing. Closers shall not be used as stops or holders. Provide parallel arm closers where possible.

a. All closers to have full coverage non-ferrous covers, steel arms, separate valves for adjusting backcheck, closing and latching cycles and adjustable spring power to provide a full range of sizes 2-6. Closers shall be furnished parallel arm mounted on all doors accommodating students, opening into corridors or other public spaces, and shall be mounted to permit 180 degrees door swing wherever wall conditions permit. Regular arm mounted closers shall be used only on in swinging doors not accommodating students to conceal them from public view (i.e. in swinging Mechanical, Custodian etc.). Furnish with non-

hold open arms. Closers shall be of the proper type to meet the conditions of use and shall allow for the full swing of the doors.

- b. All closers to be of rack and pinion construction. Delayed action closures only to be used when required by ADA or other accessibility requirements. Closers to be Underwriter Laboratories listed for all classes of labeled doors. All closers shall be non-handed.
- c. Closer valves to be concealed against unauthorized adjustment and all attached parts, such as cover and arm, will be tamper resistant, requiring tools to dismantle. All door closers to be installed on doors with through bolts or sex nuts and bolts.
- d. Available manufacturers: Subject to compliance with requirements, manufacturers offering products that may be incorporated into the work include the following:
 1. YALE3501 F series
 2. NORTON8501 BF series

- 2.1.7. Protective Plates: Furnish kick plates as specified in 3.6 of this section. For the width of the plates furnish 2 inches less the door width on the push side of the door for single doors and 1 inch less the door width on the pull side and on the push side of pairs of doors. Bevel three edges and provide in 0.05 in thickness. Acceptable Manufacturers:

1. IVES, ROCKWOOD

- 2.1.8. Door Trim: Furnish push plates, door pulls, wall stops and floor stops as specified in 3.6 of this section. Provide with fasteners as required for proper installation." All door push and pull devices shall comply with A.D.A. and all other accessibility requirements. Push plates (on doors with no lights) shall be 8" x 16" and pull plates shall be 4" x 16" minimum.

- a. Door Stops: Floor mounted at all applicable locations with the exception as to impeded or provide a tripping hazard. Floor stops are the preference of the district and shall contact the door leaf within the first quarter of the panel at the strike edge. Floor stops shall be "heavy-duty" type. The door closer assembly shall not be used as a stop. Acceptable Manufactures:

1. Trim: IVES, ROCKWOOD
2. Door Stops: Rockwood Model 463 or as scheduled

- 2.1.9. Overhead Holders: Furnish overhead holders of the type listed in 3.6 of this section. Holders and Stops to meet or exceed ANSI A 156.8 Grade 1 requirements. They shall be non-handed and field reversible and have adjustable holding force. Provide all brackets necessary for proper installation. Provide overhead stops wherever wall stops will not stop the door. Acceptable Manufacturers:

1. GLYNN-JOHNSON, ABH

2.1.10. Thresholds and Weather-Stripping: Furnish in the type listed in 3.6 of this section. Use vinyl or silicone inserts in face of stop at exterior doors. Verify threshold requirements with drawings and sill conditions for proper application. For exterior doors provide a threshold anchor channel assembly that sets firmly into the concrete and secures the threshold. Provide an abrasive, skid and corrosion resistant threshold at all exterior locations. For weather-strip provide at the jambs and head of the frame. On pairs of doors provide an overlapping astragal with a seal running the full height of the door or two split astragals at the meeting stile to seal doors that require independent operation.

a. All thresholds and saddles to be full-width aluminum and shall meet accessibility requirements.

b. Available manufacturers: Subject to compliance with requirements, and complete assembly testing for the Florida Building Code wind load requirements, manufacturers offering products that may be incorporated into the work include the following:

1. HAGER, PEMKO

2.1.11. Silencers: Furnish silencers at all interior openings. Provide 3 ea. at single doors and 2 ea. at paired openings. Do not install silencers until painting of the door frames has been completed. Acceptable Manufacturers:

a. IVES, HAGER

2.2. Finishes:

HINGES, EXTERIOR:	630
HINGES, INTERIOR:	652
LOCKSETS:	626
EXIT DEVICES:	626
CLOSERS:	689
DOOR TRIM:	630
PROTECTION PLATES:	630
THRESHOLDS:	AL

2.3. Keying

2.3.1. The contractor shall provide the following: 5 factory cut change keys per lock.

a. Cylinders to be 6-pin Russwin N Series (Reverse) in keyways N15 through N28 as directed by the owner. All cylinders shall be furnished with appropriate cams and trim rings as required by the lock manufacturer requirements. All cylinders shall be factory great grand master keyed as directed in a keying meeting to be held with Clay County. Keys shall be furnished in Russwin/Corbin type 12 bow. The bow will be stamped "Do Not Duplicate" on one side and with the appropriate keyset (e.g. AA1) on the opposite side. All permanent cylinders and keys shall be packed separate from locksets and other hardware. During construction, the finish hardware supplier shall furnish temporary cylinders for

all doors to receive new hardware. In, addition, the finish hardware supplier shall also furnish an additional 2 cylinders for the contractor's discretionary use during the course of construction. At the time of substantial completion, the contractor shall install all permanent cylinders in all locksets, exit devices, keyed mullions, rolling shutters, overhead doors, and any other locking device specified to have a cylinder. Turn all permanent keys directly over to the DCPS Locksmith Shop. Please note: this factory system is not capable of being construction keyed.

3. Execution

3.1. Inspection:

- 3.1.1. After installation has been completed a representative of the hardware supplier is to inspect the installation of the finish hardware to ensure that each item of hardware is operating properly and installed according to the approved hardware schedule.
- 3.1.2. All door hardware to be installed with care and per good industry practice. Store hardware on site, in a safe, dry, and protected manner. Protect installed hardware during the construction process. Present hardware to owner in a clean and operable condition at time of substantial completion.

3.2. Installation:

- 3.2.1. Mount hardware units at heights indicated in "Recommended Locations for Builders Hardware for Standard Steel Doors and Frames" by the Door and Hardware Institute except as specifically indicated or required to comply with governing regulations, and as may be indicated otherwise by the Architect.
- 3.2.2. Install each hardware item in compliance with the manufacturer's instructions and recommendations (failure to install hardware correctly and to make proper adjustments will result in monetary penalties applied to the installation team to correct improper installation). Wherever cutting and fitting is required to install hardware onto or into surfaces which are later to be painted or finished, coordinate removal, storage and reinstallation of items. Do not install surface mounted hardware until finishes have been applied.
- 3.2.3. Set units level, plumb and true. Adjust and reinforce the surface material as necessary for proper installation and operation.
- 3.2.4. Drill and countersink units that are not factory prepared for anchors and fasteners.
- 3.2.5. Set thresholds for exterior doors in full bed of butyl-rubber or polyisobutylene mastic sealant to completely fill voids and exclude moisture. Remove excess sealant.

3.3. Adjusting and Cleaning

- 3.3.1. Adjust and check each operating item of hardware at each door to ensure proper operation and function. Replace units that cannot be adjusted to operate freely as

intended. Make final adjustments to door closers and floor closers to ensure that all valves are set properly for proper functioning of the door.

3.3.2. After installation and before turning the building over all hardware shall be left clean and free from dirt, dust or disfigurement.

3.3.3. Instruct the owner's personnel in the proper adjustment and maintenance of hardware and electrical security systems. Turn over installation instructions, final approved finish hardware schedules, custom wiring diagrams and any special tools that were required for installation.

3.4. Protection

3.4.1. The General contractor shall be responsible for protecting all hardware and finishes of each item of hardware until the owner accepts the project as complete.

3.5. Extra Stock

3.5.1. At the completion of the project, supply to the Owner the following items:

- a. 1 set of instruction sheet for each item furnished
- b. 1 each of any non-standard tool for installation of items furnished

3.6 DOOR HARDWARE SETS

3.6.1 The hardware sets represent the design intent and direction of the owner and architect. They are a guideline only and should not be considered a detailed hardware schedule. Discrepancies, conflicting hardware and missing items should be brought to the attention of the architect with corrections made prior to the bidding process. Omitted items not included in a hardware set should be scheduled with the appropriate additional hardware required for proper application and functionality.

- a. Quantities listed are for each pair of doors, or for each single door.
- b. The supplier is responsible for handing and sizing all products.
- c. Where multiple options for a piece of hardware are given in a single line item, the supplier shall provide the appropriate application for the opening.
- d. At existing openings with new hardware the supplier shall field inspect existing conditions prior to the submittal stage to verify the specified hardware will work as required. Provide alternate solutions and proposals as needed.

3.6.2 Manufacturer's Abbreviations:

1. MK – McKinney
2. RO – Rockwood
3. VD - Von Duprin
4. RU - Corbin Russwin
5. YA – Yale
6. PE – Pemko
7. SP - Simplex

Hardware Sets

Set: EXT-2

Doors: 100, 101A, 103A

Description: Exterior Single HM Door (Card Reader)

3 Hinge, Full Mortise, Hvy Wt	T4A3386 X NRP 4-1/2" x 4-1/2"	630	MK
1 Surface Closer	3531	630	YA
1 Cipher Lockset	31NG71	630	SP
1 Electric Strike	4WY66	630	VD
1 Kick Plate	K1050 10" X 2" LDW	630	RO
1 Silencer	608		RO

Set: INT-1

Doors: 105, 108

Description: Restroom

3 Hinge, Full Mortise, Hvy Wt	T4A3386 X NRP 4-1/2" x 4-1/2"	626	MK
1 Privacy Lockset	ML2030 NSM V20	626	RU
1 Surface Closer	3531	626	YA
1 Door Stop	409/446 as required	626	RO
1 Silencer	608		RO

Set: INT-2

Doors: 110

Description: Storage, Double Door

6 Hinge, Full Mortise, Hvy Wt	T4A3386 X NRP 4-1/2" x 4-1/2"	626	MK
1 Store Room Lockset	ML2059 LWM	626	RU
2 Surface Closer	3531	626	YA
2 Door Stop	409/446 as required	626	RO
2 Silencer	608		RO

Set: INT-3

Doors: 103B, 104, 106

Description: Passage

3 Hinge, Full Mortise, Hvy Wt	T4A3386 X NRP 4-1/2" x 4-1/2"	626	MK
1 Passage Latch	ML2010 NSM	626	RU
1 Surface Closer	3531	626	YA
1 Door Stop	409/446 as required	626	RO
1 Silencer	608		RO

Set: INT-4

Doors: 101B, 102, 104A, 109

Description: Access Control, Single Door

3 Hinge, Full Mortise, Hvy Wt	T4A3386 X NRP 4-1/2" x 4-1/2"	626	MK
1 Cipher Lockset	31NG71	626	SP
1 Cylinder	As req – match key system	626	RU
1 Surface Closer	3531	626	YA
1 Electric Strike	4WY66	626	VD
1 Silencer	608		RO
1 Card Reader	(By Security Vendor)		

END OF SECTION

SECTION 08 80 00

GLAZING

PART 1 - GENERAL

- 1.1 Related Documents: The requirements of Division 1 are hereby made a part of this section as if fully repeated herein.
1. DIRECT PURCHASING: This Section is subject to the terms and procedures of Direct Purchasing, whereby the Owner reserves the right to recover the sales tax on materials by purchasing directly the materials required for this Section. Issuance of Purchase Orders by the Owner shall not relieve the Contractor of any of his responsibilities regarding material purchases or installations, with the exception of the payments for the materials as purchased.
- 1.2 SUMMARY
- A. Section Includes: Glazing for the following products and applications, including those specified in other Sections where glazing requirements are specified by reference to this Section:
 1. Windows.
 2. Doors.
 3. Aluminum framed storefronts.
 - B. Related Sections:
 1. Section 08 10 00 – Hollow Metal Doors and Frames
 2. Section 08 41 13 – Aluminum Framed Storefronts
- 1.3 DEFINITIONS
- A. Interspace: Space between lites of an insulating-glass unit that contains dehydrated air or a specified gas.
 - B. Deterioration of Coated 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 coated glass contrary to manufacturer's written instructions. Defects include peeling, cracking, and other indications of deterioration in metallic coating.
 - C. Deterioration of Insulating Glass: Failure of hermetic seal under normal use that is attributed to the manufacturing process and not to causes other than glass breakage and practices for maintaining and cleaning insulating glass contrary to manufacturer's written instructions. Evidence of failure is the obstruction of vision by dust, moisture, or film on interior surfaces of glass.
- 1.4 PERFORMANCE REQUIREMENTS
- A. General: Provide glazing systems capable of withstanding normal thermal movement and wind and impact loads (where applicable) without failure, including loss or glass breakage attributable to the following: defective manufacture, fabrication, and installation; failure of sealants or gaskets to remain watertight and airtight; deterioration of glazing materials; or other defects in construction.

1.5 SUBMITTALS

- A. Product Data: For each glass product and glazing material indicated.
- B. Samples: 12-inch-square, for each type of glass product indicated, other than monolithic clear float glass.
- C. Preconstruction Adhesion and Compatibility Test Report: From glazing sealant manufacturer.

1.6 QUALITY ASSURANCE

- A. Preconstruction Adhesion and Compatibility Testing: Submit to elastomeric glazing sealant manufacturers, for testing according to ASTM C 1087, samples of each glazing material type, tape sealant, gasket, glazing accessory, and glass-framing member that will contact or affect elastomeric glazing sealants:
- B. Glazing for Fire-Rated Window Assemblies: Glazing for assemblies that comply with NFPA 80 and that are listed and labeled by a testing and inspecting agency acceptable to authorities having jurisdiction, for fire ratings indicated, based on testing according to NFPA 257.
- C. Safety Glazing Products: Comply with testing requirements in 16 CFR 1201 and, for wired glass, ANSI Z97.1.
- D. Glazing Publications: Comply with published recommendations of glass product manufacturers and organizations below, unless more stringent requirements are indicated. Refer to these publications for glazing terms not otherwise defined in this Section or in referenced standards.
 - 1. IGMA Publication for Insulating Glass: SIGMA TM-3000, "Glazing Guidelines for Sealed Insulating Glass Units."
- E. Insulating-Glass Certification Program: Permanently marked either on spacers or on at least one component lite of units with appropriate certification label of the Insulating Glass Certification Council.
- F. Mockups: Build mockups to verify selections made under sample submittals and to demonstrate aesthetic effects and set quality standards for materials and execution.
 - 1. Build mockups where directed.
 - 2. Approved mockups may become part of the completed Work if undisturbed at time of Substantial Completion.

1.7 WARRANTY

- A. Manufacturer's Special Warranty for Coated-Glass Products: Manufacturer's standard form, made out to Owner and signed by coated-glass manufacturer agreeing to replace coated-glass units that deteriorate as defined in "Definitions" Article, f.o.b. the nearest shipping point to Project site, within specified warranty period indicated below.
 - 1. Warranty Period: 10 years from date of Substantial Completion.
- B. Manufacturer's Special Warranty on Insulating Glass: Manufacturer's standard form, made out to Owner and signed by insulating-glass manufacturer agreeing to replace insulating-glass units

that deteriorate as defined in "Definitions" Article, f.o.b. the nearest shipping point to Project site, within specified warranty period indicated below.

1. Warranty Period: 10 years from date of Substantial Completion.

PART 2 - PRODUCTS

2.1 GLASS TYPE SCHEDULE

- A. **Glass Type GL-1 (1" Insulating Gray Tinted Low E):** Factory-assembled units consisting of sealed lites of glass separated by a dehydrated interspace, and complying with ASTM E 774 for Class CBA units.

1. Basis-of-Design Products/Manufacturers:
 - a. 1" PPG "Sungate" 100 (3) Clear Insulated; PPG Glass.
 - b. Exterior Lite: 1/4" Gray by PPG Industries, Inc.
 - c. Spacer: 1/2 Air Filled
 - d. Interior Lite: 1/4" Clear Float with coating on third surface (3)
 - e. Coating: "Sungate" 100 Low -E (Sputtered) by PPG Industries, Inc.
2. Performance:
 - a. Visible Light Transmission: 36%
 - b. Visible Reflectance, Out: 7%
 - c. Solar Transmission: 24%
 - d. Ultra-violet Transmission: 14%
 - e. Solar Reflectance, Out 10%
 - f. U-Value (Winter) .31
 - g. U-Value (Summer) .30
 - h. Shading Coefficient .41
 - i. Solar Heat Gain Coefficient: .35
 - j. Light to Solar Gain: 1.03

- B. **Glass Type GL-2 (1" Insulating Gray Tinted and Frosted Low E):** Factory-assembled units consisting of sealed lites of glass separated by a dehydrated interspace, and complying with ASTM E 774 for Class CBA units.

1. Basis-of-Design Products/Manufacturers:
 - a. 1" PPG "Sungate" 100 (3) Clear Insulated; PPG Glass.
 - b. Exterior Lite: 1/4" Gray by PPG Industries, Inc. with white PVB interlayer coating on second surface (2).
 - c. Spacer: 1/2 Air Filled
 - d. Interior Lite: 1/4" Clear Float with coating on third surface (3)
 - e. Coating: "Sungate" 100 Low -E (Sputtered) by PPG Industries, Inc.
2. Performance:
 - a. Visible Light Transmission: 36%
 - b. Visible Reflectance, Out: 7%
 - c. Solar Transmission: 24%
 - d. Ultra-violet Transmission: 14%
 - e. Solar Reflectance, Out 10%
 - f. U-Value (Winter) .31
 - g. U-Value (Summer) .30
 - h. Shading Coefficient .41

- i. Solar Heat Gain Coefficient: .35
- j. Light to Solar Gain: 1.03

C. **Glass Type GL-3 (1" Insulating Gray Spandrel):** Factory-assembled units consisting of sealed lites of glass separated by a dehydrated interspace, and complying with ASTM E 774 for Class CBA units.

1. Basis-of-Design Products/Manufacturers:

- a. 1" PPG "Sungate" 100 (3) Clear Insulated; PPG Glass.
- b. Exterior Lite: ¼" Gray by PPG Industries, Inc. with Gray OPACI-COAT 300 on second surface.
- c. Spacer: ½ Air Filled
- d. Interior Lite: ¼" Clear Float with coating on third surface (3)
- e. Coating: "Sungate" 100 Low -E (Sputtered) by PPG Industries, Inc.

2. Performance:

- a. Visible Light Transmission: 36%
- b. Visible Reflectance, Out: 7%
- c. Solar Transmission: 24%
- d. Ultra-violet Transmission: 14%
- e. Solar Reflectance, Out: 10%
- f. U-Value (Winter) .31
- g. U-Value (Summer) .30
- h. Shading Coefficient .41
- i. Solar Heat Gain Coefficient: .35
- j. Light to Solar Gain: 1.03

D. **Glass Type GL-4 (Clear Fire Rated):**

1. Basis-of-Design Product/Manufacturer: "FIRELITE" by Nippon Electric Glass Company, Ltd., and distributed by Technical Glass Products, Kirkland, Washington, voice 1-800-426-0279, fax 1-800-451-9857, e-mail sales@fireglass.com, web site www.fireglass.com.

2. Properties:

- a. Thickness: 3/16 inch(5 mm).
- b. Weight: 2.4 lbs./sq. ft.
- c. Approximate Visible Transmission: 88 percent.
- d. Approximate Visible Reflection: 9 percent.
- e. Hardness (Vicker's Scale): 700.
- f. Fire-rating: 20 minutes to 90 minutes.
- g. Impact Safety Resistance: None.
- h. Positive Pressure Test: UL 10C, UBC 7-2 and 7-4; passes.
- i. Surface Finish: Premium (polished).
- j. Maximum sheet sizes based on surface finish: 48" x 96"

2.2 GLAZING GASKETS

A. **Dense Compression Gaskets:** Molded or extruded gaskets of material indicated below, complying with standards referenced with name of elastomer indicated below, and of profile and hardness required to maintain watertight seal:

1. Silicone, ASTM C 1115.

- B. Soft Compression Gaskets: Extruded or molded, closed-cell, integral-skinned gaskets of material indicated below; complying with ASTM C 509, Type II, black; and of profile and hardness required to maintain watertight seal:
 - 1. Silicone.

2.3 GLAZING SEALANTS

- A. General: Provide products of type indicated, complying with the following requirements:
 - 1. Compatibility: Select glazing sealants that are compatible with one another and with other materials they will contact, including glass products, seals of insulating-glass units, and glazing channel substrates, under conditions of service and application, as demonstrated by sealant manufacturer based on testing and field experience.
 - 2. Suitability: Comply with sealant and glass manufacturers' written instructions for selecting glazing sealants suitable for applications indicated and for conditions existing at time of installation.
 - 3. Colors of Exposed Glazing Sealants: As selected by Architect from manufacturer's full range.
- B. Elastomeric Glazing Sealants: Comply with ASTM C 920 and other requirements indicated for each liquid-applied chemically curing sealant specified, including those referencing ASTM C 920 classifications for type, grade, class, and uses related to exposure and joint substrates.
 - 1. Single-Component Silicone Glazing Sealants: Refer to Section 07 92 00 - Joint Sealants.
- C. Glazing Sealants for Fire-Resistive Glazing Products: Identical to products used in test assemblies to obtain fire-protection rating.

2.4 GLAZING TAPES

- A. Back-Bedding Mastic Glazing Tapes: Preformed, butyl-based elastomeric tape with a solids content of 100 percent; nonstaining and nonmigrating in contact with nonporous surfaces; with or without spacer rod as recommended in writing by tape and glass manufacturers for application indicated; packaged on rolls with a release paper backing; and complying with ASTM C 1281 and AAMA 800 for products indicated below:
 - 1. AAMA 806.3 tape, for glazing applications in which tape is subject to continuous pressure.

2.5 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 for application indicated, and with a proven record of compatibility with surfaces contacted in installation.
- B. Cleaners, Primers, and Sealers: Types recommended by sealant or gasket manufacturer.
- C. Setting Blocks: Elastomeric material with a Shore, Type A durometer hardness of 85, plus or minus 5.
- D. Spacers: Elastomeric blocks or continuous extrusions with a Shore, Type 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 (side walking).
- F. Perimeter Insulation for Fire-Resistive Glazing: Identical to product used in test assembly to obtain fire-resistance rating.

2.6 FABRICATION OF GLAZING UNITS

- A. Fabricate glazing units in sizes required to glaze openings indicated for Project, with edge and face clearances, edge and surface conditions, and bite complying with written instructions of product manufacturer and referenced glazing publications, to comply with system performance requirements.

PART 3 - EXECUTION

3.1 GLAZING

- A. General: Comply with combined written instructions of manufacturers of glass, sealants, gaskets, and other glazing materials, unless more stringent requirements are indicated, including those in referenced glazing publications.
 - 1. 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.
 - 2. Protect glass edges from damage during handling and installation. Remove damaged glass from Project site and legally dispose of off Project site. Damaged glass is glass with edge damage or other imperfections that, when installed, could weaken glass and impair performance and appearance.
 - 3. Apply primers to joint surfaces where required for adhesion of sealants, as determined by preconstruction sealant-substrate testing.
 - 4. Install setting blocks in sill rabbets, sized and located to comply with referenced glazing publications, unless otherwise required by glass manufacturer. Set blocks in thin course of compatible sealant suitable for heel bead.
 - 5. Do not exceed edge pressures stipulated by glass manufacturers for installing glass lites.
 - 6. Provide spacers for glass lites where length plus width is larger than 50 inches (1270 mm).
 - 7. Provide edge blocking where indicated or needed to prevent glass lites from moving sideways in glazing channel, as recommended in writing by glass manufacturer and according to requirements in referenced glazing publications.
- B. Tape Glazing: Position tapes on fixed stops so that, when compressed by glass, their exposed edges are flush with or protrude slightly above sightline of stops. Install tapes continuously, but not necessarily in one continuous length. Do not stretch tapes to make them fit opening.
 - 1. Cover vertical framing joints by applying tapes to heads and sills first and then to jambs. Cover horizontal framing joints by applying tapes to jambs and then to heads and sills.
 - 2. Place joints in tapes at corners of opening with adjoining lengths butted together, not lapped. Seal joints in tapes with compatible sealant approved by tape manufacturer.
 - 3. Apply heel bead of elastomeric sealant.
 - 4. Center glass lites in openings on setting blocks and press firmly against tape by inserting dense compression gaskets formed and installed to lock in place against faces of

removable stops. Start gasket applications at corners and work toward centers of openings.

5. Apply cap bead of elastomeric sealant over exposed edge of tape.

C. Gasket Glazing (Dry): Fabricate compression gaskets in lengths recommended by gasket manufacturer to fit openings exactly, with allowance for stretch during installation.

1. Insert soft compression gasket between glass and frame or fixed stop so it is securely in place with joints miter cut and bonded together at corners.
2. Center glass lites in openings on setting blocks and press firmly against soft compression gasket by inserting dense compression gaskets formed and installed to lock in place against faces of removable stops. Start gasket applications at corners and work toward centers of openings. Compress gaskets to produce a weathertight seal without developing bending stresses in glass. Seal gasket joints with sealant recommended by gasket manufacturer.
3. Install gaskets so they protrude past face of glazing stops.

D. Sealant Glazing (Wet): Install continuous spacers, or spacers combined with cylindrical sealant backing, between glass lites and glazing stops to maintain glass face clearances and to prevent sealant from extruding into glass channel and blocking weep systems until sealants cure. Secure spacers or spacers and backings in place and in position to control depth of installed sealant relative to edge clearance for optimum sealant performance.

1. Force sealants into glazing channels to eliminate voids and to ensure complete wetting or bond of sealant to glass and channel surfaces.
2. Tool exposed surfaces of sealants to provide a substantial wash away from glass.

3.2 CLEANING AND PROTECTION

A. Protect exterior glass from damage 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. Protect glass from contact with contaminating substances resulting from construction operations, including weld splatter. If, despite such protection, contaminating substances do come into contact with glass, remove substances immediately as recommended by glass manufacturer.

B. Remove and replace glass that is broken, chipped, cracked, or abraded or that is damaged from natural causes, accidents, and vandalism, during construction period.

END OF SECTION

SECTION 09 21 16

GYPSUM BOARD ASSEMBLIES

PART 1 - GENERAL

- 1.1 Related Documents: The requirements of Division 1 are hereby made a part of this section as if fully repeated herein.
1. This Section is subject to the terms and procedures of Direct Purchasing, whereby the Owner reserves the right to recover the sales tax on materials by purchasing directly the materials required for this Section. Issuance of Purchase Orders by the Owner shall not relieve the Contractor of any of his responsibilities regarding material purchases or installations, with the exception of the payments for the materials as purchased.
- 1.2 SUMMARY
- A. Section Includes:
 1. Interior gypsum wallboard.
 2. Non-load-bearing steel framing.
 - B. Related Sections:
 1. Section 06 10 00 - Rough Carpentry: Exterior gypsum sheathing panels
 2. Section 07 84 00 - Firestopping.
- 1.3 SUBMITTALS
- A. Product Data: For each product indicated.
 - B. Samples: For each textured finish indicated and on same backing indicated for Work.
- 1.4 QUALITY ASSURANCE
- A. Fire-Test-Response Characteristics: For gypsum board assemblies with fire-resistance ratings, provide materials and construction identical to those tested in assembly indicated according to ASTM E 119 by an independent testing and inspecting agency acceptable to authorities having jurisdiction.
 - B. Sound Transmission Characteristics: For gypsum board assemblies with STC ratings, provide materials and construction identical to those tested in assembly indicated according to ASTM E 90 and classified according to ASTM E 413 by a qualified independent testing agency.

PART 2 - PRODUCTS

2.1 STEEL FRAMING

- A. Steel Framing, General: Comply with ASTM C 754 for conditions indicated.
 1. Steel Sheet Components: Metal complying with ASTM C 645 requirements.
 - a. Protective Coating, Interior Applications: manufacturer's standard corrosion-resistant zinc coating.

- B. Partition and Soffit Framing:
1. Steel Studs and Runners (except behind tile): ASTM C 645, in depth indicated.
 - a. Minimum Base Metal Thickness 0.027 inch (22 gage).
 2. Steel Studs and Runners behind Tile: ASTM C 645, in depth indicated.
 - a. Minimum Base Metal Thickness 0.30 inch (20 gage).
 3. Deep-Leg Deflection Track: ASTM C 645 top runner with 2-inch deep flanges.
 4. Flat Strap and Backing Plate: Steel sheet for blocking and bracing in length and width indicated.
 - a. Minimum Base Metal Thickness: 0.027 inch (22 gage).
 5. Cold-Rolled Furring Channels: 0.0538-inch (16 gage) bare steel thickness, with minimum 1/2-inch- (12.7-mm-) wide flange, and in depth indicated.
 - a. Furring Brackets: Adjustable, corrugated-edge type of steel sheet with minimum bare steel thickness of 0.0312 inch (20 gage).
 - b. Tie Wire: ASTM A 641, Class 1 zinc coating, soft temper, 0.0625-inch- (1.59-mm-) diameter wire, or double strand of 0.0475-inch- (1.21-mm-) diameter wire.
 6. Z-Shaped Furring: With slotted or nonslotted web, face flange of 1-1/4 inches, wall attachment flange of 7/8 inch, minimum bare metal thickness of 0.0179 inch (25 gage), and depth required to fit insulation thickness indicated.
 7. Fasteners for Metal Framing: Of type, material, size, corrosion resistance, holding power, and other properties required to fasten steel members to substrates.

2.2 PANEL PRODUCTS

- A. Panel Size, General: Provide in maximum lengths and widths available that will minimize joints in each area and correspond with support system indicated.
- B. Gypsum Wallboard: ASTM C 36.
1. Regular Type: In thickness indicated and with long edges tapered.
 2. Type X: In thickness indicated and with long edges tapered.
- C. Exterior Gypsum Sheathing Panels: Refer to Section 06 10 00 - Rough Carpentry.

2.3 TRIM ACCESSORIES

- A. Interior Trim: ASTM C 1047.
1. Cornerbead: Use at outside corners.
 2. LC-Bead: Use at exposed panel edges.
 3. L-Bead: Use where required.
 4. U-Bead: Use where required

2.4 JOINT TREATMENT MATERIALS

- A. General: Comply with ASTM C 475.
- B. Joint Tape:
1. Interior Gypsum Wallboard: Paper.
 2. Glass-Mat Gypsum Sheathing Board: 10-by-10 glass mesh.
- C. Joint Compound for Interior Gypsum Wallboard: For each coat use formulation that is compatible with other compounds applied on previous or for successive coats.
1. Prefilling: At open joints and damaged surface areas, use setting-type taping compound.

2. Embedding and First Coat: For embedding tape and first coat on joints, flanges of trim accessories, and fasteners, use setting-type taping compound.
 - a. Use setting-type compound for installing paper-faced metal trim accessories.
3. Fill Coat: For second coat, use drying-type, all-purpose compound.
4. Finish Coat: For third coat, use drying-type, all-purpose compound.
5. Skim Coat: For final coat of Level 5 finish, use drying-type, all-purpose compound.

2.5 AUXILIARY MATERIALS

- A. General: Provide auxiliary materials that comply with referenced installation standards and manufacturer's written recommendations.
- B. Acoustical Sealant for Exposed and Concealed Joints: Nonsag, paintable, nonstaining, latex sealant complying with ASTM C 834 that effectively reduces airborne sound transmission through perimeter joints and openings in building construction as demonstrated by testing representative assemblies according to ASTM E 90.
 1. Available Products:
 - a. Pecora Corp.; AC-20 FTR Acoustical and Insulation Sealant.
 - b. Tremco, Inc.; Tremco Acoustical Sealant.
 - c. United States Gypsum Co.; SHEETROCK Acoustical Sealant.
- C. Steel Drill Screws: ASTM C 1002, unless otherwise indicated.
 1. Use screws complying with ASTM C 954 for fastening panels to steel members from 0.033 to 0.112 inch (0.84 to 2.84 mm) thick.

PART 3 - EXECUTION

3.1 NON-LOAD-BEARING STEEL FRAMING INSTALLATION

- A. General: Comply with ASTM C 754, and ASTM C 840 requirements that apply to framing installation.
- B. Partition and Soffit Framing:
 1. Where studs are installed directly against exterior walls, install isolation strip between studs and wall.
 2. Extend partition framing full height to structural supports or substrates above suspended ceilings, except where partitions are indicated to terminate at suspended ceilings. Continue framing over frames for doors and openings and frame around ducts penetrating partitions above ceiling to provide support for gypsum board.
 3. 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.
 - a. Install two studs at each jamb, unless otherwise indicated.
 - b. Extend jamb studs through suspended ceilings and attach to underside of floor or roof structure above.

4. Frame openings other than door openings the same as required for door openings, unless otherwise indicated. Install framing below sills of openings to match framing required above door heads.
- C. Z-Furring Members: Erect insulation vertically and hold in place with Z-furring members.
1. Until gypsum board is installed, hold insulation in place with 10-inch staples fabricated from 0.0625-inch-diameter, tie wire and inserted through slot in web of member.

3.2 PANEL PRODUCT INSTALLATION

- A. Gypsum Board: Comply with ASTM C 840 and GA-216.
1. Space screws a maximum of 12 inches o.c. for vertical applications.
 2. Space fasteners in panels that are tile substrates a maximum of 8 inches o.c.
 3. On ceilings, apply gypsum panels before wall/partition board application to the greatest extent possible and at right angles to framing, unless otherwise indicated.
 4. On partitions/walls, apply gypsum panels vertically (parallel to framing), unless otherwise indicated or required by fire-resistance-rated assembly, and minimize end joints.
 - a. Stagger abutting end joints not less than one framing member in alternate courses of board.
 5. On Z-furring members, apply gypsum panels vertically (parallel to framing) with no end joints. Locate edge joints over furring members.
 6. Single-Layer Fastening Methods: Apply gypsum panels to supports with steel drill screws.

3.3 WALL PRIORITY

- A. Wall Intersections: Intersections of walls shall be installed in accordance with a priority of the highest to lowest. The highest priority wall shall continue uninterrupted (IE. gypsum board layers required on each side of wall shall continue through wall intersection) while the lower priority wall shall abut the other wall.
- B. Schedule:

<u>WALL</u>	<u>PRIORITY</u>
Two-hour shaftwall:	1 (highest)
Two-hour wall:	2
One-hour shaftwall:	3
One-hour wall:	4
Non-rated wall to deck:	5
Non-rated wall to above ceiling:	6 (lowest)

3.4 FINISHING

- A. Installing Trim Accessories: For trim with back flanges intended for fasteners, attach to framing with same fasteners used for panels. Otherwise, attach trim according to manufacturer's written instructions.
- B. Finishing Gypsum Board Panels: Treat gypsum board joints, interior angles, edge trim, control joints, penetrations, fastener heads, surface defects, and elsewhere as required preparing gypsum board surfaces for decoration.
1. Prefill open joints and damaged surface areas.

2. Apply joint tape over gypsum board joints, except those with trim having flanges not intended for tape.
- C. Gypsum Board Finish Levels: Finish panels to levels indicated below, according to ASTM C 840, for locations indicated:
1. Level 1: Embed tape at joints in ceiling plenum areas, concealed areas, and where indicated, unless a higher level of finish is required for fire-resistance-rated assemblies and sound-rated assemblies.
 2. Level 2: Embed tape and apply separate first coat of joint compound to tape, fasteners, and trim flanges at utility areas and surfaces behind fixed cabinetry.
 3. Level 4: Embed tape and apply separate first, fill, and finish coats of joint compound to tape, fasteners, and trim flanges at panel surfaces that will be exposed to view, unless otherwise indicated.
 4. Level 5: Embed tape and apply separate first, fill, and finish coats of joint compound to tape, fasteners, and trim flanges, and apply skim coat of joint compound over entire surface at walls and ceilings scheduled to receive semi-gloss paint.

3.5 PARTITION IDENTIFICATION

- A. Stenciling: Stencil the wall rating on each side of wall above the ceiling. Letters shall be minimum 2" high and labeled at 20-foot centers.
1. Label as "FIRE", "SMOKE," and "No. of Hours."
 2. Non-rated walls that extend to deck shall be labeled "NO WALL RATING REQUIRED."

3.6 CLEANING AND PROTECTION

- A. Cleaning: Promptly remove any residual joint compound from adjacent surfaces.
- B. Protection: Provide final protection and maintain conditions that ensure gypsum board assemblies remain without damage or deterioration at time of Substantial Completion.

END OF SECTION

SECTION 09 30 00

TILING

PART 1 - GENERAL

1.1 SUMMARY

A. Section Includes:

1. Ceramic floor tile, thin-set.
2. Wall tile, thin-set.
3. Cementitious backer units.
4. Stone thresholds installed as part of tile installations.
5. Self-leveling underlayment for transitions between tile and other flooring substrates.

B. Related Sections:

1. Section 07 92 00 - Joint Sealants: Sealing of tile expansion joints and where tile abuts plumbing fixtures, countertops, and items penetrating tile walls, etc.

1.2 SUBMITTALS

A. Product Data: For each product indicated.

B. Shop Drawings: Show locations of each type of tile and tile pattern. Show widths, details, and locations of expansion, contraction, control, and isolation joints.

C. Samples:

1. Each type, composition, color, and finish of tile.
2. Assembled samples with grouted joints for each type, composition, color, and finish of tile.
3. Stone thresholds in 6-inch lengths.

1.3 QUALITY ASSURANCE

A. Mockups: Build mockups to verify selections made under sample Submittals and to demonstrate aesthetic effects and qualities of materials and execution.

1. Build mockup of each type of floor tile installation.
2. Build mockup of each type of wall tile installation.
3. Approved mockups may become part of the completed Work if undisturbed at time of Substantial Completion.

PART 2 - PRODUCTS

2.1 TILE PRODUCTS

A. Basis-of-Design Products: The design for each tile type is based on the product named in the Material Legend. Subject to compliance with requirements, provide the named product or an Architect-approved equivalent.

- B. ANSI Ceramic Tile Standard: Provide Standard grade tile that complies with ANSI A137.1, "Specifications for Ceramic Tile," for types, compositions, and other characteristics indicated.
- C. Ceramic Mosaic Trim Units: Matching characteristics of adjoining flat tile and coordinated with sizes and coursing where applicable.

2.2 ACCESSORY MATERIALS

- A. Thresholds: Fabricate to provide transition between adjacent floor finishes. Bevel edges at 1:2 slope, limit height of bevel to 1/2 inch or less, and finish bevel to match face of threshold.
 - 1. Marble Thresholds: ASTM C 503 with a minimum abrasion resistance of 12 per ASTM C 1353 or ASTM C 241 and with honed finish.
 - a. Description: Uniform, fine- to medium-grained white stone with gray veining.

2.3 WATERPROOFING AND CRACK-SUPPRESSION MEMBRANES FOR THIN-SET TILE INSTALLATIONS

- A. Chlorinated-Polyethylene-Sheet Product: Nonplasticized, chlorinated polyethylene faced on both sides with high-strength, nonwoven polyester fabric, for adhering to latex-portland cement mortar; 60 inches wide by 0.030-inch nominal thickness; comply with ANSI A118.10.
 - 1. Available Product: Noble Company (The); "Nobleseal TS."

2.4 SETTING AND GROUTING MATERIALS

- A. Available Manufacturers:
 - 1. Bonsal, W. R., Company.
 - 2. C-Cure.
 - 3. Custom Building Products.
 - 4. LATICRETE International Inc.
 - 5. MAPEI Corporation.
- B. Latex-Portland Cement Mortar (Thin Set): ANSI A118.4.
 - 1. Prepackaged dry-mortar mix containing dry additive to which only water must be added or prepackaged dry-mortar mix combined with liquid-latex additive.
 - 2. For wall applications, provide nonsagging mortar.
- C. Polymer-Modified Tile Grout: ANSI A118.7, color as indicated.
 - 1. Polymer Type: Liquid-latex form for addition to prepackaged dry-grout mix.
- D. Grout for PregROUTED Tile Sheets: Same silicone rubber used in factory to pregrout tile sheets.

2.5 MISCELLANEOUS MATERIALS

- A. Elastomeric Sealants: Elastomeric sealants of base polymer and characteristics indicated that comply with applicable requirements in Section 07 92 00 - Joint Sealants.
 - 1. One-Part, Mildew-Resistant Silicone: ASTM C 920; Type S; Grade NS; Class 25; Uses NT, G, A, and, as applicable to nonporous joint substrates indicated, O; formulated with fungicide, intended for in-service exposures of high humidity and extreme temperatures.
 - a. Available Products:
 - 1) Dow Corning Corporation; Dow Corning 786.
 - 2) GE Silicones; Sanitary 1700.

3) Pecora Corporation; Pecora 898 Sanitary Silicone Sealant.

- B. Metal Edge Strips: Angle or L-shape, height to match tile and setting-bed thickness; metallic, designed specifically for flooring applications.
 - 1. Provide half-hard brass, white zinc alloy, nickel silver, or stainless steel exposed-edge material as selected by Architect.
 - 2. Finish: Satin finish.
- C. Trowelable Underlayments and Patching Compounds: Latex-modified, portland cement-based formulation provided or approved by manufacturer of tile-setting materials.
 - 1. Approved Product/Manufacturer:
 - a. Ardex "K-15."
- D. Grout Sealer: Manufacturer's standard silicone product for sealing grout joints that does not change color or appearance of grout.

2.6 CEMENTITIOUS BACKER UNITS

- A. Provide cementitious backer units complying with ANSI A118.9 in maximum lengths available to minimize end-to-end butt joints.
 - 1. Thickness: 1/2 inch.
 - 2. Width: Manufacturer's standard width, but not less than 32 inches.
- B. Available Products:
 - 1. C-Cure; C-Cure Board 990.
 - 2. Custom Building Products; Wonderboard.
 - 3. FinPan, Inc.; Util-A-Crete Concrete Backer Board.
 - 4. USG Corporation; DUROCK Cement Board.

PART 3 - EXECUTION

3.1 PREPARATION

- A. Remove coatings, including curing compounds and other substances that contain soap, wax, oil, or silicone, that are incompatible with tile-setting materials.
- B. Fill cracks, holes, and depressions with trowelable leveling and patching compound according to tile-setting material manufacturer's written instructions.
- C. Remove protrusions, bumps, and ridges by sanding or grinding.
- D. Blending: For tile exhibiting color variations, use factory blended tile or blend tiles at Project site before installing.
- E. Field-Applied Temporary Protective Coating: Where indicated under tile type or needed to prevent grout from staining or adhering to exposed tile surfaces, precoat them with continuous film of temporary protective coating, taking care not to coat unexposed tile surfaces.

3.2 INSTALLATION, GENERAL

- A. ANSI Tile Installation Standards: Comply with parts of ANSI A108 Series "Specifications for Installation of Ceramic Tile" that apply to types of setting and grouting materials and to methods indicated in ceramic tile installation schedules.
- B. TCA Installation Guidelines: TCA's "Handbook for Ceramic Tile Installation." Comply with TCA installation methods indicated in ceramic tile installation schedules.
- C. Extend tile work into recesses and under or behind equipment and fixtures to form complete covering without interruptions, unless otherwise indicated. Terminate work neatly at obstructions, edges, and corners without disrupting pattern or joint alignments.
- D. Accurately form intersections and returns. Perform cutting and drilling of tile without marring visible surfaces. Grind cut edges of tile abutting trim, finish, or built-in items. Fit tile closely to electrical outlets, piping, fixtures, and other penetrations so plates, collars, or covers overlap tile.
- E. Jointing Pattern: Lay tile in grid pattern, unless otherwise indicated. Align joints when adjoining tiles on floor, base, walls, and trim are same size. Lay out tile work and center tile fields in both directions in each space or on each wall area. Adjust to minimize tile cutting. Provide uniform joint widths, unless otherwise indicated.
- F. Lay out tile wainscots to next full tile beyond dimensions indicated.
- G. Expansion Joints: Locate expansion joints and other sealant-filled joints during installation of setting materials, mortar beds, and tile. Do not saw-cut joints after installing tiles.
 - 1. Locate joints in tile surfaces directly above joints in concrete substrates.
 - 2. Prepare joints and apply sealants to comply with requirements in Section 07 92 00 - Joint Sealants.
- H. Grout tile to comply with requirements of ANSI A108.10, unless otherwise indicated.
- I. For installations indicated below, follow procedures in ANSI A108 Series tile installation standards for providing 95 percent mortar coverage.
 - 1. Tile floors in wet areas.
 - 2. Tile floors composed of tiles 8 by 8 inches or larger.
 - 3. Tile floors composed of rib-backed tiles.
- J. Floor Joint Widths:
 - 1. Ceramic Mosaic Tile: 1/16 inch.
 - 2. Quarry Tile: 1/4 inch.
 - 3. Dimension Stone Tile: 1/8 inch.
- K. Stone Thresholds: Install stone thresholds at locations indicated; set in same type of setting bed as abutting field tile, unless otherwise indicated.
 - 1. Set thresholds in latex-portland cement mortar for locations where mortar bed would otherwise be exposed above adjacent nontile floor finish.
- L. Underlayment for Concrete Floor Transitions: Mechanically remove laitance, glaze, efflorescence, curing compounds, form-release agents, dust, dirt, grease, oil, and other contaminants that might impair underlayment bond.
 - 1. Mix and apply underlayment components according to manufacturer's written instructions.

2. Feather edges to match adjacent floor elevations.
3. Maximum slope of transition shall be 1:12.

M. Wall Joint Widths:

1. Glazed Wall Tile: 1/16 inch.

- N. Apply grout sealer to grout joints in tile floors according to grout-sealer manufacturer's written instructions. As soon as grout sealer has penetrated grout joints, remove excess sealer and sealer that has gotten on tile faces by wiping with soft cloth.

3.3 FLOOR TILE INSTALLATION SCHEDULE

A. Slab-On-Grade Interior floor installation; thin-set mortar; TCA F113.

1. Thin-Set Mortar: Latex- portland cement mortar.
2. Grout: Polymer-modified sanded grout.

B. Second Floor installation; thin-set mortar; TCA F122.

1. Thin-Set Mortar: Latex- portland cement mortar.
2. Grout: Polymer-modified sanded grout.

3.4 WALL TILE INSTALLATION SCHEDULE

A. Interior wall installation; thin-set mortar; over cementitious backer units; TCA W244.

1. Thin-Set Mortar: Latex- portland cement mortar.
2. Grout: Polymer-modified unsanded grout.

END OF SECTION

SECTION 09 51 13

ACOUSTICAL PANEL CEILINGS

PART 1 - GENERAL

- 1.1 Related Documents: The requirements of Division 1 are hereby made a part of this section as if fully repeated herein.
1. DIRECT PURCHASING: This Section is subject to the terms and procedures of Direct Purchasing, whereby the Owner reserves the right to recover the sales tax on materials by purchasing directly the materials required for this Section. Issuance of Purchase Orders by the Owner shall not relieve the Contractor of any of his responsibilities regarding material purchases or installations, with the exception of the payments for the materials as purchased.
- 1.2 SUMMARY
- A. Section Includes:
 1. Acoustical panels.
 2. Exposed suspension systems.
 - B. Related Sections:
 1. Section 09 21 16 - Gypsum Board Assemblies: Suspended gypsum board ceilings.
- 1.3 SUBMITTALS
- A. Product data for each type of product specified.
 - B. Coordination drawings for reflected ceiling plans drawn accurately to scale and coordinating penetrations and ceiling-mounted items. Show the following:
 1. Ceiling suspension system members.
 2. Method of attaching suspension system hangers to building structure.
 3. Ceiling-mounted items including light fixtures; air outlets and inlets; speakers; sprinklers; and special moldings at walls, column penetrations, and other junctures of acoustical ceilings with adjoining construction.
 4. Minimum Drawing Scale: 1/4 inch = 1 foot.
 - C. Samples for verification of each type of exposed finish required, prepared on samples of size indicated below. Where finishes involve normal color and texture variations, include sample sets showing the full range of variations expected.
 1. 6-inch-square samples of each acoustical panel type, pattern, and color.
 2. Set of 12-inch-long samples of exposed suspension system members, including moldings, for each color and system type required.
 - D. Qualification data for firms and persons specified in the "Quality Assurance" Article to demonstrate their capabilities and experience. Include lists of completed projects with project names and addresses, names and addresses of architects and owners, and other information specified.

- E. Product test reports from a qualified independent testing agency that are based on it's testing of current products for compliance of acoustical panel ceilings and components with requirements.
- F. Research reports or evaluation reports of the model code organization acceptable to authorities having jurisdiction that show compliance of acoustical panel ceilings and components with the building code in effect for the Project.

1.4 QUALITY ASSURANCE

- A. Installer Qualifications: Engage an experienced Installer who has completed acoustical panel ceilings similar in material, design, and extent to that indicated for this Project and with a record of successful in-service performance.
- B. Fire-Test-Response Characteristics: Provide acoustical panel ceilings that comply with the following requirements:
 - 1. Fire-response tests are performed by a qualified testing and inspecting agency. Qualified testing and inspecting agencies include Underwriters Laboratories (UL), Warnock Hersey, or another agency that is acceptable to authorities having jurisdiction and that performs testing and follow-up services.
 - 2. Surface-burning characteristics of acoustical panels comply with ASTM E 1264 for Class A materials as determined by testing identical products per ASTM E 84.
- C. Single-Source Responsibility for Ceiling Units: Obtain each type of acoustical ceiling panel from a single source with resources to provide products of consistent quality in appearance and physical properties without delaying the Work.
- D. Single-Source Responsibility for Suspension System: Obtain each type of suspension system from a single source with resources to provide products of consistent quality in appearance and physical properties without delaying the Work.

1.5 DELIVERY, STORAGE, AND HANDLING

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

1.6 PROJECT CONDITIONS

- A. Space Enclosure and Environmental Limitations: Do not install acoustical panel ceilings until spaces are enclosed and weatherproof, wet-work in spaces is completed and dry, work above ceilings is complete, and ambient temperature and humidity conditions are being maintained at the levels indicated for Project when occupied for its intended use.

1.7 COORDINATION

- A. Coordinate layout and installation of acoustical panels and suspension system components with other construction that penetrates ceilings or is supported by them, including light fixtures, HVAC equipment, fire-suppression system components (if any), and partition assemblies (if any).

1.8 EXTRA MATERIALS

- A. Furnish extra materials described below that match products installed, are packaged with protective covering for storage, and are identified with labels clearly describing contents.
 - 1. Acoustical Ceiling Units: Furnish quantity of full-size units equal to 2.0 percent of amount installed.
 - 2. Exposed Suspension System Components: Furnish quantity of each exposed component equal to 2.0 percent of amount installed.

PART 2 - PRODUCTS

2.1 ACOUSTICAL CEILING PANELS

- A. Manufacturers/Products: Acoustical ceiling panels are based on products indicated in the Material Legend. Subject to compliance with requirements, provide the named product or a comparable product approved by the Architect.

2.2 METAL SUSPENSION SYSTEM

- A. Manufacturers/Products: Metal suspension system is based on products indicated in the Finish Schedule. Subject to compliance with requirements, provide the named product or a comparable product approved by the Architect.
- B. Steel Suspension System: Main and cross runners roll formed from cold-rolled steel sheet, prepainted, electrolytically zinc coated, or hot-dip galvanized according to ASTM A 653, not less than G30 (Z90) coating designation, with prefinished 15/16-inch-wide metal caps on flanges.
 - 1. Structural Classification: Intermediate-duty system.
 - 2. End Condition of Cross Runners: Butt-edge type.
 - 3. Cap Material: Steel or aluminum cold-rolled sheet.
 - 4. Cap Finish: Painted in color as selected from manufacturer's full range

2.3 GENERAL

- A. Acoustical Panel Standard: Comply with ASTM E 1264.
 - 1. Mounting Method for Measuring Noise Reduction Coefficient (NRC): Type E-400 per ASTM E 795.
- B. Metal Suspension System Standard: Comply with ASTM C 635.

- C. Attachment Devices: Size for five times the design load indicated in ASTM C 635, Table 1, "Direct Hung," unless otherwise indicated.
 - 1. Anchors in Concrete: Expansion anchors fabricated from corrosion-resistant materials, with holes or loops for attaching hangers of type indicated and with capability to sustain, without failure, a load equal to five times that imposed by ceiling construction, as determined by testing per ASTM E 488 or ASTM E 1512 as applicable, conducted by a qualified testing and inspecting agency.
 - 2. Power-Actuated Fasteners in Concrete: Fastener system of type suitable for application indicated, fabricated from corrosion-resistant materials, with clips or other accessory devices for attaching hangers of type indicated, and with capability to sustain, without failure, a load equal to 10 times that imposed by ceiling construction, as determined by testing per ASTM E 1190, conducted by a qualified testing and inspecting agency.

- D. Wire Hangers, Braces, and Ties: Zinc-coated carbon-steel wire; ASTM A 641, Class 1 zinc coating, soft temper.
 - 1. Size: Select wire diameter so its stress at three times hanger design load (ASTM C 635, Table 1, "Direct Hung") will be less than yield stress of wire, but provide not less than 0.106-inch-diameter wire.

PART 3 - EXECUTION

3.1 INSTALLATION

- A. General: Install acoustical panel ceilings to comply with ASTM C 636 and seismic requirements indicated, per manufacturer's written instructions and CISCA's "Ceiling Systems Handbook."
- B. Measure each ceiling area and establish layout of acoustical panels to balance border widths at opposite edges of each ceiling. Avoid using less-than-half-width tiles at borders.
- C. Suspend ceiling hangers from building's structural members, plumb and free from contact with insulation or other objects within ceiling plenum. Splay hangers only where required to miss obstructions; offset resulting horizontal forces by bracing, countersplaying, or other equally effective means. Where width of ducts and other construction within ceiling plenum produces hanger spacings that interfere with location of hangers, use trapezes or equivalent devices.
 - 1. Do not support ceilings directly from permanent metal forms or floor deck; anchor into concrete slabs.
 - 2. Do not attach hangers to steel deck tabs or to steel roof deck.
- D. Install edge moldings and trim of type indicated at perimeter of acoustical ceiling area and where necessary to conceal edges of acoustical panels. Screw attach moldings to substrate with concealed fasteners at intervals not more than 16 inches o.c. and not more than 3 inches from ends, leveling with ceiling suspension system to a tolerance of 1/8 inch in 12 feet. Miter corners accurately and connect securely.
- E. Install suspension system runners so they are square and securely interlocked with one another. Remove and replace dented, bent, or kinked members.

- F. Install acoustical panels with undamaged edges and fit accurately into suspension system runners and edge moldings. Scribe and cut panels at borders and penetrations to provide a neat, precise fit.

3.2 CLEANING

- A. Clean exposed surfaces of acoustical panel ceilings, including trim, edge moldings, and suspension system members. Comply with manufacturer's instructions for cleaning and touchup of minor finish damage. Remove and replace ceiling components that cannot be successfully cleaned and repaired to permanently eliminate evidence of damage.

END OF SECTION

SECTION 09 65 00

RESILIENT FLOOR TILE

PART 1 - GENERAL

- 1.1 Related Documents: The requirements of Division 1 are hereby made a part of this section as if fully repeated herein.
1. DIRECT PURCHASING: his Section is subject to the terms and procedures of Direct Purchasing, whereby the Owner reserves the right to recover the sales tax on materials by purchasing directly the materials required for this Section. Issuance of Purchase Orders by the Owner shall not relieve the Contractor of any of his responsibilities regarding material purchases or installations, with the exception of the payments for the materials as purchased.
- 1.2 SUMMARY
- A. Section Includes:
 1. Vinyl composition floor tile and accessories.
- 1.3 SUBMITTALS
- A. Product Data: For each product indicated.
 - B. Samples: Full-size units of each color and pattern of resilient floor tile required.
- 1.4 PROJECT CONDITIONS
- A. Maintain temperatures within range recommended by manufacturer, but not less than 70 deg F or more than 95 deg F, in spaces to receive floor tile during the following time periods:
 1. 48 hours before installation.
 2. During installation.
 3. 48 hours after installation.
 - B. After postinstallation period, maintain temperatures within range recommended by manufacturer, but not less than 55 deg F or more than 95 deg F.
 - C. Close spaces to traffic during floor covering installation.
 - D. Close spaces to traffic for 48 hours after floor covering installation.
 - E. Install resilient products after other finishing operations, including painting, have been completed.
- 1.5 EXTRA MATERIALS
- A. Furnish extra materials described below that match products installed and that are packaged with protective covering for storage and identified with labels describing contents.
 1. Floor Tile: Furnish 1 box for every 50 boxes or fraction thereof, of each type, color, and pattern of floor tile installed.

PART 2 - PRODUCTS

2.1 VINYL COMPOSITION TILE

- A. VCT Manufacturers/Products: Vinyl composition tile and accessories are based on products indicated in the Material Legend. Subject to compliance with requirements, provide the named product or a comparable product approved by Architect.
- B. Properties:
 - 1. Class: Through-pattern tile.
 - 2. Wearing Surface: Smooth.
 - 3. Thickness: 0.125 inch.
 - 4. Size: refer to finish schedule on drawings
 - 5. Fire-Test-Response Characteristics:
 - a. Critical Radiant Flux Classification: Class I, not less than 0.45 W/sq. cm per ASTM E 648.

2.2 INSTALLATION MATERIALS

- A. Trowelable Leveling and Patching Compounds: Latex-modified, portland cement based or blended hydraulic cement-based formulation provided or approved by resilient product manufacturer for applications indicated.
- B. Adhesives: Water-resistant type recommended by manufacturer to suit resilient products and substrate conditions indicated.
- C. Metal Edge Strips: Extruded aluminum with mill finish of width shown, of height required to protect exposed edges of tiles, and in maximum available lengths to minimize running joints.

PART 3 - EXECUTION

3.1 PREPARATION

- A. Prepare substrates according to manufacturer's written recommendations to ensure adhesion of resilient products.
- B. Concrete Substrates: Prepare according to ASTM F 710.
 - 1. Verify that substrates are dry and free of curing compounds, sealers, and hardeners.
 - 2. Alkalinity and Adhesion Testing: Perform tests recommended by manufacturer. Proceed with installation only after substrates pass testing.
 - 3. Moisture Testing:
 - a. Perform anhydrous calcium chloride test, ASTM F 1869. Proceed with installation only after substrates have maximum moisture-vapor-emission rate of 3 lb of water/1000 sq. ft. in 24 hours.
 - b. Perform tests recommended by manufacturer. Proceed with installation only after substrates pass testing.
- C. Remove substrate coatings and other substances that are incompatible with adhesives and that contain soap, wax, oil, or silicone, using mechanical methods recommended by manufacturer. Do not use solvents.

- D. Use trowelable leveling and patching compound to fill cracks, holes, and depressions in substrates.
- E. Move resilient products and installation materials into spaces where they will be installed at least 48 hours in advance of installation.
 - 1. Do not install resilient products until they are same temperature as space where they are to be installed.
- F. Sweep and vacuum clean substrates to be covered by resilient products immediately before installation. After cleaning, examine substrates for moisture, alkaline salts, carbonation, and dust. Proceed with installation only after unsatisfactory conditions have been corrected.

3.2 INSTALLATION

- A. Lay out tiles from center marks established with principal walls, discounting minor offsets, so tiles at opposite edges of room are of equal width.
 - 1. Adjust as necessary to avoid using cut widths that equal less than one-half tile at perimeter.
 - 2. Pattern: Lay floor materials with grain running in one direction unless otherwise indicated.
- B. Match tiles for color and pattern by selecting tiles from cartons in the same sequence as manufactured and packaged, if so numbered.
 - 1. Discard broken, cracked, chipped, or deformed tiles.
- C. Scribe, cut, and fit tiles to butt neatly and tightly to vertical surfaces and permanent fixtures including built-in furniture, cabinets, pipes, outlets, edgings, door frames, thresholds, and nosings.
- D. Extend tiles or feature strips as indicated into toe spaces, door reveals, closets, and similar openings.
- E. Maintain reference markers, holes, and openings that are in place or marked for future cutting by repeating on floor tiles as marked on substrates. Use chalk or other nonpermanent, nonstaining marking device.
- F. Install tiles on covers for telephone and electrical ducts and similar items in finished floor areas. Maintain overall continuity of color and pattern with pieces of tile installed on covers.
 - 1. Tightly adhered tile edges to substrates that abut covers and to cover perimeters.
- G. Adhere tiles to flooring substrates using a full spread of adhesive applied to substrate to produce a completed installation without open cracks, voids, raising and puckering at joints, telegraphing of adhesive spreader marks, and other surface imperfections.
- H. Perform the following operations immediately after completing resilient product installation:
 - 1. Remove adhesive and other blemishes from exposed surfaces.
 - 2. Sweep and vacuum surfaces thoroughly.
 - 3. Damp-mop surfaces to remove marks and soil.
 - a. Do not wash surfaces until after time period recommended by manufacturer.

- I. Protect resilient products from mars, marks, indentations, and other damage from construction operations and placement of equipment and fixtures during remainder of construction period. Use protection methods recommended in writing by manufacturer.

END OF SECTION

SECTION 09 65 13

RESILIENT WALL BASE AND ACCESSORIES

PART 1 - GENERAL

- 1.1 Related Documents: The requirements of Division 1 are hereby made a part of this section as if fully repeated herein.
1. DIRECT PURCHASING: This Section is subject to the terms and procedures of Direct Purchasing, whereby the Owner reserves the right to recover the sales tax on materials by purchasing directly the materials required for this Section. Issuance of Purchase Orders by the Owner shall not relieve the Contractor of any of his responsibilities regarding material purchases or installations, with the exception of the payments for the materials as purchased.
- 1.2 SUMMARY
- A. Section Includes:
 1. Resilient wall base.
- 1.3 SUBMITTALS
- A. Product data for each type of product specified.
 - B. Samples for verification purposes in manufacturer's standard sizes, but not less than 12 inches long, of each different color and pattern of product specified.
 - C. Product certificates, in lieu of laboratory test reports when permitted by Architect, signed by manufacturer certifying that each product complies with requirements.
- 1.4 QUALITY ASSURANCE
- A. Single-Source Responsibility for Products: Obtain each type and color of product specified from a single source with resources to provide products of consistent quality in appearance and physical properties without delaying progress of the Work.
 - B. Fire Performance Characteristics: Provide products with the following fire performance characteristics as determined by testing products per ASTM test method indicated below by UL or another testing and inspecting agency acceptable to authorities having jurisdiction.
 1. Critical Radiant Flux: 0.45 watts per sq. cm or more per ASTM E 648.
 2. Smoke Density: Less than 450 per ASTM E 662.
- 1.5 DELIVERY, STORAGE, AND HANDLING
- A. Deliver products to Project site in original manufacturer's unopened cartons and containers, each bearing names of product and manufacturer, Project identification, and shipping and handling instructions.
 - B. Store products in dry spaces protected from the weather with ambient temperatures maintained between 50 deg F and 90 deg F.

- C. Move products into spaces where they will be installed at least 48 hours in advance of installation.

1.6 PROJECT CONDITIONS

- A. Do not install products until they are at the same temperature as that of the space where they are to be installed.
- B. Maintain a minimum temperature of 70 deg F in spaces to receive products specified in this Section for at least 48 hours prior to installation, during installation, and for not less than 48 hours after installation. After this period, maintain a temperature of not less than 55 deg F.
- C. Close spaces to traffic during installation of products specified in this Section.

1.7 SEQUENCING AND SCHEDULING

- A. Sequence installing products specified in this Section with other construction to minimize possibility of damage and soiling during remainder of construction period.

1.8 EXTRA MATERIALS

- A. Deliver extra materials to Owner. Furnish extra materials matching products installed as described below, packaged with protective covering for storage, and identified with labels clearly describing contents.
 - 1. Furnish not less than 10 linear feet for each 500 linear feet or fraction thereof of each different type and color of resilient wall base installed.

PART 2 - PRODUCTS

2.1 RESILIENT WALL BASE

- A. Wall Base Manufacturers/Products: Wall base and accessories are based on products indicated in the Material Legend. Subject to compliance with requirements, provide the named product or a comparable product by one of the following
 - 1. Flexco Company.
 - 2. Johnsonite.
 - 3. Roppe Rubber Corporation
- B. Rubber Wall Base: Products complying with FS SS-W-40, Type I, and as follows:
 - 1. Style: Cove with top-set toe.
 - 2. Minimum Nominal Thickness: 1/8 inch.
 - 3. Height: refer to finish schedule on drawings
 - 4. Lengths: Coils in lengths standard with manufacturer but not less than 100 feet.
 - 5. Exterior Corners: Job-formed only.
 - 6. Interior Corners: Job-formed only.
 - 7. Color and Pattern: Refer to Finish Schedule.

2.2 INSTALLATION ACCESSORIES

- A. Concrete Slab Primer: Nonstaining type as recommended by flooring manufacturer.

- B. Trowelable Underlayments and Patching Compounds: Latex-modified, portland-cement-based formulation provided or approved by flooring manufacturer for applications indicated.
- C. Adhesives: Water-resistant type recommended by manufacturer to suit resilient flooring product and substrate conditions indicated.

PART 3 - EXECUTION

3.1 EXAMINATION

- A. Examine areas where installation of products specified in this Section will occur, with Installer present, to verify that substrates and conditions are satisfactory for installation and comply with manufacturer's requirements and those specified in this Section.

3.2 PREPARATION

- A. General: Comply with manufacturer's installation specifications for preparing substrates indicated to receive products indicated.
- B. Use trowelable leveling and patching compounds per manufacturers directions to fill cracks, holes, and depressions in substrates.

3.3 INSTALLATION

- A. General: Install products specified in this Section using methods indicated according to manufacturer's installation directions.
- B. Apply resilient wall base to walls, columns, pilasters, casework, and other permanent fixtures in rooms and areas where base is required. Install wall base in lengths as long as practicable. Tightly adhere wall base to substrate throughout length of each piece, with base in continuous contact with horizontal and vertical substrates.
 - 1. On masonry surfaces or other similar irregular substrates, fill voids along top edge of resilient wall base with manufacturer's recommended adhesive filler material.
 - 2. Form inside corners on job from straight pieces of maximum lengths possible by cutting an inverted V-shaped notch in toe of wall base at the point where corner is formed. Shave back of base where necessary to produce snug fit to substrate.
 - 3. Form outside corners on job from straight pieces of maximum lengths possible by shaving back of base at point where bending will occur. Remove a strip perpendicular to length of base and only deep enough to produce a snug fit without bends whitening or removal of more than half the thickness of wall base.
- C. Place resilient accessories so they are butted to adjacent materials of type indicated and bond to substrates with adhesive.

3.4 CLEANING AND PROTECTION

- A. Perform the following operations immediately after completing installation:
 - 1. Remove visible adhesive and other surface blemishes using cleaner recommended by manufacturers of resilient product involved.
 - 2. Damp-clean resilient accessories to remove black marks and soil.

- B. Protect base and accessories against mars, marks, indentations, and other damage from construction operations and placement of equipment and fixtures during remainder of construction period. Use protection methods indicated or recommended by manufacturer of resilient product involved.
 - 1. Apply protective floor polish to resilient accessories that are free from soil, visible adhesive, and surface blemishes.
 - a. Use commercially available metal, cross-linked, acrylic product acceptable to resilient accessory manufacturer.
 - b. Coordinate selection of cleaner with Owner's maintenance service.

END OF SECTION

SECTION 09 68 00

CARPETING

PART 1 - GENERAL

1.1 SUMMARY

- A. Section Includes: Direct glue-down carpet and accessories.
- B. Related Sections:
 - 1. Section 03 30 00 - Cast-In-Place Concrete: Curing compounds and other concrete treatments compatibility with carpet adhesives.
 - 2. Section 09 65 13 - Resilient Wall Base and Accessories: Resilient wall base and edge strips.

1.2 SUBMITTALS

- A. Product Data for each type of carpet material and installation accessory specified.
 - 1. Submit manufacturer's printed data on physical characteristics, durability, fade resistance, and fire-test-response characteristics.
 - 2. Submit methods of installation for each type of substrate.
- B. Shop Drawings showing columns, doorways, enclosing walls or partitions, built-in cabinets, and locations where cutouts are required in carpet. Indicate the following:
 - 1. Carpet type, color, and dye lot.
 - 2. Seam locations, types, and methods.
 - 3. Type of installation.
 - 4. Pile direction.
 - 5. Type, color, and location of insets and borders.
- C. Samples for verification of the following products, in manufacturer's standard sizes, showing the full range of color, texture, and pattern variations expected. Prepare Samples from the same material to be used for the Work. Label each sample with manufacturer's name, material type, color, pattern, and designation indicated on Drawings and carpet schedule. Submit the following:
 - 1. 12-inch- square samples of each type of carpet material required.
 - 2. 12-inch-long samples of carpet edge guard.
 - 3. Schedule of carpet using same room designations indicated on Drawings.
- D. Maintenance data for carpet to include in the operation and maintenance manual specified in Division 1. Include the following:
 - 1. Methods for maintaining carpet, including 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.

1.3 QUALITY ASSURANCE

- A. Installer Qualifications: Engage an experienced Installer, certified by the Floor Covering Installation Board (FCIB), or who can demonstrate compliance with FCIB certification program requirements.

- B. Single-Source Responsibility: Obtain each type of carpet from one source and by a single manufacturer.
- C. Carpet Fire-Test-Response Characteristics: Provide carpet with the following fire-test-response characteristics as determined by testing identical products per test method indicated below by UL or another testing and inspecting agency acceptable to authorities having jurisdiction. Identify carpet with appropriate markings of applicable testing and inspecting agency.
 - 1. Surface Flammability: Passes CPSC 16 CFR, Part 1630.
 - 2. Flame Spread: 25 or less per ASTM E 84.
 - 3. Smoke Developed: 450 or less per ASTM E 84.

1.4 DELIVERY, STORAGE, AND HANDLING

- A. General: Comply with the Carpet and Rug Institute's CRI 104, Section 5: "Storage and Handling."
- B. Deliver materials to Project site in original factory wrappings and containers, labeled with identification of manufacturer, brand name, and lot number.
- C. Store materials on-site in original undamaged packages, inside well-ventilated area protected from weather, moisture, soilage, extreme temperatures, and humidity. Lay flat, with continuous blocking off ground.

1.5 PROJECT CONDITIONS

- A. General: Comply with CRI 104, Section 6: "Site Conditions."
- B. Space Enclosure and Environmental Limitations: Do not install carpet 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.
- C. Subfloor Moisture Conditions: Moisture emission rate of not more than 3 lb/1000 sq. ft./24 hours when tested by calcium chloride moisture test in compliance with CRI 104, 6.2.1, with subfloor temperatures not less than 55 deg F.
- D. Subfloor Alkalinity Conditions: A pH range of 5 to 9 when subfloor is wetted with potable water and pHDrion paper is applied.

1.6 EXTRA MATERIALS

- A. Furnish extra materials described below that match products installed, are packaged with protective covering for storage, and are identified with labels clearly describing contents.
 - 1. Carpet: Before installation begins, furnish quantity of full-width units equal to 5 percent of amount installed.

PART 2 - PRODUCTS

2.1 CARPET MATERIALS

- A. Carpet Manufacturers/Products: Refer to Material Legend for Basis of Design Products. Products of other manufacturers are acceptable upon Architect's approval.

2.2 INSTALLATION ACCESSORIES

- A. Concrete-Slab Primer: Nonstaining type as recommended by the carpet manufacturer.
- B. Trowelable Underlayments and Patching Compounds: As recommended by the carpet manufacturer.
- C. Adhesives: Water-resistant, mildew-resistant, nonstaining type to suit products and subfloor conditions indicated and to comply with flammability requirements for installed carpet as recommended by the carpet manufacturer.
- D. Seaming Cement: Hot-melt adhesive tape or similar product recommended by carpet manufacturer for taping seams and butting cut edges at backing to form secure seams and to prevent pile loss at seams.

PART 3 - EXECUTION

3.1 EXAMINATION

- A. Examine subfloors and conditions, with Installer present, for compliance with requirements for maximum moisture content, alkalinity range, installation tolerances, and other conditions affecting performance of carpet.
 - 1. Do not proceed with installation until unsatisfactory conditions have been corrected.
- B. Verify that subfloors and conditions are satisfactory for carpet installation and comply with requirements specified in this Section and those of the carpet manufacturer.

3.2 PREPARATION

- A. General: Comply with carpet manufacturer's installation recommendations to prepare substrates indicated to receive carpet installation.
- B. Level subfloor within 1/4 inch in 10 feet, noncumulative, in all directions. Sand or grind protrusions, bumps, and ridges. Patch and repair cracks and rough areas. Fill depressions.
 - 1. Use leveling and patching compounds to fill cracks, holes, and depressions in subfloor as recommended by the carpet manufacturer.
- C. Remove subfloor coatings, including curing compounds, and other substances that are incompatible with adhesives and that contain soap, wax, oil, or silicone.
- D. Broom or vacuum clean subfloors to be covered with carpet. Following cleaning, examine subfloors for moisture, alkaline salts, carbonation, or dust.
- E. Concrete-Subfloor Preparation: Apply concrete-slab primer, according to manufacturer's directions, where recommended by the carpet manufacturer.

3.3 INSTALLATION

- A. Direct Glue-Down Installation: Comply with CRI 104, Section 8: "Direct Glue-Down."
- B. Comply with carpet manufacturer's recommendations for seam locations and direction of carpet; maintain uniformity of carpet direction and lay of pile. At doorways, center seams under door in closed position. Do not bridge building expansion joints with continuous carpet.
- C. Where demountable partitions or other items are indicated for installation on top of finished carpet floor, install carpet before installation of these items.
- D. Cut and fit carpet to butt tightly to vertical surfaces, permanent fixtures, and built-in furniture including cabinets, pipes, outlets, edgings, thresholds, and nosings. Bind or seal cut edges as recommended by carpet manufacturer.
- E. Extend carpet into toe spaces, door reveals, closets, open-bottomed obstructions, removable flanges, alcoves, and similar openings.

3.4 CLEANING

- A. Perform the following operations immediately after completing installation.
 - 1. Remove visible adhesive, seam sealer, and other surface blemishes using cleaner recommended by carpet manufacturer.
 - 2. Remove protruding yarns from carpet surface.
 - 3. Vacuum carpet using commercial machine with face-beater element.

3.5 PROTECTION

- A. General: Comply with CRI 104, Section 15: "Protection of Indoor Installation."
- B. Provide final protection and maintain conditions in a manner acceptable to manufacturer and Installer.
- C. Ensure that carpet is without damage or deterioration at the time of Substantial Completion.

END OF SECTION

SECTION 09 91 00

PAINTING

1. GENERAL:

- 1.1. Related Documents: The requirements of Division 1 are hereby made a part of this section as if fully repeated herein.
 - 1.1.1. DIRECT PURCHASING: This Section is subject to the terms and procedures of Direct Purchasing, whereby the Owner reserves the right to recover the sales tax on materials by purchasing directly the materials required for this Section. Issuance of Purchase Orders by the Owner shall not relieve the Contractor of any of his responsibilities regarding material purchases or installations, with the exception of the payments for the materials as purchased.
- 1.2. The following specifications cover the complete painting and finishing of all surfaces, interior and exterior, as shown on the drawings and described in the specifications except as otherwise specified.
- 1.3. Work not included:
 - 1.3.1. Copper, bronze, chromium plate, nickel, stainless steel, anodized aluminum, lead, and bright metals normally not intended to be painted.
 - 1.3.2. Factory applied finishes.
 - 1.3.3. Shop painting of structural and miscellaneous iron and steel.
 - 1.3.4. Face brick (with the exception of the specified sealer).
 - 1.3.5. Concealed ducts, pipes and conduit.
 - 1.3.6. Refinished wall, ceiling and floor coverings.
- 1.4. The painting contractor shall supply all labor, materials, tools, ladders, scaffolding and equipment necessary for the completion of the work according to the drawings and specifications.
- 1.5. The painting contractor is responsible for inspecting the work of others prior to the application of any paint or finishing material. If any surface to be finished cannot be put in proper condition for finishing by customary cleaning, sanding and puttying operations, the painting contractor will immediately notify the general contractor or the Architect in writing, and shall not proceed with this work until conditions have been corrected and are acceptable.
- 1.6. Before proceeding with any painting, the painting contractor shall prepare and finish a sample room complete or in part, as directed by the Architect. Finish all areas or items in accordance with the specification and in colors selected by the Architect. These areas or items will be inspected by the Architect. When approved, they shall serve as a standard for workmanship,

appearance, and materials approved for similar areas or items throughout this project.

- 1.7. Submittals: Manufacturer's data on painting products item by item and warranties. Minimum (2) year warranty required.
 - 1.7.1. Colors:
 - a. The Architect will furnish to the Contractor a set of color cards and a schedule showing where the various colors shall be used. The contractor shall then prepare duplicate 8-1/2" x 11" samples of finish on hardboard or other suitable materials to simulate job surfaces. A total of 4 colors will be used.
 - b. Final work shall match approved color samples, except if the Architect so directs between coats, the succeeding coat or coats may be slightly lightened or darkened.
- 1.8. STORAGE: Store all materials used on the job in a single place designated by Architect. Keep storage place neat and clean. All damaged areas shall be corrected by cleaning, repairing or replacing. All soiled or used rags, waste and trash must be removed from the building every night, and every precaution taken to avoid the danger of fire.
- 1.9. EXTRA MATERIAL: Upon substantial completion, the Contractor shall deliver to the Owner an extra stock consisting of one gallon of each color used in painting. Such stock shall be new, tightly sealed in clearly labeled containers.

2. MATERIALS:

- 2.1. All paints, varnishes, enamels, lacquers, stains, paste fillers, and similar materials must be delivered in the original containers, with the seals unbroken and labels intact and shall be used from the original containers.
- 2.2. Use only first line products of approved manufacturers.
- 2.3. Use materials only in accordance with the manufacturer's directions.
- 2.4. Colors: Refer to Material Legend for colors.
- 2.5. Fungicidal agent shall be incorporated into the paint by the manufacturer.
- 2.6. Colors: Color of the final coat shall match the color selections furnished by the Architect. Preceding coats shall vary slightly in shade of color. Upon request, finish one room completely, space or item of each color scheme prior to proceeding with the painting. Approved color schemes shall serve as a standard for the similar work throughout the project.
- 2.7. APPROVED MANUFACTURER:
 - 2.7.1. All painting products shall be first line products from a single manufacturer. Products from recognized major manufacturers shall be submitted to the Architect for approval. Approved manufacturers are: Sherwin – Williams, ICI, Benjamin Moore, PPG, Pratt & Lambert.

2.7.2. Basis of Design: Sherwin-Williams

3. WORKMANSHIP:

- 3.1. Employ skilled mechanics to insure the very best workmanship. Quality workmanship is required. Materials to be applied by craftsman experienced in the use of the specific product involved.
- 3.2. Where interior or exterior wood and metal are primed in the mill or shop as a part of the painting contract, use materials specified in every case for such surfaces and use in accordance with manufacturer's directions for the first or priming coat.
- 3.3. When surface temperature is below 50 degrees F., do not apply paints, varnishes, and special coatings, unless otherwise specified. Do not prime exteriors during frosty or rainy weather. Avoid painting surfaces while they are exposed to direct sunlight.
- 3.4. Clean floors and adjacent surfaces as well as all surfaces to be painted, before painting. Painting environment shall be relatively dust free.
- 3.5. Touch up knots, pitch streaks and sappy spots with recommended sealer before priming.
- 3.6. Putty nail holes, cracks and other defects after the first coat, with putty color to match the finish. Bring putty flush with the adjoining surface.
- 3.7. Wash metal surfaces with mineral spirits to remove dirt, oil and grease, before applying materials. Remove rust and scale by wire brushing or sanding clean before painting. Clean and touch up shop coats of paint that have become badly weathered, worn or marred with the primer specified.
- 3.8. Clean galvanized metal thoroughly and apply recommended primer.
- 3.9. Back-prime interior and exterior trim before installation with primer specified.
- 3.10. Apply all materials under adequate illumination, spread evenly and flow on smoothly without runs or sags.
- 3.11. All coats must be thoroughly dry before applying succeeding coats.
- 3.12. Sand smooth all woodwork to be finished with enamel or varnish. Clean surface before proceeding with the application of the first coat.
- 3.13. After doors are fitted, finish tops, bottoms and edges same as face and back. Finish tops and bottoms in a yellow or brown-pigmented sealer.
- 3.14. Secure color schedules before applying paint or finish. Tint primer and undercoat to the approximate shade of the finish coat.
- 3.15. Masonry surfaces shall be dry and clean from all dust, dirt, oil and efflorescence before painting. When recommended, etch concrete that is dense and smooth or that has had a hardener applied before painting. Fill masonry before painting.

- 3.16. Do not paint drywall containing more than 15% moisture. Touch up suction spots or "hot spots" as recommended after application of the first coat and before applying the second coat.
- 3.17. Repair scratches, cracks and abrasions in drywall surfaces and openings adjoining trim with a spackling compound, flush with adjoining surface, and when dry, sand smooth and seal before applying prime coat.
- 3.18. Cover surfaces to be stained with a uniform coat and wipe off if required.
- 3.19. Between coats, sand enamel or varnish finish, applied to wood or metal, with fine sandpaper and clean to produce an even, smooth finish.
- 3.20. Finish closets the same as adjoining rooms, unless otherwise specified. Finish all other surfaces the same as nearest or adjoining surfaces unless specified or directed otherwise by the Architect.
- 3.21. Protect work, adjacent work, and materials at all times, by suitable covering. Upon completion of the work, remove all paint and varnish spots from the floors, glass and other surfaces. Remove from the premises all rubbish and accumulated materials of whatever nature not caused by others and leave work in clean, orderly and acceptable condition.

4. Painting Schedule:

4.1. Painting Schedule - Exterior:

- 4.1.1. Concrete Masonry Units (New):
 - a. Primer: B42W00046 – Heavy Duty Block Filler White
 - b. Primer: B51W00620 – PrepRite® ProBlock® Interior/Exterior Latex Primer/Sealer White
 - c. 2 Coats: A05W00651 - SherLastic® Elastomeric Masonry Coating (color to match adjacent)
- 4.1.2. Concrete Masonry Units and/or EFIS (Previously Painted OR New Patched or Repaired), color to match adjacent
 - a. Primer: B51W00620 – PrepRite® ProBlock® Interior/Exterior Latex Primer/Sealer White
 - b. 2 Coats: A05W00651 - SherLastic® Elastomeric Masonry Coating Extra White
- 4.1.3. Ferrous Metals:
 - a. Primer: B50WZ0001 – Kem Kromik® Universal Metal Primer Off White
 - b. 2 coats B53W00311 – Waterbased Industrial Enamel Extra White/Tint Base
- 4.1.4. Hollow Metal Doors and Jambs and Non Ferrous Metals
 - a. Primer: B66W00310 – Pro Industrial Pry-Cryl® Universal Acrylic Primer Off White
 - b. 2 Coats: B66W00651 – Pro Industrial High Performance Acrylic- Semi-Gloss Extra White

4.2. Painting Schedule - Interior:

- 4.2.1. Ferrous Metals / Doors, Trim, Ferrous Metals
 - a. Primer: B66W00310 – Pro Industrial Pry-Cryl® Universal Acrylic Primer Off-White
 - b. 2 Coats: B66W00651 – Pro Industrial High Performance Acrylic- Semi-Gloss Extra White

- 4.2.2. Concrete and Concrete Masonry Units (new)
 - a. Primer: B42W00046 – Heavy Duty Block Filler White
 - b. Primer: B51W000620 - PrepRite® ProBlock® Interior/Exterior Latex Primer/Sealer White
 - c. 2 Coats: B70W00211 – Waterbased Catalyzed Epoxy (Part A) Extra White/Tint Base

- 4.2.3. Concrete and Concrete Masonry Units (Previously Painted)
 - a. Primer: B51W00620 - PrepRite® ProBlock® Interior/Exterior Latex Primer/Sealer White
 - b. 2 Coats: B70W00211 – Waterbased Catalyzed Epoxy (Part A) Extra White/Tint Base

- 4.2.4. Gypsum Board/Paint
 - a. Primer: B51W00620 – Prep Rite® ProBlocker® Interior/Exterior Latex Primer/Sealer White
 - b. 2 Coats: B66W00561 – Pro Industrial Multi-Surface Acrylic Eg-Shel Coating Extra White

- 4.2.5. All new exposed piping and electrical conduit shall be painted. Color shall be determined by the Architect.

- 4.3. Labeling of Fire-Rated or Smoke-Tight Walls:
 - 4.3.1. Frequency: Provide message at 20 feet nominally on center on each side of wall located at nominally 6” above ceiling line. Where no ceiling is scheduled, locate at nominally 12” below roof deck. As a minimum provide two messages, one on each side of the rated partition, for each wall segment.

 - 4.3.2. Letters to be 2” high x ¼”-stroke and be red in color. Follow the same instruction for each rated wall type. 20-foot interval for all labeling. Rated firewalls shall be stenciled with message as applicable:

“1-HOUR FIRE PARTITION
PROTECT ALL OPENINGS AND PENETRATIONS”

“2-HOUR FIRE PARTITION
PROTECT ALL OPENINGS AND PENETRATIONS”

END OF SECTION

SECTION 10 14 00

SIGNAGE

PART 1 - GENERAL

1.1 SUMMARY

A. Section Includes:

1. Interior, public toilet room signs.

B. Related Sections:

1. Section 01 50 00 - Temporary Facilities and Controls: Temporary project identification signs.
2. Section 09 29 00 - Gypsum Board.

1.2 ACTION SUBMITTALS

A. Product Data: For each product indicated.

B. Shop Drawings: Include plans, elevations, sections, details, and attachments to other Work.

1. Verify dimensions by field measurements before fabrication and indicate measurements on Shop Drawings.
2. Message list for each sign, including large-scale details of wording, lettering, and braille layout.

C. Samples: For each sign material indicated that involves color selection.

1.3 QUALITY ASSURANCE

A. Regulatory Requirements: Comply with the Americans with Disabilities Act (ADA) and with code provisions as adopted by authorities having jurisdiction.

B. Sign Fabricator Qualifications: Firm experienced in producing signs similar to those indicated for this Project, with a record of successful in-service performance, and sufficient production capacity to produce sign units required without causing delay in the Work.

C. Single-Source Responsibility: For each separate sign type required, obtain signs from one source of a single manufacturer.

D. Design Concept: The Drawings indicate sizes, profiles, and dimensional requirements of signs and are based on the specific types and models indicated. Sign units by other manufacturers may be considered provided deviations in dimensions and profiles do not change the design concept as judged by the Architect. The burden of proof of equality is on the proposer.

1.4 PROJECT CONDITIONS

A. Field Measurements: Take field measurements prior to preparation of shop drawings and fabrication to ensure proper fitting. Show recorded measurements on final shop drawings. Coordinate fabrication schedule with construction progress to avoid delay.

1.5 COORDINATION

- A. For signs supported by or anchored to permanent construction, advise installers of anchorage devices about specific requirements for placement of anchorage devices and similar items to be used for attaching signs.
 - 1. For signs supported by or anchored to permanent construction, furnish templates for installation of anchorage devices.

PART 2 - PRODUCTS

2.1 INTERIOR PANEL SIGNS

- A. Basis-of-Design: Interior panels signs are based on products as manufactured by THE SOUTHWELL COMPANY; www.southwellco.com.
- B. Interior Panel Sign Schedule:
 - 1. Interior Toilet Room Signs: **Southwell "SS-4 – ADA Tactile" 6" x 8"**.
 - a. Locations: One sign at each toilet room door.
- C. General: Comply with requirements indicated for materials, thicknesses, finishes, colors, designs, shapes, sizes, and details of construction.
 - 1. Produce smooth, even, level sign panel surfaces, constructed to remain flat under installed conditions within a tolerance of plus or minus 1/16 inch measured diagonally.
- D. Description - Unframed Panel Signs: Fabricate signs with edges mechanically and smoothly finished to conform with the following requirements:
 - 1. Edge Condition: Square cut.
 - 2. Edge Color for Plastic Laminate: Edge color same as background.
 - 3. Corner Condition: Square corners.
 - 4. Graphic Content and Style: Provide sign copy that complies with the requirements indicated for size, style, spacing, content, position, material, finishes, and colors of letters, numbers, and other graphic devices.
 - 5. Engraved Copy: Machine-engage letters, numbers, symbols, and other graphic devices into sign panel on the face indicated to produce precisely formed copy, incised to uniform depth. Use high-speed cutters mechanically linked to master templates in a pantographic system or equivalent process capable of producing characters of the style indicated with sharply formed edges.
 - a. Engraved Plastic Laminate: Engrave through the exposed face ply of the plastic laminate sheet to expose the contrasting core ply.
 - 6. Colors and Surface Textures: For exposed sign material that requires selection of materials with integral or applied colors, surface textures or other characteristics related to appearance, provide color matches indicated, or if not indicated, as selected by the Architect from the manufacturer's standards.

2.2 MATERIALS

- A. Plastic Laminate: Provide high-pressure plastic laminate engraving stock with face and core plies in contrasting colors, in finishes and color combinations indicated or, if not indicated, as selected from the manufacturer's standards full range.

- B. Fasteners: Use concealed fasteners fabricated from metals that are not corrosive to the sign material and mounting surface.

PART 3 - EXECUTION

3.1 EXAMINATION

- A. Examine substrates, areas, and conditions, with Installer present, for compliance with requirements for installation tolerances and other conditions affecting performance of work.
- B. Verify that items, including anchor inserts, provided under other sections of Work are sized and located to accommodate signs.
- C. Examine supporting members to ensure that surfaces are at elevations indicated or required to comply with authorities having jurisdiction and are free from dirt and other deleterious matter.
- D. Proceed with installation only after unsatisfactory conditions have been corrected.

3.2 INSTALLATION

- A. General: Locate signs and accessories where indicated, using mounting methods of types described and in compliance with manufacturer's written instructions.
 - 1. Install signs level, plumb, and at heights indicated, with sign surfaces free from distortion and other defects in appearance.
- B. Wall-Mounted Panel Signs: Attach panel signs to wall surfaces using methods indicated below:
 - 1. Silicone-Adhesive Mounting: Use liquid-silicone adhesive recommended in writing by sign manufacturer to attach signs to irregular, porous, or vinyl-covered surfaces. Use double-sided vinyl tape where recommended in writing by sign manufacturer to hold sign in place until adhesive has fully cured.

3.3 CLEANING AND PROTECTION

- A. After installation, clean soiled sign surfaces according to manufacturer's written instructions. Protect signs from damage until acceptance by Owner.

END OF SECTION

SECTION 10 28 00

TOILET ACCESSORIES

PART 1 - GENERAL

1.1 SUMMARY

- A. Section Includes:
 - 1. Toilet accessories.
 - 2. Underlavatory guards.

1.2 SUBMITTALS

- A. Product Data: For each product indicated.
- B. Product Schedule: Indicating types, quantities, sizes, and installation locations by room of each accessory required. Use room and product designations indicated on Drawings.

1.3 QUALITY ASSURANCE

- A. Inserts and Anchorages: Furnish accessory manufacturers' standard inserts and anchoring devices that must be built into masonry or other work. Coordinate delivery with other work to avoid delay.
- B. Single-Source Responsibility: Provide products of same manufacturer for all toilet accessories of each different finish required, unless otherwise acceptable to Architect.
- C. Regulatory Requirements: Toilet room accessories shall comply with the Americans with Disability Act (ADA) Accessibility Guidelines.

1.4 PROJECT CONDITIONS

- A. Coordination: Coordinate accessory locations, installation, and sequencing with other work to avoid interference with and ensure proper installation, operation, adjustment, cleaning, and servicing of toilet accessory items.

PART 2 - PRODUCTS

2.1 TOILET ACCESSORIES - MANUFACTURERS

- A. Basis-of-Design Products: Toilet and bath accessories are based on products indicated on the Drawings and described in the Schedule at the end of this Section. Subject to compliance with requirements, provide the named product or a comparable product by one of the following:
 - 1. Toilet and Bath Accessories:
 - a. A & J Washroom Accessories, Inc.
 - b. American Specialties, Inc.
 - c. Bobrick Washroom Equipment, Inc.
 - d. Bradley Corporation.
 - e. General Accessory Manufacturing Co. (GAMCO).
 - f. McKinney/Parker Washroom Accessories Corp.

2.2 UNDERLAVATORY GUARDS

- A. Approved Product/Manufacturer:
 - 1. "Model No. 102W"; TrueBro, Inc.

2.3 MATERIALS

- A. Stainless Steel: ASTM A 666, Type 304, No. 4 finish (satin), 0.0312-inch minimum nominal thickness, unless otherwise indicated.
- B. Brass: ASTM B 19, ASTM B 16, or ASTM B 30 castings.
- C. Steel Sheet: ASTM A 366, 0.0359-inch minimum nominal thickness.
- D. Galvanized Steel Sheet: ASTM A 653, G60.
- E. Chromium Plating: ASTM B 456, Service Condition Number SC 2 (moderate service).
- F. Galvanized Steel Mounting Devices: ASTM A 153, hot-dip galvanized after fabrication.
- G. Fasteners: Screws, bolts, and other devices of same material as accessory unit, tamper and theft resistant when exposed, and of galvanized steel when concealed.
- H. Keys: Provide universal keys for internal access to accessories for servicing and resupplying. Provide minimum of six keys to Owner's representative.

2.4 FABRICATION

- A. Weld and grind smooth joints of fabricated components.
- B. Form exposed surfaces from single sheet of stock, free of joints.
- C. Form surfaces flat without distortion. Maintain flat surfaces without scratches or dents.
- D. Shop assemble components and package complete with anchors and fittings.
- E. Provide steel anchor plates, adapters, and anchor components for installation.
- F. Hot dip galvanize exposed and painted ferrous metal and fastening devices.
- G. Keys: Provide a minimum of six universal keys for access to toilet and bath accessory units requiring internal access for servicing, resupply, etc.

2.5 FACTORY FINISHING

- A. Galvanizing: ANSI/ASTM A123 and A386 to 1.25 oz/sq yd.
- B. Shop Primed Ferrous Metals: Pretreat and clean, spray apply one coat primer and bake.
- C. Enamel: Pretreat to clean condition, apply one coat primer and minimum two coats baked enamel.

- D. Chrome/Nickel Plating: ANSI/ASTM B456, Type SC 2, polished finish.
- E. Stainless Steel: No. 4 satin luster finish.

PART 3 - EXECUTION

3.1 INSTALLATION

- A. Install accessories using fasteners appropriate to substrate indicated and recommended by unit manufacturer. Install units level, plumb, and firmly anchored in locations and at heights indicated.
 - 1. Install grab bars to withstand a downward load of at least 250 lbf, when tested according to method in ASTM F 446.
- B. Adjust accessories for unencumbered, smooth operation and verify that mechanisms function properly. Replace damaged or defective items. Remove temporary labels and protective coatings.

3.2 ADJUSTING AND CLEANING

- A. Adjust toilet accessories, both new items and existing items that are being reinstalled, for proper operation and verify that mechanisms function smoothly.
 - 1. Replace new items that are damaged or defective.

3.3 SCHEDULE OF TOILET ACCESSORIES

Item # T1: 36" Long Grab Bar – “Bobrick B-5806 x 36”

Item # T2: 42" Long Grab Bar – “Bobrick B-5806 x 42”

Item # T3: 36" x 18" Wall Mounted Mirror w/ Stainless Steel Frames-“Bobrick B-165

Item # T4: Paper Towel Dispenser-“Bobrick B-262”

~~**Item # T5: Feminine Napkin Receptacle – “Bobrick B-270”**~~

Item # T6: Toilet Tissue Dispenser – “Bobrick-B-4288”

Item # T7: Liquid Soap Dispenser – “Bobrick-B-2013”

Item # T8: Seat Cover Dispenser, Wall Mounted –“Bobrick-B-4221”

Item # T10: Mop & Broom Holder – “Bobrick B-224”

Item # T11: 18" Long Grab Bar – “Bobrick B-5806 x 18”

END OF SECTION

SECTION 10 52 00

FIRE EXTINGUISHERS AND CABINETS

1. GENERAL:

- 1.1. Related Documents: The requirements of Division 1 are hereby made a part of this section as if fully repeated herein.
 - 1.1.1. DIRECT PURCHASING: This Section is subject to the terms and procedures Direct Purchasing, whereby the Owner reserves the right to recover the sales tax on materials by purchasing directly the materials required for this Section. Issuance of Purchase Orders by the Owner shall not relieve the Contractor of any of his responsibilities regarding material purchases or installations, with the exception of the payments for the materials as purchased.
- 1.2. Fire extinguisher signage. Provide fire extinguisher signage as required by Authority Having Jurisdiction (AHJ).
- 1.3. Furnish and install where indicated as NEW on the drawings. Existing fire extinguishers and/or cabinets are to remain, see Life Safety Plan.
- 1.4. Submittals:
 - 1.4.1. Manufacturer's data
 - 1.4.2. Shop drawings showing complete fabrication and installation details.
 - 1.4.3. Fire Extinguisher Schedule of each fire extinguisher: identify fire extinguisher type, location, mounting type, finishes, and whether installation is in a fire-rated wall.

2. PRODUCTS:

- 2.1. Fire extinguishers and cabinets shall be products manufactured by any of the following:
 - 2.1.1. Acceptable manufacturers:
 - a. J.L. Industries,
 - b. Larsen,
 - c. Amerex.
- 2.2. Identify all fire extinguishers with permanent marking (non-removable label, and silk-screen process) as follow:

PROPERTY OF
CLAY COUNTY TAX COLLECTOR'S OFFICE
UNLAWFUL FOR PERSONAL USE

- 2.3. Extinguishers Cabinets:
 - 2.3.1. All cabinets to be the same style and size. Basis of Design shall be RC Series.

- 2.3.2. Provide fire-rated FIRE-FX optional wall insert where required, see Life Safety Plans.
 - 2.3.3. Provide continuous hinges on cabinet door, 180 degree opening.
 - 2.3.4. Semi-recessed, maximum 4" extended from face of wall.
 - 2.3.5. Aluminum trim and door, satin clear anodized finish.
 - 2.3.6. full glazed door, clear acrylic, do not use bubble type glazing.
 - 2.3.7. Provide vertical red lettering "FIRE EXTINGUISHER" silk-screened onto acrylic glazing, mounted inside face of glazing.
 - 2.3.8. Door hardware: lever handle with cam action or friction fit pull.
- 2.4. Fire Extinguisher Wall Brackets:
- 2.4.1. Provide brackets for extinguishers not located in cabinets.
 - 2.4.2. Brackets shall be per manufacturer's standard bracket for supplied fire extinguisher, weight and size. Wall brackets shall be painted red.
 - 2.4.3. Provide signage as required by the AHJ.
- 2.5. Fire Extinguishers, install on wall bracket or in cabinets as indicated. See Life Safety Plans.
- 2.5.1. Where indicated in mechanical spaces: CO2 type, nominal 10 lbs.: Sentinel 10, UL rating 10BC (Class B, C fires).
 - 2.5.2. Where indicated in kitchen, or near cooking equipment: Class K wet chemical, low ph: Saturn 25, 2.5 gallons, nominal 35 lbs.
 - 2.5.3. All other locations: Cosmic 10E', UL rating 4A-80BC, nominal 10 lbs. capacity.
3. INSTALLATION:
- 3.1. Provide necessary rough opening at semi-recessed locations.
 - 3.1.1. Locate cabinet at 3'-4" above finished floor to bottom, or as required for ADA.
 - 3.2. Set wall brackets at 48 inches above finished floor, or as required for ADA.
 - 3.3. Provide inspection tagging and full charging of all extinguishers.
 - 3.4. Locations: As indicated on the drawings.
 - 3.4.1. Extinguishers type FEB are required in all equipment rooms, and in all storage rooms, regardless of whether shown on the drawings or not.

END OF SECTION

SECTION 11 31 00

RESIDENTIAL APPLIANCES

PART 1 - GENERAL

1.1 SUMMARY

A. Section Includes:

1. Freestanding refrigerator/freezer.
2. Microwave oven.

B. Related Sections:

1. Section 06 40 23 - Interior Architectural Woodwork: Custom-made cabinets and tops that receive residential appliances.
2. Division 23 – MECHANICAL: Water distribution piping connections to residential appliances.
3. Division 26 – ELECTRICAL: Electrical service and connections to residential appliances.

1.2 SUBMITTALS

- A. Product Data: For each type of product indicated. Include operating characteristics, dimensions of individual appliances, and finishes for each appliance.
- B. Samples: For each exposed finish.
- C. Appliance Schedule: Use same designations indicated on Drawings.
- D. Maintenance data.

1.3 QUALITY ASSURANCE

- A. Installer Qualifications: An employer of workers trained and approved by manufacturer for installation and maintenance of units required for this Project.
- B. Electrical Components, Devices, and Accessories: Listed and labeled as defined in NFPA 70, Article 100, by a testing agency acceptable to authorities having jurisdiction, and marked for intended use.
- C. Residential Appliances: Comply with NAECA standards.

1.4 WARRANTY

- A. Special Warranty: Manufacturer's standard form in which manufacturer of each appliance specified agrees to repair or replace residential appliances or components that fail in materials or workmanship within specified warranty period.
1. Microwave Oven: Five-year limited warranty for defects in the magnetron tube.
 2. Refrigerator/Freezer: Five-year limited warranty for in-place service on the sealed refrigeration system.

PART 2 - PRODUCTS

2.1 MANUFACTURERS

- A. Basis-of-Design Products: The design for each residential appliance is based on the product named. Subject to compliance with requirements, provide either the named product or a comparable product by one of the following manufacturers:
1. Amana Refrigeration, Inc.
 2. Frigidaire Appliance Company.
 3. General Electric Company.
 4. Hotpoint.
 5. Kitchen Aid Inc.
 6. Maytag Corporation.
 7. Whirlpool Corporation.
 8. White-Westinghouse.

2.2 RESIDENTIAL APPLIANCES

- A. Refrigerator/Freezer: Freestanding, two-door refrigerator with freezer and automatic ice maker, UL listed.
1. Basis-of Design Product: GENERAL ELECTRIC "Model No. GTS18DCP" (29 ½" wide).
 2. Type: Freezer above refrigerator.
 3. Capacity: 17.9 cu. ft. minimum.
 4. Icemaker: Factory-installed icemaker.
 5. Defrosting: Frost-free.
 6. Color: White.
- B. Microwave Oven: UL listed.
1. Basis of Design Product: GENERAL ELECTRIC "Model No. JE740WY/GY"
 2. Capacity: 0.7 cu. ft.
 3. Wattage: 700.
 4. Color: White.

PART 3 - EXECUTION

3.1 EXAMINATION

- A. Examine conditions, with Installer present, for compliance with requirements for installation tolerances and other conditions affecting performance of work.
- B. Examine roughing-in for piping systems to verify actual locations of piping connections before equipment installation.
- C. Proceed with installation only after unsatisfactory conditions have been corrected.

3.2 INSTALLATION, GENERAL

- A. General: Comply with manufacturer's written instructions.

- B. Built-in Equipment: Securely anchor units to supporting cabinets or countertops with concealed fasteners. Verify that clearances are adequate for proper functioning and rough openings are completely concealed.
- C. Freestanding Equipment: Place units in final locations after finishes have been completed in each area. Verify that clearances are adequate to properly operate equipment.
- D. Utilities: Refer to Divisions 23 and 26 for plumbing and electrical requirements.

3.3 CLEANING AND PROTECTION

- A. Test each item of residential appliances to verify proper operation. Make necessary adjustments.
- B. Verify that accessories required have been furnished and installed.
- C. Remove packing material from residential appliances and leave units in clean condition, ready for operation.

END OF SECTION

Clay County Tax Collectors' Office
Keystone Heights, Florida

SECTION 12 93 00

SITE FURNISHINGS

PART 1 - GENERAL

1.1 SUMMARY

- A. Section Includes:
 - 1. Bike racks.
- B. Related Sections:
 - 1. Section 02750 - Portland Cement Concrete Paving: Concrete for anchors and footings.

1.2 SUBMITTALS

- A. Product Data: Manufacturer's descriptive literature for each specified product.
- B. Manufacturer's printed installation instructions for each product requiring anchoring devices.
- C. Samples for Verification: Representative color samples for each type of site furnishing.

PART 2 - PRODUCTS

2.1 MANUFACTURED SITE FURNISHINGS

- A. Bike Rack:
 - 1. ULINE – 5 Loop Wave Style Bike Rack p Black
 - 2. Construction: 10-ga steel
 - 3. Model: H-2544BL (68 x 2 ½ x 39")
 - 4. Base Plate (Diameter): 7", Mounting Holes 9/16".
 - 5. Color: Black.

PART 3 - EXECUTION

3.1 INSTALLATION

- A. Install products in locations indicated on drawings.
- B. Install products requiring anchoring devices in accordance with manufacturer's instructions and details shown.

3.2 PROTECTION OF INSTALLED PRODUCTS

- A. Protect products of this section from damage by subsequent construction activities.
- B. Replace damaged products which cannot be repaired to Architect's satisfaction.

END OF SECTION

Clay County Tax Collectors' Office
Keystone Heights, Florida

SECTION 12 93 00

SITE FURNISHINGS

PART 1 - GENERAL

1.1 SUMMARY

- A. Section Includes:
 - 1. Bike racks.
- B. Related Sections:
 - 1. Section 02750 - Portland Cement Concrete Paving: Concrete for anchors and footings.

1.2 SUBMITTALS

- A. Product Data: Manufacturer's descriptive literature for each specified product.
- B. Manufacturer's printed installation instructions for each product requiring anchoring devices.
- C. Samples for Verification: Representative color samples for each type of site furnishing.

PART 2 - PRODUCTS

2.1 MANUFACTURED SITE FURNISHINGS

- A. Bike Rack:
 - 1. ULINE – 5 Loop Wave Style Bike Rack p Black
 - 2. Construction: 10-ga steel
 - 3. Model: H-2544BL (68 x 2 ½ x 39")
 - 4. Base Plate (Diameter): 7", Mounting Holes 9/16".
 - 5. Color: Black.

PART 3 - EXECUTION

3.1 INSTALLATION

- A. Install products in locations indicated on drawings.
- B. Install products requiring anchoring devices in accordance with manufacturer's instructions and details shown.

3.2 PROTECTION OF INSTALLED PRODUCTS

- A. Protect products of this section from damage by subsequent construction activities.
- B. Replace damaged products which cannot be repaired to Architect's satisfaction.

END OF SECTION

SECTION 22 00 00

PLUMBING

PART 1 – GENERAL

1.1 DESCRIPTION

- A. The General Provisions of the Contract, including the General Requirements, Supplementary Conditions and Special Conditions, are hereby made a part of this Section as if fully repeated herein.
- B. Scope of Work: Work included under this section of the specifications shall include complete plumbing systems as shown on the drawings and as specified herein.
 - 1. Trench excavation, pumping, backfilling and compaction for underground piping and plumbing.
 - 2. Soil, waste and vent piping.
 - 3. Domestic hot and cold water piping.
 - 4. Fixtures.
 - 5. Water coolers.
 - 6. Water heaters and water heater drain pans.
 - 7. Fittings, hangers, valves, sleeves, escutcheons, etc.
 - 8. Lead flashing.
 - 9. Insulation.
 - 10. Backflow preventer.
 - 11. Circulating pumps.
 - 12. Controls.
 - 13. Connections to equipment furnished and installed by others.
 - 14. Installation of and connection to equipment furnished by others.
 - 15. Demolition.
 - 16. Disinfection of potable water piping.
- C. Related Work: The following work is specified in other sections of these specifications.
 - 1. Power wiring: Electrical – 26 00 00.
- D. Point of Connection: Anticipated location of the existing below floor gravity lines is shown on the plumbing drawings. Field verification will be necessary to determine the exact location and direction of flow.

1.2 CODES, ORDINANCES AND PERMITS

- A. Comply with all codes applying to the Work of this contract including Florida Building Code 2023, Florida Building Code 2023 - Mechanical, and Florida Building Code 2023 - Plumbing. Obtain information on all code restrictions and requirements. In case of conflict between the contract documents and a governing code or ordinance, such conflict shall be immediately brought to the attention of the Architect for resolution. Extra payment will not be allowed for Work required by code restrictions except through written agreement with the Owner.

- B. Apply for, obtain, and pay for all required permits and inspection certificates. Final payment is contingent upon delivery of such certificates to the Architect.
- C. Where applicable, all materials and equipment shall bear the Underwriters' Laboratories seal or ASME code stamp. Certificates to this effect shall be furnished to the Architect upon request.

1.3 SITE INSPECTION

- A. Visit the site and thoroughly inspect conditions affecting the Work before submitting bid. Assume responsibility for meeting all existing conditions including access and workspace limitations.

1.4 DRAWINGS AND SPECIFICATIONS.

- A. Refer to the general construction drawings which are bound with the drawings of this Work for construction details, elevations, etc. Architectural and structural drawings shall take precedence over plumbing drawings. It is the intent of the plumbing drawings to show the general arrangement of the system and not to indicate all offsets, fittings and accessories which may be required, nor to show exact locations of piping, fixtures or equipment except where actual dimensions are given. All vertical piping shall be located in walls in finished spaces unless otherwise noted.
- B. Specifications and drawings shall be considered as supplementary to each other, requiring materials and labor indicated, specified, or implied by either specifications or drawings. It is the intent of the drawings and specifications to call for finished Work, tested, and ready for operation, and in complete conformance with all applicable codes, rules and regulations. Minor details not usually shown nor specified, but manifestly necessary for the proper installation and operation of the various systems, shall be included in the Work and in the bid proposal, the same as if specified or shown on the drawings.
- C. If any departures from the drawings and specifications are deemed necessary, details of such departures and the reasons therefore shall be submitted to the Architect for approval. No departures shall be made without prior approval of the Architect.

1.5 APPROVED MANUFACTURERS

- A. Specific reference in the specifications to any article, device, product, material, fixture or type of construction, etc., by proprietary name, make or catalog number shall be interpreted as establishing a standard of quality and shall not be construed as limiting competition. Equal products may be submitted for approval to be used subject to compliance with requirements set forth in the General Requirements, Division 01, and, if applicable, in the Instructions to Bidders.

1.6 MANUFACTURER'S SPECIFICATIONS

- A. Where the name of a concern or manufacturer is mentioned on the drawings or in specifications in reference to his required service or product, and no qualifications or specification of such is included, then the material gauges, details of manufacturer, finish, etc., shall be in accordance with his standard practice, directions or specifications. The Contractor shall be responsible for any infringement of patents, royalties or copyrights which may be incurred thereby.
- B. Equipment scheduled on the drawings was used to arrive at space, maintenance, and utility service. If other equipment is submitted and approved, take responsibility for maintaining these space, maintenance, and utility service requirements and cost for any resulting changes including cost to change electrical service required by substituted equipment.

- C. All materials and equipment shall be new and first class in every respect. As far as is practical, similar products shall be by one manufacturer.
- D. All products designed for dispensing potable water must meet both the NSF 61 and NSF 372 test standards via third-party testing and certification.

1.7 SUBMITTALS

- A. Submit shop drawings in accordance with the General Requirements, Division 01.
- B. Samples of any plumbing equipment or materials shall be submitted if requested by the Architect. If a sample is requested, have the sample delivered to the Architect or arrange for the Architect to examine it elsewhere. Failure to comply may be cause for rejection.
- C. Submit shop drawings or catalog data for the Architect's approval before purchasing or installing the following:
 - 1. Piping (where revised from the drawings).
 - 2. Fixtures.
 - 3. Water coolers.
 - 4. Water heaters and water heater drain pans.
 - 5. Valves and appurtenances.
 - 6. Pipe hangers.
 - 7. Insulation.
 - 8. Backflow preventer.
 - 9. Floor drains and trap primers.
 - 10. Circulating pumps.
 - 11. Controls.

1.8 PERFORMANCE DATA

- A. All performance data specified herein shall be considered actual performance of equipment as installed. Make suitable allowances if installation details are such that actual operating conditions unfavorably affect performance as compared to conditions under which the equipment was rated.

1.9 CATALOG, OPERATION AND MAINTENANCE DATA

- A. Provide four (4) complete sets of a compilation of catalog data of each manufactured item of fixtures and equipment used in the Plumbing Work. In addition to the catalog data, installation, operating and maintenance data and bill of materials for all operating equipment shall be submitted. Each of the four sets of data shall be bound in loose leaf binders and submitted to the Architect before final payment is made. A complete double index shall be provided as follows:
 - 1. Listing the products alphabetically by name.
 - 2. Listing the names of manufacturers alphabetically by name together with their addresses and the names and addresses of local sales representatives.
- B. It is the intent of this catalog, operation and maintenance data to provide the Owner with complete instructions on the proper operation and use, lubrication and periodic maintenance, together with the source of replacement parts and service, for the items of equipment covered.

1.10 CONTRACTOR COORDINATION

- A. The Electrical Contractor shall furnish, set and wire all controls, disconnect devices, and starters as required for all equipment except for those items furnished with integral controls, disconnect devices, and/or starters.
- B. Furnish detailed information to the Electrical Contractor on power wiring requirements for all plumbing equipment actually purchased as soon as practical. This shall include all diagrams and instructions necessary for the Electrical Contractor to make connections properly. If equipment actually purchased requires larger electrical service than equipment scheduled, arrange and pay for required electrical service change.
- C. Coordinate location of equipment and piping with Electrical, Fire Protection, and HVAC Contractors to maintain clearance for equipment maintenance, avoid interference with duct and HVAC piping runs, and to prevent piping from being installed over electrical panels. If interference develops, the Architect will decide which equipment, conduit, duct, piping, etc., must be relocated regardless of installation order. Take responsibility for relocating Plumbing work, if so ordered, including all associated costs.
- D. Within 30 days following award of the contract, report to the Architect in writing, all real or potential errors, ambiguities and/or conflicts on the Plumbing Work or between the trades and obtain an agreement with the Architect on a solution. Those reported after 30 days, except as a result of unforeseen circumstances, shall be resolved at the discretion of the Architect. Report conflicts resulting from the progress of Work to the Architect immediately or accept the expense for corrective work caused by failure to report such a conflict. Do not make any changes in design without the written approval of the Architect. Changes in design means any change which will affect the capacity, reliability, operation or safety of the systems or any parts thereof, including changes which may be required to conform to local regulations or codes.

1.11 CONTRACTOR'S WARRANTY

- A. Provide written warranties as specified in the General Requirements, Division 01, and repair any defects becoming apparent within the warranty period as directed by the Architect.

1.12 PROTECTION

- A. Protect all materials and equipment against damage and vandalism during construction. Replace any damaged material or equipment and place the systems in perfect working condition.

PART 2 - PRODUCTS

2.1 FIXTURES

- A. Fixtures including faucets, valves, drains, and trim, shall be as scheduled on drawings. Unless otherwise noted on the Plumbing Schedules, approved manufacturers are Acorn, American Standard, Bradley, Chicago, Crane, Delta, Eljer, Elkay, Just, Kohler, Plumbingwaire, Speakman, T & S.
- B. Flush valves shall be American Standard, Delaney, Sloan or Zurn.

2.2 WATER COOLERS

- A. Water coolers shall be as scheduled on drawings. Approved manufacturers are Oasis, Elkay, Halsey Taylor.

2.3 WATER HEATERS AND DRAIN PANS

- A. Water heaters shall be as scheduled on drawings. Approved manufacturers are A.O. Smith, State, Lochinvar, Rheem, Bradford White.
- B. Drain pans for electric water heaters shall be minimum 2" deep with molded and sealed corners and shall be fabricated from 24 gage (0.0236") galvanized steel or high impact plastic with minimum thickness 0.0625".

2.4 PIPE

- A. Soil, waste and vent piping above and below grade shall be solid wall DWV polyvinyl chloride (PVC), Schedule 40, solvent weld joints. Exposed sanitary piping under lavatories shall be chrome plated copper/brass. Soil, waste and vent piping located in supply or return air plenums shall be service weight cast iron or copper DWV with solder joints. All cast iron pipe and fittings shall be made in the United States, marked with the collective trademark of Cast Iron Soil Pipe Institute (CISPI) and be listed by NSF International.
- B. Cellular Core (Foam Core) piping is not acceptable.
- C. Hot and cold water supply piping above grade shall be chlorinated polyvinyl chloride (CPVC), solvent weld joints, suitable for use at minimum working pressure of 160 PSI at 73 deg. F. and 100 PSI at 180 deg. F. Pipes 1/2" thru 2" shall be CPVC-CT (copper pipe size) meeting test requirements of SDR 11. Pipes larger than 2" shall be CPVC Schedule 80 with Schedule 80 fittings. Exposed hot and cold water piping under lavatories, and connections to urinals and water closets shall be chrome plated copper/brass. Piping serving urinals and water closets shall make transition from the water riser(s) located within chases/walls from CPVC to copper.
- D. Cold water supply piping below grade shall be chlorinated polyvinyl chloride (CPVC), solvent weld joints, suitable for use at minimum working pressure of 160 PSI at 73 deg. F. and 100 PSI at 180 deg. F. Pipes 1/2" thru 2" shall be CPVC-CT (copper pipe size) meeting test requirements of SDR 11. Pipes larger than 2" shall be CPVC Schedule 80 with Schedule 80 fittings.

2.5 DIELECTRIC UNIONS

- A. Use dielectric unions when joining dissimilar metals.

2.6 FLOOR DRAINS AND TRAP PRIMERS

- A. Floor drains shall be as scheduled on drawings and shall have perforated or slotted strainers, outlets same size as waste pipe to which connected, cast-iron body with inside caulk connection, and deep seal trap. Strainers shall be minimum size required for sanitary pipe size indicated. Approved manufacturers are Ancon, Josam, Smith, Wade, Zurn.
- B. Trap primers shall be as scheduled on drawings. Pressure drop activated trap primers shall be Mifab model M1-500 with model MI-DU distribution unit (where required).

2.7 INTERIOR HOSE BIBS AND FREEZELESS EXTERIOR WALL HYDRANTS

- A. Interior hose bibs shall be angle type, all brass 3/4" inlet, with flange for wall mounting and vacuum breaker.
- B. Freezeless wall hydrant shall have 3/4" hose nozzle, loose operating key, compression type valve seat, vacuum breaker, chromed brass, and box with locking cover for recessed installation in wall or floor.
- C. Approved manufacturers are Woodford, Prier, J. R. Smith and Zurn.

2.8 SHOCK ABSORBERS

- A. Shock absorbers shall be bellows or piston type water hammer arrestors. Closed end, vertical standpipe air chambers will not be accepted. Water hammer arrestors shall be sized and installed in accordance with PDI standards and the manufacturers specifications. Access shall be provided to water hammer arrestors.

2.9 CLEANOUTS

- A. Floor cleanouts shall be cast-iron with adjustable housing, ferrule with plug, with round secured nickel brass scoriated top for finished concrete floors (including those covered by carpeting) and round secured nickel brass recessed top for vinyl tile floors and carpeted floors.
- B. Wall cleanouts shall be screw type with chromium plated bronze or stainless steel access cover plates designed to be installed outside wall finish material.

2.10 VALVES

- A. Valves offered under these specifications shall be limited to the products of a type regularly produced for the service and capacities specified. Ratings shall be in accordance with the manufacturer's latest literature available. Valves shall be line size unless specifically shown otherwise. All equipment service valves and all shut-off valves 2" and smaller shall be bronze body full port ball valves with stainless steel ball and reinforced TFE (Teflon) seat.
- B. Check valves shall be vertical lift check with bronze disc for vertically mounted valves and swing check, horizontal swing bronze disc with screw cap for horizontally mounted valves.
- C. Drain valves for all lines shall be 1/2" size, 200 pound, bronze globe valves with threaded ends and hose thread adapter nipple.
- D. Balancing valves for use in domestic hot water recirculation systems shall be lead free brass construction with stainless steel ball and TFE (Teflon) seat. Balancing valves shall be of the low-flow, bi-directional type with position indicator, memory stop feature, and shall be calibrated and sized for flows indicated on the Plumbing drawings, with minimum pressure drop across valve. Install balancing valves in accordance with Manufacturers instructions and guidelines.
- E. Plastic valves are not acceptable.

- F. Approved manufacturers are Apollo, Armstrong, Bell & Gossett, Brass Craft, Capital, Crane, Delany, Delta, Dunham Bush, Jamesbury, Jomar, Milwaukee, Nibco, Sloan, Stockham, T & S, Walworth, Watts, Zurn.

2.11 PIPE HANGERS

- A. Hangers and supports specified by "Type" herein shall be designed and manufactured in accordance with the Manufacturers Standardization Society of Valve and Fittings Industry (MSS) Publication SP-58 and shall be selected and applied in accordance with the Manufacturers Standardization Society of Valve and Fittings Industry (MSS) Publication SP-69.
- B. Pipe hangers shall be galvanized steel hangers selected within the manufacturer's published load ratings and shall be Auto-Grip, Fee and Mason, or Grinnel. Pipe 2-1/2 inches and smaller shall be MSS Type 7, 10. Pipe 3 inches and larger shall be MSS Type 1, 260.
- C. Hanger rods shall be galvanized steel threaded both ends or continuous thread, sized with safety factor of five (5). Approved: Grinnell Fig. 140 or 146. Rods for trapeze hangers supporting several pipes shall be sized for the total piping load.
- D. Hangers for copper pipe shall be either copper-plated type or pipe contact area shall be plastic coated to prevent direct contact between the pipe and hanger.
- E. Supports for insulated pipes shall have insulation shields MSS Type 40.
- F. Beam clamps shall be MSS Type 29.
- G. Inserts:
 - 1. Preset Type: Malleable iron with removable interchangeable nuts having lateral adjustment of not less than one and five-eighths inch. Continuous inserts shall have a capacity of 2000 lb. per foot and shall be hooked over reinforcing. Approved: C-B Universal Fig. 282; Unistrut Products Co., P-300; Brinkley B32-1.
 - 2. After Set Type: Self-drilling style expansion shells shall be used in concrete and brick. Toggle bolts shall be used on block walls and partitions. Approved: Phillips Drill Co. "Red Head"; Raul "Saber Tooth" and "Spring Wings".
 - 3. Power Actuated After Set Features: Pin and stud anchors shall have a withdrawal resistance four times the indicated load. Approved: Hilti Fastening Systems, Hilti, Inc.; Ramset Fastening Systems, Olin Corp.
- H. Use vibration isolators in hanger rods to isolate vibration in piping subject to vibration, or where shown on drawings.

2.12 SECONDARY PIPE POSITIONING AND SUPPORTS:

- 1. Makeshift, field devised methods of plumbing pipe support, such as with the use of scrap framing materials, are not allowed. Support and positioning of piping shall be by means of engineered methods that comply with IAPMO PS 42-96. These shall be Hubbard Enterprises/HOLDRITE support systems or Owner-approved equivalent.

2. For plenum applications use pipe supports that meet ASTM E-84 25/50 standards, such as the Hubbard Enterprises/HOLDRITE Flame Fighter™ or Owner-approved equivalent.
3. For vertical mid-span supports of piping 4" and under, use Hubbard Enterprises/HOLDRITE Stout Brackets™ with Hubbard Enterprises/HOLDRITE Stout Clamps or two-hole pipe clamps (MSS Type 26).

2.13 SLEEVES AND ESCUTCHEONS

- A. Sleeves shall be 18 gauge galvanized steel or pre-formed plastic. Sleeves shall be sized to allow approximately 1/8" gap around the pipe or its insulation.
- B. Sleeves through floor slabs or fire walls shall be galvanized steel pipe of proper size. Sleeves through floor slabs shall extend 1/2" above the finished floor.
- C. Sleeves penetrating fire-rated walls, floors or ceilings shall be filled with fire-rated material capable of maintaining the fire-resistance rating of the wall, floor or ceiling.
- D. Escutcheon plates for finished spaces shall be nickel-plated.

2.14 EQUIPMENT, VALVE AND PIPE IDENTIFICATION

- A. All identification legends, arrows and color bands shall be stenciled on pressure-sensitive labeling material approved by the Architect. Labeling material colors for use on piping shall be as specified in ANSI A 13.1 latest revision.
- B. Valve tags shall be plastic, aluminum or brass at least 1" in diameter and stamped with contrasting colored figures as large as possible.
- C. Pipe markers shall be Seton style RPM or approved equal.

2.15 INSULATION

- A. Piping insulation shall be pre-formed, flame-retardant, elastomeric, polyethylene, pipe insulation similar to AP Armaflex, AP Armaflex SS, IMCOA Imolock or NOMACO Nomalock, and installed in accordance with manufacturer's instructions. Pre-formed Owens-Corning 3.5 pound density fiberglass pipe insulation with all service jacket and self-sealing lap will be approved for pipe installed in dry locations. Insulation thicknesses shall be as follows:
 1. Cold water: 1/2" thick.
 2. Hot water: 1" thick for pipe sizes up to 1-1/4" and 1-1/2" thick for pipe sizes 1-1/2" to 4".
 3. All PVC piping located in supply or return air plenums: 1/2" thick. Insulation shall meet all state and local code requirements for plenum use.
 4. All horizontal primary condensate drains within unconditioned areas shall be insulated with 1/2" thick pipe insulation to prevent condensation from forming on the exterior of the drain pipe.
 5. When required by the Local Authority Having Jurisdiction (AHJ), all PVC piping located within ceilings shall be insulated with 1/2" thick pipe insulation. Insulation shall meet all state and local code requirements for plenum use. Contractor shall coordinate requirements with local Building Official prior to bid.
- B. At all exposed piping under handicapped lavatories in rest rooms, provide pre molded vinyl Insulation. Insulation shall be "Lav-Guard 2" insulation kits as manufactured by Truebro Inc. or approved equal.
- C. Acoustical pipe lagging shall be 1" thick B-10Lag/QFA-3 Sound Seal as manufactured by United Process, Inc. Acoustical pipe lagging shall be used on all above ground sanitary and rain water piping running above and along side of noise sensitive areas.

- D. All insulation materials and coatings shall meet flame spread and smoke developed ratings per NFPA Bulletin 90-A when tested in accordance with ASTM Standard E 84 and shall meet local requirements for use in return air plenums. Smoke developed less than or equal to 50, and flame spread less than or equal to 25. All coatings and mastics shall be nonflammable in wet state.

2.16 LEAD FLASHING

- A. Lead flashing shall be sheet lead weighing 4 pounds per square foot for all pipe flashing through roof.

2.17 EQUIPMENT SUPPORTS

- A. Equipment supports shall be sized and designed to support the equipment and shall be hot-dip galvanized steel.

2.18 PUMPS

- A. Pump type, capacity and electrical characteristics shall be as indicated on drawings. Approved manufacturers are QuantumFlo, Bell & Gossett, Grundfos, Taco, Delta P Systems.
- B. Provide line sized bypass with associated valves for domestic water booster pumps as indicated on plumbing drawings.

2.19 STRAINERS

- A. Strainers shall be self-cleaning and of same size as pipe lines in which they are installed and shall be Webster, Sarco, Dunham, Hoffman, Illinois, or approved equal, Y type with 125 pound iron body, screwed connections to 2" in size and flanged ends for larger sizes.
- B. Screens for water strainers shall be perforated Monel cylinders with 3/64" perforations.
- C. Water strainer 2" and larger shall have a 3/4" valved blow-down connection extended full size to discharge over the nearest accessible floor drain.

2.20 MOTORS

- A. Full Load Motor Efficiencies: All motors installed in equipment specified in these specifications shall be classified under the National Electric Manufacturers Association's Standard as "energy efficient" or shall otherwise meet the requirements of the Florida Energy Code.
- B. Except where otherwise specified, all motors shall be designed for continuous service and for regular starting on full-line voltage with normal starting current. The limits on service factor and temperature rise above 40 deg. C. ambient at rated load shall be as follows:

Motor Enclosure	Service Factor	Temperature Rise
Drip-Proof	115%	40 deg. C.
Totally Enclosed	None	55 deg. C.

- C. The insulation portion of the motor leads between the lug and motor frame shall be at least 5" in length when four or less motor leads are used and at least 8" in length when more than four motor leads are used. When terminal type lugs are supplied, they shall be solderless, Burndy "Hy-Dent" type or approved equal.

- D. Motors shall be furnished for operation as specified or as noted on drawings. All motors shall conform to IEEE, NEMA and ANSI standards and shall be General Electric, Westinghouse, Louis Allis.
- E. Motors furnished for indoor installation shall be of the open, drip-proof design. Motors furnished for installation in wet locations or outdoors shall be of the totally-enclosed design. Motors furnished for installation in hazardous locations shall be of the explosion-proof design.

2.21 ACCESS DOORS

- A. Access doors shall be as similar to those manufactured by Milcor Division of Inland-Ryerson of type as follows:

Door Location	Door Type
Drywall	Style "DW"
Masonry or Tile	Style "M-Stainless"
Acoustical Tile	Style "AT"
Plaster	Style "K"
Fire Rated Walls/Ceilings	Style "Fire Rated"

- B. Each door shall be equipped with two flush, screwdriver operated, cam latches and, other than Style "M", shall be finished to match adjacent surface. Door sizes shall be applicable to access required for normal service.

PART 3 - EXECUTION

3.1 CUTTING AND PATCHING

- A. Cut and patch existing construction as required for the proper installation of this Work. Cut openings carefully without undue weakening of the structure or damage to the building. Do not cut structural members without permission of the Architect. Provide required bracing, shoring, weather protection, etc. for openings and water stop in concrete floor patches.
- B. Patching shall replace the Work to a condition at least equal to its condition before the cutting was done. Use materials and methods approved by the Architect.
- C. Repainting will not be required under this contract for normal cutting and patching. This does not reduce the responsibility for redecorating of existing Work that is damaged unnecessarily by carelessness.
- D. Cutting and patching includes necessary relocation of existing pipes, conduits, etc. that pass through openings and the proper closing of openings in walls, floors, ceilings, etc. where abandoned mechanical facilities are removed.

3.2 DEMOLITION

- A. Remove all existing fixtures and above ground piping and insulation related to plumbing work where shown on drawings. Cap all underground piping located under concrete floor slabs designated to be abandoned. Remove all underground piping in excavated areas. Cap all piping where shown on drawings. Remove all piping where shown on drawings.

3.3 SALVAGE MATERIALS

- A. Materials and items of equipment that is to be removed and not reused shall be brought to the attention of the Owner for inspection and determination of disposition.
- B. Materials and items of equipment designated as "unsalvageable" by the Owner shall be promptly removed from the premises, disposed of in a completely legal manner, and shall not be re-used in the new Work unless specifically authorized by the Architect.
- C. Materials and items of equipment designated as "salvageable" by the Owner to keep for their future use shall be carefully removed and stored in an Owner designated area on the Job site.
- D. Fixtures scheduled on drawings to be reused shall be carefully removed, cleaned, modified as required by drawings, and installed where shown.

3.4 INSTALLATION OF THE WORK

- A. Examine the site and all drawings before proceeding with the layout and installation of the Work. Locate all vertical piping within walls in finished spaces unless specifically noted otherwise. Such piping cannot always be shown within walls on drawings due to their small scale.
- B. Arrange the Work essentially as shown, exact layout to be made on the job to suit actual conditions. Confer and cooperate with other trades on the job so all Work will be installed in proper relationship and coordinate precise location of parts with the Work of others.
- C. Arrange for required chases, slots and openings with the General Contractor including locations of required pipe sleeves through walls and foundations. Assume liability for cutting or patching made necessary by failure to make proper arrangements in this respect.
- D. Indicated equipment connections are necessarily based on equipment of a given manufacture. Assume responsibility for proper arrangement of piping, ducts, etc. to connect approved equipment in a proper and approved manner. Follow equipment manufacturer's detailed instructions and recommendations in the installation and connection of all equipment. In case of conflict between manufacturer's instructions and the contract documents, notify the Architect before proceeding. No equipment installation or connections shall be made in a manner that voids the manufacturer's warranty.
- E. Install all Work in a neat and workmanlike manner, using only workmen thoroughly qualified in the trade or duties they are to perform. Rough Work will be rejected.

3.5 EXCAVATION, BACKFILLING AND PUMPING

- A. Cutting and replacement of concrete floors will be completed by the General Contractor.
- B. Excavate, back-fill and compact all trenches required for underground plumbing work. Maintain trenches free of water until installation is complete and provide all necessary shoring.
- C. Contractor shall field verify all existing underground utilities and avoid damage to same. Where existing utilities are damaged, the contractor shall be responsible for all repairs or replacement.
- D. Excavate trenches suitable in width to provide a minimum of 6" clear space between the barrel of the pipe and the trench wall on both sides of the pipe. Accurately grade the trench bottom to provide uniform bearing and support for each section of the pipe on undisturbed soil at every point along its entire length.

Take care not to excavate below the depth necessary and excavate bell holes to ensure proper bedding. Backfill over-depths with loose, granular, moist material and thoroughly compact to the depth required.

- E. Place and compact backfill material in 6" layers until the pipe has a minimum cover of 12". Place and compact the remaining material in 12" layers. Grade the surface to a reasonable uniformity and leave the mounding in neat condition as approved by the Architect.
- F. Backfill all trenches passing under foundations with concrete to the underside of the foundation and at a 2:1 slope away from each side of the foundation. Backfill all trenches that are parallel and deeper than foundations with concrete to a point that will place the top of the concrete on a 2:1 slope away from the foundation bottom. Do not backfill trenches until all required tests and inspections are completed.

3.6 PIPE INSTALLATION – GENERAL

- A. Install all piping in a workmanlike manner, according to the best practice of the trade, properly pitched and vented to eliminate air pockets or traps, and to ensure rapid and noiseless circulation throughout the entire system. Run all piping parallel with or at right angles to building walls and partitions. Run all vertical piping within walls in finished spaces unless noted otherwise.
- B. Install all piping so as not to interfere with any electric lighting outlets, ductwork, other piping, or equipment. Do not install piping in front of any door or window and avoid interference with any such openings. Do not install any piping over any motors, transformers, electrical panels, or other electrical equipment.
- C. Cut pipes accurately to measurements established at the building and install without springing or forcing. Cut piping square and remove all burrs and fins before assembling. Use standard fittings for all reductions in size and changes in direction. Mitering of pipe to form elbows or reducers will not be permitted. Thoroughly clean all piping before installation and make sure the piping is free of all foreign material after installation.
- D. Because of the small scale of the drawings, it is not possible to indicate all offsets, fittings and valves. Carefully investigate all conditions affecting the Work to avoid interferences between pipes, ducts, valves, conduits, electrical fixtures and equipment and install as conditions may dictate as part of this contract.
- E. Install all piping in cabinets and vanities as tight to the rear of the cabinet or vanity as possible to provide full utilization of the cabinet or vanity for storage.

3.7 PIPE INSTALLATION

- A. Install #12 stainless steel locator wire on top of all underground piping extending beyond the building regardless of pipe material. Terminate and secure locator wire at all ends where piping rises above grade and secure phenolic nameplates with name of piping service beside terminations.
- B. Sanitary Piping: Locate and size sanitary piping within the building where not shown on the drawings in accordance with applicable plumbing code. Flash all vents passing through roof with sheet lead flashing extending a minimum of 6" out around base and a minimum of 6" up the stack into a cast-iron flashing collar. Support all soil and vent stacks at the base by means of piers or heavy hangers close to the bottom of the riser and at each floor by means of heavy iron clamps. Pitch all 2 1/2" and smaller drain piping at least 1/4" per foot and 3" and larger drain piping at least 1/8" per foot unless otherwise noted.

- C. Fixtures, Floor Drains and Cleanouts: Provide all fixtures and floor drains with traps to comply with local regulations and as hereinafter specified. Provide exposed traps with brass cleanout plugs. Provide floor drains with trap primers connected as shown on drawings. Provide cleanouts in soil and waste lines as shown on the plans and as required by the governing codes. Extend cleanouts for piping concealed in floor or ceiling construction through the floor above and provide with adjustable floor level cleanout set flush with the finished floor. Use wall cleanouts for piping concealed in wall construction.
- D. Water Supply Piping:
 - 1. Provide a complete system of hot and cold water piping extending from water supply to each fixture and item of equipment requiring water as indicated on drawings.
 - 2. Install all water piping systems in such a manner that systems can be drained or vented completely by providing vents and drain valves at all high and low points.
 - 3. Install valves at take-off from the main and upstream of all equipment connections and elsewhere as indicated on drawings or as required. Provide shock absorbers in accordance with PDI selection standards. Make final connection to the plumbing fixtures as specified with the plumbing fixture. Provide a union in the connection to each threaded valve, fixture or piece of apparatus so that it may be readily removed. Install unions downstream of shut-off valves.

3.8 PIPE ASSEMBLY

- A. Sweat Joints in Copper Pipe: Cut pipe squarely to accurate length for full penetration into fittings. Remove burrs from ends, clean soldering surface thoroughly, flux, assemble and solder before surfaces oxidize. Use approved non-corrosive flux and 95-5 lead free solder. Use sufficient heat for complete penetration of solder and wipe away excess flux and solder.
- B. Sewer Pipe: Start laying pipe so that spigot end is pointed in direction of flow. Lay all pipe with ends abutting and true to line and slope. Fit and match all pipe sections to form a sewer with a smooth and uniform invert. Clean sockets before joining pipes and form all joints in accordance with the pipe manufacturer's recommendations.
- C. Elastomeric Compression Gasket Joints: Install elastomeric compression gasket joints in accordance with manufacturer's instructions.
- D. Solvent Weld Joints in PVC and CPVC Pipe: Cut pipe squarely to accurate length for full penetration into fittings. Remove burrs from ends, solvent clean joining surfaces thoroughly and form all joints in accordance with the pipe manufacturer's recommendations.
- E. No-Hub Joints: Cut pipe squarely to accurate length for full penetration into fittings. Remove burrs from ends, clean joining surfaces thoroughly and form all joints in accordance with the pipe manufacturer's recommendations.

3.9 VALVE INSTALLATION

- A. Install all valves with the stems or spindle above the horizontal where possible and exercise utmost care not to install valves over electrical equipment. Provide extended valve stems on insulated pipe.
- B. Locate valves at all automatic valves, check valves, at all equipment so they can be isolated for repairs, at all branch lines connecting mains, and elsewhere as shown on drawings.

- C. Locate check valves on the discharge side of all pumps and elsewhere as shown on drawings.
- D. After all water circuits are properly balanced and approved, make a slight hacksaw cut across the end of all plug valves to indicate proper operating position of valve.

3.10 PIPE HANGER INSTALLATION

- A. Space hangers for horizontal pipe as follows:

Cast iron soil pipe	5' lengths	5' on center maximum
	10' lengths	10' " " "
Plastic pipe	1/2" to 1"	3' on center maximum
	1-1/4" and larger	4' " " "
Copper pipe	1-1/4" and smaller	6' on center maximum
	1-1/2" and larger	10' " " "

- B. Space hangers for vertical pipe as follows:

1. Cast iron soil and vent pipe: At the base of each riser, at each story level, at no more than 10' intervals, at centerline between joints and each branch connection. Prevent sagging and maintain alignment.
2. Plastic pipe: At the base of each riser, at each story level, not more than 6' intervals for piping 1-1/4" and smaller, not more than 10' foot intervals for piping 1-1/2" and larger, at center line between joints and each branch connection. prevent sagging and maintain alignment. Provide midstory guides for pipe sized two (2) inches and smaller.
3. Copper pipe: At the base of each story and not more than 6' intervals for piping 1-1/4" and smaller and not more than 10' intervals for piping 1-1/2" and larger.

- C. Attach hanger rods to sufficiently rigid structural building members. If hangers must be attached to either the top chord or bottom chord of steel bar joist, attach the rods by clamp at the panel points. Do not under any circumstances burn or drill holes in either chord. Do not weld either chord. Provide additional hangers or anchoring devices necessary for proper support of piping at corners, tops of risers, etc. Provide galvanized steel shields over pipe insulation at pipe supports.

- D. Support of pipe tubing and equipment shall be accomplished though means of engineered products specific to each application. Makeshift field devised methods shall not be allowed.

- E. Suspend hangers from Unistrut or approved equal in tunnels or by properly spaced structural steel members spanning the tunnels and bearing on the tunnel walls.

3.11 SLEEVE AND ESCUTCHEON INSTALLATION

- A. Accurately locate and set required sleeves in walls, foundations, floors, etc. Where more than one pipe is necessarily passed through a single sleeve as to a unit piping enclosure or other conditions resulting in larger than 1/8" gap within the sleeve, tightly pack space with proper material to form a barrier against sound, vermin, fire, etc.
- B. Provide escutcheons on all finished surfaces where exposed piping, bare or insulated, pass through floors, walls or ceilings, except in boiler, utility or equipment rooms. Fasten escutcheons securely to pipe or pipe covering.

3.12 FIRE RATED PENETRATIONS

- A. Fill all spaces around piping and spaces between piping and sleeves passing through fire-rated walls, floors, or ceilings with material capable of maintaining the fire-resistance rating of the wall, floor or ceiling. Use Metacaulk 950GW-1 or approved equal caulking material for PVC and CPVC piping.
- B. Recessed fixture penetrations (ie. washer supply boxes, refrigerator supply boxes, etc.) of 1-hour rated firewalls shall be installed such that the required fire resistance will not be reduced. Contractor shall provide and install fire rated assembly washer supply and refrigerator supply boxes for fire rated walls. See architectural drawings for fire rated wall locations and penetration details.

3.13 ACCESS DOORS

- A. Provide access doors at circulation pumps, valves, trap primers, air vents, shock absorbers, and like items requiring adjustment or maintenance accessibility if they cannot be located over lay-in type ceilings or cannot be accessible from attics or mechanical rooms. Obtain approval from Architect for location of access doors. Provide visible markers for access doors in concealed locations.
- B. Provide visible markers on finished side of lay-in type ceilings to indicate locations of valves, air vents, and like items. See Architect for marker type.

3.14 INSULATION

- A. Use application details in accordance with the insulating material supplier's recommendations except where a higher standard is specified herein.
- B. Run covering for piping unbroken through hanger clevises, sleeves, etc. Use details for covering cold surfaces such that continuous covering with unbroken vapor barrier is provided. Use these same covering and hanging details for pipes connecting to vibrating equipment or carrying pulsating pressure to avoid metal-to-metal contact between pipes and hangers.
- C. Provide an insert, not less than 6" long, of the same thickness and contour as adjoining insulation, between support shield and piping, but under the finish jacket, on piping 2" or larger, to prevent insulation from sagging at support points. Use heavy density insulating materials suitable for the specified temperature range and strong enough to prevent crushing.
- D. Cover surfaces of valves, fittings, strainers, and specialties with built-up insulation around irregular shapes to form smooth cylindrical surfaces. Cover such specialties in "cold" systems with special care to maintain continuous vapor barrier. Cover flanges and ground joint unions in "cold" systems.
- E. Insulate all piping as indicated in these specifications including piping run above ceilings, in attics, in crawl space and concealed inside walls.
- F. Insulate all above grade domestic cold and hot water piping including piping run above ceilings, in attics, in crawl space and concealed inside walls.

3.15 EQUIPMENT SUPPORTS INSTALLATION

- A. Furnish, fabricate, and erect all structural supports and platforms as required for all equipment installed in this Work, unless otherwise specified. Make these supports and platforms independent of all other equipment supports and suspend them from the building structural steel, roof purlins, inserts imbedded in concrete slabs, or support them on columns as required by the drawings. Attachments to steel bar joists

must be approved by the Architect and must only be at panel points. Do not, under any circumstances, burn, drill or weld either chord of steel bar joist.

- B. Prepare and furnish drawing and templates indicating all concrete Work required for equipment furnished under this Work. All concrete required will be provided by the General Contractor. Provide, at the time concrete foundations, bases, or curbs are formed, all necessary anchor bolts as required for the various equipment in this Work. Grout all spaces between the equipment base and concrete supports.

3.16 STRAINERS

- A. Locate strainers ahead of each automatic control valve, suction side of each pump and elsewhere as shown on drawings.

3.17 CONTROLS

- A. Provide all pressure controls, tempering valves, aquastats, temperature and pressure relief valves and control valves necessary for the operation or adjustment of equipment and not supplied as part of the equipment.
- B. Install all high voltage (120 V or above) control wiring in EMT conduit. Install low voltage control wiring in conduit unless concealed in walls or above finished ceilings. Do not run low voltage control wiring in the same conduit as high voltage control or power wiring.

3.18 CONNECTIONS TO EQUIPMENT FURNISHED AND INSTALLED BY OTHERS

- A. Complete all rough-in and final connections to the kitchen and equipment furnished and installed by others. See Architectural drawings for details of equipment and location.

3.19 INSTALLATION OF AND CONNECTION TO RELOCATED EQUIPMENT

- A. Complete all rough-in and final connections to the equipment shown on the drawings to be relocated.
- B. See Architectural drawings for details of equipment and location.

3.20 EQUIPMENT, VALVE AND PIPE IDENTIFICATION

- A. Securely attach manufacturer's nameplate to all equipment giving data as to design and operating characteristics.
- B. Securely attach nameplates to all switches, control devices and similar items, giving the name and number of the item of equipment to which it is connected.
- C. Provide direction arrows and color bands every 25 feet where piping is located above lay-in type ceilings and in accessible attic and crawl spaces and within 5 feet of both sides of accessible wall penetrations for the following piping:
 - 1. Domestic hot water piping.
 - 2. Domestic hot water recirculating piping.
 - 3. Domestic cold water piping.
 - 4. Sanitary drain piping.
 - 5. Plumbing vent piping.

- D. Provide small scale drawing showing valve locations and valve number. Provide valve number on each valve tag. Intent of small scale drawing is to show what equipment each valve serves.

3.21 TESTS

- A. Testing requirements are minimum and are not intended to be limiting where additional testing methods are required by the authority having jurisdiction.
- B. All drainage, vent and inside conductor piping shall be tested before fixtures are installed by capping or plugging the openings and filling the entire system with water, allowing it to stand thus filled for 24 hours with at least 10 feet of pressure. If required to test system in sections, provide necessary test tees, plugs and stand pipe to test the system with at least 10 feet of pressure. Remake all leaking joints and retest.
- C. Test all water supply piping before fixtures, equipment and/or hydrants are connected. Cap or plug the openings, fill the system with water and apply a hydrostatic pressure of 1.5 times the operating pressure or 125 PSIG, whichever is higher. Hold test pressures for at least 24 hours. Remake all leaking joints and retest.
- D. Test each fixture for soundness, stability of support and satisfactory operation of all its parts.

3.22 DISINFECTION OF POTABLE WATER PIPING

- A. Disinfect any part of potable water system installed or repaired in accordance with one of the following methods before it is placed in service:
 - 1. After tests are completed, fill all water supply systems with a solution containing 50 PPM of available chlorine and allow to stand for a period of at least 24 hours before being flushed with clean water. Deliver a dated letter certifying sterilization to the Architect.
 - 2. After tests are completed, fill all water supply systems with a solution containing 200 PPM of available chlorine and allow to stand for a period of at least 3 hours before being flushed with clean water. Deliver a dated letter certifying sterilization to the Architect.

3.23 INSTRUCTION OF OWNER'S REPRESENTATIVE

- A. After final acceptance of all Work and occupancy of building, provide service to make system adjustments to suit conditions created by the occupancy; instruct Owner's operating personnel in operation adjustment and maintenance procedures of system components and acquaint Owner's operating personnel with locations and functions of valves, control devices, etc., in the system.

3.24 CLEANING AND RUBBISH

- A. During the Work, keep the premises clear of rubbish created as a result of the Work. Protect and prevent unnecessary induction of dirt into piping, fixtures and equipment. On completion of the Work, remove all rubbish and debris resulting from the Work and dispose of same. Thoroughly clean and leave in a satisfactory condition for use all equipment, pipe, fixtures, etc.

3.25 RECORD DRAWINGS

- A. The Architect will furnish one set of blue line prints of the drawings as issued for this contract. Use these prints to indicate accurately and neatly any deviation in the actual installation from the drawings as

issued. At the completion of the job, deliver the marked-up drawings to the Architect for a permanent record of the exact location of all equipment, pipe runs, etc. as incorporated in the job.

3.26 COMPLETE SYSTEMS

- A. Leave all systems completely operative in all details and in satisfactory working condition, as determined by the Architect. Furnish and install as part of this contract all apparatus and material obviously a part of the systems and necessary for their operation.

END OF SECTION 22 00 00

SECTION 23 00 00

HEATING, VENTILATING & AIR CONDITIONING

PART 1 – GENERAL

1.1 DESCRIPTION OF WORK

- A. The General Provisions of the Contract, Division 01, including the General Requirements, Supplementary Conditions and Special Conditions, along with the General Requirements, are hereby made a part of this Section as if fully repeated herein.
- B. The Florida Energy Code establishes system commissioning requirements for buildings. Mechanical systems where mechanical cooling equipment capacity is 480,000 BTUH or greater or heating capacity is 600,000 BTUH or greater shall be commissioned. A complete system test and balance shall be performed, and a certified report shall be submitted to and approved by the Engineer prior to the commencement of functional performance testing.
- C. Scope of Work: The scope of the work included under this section of these specifications shall include complete heating, ventilating and air conditioning systems as shown on the drawings and specified herein. This work shall include:
 - 1. Ductless split systems.
 - 2. Refrigeration piping.
 - 3. Condensate drain piping.
 - 4. Duct work.
 - 5. Insulation.
 - 6. Air distribution equipment.
 - 7. Controls and control wiring.
 - 8. Testing, adjusting, and balancing.
 - 9. Demolition.
 - 10. Instructions of owner's representative.
- D. Related Work Specified Elsewhere:
 - 1. Instruments and Controls for HVAC: Building Automation System (BAS) – 23 09 00
 - 2. Service and maintenance: Operation and Maintenance of HVAC Systems – 230100.
 - 3. Power wiring: Electrical – 26 00 00.

1.2 CODES, ORDINANCES AND PERMITS

- A. Comply with the latest edition of all codes applicable to the Work of this contract including but not limited to the Florida Energy Efficiency Code, Florida Building Code and Florida Building Code - Mechanical. Obtain information on all code restrictions and requirements. In case of conflict between the contract documents and a governing code or ordinance, such conflict shall be immediately brought to the attention of the Architect for resolution. Extra payment will not be allowed for Work required by code restrictions except through written agreement with the Owner.
- B. Apply for, obtain, and pay for all required permits and inspection certificates. Final payment is contingent upon delivery of such certificates to the Architect.
- C. Where applicable, all materials and equipment shall bear the Underwriters' Laboratories seal or ASME code stamp. Certificates to this effect shall be furnished to the Architect upon request.

1.3 INDUSTRY STANDARDS

- A. Industry Standards: Unless modified by these specifications, the design, manufacture, testing and method of installing all materials, apparatus and equipment shall conform to the following:

1. ASHRAE Standard 90, Energy Conservation in New Building Design.
2. ANSI B9.1 Safety Code for Mechanical Refrigeration.
3. Standards of National Fire Protection Association.
4. ASHRAE Handbook of Fundamentals.
5. SMACNA Standards for Duct work.
6. Associated Air Balance Council or National Environmental Balancing Bureau Standards for Field Measurement and Instrumentation.
7. Underwriters' Laboratories.
8. National Electrical Code.
9. Air Moving & Conditioning Association.
10. Air Conditioning & Refrigeration Institute.

1.4 SITE INSPECTION

- A. Visit the site and thoroughly inspect conditions affecting the Work before submitting bid. Assume responsibility for meeting all existing conditions including access and workspace limitations.

1.5 DRAWINGS AND SPECIFICATIONS.

- A. Refer to the general construction drawings which are bound with the drawings of this Work for construction details, elevations, etc. Architectural and structural drawings shall take precedence over Division 23 drawings (Mechanical Drawings). It is the intent of the Mechanical Drawings to show the general arrangement of the system and not to indicate all offsets, fittings and accessories which may be required, nor to show exact locations of piping, duct work or equipment except where actual dimensions are given. All vertical piping shall be located in walls in finished spaces unless otherwise noted.
- B. Specifications and drawings shall be considered as supplementary to each other, requiring materials and labor indicated, specified, or implied by either specifications or drawings. It is the intent of the drawings and specifications to call for finished Work, tested, and ready for operation, and in complete conformance with all applicable codes, rules and regulations. Minor details not usually shown or specified, but manifestly necessary for the proper installation and operation of the various systems, shall be included in the Work and in the proposal, the same as if specified or shown on the drawings.
- C. If any departures from the drawings and specifications are deemed necessary, details of such departures and the reasons therefore shall be submitted to the Architect for approval. No departures shall be made without prior approval of the Architect.
- D. Specific reference in the specifications to any article, device, product, material, fixture or type of construction, etc., by proprietary name, make or catalog number shall be interpreted as establishing a standard of quality and shall not be construed as limiting competition. Substitutes may be used subject to compliance with requirements set forth in the General Requirements, Division 1, and as approved by the Architect.
- E. Submit cost implications to contract in bid when providing substitutes for specified equipment and for all alternatives requested in the construction documents.

1.6 MANUFACTURER'S SPECIFICATIONS

- A. Where the name of a concern or manufacturer is mentioned on the Drawings or in Specifications in reference to his required service or product, and no qualifications or specification of such is included, then the material gauges, details of manufacturer, finish, etc., shall be in accordance with his standard practice,

directions, or specifications. The Contractor shall be responsible for any infringement of patents, royalties, or copyrights which may be incurred thereby.

- B. Equipment scheduled on drawings was used to arrive at space, maintenance access, utility service and equipment supports. If other equipment is submitted and approved, take responsibility for maintaining this space for maintenance access, utility service requirements and any revisions required for installation such as equipment supports, roof curbs and access ladders. Take responsibility for the coordination and cost for any resulting changes including cost to change electrical service required by substituted equipment.
- C. All materials and equipment shall be new and first class in every respect. As far as is practical, similar products shall be by one manufacturer. Equipment designed to operate as a system such as outdoor condenser or heat pump units with indoor air handling units shall be from one manufacturer unless scheduled otherwise.

1.7 SUBMITTALS

- A. Submit shop drawings in accordance with the General Requirements, Division 1.
- B. Samples of insulation, diffusers, dampers or any other mechanical equipment or materials shall be submitted if requested by the Architect. If a sample is requested, have the sample delivered to the Architect or arrange for the Architect to examine it elsewhere. Failure to comply may be cause for rejection.
- C. Submit shop drawings or catalog data for the Architect's approval before purchasing or installing the following:
 - 1. Ductless split systems.
 - 2. Exhaust and supply fans.
 - 3. Insulation.
 - 4. Controls and wiring diagrams.

1.8 PERFORMANCE DATA

- A. All performance data specified herein shall be considered actual performance of equipment as installed. Make suitable allowances if installation details are such that actual operating conditions unfavorably affect performance as compared to conditions under which the equipment was rated.

1.9 CATALOG, OPERATION AND MAINTENANCE DATA

- A. Provide four (4) complete sets of a compilation of catalog data of each manufactured item of equipment used in the Mechanical Work. In addition to the catalog data, installation, operating and maintenance data and bill of materials for all operating equipment shall be submitted. Each of the four sets of data shall be bound in loose leaf binders and submitted to the Architect before final payment is made. A complete double index shall be provided as follows:
 - 1. Listing the products alphabetically by name.
 - 2. Listing the names of manufacturers alphabetically by name together with their addresses and the names and addresses of local sales representatives.
- B. It is the intent of this catalog, operation, and maintenance data to provide the Owner with complete instructions on the proper operation and use, lubrication and periodic maintenance, together with the source of replacement parts and service, for the items of equipment covered.

1.10 CONTRACTOR COORDINATION

- A. The Electrical Contractor will furnish, set and wire all disconnect devices and starters as required for all equipment except for those items furnished with integral disconnect devices and/or starters.
- B. Furnish detailed information to the Electrical Contractor on power wiring requirements for all mechanical equipment purchased as soon as practical. This shall include all diagrams and instructions necessary for the Electrical Contractor to make connections properly. If equipment purchased requires larger electrical service than equipment scheduled, arrange, and pay for required electrical service change.
- C. Provide all air conditioning control devices, including thermostats and complete all control wiring, including final connections.
- D. Within 30 days following award of the contract, report to the Architect in writing, all real or potential errors, ambiguities and/or conflicts on the Mechanical Work or between the trades and obtain an agreement with the Architect on a solution. Those reported after 30 days, except as a result of unforeseen circumstances, shall be resolved at the discretion of the Architect. Report conflicts resulting from the progress of Work to the Architect immediately or accept the expense for corrective work caused by failure to report such a conflict.

1.11 CHANGES

- A. Do not make any changes in design without the written approval of the Architect. Changes in design means any change which will affect the capacity, reliability, operation or safety of the systems or any parts thereof, including changes which may be required to conform to local regulations or codes.

1.12 MECHANICAL CONTRACTOR'S WARRANTY

- A. Provide written warranties as specified in the General Requirements, Division 1, and provide a five year warranty for all refrigeration compressors against defects in materials and workmanship. Repair any defects becoming apparent within the warranty period as directed by the Architect.

1.13 PROTECTION OF MATERIALS AND EQUIPMENT

- A. Provide complete protection against weather, rain, windstorms, frost, ice, heat, and acts of vandalism, so as to maintain all materials and equipment free from injury or damage, including physical damage of any nature. At end of each workday, cover work as required to provide such protection. This shall include but not be limited to erection of all temporary shelters to protect adequately any materials and equipment stored on site, cribbing of any materials and equipment above the floor of the construction, and the covering of materials and equipment in the building under construction with protective covering.
- B. Provide dry storage facilities for materials and equipment; including but not limited to duct work, insulation, air handling units, controls, motor operated equipment, etc.; sensitive to damage by moisture. Outside, unprotected storage will not be accepted. Storage inside building being constructed will not be accepted until roof and walls are weather tight unless temporary protection is provided.
- C. Failure to comply shall be sufficient cause for rejection of damaged materials and equipment. Replace any damaged material or equipment and place the systems in perfect working condition.

PART 2 – PRODUCTS

2.1 SINGLE DUCTLESS INDOOR UNIT AND SINGLE OUTDOOR UNIT

- A. Manufacturers: Basis of Design is Mitsubishi. Approved equals meeting all specified criteria are: Daikin Applied, EMI, Fujitsu, Sanyo, LG.
- B. Capacity shall be as scheduled on the drawings and adjusted for line losses of refrigerant piping. Capacity shall be combined rating at actual conditions entering the evaporator and 95 degrees F outdoor ambient temperature.

- C. Air handling units shall be draw through type with 1" thick, standard size, disposable type filters and shall have DX cooling coils and electric heating coils as scheduled on drawings with minimum unit capacities as indicated. Fan capacities shall be as scheduled on drawings. Fans shall be direct drive with two or three speed motors or belt drive as scheduled. Fans and motors shall be mounted on vibration isolators. Casing shall be constructed of heavy duty, factory painted, galvanized sheet steel adequately reinforced with structural members. All unit panels shall be internally insulated to meet requirements of the Florida Energy Code. All insulating materials shall meet the requirements of NFPA 90-A. Units shall be equipped with single point power connection.
- D. The compressor shall be a direct current rotary and/or scroll compressor with Variable Compressor Speed Inverter Technology. The compressor shall be driven by inverter circuit to control compressor speed. The compressor speed shall dynamically vary to match the room load for significantly increasing the efficiency of the system which results in vast energy savings. The outdoor unit shall have an accumulator and high pressure safety switch. The compressor shall be mounted to avoid the transmission of vibration
- E. Condenser Unit shall have all operating components assembled on one common base. These shall include: compressor, condenser coil, condenser fan and motor, charging valves, all controls, and a holding charge of refrigerant. Units shall be designed for outdoor installation with all exterior surfaces factory painted with primer and enamel for weather protection. Drain holes shall be provided for elimination of rain. Provide removable panels for access to components.
- F. Refrigeration circuit components shall include liquid line service valve, suction line service valve, and full charge of compressor oil and holding charge of refrigerant.
- G. System shall be provided with controls specified on the drawings and all standard controls including the following even if not considered standard:
 - 1. Single point power connection.
 - 2. Compressor and fan contactors.
 - 3. Motor overload protection for ungrounded legs.
 - 4. Crankcase oil heater.
 - 5. High pressure cut-out.
 - 6. Auto reset low-pressure switch to stop compressor if refrigerant pressure drops below 7 psig.
 - 7. 24 volt transformer for unit controls.
 - 8. Compressor anti-cycling relays set between 3 and 5 minutes.
 - 9. Low-ambient controller down to 0° F. for winter operation.
 - 10. Evaporator freeze thermostat to stop unit operation if evaporator reaches freeze-up conditions.
 - 11. Isolation relay to remove low-ambient controller out of condenser fan circuit during heating mode.
 - 12. Indoor time delay relay to continue indoor blower motor after compressor cycles off.
 - 13. Refrigerant filter dryer (two-way for heat pumps).
 - 14. Adjustable outdoor thermostat to prevent supplemental electric heat from operating except during defrost mode or when outside air temperature is below set-point (40 F).
 - 15. Thermostatic expansion valve kit.
 - 16. Liquid solenoid valve to stop and start liquid refrigerant flow in response to compressor operation.
 - 17. Service alarm to signal compressor not operating during heating mode with indicating light on indoor thermostat.
 - 18. Dry Mode control operation for humidity control.
 - 19. Condensate overflow switch to turn off unit in the event of condensate overflow.

2.1 SUPPLY AND EXHAUST FANS

- A. Manufacturers: Basis of Design is Loren Cook. Approved equals meeting all specified criteria are Acme, Aerovent, American Coolair, Greenheck, Hartzell, Penn Ventilator, Swartwout, and Twin City.

- B. Fans shall be of size, type and capacity indicated on the drawings. Power supply shall be as scheduled. The complete units shall be approved by the Underwriters' Laboratories and be in full accordance with all provisions of the National Electric Code.
- C. Provide fan with internal integral thermal protector and unit mounted disconnect.
- D. Pre-wired, factory mounted speed controller for direct drive units.

2.2 REFRIGERANT PIPING AND ACCESSORIES

- A. Piping shall be type "L" hard drawn copper with wrought copper, refrigerant grade fittings. All elbows shall be long radius.
- B. Moisture indicator shall be installed in the liquid line just before the refrigerant solenoid valve. Thermostatic expansion valves shall be provided for each evaporator circuit. Valves shall be equipped with external equalizer.

2.3 CONDENSATE DRAIN PIPING AND SECONDARY DRAIN PAN

- A. Condensate piping located above ceilings shall be insulated schedule 40 polyvinyl (PVC). Non-insulated piping located above ceilings, whether used for return or supply air plenums or not, will not be allowed.

2.4 PIPE HANGERS

- A. Pipe hangers for refrigerant and condensate piping located inside building shall be non-metallic strap hangers designed to rigidly support piping without damage to pipe insulation.
- B. Pipe hangers shall be Auto-Grip, Fee and Mason, Grinnel, galvanized steel clevis hangers, roller or fixed as shown on drawings, selected within the manufacturer's published load ratings.
- C. Galvanized steel hanger rods shall be at least:
 - Pipe to 2" 3/8" diameter
 - 2-1/2" to 3" 1/2" diameter
 - 4" to 5" 5/8" diameter
 - 6" 3/4" diameter
 - 8" and larger 7/8" diameter
- D. Rods for trapeze hangers supporting several pipes shall be sized for the equipment load.
- E. Hangers for copper pipe shall be either copper-plated type or there shall be a shield of 4 pounds sheet lead to completely surround the pipe to prevent direct contact with the hanger.
- F. Supports for pipes with vapor barrier type covering shall not contact the pipe but shall surround the unbroken covering. Provide galvanized steel shields with mitered corners properly formed to the jacket outside diameter between hanger clevises and the lower 1/3 of the circumference. Size shields as follows:

Pipe up to 1"	18 gauge x 8" long
1-1/4" to 2"	16 gauge x 12" long
2-1/2" to 4"	14 gauge x 16" long
5" and larger	12 gauge x 20" long

- G. Use vibration isolators in hanger rods to isolate vibration in piping subject to vibration, or where shown on drawings.

2.5 SLEEVES AND ESCUTCHEONS

- A. Sleeves shall be 18 gauge galvanized steel or pre-formed plastic. Sleeves shall be sized to allow approximately 1/8" gap around the pipe or its insulation.

- B. Sleeves through floors or fire walls shall be galvanized steel pipe of proper size. Sleeves through floors shall extend 1/2" above the finished floor. Sleeves penetrating fire-rated walls, floors or ceilings shall be filled with fire-rated material capable of maintaining the fire-resistance rating of the wall, floor, or ceiling.
- C. Escutcheon plates for finished spaces shall be nickel-plated.

2.6 DUCT WORK

- A. Supply air duct work shall be Fibrous Glass Duct System.
- B. Return air duct work shall be Fibrous Glass Duct System.
- C. Transfer air duct work shall be 1" thick Fibrous Glass Duct System.
- D. Fibrous glass duct system shall be a rigid, resin bonded fibrous glass board with a damage-resistant, flame retardant, reinforced aluminum foil exterior facing. Inside air stream surface shall be faced with non-abrasive, fire-resistant coating to minimize air flow resistance, prevent microbial growth per ASTM G21 and G22 and allow duct system cleaning using methods and equipment described in North American Insulation Manufacturers Association (NAIMA) Publication AH122, Cleaning Fibrous Glass Insulated Duct Systems, Recommended Practice. Fibrous duct system shall have the following thermal performance:
 - 1. Wall thickness = 1" with minimum R = 4.30 for ductwork located inside building thermal envelope.
 - 2. Wall thickness = 1.5" with minimum R = 6.50 for ductwork located inside building and outside thermal envelope.
 - 3. Wall thickness = 2" with minimum R = 8.70 for ductwork located outside building including crawl spaces. Fibrous duct system located outside building and in crawl spaces shall be enclosed with galvanized sheet metal.

Approved manufacturers are Manville, Owens Corning or pre-approved equal.

- E. Duct dimensions shown on drawings are finished inside dimensions. Increase duct sizes to allow for double wall construction, acoustic duct liner or fibrous glass duct system wall thickness where applicable.
- F. Changes in direction, including Tees, in square and rectangular duct work for both supply air, outside air, and return air shall be made with mitered elbows fitted with closely spaced full radius air foil type turning vanes constructed for maintaining constant velocity through elbow. Changes in direction in supply and return ducts may be made with radius elbows instead of mitered elbows and turning vanes if space limitations permit or if shown on drawings. Radius elbows in round duct work do not require turning vanes for either supply or return air.

2.7 A/C DUCT WORK ACCESSORIES

- A. Manual balance/volume dampers shall be opposed blade type and shall be 16 gauge minimum galvanized steel with zinc-plated hardware and bronze or nylon bearings. Blades shall not be over 8" wide nor less than 16 gage galvanized steel. Maximum leakage shall be less than 1% at static pressure of 4" W.G. Provide locking quadrant damper operators on manual dampers.
- B. Provide 24 V electric operators on automatic dampers. Electric operators shall be oil immersed gear train type with spring return and shall function proportionally or pulsed directly for position control and shall be compatible with DDC system.
- C. Turning vanes shall be factory fabricated full radius double thickness air foil type with 24 gauge rails and hollow vanes.

- D. Extractors at branch take-offs shall be adjustable push rod type with locking hardware. Extractors at sidewall supply grilles shall be adjustable by removing the grille face.
- E. Splitters shall be constructed of at least the same gauge galvanized steel as the duct wherein they are used and shall not be less than 24 gauge. Blades shall be formed in two thickness of metal to provide rounded nose to air flow.
- F. Access doors shall be factory fabricated, double wall insulated type of 24 gauge minimum galvanized steel. Doors shall be non-hinged, completely removable with hand operated adjustable tension catches and shall be completely gasketed around their perimeter. Doors shall be as large as the duct size will permit (within 1" of each duct edge) and large enough to permit access to fire dampers and other items requiring access. Doors larger than 12" shall have latches on all four sides.
- G. Flexible connectors shall meet requirements of UL 191 for Class 1 connectors.

2.8 FLEXIBLE DUCT

- A. Flexible duct shall be pre-insulated type, listed by Underwriters' Laboratories, Inc., Class 1 ducts, polymer film supported by helically wound, spring-steel wire; fibrous-glass insulation; aluminized vapor-barrier film and shall conform to NFPA Bulletin 90-A.
- B. Duct shall be designed for pressure rating of 4-inch W.G. positive and 0.5-inch W.G. negative. Maximum air velocity shall be 4000 fpm.
- C. Insulation shall be the required thickness and material to provide a minimum thermal resistance "R" of 6.0 when located outside of the building thermal envelop and "R" of 4.2 when located inside the building thermal envelope. Comply with ASHRAE/IESNA 90.1-2004.
- D. Flexible duct connectors shall be stainless-steel band with cadmium-plated hex screw to tighten band with a worm-gear action.

2.9 INSULATION – GENERAL

- A. All insulation materials and coatings shall meet flame spread and smoke developed ratings per NFPA Bulletin 90-A when tested in accordance with ASTM Standard E-84. Smoke developed less than or equal to 50, and flame spread less than or equal to 25. All coatings and mastics shall be nonflammable in wet state.
- B. Approved Manufacturers: Armstrong World Industries, CertainTeed Corp., Manville, IMCOA, NOMACO, Owens-Corning Fiberglas Corp., Pittsburg Corning Corp.

2.10 DUCT WORK INSULATION

- A. General: Duct insulation shall be the required thickness and material to provide a minimum thermal resistance "R" of 8 when duct is located outside building, "R" of 6.0 when duct is located in areas within the building but on the non-air conditioned side of the building insulation and 4.2 when located on the air conditioned side of the building insulation unless otherwise noted on the drawings. These R values are "as-installed" minimums. Insulation nominal thickness shall not exceed 2".
- B. Vapor Barrier Jacket:
 - 1. ASTM C921, White kraft paper reinforced with glass fiber yarn and bonded to aluminized film.
 - 2. Moisture Vapor Transmission: ASTM E96; 0.02 perm inches.
 - 3. Secure with self sealing longitudinal laps and butt strips.
 - 4. Secure with outward clinch expanding staples and vapor barrier mastic.

2.11 REFRIGERANT SUCTION PIPING INSULATION

- A. Above grade piping inside building and when installed in PVC conduit: 1/2" thick, pre-formed, flame-retardant, elastomeric, polyethylene, pipe insulation similar to IMCOA Imolock or NOMACO Nomalock, and installed in accordance with manufacturer's instructions.
- B. Exposed piping outside building: 3/4" thick, pre-formed, flame-retardant, elastomeric, polyethylene, pipe insulation similar to IMCOA Imolock or NOMACO Nomalock, and installed in accordance with manufacturer's instructions and, in addition, provide banded aluminum jackets to floor or wall penetration. Install and secure aluminum jackets in accordance with manufacturer's instructions.

2.12 CONDENSATE DRAIN PIPING INSULATION

- A. Primary condensate copper piping, if used instead of schedule 40 PVC, shall be insulated with 1/2", pre-formed, flame-retardant, elastomeric, polyethylene, pipe insulation similar to IMCOA Imolock and Armstrong Armaflex, or, in dry locations, 1/2" thick 3.5 pound density molded fiberglass with all-purpose, high density, white kraft bonded to aluminum foil, reinforced with fiberglass yarn jacket. Insulation located in supply or return air plenums shall meet all state and local code requirements for plenum use. Install pipe insulation in accordance with manufacturer's instructions.
- B. Copper or PVC used for primary or secondary condensate piping located inside building above ceilings shall be insulated with 1/2", pre-formed, flame-retardant, elastomeric, polyethylene, pipe insulation similar to IMCOA Imolock and Armstrong Armaflex, or, in dry locations, 1/2" thick 3.5 pound density molded fiberglass with all-purpose, high density, white kraft bonded to aluminum foil, reinforced with fiberglass yarn jacket. Install pipe insulation in accordance with manufacturer's instructions.

2.13 PIPE INSULATION JACKETING, BANDING, AND TAPING

- A. All service jacketing: Kraft Paper aluminum foil/vinyl coating fire retardant construction by Lamtec Corp., Alpha Associates, or approved equal.
- B. Aluminum jacketing: 0.016" thick minimum with 1/2" wide bands and seals of same material by Premetco International or approved equal.
- C. PVC jacketing: 0.03" thick minimum with self sealing laps and heavy duty fitting covers of matching thickness by Proto Corp or approved equal. All PVC shall have flame and smoke rating of 25/50 or less and be UV resistant.
- D. PITTCOTE® 404 coating and PC® fabric 79 reinforcing by Pittsburgh Corning. No alternatives accepted.
- E. Fiber reinforced tape 3/4" wide Scotch Brand #8934 by 3M or approved equal.

2.14 AIR DISTRIBUTION EQUIPMENT

- A. Manufacturers: Basis of Design is Titus. Approved equals meeting all specified criteria are: Acutherm, Anemostat, Krueger, Metalaire, Metal Industries, Nailor, Price, Seiho, and Tuttle & Bailey.
- B. Air distribution devices shall be as scheduled on the drawings. All supply diffusers shall be selected to deliver the indicated volume of supply air without exceeding the available throw and with an NC rating not to exceed 25, including half open damper. Submittal data shall clearly indicate performance of selected devices including air quantity, pattern, throw, pressure drop, sound level, finish, dimensions, and construction of all air distribution devices.
- C. Refer to Architectural reflected ceiling plans for exact location of air distribution devices. All supply, return and exhaust diffusers, grilles and registers shall be steel construction unless scheduled otherwise and shall have baked enamel finish with color selected by the Architect.

- D. Ceiling surface and sidewall supply registers shall, unless otherwise scheduled, have opposed blade type key operated dampers with a detachable key. One (1) key shall be furnished for each register.

2.15 CONTROLS

- A. Room temperature thermostats shall be programmable type designed for cooling and electric heating or heat pump with electric emergency heating applications as applicable. Unit shall have automatic heating/cooling changeover with system light; digital display indicating time of day, day of week, room temperature, current program operating mode, and current active stage; 3 hour timed override; two occupied and two unoccupied programs per day; keyboard disable to prevent tampering; 7-day program basis; status indicating lights displayed in digital display; constant fan operation during occupied mode; auto fan operation during setback (set applicable dip switch or program mode); wall-mounted temperature sensor. "Auto" fan mode shall allow supply fan to run only when cooling or heating is required by the room thermostat.
- B. Motor operated dampers shall have aluminum frames and aluminum air foil blades with synthetic elastomeric mechanically attached, field replaceable blade seals. Electric actuators shall be manufactured by Belimo and shall be selected for the required operating characteristics compatible with the control system.

2.16 ACCESS DOORS

- A. Access doors shall be as similar to those manufactured by Milcor Division of Inland-Ryerson of type as follows:

Door Location	Door Type
Drywall	Style "DW"
Masonry or Tile	Style "M-Stainless"
Acoustical Tile	Style "AT"
Plaster	Style "K"
Fire Rated Walls/Ceilings	Style "Fire Rated"

- B. Each door shall be equipped with two flush, screwdriver operated, cam latches and, other than Style "M", shall be finished to match adjacent surface. Door sizes shall be applicable to access required for normal service.

PART 3 – EXECUTION

3.1 DEMOLITION

- A. Remove all existing air handling units, outdoor condensing units, exhaust and supply fans, duct work, and piping related to HVAC work where shown on drawings.
- B. Provide refrigerant recovery in accordance with applicable codes and local requirements for all equipment being removed which contain refrigerant.
- C. Specific demolition:

3.2 CUTTING AND PATCHING

- A. Cut and patch existing construction as required for the proper installation of this Work. Cut openings carefully without undue weakening of the structure or damage to the building. Do not cut structural members without permission and being under the direction of the Architect. Provide required bracing, shoring, weather protection, etc. for openings.
- B. Patching shall replace the Work to a condition at least equal to its condition before the cutting was done. Use materials and methods approved by the Architect.

- C. Repainting will not be required under this contract for normal cutting and patching. This does not reduce the responsibility for redecorating of existing Work that is damaged unnecessarily by carelessness.
- D. Cutting and patching includes necessary relocation of existing pipes, conduits, etc, that pass through openings and the proper closing of openings in walls, floors, ceilings, etc. where abandoned mechanical facilities are removed.

3.3 EXCAVATION, BACKFILLING AND PUMPING [XH EXCAVATION PT3](#)

3.4 INSTALLATION OF THE WORK

- A. Examine the site and all drawings before proceeding with the layout and installation of the Work.
- B. Arrange the Work essentially as shown, exact layout to be made on the job to suit actual conditions. Confer and cooperate with other trades on the job so all Work will be installed in proper relationship and coordinate precise location of parts with the Work of others.
- C. Arrange for required chases, slots and openings with the General Contractor including locations of required pipe sleeves through walls and foundations. Assume liability for cutting or patching made necessary by failure to make proper arrangements in this respect.
- D. Indicated equipment connections are necessarily based on equipment of a given manufacture. Assume responsibility for proper arrangement of pipes, ducts, etc. to connect approved equipment in a proper and approved manner. Follow equipment manufacturer's detailed instructions and recommendations in the installation and connection of all equipment. In case of conflict between manufacturer's instructions and the contract documents, notify the Architect before proceeding. No equipment installation or connections shall be made in a manner that voids the manufacturer's warranty.
- E. Duct work shown on drawings is designed to produce required air quantity at estimated pressure drop which is used for air handling unit air quantity, pressure, and motor horsepower. Actual field installation may result in lower or higher pressure drop at the design air quantity which may require adjustment of fan speed. Take responsibility for this adjustment including replacement of fan sheave, if required, to obtain required air quantity and maintain required duct static pressure.
- F. Install all Work in a neat and workmanlike manner, using only workmen thoroughly qualified in the trade or duties they are to perform. Rough Work will be rejected.

3.5 PIPE INSTALLATION – GENERAL

- A. Install all piping in a workmanlike manner, according to the best practice of the trade, properly pitched and vented to eliminate air pockets or traps, and to insure rapid and noiseless circulation throughout the entire system. Run all horizontal piping parallel with or at right angles to building walls and partitions and run vertical piping plumb. Run horizontal piping above ceilings and vertical piping inside walls in finished spaces (not including mechanical rooms).
- B. Install all piping so as not to interfere with any electric lighting outlets, duct work, other piping, or equipment. Do not install piping in front of any door or window and avoid interference with any such openings. Do not install any piping over any motor, transformer, electrical panels, or other electrical equipment.
- C. Cut pipes accurately to measurements established at the building and install without springing or forcing. Cut piping square and remove all burrs and fins before assembling. Use standard fittings for all reductions in size and changes in direction. Mitering of pipe to form elbows or reducers will not be permitted. Thoroughly clean all piping before erection and make sure the piping is free of all foreign material after erection.

3.6 REFRIGERANT PIPE INSTALLATION

- A. Size and install all refrigerant piping to complete the system connecting heat pumps/condensers to air handlers in accordance with the equipment manufacturer's instructions based on equipment size, route of piping, and good refrigeration system practice. Layout piping in most direct route to minimize amount of system refrigerant. Install refrigerant tube size to minimize pressure drop and provide for oil return to compressor. Braze all joints with 15% minimum silver alloy solder.
- B. Run horizontal piping above ceilings and vertical piping inside walls in finished spaces (not including mechanical rooms).
- C. After completion of entire system and before any pipe is covered, test the entire refrigerant circuit to assure that it is absolutely tight. Conduct low-side test at 150 psi; high-side at 300 psi.
- D. After completion of leak testing, evacuate and charge the system utilizing a procedure approved by air conditioning unit's manufacturer.
- E. Install all refrigerant lines located underground or under the building floor in PVC conduit sized to contain both the liquid and hot gas lines including required insulation. Seal space between piping and PVC conduit at each end of conduit to eliminate entry of water.

3.7 CONDENSATE DRAINPIPE INSTALLATION

- A. Provide a valve, female hose connection with hose thread cap and rubber washer, and 4" deep trap to prevent back suction into the air unit as detailed on drawings.
- B. Run condensate drain line from each A/C unit to mop sink as noted on the drawings.
- C. Install condensate drain trap float switch to turn off unit if condensate backs up in trap.

3.8 PIPE ASSEMBLY

- A. Sweat Joints in Copper Pipe (other than refrigerant piping): Cut pipe squarely to accurate length for full penetration into fittings. Remove burrs from ends, clean soldering surface thoroughly, flux, assemble and solder before surfaces oxidize. Use approved non-corrosive flux. Use sufficient heat for complete penetration of solder and wipe away excess flux and solder.
- B. Solvent Weld Joints in PVC Pipe: Cut pipe squarely to accurate length for full penetration into fittings. Remove burrs from ends, clean joining surfaces thoroughly and form all joints in accordance with the pipe manufacturer's recommendations.

3.9 HVAC DUCT WORK

- A. Install all duct work in accordance with SMACNA standards. Install extractors and air balance dampers in all branch take-offs including take-offs to supply diffusers. Paint inside of diffusers and duct visible through diffusers flat black.
- B. Support duct from building structure with straps, rods, or angles as detailed in "HVAC Duct Construction Standards - Metal and Flexible" as published by SMACNA. Horizontal and diagonal joist bridging shall not be considered part of building structure for duct supporting purposes. Where joists are located too far apart for duct support or duct runs are parallel to joist, provide angles between joists designed to support duct without sagging.
- C. Fabricate and install fibrous glass duct systems in accordance with the UL listing and conforming to manufacturer's published methods and/or latest editions of NAIMA (North American Insulation Manufacturers Association) Fibrous Glass Duct Construction Standards or SMACNA (Sheet Metal and Air Conditioning Contractors National Association) Fibrous Glass Duct Construction Standards. One of the following closure methods shall be employed to meet the requirements of UL 181/ULC S110. Non-listed closure system shall not be used:

1. Pressure-Sensitive Tape: Any tape listed and labeled under UL 181A, Part I (P).
 - a. All longitudinal and circumferential joints shall be stapled with outward flaring ½" staples, 2" on center and covered with pressure sensitive tape. Heat sealing iron shall be used to assure good bond when installed below 50°F.
 2. Heat-Activated Tape: Any tape listed and labeled under UL 181A, Part II (H).
 - a. All longitudinal and circumferential joints shall be stapled with outward flaring ½" staples, 2" on center and covered heat-activated tape. Tape shall be sealed down with 500°F. iron. Use of heat gun will not be allowed.
 3. Mastic and Glass Fabric: Any mastic and glass fabric closure system listed and labeled under UL 181, Part III (M).
 - a. All longitudinal and circumferential joints shall be stapled with outward flaring ½" staples, 2" on center and covered by brush applied mastic onto joint and embed glass fabric in mastic. Apply as many additional coats of mastic as required to completely cover joint and fabric. Allow joints to dry in accordance with mastic manufacturer's recommendation before pressurizing fibrous glass duct system. Fabricate and install phenolic outside air duct system in accordance with manufacturer's requirements including joint sealant system.
- D. Install flexible ducts with a minimum run and with a minimum of bends. No run shall exceed 12 feet for diffusers and bends shall have a minimum radius of 1-1/2 times the diameter of the duct measured from the center line. Seal all joints and connections. Connect flex duct to spin-in and air distribution fittings using metal clamps; nylon draw bands and wire straps will not be accepted. Support flexible duct from building structure. Do not lay on light fixtures or ceiling. Flexible duct sizes shall be as noted on drawings.
- 3.10 BALANCE DAMPERS
- A. Install volume dampers at points on supply, return, and exhaust systems where branches extend from larger ducts and at other locations shown on drawings. Install balance dampers at all flex duct connections for return air grilles and supply air diffusers except where only one device is connected to a branch duct.
 - B. Install automatic/motor operated volume dampers where shown on drawings in accordance with manufacturer's instruction.
- 3.11 ACCESS DOORS
- A. Provide wall/ceiling access doors at dampers, valves, air vents, fire damper access doors, and like items requiring adjustment or maintenance accessibility if they cannot be located over lay-in type ceilings or in attic and mechanical rooms. Obtain approval from Architect for location of access doors.
 - B. Provide access doors in ducts within arm-reach of fire dampers and located to permit opening and resetting fire damper shutter. Locate access doors over lay-in type ceilings. Provide ceiling access doors if duct access doors cannot be located over lay-in type ceilings. Provide access doors in walls behind which duct access doors are located. Obtain approval from Architect for location of access doors.
 - C. Provide visible markers on finished side of lay-in type ceiling grid to indicate locations of duct access doors, valves, adjustable dampers, air vents, fire damper access doors, FTUs, VAV boxes and like items. See Architect for marker type.
- 3.12 CONTROLS – GENERAL

- A. Furnish all controls and control wiring to provide for proper performance of equipment. Contractor responsible for control system installation shall provide support to HVAC system test and balance contractor to access control system to facilitate the TAB work.
- B. Install all high voltage (120 V or above) control wiring in EMT conduit. Install low voltage control wiring in conduit unless concealed in walls or above finished ceilings. Use plenum rated wire above ceilings when used as supply and return air plenums. Do not run low voltage control wiring in the same conduit as high voltage control or power wiring.
- C. Connect each time clock channel to 24 volt output of the designated air handling unit control transformer in a manner agreeable to air handling unit manufacturer.
- D. Install room thermostats where shown on drawings and 48" above the floor unless otherwise noted on drawings. Program thermostats to run supply fan continuously during building occupied periods and in the "auto" mode during building unoccupied periods.

3.13 EQUIPMENT INSTALLATION

- A. Install all equipment in accordance to equipment manufacturer's instructions. Install all equipment to permit removal of coils, fan shafts and wheels, filters, belt guards, sheaves and drives, and all other parts requiring periodic replacement or maintenance.
- B. Arrange equipment to permit ready access to valves, cocks, traps, starters, motors and control components, and to clear the openings of swinging and overhead doors and of access panels.

3.14 IDENTIFICATION OF EQUIPMENT AND EQUIPMENT LOCATIONS

- A. Securely attach manufacturer's nameplate to all equipment giving data as to design and operating characteristics.

3.15 INSULATION – GENERAL

- A. Use application details in accordance with the insulating material supplier's recommendations except where a higher standard is specified herein. Clean exterior of all piping and duct work of foreign substances, including moisture, prior to application of insulation. Apply insulation to piping and duct work with all joints tightly fitted to eliminate voids. Replace broken or damaged insulation with new insulation and joint material.
- B. Replace or repair all existing insulation disturbed by new work and refinish to match adjacent insulation.

3.16 REFRIGERANT PIPING INSULATION

- A. Run covering for piping unbroken through hangers. Cover all insulated refrigerant piping exterior to building with banded aluminum jackets. Install and secure all aluminum jackets in accordance with manufacturer's instructions.

3.17 PIPING INSULATION – GENERAL

- A. Run covering for piping unbroken through hanger clevises, sleeves, etc. Avoid metal-to-metal contact between pipes and hangers. Insulate exposed risers same as specified for each piping system and, in addition, provide banded aluminum jackets to at least 6 feet above floor. Extend tops of aluminum jackets to same height in each room. Cover all insulated piping exterior to building with banded aluminum jackets. Install and secure all aluminum jackets in accordance with manufacturer's instructions.
- B. Provide an insert, not less than 6" long, of the same thickness and contour as adjoining insulation, between support shield and piping, but under the finish jacket, on piping 2" or larger, to prevent insulation from sagging at support points. Use heavy density insulating materials suitable for the specified

temperature range and strong enough to prevent crushing. Cover fittings, valves, irregular surfaces, etc., with same insulation specified for piping including jacket. Cut jacket to fit without wrinkles or folds.

3.18 AIR SYSTEM TEST AND BALANCE

- A. The Test and Balance (TAB) Agency, completely independent from Contractors installing work under this specification section, shall perform all test and balance work in accordance with the recommendations of the Associated Air Balance Council (AABC) or the National Environmental Balancing Bureau (NEBB), and after the entire mechanical system has been completed and is in full working order.
- B. TAB Agency shall contact the Architect and provide the schedule for TAB work at least one week prior to start of TAB work to afford the Architect the opportunity to visit the job site during the TAB work.
- C. TAB Agency shall make provisions in the contract to meet the Architect at the job site after the TAB report has been submitted to spot check at least 10% of the TAB tested points. TAB Agency shall furnish equipment and TAB technician to complete these spot checks in the presence of the Engineer.
- D. The organizations approved for Test and Balance work for this project shall be certified by AABC or NEBB.
- E. Take responsibility for the following:
 1. Place all heating, ventilating, and air conditioning systems and equipment into full operation and maintain operation during each working day of the TAB Agency.
 2. Make any changes required for correct balance, as recommended by the TAB Agency, at no additional cost to the Owner. Such changes may encompass but are not limited to pulleys, belts, duct work, dampers, or the addition of dampers and access doors.
 3. Furnish TAB Agency with full set of applicable shop drawings, submittal data, and manufacturer's performance data.
 4. Provide assistance to TAB Agency for operation of control system during TAB work.
- F. TAB Agency shall complete all following specified work:
 1. Mark all duct traverse points and other information on set of reproducible HVAC drawings. Assign ID numbers to all diffusers and grilles, note ID numbers on reproducible HVAC drawing, and use ID numbers in TAB report.
 2. Before commencing work, verify that systems are complete and operable. Insure the following:
 - a. Equipment is operable and in a safe and normal condition.
 - b. Temperature control systems are installed complete and operable.
 - c. Proper thermal overload protection is in place for electrical equipment.
 - d. Final filters are clean and in place.
 - e. Correct fan rotation.
 - f. Duct systems are clean of debris.
 - g. Fire and volume dampers are in place and open.
 - h. Coil fins have been cleaned and combed.
 - i. Access doors are closed, and duct end caps are in place.
 - j. Air outlets are installed and connected.
 - k. Duct system leakage has been minimized.

3. Report any defects or deficiencies noted during performance of services to the Engineer. Promptly report abnormal conditions in mechanical systems or conditions which prevent system balance. Beginning of balance work means acceptance of existing conditions.
4. Adjust all air systems to the design values.
5. Test and record all actual motor currents and note corresponding nameplate full load amperes.
6. Test and adjust rpm of all blowers, fans, and similar air handling devices to within plus or minus 10% of design quantities. Make pitot tube traverses of all main exhaust, supply, and return ducts and obtain air flow of each fan. Test and record each system's starting pressure, suction, and discharge. Test and adjust system for design recirculated and outside air flows.
7. Test and adjust each diffuser, grille and register to within 5% of design requirements and identify and list each grille, diffuser, and register. Use manufacturer's ratings on all equipment for required calculations.
8. Recorded data shall represent actually measured or observed conditions.
9. Permanently mark settings of dampers and other adjustment devices allowing settings to be restored. Set and lock memory stops.
10. After adjustment, take measurements to verify balance has not been disrupted or that such disruption has been rectified.
11. Leave systems in proper working order, replacing belt guards, closing access doors, closing doors to electrical switch boxes, and restoring thermostats to specified settings.
12. Upon completion of test and balance work, insert all data, including copy of marked-up HVAC drawing, into a complete typewritten report and submit six (6) copies of this report to the Architect.

3.19 INSTRUCTION OF OWNER'S REPRESENTATIVE

- A. After final acceptance of all Work and occupancy of building, provide service to make system adjustments to suit conditions created by the occupancy; instruct Owner's operating personnel in operation adjustment and maintenance procedures of system components, acquaint them with locations and functions of valves, control devices, etc., in the system, and instruct them in the operation of the HVAC control system.

3.20 CLEANING AND RUBBISH

- A. During the Work, keep the premises clear of rubbish created as a result of the Work. Protect and prevent unnecessary induction of dirt and thoroughly clean all equipment used for temporary heat and/or ventilation.
- B. Use and maintain adequate filters in all fan coil equipment used for temporary heat and/or ventilation. Replace with new filters after construction and before units are placed in service. Close all air duct openings to effectively prevent the entrance of dust and construction debris during construction.
- C. On completion of the Work, remove all rubbish and debris resulting from the Work and dispose of same. Thoroughly clean and leave in a satisfactory condition for use all equipment, pipe, fixtures, duct work, etc.

3.21 RECORD DRAWINGS

- A. The Architect will furnish prints of the mechanical drawings as issued for this contract. Use these prints to indicate accurately and neatly any deviation in the actual installation from the drawings as issued. At

the completion of the job, deliver the marked-up drawings to the Architect for a permanent record of the exact location of all equipment, pipe runs, etc. as incorporated in the job.

3.22 COMPLETE SYSTEMS

- A. Leave all systems completely operative in all details and in satisfactory working condition, as determined by the Architect. Furnish and install as part of this contract all apparatus and material obviously a part of the systems and necessary for their operation.
- B. Coordinate work specified herein and shown on mechanical drawings and insure completion in a timely and proper manner. Prior to requesting "Substantial Completion Inspection", provide the Architect with letter stating all requirements of this section have been met. Letter shall contain itemized list indicating each item has been personally checked by the Superintendent and that it is ready for inspection. With letter, provide reports, schedules, etc., as required. This section is intended as a checklist to insure items specified are properly installed and to insure against premature "Substantial Completion Inspection" requests.
- C. Check air distribution systems and insure systems are properly tested and balanced. Check filters and, if dirty, install new filters in units with disposable type filters and remove, wash and reinstall filters in units with permanent type filters. Dirty filters shall be defined as pressure drop exceeding 0.5" W.G. Provide one additional set of disposable and/or metal, washable, permanent, type filters as applicable for each unit. Lubricate fans, motors, and all other moving equipment requiring lubrication. Provide a maintenance schedule listing each piece of equipment requiring lubrication, points to be lubricated, product and device to be used, and frequency of lubrication required.
- D. Check and insure all equipment is properly installed, mounted as specified or shown and in accordance with manufacturer's recommendations. At equipment start-up, insure controls, power wiring, and interlocks are complete. Check alignment of motors and drives. Verify overload heaters are properly sized and installed. Check for proper motor rotation. Provide specified system identification.
- E. Provide for thorough cleaning of installation. Cleaning shall include removing temporary covers; removing adhesive applied stickers except those giving specific maintenance instructions which were intended to remain on equipment; removing cord and wire affixed tags; removing paint, coating and adhesive spatters; and vacuuming inside air handling unit plenums.
- F. Provide for touch-up painting of factory finished equipment. Touch-up painting is intended to cover minor dents, scratches, and scuff marks. Prepare surface by light sanding or remove rust with chemical compounds designed for application and coat surface with primer followed by matching top-coat. Where equipment has major surface damage and/or rusting, refinish entire equipment surfaces as directed by the Architect.
- G. Provide all specified operation and maintenance manuals. Obtain letter from Owner stating specified operating instructions have been completed.

END OF SECTION 230000

SECTION 26 00 00

ELECTRICAL

PART 1 – GENERAL

1.1 DESCRIPTION OF WORK

- A. The General Provisions of the Contract, Division 1, including the General Requirements, Supplementary Conditions and Special Conditions, along with the General Requirements, are hereby made a part of this Section as if fully repeated herein.
- B. Scope of Work: The scope of the work included under this section of these specifications shall include complete electrical systems as shown on the drawings and specified herein. This work shall include:
 - 1. Temporary electric service and distribution for construction purpose.
 - 2. Permanent building service entrance equipment and feeder distribution.
 - 3. Trench excavation, pumping, backfilling and compaction for all underground electrical work.
 - 4. Building panelboards and branch circuits to electrical devices, lighting fixtures, and other electrically operated equipment.
 - 5. Empty conduits and outlets for telephone and computer systems.
 - 6. Coordination.
- C. Related Work Specified Elsewhere:
 - 1. 27 00 00 Communications Cabling

1.2 CODES, ORDINANCES AND PERMITS

- A. Comply with all codes applying to the Work of this contract including but not limited to the Florida Building Code, the National Electrical Code (NEC), National Electrical Safety Code, ADA and OSHA. Obtain information on all code restrictions and requirements. In case of conflict between the contract documents and a governing code or ordinance, such conflict shall be immediately brought to the attention of the Architect for resolution. Extra payment will not be allowed for work required by code restrictions except through written agreement with the Owner.
- B. Apply for, obtain, and pay for all required permits and inspection certificates. Final payment is contingent upon delivery of such certificates to the Architect.
- C. Where applicable, all materials and equipment shall bear the Underwriters' Laboratories seal. Certificates to this effect shall be furnished to the Architect upon request.

1.3 SITE INSPECTION

- A. Visit the site and thoroughly inspect conditions affecting the work before submitting bid. Assume responsibility for meeting all existing conditions including access and work space limitations.

1.4 DRAWINGS AND SPECIFICATIONS.

- A. Refer to the general construction drawings which are bound with the drawings of this Work for construction details, elevations, etc. Architectural and structural drawings shall take precedence over Division 16 drawings (Electrical Drawings).
- B. It is the intent of the drawings and specifications to call for finished Work, tested, and ready for operation, and in complete conformance with all applicable codes, rules and regulations. Minor details not usually shown or specified, but manifestly necessary for the proper installation and operation of the various systems, shall be included in the Work and in the proposal, the same as if specified or shown on the drawings.
- C. Specifications and drawings shall be considered as supplementary to each other, requiring materials and labor indicated, specified, or implied by either specifications or drawings. If any departures from the drawings and specifications are deemed necessary, details of such departures and the reasons therefore shall be submitted to the Architect for approval. No departures shall be made without prior approval of the Architect.
- D. Specific reference in the specifications to any article, device, product, material, fixture or type of construction, etc., by proprietary name, make or catalog number shall be interpreted as establishing a standard of quality and shall not be construed as limiting competition. Substitutes may be used subject to compliance with requirements set forth in the General Requirements, Division 1, and as approved by the Architect.

1.5 SUBMITTALS

- A. Submit shop drawings, catalog sheets, or other descriptive data with sufficient information to establish design, quality and performance. Data shall describe apparatus, equipment, panels, fixtures, and other items requiring descriptive literature. Submittals shall include the following:
 - 1. Light fixtures
 - 2. Panelboards
 - 3. Safety switches
 - 4. Wiring devices
 - 5. Occupancy sensors
 - 6. Time switches
 - 7. Lighting contactors
- B. Review of the submittals does not grant the contractor leave to proceed in error. The requirements of the drawings and specifications must be followed and are not waived or superseded in any way by the submittal review.
- C. Submittal data may be submitted for review and 'revised and resubmitted' only two times without cost to the contractor. Each subsequent submittal shall be reviewed for a flat fee of \$100.00 payable to the reviewing engineer.

1.6 MAINTENANCE DATA

- A. Collect and neatly retain maintenance and service data supplied with equipment furnished and installed under this contract until job completion, at which time deliver to the Architect for inclusion in the Maintenance Manual. All such data must be properly identified as for equipment served.
- B. Keep one set of prints current of any changes or variations by marking prints in a legible manner; and upon completion of project, deliver prints to the Architect. Do not make changes without prior approval of the Architect.

1.7 TEMPORARY ELECTRIC SERVICE

- A. Provide complete temporary system of power and lighting wiring for use during construction and for testing of equipment. Comply with OSHA and NEC including personnel ground-fault protection requirements.

1.8 ELECTRIC SERVICE

- A. Building electrical service will be provided by local utility and arranged generally as indicated on drawings.
- B. Provide all labor, materials and equipment not provided by the utility in accordance with the utilities' installation policies, specifications and procedures without additional cost.
- C. The contractor shall contact the utility in advance and verify availability and arrangements for electrical service as indicated. Should a significant installation conflict occur, notify the Architect immediately for resolution before starting any work.

1.9 COORDINATION - GENERAL

- A. Drawings are generally diagrammatic. Review all project drawings and coordinate all work with general contractor and different trades prior to installing any work so that interferences between electrical work and ducts, piping, equipment, architectural and structural work will be avoided. Do not install conduits, boxes and fittings in spaces required for ductwork or piping.
- B. Furnish all necessary offsets in raceways, fittings, etc., required to properly install work so as to take up minimum space. Install all equipment to provide code required 'working space'. Furnish and install all materials required to accomplish this without additional cost.
- C. In case interference develops, the Architect will decide which trade work must be relocated regardless of which was installed first. Damage from interference or rework caused by inadequate coordination with other trades shall be rectified without additional cost.
- D. Within 30 days following award of contract, report to the Architect in writing all real or potential errors, ambiguities and/or conflicts on electrical work or between trades. Those reported after 30 days, except as a result of unforeseen circumstances, shall be resolved at the discretion of the Architect. Report conflicts resulting from progress of work to the Architect immediately.

1.10 COORDINATION - ELECTRICAL / MECHANICAL

- A. Unless specifically required otherwise, all motors, integral starters, control and monitoring devices, timers, relays, pilot devices and other required control components will be furnished under Division 15.
- B. Unless specifically required otherwise, furnish and install disconnect switches, fuses and power wiring connections to all equipment as indicated on drawings or as specifically required by the equipment manufacturer.
- C. The mechanical contractor will furnish and install all heating, ventilation and air conditioning equipment, including all control devices and control wiring.
- D. Unless specifically required otherwise, make all power wiring connections to all water heaters, pumps, machinery, appliances and other electrically operated equipment as indicated on drawings or as required. Furnish and install disconnect switches and starters as indicated on drawings, except for items furnished with integral disconnect switches and/or starters.
- E. Install and connect all separate disconnect switches and line voltage control devices furnished with the equipment but not factory mounted and connected on the equipment.
- F. Review shop drawings and verify final electrical characteristics and wiring before rough-in of power feeds to any equipment to be provided. When electrical data on shop drawings differs from contemplated design, make necessary adjustments to wiring, disconnect, and branch-circuit protection for equipment actually installed.

1.11 WORKING CLEARANCES

- A. Working clearances around electrical equipment requiring service shall comply with NEC requirements. Coordinate and verify clearances from equipment and work furnished by other trades. Should there be any apparent violations of clearance requirements, notify the Architect before proceeding with connection or placement of equipment. Rework caused by inadequate coordination shall be rectified at no extra cost.

PART 2 – PRODUCTS

2.1 MATERIALS

- A. All materials used in this project shall be new, unless otherwise noted, and listed by the Underwriters' Laboratories, Inc. as conforming to its standards where such standards have been established. These materials shall bear the U.L. label.
- B. Where materials, equipment, apparatus or other products are specified by manufacturer, brand name, type or catalog number, such designation is to establish standards of desired design or quality and shall be basis of bid. Alternatives may be submitted to Architect for consideration.

2.2 DISTRIBUTION EQUIPMENT

- A. Panelboards shall be molded case circuit breaker type with completely dead fronts enclosed in code gauge, galvanized sheet steel cabinets with adequate wiring gutters top, bottom and sides. Neutral bus bars shall be 100% rated, insulated for panelboards shown with 100% neutral. Front trim shall contain hinged door with keyed lock and catch. Door shall be provided with plastic enclosed circuit directory. Upon completion of installation, circuit directory shall be typewritten indicating usage and location of circuits as indicated on drawings.
- B. Circuit breakers shall be single or multi-pole molded case, of common handle, common trip without handle ties, thermal magnetic, quick-make, quick-break, for manual and automatic operation. Refer to schedules on drawings for details regarding panel types, capacity, interrupting rating, mounting and other information. Circuit breakers which are indicated to serve permanently connected appliances such as water heaters, dishwashers, etc., shall be capable of being locked in open position.

2.3 SAFETY SWITCHES

- A. Safety switches shall be quick-make, quick-break, general duty type in sheet steel enclosure, except as required for rain tight installations, with door cover interlock. Provide fused type safety switches and fuses where indicated on drawings or as required by code. Fuse type and size shall be as indicated or as specifically required by the equipment manufacturer.

2.4 LIGHTING CONTACTORS

- A. Lighting contactors shall be totally enclosed, magnetic type, electrically held, with voltage rating, ampacity and number of poles indicated on drawings. Provide contactor control from switch, photocell or time switch as shown on drawing.
- B. Contactor enclosure shall be NEMA-1 type cabinet for interior and NEMA-3R for exterior locations.

2.5 CONDUIT

- A. Electrical metallic tubing (EMT) shall generally be used for building interior except where exposed to physical damage, unless otherwise indicated or specified herein.
- B. Rigid or intermediate metal conduit with galvanized fittings and hardware shall be used on building exterior where exposed to weather.
- C. Rigid nonmetallic conduit (schedule 40 PVC) shall be used underground and in concrete slabs. Floor penetrations shall be rigid galvanized ell's.
- D. Flexible conduit shall be used for final connections to motors, appliances and vibrating equipment.
- E. Metal-clad cable (Type MC) with approved fittings may used where totally concealed and as permitted by codes.
- F. Electrical nonmetallic tubing (ENT) shall not be used.

- G. On existing solid masonry walls in finished spaces where conduits/boxes cannot be concealed, provide surface type 'Wiremold' metal raceway system and fittings of size and type required. The use of this type raceway system shall however be kept to a minimum. Surface raceways shall include all required accessories including outlet/service boxes, couplings, elbows, tees, covers, end plates and installation hardware. Surface raceways shall include all required accessories including outlet/service boxes, couplings, elbows, tees, covers, end plates and installation hardware.
- H. In locations where exterior devices are connected to an interior device via a common raceway, provide silicone sealant in conduit at junction box in interior and exterior locations after branch circuit wiring has been installed. Sealant shall be applied to inhibit air flow in raceway between interior and exterior device locations.

2.6 SURGE SUPPRESSION DEVICES

- A. Voltage surge suppressor shall be UL 1449 Listed, 4th edition, and shall meet or exceed maximum fault current indicated for panelboards on which installed. ASCO model for 1 phase/3 wire systems, in NEMA-1 enclosure, or approval equal by, Liebert, or Intermatic only.
- B. Provide and install all wiring/conduit connections in accordance with manufacturer's recommendations.

2.7 CONDUCTORS

- A. All conductors shall be copper and shall not be smaller than #12 except where otherwise noted. Conductors smaller than #6 shall be solid. Conductors #6 and larger shall be stranded.
- B. Conductor insulation shall generally be XHHW or THHN as required for dry, damp or wet locations per NEC. Conductors subjected to higher ambient temperatures shall be derated in accordance with NEC.

2.8 OUTLET BOXES

- A. All outlet boxes, extensions, and cover frames shall be galvanized sheet steel for concealed locations or cast metal for exposed locations unless otherwise noted. Boxes shall be 1 1/2" deep, minimum, and shall be sized to accommodate the installed conduit, conductors and device. Boxes to which fixtures are installed shall have studs and straps to support fixture weight. *Where more than two switches are located side by side, outlet box shall be multi-ganged type as required for switches to be mounted under single cover plate. Provide divider plate between each device within multi-gang outlet.
- B. Boxes for installation in concrete block wall construction shall be gang type, 3 1/2" deep for switch devices and 4" square by 1 1/2" deep, with 1 1/4" single and two gang square corner extension covers for receptacle and junction purposes. Boxes for installation in brick wall construction shall be gang type, 3 1/2" deep. Boxes installed in plastered walls shall be 4" square by 1 1/2" deep, with 3/4" single and two gang plaster covers. All boxes shall have internal mounting ears or threaded tappings.

2.9 PULL AND JUNCTION BOXES

- A. Pull and junction boxes shall be constructed of code gauge galvanized sheet steel and fitted with screw covers held in place with corrosion resistant machine screws.
- B. Provide boxes where noted on drawings or where necessary to facilitate conductor pulling and splicing. Splicing of conductors is to be avoided as much as possible with continuous lengths being preferred. Box sizes shall conform to sizes required by NEC or as indicated on drawings.

2.10 WIRING DEVICES

- A. All wiring devices shall be commercial grade and product of one manufacturer throughout project except as otherwise noted. Device color shall be determined by architect in shop drawing phase.
- B. Wall switches shall be 20 ampere, 120-277V, A.C., toggle handle, quiet type, with side or back wiring terminals. Switches shall be single or multi-pole as indicated on drawings. Tamper resistant receptacles shall be equipped with integral mechanical shutter system which prevents insertion of any object in one side.
- C. Wall occupancy sensors shall be wall mounted combination ultrasonic and passive infrared type, with integral on/off manual switch. Occupancy sensor shall be line voltage and intrinsically grounding type. Manufacturer shall be Sensor switch model # WSD-PDT, color by architect, or approved equal. Open area and Corridor occupancy sensors shall be ceiling mounted combination ultrasonic and passive infrared type. Sensor shall be equipped with automatic gain control thereby allowing self calibration. Connect for use via wall switch generally as indicated on drawings. Manufacturer shall be Sensor Switch model # CM-PDT-10/CM-BoxPlate with PP-20 power pack, or approved equal by Hubbel or Wattstopper. Contractor shall coordinate location in field to maintain 5' clear between ceiling mounted sensor and HVAC supply grilles.
- D. Duplex receptacles shall be straight blade, 20 ampere 125V, A.C., of grounding type, with side or back wiring terminals. GFI type receptacles shall be equipped with integral safety mechanism to remove power from device upon GFI component failure (UL943 compliant) with 'test' and 'reset' buttons shall be provided where indicated. Isolated ground type receptacles shall specification grade, orange in color with complete w/ isolated ground symbol ' '.
- E. Device plates shall be smooth plastic, color determined by architect, for all flush installed outlet boxes in finished spaces. Weatherproof devices shall be equipped with rain tight in use cover . Surface mounted device outlets shall be fitted with appropriate sheet steel or cast metal cover plates to match device and box.
- F. Special purpose outlets shall be as indicated on drawings and have matching cover plate.

2.11 LIGHTING FIXTURES

- A. Furnish and install all lighting fixtures as shown on drawings and specified in fixture schedule. The fixture schedule is intended as a guide for selection. Unless otherwise noted, fixtures of other manufacturers will be acceptable if of similar design and characteristics, subject to approval.

- B. Although not specifically shown or specified, all light fixtures shall be provided with all necessary optional accessories and mounting hardware for installation as indicated or required.

2.12 LAMPS

- A. Furnish and install one complete set of lamps for all installed fixtures as designated in fixture schedule, on drawings or specified herein. All lamps shall be of proper design to fit specific fixture indicated. To ensure uniform lighting and color, all lamps of the same type shall be provided by the same manufacturer.

2.13 TIME SWITCHES

- A. Time switch shall be solid state digital type capable of permitting set points on independent (per pole) daily schedules through a 7 day time period. Schedule programming shall be accomplished through the use of an integral numerical keypad and self prompting LED indicators. Programmable features shall include the minute programming with up to 99 'holidays' each of which can be independently controlled, fully automatic daylight saving time adjustment with user selectable override, and automatic leap year adjustment.
- B. All programmable information shall be stored in non-volatile memory backed by a factory installed lithium battery which shall maintain clock time and calendar data for 8 years (minimum).
- C. Time switch poles shall be normally open type with quantities, or type of control as indicated on drawings, each rated 120/277V and 20 amperes. Time switch shall be rated for 120/277V control voltage input/output, and shall be installed in a lockable NEMA-1 surface enclosure.
- D. Time switch shall be as manufactured by Intermatic #ET70 series or approved equal.

PART 3 – EXECUTION

3.1 DEMOLITION

- A. Demolition shall include all existing building areas to be renovated and as well as other demolition work as indicated or required. Refer to both the demolition drawings and construction plans. Demolition work shall include disconnection and removal of all existing light fixtures, devices, outlets, boxes, conduit/wiring, apparatus and equipment as indicated or required.
- B. Remove all wiring/cables, conduits and boxes that are replaced with new work and/or will not be reused.
- C. Existing panels shall be reused for new circuits where indicated. Provide additional circuit breakers as required for new circuits. Existing concealed homerun conduits into existing flush mounted panels shall be reused with new wiring provided.
- D. In existing rooms and areas not indicated for renovation, all fixtures, devices, controls, systems and circuits shall remain in operation. Incidental damage or disruption of these items shall be corrected automatically.

- E. Existing concealed conduits, junction boxes and recessed outlet/switch boxes shall be reused with new wiring wherever practical.
- F. Specific demolition:

3.2 SALVAGE MATERIALS

- A. Materials and items of equipment that is to be removed and not reused shall be brought to the attention of the Owner for inspection and determination of disposition.
- B. Materials and items of equipment designated as "unsalvageable" by the Owner shall be promptly removed from the premises, disposed of in a completely legal manner, and shall not be re-used in the new Work unless specifically authorized by the Architect.
- C. Materials and items of equipment designated as "salvageable" by the Owner to keep for their future use shall be carefully removed and delivered to Owner designated location (within 30 miles of the project site), and unloaded.

3.3 CUTTING AND PATCHING

- A. Place all sleeves, inserts, conduit hangers, etc. as construction progresses to avoid any unnecessary cutting of structural members. Cooperate with other contractors in location of electrical outlets that may conflict with location of other equipment.
- B. Obtain authorization from the Architect for any necessary cutting of building structure to facilitate installation of this work and do not proceed until authorization has been received. Limit necessary cutting and patching to the minimum size required for installation of conduit or apparatus.

3.4 TRENCH EXCAVATION, PUMPING, BACKFILLING AND COMPACTION

- A. Excavate, back-fill and compact all trenches required for underground electrical work. Maintain trenches free of water until installation is complete and provide all necessary shoring.
- B. Contractor shall field verify all existing underground utilities and avoid damage to same. Where existing utilities are damaged, the contractor shall be responsible for all repairs or replacement.
- C. Back-fill with loose, dry granular material in 6-inch lifts and thoroughly compact each lift. Dispose of all surplus material and rock as directed by the Architect. Grade the surface to a reasonable uniformity and leave the mounding in neat condition as approved by the Architect.
- D. Back-fill all trenches passing under foundations with concrete to the underside of the foundation and at a 2:1 slope away from each side of the foundation. Back-fill all trenches that are parallel and deeper than foundations with concrete to a point that will place the top of the concrete on a 2:1 slope away from the foundation bottom. Do not back-fill trenches until required inspections are completed.
- E. Repair or replace all topsoil, shrubbery, sod, sidewalks, streets, walls, etc. disturbed by the excavation, backfilling or pumping to the satisfaction of the Architect. Repair sidewalks in complete blocks; partial patching will not be accepted.

3.5 GROUNDING AND BONDING

- A. Provide grounding electrode conductor for electric service equipment sized and connected in accordance with NEC.
- B. Bond equipment such as metallic housing and feeder metallic conduits to grounding conductor. Use grounding bushings, on service conduit and at other points where grounding continuity is broken.
- C. Although not specifically indicated or required by code, provide insulated green equipment grounding conductor for all feeders and branch circuits.
- D. Provide a bonding jumper for any equipment, motor, fixture or device to which current carrying conductors are connected that is not bonded directly to the grounded system. Connect bonding jumper to approved lugs and grounding conduit bushings or clamps. All non-metallic conduit shall contain an equipment grounding conductor.
- E. All grounding or bonding conductors shall be sized as required by NEC, or as herein specified, and shall be bare copper or TW insulated, with green coding.

3.6 RACEWAYS

- A. Follow routing for conduit installation described on drawings as nearly as possible. Routing layout, however, is diagrammatic and where changes are necessary as a result of structural conditions, apparatus, or other causes, routing will have to be changed to meet these conditions. Conduit risers and offsets are not indicated on drawings but are intended to be installed as required.
- B. Run conduit required to be exposed parallel or perpendicular to the walls, ceilings, or structural members and provide supports as required by NEC. In addition, install supports as required to form a secure and firm installation. Supports shall be galvanized pipe straps, hangers or wall brackets. Firmly support concealed conduit at the structure and install so as to prevent any vibration against structure, pipe or duct work.
- C. Fit conduit installed in concrete or secured to structural members that pass through expansion joints constructed in the building with expansion fittings, complete with copper bonding jumper.
- D. All metallic conduit terminating in outlet, junction or pull boxes and cabinets must terminate with bushing and double locknuts except exposed cast boxes, where they may be omitted. Conduit sizes 1 1/4" and above shall have insulating fiber bushings with double locknuts. Grounding type bushings must be used at points where grounding continuity is broken and at service equipment.
- E. Fit all empty conduit systems with suitable nylon pull-string and blank off to prevent entrance of foreign matter until conductors are installed.
- F. At motor connections, flexible connections, or connections subject to vibration, use flexible galvanized conduit with PVC outer jacket with grounding conductor.
- G. Conduit shall not be smaller than 1/2" trade size and must be sized to accept conductors indicated.

3.7 WIRING

- A. No wiring shall be installed until the required raceway system including junction, outlet and device boxes is completed. Install wiring before painting begins and protect against being painted.
- B. Branch circuit sizes are noted on drawings and must be continuous without reduction in size throughout their length except where connecting to fixtures or devices.
- C. Branch circuit wire sizes shall be increased as required where long runs will cause excessive voltage drop per NEC.
- D. Wire circuits as described or indicated on drawings to achieve a connected load as scheduled. Should any change be necessary, it must be brought to the Architect's attention.

3.8 BOXES

- A. The location of outlets on drawings is to be considered as approximate only inasmuch as outlets are to be centered in blocks, panels, or other modular units. Be familiar with requirements of other trades as well as the building in general to become aware of various materials and finished surfaces in which outlets are to be installed.
- B. Install boxes square and plumb with receptacle and junction boxes in a vertical position. Cover all boxes for future use or junction purposes with blank plates.
- C. Boxes in exterior locations shall be cast metal boxes with threaded conduit hubs. Securely fasten boxes to building surfaces.

3.9 PANELBOARDS

- A. Panelboards shall not be installed under any ducts, piping or other foreign equipment up to the structural ceiling as per code requirements. Where it appears that this condition will exist, the contractor shall notify the Architect immediately for resolution before proceeding with the installation. Any rework caused by the lack of timely notification and coordination shall be provided without additional cost.

3.10 ACCESS PANELS

- A. Provide ceiling access panels for equipment, devices, boxes and other like items requiring adjustment or maintenance accessibility if they are not located over lay-in type ceilings or are not otherwise accessible. Obtain approval from Architect for type and location of access panels.

3.11 WIRING DEVICES

- A. Where indicated, gang devices together in common boxes with device straps bonded to metallic system or separate grounding conductor.
- B. Wiring device mounting heights shall be as follows, unless otherwise noted or required:
 - 1. Light switches and controls- 48" above floor to top

2. Receptacles- 16" above floor to bottom
3. Telephone and computer outlets- 16" above floor to bottom

3.12 IDENTIFICATION LABELS

- A. Provide identification labels for each motor controller, safety switch, panelboard, contactor, time switch, control device, and circuit breaker. Labels shall be laminated, phenolic strips 1/16" thick and engraved to show black letters on white background not less than 1/4" high. *Emergency equipment and control device labels shall be white letters on red background. Where brackets are not provided, labels shall be mounted with screws, or approved adhesive.
- B. Where control apparatus is installed on or immediately adjacent to equipment, labels are not required.
- C. Provide UL approved arc-flash hazard marking on front cover (or other clearly visible location) of all electrical equipment as required by the NEC 110.

3.13 LIGHTING FIXTURES

- A. All light fixtures shall be installed in accordance with the manufacturer's installation instructions or recommendations.
- B. Connect single-connected fixtures, surface or stem hung, with heat resistant fixture wire. Connect multiple-connected fluorescent fixtures, surface or stem hung, with type THHN heat resistant thermoplastic wire of a size indicated for branch circuit.
- C. Support fixtures to be recessed in readily removable tile ceilings (lay-in type) from the T-bar tile support and connect to remote mounted 4" square junction boxes with approved six foot long, 3/8" flexible conduit 'fixture whip' with grounding conductor bonded between conduit system and fixture.
- D. Lay-in type light fixtures installed in fire rated ceilings shall be independently supported per UL requirements.
- E. Upon project completion and just prior to delivering project to the Owner, clean all fixtures and remove all instruction tags.

3.14 LAMPS

- A. Do not install full set of lamps until specific permission of the Architect has been obtained. Temporary lamps may be installed in permanent fixtures for construction purposes, but they must be replaced with new lamps when directed.

3.15 TELEPHONE AND COMPUTER CONDUIT SYSTEM

- A. Install conduits, outlet boxes and backboards as shown on drawings. Conduit shall be as previously specified, with 3/4" as the minimum size. Provide all conduits with pull-wire. Backboards shall be 3/4" plywood painted light gray with fire resistant paint.

- B. Wall outlets shall be 4" square by 1 1/2" deep, with single gang extension covers and covered with blank specified plates. *Floor outlets shall be floor outlet boxes as previously specified.
- C. Coordinate with local telephone company and verify routing and termination point of building telephone service entry conduits.
- D. Provide telephone service entry conduits and backboard with receptacles and ground conductor in accordance with telephone company requirements.
- E. Provide #6 stranded, green insulated, ground conductor from backboard to the electrical service ground and/or other ground sources approved and verified by the telephone company.
- F. Provide grounding electrode conductor at telephone service entry sized and connected in accordance with NEC. Ground rod shall be minimum 10' in length and 3/4" in diameter.

3.16 EQUIPMENT CONNECTIONS

- A. Make all final power feed connections to starters and/or motorized equipment installed by heating and air conditioning and plumbing contractors as indicated or required. Refer to Electrical sections of the other contractors' specifications for further information.
- B. Contractor shall assume that all circuit breakers indicated for 'hermetic refrigerate motor-compressor' A/C equipment are the wrong size. The contractor shall field verify and provide 'HACR' type circuit breaker sized for 'maximum-overcurrent-protection' in accordance with the nameplate data for the equipment actually supplied.
- C. Verify all equipment for service and characteristics provided prior to rough-in and connection. Provide a grounding conductor for all equipment connected with flexible conduit and bond to conduit system and metallic frame of equipment.
- D. Be responsible for securing and installing proper insulated conductors required for equipment of higher temperature range beyond that of specified branch circuit type.

3.17 CLOSE OUT DOCUMENTATION

- A. Upon project completion Contractor shall provide all operation and maintenance manuals to Owner as a single bound set which includes manufacturers' make and model number of all installed equipment including but not limited to the following:
 - 1. All submittal data stating each piece of equipment rating and selected options for each piece of equipment.
 - 2. Operation manuals and maintenance manuals for each piece of equipment requiring maintenance. Required routine maintenance actions shall be clearly identified.
 - 3. Names and addresses for at least one qualified service agency.
- B. Within 30 days of project completion, Contractor shall provide record (as-built) drawings of the actual installation. These drawings shall contain (at a minimum):
 - 1. A single line diagram of the building electrical system with complete panel schedules.

2. Floor plans indicating location and area served for all distribution.

END OF SECTION 260000

SECTION 270000

COMMUNICATIONS CABLING

PART 1 – GENERAL

1.1 DESCRIPTION OF WORK

- A. General Requirements, included in Division 1, are hereby made a part of this section as if fully repeated herein.
- B. Specifications and drawings shall be considered as supplementary to each other, requiring materials and labor indicated, specified, or implied by either specifications or drawings. Contradictions shall be presented to the Architect for resolution.
- C. Interpretation of specifications or drawings, where deemed necessary, shall be made only by the Architect.

1.2 SCOPE OF WORK

- A. Necessary labor and materials generally include, but shall not be limited to, the following:
 - 1. Network/Telephone cable installation. Bring fiber/cable to I.T. Room via (2) 2” conduits. See Electrical Site Plan.
 - 2. Coordination.
- B. The following related work is specified in Section 26000.
 - 1. Conduit/Raceway system.
 - 2. Pull and Junction boxes.
 - 3. Outlet Boxes and Access Panels.
 - 4. Cutting and Patching.

1.3 CODES AND STANDARDS

- A. All materials and workmanship described in this document shall conform to the following standards:
 - 1. NEC - National Electrical Code, 2020 Edition.
 - 2. BICSI - Building Industry Consulting Service International, Inc.EIA/TIA-569-B commercial building standard for telecommunications pathway and spaces.
 - 3. EIA/TIA-568-B commercial building telecommunications wiring standard.
 - 4. IEEE 802.3
 - 5. UL listed - Underwriters Laboratories listed
 - 6. ANSI - American National Standards Institute.
 - 7. TSB-67 Cable Testing Standards.
 - 8. Motorola R56 - Standards and guidelines for grounding and surge protection practices observed by the County.
- B. Be familiar with local code requirements and/or standards for Building cabling requirements, and make installation in accordance with such requirements.

1.4 SITE INSPECTION

- A. Visit the site and thoroughly inspect conditions affecting the work before submitting bid. Assume responsibility for meeting all existing conditions including access and work space limitations.

1.5 SUBMITTALS

- A. Any submittal package which is submitted without specific model numbers for all equipment indicated will result in the entire package being rejected. Submit shop drawings, catalog sheets, or other descriptive data with sufficient information to establish design, quality and performance. Data shall describe apparatus, cables, cabinets, and other items requiring descriptive literature. Submittals shall include the following:
 - 1. Equipment racks
 - 2. Patch panels
 - 3. Cable
 - 4. Outlets
 - 5. Surge suppression equipment.
 - 6. A complete cable schematic plan for inside the facility wiring indicating cable descriptions, routing, quantities, and types of connectors and hardware for all interior cables proposed.
 - 7. Shop drawings showing the orderly arrangement and layout of systems equipment, terminal blocks, receptacles and conduit stub-ups for each IDF/TBB location. These shop drawings shall be submitted to the Architect for review and approval. These shop drawings will also be used by the electrical contractor to ensure the orderly arrangement of conduit stub-ups and receptacles to match backboard layouts and avoid the unnecessary crossing of different wiring systems.
 - 8. Review of the submittals does not grant the contractor leave to proceed in error. The requirements of the drawings and specifications must be followed and are not waived or superseded in any way by the submittal review.
- B. Submittal data may be submitted for review and 'revised and resubmitted' only two times without cost to the contractor. Each subsequent submittal shall be reviewed for flat fee of \$100.00 payable to the reviewing engineer.

1.6 MAINTENANCE DATA

- A. Collect and neatly retain maintenance and service data supplied with equipment furnished and installed under this contract until job completion, at which time deliver to the Architect for inclusion in the Maintenance Manual. All such data must be properly identified as for equipment served.
- B. Keep one set of prints current of any changes or variations by marking prints in a legible manner; and upon completion of project, deliver prints to the Architect. Do not make changes without prior approval of the Architect.

1.7 COORDINATION – GENERAL

- A. Drawings are generally diagrammatic. Review all project drawings and coordinate all work with general contractor and different trades prior to installing any work so that interferences between electrical work and ducts, piping, equipment, architectural and structural work will be avoided. Do not install conduits, boxes and fittings in spaces required for ductwork or piping.
- B. Furnish all necessary offsets in raceways, fittings, etc., required to properly install work so as to take up minimum space. Install all equipment to provide code required 'working space'. Furnish and install all materials required to accomplish this without additional cost.
- C. In case interference develops, the Architect will decide which trade work must be relocated regardless of which was installed first. Damage from interference or rework caused by inadequate coordination with other trades shall be rectified without additional cost.
- D. Within 30 days following award of contract, report to the Architect in writing all real or potential errors, ambiguities and/or conflicts on electrical work or between trades. Those reported after 30 days, except as a result of unforeseen circumstances, shall be resolved at the discretion of the Architect. Report conflicts resulting from progress of work to the Architect immediately.

1.8 WORKING CLEARANCES

- A. Working clearances around electrical equipment requiring service shall comply with NEC requirements. Coordinate and verify clearances from equipment and work furnished by other trades. Should there be any apparent violations of clearance requirements, notify the Architect before proceeding with connection or placement of equipment. Rework caused by inadequate coordination shall be rectified at no extra cost.

PART 2 – PRODUCTS

2.1 MATERIALS

- A. All materials used in this project shall be new, unless otherwise noted, and listed by the Underwriters' Laboratories, Inc. as conforming to its standards where such standards have been established. These materials shall bear the U.L. label.
- B. Where materials, equipment, apparatus or other products are specified by manufacturer, brand name, type or catalog number, such designation is to establish standards of desired design or quality and shall be basis of bid. Alternatives may be submitted to Architect for consideration.
- C. All outlets, and patch panels shall be of the same manufacturer.

2.2 CONDUIT/RACEWAY SYSTEM - SPECIAL PROVISIONS

- A. Conduit shall not be smaller than 1/2" trade size and must be sized to accept conductors indicated.
- B. Where conduits are utilized, provide separate conduits for backbone and work station data cables. All conduits for backbone cables shall be 2" minimum and account for the minimum bend radius of the specified fiber optic cable. Conduits used for work station data cables shall be 3/4" diameter minimum. Larger conduit runs to serve multiple data outlets via distribution junction boxes shall be used where practical instead of using individual conduits to serve each outlet.

Provide "tee" type conduit fittings in main conduit runs to accommodate branch runs to individual outlet locations. Size of main conduit runs serving multiple outlets and sleeves for open cables shall be:

- | | | |
|----|--------------|---------|
| 1. | 1-8 cables | 1"C |
| 2. | 9-15 cables | 1-1/4"C |
| 3. | 16-21 cables | 1-1/2"C |

2.3 WIRE MANAGEMENT

- A. Vertical wire management shall be provided on both sides of every rack. Wire management shall be 5" double sided master cabling sections with edge protected pass through ports and vertical slots of optional Saf-T-Grip straps.
- B. Vertical wire management shall be equipped with universal door cover which may be switched from left side to right side.
- C. Vertical wire management shall be equipped with cable guides not to exceed 1RMU.
- D. Vertical wire management shall be meet UL 94-V-O Flame Resistant Standards.

2.4 CABLES

- A. All cabling shall be UL level and meet the performance specifications of EIA/TIA-568 category 6, and UL 444 safety requirements. The following minimum performance criteria shall be met:
 - 1. Cabling shall be manufacturer guaranteed performance to 400 MHz.
 - 2. Cabling shall be factory tested (with manufacturer published literature) to 550 MHz (minimum). Published literature shall indicate attenuation.
- B. Horizontal distribution cables shall be plenum rated 4 pair, 24 AWG, solid copper cable certified as Level 6. Acceptable cable surface markings: "Verified Level 6" and "Classified Level 6".
- C. Patch and Voice/data cables shall be 4 pair, 24 AWG, stranded copper cable - certified as Level 6.
- D. Each backbone cable shall be identified with a unique number at each end and at all pull or junction boxes, identification shall be standard vinyl cloth wire markers. Additionally, at each cabinet location each backbone cable shall be provided with a vinyl cable tag marked to indicate the destination of the respective cable.

2.5 VOICE/DATA OUTLETS

- A. Voice/Data Outlets shall be provided with quantity indicated Cat 6 #24 AWG unshielded twisted pair plenum rated cable terminated in configurations of three EIA/TIA 568B 8-pin modular snap in type keystone jacks (RJ-45) installed in a single gang wall plates.
- B. Combination floor outlets shall be with indicated cat 6 #24 AWG unshielded twisted pair plenum rated cable terminated in configurations of three EIA/TIA 58A 8-pin modular snap in type keystone jacks (RJ-45) installed in a single gang wall plates.

- C. All voice/data outlets shall consist of modularized jack assemblies which snap into a base plate and mate with a contained connector which connects permanently to the Category 6 (level 6), UTP cable. Jack assemblies shall be certified to perform to Category 6 standards per EIA/TIA TSB-3 and TSB-40. The base plate jacks shall be 8 position non keyed (EIA/TIA 58A) jacks.
- D. Acceptable products for the voice/data outlets are: Leviton 6 Modular system.

2.6 PATCH PANELS

- A. Patch panels shall be provided in the IDF locations as required for termination of horizontal cabling. Patch panels shall be suitable for both rack mounting to EIA standard 19" racks and wall mounting using hinged brackets. Patch panels and associated equipment shall be high density type, Panduit CPPL48WBLY with sliding trays, 48 port type.
- B. Each patch panel port shall be labeled to indicate the respective data cable connected thereto using typewritten label strips installed in clear plastic designation holders.

2.7 RACKS

- A. Provide and install (2) Panduit 45RU racks. Racks shall be furnished and installed in the I.T. Room by the contractor.

2.8 SURGE PROTECTION

- A. Network surge protection shall be included to meet Level 6 certification. Provide a transient voltage surge protector for each power circuit serving a distribution frame wall. Locate protectors within 24" of the receptacles providing power to the hub location. Refer to Motorola R56.
- B. Surge suppression receptacles shall have UL 1449 330V rating. Device shall have visible LED indicators to denote status of unit. The suppression device shall be rated for 20A, 120V and include a hard wired type module with a surface NEMA 1 enclosure. Approved Manufacturer is Leviton. Refer to Motorola R56.

PART 3 – EXECUTION

3.2 CONDUITS/ RACEWAYS - SPECIAL PROVISIONS

- A. Voice/data data cables shall be installed as open cables run concealed above accessible ceilings with j-hooks. All cables shall be rated for plenum installations, including installations in areas where the space above the ceiling is not utilized as an air circulation plenum. All accessible ceiling areas used for cable installations shall be interconnected, utilizing appropriately sized conduit. Open cables shall be routed on common paths where practical and shall be run parallel with or perpendicular to building lines. Neatly bundle multiple cable runs at maximum 4'-0" intervals using nylon cable ties, and independently support cables from the building structure using cable tray or similar supports to prevent cables from resting on ceiling tiles, light fixtures, etc.

- B. Where open cables penetrate a wall, floor, or other building member; provide a conduit sleeve with a non-metallic bushing on each end to extend a minimum of 2" beyond each side of the penetration. Openings around electrical penetrations through fire-resistant rated walls, partitions, floors, or ceilings shall be sealed with appropriate UL listed fire stopping materials installed in accordance with manufacturer's written instructions. Openings around electrical penetrations through non-fire resistance-rated walls, partitions, floors, or ceilings shall have an annular space not exceeding 0.125" and shall be sealed on both sides of each penetration with waterproof silicon caulking compound.
- C. Where cables enter a room or space where cabinet racks are located; appropriately sized ladder racks shall be used from the point at which cables enter the room to the entrance of the cabinet rack.
- D. The number of bends in backbone conduit shall be kept to a minimum and it is desirable that all conduits between racks have no more than two 90 degree bends. Conduits for all data cables shall be arranged so that no single cable pull will be longer than 200', and no cable will be pulled through more than 200 degrees of total conduit bend or offset in a single pull. Provide pull boxes, stand-off channels, or conduits as necessary to comply with this requirement.
- E. All cables shall be installed in continuous runs from outlet to IDF and patch panel locations without any intermediate splices.
- F. The installation path for all cables shall be carefully planned to minimize the total length of each cable run. The twisted pair cable length between a distribution frame location and a voice/data outlet shall not exceed 300'.
- G. Fit all empty conduit systems with 1 gauge pull wire and blank off to prevent entrance of foreign matter until conductors are installed.

3.3 TESTING AND DOCUMENTATION

- A. Upon completion of each installation and prior to acceptance by Owner, the contractor shall obtain the services of an independent agency that specializes in testing network data cable systems to test the system. Upon completion of testing, the agency shall compile and submit two written copies. All tests listed shall be performed on all cables in both directions. Test reports for copper cables shall include the following as a minimum.
 - 1. Impedance
 - 2. Cable length
 - 3. Attenuation
 - 4. Near End Cross Talk
 - 5. Line Mapping
 - 6. DC OHMS Resistance
 - 7. Signal to Noise Ratio
 - 8. Noise test
- B. Report shall be tabulated on a per cable basis using the outlet number for reference to node cables and using the tagged cable identification number for backbone tests.

3.4 GROUNDING

- A. Each IDF location shall be grounded to the building grounding electrode system via a # 6 AWG copper ground wire in 3/4" C. Refer to Motorola R56.
- B. Grounding shall be provided at each hub location such that resistance to ground does not exceed 5 ohms. Water pipes and building foundations may be used in accordance with the NEC. Refer to Motorola R56.
- C. All grounding or bonding conductors shall be sized as required by NEC, or as herein specified, and shall be bare copper or TW insulated, with green coding. Refer to Motorola R56.
- D. Ground rods shall be copper clad steel, 5/8" diameter and 10 feet long. Refer to Motorola R56.

3.5 ACCEPTANCE

- A. Prior to requesting the substantial completion inspection, wiring diagrams, and all testing and documentation as specified herein shall be complete and submitted for review by Owner.

END OF SECTION 27 0000

HOT-MIX ASPHALT

SECTION 32 12 16

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

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

1.2 SUMMARY

- A. Provide all labor, materials and equipment as necessary to complete all work as indicated on the Drawings and specified herein.

- B. This Section includes:

1. Cold milling of existing hot-mix asphalt pavement.
2. Hot-mix asphalt patching.
3. Hot-mix asphalt paving.
4. Hot-mix asphalt paving overlay.
5. Asphalt surface treatments.
6. Pavement-marking paint.
7. Traffic-calming devices.

1.3 DEFINITIONS

- A. Hot-Mix Asphalt Paving Terminology: Refer to ASTM D 8 for definitions of terms.

1.4 SUBMITTALS

- A. Product Data: For each type of product indicated. Include technical data and tested physical and performance properties.

1. Job-Mix Designs: Certification, by authorities having jurisdiction, of approval of each job mix proposed for the Work.

- B. Qualification Data: For qualified manufacturer and Installer.
- C. Material Certificates: For each paving material, from manufacturer.
- D. Material Test Reports: For each paving material.

1.5 QUALITY ASSURANCE

- A. Manufacturer Qualifications: A paving-mix manufacturer registered with and approved by authorities having jurisdiction.

- B. Testing Agency Qualifications: Qualified according to ASTM D 3666 for testing indicated.
 - C. Regulatory Requirements: Comply with materials, workmanship, and other applicable requirements of the City of **Keystone Heights** for asphalt paving work.
- 1.6 Project Conditions:
- A. Environmental Limitations: Do not apply asphalt materials if subgrade is wet or excessively damp, if rain is imminent or expected before time required for adequate cure, or if the following conditions are not met:
 - 1. HMA Temperature: Delivered between 250 deg F and 350 deg F
 - 2. Prime Coat: Minimum surface temperature of 60 deg F
 - 3. Slurry Coat: Comply with weather limitations in ASTM D 3910.
 - 4. Asphalt Base Course: Minimum surface temperature of 40 deg F in the shade and rising at time of placement.
 - 5. Asphalt Surface Course: Minimum surface temperature of 45 deg F in the shade at time of placement and rising at time of placement.
 - C. Pavement-Marking Paint: Proceed with pavement marking only on clean, dry surfaces and at a minimum ambient or surface temperature of 55 deg F for water-based materials, and not exceeding 95 deg F. When more restrictive, manufacturer limits shall be adhered to.
 - D. Imprinted Asphalt Paving: Proceed with coating imprinted pavement only when air temperature is at least 50 deg F and rising and will not drop below 50 deg F within 8 hours of coating application. Proceed only if no precipitation is expected

PART 2 - PRODUCTS A.

Aggregates:

- 1. General: Use materials and gradations that have performed satisfactorily in previous installations.
- 2. Coarse Aggregate: ASTM D 692, sound; angular crushed stone, crushed gravel.
- 3. Fine Aggregate: ASTM D 1073, sharp-edged natural sand or sand prepared from stone, gravel, or combinations thereof.
- 4. For hot-mix asphalt, limit natural sand to a maximum of 20 percent by weight of the total aggregate mass.
- 5. Mineral Filler: ASTM D 242, rock or slag dust, hydraulic cement, or other inert material. B.

Asphalt Materials:

- 1. Asphalt Binder: AASHTO M 320 and AASHTO MP 1a, PG 58-28, PG58-22, PG64-22
- 2. Prime Coat: ASTM D 2027, medium-curing cutback asphalt matching IDOT MC-30 per Section 1032 of the Standard Specifications for Road and Bridge construction.
- 3. Tack Coat: IDOT SS-1, SS-1hP, CSS-1, CSS-1hP, emulsified asphalt or cationic emulsified asphalt, slow curing, diluted in water, per Section 1032 of the Standard Specifications for Road and Bridge Construction and of suitable grade and consistency for application.

4. Tack Coat: Where Paving Geotextile as an interlayer is used; Performance Grade asphalt binder of the same grade as the overlaying pavement.
 5. Fog Seal: AASHTO M 140, emulsified asphalt, or AASHTO M 208 cationic emulsified asphalt, slow curing, factory diluted in water, of suitable grade and consistency for application.
 6. Water: Potable.
- C. Herbicide: Commercial chemical for weed control, registered by the EPA. Provide in granular, liquid, or wettable powder form.
- D. Sand: AASHTO M 29 Grade Nos. 2 or 3.
- E. Paving Geotextile (Reflective Crack Control): AASHTO M 288-06, nonwoven polypropylene; resistant to chemical attack, rot, and mildew; and specifically designed for paving applications.
1. Weight: ASTM D1910, minimum 4.1 oz/sq. yd.
 2. Grab Tensile Strength: ASTM D4632, minimum 101 lbs 3. Asphalt Retention: ASTM 6140, minimum 0.20 gal/sq. yd.
- F. Joint Sealant: ASTM D 6690 or AASHTO M 324 Type II or III Type II Type IV, hot-applied, single-component, polymer-modified bituminous sealant.
- G. Pavement-Marking Paint Type 1: Alkyd-resin type, lead and chromate free, ready mixed, complying with AASHTO M 248, Type N Type F Type S; colors complying with FS TT-P-1952.
1. Colors: Yellow and/or White. Accessible spaces shall typically be yellow with blue and white signage.
- H. Pavement-Marking Paint Type 2: Latex, waterborne emulsion, lead and chromate free, ready mixed, complying with FS TT-P-1952, Type II, with drying time of no more than 15 minutes
1. Colors: Yellow and/or White. Accessible spaces shall typically be yellow with blue and white signage.
 2. Glass Beads: AASHTO M 247, Type 1. I. Wheel Stops:
- J. Imprinted Asphalt Materials:
1. Templates: Imprinted-asphalt manufacturer's standard flexible templates for imprinting pattern into hot asphalt paving.
 2. Pattern: Specify or indicate on Drawings.
- L. Coating System: Imprinted-asphalt manufacturer's standard system formulated for exterior application on asphalt paving surfaces.
1. Base Coating: Portland cement and epoxy-modified acrylic polymer blended with sand and aggregate, formulated for exterior application on asphalt paving surfaces.
 2. Top Coating: Epoxy-modified acrylic polymer blended with sand and aggregate, formulated for exterior application on asphalt paving surfaces.
 3. Colorant: UV-stable pigment blend, added to each coating layer.
 4. Color: Specify or indicate on Drawings. M. Mixes:

1. Hot-Mix Asphalt: Dense, hot-laid, hot-mix asphalt plant mixes designed according to the Illinois Modified Strategic Highway Research Program criteria and the IDOT Special Provision "Superpave Bituminous Concrete Mixtures".
2. Binder Course Mixture N50, IL-19.0, Surface Course Mixture N50, IL-9.5, Mix "C" designed in accordance with Sections 1030 and Sections 406 and 407 of the Standard Specifications for Road and Bridge Construction and the special provision, "Quality Control/Quality Assurance of Bituminous Concrete Mixtures."
3. Provide mixes with a history of satisfactory performance in geographical area where Project is located.
4. Emulsified-Asphalt Slurry: ASTM D 3910, Type 1, consisting of emulsified asphalt, fine aggregate, and mineral fillers.

PART 3 - EXECUTION

3.1 EXAMINATION

- A. Verify that subgrade is dry and in suitable condition to begin paving.
- B. Proof-roll subgrade below pavements with heavy pneumatic-tired equipment to identify soft pockets and areas of excess yielding. Do not proof-roll wet or saturated subgrades.
 1. Completely proof-roll subgrade in one direction, repeating proof-rolling in direction perpendicular to first direction]. Limit vehicle speed to 3 mph.
 2. Proof roll with a loaded 10-wheel, tandem-axle dump truck weighing not less than 15 tons.
 3. Excavate soft spots, unsatisfactory soils, and areas of excessive pumping or rutting, Proceed with paving only after unsatisfactory conditions have been corrected.

3.2 SURFACE PREPARATION

- A. General: Immediately before placing asphalt materials, remove loose and deleterious material from substrate surfaces. Ensure that prepared subgrade is ready to receive paving.
- B. Prime Coat: Apply uniformly over surface of compacted unbound-aggregate base course at a rate of 0.15 to 0.50 gal./sq. yd. Apply enough material to penetrate and seal but not flood surface. Allow prime coat to cure.
 1. If prime coat is not entirely absorbed within 24 hours after application, spread sand over surface to blot excess asphalt. Use enough sand to prevent pickup under traffic. Remove loose sand by sweeping before pavement is placed and after volatiles have evaporated.
 2. Protect primed substrate from damage until ready to receive paving.
- C. Tack Coat: Apply uniformly to surfaces of existing pavement at a rate of 0.05 to 0.15 gal./sq. yd.
 1. Allow tack coat to cure undisturbed before applying hot-mix asphalt paving.
 2. Avoid smearing or staining adjoining surfaces, appurtenances, and surroundings. Remove spillages and clean affected surfaces.

~~3.3 PAVING GEOTEXTILE INSTALLATION~~

- ~~A. Apply tack coat uniformly to existing pavement surfaces at a rate of 0.20 to 0.30 gal./sq. yd.~~
- ~~B. Place paving geotextile promptly according to manufacturer's written instructions. Broom or roll geotextile smooth and free of wrinkles and folds. Overlap longitudinal joints 4 inches and transverse joints 6 inches.~~
 - ~~1. Protect paving geotextile from traffic and other damage and place hot-mix asphalt paving overlay the same day.~~

3.4 COMPACTION

- A. General: Begin compaction as soon as placed hot-mix paving will bear roller weight without excessive displacement. Compact hot-mix paving with hot, hand tampers or with vibratory-plate compactors in areas inaccessible to rollers.
 - 1. Complete compaction before mix temperature cools to 185 deg F. Breakdown Rolling: Complete breakdown or initial rolling immediately after rolling joints and outside edge. Examine surface immediately after breakdown rolling for indicated crown, grade, and smoothness. Correct laydown and rolling operations to comply with requirements.
- B. Intermediate Rolling: Begin intermediate rolling immediately after breakdown rolling while hotmix asphalt is still hot enough to achieve specified density. Continue rolling until hot-mix asphalt course has been uniformly compacted to the following density:
 - 1. Average Density: 96 percent of reference laboratory density according to ASTM D 6927 but not less than 94 percent nor greater than 100 percent.
 - 2. Average Density: 92 percent of reference maximum theoretical density according to ASTM D 2041, but not less than 90 percent nor greater than 96 percent.
- C. Finish Rolling: Finish roll paved surfaces to remove roller marks while hot-mix asphalt is still warm.
- D. Edge Shaping: While surface is being compacted and finished, trim edges of pavement to proper alignment. Bevel edges while asphalt is still hot; compact thoroughly.
- E. Repairs: Remove paved areas that are defective or contaminated with foreign materials and replace with fresh, hot-mix asphalt. Compact by rolling to specified density and surface smoothness.
- F. Protection: After final rolling, do not permit vehicular traffic on pavement until it has cooled and hardened.
- G. Erect barricades to protect paving from traffic until mixture has cooled enough not to become marked.

3.5 INSTALLATION TOLERANCES

- A. Pavement Thickness: Compact each course to produce the thickness indicated within the following tolerances:

1. Base Course: Plus or minus 1/2 inch.
2. Surface Course: Plus 1/4 inch, no minus.

B. Pavement Surface Smoothness: Compact each course to produce a surface smoothness within the following tolerances as determined by using a 10-foot straightedge applied transversely or longitudinally to paved areas:

1. Base Course: 1/4 inch.
2. Surface Course: 1/8 inch.
3. Crowned Surfaces: Test with crowned template centered and at right angle to crown. Maximum allowable variance from template is 1/4 inch.

C. Traffic-Calming Devices: Compact and form asphalt to produce the contour indicated and within a tolerance of plus or minus 1/8 inch of height indicated above pavement surface.

3.6 ~~FIELD QUALITY CONTROL~~

A. ~~Thickness: In-place compacted thickness of hot-mix asphalt courses will be determined according to ASTM D 3549.~~

B. ~~Surface Smoothness: Finished surface of each hot-mix asphalt course will be tested for compliance with smoothness tolerances.~~

C. ~~In-Place Density: Testing agency will take samples of uncompacted paving mixtures and compacted pavement according to ASTM D 979.~~

1. ~~Reference maximum theoretical density will be determined by averaging results from four samples of hot-mix asphalt paving mixture delivered daily to site, prepared according to ASTM D 2041, and compacted according to job-mix specifications.~~

2. ~~In-place density of compacted pavement will be determined by testing core samples according to ASTM D 1188 or ASTM D 2726.~~

- a. ~~One core sample will be taken for every 1000 sq. yd. or less of installed pavement, with no fewer than 3 cores taken.~~

- b. ~~Field density of in-place compacted pavement may also be determined by nuclear method according to ASTM D 2950 and correlated with ASTM D 1188 or ASTM D 2726.~~

E. ~~Replace and compact hot-mix asphalt where core tests were taken.~~

F. ~~Remove and replace or install additional hot-mix asphalt where test results or measurements indicate that it does not comply with specified requirements.~~

3.7 DISPOSAL

A. Except for material indicated to be recycled, remove excavated materials from Project site and legally dispose of them in an EPA-approved landfill. Contractor shall not allow milled materials to accumulate on-site.

END OF SECTION 32 12 16