

**PROJECT MANUAL**

**ASHTON BROSNAHAM SPORTS COMPLEX  
RESTROOM BUILDINGS**

**PROJECT NO. ENG2048**

**FOR**

**ESCAMBIA COUNTY PARKS & RECREATION  
ESCAMBIA COUNTY, FLORIDA**

**MAY 2022**

**AIA DIVISION SPECIFICATIONS**

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## **DIVISION 0**

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### **BIDDING AND CONTRACT REQUIREMENTS**

## **DIVISION 1**

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### **GENERAL REQUIREMENTS**

**1. DESCRIPTION**

- 1.1 The Engineer of Record will schedule a pre-construction conference after award of the contract but prior to issuance of the Notice to Proceed.
- 1.2 The Contractor shall schedule and administer weekly progress meetings and specially called meetings throughout the progress of the work. The Contractor shall notify participants, including the Engineer of Record and the Owner of meeting dates in advance, shall prepare the agenda, make physical arrangements, preside, record minutes, and reproduce and distribute minutes to all participants and all those affected by meeting decisions, including the Engineer of Record and the Owner.
- 1.3 Representatives of the Contractor, Subcontractors and suppliers attending the meetings shall be qualified and authorized to act on behalf of the entity each represents.
- 1.4 The Engineer of Record, Owner, and Engineers may attend meetings to ascertain that Work is expedited consistent with Contract Documents and the construction schedules.

**2. SUGGESTED MEETING AGENDUM**

- 2.1 Review and approval of minutes of previous meeting.
- 2.2 Review of work progress since previous meeting.
- 2.3 Field observations, problems, and conflicts.
- 2.4 Review of off-site fabrication, delivery schedules.
- 2.5 Corrective measures and procedures to regain projected schedule.
- 2.6 Revisions to Construction Schedule.
- 2.7 Plan progress schedule during succeeding work period.
- 2.8 Coordination of schedules, including Owner Supplied Items.
- 2.9 Review submittal schedules; expedite as required.
- 2.10 Maintenance of quality standards.
- 2.11 Review proposed changes, if any, for effect on Construction Schedule and completion date.
- 2.12 Coordination of various contracts and Contractors, including all of the Owner=s separate Contractors.
- 2.13 Other business.

END OF SECTION 01020



## 1. GENERAL

- 1.1 Related Documents: Drawings and general provisions of Contract, including General and Supplementary Conditions and other Division-1 Specification sections, applying to work of this section.
- 1.2 Description of Requirements:
- 1.2.1 General: This section specifies procedural and administrative requirements for compliance with governing regulations and the codes and standards imposed upon the work. These requirements include the obtaining of permits, licenses, inspections, releases and similar documentation, as well as payments, statements and similar requirements associated with regulations, codes and standards.
- "Regulations" is defined to include laws, statutes, ordinances and lawful orders issued by governing authorities, as well as those rules, conventions and agreements within the construction industry which effectively control the performance of the work regardless of whether they are lawfully imposed by governing authority or not.
- 1.2.2 Governing Regulations: Refer to General and Supplementary Conditions for requirements related to compliance with governing regulations.
- 1.3 Definitions:
- 1.3.1 General Explanation: A substantial amount of specification language consists of definitions for terms found in other Contract Documents, including the drawings. (Drawings must be recognized as diagrammatic in nature and not completely descriptive of the requirements indicated thereon). Certain terms used in Contract Documents are defined in this article.
- Definitions and explanations contained in this section are not necessarily either complete or exclusive, but are general for the work to the extent that they are not stated more explicitly in another element of the Contract Documents.
- 1.3.2 General Requirements: The provisions or requirements of Division-1 sections apply to entire work of Contract and, where so indicated, to other elements which are included in Project.
- 1.3.3 Indicated: The term "indicated" is a cross reference to graphic representations, notes or schedules on drawings to other paragraphs or schedules in the Specifications, and to similar means of recording requirements in Contract Documents. Where terms

such as "shown", "noted", "scheduled", and "specified" are used in lieu of "indicated", it is for purpose of helping reader locate cross-reference, and no limitation of location is intended except as specifically noted.

- 1.3.4 Directed, Requested, etc: Where not otherwise explained, terms such as "directed", "requested", "authorized", "selected", "approved", "required", "accepted", and "permitted" mean "directed by Engineer of Record", "requested by Engineer of Record", and similar phrases. However, no such implied meaning will be interpreted to extend the Engineer of Record's responsibility into the Contractor's area of construction supervision.
- 1.3.5 Approve: Where used in conjunction with Engineer of Record's response to submittals, requests, applications, inquiries, reports and claims by Contractor, the meaning of term "approved" will be held to limitations of Engineer of Record's responsibilities and duties as specified in General and Supplementary Conditions. In no case will "approve" by Engineer of Record be interpreted to fulfill requirements of Contract Documents.
- 1.3.6 Project Site: The term "project site" is defined as the space available to the Contractor for performance of the work, either exclusively or in conjunction with others performing other work as part of the Project. The extent of the Project Site is shown on the drawings, and may or may not be identical with the description of the land, or the area depicted on the drawings, upon which the Project is to be built.
- 1.3.7 Furnish: Except as otherwise defined in greater detail, term "furnish" is used to mean supply and deliver to Project Site, ready for unloading, unpacking, assembly, installation, etc. as applicable in each instance.
- 1.3.8 Install: Except as otherwise defined in greater detail, term "install" is used to describe operations at Project Site including unloading, unpacking, assembly, erection, lacing, anchoring, applying, working to dimension, finishing, curing, protecting, cleaning and similar operations, as applicable in each instance.
- 1.3.9 Provide: Except as otherwise defined in greater detail, term "provide" means furnish and install, complete and ready for intended use, as applicable in each instance.
- 1.3.10 Installer: The term "installer" is defined as the entity (person or firm) engaged by the Contractor, or Subcontractor for performance of a particular unit of work at the Project Site, including installation,

erection, application and similar required operations. It is a general requirement that such entities (installers) be expert in the operations they are engaged to perform.

- 1.3.11 Testing Laboratories: The term "testing laboratory" is defined as an independent entity engaged to perform specific inspections or tests of the work, either at the Project Site or elsewhere, and to report, and (if required) interpret results of those inspections or tests. These services shall be coordinated by the Contractor with the Owner's selection of testing laboratory and all expenses shall be borne by the Contractor.

1.4 Format and Specification Content Explanation:

- 1.4.1 Specification Format:
- a. Sections and Divisions: For convenience, the basic unit of text is a "Section". Each Section is identified by a descriptive title (name) and number. Individual Sections are grouped together with other sections of similar or related work in groupings known as "Divisions". Divisions are recognized as the present industry consensus on uniform specification organization and sequence. The section title is not intended to limit the meaning or content of a section, nor to be fully descriptive of the requirements specified therein, nor to be an integral part of the text. Each section of the technical Specifications has been subdivided into 3 "parts" for uniformity and convenience (Part 1 - General, Part 2 - Products, and Part 3 - Execution); some sections may not require the use of all three parts. These parts do not limit the meaning and are not an integral part of text that specifies requirements.
  - b. Section numbering is used to facilitate cross-references in the Contract Documents. Sections are placed in Project Manual in numeric sequence; however, numbering sequence is not complete, and listing of sections at beginning of Project Manual must be consulted to determine numbers and names of Specification sections in Contract Documents.
  - c. Page Numbering: Pages are numbered independently for each section. The section number is shown together with the page number at the bottom of each page to facilitate the location of text in the Project Manual.
- 1.4.2 Specification Content: Because of methods by which this Project Specification has been produced, certain general characteristics of

content and conventions in use of language are explained as follows:

- a. The techniques or methods of specifying to record requirements varies throughout text, and may include "prescriptive", "open generic-descriptive", "compliance with standards", "performance", "proprietary", or a combination of these. The method used for specifying one unit of work has no bearing on requirements for another work unit.
- b. **Overlapping and Conflicting Requirements:** Where compliance with two or more industry standards or sets of requirements is specified, and overlapping of those different standards or requirements establishes different or conflicting minimums or levels of quality, the most stringent requirement is intended and will be enforced, unless specifically detailed language written into the Contract Documents clearly indicates that a less stringent requirement is to be fulfilled. Refer to apparently-equal-but different requirements, and uncertainties as to which level of quality is more stringent, to Engineer of Record for a decision before proceeding.
- c. **Contractor's Options:** Except for overlapping or conflicting requirements, where more than one set of requirements are specified for a particular unit of work, option is intended to be Contractor's regardless of whether or not it is specifically indicated as such.
- d. **Minimum Quality/Quantity:** In every instance, the quality level or quantity shown or specified is intended to be the minimum for the work to be performed or provided. Except as otherwise specifically indicated, the actual work may either comply exactly with that minimum (within specified tolerances), or may exceed that minimum within reasonable limits. In complying with these requirements, indicated numeric values are either minimums or maximums as noted, or as appropriate for context of the requirements. Refer instances of uncertainty to Engineer of Record for decision before proceeding.
- e. **Specialist Assignments:** In certain instances, Specification text requires (or implies) that specific work is to be assigned to specialists or expert entities, who must be engaged for the performance of that work. Such assignments shall be recognized as special requirements over which the Contractor has no choice or option. These requirements

should not be interpreted so as to conflict with the enforcement of building codes and similar regulations governing the work; they are also not intended to interfere with local union jurisdiction settlements and similar conventions. Such assignments are intended to establish which party or entity involved in a specific unit of work is recognized as "expert" for the indicated construction processes or operations. Nevertheless, the final responsibility for fulfillment of the entire set of Contract requirements remains with the Contractor.

- f. Trades: Except as otherwise indicated, the use of titles such as "carpentry" in Specification text, implies neither that the work must be performed by an accredited or unionized tradesperson of corresponding generic name (such as "carpenter"), nor that specified requirements apply exclusively to work by tradespersons of that corresponding generic name.
- g. Abbreviations: The language of these Specifications and other Contract Documents is of the abbreviated type in certain instances, and implies words and meanings that will be appropriately interpreted. Actual word abbreviations of a self-explanatory nature have been included in texts. For specific technical terminology and primarily in conjunction with coordination of Specification requirements with notations on drawings and in schedules, these are frequently defined in section at first instance of use. Trade association names and titles of general standards are frequently abbreviated. Singular words will be interpreted as plural and plural words will be interpreted as singular where applicable and where full context of the Contract Documents so indicates.

## 1.5 Drawing Symbols:

- 1.5.1 General: Except as otherwise indicated, graphic symbols used on drawings are those symbols recognized in the construction industry for purposes indicated or are explained by note or other indication on the drawings.
- 1.5.2 Mechanical/Electrical Drawings: Graphic symbols used on the mechanical and electrical drawings are generally aligned with symbols recommended by ASHRAE or are explained by note or other indication on the drawings. Where appropriate, these symbols are supplemented by more specific symbols as recommended by

other recognized technical associations including ASME, ASPE, IEEE and similar organizations. Refer instances of uncertainty to the Engineer of Record for clarification before proceeding.

## 1.6 INDUSTRY STANDARDS

1.6.1 General Applicability of Standards: Except to the extent that more explicit or more stringent requirements are written directly into the Contract Documents, applicable standards of the construction industry have the same force and effect (and are made a part of the Contract Documents by reference) as if copied directly into the Contract Documents, or as if published copies were bound herewith. Refer to other Contract Documents for resolution of overlapping and conflicting requirements, which result from the application of several different industry standards to the same unit of work. Refer to individual unit of work sections for indications of which specialized codes and standards the Contractor must keep at the Project Site, available for reference.

- a. Referenced Standards: (reference directly in Contract Documents or by governing regulations) have precedence over nonreferenced standards that are recognized in industry for applicability to work.
- b. Non-referenced Standards: Recognized in the construction industry are hereby defined, except as otherwise limited in the Contract Documents as having direct applicability to the work, and will be so enforced for the performance of the work. The decision as to whether an industry code or standard is applicable to the work, or as to which of several standards are applicable, is the sole responsibility of the Engineer of Record.
- c. Publication Dates: Except as otherwise indicated, where compliance with an industry standard is required, comply with standard in effect as of date of Contract Documents.
- d. Copies of Standards: The Contract Documents require that each entity performing work be experienced in that part of the work being performed. Each entity is also required to be familiar with recognized industry standards applicable to that part of the work. Copies of applicable standards are not bound with the Contract Documents.

Where copies of standards are needed for proper performance of the work, the Contractor is required to obtain such copies directly from the publication source.

Although certain copies of standards needed for enforcement of the requirements may be required submittals, the Engineer of Record reserves the right to require the Contractor to submit additional copies of these standards as necessary for enforcement of the requirements.

- 1.6.2 Abbreviations and Names: The following acronyms or abbreviations as referenced in the Contract Documents are defined, and mean the associated names. Both names and addresses are subject to change, and are believed to be, but are not assured to be, accurate and up-to-date of Contract Documents.

AA Aluminum Association  
818 Connecticut Avenue, NW; Washington, DC 20006; 202/862-5100

AAMA American Engineer of Recordal Manufacturer's Association  
2700 River Road, Suite 118, DesPlaines, IL 312/699-7130

AAN American Association of Nurserymen  
1250 Eye Street, NW; Suite 500; Washington, DC 20001; 202/789-2900

ACI American Concrete Institute  
P.O. Box 19150; Detroit, MI 48219; 313/532-2600

ACPA American Concrete Pipe Association  
8320 Old Courthouse Road; Vienna, VA 22180; 703/821-1990

ADC Air Diffusion Council  
230 N. Michigan Ave.; Suite 1200; Chicago, IL 60611; 312/372-9800

AGA American Gas Association  
1515 Wilson Blvd.; Arlington, VA 22209; 703/841-8400

AHAM Association of Home Appliance Manufacturers  
20 N. Wacker Dr.; Chicago, IL 60606; 312/984-5800

AI Asphalt Institute  
Asphalt Inst. Bldg; College Park, MD 20740; 301/277-4258

AIA American Insurance Association  
1735 New York Ave., NW; Washington, DC 20006; 202/626-7474

A.I.A. American Institute of Engineer of Records  
85 John Street; New York, NY 10038; 212/669-0400

AISC American Institute of Steel Construction  
400 N. Michigan Ave.; 8th Floor; Chicago, IL 60611; 312/670-2400

AISI American Iron and Steel Institute  
1000 16th St., NW; Washington, DC 20036; 202/452-7100

AITC American Institute of Timber Construction  
33 W. Hampden Ave.; Englewood, CO 80100; 303/761-3212

ALSC American Lumber Standards Committee  
P.O. Box 210; Germantown, MD 20874; 301/972-1700

AMCA Air Movement and Control Association  
30 W. University Dr.,; Arlington Heights, IL 60004; 312/394-0150



ANSI American National Standards Institute  
1430 Broadway; New York, NY 10018; 212/354-3300

APA American Plywood Association  
P.O. Box 11700; Tacoma, WA 98411; 206/565-6600

ARI Air Conditioning and Refrigeration Institute  
1501 Wilson Blvd.; Arlington, VA 22209; 703/524-8800

ASC Adhesive and Sealant Council  
1600 Wilson Blvd; Suite 910; Arlington, VA 22209; 703/841-1112

ASHRAE American Society of Heating, Refrigeration and Air Conditioning Engineers  
1791 Tullie Circle, NE, Atlanta, GA 30329; 404/636-8400

ASME American Society of Mechanical Engineers  
345 East 47th St.; New York, NY 10017; 212/705-7722

ASPE American Society of Plumbing Engineers  
15233 Ventura Blvd.; Suite 811; Sherman Oaks, CA 91403; 213/783-4845

ASSE American Society of Sanitary Engineering  
P.O. Box 40362; Bay Village, OH 44140; 216/835-3040

ASTM American Society for Testing and Materials  
1916 Race St.; Philadelphia, PA 19103; 215/299-5400

AWI Engineer of Recordural Woodwork Institute  
2310 S. Walter Reed Drive; Arlington, VA 22206; 703/671-9100

AWPA American Wood-Preserver's Association  
P.O. Box 849; Stevensville, MD 21666; 301/643-4163

AWPB American Wood Preservers Bureau  
P.O. Box 6058; 2772 S. Randolph St.; Arlington, VA 22206; 703/931-8180

AWS American Welding Society  
P.O. Box 351040; 550 Le Jeune Rd., NW; Miami, FL 33135; 305/443-9353

AWWA American Water Works Association  
666 W. Quincy Ave.; Denver, CO 80235; 303/794-7711

BHMA Builders' Hardware Manufacturers Association  
60 East 42nd St.; Room 511; New York, NY 10165; 212/682-8142

BIA Brick Institute of America  
1750 Old Meadow Rd.; McLean, VA 22101; 703/893-4010

CBM Certified Ballast Manufacturers  
2122 Keith Bldg.; Cleveland, OH 44115; 216/241--0711

CISPI Cast Iron Soil Pipe Institute  
1499 Chin Bridge Rd.; Suite 203; McLean, VA 22101; 703/827-9177

CRSI Concrete Reinforcing Steel Institute  
933 Plumb Grove Rd.; Schaumburg, IL 60195; 312/490-1700

CS Commercial Standard of NBS (U.S. Dept. of Commerce)  
Government Printing Office, Washington, DC 20402

CTI Ceramic Tile Institute  
700 North Virgil Ave.; Los Angeles, CA 90029; 213/660-1911

DHI Door and Hardware Institute  
7711 Old Springhouse Rd.; McLean, VA 22102; 703/556-3990

DOC Department of Commerce  
14th Street & Constitution Avenue, NW; Washington, DC 20230;  
202/377-2000

DOT Department of Transportation  
400 7th Street, SW, Washington, DC 20590; 202/426-4000

EIA Electronic Industries Association  
2001 Eye St., NW; Washington, DC 20006; 202/457-4900

EPA Environmental Protection Agency  
401 M Street, SW; Washington, DC 20460; 202/829-3535

FM Factory Mutual System  
1151 Boston-Providence Turnpike; Norwood, MA 02062; 617/762-  
4300

FS Federal Specification (General Services Admin.)  
Obtain from your Regional GSA Office or purchase from GSA  
Specifications Unit (WFSIS); 7th and D Streets, SW; Washington, DC  
20406; 202/472-2205 or 2140

GA Gypsum Association  
1603 Orrington Avenue; Evanston, IL 60201; 312/491-1744 IEEE  
Institute of Electrical and Electronic Engineers, Inc. 345 E. 47th Street;  
New York, NY 10017; 212/705-7926

IGCC Insulating Glass Certification Council

Route 11; Industrial Park; Cortland, NY 13045

ISA	Instrument Society of America P.O. Box 12277; 67 Alexander Drive; Research Triangle Park, NC 17709; 919/549-8411
MBMA	Metal Building Manufacturer's Association 1230 Keith Building; Cleveland, OH 44115; 216/241-7333
MCAA	Mechanical Contractors Association of America 5530 Wisconsin Avenue; Suite 750; Chevy Chase, MD 20815; 301/654-7960
MIA	Marble Institute of America 33505 State Street, Farmington, MI 48024; 313/476-5558
ML/SFA	Metal Lath/Steel Framing Association 221 N. LaSalle Street; Chicago, IL 60601; 312/346-1600
MSS	Manufacturers Standardization Society of the Valve and Fittings Industry 5203 Leesburg Pike; Suite 502; Falls Church, VA 22041; 703/988- 7996
NAAM	National Association of Engineer of Recordal Manufacturers 221 North LaSalle Street; Chicago, IL 60601; 312/346-1600
NBGQA	National Building Granite Quarries Association c/o H. E. Fletcher Co.; West Chelmsford, MA 01863
NBHA	National Builders Hardware Association (Now Part of DHI) 711 Old Springhouse Road; McLean, VA 22101; 703/556-3990
NBS	National Bureau of Standards (U.S. Department of Commerce) Gathersburg, MD 20234; 301/921-1000
NCMA	National Concrete Masonry Association 7315 Wisconsin Avenue; Bethesda, MD 20814; 301/657-3110
NEMA	National Electrical Manufacturers Association 2101 L Street, NW; Washington, DC 20037; 202/457-8400
NFPA	National Fire Protection Association Batterymarch Park; Quincy, MA 02269; 617/770-3000
N.F.P.A.	National Forest Products Association 1619 Massachusetts Avenue, NW; Washington, DC 20036; 202/797- 5800

NHLA National Hardwood Lumber Association  
P.O. Box 34518; Memphis, TN 38104; 901/377-1818

NPCA National Paint and Coatings Association  
1500 Rhode Island Avenue, NW; Washington, DC 20005; 202/462-6272

NWMA National Woodwork Manufacturers Association  
205 West Touchy Avenue; Park Ridge, IL 60068; 312/823-6747

OSHA Occupational Safety Health Administration (U.S. Department of Labor)  
Government Printing Office; Washington, DC 20402

PCI Prestressed Concrete Institute  
201 North Wells Street; Chicago, IL 60606; 312/436-4071

PDI Plumbing and Drainage Institute (c/o Austin O. Roche, Jr.)  
5342 Boulevard Place; Indianapolis, IN 46208; 317/251-5298

PS Product Standard of NBS (U.S. Department of Commerce)  
Government Printing Office; Washington, DC 20402

RFCI Resilient Floor Covering Institute  
966 Hungerford Drive; Suite 12-B; Rockville, MD 20805; 301/340-8580

SDI Steel Deck Institute  
P.O. Box 3812; St. Louis, MO 63122; 314/965-1741

S.D.I. Steel Door Institute (c/o A.P. Wherry and Associates, Inc.)  
712 Lakewood Cnt. N.; Cleveland, OH 44107; 216/226-7700

SGCC Safety Glazing Certification Council  
1640 West 32 Place; Hialeah, FL 33012; 305/558-1352

SIGMA Sealed Insulating Glass Manufacturers Association  
111 East Wacker Drive; Chicago, IL 60601; 312/644-6610

SJI Steel Joist Institute  
1703 Parham Road; Suite 204; Richmond, VA 23229; 804/288-3071

SMACNA Sheet Metal and Air Conditioning Contractor's National Association  
P.O. Box 70; Merrifield, VA 22116; 703/790-9890

SPIB Southern Pine Inspection Bureau (Grading Rules)  
4709 Scenic Highway; Pensacola, FL 32504; 904/434-2611

SSPC Steel Structures Painting Council  
440 5th Avenue; Pittsburgh, PA 15213; 412/578-3327

TCA	Tile Council of America P.O. Box 326; Princeton, NJ 08540; 609/921-7050
TIMA	Thermal Insulation Manufacturers Association 7 Kirby Plaza; Mt. Kisco, NY 10549; 914/241-2284
TPI	Truss Plate Institute 100 W. Church Street; Frederick, MD 21701; 301/694-6100
UL	Underwriters Laboratories 333 Pfingsten Road; Northbrook, IL 60062; 312/272-8800
WRI	Wire Reinforcement Institute 7900 West Park Drive; Suite 611; McLean, VA 22102; 703/790-9790
WWPA	Western Wood Products Association (Grading Rules) 1500 Yeon Bldg.; Portland, OR 97204; 503/224-3930
W.W.P.A.	Woven Wire Products Association 2515 N. Nordica Avenue; Chicago, IL 60635; 312/637-1359

#### 1.7 GOVERNING REGULATIONS/AUTHORITIES:

- 1.7.1 General: The procedure followed by the Engineer of Record has been to contact governing authorities where necessary to obtain information needed for the purpose of preparing Contract Documents; recognizing that such information may or may not be of significance in relation to Contractor's responsibilities for performing the work. Contact governing authorities directly for necessary information and decisions having a bearing on performance of the work.
- 1.7.2 Copies of Regulations: Obtain copies of the following regulations and retain at the Project Site during the Contract Time, available for reference by parties at the site who have a reasonable need for such reference:
  - a. Florida Building Code (all trades).
  - b. Florida Fire Prevention Code.
  - c. NFPA 101 Life Safety Code.
  - d. ADA Compliance Guidebook
- 1.7.3 Trade Union Jurisdiction: It is a procedural requirement that the Contractor maintain, and require prime Subcontractors to maintain, complete current information on jurisdictional matters, regulations actions and pending actions, as applicable to the work. Discuss new developments at appropriate Project meetings at the earliest

feasible dates, and record information of relevance along with the actions agreed upon. The manner in which Contract Documents have been organized and subdivided is not intended to be an indication of jurisdictional or trade union agreements. Assign and subcontract the work, and employ tradesmen and laborers, in a manner that will not unduly risk jurisdictional disputes of a kind that could result in conflicts, delays, claims and losses in the performance of the work.

END OF SECTION 01090

**1. GENERAL****1.1 SUMMARY:**

- A. To enable the Owner to compare total costs where alternate materials and/or methods might be used, Alternates may be submitted to the Engineer of Record for approval.
- B. Related Work:
  - 1. Documents affecting work of this Section include, but are not necessarily limited to, General Conditions, Supplementary Conditions, and Sections in Division 1 of these Specifications.
  - 2. Section 00010: Scope of Project.
  - 3. Method for stating the proposed Contract Sum is shown on Bid Proposal Form.

**1.2 SUBMITTALS**

- A. All Alternates are required to be reflected on the Bid Form as submitted by the bidder.

**1.3 DELIVERY, STORAGE, AND HANDLING**

- A. If the Owner elects to proceed on the basis of one or more Alternates, make modifications to the Work required in providing the selected Alternate or Alternates to the approval of the Engineer of Record and at no additional cost to the Owner as proposed on the Bid Form.

**1.4 ADVANCE COORDINATION**

- A. Immediately after award of the Contract, or as soon thereafter as the Owner has made a decision on which if any of the Alternates will be selected, thoroughly and clearly advise necessary personnel and suppliers as to the nature of Alternates selected by the Owner.

END OF SECTION 01100

**1. GENERAL**

- 1.1 Throughout the entire operation, maintain the area as safe and clean as possible, with materials carefully stacked, ladders removed and stored at the end of each day's work and scaffolding and equipment left in a condition to present the least possible "attractive hazard".
  - A. There shall be NO SMOKING or EATING within any building; contractor shall provide areas for smoking or eating.
- 1.2 Collect debris, waste material and rubbish as work progresses and pile in a safe manner at designated places for removal. Keep discarded bottles, cans, cartons and other such refuse in suitable containers or remove promptly from the work area. Accumulations of such items on window sills, work benches, scaffolds, ledges, stairs, platforms, aisles etc., will not be permitted.
- 1.3 Remove all hazardous piles of such material promptly as work progresses. Waste materials and rubbish moved from upper to lower levels to be lowered in a controlled manner.
- 1.4 Maintain materials stored or piled at the site so that stacks or piles are neat and stable, properly secured if necessary, and in locations which do not protrude into aisles or walkways or otherwise secured against sliding or collapse.
- 1.5 Maintain all material in bags, containers or bundles in tiers properly stacked, blocked, interlocked and limited in height so that it is stable and otherwise secured against sliding or collapse.
- 1.6 Protruding nails shall be removed, hammered in or bent over and boards neatly stacked.
- 1.7 Store tools and loose equipment properly when not in use or place them in their proper racks, especially tools and equipment used in overhead locations.
- 1.8 Remove from work areas ropes, cables, pipes, etc., not in use and safely store. If in use, arrange such items in a manner to avoid tripping hazards.
- 1.9 Interior areas shall be cleaned and debris removed from building at the end of each workday. Site refuse and debris shall be removed from the site at least once a week.

**2. FEDERAL LAW (O.S.H.A.)**

Comply with the applicable rules and regulations, including latest amendments of the William-Steiger Occupational Safety and Health Act of 1970, Public Law 91-596, which shall govern work at all times.



END OF SECTION 01310

1. GENERAL
  - 1.1 Latest adopted editions with current adopted revisions and amendments of stated codes and standards are considered minimum requirements for materials, workmanship, methods and safety where not covered elsewhere.
2. CODES AND STANDARDS
  - 2.1 Florida Building Code - (FBC)
  - 2.2 Western Wood Products Association - (WWPA)
  - 2.3 Southern Pine Inspection Bureau (SPIB)
  - 2.4 American Wood Preservers Institute - (AWPI)
  - 2.5 American Wood Preservers Association (AWPA)
  - 2.6 American Wood Preservers Bureau - (AWPB)
  - 2.7 National Fire Protection Association - (NFPA)
  - 2.8 Underwriters Laboratory - (UL)
  - 2.9 American Concrete Institute - (ACI)
  - 2.10 Concrete Reinforcing Steel Institute - (CRSI)
  - 2.11 American Institute of Steel Construction - (AISC)
  - 2.12 American Welding Society - (AWS)
  - 2.13 American National Standards Institute - (ANSI)
  - 2.14 Metal Building Manufacturer's Association - (MBMA)
  - 2.15 American Society of Testing and Methods - (ASTM)
  - 2.16 Federal Specifications - (FS)
  - 2.17 National Bureau of Standards - (NBS)
  - 2.18 National Concrete Masonry Association - (NCMA)
  - 2.19 Aluminum Association - (AA)
  - 2.20 Tile Council of America - (TCA)
  - 2.21 Florida Accessibility Requirements Manual
  - 2.22 The Americans with Disabilities Act

END OF SECTION 01320

**1. GENERAL**

The General Construction Requirements outlined in this Section are typical and apply to the other Sections of the specifications even though not specifically indicated or referred to in the various technical Sections for all applicable work.

**2. SECURING ITEMS**

2.1 Positively secure every item to the building by means of nails, bolts, clips, cleats, clamps, adhesives or other devices or means.

**3. BUILT-IN ITEMS**

3.1 Provide holes, solid blocking, pockets, chases and notches to accommodate items of all trades.

3.2 Build-in sleeves, inserts, anchors, clips, bolts, boxes and other items of all trades.

**4. INCIDENTAL ITEMS**

4.1 Deliver to Owner: spare or surplus materials, manufacturer's installation and maintenance instructions, warranty and guarantee bonds and all other items that are required.

4.2 Deliver all items clean, wrapped, boxed and labeled, with identification marked.

**5. BRAND MATERIALS**

5.1 Deliver "Brand" materials to building or place of work in factory-sealed and labeled unopened containers.

5.2 Use brands of one manufacturer for the same items of work. Do not change brands or product types from that approved.

**6. WORKMANSHIP**

6.1 Install items in accurate location, secure, plumb, level, square, parallel, straight, flush, in place and line, true to shape and neat.

6.2 Use necessary, suitable shims to plumb and secure line and planes, and brace and secure lines temporarily and permanently, as conditions require.

6.3 Check work of each trade for soundness of construction, location, workmanship and other suitability, and proceed only after all imperfections have been eliminated.

- 6.4 Clean and make surfaces or work, to which further work is being applied, most suitable to receive successive work prior to applying successive work. Patch, repair and prime in an approved manner, surfaces as may be required for proper application of work.
- 6.5 Application of a work element or trade to surfaces or areas prepared by others shall denote acceptance of those surfaces or areas by the applicator.

## 7. FIELD CONDITIONS

- 7.1 Inspect and determine field conditions and request Engineer of Record's decision about manner of execution where such conditions are at variance with the intent of the drawings and specifications.

## 8. STORAGE

- 8.1 Provide adequate storage facilities.
- 8.2 Store materials and prevent their deterioration.
- 8.3 Use materials only when in perfect and suitable condition.
- 8.4 Submit plan for storage of any poisonous, inflammable and explosive materials.
- 8.5 Secure all storage.
- 8.6 Receive, unpack, check, dispose of packing material, replace and return if not acceptable, store, transport to location of installation, protect, install and handle appropriately items by other trades and/or other parties.

END OF SECTION 01330

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## 1. GENERAL

1.1 Related Documents: Drawings and general provisions of Contract, including General Conditions and other Division-1 Specification Sections, apply to work specified in this section.

### 1.2 Description of Requirements:

1.2.1 The types of submittal requirements specified include shop drawings, product data, samples and miscellaneous work-related submittals.

1.2.2 Definitions: Work related submittals of this section are categorized for convenience as follows:

- a. Shop drawings include specially-prepared technical data for this Project, including drawings, diagrams, performance curves, data sheets, schedules, templates, patterns, reports, calculations, instructions, measurements and similar information not in standard printed form for general application to a range of similar projects.
- b. Product data include standard printed information on materials, products and systems; not specially-prepared for this Project, other than the designation of selections from among available choices printed therein.
- c. Samples include both fabricated and nonfabricated physical examples of materials, products and units of work; both as complete units and as smaller portions of units of work; either for limited visual inspection or (where indicated) for more detailed testing and analysis.
- d. Miscellaneous submittals related directly to the work (nonadministrative) include warranties, maintenance agreements, workmanship bonds, Project photographs, survey data and reports, physical work records, quality testing and certifying reports, copies of industry standards, record drawings, field measurement data, operating and maintenance materials, overrun stock, and similar information, devices and materials applicable to the work and not processed as shop drawings, product data or samples.

### 1.3 General Submittal Requirements:

- 1.3.1 Coordination and Sequencing: Coordinate preparation and processing of submittals with performance of the work so that work will not be delayed by submittals. Coordinate and sequence different categories of submittals for same work, and for interfacing units of work, so that one will not be delayed for coordination of Engineer of Record's review with another.
- 1.3.2 Preparation of Submittals: Provide permanent marking on each submittal to identify Project, date, Contractor, Subcontractor, submittal name and similar information to distinguish it from other submittals. Show Contractor's executed review and approval marking and provide space for Engineer of Record's "Action" marking. Package each submittal appropriately for transmittal and handling. Submittals that are received from sources other than through the General Contractor's office will be returned by the Engineer of Record "without action".
- 1.3.3 Transmittal Form: Prepare a draft of special transmittal form for Project, and submit to the Engineer of Record for acceptance. Provide places to indicate Project, date, "TO:", "FROM:", names of subcontractors, suppliers, manufacturers, required references, specification section number, category and type of submittal, purpose, description, distribution record (for both transmittal and submittals), and signature of transmitter.
- 1.3.4 Provide electronic (.PDF) copy of all submittals.
- 1.4 Specific Category Submittal Requirements:
  - 1.4.1 General: Except as otherwise indicated in individual work sections, comply with requirements specified herein for each indicted category of submittal.
  - 1.4.2 Shop Drawings: Provide newly-prepared information, on reproducible sheets, with graphic information at accurate scale (except as otherwise indicated), with name of preparer indicated (firm name). Show dimensions and note which are based on field measurement. Identify materials and products in the work shown. Indicate compliance with standards, and special coordination requirements. Do not allow shop drawing copies without appropriate final "Action" markings by the Engineer of Record to be used in connection with the work.
  - 1.4.3 Product Data: Collect required data into one submittal for each unit of work or system; and mark each copy to show which choices and options are applicable to Project. Include manufacturer's standard printed recommendations for application and use, compliance with

standards, application of labels and seals, notation of field measurements that have been checked, and special coordination requirements. Maintain one set of product data (for each submittal) at Project Site, available for reference by the Engineer of Record.

- 1.4.4 Submittals: Do not submit product data, or allow its use on the Project, until compliance with requirements of contract documents have been confirmed by Contractor. Submittal is for information and record, unless otherwise indicated. Initial submittal is final submittal unless returned promptly by the Engineer of Record marked with "Action" which indicates an observed noncompliance. Submit two (2) copies, plus two (2) additional copies (which will be returned) where required for maintenance manuals.
- 1.4.5 Installer's Copy: Do not proceed with installation of materials, products or systems until final copy of applicable product data is in possession of Installer.
- 1.4.6 Samples: Provide units identical with final condition of proposed materials or products for the work. Include "range" samples (not less than 5 units) where unavoidable variations must be expected, and describe or identify variations between units of each set. Provide full set of optional samples where Owner's selection is required. Prepare samples to match Owner's sample where so indicated. Include information with each sample to show generic description, source or product name and manufacturer, limitations, and compliance with standards. Samples are submitted for review and confirmation of color, pattern, texture and "kind" by the Engineer of Record. The Engineer of Record will not "test" samples (except as otherwise indicated) for compliance with other requirements, which are therefore the exclusive responsibility of the Contractor.
- a. Submittal: Submit five (5) sets of samples in final submittal; two (2) sets will be returned.
  - b. Quality Control Set: Maintain returned final set of samples at Project Site, in suitable condition and available for quality control comparisons by the Engineer of Record.
- 1.4.7 Inspection and Test Reports: Classify each as either "shop drawing" or "product data", depending upon whether report is uniquely prepared for Project or a standard publication of workmanship control testing at point of production; process accordingly.

- 1.4.8 Standards: Where copy submittal is indicated, and except where specified integrally with "Product Data" submittal, submit a single copy for the Engineer of Record's use. Where workmanship at Project Site and elsewhere is governed by standard, furnish additional copies to fabricators, installers and others involved in performance of the work.
- 1.4.9 Closeout Submittals: Refer to individual work sections and to "closeout" sections for specific requirements on submittal of closeout information, materials, tools and similar items.
  - a. Record Document Copies: Furnish one (1) set.
  - b. Materials and Tools: Refer to individual work sections for required quantities of spare parts, extra and overrun stock, maintenance tools and devices, keys, and similar physical units to be submitted.
- 1.4.10 General Distribution: Provide additional distribution of submittals (not included in foregoing copy submittal requirements) to subcontractors, suppliers, fabricators, installers, governing authorities and others as necessary for proper performance of the work. Include such additional copies in transmittal to the Engineer of Record where required to receive "Action" marking before final distribution. Record distributions on transmittal forms.
- 1.5 Action on Submittals:
  - 1.5.1 The Engineer of Record's Action: Where action and return is required or requested, the Engineer of Record will review each submittal, mark with "Action", and where possible return within two (2) weeks of receipt. Where submittal must be held for coordination, Contractor will be so advised by the Engineer of Record.
    - a. Final Unrestricted Release: Work may proceed, provided it complies with contract documents, when submittal is returned with the following: Marking: "Accepted"; or, "Approved".
    - b. Final-But-Restricted Release: Work may proceed, provided it complies with notations and corrections on submittal is returned with the following: Marking: "Accepted as Noted"; or, "Approved as Noted".
    - c. Returned for Resubmittal: Do not proceed with work. Revise submittal in accordance with notations thereon, and resubmit without delay to obtain a different action marking. Do not allow submittals with the following marking (or unmarked



submittals where a marking is required) to be used in connection with performance of the work: "Not Accepted, Resubmit", "Disapproved, Resubmit"; or, "Revise and Resubmit".

- d. Other Action: Where submittal is returned for other reasons, with the Engineer of Record's explanation included, it will be marked as follows: Marking: "Action Not Required"; or, "No Action".

END OF SECTION 01340

**1. GENERAL:**

- 1.1 The Contractor shall employ and pay for the services of an Independent Testing Laboratory to perform specified services and testing.
- 1.2 Testing Laboratory inspection, sampling and/or testing is required for concrete reinforcement, cast-in-place concrete, backfill material and compaction, resilient paving, and any other products requiring testing as delineated by laws, ordinances, rules, regulations, orders or approvals of public authorities.

**2. QUALIFICATIONS OF LABORATORY;**

- 2.1 Meet "Recommended Requirements for Independent Laboratory Qualification", published by American Council of Independent Laboratories.
- 2.2 Meet basic requirements of ASTM E 329, "Standard of Recommended Practice for Inspection and Testing Agencies for Concrete and Steel as Used in Construction."
- 2.3 Authorized to operate in the State of Florida.
- 2.4 Submit copy of report of inspection of facilities made by Materials Reference Laboratory of National Bureau of Standards during the most recent tour of inspection, with memorandum of remedies of any deficiencies reported by the inspection.
- 2.5 Testing Equipment: Calibrated at reasonable intervals by devices of accuracy traceable to either National Bureau of Standards or accepted values of natural physical constants.

**3. LABORATORY DUTIES:**

- 3.1 Cooperate with Engineer of Record, Owner, Consultants and Contractor; provide qualified personnel after due notice.
- 3.2 Perform specified inspections, sampling and testing of materials and methods of construction to comply with specified standards, or to ascertain compliance of materials with requirements of Contract Documents.
- 3.3 Promptly notify Engineer of Record, Owner, Consultants and Contractor of observed irregularities or deficiencies of work or products.
- 3.4 Promptly submit written report of each test and inspection; one copy each to Engineer of Record, Owner, Structural Engineer, Civil Engineer and Contractor. Each report shall include:
  - Date issued.
  - Project title and number.

- Testing laboratory name, address and telephone number.
- Name and signature of laboratory inspector.
- Date and time of sampling or inspection.
- Record of temperature and weather conditions.
- Date of test.
- Identification of product and Specification Section.
- Location of sample or test in the Project.
- Type of inspection or test.
- Results of tests and compliance with Contract Documents.
- Interpretation of test results, when requested by Engineer of Record or Consultants.

3.5 Perform additional tests as required by Engineer of Record and Consultants

4. LIMITATIONS OF AUTHORITY OF TESTING LABORATORY: Laboratory is not authorized to:

4.1 Release, revoke, alter or enlarge on requirements of Contract Documents.

4.2 Approve or accept any portion of the Work.

4.3 Perform any duties of the Contractor.

5. CONTRACTOR'S RESPONSIBILITIES:

5.1 Cooperate with laboratory personnel and provide access to all applicable work.

5.2 Secure and deliver to the laboratory adequate quantities of representational samples of materials proposed to be used and which require testing.

5.3 Provide to the laboratory the preliminary design mix proposed to be used for concrete, and other materials mixes that require control by the testing laboratory.

5.4 Furnish incidental labor and facilities:

- To provide access to work to be tested;
- To obtain and handle samples at the Project Site or at the source of the product to be tested;
- To facilitate inspections and tests; and,
- For storage and curing of test samples.

5.5 Notify laboratory sufficiently in advance of operations to allow for laboratory assignment of personnel and scheduling of tests.

END OF SECTION 01410

## 1. GENERAL

### 1.1 Related Documents:

Drawings and general provisions of Contract, including General Conditions and other Division-1 Specification sections, apply to work of this section.

### 1.2 Description of Requirements:

Definitions: Specific administrative and procedural minimum actions are specified in this section, as extensions of provisions in General Conditions and other contract documents. These requirements have been included for special purposes as indicated. Nothing in this section is intended to limit types and amounts of temporary work required, and no omission from this section will be recognized as an indication by the Engineer of Record that such temporary activity is not required for successful completion of the work and compliance with requirements of contract documents. Provisions of this section are applicable to, but not by way of limitation, utility services, construction facilities, security/protection provisions, support facilities, etc.

### 1.3 Quality Assurance;

1.3.1 General: In addition to compliance with governing regulations and rules / recommendations of franchised utility companies, comply with specific requirements indicated and with applicable local industry standards for construction work (published recommendations by local consensus "building councils").

1.3.2 ANSI Standards: comply with applicable provisions of ANSI A10-Series Standards on construction safety, including A10.3, A10.4, A10.5, A10.6, A10.7, A10.8, A10.9, A10.10, A10.11, A10.12, A.10.13, A10.14, A10.15, A10.17, A10.18, A10.20, and A10.22.

1.3.3 NFPA Code: Comply with NFPA Code 241 "Building Construction and Demolition Operations".

1.3.4 Conservation: In compliance with Owner's policy on energy/materials conservation, install and operate temporary facilities and perform construction activities in manner which reasonably will be conservative and avoid waste of energy and materials including water.

### 1.4 Job Conditions:

1.4.1 General: Establish and initiate use of each temporary facility at time first reasonably required for proper performance of the work. Terminate use and remove facilities when no longer needed.

- 1.4.2 The following requirements are mandatory for the General Contractor and all Subcontractors unless approved otherwise by the Owners Representative and the Engineer of Record; no Construction/Support Facilities, Senior Project Managers, Associate Project Managers, Chief Superintendents, Field Superintendents, Secretaries, etc. shall be removed from the Project nor relieved from the obligation of attending all scheduled or special meetings until final completion of the Project or until all Punch List Items have been completed, as determined by the Engineer of Record and/or the Owners Representative.
- 1.4.3 Conditions of Use: Install, operate, maintain and protect temporary facilities in a manner and at locations that will be safe, non-hazardous, sanitary and protective of persons and property, and free of deleterious effects.

## 2. PRODUCTS

### 2.1 Temporary Utility Services:

- 2.1.1 The types of services required include, but not by way of limitation, water, sewerage, surface drainage, electrical power and telephones. Where possible and reasonable, connect to existing utilities for required services; and comply with service companies' recommendations on materials and methods, or engage service companies to install services. Locate and relocate services (as necessary) to minimize interference with construction operations.
- 2.1.2 Temporary Power: Provide service with ground-fault circuit interrupter features, activated from each circuit of 20-amp or less rating.
- 2.1.3 Metering: Provide meters for water, gas and electrical power services.

### 2.2 Temporary Construction Facilities:

- 2.2.1 The types of temporary construction facilities required include, but not by way of limitation, water distribution, drainage, de-watering equipment, enclosure of work, heat, ventilation, electrical power distribution, lighting, hoisting facilities, stairs, and ladders. Provide facilities reasonably required to perform construction operations properly and adequately.
- 2.2.2 Water Distribution: Pipe to each floor level and provide hose lengths sufficient to reach entire area of construction work, not less than 1" hose size. Prevent freezing of water distribution by either prompt drainage after each use, or by suitable protection.

- 2.2.3 Enclosure: Provide temporary enclosures where required to ensure adequate workmanship and protection from weather and unsatisfactory ambient conditions for the work, including enclosures where temporary heat is used. Prior to installation of final exterior doors, corridor doors, stairwell doors and exterior windows, temporary closures shall be installed to maintain a dry building and to minimize the loss of conditioned air before, during and after start-up of HVAC Systems.
  - 2.2.4 Heating: Heat with piped natural gas or self-contained LP gas for fuel oil heaters, bearing UL labels appropriate for application. Vent fuel-burning heaters, and equip units with individual-space thermostatic controls. Use electric resistance space heaters only where no other, more energy-efficient type of heat is available and allowable. See also, Section 00800.
  - 2.2.5 Electrical Power: Provide weatherproof, grounded, power distribution system sufficient to accommodate construction operations requiring power, use of power tools, electrical heating, lighting, and start-up testing of permanent electric-powered equipment prior to its permanent connection to electrical system. Provide overload protection. Supply power for electric welding, if any, from either temporary power distribution system or by engine-driven power-generator sets, at Contractor's option.
  - 2.2.6 Lighting: Provide sufficient temporary lighting to ensure proper workmanship everywhere; by combined use of daylight and general lighting with local switching which will enable energy conservation during periods of varying activity.
  - 2.2.7 Access Provision: Provide ramps, stairs, ladders and similar temporary access elements as reasonably required to perform the work and facilitate its inspection or review during installation. Comply with reasonable requests of governing authorities performing inspections. When permanent stairs are available for access during construction, cover finished surfaces with sufficient protection to ensure freedom from damage and deterioration.
- 2.3 Security/Protection Provisions:
- 2.3.1 The type of temporary security and protection provisions required include, but not by way of limitation, fire protection, barricades, warning signs/lights, site enclosure fence, sidewalk bridges, building enclosure/lockup, watchman service, personnel security program (theft prevention), environmental protection, and similar

provisions intended to minimize property losses, personal injuries and claims for damages at Project Site.

2.3.2 Fire Extinguishers: Provide types, sizes, numbers and locations as would be reasonably effective in extinguishing fire during early stages, by personnel at Project Site. Provide Type A Extinguishers at locations of low potential for either electrical or grease-oil-flammable liquids fires; provide Type AC dry chemical extinguishers at other locations; comply with recommendations of NFPA NO. 10. Post local fire department call number on each telephone instrument at Project Site.

2.4 Temporary Support Facilities:

2.4.1 The types of temporary support facilities required include, but not by way of limitation, field offices, storage sheds, fabrication sheds, sanitary facilities, drinking water, first aid facilities, bulletin boards, telephones, clean-up facilities, waste disposal service, rodent/pest control and similar miscellaneous general services, all as may be reasonably required for proficient performance of the work and accommodation of personnel at the site including Owner's personnel. Discontinue and remove temporary support facilities, and make incidental similar use of permanent work of the Project, only when and in manner authorized by the Owner; and, if not otherwise indicated, immediately before time of substantial completion. Locate temporary support facilities for convenience of users, and for minimum interference with construction activities. See also 1.4.2.

2.4.2 Contractor's Field Office: Provide adequate office space for field office personnel plus one spare work station for incidental use by subcontractor's personnel, suitably finished, furnished, equipped and conditioned. See also 1.4.2.

2.4.3 Sanitary Facilities: At Contractor's option, provide either piped (wet) toilet facilities or self-contained toilet units of type acceptable to governing authorities, adequate (at all stages of construction) for use of personnel at Project Site. Provide separate facilities for male and female personnel when both sexes are working (in any capacity) at Project Site.

2.4.4 Drinking Water: Provide dispenser-type, drinking water units; either piped with potable water or supplied with bottled water; adequate in number and locations for personnel at Project Site. Furnish paper cups and waste receptacles.

2.4.5 Fencing: Site fencing shall be by the General Contractor, as shown on the Civil Engineering Documents.

END OF SECTION 01505



## 1. GENERAL

- 1.1 Related Documents: Drawings and general provisions of Contract, including General and Supplementary Conditions and other Division 1 Specification sections, apply to work of this and other sections of Division 1.
- 1.2 Description of Requirements:
  - 1.2.1 Definitions: "Products" is defined to include purchased items for incorporation into the work, regardless of whether specifically purchased for this Project or taken from Contractor's stock of previously purchased products. "Materials", is defined as products which must be substantially cut, shaped, worked, mixed, finished, refined or otherwise fabricated, processed, installed or applied to form units of work. "Equipment" is defined as products with operational parts, regardless of whether motorized or manually operated, and particularly including products with service connections (wiring, piping, etc.). Definitions in this paragraph are not intended to negate the meaning of other terms used in contract documents, including "specialties", "systems", "structure", "finishes", "accessories", "furnishings", "special construction", and similar terms, which are self-explanatory and have recognized meanings in the construction industry.
  - 1.2.2 Substitutions: The requirements for substitutions do not apply to specified Contractor options on products and construction methods. Revisions to contract documents, where requested by Owner, or Engineer of Record, are "changes" not "substitutions". Requested substitutions during bidding period, which have been accepted prior to Contract Date, are included in contract documents and are not subject to requirements for substitutions as specified herein. Contractor's determination of and compliance PRODUCTS AND SUBSTITUTIONS 01600 - 2 with governing regulations and orders issued by governing authorities do not constitute "substitutions"; and do not constitute a basis for change orders, except as provided for in contract documents. Otherwise, Contractors' requests for changes in products, materials and methods of construction required by contract documents are considered requests for "substitutions", and are subject to requirements hereof.
  - 1.2.3 Standards: Refer to Division-1 section "Definitions and Standards" for applicability of industry standards to products of Project, and for acronyms used in text of specification sections.
- 1.3 Quality Assurance:

- 1.3.1 Source Limitations: To the greatest extent possible for each unit of work, provide products, materials or equipment of a singular generic kind and from a single source.
- 1.3.2 Compatibility of options: Where more than one choice is available as options for Contractor's selection of a product or material, select an option which is compatible with other products and materials already selected (which may have been from among options for those other products and materials). Total compatibility among options is not assured by limitations within contract documents, but must be provided by Contractor. Compatibility is a basic general requirement of product/material selections.
- 1.4 Submittals: Submit eight (8) copies, fully identified for product or method being replaced by substitutions, including related specification section and drawing number(s), and fully documented to show compliance with requirements for substitutions. Include product data/drawings, description of methods, samples where applicable, Contractor's detailed comparison of significant qualities between specified item and proposed substitution, statement of effect on construction time and coordination with other affected work, cost information or proposal, and Contractor's statement to the effect that proposed substitution will result in overall work equal-to-or-better-than work originally indicated.
- 1.5 Product Delivery-Storage-Handling: Deliver, handle and store products in accordance with manufacturer's recommendations and by methods and means which will prevent damage, deterioration, and loss including theft. Control delivery schedules to minimize long-term storage of products at site and overcrowding of construction spaces. In particular, provide delivery/installation coordination to ensure minimum holding or storage times for products recognized to be flammable, hazardous, easily damaged, or sensitive to deterioration, theft and other sources of loss.
- 1.6 Warranties (Guarantees):
  - 1.6.1 Categories of Specific Warranties: Warranties on the work are in several categories, including those of General Conditions and including (but not necessarily limited of) the following specific categories of Division 2 through 16 of these specifications:
    - a. Special Project warranty (Guarantee): A warranty specifically written and signed by Contractor for a defined portion of the work; and, where required, countersigned by subcontractor, installer, manufacturer or other entity engaged by Contractor.

- b. Specified Product Warranty: A Warranty which is required by contract documents, to be provided for a manufactured product incorporated into the work; regardless of whether manufacturer has published a similar warranty without regard for specific incorporation of product into the work, or has written and executed a special Project warranty as a direct result of contract document requirements.
- c. Coincidental Product Warranty: A warranty which is not specifically required by contract documents (other than as specified in this Section); but which is available on a product incorporated into the work, by virtue of the fact that manufacturer of product has published warranty in connection with purchases and uses of product without regard for specific applications except as otherwise limited by terms of warranty.

- 1.6.2 Refer to individual sections of Division 2 through 17 for the determination of units of work which are required to be specifically or individually warranted, and for the specific requirements and terms of those warranties (or guarantees).
- 1.6.3 General Limitations: It is recognized that specific warranties are intended primarily to protect Owner against failure of the work to perform as required, and against deficient, defective and faulty materials and workmanship, regardless of sources. Except as otherwise indicated, specific warranties do not cover failures in the work which results from: a) Unusual and abnormal phenomena of the elements, b) the Owner's misuse, maltreatment or improper maintenance of the work, c) vandalism after time of substantial completion, or d) Insurrection of acts of aggression including war.
- 1.6.4 Related Damages and Losses: In connection with Contractor's Correction of warranted work which has failed, remove and replace other work of Project which has been damaged as a result of such failure, or must be removed and replaced to provide access for correction of warranted work.
- 1.6.5 Reinstatement of Warranty Period: Except as otherwise indicated, when work covered by a special Project warranty or product warranty has failed and has been corrected by replacement or restoration, reinstate warranty by written endorsement for a period of time equal to original warranty period of time, starting on date of acceptance of replaced or restored work.

- 1.6.6 Replacement Cost, Obligations: Except as otherwise indicated, costs of replacing or restoring failing warranted units or products is Contractor's obligation, without regard for whether Owner has already benefited from use through a portion of anticipated useful service lives.
- 1.6.7 Contractor's Procurement Obligations: Do not purchase, subcontract for, or allow others to purchase or sub-subcontract for materials or units of work for Project where a special Project warranty, specified product warranty, certification or similar commitment is required, until it has been determined that entities required to countersign such commitments are willing to do so.
- 1.6.8 Specific Warranty Forms: Where a special Project warranty (guarantee) or specific product warranty is required, prepare a written document to contain terms and appropriate identification, ready for execution by required parties. Submit draft to Owner for approval prior to final executions.

## 2. PRODUCTS

### 2.1 General Product Compliance's:

- 2.1.1 General: The compliance requirements, for individual products as indicated in contract documents, are multiple in nature and may include generic, descriptive, proprietary, performance, prescriptive, compliance with standards, compliance with codes, conformance with graphic details and other similar forms and methods of indicating requirements, all of which must be complied with. Also "allowances" and similar provisions of contract documents will have a bearing on selection process.
- 2.1.2 Procedures for Selecting Products: Contractor's options for selecting products are limited by contract document requirements, and governing regulations, and are not controlled by industry traditions or procedures experienced by Contractor on previous construction projects. Required procedures include, but are not necessarily limited to, the following for various indicated methods of specifying.
  - a. Single Product/Manufacturer Name: Provide product indicated, except advise Engineer of Record before proceeding, where known that named product is not a feasible or acceptable selection.
  - b. Two or More Product/Manufacturer Names: Provide one of the named products, at Contractor's option; but excluding

products which do not comply with requirements. Do not provide or offer to provide an unnamed product, except where none of named products comply with requirements or are feasible selection; advise Engineer of Record before proceeding.

- c. "Or Equal": Where named products in specifications text are accompanied by the term "or equal or similar", or other language of similar effect, comply with those contract document provisions concerning "substitutions" for obtaining Engineer of Record's approval (by change order) to provide an unnamed product.
- d. "Named", except as otherwise indicated, is defined to mean manufacturer's name for product, as recorded in published product literature, of latest issue as of date of contract documents. Refer to requests to use products of a later (or earlier) model to the Engineer of Record for acceptance before proceeding. PRODUCTS AND SUBSTITUTIONS 01600 - 7
- e. Standards, Codes and Regulations: Where only compliance with an imposed standard, code or regulation is required, selection from among products which comply with requirements including those standards, codes and regulations, is Contractor's option.
- f. Performance Requirements: Provide products which comply with specific performances indicated, and which are recommended by manufacturer (in published product literature or by individual certification) for application indicated. Overall performance of a product is implied where product is specified with only certain specific performance requirements.
- g. Prescriptive Requirements: Provide products which have been produced in accordance with prescriptive requirements, using specified ingredients and components, and complying with specified requirements for mixing, fabricating, curing, finishing, testing and similar operations in manufacturing process.
- h. Visual Matching: Where matching with an established sample is required, final judgement of whether a product proposed by Contractor matches sample satisfactorily is the Engineer of Record's judgment. Where no product within

specified cost category is available, which matches sample satisfactorily and complies with requirements, comply with contract document provisions concerning, "substitutions" and "change orders" for selection of a matching product outside established cost category or of a product not complying with requirements.

- i. Visual Selection: Except as otherwise indicated, where specified product requirements include "...as selected from manufacturer's standard colors, patterns, textures..." or words of similar effect, the selection of manufacturer and basic product (complying with requirements) is Contractor's option, and subsequent selection of color, pattern and texture is Owner's selection. Where specified product requirements include "...as selected from standard colors, patterns, textures available within the industry...", or words to that effect, selection of product (complying with requirements, and within established cost category) is Owner's selection, including designation of manufacturer where necessary to obtain desired color, pattern or texture.

## 2.2 Substitutions:

2.2.1 Conditions: Contractor's request for substitution will be received and considered when extensive revisions to contract documents are not required and changes are in keeping with general intent of contract documents; when timely, fully documented and properly submitted; and when one or more of the following conditions is satisfied, all as judged by the Engineer of Record. Otherwise, requests will be returned without action except to record non-compliance with these requirements.

- a. Where request is directly related to an "or equal" clause or other language of same effect in contract documents.
- b. Where required product, material or method cannot be provided within Contract Time, but not as a result of Contractor's failure to pursue the work promptly to coordinate various activities properly.
- c. Where required product, material or method cannot be provided in a manner which is compatible with other materials of the work, or cannot be properly coordinated, therewith, or cannot be warranted as required, or cannot be used without adversely affecting Owner's insurance coverage on completed work, or will encounter other

substantial noncompliance's which are not possible to otherwise overcome except by making requested substitution, which Contractor thereby certifies to overcome such noncompatibility, non-coordination, nonwarranty, non-insurability or other noncompliance as claimed.

- d. Where required product, material or method cannot receive required approval by a governing authority, and requested substitution can be so approved.
- e. Where substantial advantage is offered Owner, in terms of cost, time, energy conservation or other valuable considerations, after deducting offsetting responsibilities Owner may be required to bear, including additional compensation to Engineer of Record for redesign and evaluation services, increased cost of other work by Owner or separate Contractors, and similar considerations.

2.2.2 Work-Related Submittals: Contractor's submittal of, (and Engineer of Record's acceptance or approval of) shop drawings, product data or samples which indicated work not complying with requirements of contract documents, does not constitute an acceptable and valid request for, nor approval of, a substitution.

### 2.3 General Product Requirements:

2.3.1 General: Provide products which comply with requirements, and which are undamaged and unused at time of installation, and which are complete with accessories, trim, finish, safety guards and other devices and details needed for a complete installation and for intended use and effect.

- a. Standard Products: Where available, provide standard products of types which have been produced and used previously and successfully on other projects and in similar applications.
- b. Continued Availability: Where additional amounts of a product, by nature of its application, are likely to be needed by Owner at a later date for maintenance and repair or replacement work, provide a standard, domestically produced product which is likely to be available to Owner at such later date.

2.3.2 Nameplates: Except as otherwise indicated for required approval labels, and operating data, do not permanently attach or imprint manufacturer's or producer's nameplates or trademarks on

exposed surfaces of products which will be exposed to view either in occupied spaces or on exterior of the work.

- a. Labels: Locate required labels and stamps on a concealed surface or, where required for observation after installation, on an accessible surface which, in occupied spaces, is not conspicuous.
- b. Equipment Nameplates: Provide permanent nameplate on each item of service connected or power operated equipment. Indicate manufacturer, product name, model number, serial number, capacity, speed, ratings and similar essential operating data. Locate nameplates on an easily accessed surface, which, in occupied spaces, is not conspicuous.

END OF SECTION 01600



## 1. GENERAL

- 1.1 Related Documents: Drawings and general provisions of the Contract, including General and Supplementary Conditions and other Division-1 Specification sections, apply to work specified in this and all other Division-1 sections.
- 1.2 Description of Requirements: Closeout is hereby defined to include general requirements near the end of Contract Time, in preparation for final acceptance, final payment, normal termination of Contract, occupancy by Owner and similar actions evidencing completion of the work. Specific requirements for individual units of work are specified in sections of Division 2 through 16. Time of closeout is directly related to "Substantial Completion", and therefore may be either a single time period for entire work which has been certified as substantially complete at different dates. That time variation (if any) shall be applicable to other provisions of this section.
- 1.3 Prerequisites for Substantial Completion:
  - 1.3.1 General: Prior to requesting Engineer of Record's review for certification of substantial completion (for either entire work or portions thereof), complete the following and list known exceptions in request:
    - a. In progress payment request, coincident with or first following date claimed, show either 100% completion for portion of work claimed as "substantially complete", or list incomplete items, value of incompleteness, and reasons for being incomplete.
    - b. Include supporting documentation for completion as indicated in these contract documents.
    - c. Submit statement-showing accounting of changes to the Contract Sum.
    - d. Submit special warranties, workmanship/maintenance Bonds, maintenance agreements, final certifications and similar documents.
    - e. Obtain and submit releases enabling Owner's full and unrestricted use of the work and access to services and utilities, including (where required) occupancy permits, operating certificate, and similar releases.
    - f. Deliver tools, spare parts, extra stocks of materials, and similar physical items to Owner.

- g. Make final changeover of locks and/or transmit keys to Owner, and advise Owner's personnel to changeover in security provisions.
- h. Complete start-up testing of systems, and instructions of Owner's operating/maintenance personnel. Discontinue (or changeover) and remove from Project Site temporary facilities and services, along with construction tools and facilities, mock-ups, and similar elements. See also 01505/2/1.4.2.
- i. Complete final cleaning up requirements, including touch-up or repainting of marred surfaces. Touch-up and otherwise repair and restore marred exposed finishes for a uniform appearance.
- j. Provide a copy of Certificate of Occupancy from Building Inspections before the substantial completion inspection.

1.3.2 Reviewing Procedures: Upon receipt of Contractor's request, Engineer of Record will either proceed with review or advise Contractor of prerequisites not fulfilled. Following initial review, Engineer of Record will either prepare AIA form for substantial completion, or advise Contractor of work which must be performed prior to issuance of certificate; and repeat review when requested and assured that work has been substantially completed. Results of completed review will form initial "punch-list" for final acceptance.

#### 1.4 Prerequisites for Final Acceptance:

- 1.4.1 General: Prior to requesting Engineer of Record's final review for certification of final acceptance and final payment, as required by General Conditions, complete the following and list known exceptions (if any) in request:
  - a. Submit final payment request with final releases and supporting documentation not previously submitted and accepted. Include certificates of insurance for products and completed operations where required.
  - b. Submit updated final statement, accounting for additional (final) changes to the Contract Sum.
  - c. Submit certified copy of Engineer of Record's final punch-list of itemized work to be completed or corrected, stating that each item has been completed or otherwise resolved for acceptance, endorsed and dated.
  - d. Submit consent to surety.

- e. Submit final liquidated damages settlement statement, if any, acceptable to Owner.
- f. Revise and submit evidence of final, continuing insurance coverage complying with insurance requirements.

1.4.2 Re-reviewing Procedure: Upon receipt of Contractor's notice that the work has been completed, including punch-list items resulting from earlier reviews, and expecting incomplete items delayed because of acceptable circumstances, Engineer of Record will rereview the work. Upon completion of review, Engineer of Record will either prepare certificate of final acceptance or advise Contractor of work not completed or obligations not fulfilled as required for final acceptance. If necessary, procedure will be repeated.

#### 1.5 Record Document Submittals:

1.5.1 General: Specific requirements for record documents are indicated in individual sections of these specifications. Other requirements are indicated in General Conditions. General submittal requirements are indicated in "Submittals" sections. Do not use record documents for construction purposes; protect from deterioration and loss in a secure fire-resistive location; provide access to record documents for Engineer of Record's reference during normal working hours.

1.5.2 Record Drawings: Maintain a white-print set (blue-line or black-line) of contract drawings and shop drawings in clean, undamaged condition, with mark-up of actual installations which vary substantially from the work as originally shown. Mark whichever drawing is most capable of showing "field" condition fully and accurately; however, where shop drawings are used for mark-up, record a cross-reference at corresponding locations on working drawings. Mark with red erasable pencil and, where feasible, use other colors to distinguish between variations in separate categories of work. Mark-up new information that is recognized to be of importance to Owner, but was for some reason not shown on either the contract drawings or shop drawings. Give particular attention to concealed work, which would be difficult to measure and record at a later date. Note related change order numbers where applicable. Organize record drawing sheets into manageable sets, bind with durable paper cover sheets, and print suitable titles, dates and other identification on cover of each set. Also supply to the Owner, one (1) set of reproducible Mylar sepias of all as-built drawings.

- 1.5.3 Record Specifications: Maintain one copy of specifications, including addenda, change orders and similar modifications issued in printed form during construction, and mark-up variation (of substance) in actual work in comparison with text of specifications and modifications as issued. Give particular attention to specifications and modifications as issued. Give particular substitutions, selection of options, and similar information on work where it is concealed or cannot otherwise be readily discerned at a later date by direct observation. Note related record drawing information and product data, where applicable. Upon completion of mark-up, submit to Owner for Owner's records.
- 1.5.4 Record Product Data: Maintain one copy of each product data submittal, and mark-up significant variations in actual work in comparison with submitted information. Include both variations in product as delivered to site and variations from manufacturer's instructions and recommendations for installation. Give particular attention to concealed products and portions of the work that cannot otherwise be readily discerned at a later date by direct observation. Note related change orders and mark-up of record drawings and specifications. Upon completion of mark-up, submit complete set to Owner for Owner's records.
- 1.5.5 Miscellaneous Record Submittals: Refer to other sections of these specifications for requirements of miscellaneous record-keeping and submittals in connection with actual performance of the work. Immediately prior to date(s) of substantial completion, complete miscellaneous records and place in good order, properly identified and bound or filed, ready for continued use and reference. Submit to Owner for Owner's records.
- 1.5.6 Maintenance Manuals: Organize maintenance and- operating manual information into suitable sets of manageable size, and bind into individual binders properly identified and indexed (thumb-tabbed). Include emergency instructions, spare parts listing, copies of warranties, wiring diagrams, recommended "turn-around" cycles, inspection procedures, shop drawings, product data, and similar applicable information. Bind each manual of each set in a heavy-duty 2", 3-ring vinyl-covered binder, and include pocket folders for folded sheet information. Mark identification on both front and spine of each binder. **Additionally, provide electronic copy of all manuals in .pdf format.**

## 2. PRODUCTS (Not Applicable)

### 3. EXECUTION

3.1 General Operating/Maintenance Instructions: Arrange for each installer of work requiring continuing maintenance or operation, to meet with Owner's personnel, at Project Site, to provide basic instructions needed for proper operation and maintenance of entire work. Include instructions by manufacturer's representatives where installers are not expert in the required procedures. Review maintenance manuals, record documentation, tools, spare parts and materials, lubricants, fuels, identification systems, control sequences, hazards, cleaning and similar procedures and facilities. For operational equipment, demonstrate start-up, shutdown, emergency operations, noise and vibration adjustments, safety, economy/efficiency adjustment, energy effectiveness, and similar operations. Review maintenance and operations in relation with applicable warranties and agreements, to maintain Bonds and similar continuing commitments.

#### 3.2 Final Cleaning:

3.2.1 General: Special cleaning for specific units of work is specified in sections of Division 2 through 16. General cleaning during progress of work is specified in General Conditions and as temporary services. Provide final cleaning of entire Project by a business currently engaged to provide services of this nature. Contractors own work forces are not acceptable. Provide final cleaning of the work, at time indicated, consisting of cleaning each surface or unit of work to normal "clean" condition expected for a first-class building cleaning and maintenance program. Comply with manufacturers' instructions for cleaning operations. The following are examples, but not by way of limitation, of cleaning levels required:

- a. Remove labels that are not required as permanent labels.
- b. Clean transparent materials, including mirrors and window/door glass, to a polished condition, removing substances that are noticeable as vision-obscuring materials. Replace scratched or broken glass and damaged transparent materials.
- c. Clean exposed exterior and interior hard-surfaced finishes, to a dirt-free condition, free of dust, stains, films and similar noticeable distracting substances. Except as otherwise indicated, avoid disturbance of natural weathering of exterior surfaces. Restore reflective surfaces to original reflective condition.

- d. Wipe surfaces of mechanical and electrical equipment clean, remove excess lubrication and other substances.
- e. Remove debris and surface dust from limited-access spaces including roofs, plenums, shafts, equipment spaces, manholes, attics or lofts and similar spaces.
- f. Clean concrete floors in non-occupied spaces broom clean.
- g. Vacuum clean carpeted surfaces and similar soft surfaces.
- h. Clean plumbing fixtures to a sanitary condition, free of stains including those resulting from water exposure.
- i. Clean light fixtures and lamps so as to function with full efficiency.
- j. Clean Project Site (yard and grounds), including landscape, development areas, of litter and foreign substances. Sweep paved areas to a broom-clean condition; remove stains, petro-chemical spills and other foreign deposits. Rake grounds that are neither planted nor paved, to a smooth, even-textured surface.

3.2.2 Removal of Protection: Except as otherwise indicated or requested by the Owner, remove temporary protection devices and facilities which were installed during course of the work to protect previously completed work during remainder of construction period. A concerted effort shall be made between the General Contractor and all Subcontractors for proper protection of all finishes and systems thru-out the project until final completion of the entire project.

3.2.3 Compliance's: Comply with safety standards and governing regulations for cleaning operations. Do not burn waste materials at site, or bury debris or excess materials on Owner's property, or discharge volatile or other harmful or dangerous materials into drainage systems; remove waste materials from site and dispose of in a lawful manner.

- a. Where extra materials of value remaining after completion of the associated work have become Owner's property, dispose of these to Owner's best advantage as directed by the Owner.

END OF SECTION 01700

1. GENERAL:
  - 1.1 Compile specified warranties. Co-execute submittals when required. Review submittals to verify compliance with Contract Documents. Submit to Owner for review.
  - 1.2 Related requirements in other parts of the Project Manual include the Bid Bond, the Contract Bond(s), and the general warranty of construction contained in the General Conditions.
  - 1.3 Make submittals within ten (10) days after Date of Substantial Completion, and prior to final request for payment.
2. SUBMITTAL REQUIREMENTS:
  - 2.1 Assemble warranties executed by each of the respective manufacturer's suppliers, and subcontractors.
  - 2.2 Number of original signed copies required: Two (2) each.
  - 2.3 Table of Contents: Typed, in orderly sequence. Provide complete information for each item as follows:
    - Product or work item.
    - Firm, with name of principal, address and telephone number.
    - Scope.
    - Date of beginning of warranty.
    - Duration of Warranty.
    - Provide information for Owner's personnel such as proper procedure in case of failure, or instances that might affect the validity of the warranty.
    - Contractor, name of responsible principal, address and telephone number.
  - 2.4 Furnish all equipment submittals to the Owner immediately, upon receipt, for all Owner purchased equipment that is handled through the Contractor's office by Owner supplied purchase orders.

END OF SECTION 01740

**DIVISION 2**

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**SITE WORK**



**PART 1 – GENERAL**

The Contractor shall furnish all labor, materials, tools, equipment, and perform all work and services for soil poisoning as shown on drawings and as specified in accordance with provisions of the contract documents, and completely coordinate with work of all other trades. The soil poisoning Contractor shall be EcoLab, Charlie's Pest Control, Orkin, Terminex or other as approved by Owner/ Engineer of Record. The Contractor is to notify the Owner's Representative and Engineer 48 hours prior to application so that the work may be witnessed in the field by Owner/Engineer. The General Contractor is to cooperate and coordinate with the soil poisoning contractor and Owner.

**PART 2 - MATERIALS**

Cyper TC Insecticide or approved equal. Submit for approval prior to beginning work.

**PART 3 - APPLICATION**

Applications shall be in strict accordance with the recommendations of the National Pest Control Association applied at the following rates:

1. At each side of exterior walls, apply 2 gallons per 5 lineal feet.
2. At all penetrations through floor slab, including column walls, conduit, etc., apply 2 gallons per lineal foot.
3. Under all interior floor slabs on grade, 1 gallon per 10 square feet of area.
4. Area under concrete slabs shall be sprayed after grading is complete and before waterproof membrane is installed.

**PART 4 - GUARANTEE**

Treatment shall remain effective for not less than 5 years. The contractor shall furnish a written 5- year guarantee and three (3) copies stating that if at any time during the 5-year period, ground nesting termites occur, treatment will be applied to exterminate all infestation with no cost to owner.

END OF SECTION 02280

**DIVISION 3**

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**CONCRETE**

**1. GENERAL****1.1 RELATED DOCUMENTS**

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

**1.2 SUMMARY**

A. Extent of concrete work is shown on drawings.

B. Concrete walks are specified in Division 2.

**1.3 SUBMITTALS**

A. Product Data: Submit data for proprietary materials and items, including reinforcement and forming accessories, admixtures, patching compounds, waterstops, joint systems, curing compounds, and others as requested by Engineer of Record.

B. Shop Drawings; Reinforcement: Submit original shop drawings prepared by registered Professional Engineer for fabrication, bending, and placement of concrete reinforcement. Comply with ACI 315 "Manual of Standard Practice for Detailing Reinforced Concrete Structures" showing bar schedules, stirrup spacing, diagrams of bent bars, arrangement of concrete reinforcement. Include special reinforcement required for openings through concrete structures.

C. Laboratory Test Reports: Submit laboratory test reports for concrete materials and mix design test for approval before placement of any concrete.

**1.4 QUALITY ASSURANCE**

A. Codes and Standards: Comply with provisions of following codes, specifications, and standards, except where more stringent requirements are shown or specified:

1. ACI 301 "Specifications for Structural Concrete for Buildings".
2. ACI 318 "Building Code Requirements for Reinforced Concrete".
3. Concrete Reinforcing Steel Institute (CRSI), "Manual of Standard Practice".

B. Concrete Testing Service: Engage a testing laboratory acceptable to Engineer of Record to prepare test specimens, perform material evaluation tests and to design concrete mixes. This shall be included in contract work.

Materials and installed work may require testing and re-testing at anytime during progress of work. Tests, including retesting of rejected materials for installed work, shall be done at Contractor's expense.

**1.5 PROJECT CONDITIONS**

A. Protection of Footings Against Freezing: Cover completed work at footing level with sufficient temporary or permanent cover as required to protect footings and adjacent subgrade against possibility of freezing; maintain cover for time period as necessary. Protect adjacent finish materials against spatter during concrete placement.

## 2. PRODUCTS

### 2.1 FORM MATERIALS

A. Forms for Exposed Finish Concrete: Plywood, metal, metal-framed plywood faced, or other acceptable panel-type materials, to provide continuous, straight, smooth, exposed surfaces. Furnish in largest practicable sizes to minimize number of joints and to conform to joint system shown on drawings.

B. Forms for Unexposed Finish Concrete: Plywood, lumber, metal, or other acceptable material. Provide lumber dressed on at least 2 edges and one side for tight fit.

C. Form Coatings: Provide commercial formulation form-coating compounds that will not bond with, stain, nor adversely affect concrete surfaces, and will not impair subsequent treatments of concrete surfaces.

### 2.2 REINFORCING MATERIALS

A. Reinforcing Bars: ASTM A 615, Grade 60, deformed.

B. Steel Wire: ASTM A 82, plain, cold-drawn steel.

C. Supports for Reinforcement: Bolsters, chairs, spacers, and other devices for spacing, supporting, and fastening reinforcing bars and welded wire fabric in place. Use wire bar type supports complying with CRSI specifications.

1. For slabs-on-grade, use supports with sand plates or horizontal runners where base material will not support chair legs.

2. For exposed-to-view concrete surfaces, where legs of supports are in contact with forms, provide supports with legs which are plastic protected (CRSI, Class 1) or stainless steel protected (CRSI, Class 2).

### 2.3 CONCRETE MATERIALS

A. Portland Cement: ASTM C 150, Type I. Use one brand of cement throughout project, unless otherwise acceptable to Engineer of Record.

B. Normal Weight Aggregates: ASTM C 33, and as herein specified. Provide aggregates from a single source for exposed concrete.

1. Local aggregates not complying with ASTM C 33 but which have shown by special test or actual service to produce concrete of adequate strength and durability may be used when acceptable to Engineer of Record.

C. Water: Drinkable.

D. Air-Entraining Admixture: ASTM C 260, certified by manufacturer to be compatible with other required admixtures.

1. Available Products: Subject to compliance with requirements, products which may be incorporated in the work include, but are not limited to, the following:

2. Products: Subject to compliance with requirements, provide one of the following:

"Air-Mix"; Euclid Chemical Co.

"Sika Aer"; Sika Corp.

"MB-VR or MB-AE"; Master Builders.

"Darex AEA" or "Daravair"; W.R. Grace.

"Edoco 2001 or 2002"; Edoco Technical Products.

"Air-Tite"; Gifford-Hill/American Admixtures.

E. Water-Reducing Admixture: ASTM C 494, Type A, and containing not more than 0.1 percent chloride ions.

1. Available Products: Subject to compliance with requirements, products which may be incorporated in the work include, but are not limited to, the following:

2. Products: Subject to compliance with requirements, provide one of the following: "WRDA Hycol"; W.R. Grace.

"PSI N"; Gifford-Hill/American Admixtures.

"Eucon WR-75"; Euclid Chemical Co.

"Pozzolith Normal"; Master Builders.

"Plastocrete 160"; Sika Chemical Corp.

"Chemtard"; Chem-Masters Corp.

"Pro-Kete-N"; Protex Industries, Inc.

F. High-Range Water-Reducing Admixture (Super Plasticizer): ASTM C 494, Type F or Type G and containing not more than 0.1 percent chloride ions.

1. Available Products: Subject to compliance with requirements, products which may be incorporated in the work include, but are not limited to, the following:

2. Products: Subject to compliance with requirements, provide one of the following:

"WRDA 19" or "Daracem"; W.R. Grace.

"PSP"; Protex Industries Inc.

"Super P"; Anti-Hydro.

"Sikament"; Sika Chemical Corp.

"Mighty 150"; ICI Americas Corp.

"Eucon 37"; Euclid Chemical Co.

"PSI Super"; Gifford-Hill.

"Rheobuild"; Master Builders.

G. Prohibited Admixtures: Calcium chloride thiocyanates or admixtures containing more than 0.1 percent chloride ions are not permitted.

## 2.4 RELATED MATERIALS

A. Polyvinyl Chloride Waterstops: Corps of Engineers CRD-C 572.

1. Available Manufacturers: Subject to compliance with requirements, manufacturers offering products which may be incorporated in the work include, but are not limited to, the following:

2. Manufacturer: Subject to compliance with requirements, provide products of one of the following:

AFCO Products.

The Burke Co.

Edoco Technical Products.

Greenstreet Plastic Products.

Harbour Town Products.

W.R. Meadows.

Progress Unlimited.

Schleigel Corp.

Vinylex Corp.

B. Vapor Retarder: Provide vapor retarder cover over prepared base material where indicated below slabs on grade. Use only materials that are resistant to decay when tested in accordance with ASTM E 154, as follows:

1. See Section 07192 – Laminated Vapor Barrier.

C. Non-Shrink Grout: CRD-C 621, factory pre-mixed grout.

1. Products: Subject to compliance with requirements, provide one of the following:

Non-metallic:

"Set Grout"; Master Builders.

"SonogROUT"; Sonneborn-Rexnord.

"Euco-NS"; Euclid Chemical Co.

"Supreme"; Gifford-Hill/American Admixtures.

"Crystex"; L & M Const. Chemical Co.

"Sure-Grip Grout"; Dayton Superior Corp.

"Horngrout"; A.C. Horn, Inc.

"Five Star Grout"; U.S. Grout Corp.

D. Absorptive Cover: Burlap cloth made from jute or kenaf, weighing approximately 9 oz. per sq. yd., complying with AASHTO M 182, Class 2.

E. Moisture-Retaining Cover: One of the following, complying with ASTM C 171.

1. Waterproof paper.

2. Polyethylene film.

3. Polyethylene-coated burlap.

F. Liquid Membrane-Forming Curing Compound: Liquid type membrane-forming curing compound complying with ASTM C 309, Type I, Class A. Moisture loss not more than 0.055 gr./sq. cm. when applied at 200 sq. ft./gal.

1. Products: Subject to compliance with requirements, provide one of the following:

"Masterseal"; Master Builders.

"A-H 3 Way Sealer "; Anti-Hydro Waterproofing Co.

"Ecocure"; Euclid Chemical Co.

"Clear Seal"; A.C. Horn, Inc.

"Sealco 309"; Gifford-Hill/American Admixtures.

"J-20 Acrylic Cure"; Dayton Superior.

"Spartan-Cote"; The Burke Co.

"Sealkure"; Toch Div. - Carboline.

"Kure-N-Seal"; Sonneborn-Rexnord.

"Polyclear"; Upco Chemical/USM Corp.

"L&M Cure"; L & M Construction Chemicals.

"Klearseal"; Setcon Industries.

"LR-152"; Protex Industries.

"Hardtop"; Gifford-Hill.

G. Underlayment Compound: Free flowing, selfleveling, pumpable cementitious base compound.

1. Products: Subject to compliance with requirements, provide one of the following:

"Flo-Top"; Euclid Chemical Co.

"ACD Pourable Underlayment"; ACD International, Inc.

"Thoro Underlayment Self-Leveling"; Thoro System Products.

H. Bonding Compound: Polyvinyl acetate or acrylic base.

1. Available Products: Subject to compliance with requirements, products which may be incorporated in the work include, but are not limited to, the following:

2. Polyvinyl Acetate (Interior Only):

"Euco Weld"; Euclid Chemical Co.

"Weldcrete"; Larsen Products Corp.

3. Acrylic or Styrene Butadiene:

"J-40 Bonding Agent"; Dayton Superior Corp.

"Everbond"; L & M Construction Chemicals.

"Hornweld"; A.C. Horn, Inc.

"Sonocrete"; Sonneborn-Rexnord.

"Acrylic Bondcrete"; The Burke Co.

"SBR Latex"; Euclid Chemical Co.

"Daraweld C"; W.R. Grace.

I. Epoxy Adhesive: ASTM C 881, two component material suitable for use on dry or damp surfaces. Provide material "Type", "Grade", and "Class" to suit project requirements.

1. Available Products: Subject to compliance with requirements, products which may be incorporated in the work include, but are not limited to, the following:

"Thiopoxy"; W.R. Grace.



"Epoxtite"; A.C. Horn, Inc.

"Edoco 2118 Epoxy Adhesive"; Edoco Technical Prod.

"Sikadur Hi-Mod"; Sika Chemical Corp.

"Euco Epoxy 452 or 620"; Euclid Chemical Co.

"Patch and Bond Epoxy"; The Burke Co.

"Concresive 1001"; Adhesive Engineering Co.

## 2.5 PROPORTIONING AND DESIGN OF MIXES

A. Prepare design mixes for each type and strength of concrete by either laboratory trial batch or field experience methods as specified in ACI 301. If trial batch method used, use an independent testing facility acceptable to Engineer of Record for preparing and reporting proposed mix designs. The testing facility shall not be the same as used for field quality control testing.

1. Limit use of fly ash to not exceed 15 percent of cement content by weight.

B. Submit written reports to Engineer of Record and Structural Engineer of each proposed mix for each class of concrete at least 15 days prior to start of work. Do not begin concrete production until mixes have been reviewed by Engineer of Record.

C. Design mixes to provide normal weight concrete with the following properties, as indicated on drawings and schedules:

1. Ultimate strength: a. Footing, grade beams, slabs on grade - 3,000 psi at 28 days.

b. Walls and beams - 4,000 psi at 28 days.

c. Grout – (Sand/Cement) 3,000 psi @ 28 days

D. Adjustment to Concrete Mixes: Mix design adjustments may be requested by Contractor when characteristics of materials, job conditions, weather, test results, or other circumstances warrant; at no additional cost to Owner and as accepted by Engineer of Record. Laboratory test data for revised mix design and strength results must be submitted to and accepted by Engineer of Record before using in work.

E. Admixtures:

1. Use water-reducing admixture or high range water-reducing admixture (super plasticizer) in concrete as required for placement and workability.

2. Use non-chloride accelerating admixture in concrete slabs placed at ambient temperatures below 50 deg F.

3. Use high-range water-reducing admixture in pumped concrete, concrete for industrial slabs, Engineer of Record concrete, concrete required to be watertight, and concrete with water/cement ratios below 0.50.

4. Use air-entraining admixture in exterior exposed concrete, unless otherwise indicated. Add air-entraining admixture at manufacturer's prescribed rate to result in concrete at point of placement having total air content with a tolerance of plus-or-minus 1- 1/2 percent within following limits:
  - a. Concrete structures and slabs exposed to freezing and thawing, deicer chemicals, or subjected to hydraulic pressure: (1) 5.0 percent (moderate exposure); 6.0 percent (severe exposure) 3/4" max. aggregate.
  - b. Other Concrete (not exposed to freezing, thawing, or hydraulic pressure): 2 percent to 4 percent air.
5. Use admixtures for water reducing and setcontrol in strict compliance with manufacturer's directions.
6. Water-Cement Ratio: Provide concrete for following conditions with maximum watercement (W/C) ratios as follows:
  - a. Subjected to freezing and thawing: W/C 0.50.
7. Slump Limits: Proportion and design mixes to result in concrete slump at point of placement as follows:
  - a. Footings, slabs on grade and walls: Not more than 4".
  - b. Reinforced foundation systems: Not less than 1" and not more than 4".
  - c. Concrete containing HRWR admixture (super-plasticizer): Not more than 8" after addition of HRWR concrete.
8. Other concrete: Not less than 1" or more than 4".

## 2.6 CONCRETE MIXING

A. Ready-Mix Concrete: Comply with requirements of ASTM C 94, and as herein specified. During hot weather, or under conditions contributing to rapid setting of concrete, a shorter mixing time than specified in ASTM C 94 may be required.

## 3. EXECUTION

### 3.1 GENERAL

A. Coordinate the installation of joint materials and vapor retarders with placement of forms and reinforcing steel.

### 3.2 FORMS

A. Design, erect, support, brace, and maintain formwork to support vertical and lateral, static, and dynamic loads that might be applied until such loads can be supported by concrete structure. Construct formwork so that concrete members and structures are of correct size, shape, alignment, elevation, and position. Maintain formwork construction tolerances complying with ACI 347.

B. Design formwork to be readily removable without impact, shock or damage to cast-in-place concrete surfaces and adjacent materials.

C. Construct forms to sizes, shapes, lines, and dimensions shown, and to obtain accurate alignment, location, grades, level and plumb work in finished structures. Provide for openings, offsets, sinkages,

keyways, recesses, moldings, rustications, reglets, chamfers, blocking, screeds, bulkheads, anchorages and inserts, and other features required in work. Use selected materials to obtain required finishes. Solidly butt joints and provide back up at joints to prevent leakage of cement paste.

D. Fabricate forms for easy removal without hammering or prying against concrete surfaces. Provide crush plates or wrecking plates where stripping may damage cast concrete surfaces. Provide top forms for inclined surfaces where slope is too steep to place concrete with bottom forms only. Kerf wood inserts for forming keyways, reglets, recesses, and the like, to prevent swelling and for easy removal.

E. Provide temporary openings where interior area of formwork is inaccessible for cleanout, for inspection before concrete placement, and for placement of concrete. Securely brace temporary openings and set tightly to forms to prevent loss of concrete mortar. Locate temporary openings on forms at inconspicuous locations.

F. Chamfer exposed corners and edges as indicated, using wood, metal, PVC, or rubber chamfer strips fabricated to produce uniform smooth lines and tight edge joints.

G. Provisions for Other Trades: Provide openings in concrete formwork to accommodate work of other trades. Determine size and location of openings, recesses, and chases from trades providing such items. Accurately place and securely support items built into forms.

H. Cleaning and Tightening: Thoroughly clean forms and adjacent surfaces to receive concrete. Remove chips, wood, sawdust, dirt, or other debris just before concrete is placed. Retightening forms and bracing after concrete placement is required to eliminate mortar leaks and maintain proper alignment.

### 3.3 VAPOR RETARDER INSTALLATION

A. Following leveling and tamping of granular base for slabs on grade, place vapor retarder sheeting with longest dimension parallel with direction of pour. Lap joints 6" and seal with appropriate tape.

### 3.4 PLACING REINFORCEMENT

A. Comply with Concrete Reinforcing Steel Institute's recommended practice for "Placing Reinforcing Bars", for details and methods of reinforcement placement and supports, and as herein specified.

1. Avoiding cutting or puncturing vapor retarder during reinforcement placement and concreting operations.

B. Clean reinforcement of loose rust and mill scale, earth, ice, and other materials, which reduce or destroy bond with concrete.

C. Accurately position, support, and secure reinforcement against displacement by formwork, construction, or concrete placement operations. Locate and support reinforcing by metal chairs, runners, bolsters, spacers, and hangers, as required.

D. Place reinforcement to obtain at least minimum coverages for concrete protection, according to ACI-318, Section 7.7.1. Arrange, space, and securely tie bars and bar supports to hold reinforcement in position during concrete placement operations. Set wire ties so ends are directed into concrete, not toward exposed concrete surfaces.

### 3.5 JOINTS

A. Construction Joints: Locate and install construction joints as indicated or, if not indicated, locate so as not to impair strength and appearance of the structure, as acceptable to Engineer of Record.

B. Provide keyways at least 1-1/2" deep in construction joints in walls, slabs, and between walls and footings, accepted bulkheads designed for this purpose may be used for slabs.

C. Place construction joints perpendicular to main reinforcement. Continue reinforcement across construction joints, except as otherwise indicated.

D. Waterstops: Provide waterstops in construction joints as indicated. Install waterstops to form continuous diaphragm in each joint. Make provisions to support and protect exposed waterstops during progress of work. Fabricate field joints in waterstops in accordance with manufacturer's printed instructions.

E. Isolation Joints in Slabs-on-Ground: Construct isolation joints in slabs-on-ground at points of contact between slabs-on-ground and vertical surfaces, such as column pedestals, foundation walls, grade beams, and elsewhere as indicated.

1. Joint filler and sealant materials are specified in Division-7 Sections of these Specifications.

F. Contraction (Control) Joints in Slabs-on-Ground: Construct contraction joints in slabs-on-ground to form panels of patterns as shown. Use saw cuts 1/8" x 1/4 slab depth or inserts 1/4" wide x 1/4 of slab depth, unless otherwise indicated.

G. Form contraction joints by inserting premolded plastic, hardboard or fiberboard strip into fresh concrete until top surface of strip is flush with slab surface. Tool slab edges round on each side of insert. After concrete has cured, remove inserts and clean groove of loose debris.

1. Contraction joints in unexposed floor slabs may be formed by saw cuts as soon as possible after slab finishing as may be safely done without dislodging aggregate.

H. If joint pattern not shown, provide joints not exceeding 15' in either direction and located to conform to bay spacing wherever possible (at column centerlines, half bays, third-bays).

1. Joint sealant material is specified in Division-7 sections of these specifications.

### 3.6 INSTALLATION OF EMBEDDED ITEMS

A. General: Set and build into work anchorage devices and other embedded items required for other work that is attached to, or supported by, cast-in-place concrete.

### 3.7 PREPARATION OF FORM SURFACES

A. Clean reused forms of concrete matrix residue, repair and patch as required to return forms to acceptable surface condition.

B. Coat contact surfaces of forms with a form-coating compound before reinforcement is placed.

C. Thin form-coating compounds only with thinning agent of type, amount, and under conditions of form-coating material to accumulate in forms or to come into contact with in-place concrete surfaces against which fresh concrete will be placed. Apply in compliance with manufacturer's instructions.

### 3.8 CONCRETE PLACEMENT

A. Preplacement Inspection: Before placing concrete, inspect and complete formwork installation, reinforcing steel, and items to be embedded or cast-in. Notify other crafts to permit installation of their work; cooperate with other trades in setting such work. Moisten wood forms immediately before placing concrete where form coatings are not used.

1. Apply temporary protective covering to lower 2' of finished walls adjacent to poured floor slabs and similar conditions, and guard against spattering during placement.

B. General: Comply with ACI 304 "Recommended Practice for Measuring, Mixing, Transporting, and Placing Concrete", and as herein specified. Deposit concrete continuously or in layers of such thickness that no concrete will be placed on concrete which has hardened sufficiently to cause the formation of seams or planes of weakness. If a section cannot be placed continuously, provide construction joints as herein specified. Deposit concrete as nearly as practicable to its final location to avoid segregation.

C. Placing Concrete in Forms: Deposit concrete in forms in horizontal layers not deeper than 24" and in a manner to avoid inclined construction joints. Where placement consists of several layers, place each layer while preceding layer is still plastic to avoid cold joints.

D. Consolidate placed concrete by mechanical vibrating equipment supplemented by hand spading, rodding, or tamping. Use equipment and procedures for consolidation of concrete in accordance with ACI 309.

E. Do not use vibrators to transport concrete inside forms. Insert and withdraw vibrators vertically at uniformly spaced locations not farther than visible effectiveness of machine. Place vibrators to rapidly penetrate placed layer and at least 6" into preceding layer. Do not insert vibrators into lower layers of concrete that have begun to set. At each insertion limit duration of vibration to time necessary to consolidate concrete and complete embedment of reinforcement and other embedded items without causing segregation of mix.

F. Placing Concrete Slabs: Deposit and consolidate concrete slabs in a continuous operation, within limits of construction joints, until the placing of a panel or section is completed.

G. Consolidate concrete during placing operations so that concrete is thoroughly worked around reinforcement and other embedded items and into corners.

H. Bring slab surfaces to correct level with straight edge and strikeoff. Use bull floats or darbies to smooth surface, free of humps or hollows. Do not disturb slab surfaces prior to beginning finishing operations.

I. Maintain reinforcing in proper position during concrete placement operations.

J. Cold Weather Placing: Protect concrete work from physical damage or reduced strength which could be caused by frost, freezing actions, or low temperatures, in compliance with ACI 306 and as herein specified. When air temperature has fallen to or is expected to fall below 40 deg F, uniformly heat water and

aggregates before mixing to obtain a concrete mixture temperature of not less than 50 deg F, and not more than 80 deg F, at point of placement.

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

L. Do not use calcium chloride, salt, and other materials containing antifreeze agents or chemical accelerators, unless otherwise accepted in mix designs.

M. Hot Weather Placing: When hot weather conditions exist that would seriously impair quality and strength of concrete, place concrete in compliance with ACI 305 and as herein specified.

N. Cool ingredients before mixing to maintain concrete temperature at time of placement below 90 deg F. Mixing water may be chilled, or chopped ice may be used to control temperature provided water equivalent of ice is calculated to total amount of mixing water. Use of liquid nitrogen to cool concrete is Contractor's option.

O. Cover reinforcing steel with water-soaked burlap if it becomes too hot, so that steel temperature will not exceed the ambient air temperature immediately before embedment in concrete.

P. Fog spray forms, reinforcing steel and subgrade just before concrete is placed.

Q. Use water-reducing retarding admixture (Type D) when required by high temperatures, low humidity, or other adverse placing conditions.

### 3.9 FINISH OF FORMED SURFACES

A. Rough Form Finish: For formed concrete surfaces not exposed-to-view in the finish work or by other construction, unless otherwise indicated. This is the concrete surface having texture imparted by form facing material used, with tie holes and defective areas repaired and patched and fins and other projections exceeding 1/4" in height rubbed down or chipped off.

B. Smooth Form Finish: For formed concrete surfaces exposed-to-view, or that are to be covered with a coating material applied directly to concrete, or a covering material applied directly to concrete, such as waterproofing, dampproofing, veneer plaster, painting, or other similar system. This is as-cast concrete surface obtained with selected form facing material, arranged orderly and symmetrically with a minimum of seams. Repair and patch defective areas with fins or other projections completely removed and smoothed.

C. Float Finish: Apply float finish to monolithic slab surfaces to receive trowel finish and other finishes as hereinafter specified, and slab surfaces which are to be covered with membrane or elastic waterproofing, membrane or elastic roofing, and as otherwise indicated. After screeding, consolidating, and leveling concrete slabs, do not work surface until ready for floating. Begin floating when surface water has disappeared or when concrete has stiffened sufficiently to permit operation of power-driven floats, or both. Consolidate surface with powerdriven floats, or by hand floating if area is small or inaccessible to power units. Check and level surface plane to tolerances of F 18 - F 15. Cut down high spots and fill low spots. Uniformly slope surfaces to drains. Immediately after leveling, refloat surface to a uniform, smooth, granular texture.

D. Trowel Finish: Apply trowel finish to monolithic slab surfaces to be exposed-to-view, and slab surfaces to be covered with resilient flooring, carpet, ceramic or quarry tile, paint, or other thin film finish coating system. After floating, begin first trowel finish operation using a power-driven trowel. Begin final troweling when surface produces a ringing sound as trowel is moved over surface. Consolidate concrete surface by final handtroweling operation, free of trowel marks, uniform in texture and appearance, and with surface leveled to tolerances of F 20 - F 17. Grind smooth surface defects that would telegraph through applied floor covering system.

E. Trowel and Fine Broom Finish: Where ceramic or porcelain tile is to be installed with thin-set mortar, apply trowel finish as specified, then immediately follow with slightly scarifying surface by fine brooming.

F. Non-Slip Broom Finish: Apply non-slip broom finish to exterior concrete platforms, steps, and ramps, and elsewhere as indicated. Immediately after float finishing, slightly roughen concrete surface by brooming with fiber bristle broom perpendicular to main traffic route. Coordinate required final finish with Engineer of Record before application.

### 3.10 CONCRETE CURING AND PROTECTION

A. General: Protect freshly placed concrete from premature drying and excessive cold or hot temperatures. Start initial curing as soon as free water has disappeared from concrete surface after placing and finishing. Weather permitting, keep continuously moist for not less than 7 days. Begin final curing procedures immediately following initial curing and before concrete has dried. Continue final curing for at least 7 days in accordance with ACI 301 procedures. Avoid rapid drying at end of final curing period.

B. Curing Methods: Perform curing of concrete by curing and sealing compound, by moist curing, by moisture-retaining cover curing, and by combinations thereof, as herein specified.

C. Provide moisture curing by following methods.

1. Keep concrete surface continuously wet by covering with water.

2. Continuous water-fog spray.

3. Covering concrete surface with specified absorptive cover, thoroughly saturating cover with water and keeping continuously wet. Place absorptive cover to provide coverage of concrete surfaces and edges, with 4" lap over adjacent absorptive covers.

D. Provide moisture-cover curing as follows:

1. Cover concrete surfaces with moisture-retaining cover for curing concrete, placed in widest practicable width with sides and ends lapped at least 3" and sealed by waterproof tape or adhesive. Immediately repair any holes or tears during curing period using cover material and waterproof tape.

E. Provide curing and sealing compound to exposed interior slabs and to exterior slabs, walks, and curbs, as follows:

1. Apply specified curing and sealing compound to concrete slabs as soon as final finishing operations are complete (within 2 hours). Apply uniformly in continuous operation by power-spray or roller in accordance with manufacturer's directions. Re-coat areas subjected to heavy rainfall within 3 hours after initial

application. Maintain continuity of coating and repair damage during curing period. Do not use membrane curing compounds on surfaces which are to be covered with coating material applied directly to concrete, liquid floor hardener, waterproofing, dampproofing, membrane roofing, flooring (such as ceramic or porcelain tile, glue-down carpet), painting, and other coatings and finish materials, unless otherwise acceptable to Engineer of Record.

F. Curing Formed Surfaces: Cure formed concrete surfaces, including undersides of beams, supported slabs, and other similar surfaces by moist curing with forms in place for full curing period or until forms are removed. If forms are removed, continue curing by methods specified above, as applicable.

G. Curing Unformed Surfaces: Cure unformed surfaces, such as slabs, floor topping, and other flat surfaces by application of appropriate curing method. Final cure concrete surfaces to receive liquid floor hardener or finish flooring by use of moisture retaining cover, unless otherwise directed.

H. Sealer and Dustproofers: Apply a second coat of specified curing and sealing compound only to surfaces given a first coat.

### 3.11 REMOVAL OF FORMS

A. Formwork not supporting weight of concrete, such as sides of beams, walls, columns, and similar parts of the work, may be removed after cumulatively curing at not less than 50 deg F for 24 hours after placing concrete, provided concrete is sufficiently hard to not be damaged by form removal operations, and provided curing and protection operations are maintained.

### 3.11 RE-USE OF FORMS

A. Clean and repair surfaces of forms to be re-used in work. Split, frayed, delaminated, or otherwise damaged form facing material will not be acceptable for exposed surfaces. Apply new form coating compound as specified for new formwork. When forms are extended for successive concrete placement, thoroughly clean surfaces, remove fins and laitance, and tighten forms to close joints. Align and secure joint to avoid offsets. Do not use "patched" forms for exposed concrete surfaces, except as acceptable to Engineer of Record.

### 3.12 MISCELLANEOUS CONCRETE ITEMS

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

B. Curbs: Provide monolithic finish to interior curbs by stripping forms while concrete is still green and steel-troweling surfaces to a hard, dense finish with corners, intersections, and terminations slightly rounded.

C. Grout base plates and foundations as indicated using specified non-shrink grout. Use nonmetallic grout for exposed conditions, unless otherwise indicated.



D. Reinforced Masonry: Provide concrete grout for reinforced masonry lintels and bond beams where indicated on drawings and as scheduled. Maintain accurate location of reinforcing steel during concrete placement.

### 3.13 CONCRETE SURFACE REPAIRS

A. Patching Defective Areas: Repair and patch defective areas with cement mortar immediately after removal of forms, when acceptable to Engineer of Record. Cut out honeycomb, rock pockets, voids over 1/4" in any dimension, and holes left by tie rods and bolts, down to solid concrete but, in no case to a depth of less than 1". Make edges of cuts perpendicular to the concrete surface. Thoroughly clean, dampen with water, and brush-coat the area to be patched with specified bonding agent. Place patching mortar after bonding compound has dried.

B. For exposed-to-view surfaces, blend white Portland cement and standard Portland cement so that, when dry, patching mortar will match color surrounding. Provide test areas at inconspicuous location to verify mixture and color match before proceeding with patching. Compact mortar in place and strike-off slightly higher than surrounding surface.

C. Repair of Formed Surfaces: Remove and replace concrete having defective surfaces, if defects cannot be repaired to satisfaction of Engineer of Record. Surface defects, as such, include color and texture irregularities, cracks, spalls, air bubbles, honeycomb, rock pockets, fins and other projections on surface, and stains and other discolorations that cannot be removed by cleaning. Flush out form tie holes, fill with dry pack mortar, or precast cement cone plugs secured in place with bonding agent.

D. Correct high areas in unformed surfaces by grinding, after concrete has cured at least 14 days.

E. Correct low areas in unformed surfaces during or immediately after completion of surface finishing operations by cutting out low areas and replacing with fresh concrete. Finish repaired areas to blend into adjacent concrete. Proprietary patching compounds may be used when acceptable to Engineer of Record.

F. Repair defective areas, except random cracks and single holes not exceeding 1" diameter, by cutting out and replacing with fresh concrete. Remove defective areas to sound concrete with clean, square cuts and expose reinforcing steel with at least 3/4" clearance all around. Dampen concrete surfaces in contact with patching concrete and apply bonding compound. Mix patching concrete of same materials to provide concrete of same type or class as original concrete. Place, compact, and finish to blend with adjacent finished concrete. Cure in same manner as adjacent concrete.

G. Perform structural repairs with prior approval of Engineer of Record or Structural Engineer for method and procedure, using specified epoxy adhesive and mortar.

H. Repair methods not specified above may be used, subject to acceptance of Engineer of Record.

I. Underlayment Application: Leveling of floors for subsequent finishes may be achieved by use of specified underlayment material.

### 3.15 QUALITY CONTROL TESTING DURING CONSTRUCTION

A. The testing laboratory shall perform tests and submit test reports to the Engineer of Record. Sampling and testing for quality control during placement of concrete may include the following, as directed by Engineer of Record.

B. Sampling Fresh Concrete: ASTM C 172, except modified for slump to comply with ASTM C 94.

1. Slump: ASTM C 143; one test at point of discharge for each day's pour of each type of concrete; additional tests when concrete consistency seems to have changed.

2. Air Content: ASTM C 173, volumetric method for lightweight or normal weight concrete; ASTM C 231 pressure method for normal weight concrete; one for each day's pour of each type of air-entrained concrete.

3. Concrete Temperature: Test hourly when air temperature is 40 deg F and below, and when 80 deg F and above; and each time a set of compression test specimens are made.

4. Compression Test Specimen: ASTM C 31; one set of 4 standard cylinders for each compressive strength test, unless otherwise directed. Mold and store cylinders for laboratory cured test specimens except when field-cure test specimens are required.

5. Compressive Strength Tests: ASTM C 39; one set for each day's pour exceeding 5 cu. yds. plus additional sets for each 50 cu. yds. over and above the first 25 cu. yds. of each concrete class placed in any one day; one specimen tested at 7 days, two specimens tested at 28 days, and one specimen retained in reserve for later testing if required. When frequency of testing will provide less than 5 strength tests for a given class of concrete, conduct testing from at least 5 randomly selected batches or from each batch if fewer than 5 are used.

C. Test results will be reported in writing to Engineer of Record, Structural Engineer and Contractor within 24 hours after tests. Reports of compressive strength tests shall contain the project identification name and number, date of concrete placement, name of concrete testing service, concrete type and class, location of concrete batch in structure, design compressive strength at 28 days, concrete mix proportions and materials; compressive breaking strength and type of break for both 7-day tests and 28-day tests.

1. Breaking Schedule:

1 cylinder @ 7 day

2 cylinders @ 28 days (average results to obtain strength)

1 cylinder held as a spare.

D. Nondestructive Testing: Impact hammer, sonoscope, or other nondestructive device may be permitted but shall not be used as the sole basis for acceptance or rejection.

E. Additional Tests: The testing service will make additional tests of in-place concrete when test results indicate specified concrete strengths and other characteristics have not been attained in the structure, as directed by Engineer of Record. Testing service may conduct tests to determine adequacy of concrete by cored cylinders complying with ASTM C 42, or by other methods as directed. Contractor shall pay for such tests when unacceptable concrete is verified.

END OF SECTION 03310

**DIVISION 4**

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**MASONRY**

## **SECTION 04150 MASONRY ACCESSORIES**

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### 1. GENERAL

#### 1.1 DESCRIPTION

A. Work included: Provide masonry accessories as specified herein, and as needed for a complete and proper installation.

B. Related work:

1. Documents affecting work for this Section include, but are not necessarily limited to General Conditions, Supplementary Conditions and Sections in Division 1 of these Specifications.

2. Section 03310: Concrete Work.

3. Section 04220: Concrete Masonry Units.

4. Division 7: Thermal and Moisture Protection

#### 1.2 QUALITY ASSURANCE

A. Use adequate numbers of skilled workmen who are thoroughly trained and experienced in the necessary crafts and who are completely familiar with the specified requirements and methods needed for proper performance of the work of this Section.

#### 1.3 SUBMITTALS

A. Comply with pertinent provisions of Section 01340 and Section 01600.

B. Product data: Within 35 calendar days after the Contractor has received the Owner's Notice to Proceed, submit:

1. Materials list of items proposed to be provided under this Section.

2. Manufacturer's specifications and other data needed to prove compliance with specified requirements.

3. Manufacturer's recommended installation procedures which, when approved by the Engineer of Record, will become the basis for accepting or rejecting actual installation procedures based on the Work.

#### 1.4 PRODUCT HANDLING

A. Comply with pertinent provisions of Section 01600.

B. Store masonry accessories above ground on level platforms, which allow air circulation under the stacked units.

C. Cover and protect against wetting prior to use.

### 2. PRODUCTS

#### 2.1 MASONRY TIES

A. Provide masonry ties for, but not limited to, the following conditions:

1. Horizontal Reinforcing: a. Single Wythe walls, standard weight hot dip galvanized D/A 320 Ladur as manufactured by DUR-O-WAL, Inc. or Engineer of Record approved equal.

## 2.2 CONTROL JOINTS

A. Prefabricated synthetic rubber conforming to ASTM D-2000, 2AA-805 with a Durometer hardness of 80 when tested in accordance with ASTM D2240. Product shaped to mate with sash block units. Head joint thickness to be 3/8 inch.

B. Acceptable manufacturers:

1. DUR-O-WAL, Inc. – Rapid Control Joint/Rubber Compound.
2. Hohmann & Barnard, Inc. - #RS Series/Rubber Control Joint.
3. Equal manufacturer's when approved by the Engineer of Record.

## MASONRY ACCESSORIES 04150 - 3

### 2.3 SINGLE-WYTHE CMU FLASHING SYSTEM

A. System of CMU flashing pans and interlocking CMU web bridges made from high-density polyethylene incorporating chemical stabilizers that resist UV degradation. Flashing pans laid in CMU bed joints have integral weep spouts extending from the center of each pan to the outside face of the CMU to reduce mortar clogging and collect and divert moisture to the exterior.

B. Subject to compliance with requirements, provide one of the following or Engineer of Record approved equal:

1. Deslauriers, Inc. "Blok-Flash", 800-743-4106.
2. Advanced Building Products "Blok-Flash", 800- 252-2306.
3. MASONPRO, Inc. "Blok-Flash", 800-659-4731.

## 3. EXECUTION

### 3.1 MASONRY-TIES

A. Horizontal Reinforcing:

1. Place reinforcing wire in mortar joint of concrete block at 16" on center, vertically.
2. Embed prefabricated horizontal joint reinforcement as the work progresses, with a minimum cover of 5/8" on exterior face of walls and 2" at other locations. Lap units not less than 6" at ends. Use prefabricated corners and intersections. Cut and bend units as recommended by manufacturer for continuity at returns, offsets, column fireproofing, pipe enclosures and other special conditions.

3. Reinforce between top two courses of masonry wall and in two courses above and two courses below all masonry wall openings for 24" beyond opening on both sides.

### 3.2 MOVEMENT JOINTS

A. Expansion joints: Fill expansion joints with backer rod and sealant.

B. Control joints: Fill control joints with backer rod and sealant.

### 3.3 SINGLE-WYTHE CMU FLASHING SYSTEM

A. Install the Blok-Flash course by spacing two units on each block or evenly along formed concrete foundation or slab. The drip edge of the Blok-Flash weep spout shall extend slightly beyond the exterior face of the block unit or slab edge it is resting on a minimum of 4-inches above finish grade.

B. Span the continuous rows of Blok-Flash with Blok-Flash bridge units.

C. Eliminate the Blok-Flash unit and adjoining bridges at the reinforced grouted cores.

D. Provide a 2-inch to 3-inch layer of pea gravel into the core cavity above the Blok-Flash locations.

E. Tool all head and bed joints and remove any obstruction from the weep spouts.

END OF SECTION 04150

## **SECTION 04220 CONCRETE MASONRY UNITS**

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### **1. GENERAL**

#### **1.1 DESCRIPTION**

A. Work included: Provide water-repellent concrete unit masonry and mortar as specified herein, and as needed for a complete and proper installation.

1. Section includes liquid polymeric admixture added to the concrete masonry units at the time of manufacture. Provide Dry-Block Block Admixture as manufactured by Grace Construction Products or equal as approved by Engineer of Record.

2. Section includes liquid polymeric admixture added to the mortar for wall construction at the time of mixing. Provide Dry-Block Mortar Admixture as manufactured by Grace Construction Products or equal as approved by Engineer of Record.

B. Related work:

1. Documents affecting work of this Section include, but are not necessarily limited to, General Conditions, Supplementary Conditions and Sections in Division 1 of these specifications.

2. Section 04150: Masonry Accessories.

3. Division 7: Thermal and Moisture Protection.

#### **1.2 PERFORMANCE REQUIREMENTS**

A. Water Permeance of Masonry: ASTM E 514, "Standard Test Method for Water Penetration and Leakage through Masonry."

B. Flexural Bond Strength of Masonry: ASTM C 1357, "Standard Test Method for Evaluating Masonry Bond Strength."

C. Compressive Strength of Masonry Prisms: ASTM C 1314, "Standard Test Method for Constructing and Testing Masonry Prisms Used to Determine Compliance with Specified Compressive Strength of Masonry."

D. Drying Shrinkage of CMU: ASTM C 426, "Standard Test Method for Measuring the Drying Shrinkage of Concrete Masonry Units."

E. Drying Shrinkage of Mortar: ASTM C 1148, "Standard Test Method for Measuring the Drying Shrinkage of Masonry Mortar."

F. Grout Shear Bond Strength: Test consistent with the Department of State Engineer of Record of California requirements in California State Chapter 2405( c ) 3.C. Test method is described in Concrete Masonry Association of California and Nevada document, "Recommended Grouting Procedure for Hollow Concrete Masonry Constructed under CAC Title 24."

#### **1.3 QUALITY ASSURANCE**

A. CMU producer shall be qualified by manufacturer of integral CMU water-repellent admixture.



B. Use adequate numbers of skilled workmen who are thoroughly trained and experienced in the necessary crafts and who are completely familiar with the specified requirements and methods needed for proper performance of the work of this Section.

#### 1.4 SUBMITTALS

A. Comply with pertinent provisions of Section 01340 and Section 01600.

B. Product data: Within 35 calendar days after the Contractor has received the Owner's Notice to Proceed, submit:

1. Manufacturer's Spec-Data Sheets for System of Integral Water-Repellent Admixtures for Block and Mortar.

2. Technical Bulletin on Cleaning Masonry Containing Integral Water-Repellent Admixtures.

3. Test Reports prepared by a qualified independent laboratory indicating compliance with the performance requirements for integral CMU and mortar water-repellency as tested using:

a. ASTM E 514, extended to 72 hours.

b. ASTM C 1357.

c. ASTM C 1314.

d. ASTM C 1148.

e. ASTM C 426.

f. California State Chapter 2405(c)3.C test for Grout Shear Bond Strength.

4. Current "Qualified Producer Certification" issued by manufacturer of integral CMU waterrepellent admixture, indicating that CMU producer is qualified to produce CMU units containing manufacturer's admixture.

C. Mock-ups:

1. At an area on the site where approved by the Engineer of Record, provide mock-up concrete unit masonry panel.

a. Make mock-up panel approximately 4'-0" high and 6'-0" long.

b. Construct mock-up panel to determine the compatibility of materials and the effect of the materials and construction procedures on the final appearance of the wall. Use jobsite materials, including specified water-repellent CMU and mortar to construct sample panel. Perform all construction procedures on sample panel, including cleaning and application of coatings and sealants. Retain sample panel during construction as standard for judging completed masonry work.

c. The mock-up panel may be part of the Work, and may be incorporated into the finished Work, when so approved in advance by the Engineer of Record.

d. Revise as necessary to secure the Engineer of Record's approval.

3. If the mock-up panels are not permitted to be part of the finished Work, completely demolish and remove them from the job site upon completion and acceptance of other work of this Section.

#### 1.5 PRODUCT HANDLING

A. Comply with pertinent provisions of Section 01600

B. Store masonry units above ground on level platforms that allow air circulation under the stacked units.

C. Cover and protect against wetting prior to use.

D. Store integral water-repellent mortar admixture in an area where temperature is maintained between 40°F to 100°F.

E. Do not allow integral water-repellent mortar admixture to freeze; discard any frozen admixture.

#### 1.6 WARRANTY

A. Integral CMU and mortar water-repellent admixtures shall be warranted by admixture manufacturer to be free of defects and to meet manufacturer's published physical and chemical properties.

B. CMU producer shall warrant that integral CMU water-repellent admixture has been provided at appropriate dosage rate in all CMU units shipped to project site for use in exterior wall construction.

C. Installer shall warrant that only CMU's containing integral CMU water-repellent admixtures have been placed in exterior CMU walls.

D. Installer shall warrant that only mortar containing integral water-repellent mortar admixture at the manufacturer's recommended addition rate has been placed in exterior walls.

### 2. PRODUCTS

#### 2.1 CONCRETE MASONRY UNIT

A. Provide lightweight, hollow, load-bearing, concrete masonry units complying with ASTM C90, Grade N, Type II, in "natural gray" color, for all concrete masonry unit construction.

B. Dimensions:

1. Provide units having nominal face dimensions of 16" long by 8" high.

c. Provide accessory shapes as required.

#### 2.2 INTEGRAL CMU WATER-REPELLENT:

A. Description: Integral liquid polymeric admixture mixed with concrete during production of CMU's.

B. Water Permeance of Masonry: Capable of achieving a Class E Rating when evaluated using ASTM E 514 with the test extended to 72 hours, using the rating criteria specified in ASTM E 514-74.

C. Flexural Bond Strength of Masonry: An increase of minimum 10% in masonry flexural bond strength shall occur as a result of adding integral waterrepellent CMU and mortar admixtures when compared to a control (containing no admixtures) CMU and mortar tested according to ASTM C 1357.

D. Compressive Strength of Masonry Prisms: Maximum 5% decrease in compressive strength of prisms shall occur as a result of adding integral waterrepellent CMU and mortar admixtures when compared to a control (containing no admixtures) CMU and mortar when tested according to ASTM C 1314.

E. Drying Shrinkage of CMU: Maximum 5% increase in drying shrinkage of the CMU shall occur as a result of adding integral water-repellent CMU admixture when compared to a control (containing no admixtures) CMU when tested according to ASTM C 426.

F. Grout Shear Bond Strength: Maximum 5% decrease in grout shear bond strength shall occur as a result of adding integral water-repellent admixture to the CMU compared to a control (containing no admixtures) CMU when tested according to California State Chapter 2405( c )3.C test for Grout Shear Bond Strength.

### 2.3 REINFORCEMENT AND ACCESSORIES

A. Comply with the following as minimums.

1. Bars: ASTM A615, grade 60, unless otherwise shown on the Drawings using deformed bars of number 3 or larger.

2. Bending: ACI 318.

3. Wire reinforcement: ASTM A82.

B. Fabricate reinforcement in accordance with recommendations contained in CRSI "Manual of Standard Practices".

### 2.4 MORTAR

A. Ingredients:

1. Portland cement: Comply with ASTM C150, Type I.

2. Lime:

a. Provide hydrated lime complying with ASTM C207, or quicklime complying with ASTM C5. b. When quicklime is used, slake and then screen through a #16 mesh sieve. After slaking and screening, but before using, store and protect for not less than ten (10) days.

3. Aggregate: Provide clean, sharp, well graded aggregate free from injurious amounts of dust, lumps, shale, alkali, surface coatings and organic matter and complying with ASTM C144.

4. Integral Water-Repellent Mortar Admixture:

a. Provide mortar containing integral water-repellent mortar admixture at the manufacturer's recommended addition rate and mixed according to the manufacturers recommended instructions.

b. Manufacturers approved: (1) Dry-Block Mortar Admixture as manufactured by Grace Construction Products.

5. Admixtures: Do not use other admixtures unless specifically approved in advance by the Engineer of Record.

6. Water: Provide potable water free from injurious amounts of acids, alkalis, oil and organic matter.

B. Mixing:

1. Provide Type "S" mortar, in accordance with ASTM C270.

2. Proportions:

a. For Type "S" mortar, provide one (1) part Portland cement to one half (1/2) part hydrated lime and four and one half (4-1/2) parts sand by volume. 2. Mechanically mix in a batch mixer for not less than three (3) minutes, using only sufficient water to produce a mortar that is spreadable and of a workable consistency.

## 2.5 GROUT

A. Ingredients:

1. Portland cement: Comply with ASTM C150, Type I.

2. Aggregate: Provide clean, sharp, well graded aggregate free from injurious amounts of dust, lumps, shale, alkali, surface coatings, and organic matter.

3. Admixtures: Do not use admixtures unless specifically approved in advance by the Engineer of Record.

4. Water: Provide water free from injurious amounts of acids, alkalis, and organic materials.

B. Mixing:

1. Provide "fine grout" or "coarse grout" as directed by the Engineer of Record, and in accordance with ASTM C476.

2. When the minimum grout compressive strength is required to be more than 2000 psi, provide laboratory design mix prepared as required for design mixes of concrete under Section 03310 of these Specifications.

3. Proportions:

a. For "fine grout", provide one part portland cement to 2-1/4 parts minimum to 3 parts maximum of damp loose sand, with sufficient water to achieve fluid consistency.

b. For "coarse grout", provide one part portland cement to 3 parts maximum of damp loose sand to two parts coarse aggregate, with sufficient water to achieve fluid consistency.

4. "Fluid consistency" is interpreted as meaning as fluid as possible for pouring intimately in place without segregation.

C. Use "fine grout" where the grout space is less than 3" in its least dimension, and where otherwise directed by the Engineer of Record or required by governmental agencies having jurisdiction.

### 3. EXECUTION

#### 3.1 SURFACE CONDITION

A. Examine the areas and conditions under which work of this Section will be performed. Correct conditions detrimental to timely and proper completion of the Work. Do not proceed until unsatisfactory conditions are corrected.

#### 3.2 ENVIRONMENTAL CONDITIONS

A. Place concrete masonry units only when air temperature is not less than 40°F and rising. Do not place any masonry units when temperature is below 40°F or 40°F and falling.

B. Protect masonry construction from direct exposure to wind and sun when erected in ambient air temperature of 99°F in the shade, with relative humidity less than 50%.

#### 3.3 INSTALLATION

##### A. Integral Water-Repellent CMU Walls:

1. Installer shall use only concrete masonry units manufactured containing integral liquid polymeric water-repellent admixture for construction of water-repellent exterior walls.

2. Installer shall use only mortar containing compatible integral liquid polymeric waterrepellent mortar admixture at the manufacturer's recommended addition rate and mixed according to manufacturer's recommended instructions for construction of waterrepellent exterior walls.

##### B. General:

1. Do not commence installation of the work of this section until horizontal and vertical alignment of foundation is within 1" of plumb.

2. Lay only dry masonry units.

3. Use masonry saws to cut and fit masonry units.

4. Set units plumb, true to line, and with levelcourses accurately spaced.

5. Clean the top surface of foundation free from dirt, debris, and laitance, and expose the aggregate prior to start of installing first course.

6. Accurately fit the units to plumbing, ducts, openings and other interfaces, neatly patching all holes.

7. Keep the walls continually clean, preventing grout and mortar stains. If grout does run over, clean immediately.

B. Provide running bond with vertical joints located at center of masonry units in the alternate course below.

C. Do not use chipped or broken units; if such units are discovered in the finished wall, the Engineer of Record may require their immediate removal and replacement with new units at no additional cost to the Owner.

D. Laying up:

1. Place units in mortar with full bed joints and full shovled head joints.
2. Align vertical cells of hollow units to maintain a clear and unobstructed system of flues. 3. Hold racking to an absolute minimum.

E. Reinforcement:

1. Provide reinforcement fully embedded in cement grout and NOT in mortar or vertical mortar joints.
2. Provide required metal accessories to ensure adequate alignment of steel during grout filling operations.

F. Tooling:

1. Tool joints to a dense, smooth surface.
2. Provide joints of "concave" pattern.

### 3.4 CLEANING

A. Inspection and adjustment:

1. Upon completion of the work of this Section, make a thorough inspection of installed masonry and verify that units have been installed in accordance with the provisions of this Section.

B. Clean surfaces of masonry as required for proper application of the specified finishes.

END OF SECTION 04220

## **SECTION 04230 REINFORCED UNIT MASONRY**

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### **1. GENERAL**

#### **1.1 RELATED DOCUMENTS**

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

B. Requirements of Section 04150 – Masonry Accessories and Section 04220 – Concrete Masonry Units apply to work of this Section.

#### **1.2 DESCRIPTION OF WORK**

A. Extent of each type of reinforced unit masonry work is indicated on drawings and in schedules.

#### **1.3 SUBMITTALS**

##### **A. Shop Drawings**

1. Submit shop drawings for fabrication, bending, and placement of reinforcement bars. Comply with ACI 315 "Manual of Standard Practice for Detailing Reinforced Concrete Structures". Show bar schedules, diagrams of bent bars, stirrup spacing, lateral ties and other arrangements and assemblies as required for fabrication and placement of reinforcement for unit masonry work.

### **2. PRODUCTS**

#### **2.1 MATERIALS**

##### **A. General**

1. Refer to Section 04220 – Concrete Masonry Units for masonry materials and Section 04150 – Masonry Accessories for accessories not included in this Section.

2. Provide masonry units with an F'm (net compressive strength of 3,000 PSI).

##### **B. Reinforcement Bars**

1. Provide deformed bars of following grades complying with ASTM A 615, except as otherwise indicated.

2. Provide Grade 60 for bars No. 3 to No. 18, except as otherwise indicated.

3. Where No. 2 bars are shown, provide plain, round, carbon steel bars, ASTM A 675, Grade 80.

4. Shop-fabricate reinforcement bars that are shown to be bent or hooked.

### **3. EXECUTION**

#### **3.1 PLACING REINFORCEMENT**

##### **A. General**

1. Clean reinforcement of loose rust, mill scale, earth, ice or other materials that will reduce bond to mortar or grout. Do not use reinforcement bars with kinks or bends not shown on drawings or final shop drawings, or bars with reduced cross-section due to excessive rusting or other causes.
2. Position reinforcement accurately at the spacing indicated. Support and secure vertical bars against displacement. Horizontal reinforcement may be placed as the masonry work progresses. Where vertical bars are shown in close proximity, provide a clear distance between bars of not less than the nominal bar diameter or 1" (whichever is greater).
  - a. For columns, piers and pilasters provide a clear distance between vertical bars as indicated, but not less than 1-1/2", whichever is greater. Provide lateral ties as indicated.
3. Splice reinforcement bars where shown; do not splice at other points unless acceptable to the Engineer of Record. Provide lapped splices, unless otherwise indicated. In splicing vertical bars or attaching to dowels, lap ends, place in contact and wire tie.
  - a. Provide not less than minimum lap indicated, or if not indicated, as required by governing code.
4. Embed metal ties in mortar joints as work progresses, with a minimum mortar cover of 5/8" on exterior face of walls and 1/2" at other locations.
5. Embed prefabricated horizontal joint reinforcement as the work progresses, with a minimum cover of 5/8" on exterior face of walls and 1/2" at other locations. Lap units not less than 6" at ends. Use prefabricated "L" and "T" units to provide continuity at corners and intersections. Cut and bend units as recommended by manufacturer for continuity at returns, offsets, column fire proofing, pipe enclosures and other special conditions.

#### B. Anchoring

1. Anchor reinforced masonry work to supporting structure as indicated.
  - a. Anchor reinforced masonry walls to nonreinforced masonry where they intersect.

### 3.2 INSTALLATION, GENERAL

A. Refer to Section 04220 – Concrete Masonry Units for general installation requirements of unit masonry.

#### B. Temporary Formwork

1. Provide formwork and shores as required for temporary support of reinforced masonry elements.
  - a. Construct formwork to conform to shape, line and dimensions shown. Make sufficiently tight to prevent leakage of mortar, grout, or concrete (if any). Brace, tie and support as required maintaining position and shape during construction and curing of reinforced masonry.

C. Do not remove forms and shores until reinforced masonry members have hardened sufficiently to carry their own weight and all other reasonable temporary loads that may be placed on them during construction.

1. Allow not less than the following minimum time to elapse after completion of members before removing shores or forms, provided suitable curing conditions have been obtained during the curing period.



10 days for girders and beams

7 days for slabs

7 days for reinforced masonry soffits.

### 3.3 INSTALLATION OF REINFORCED CONCRETE UNIT MASONRY

#### A. General

1. Do not wet concrete masonry unit (CMU).

2. Lay CMU units with full-face shell mortar beds. Fill vertical head joints (end joints between units) solidly with mortar from face of unit to a distance behind face equal to not less than the thickness of longitudinal face shells. Solidly bed cross-webs of starting courses in mortar. Maintain head and bed joint widths shown, or if not shown, provide 3/8" joints.

#### B. Walls

1. Pattern Bond: Lay CMU wall units in 1/2 running bond with vertical joints in each course centered on units in courses above and below, unless otherwise indicated. Bond and interlock each course at corners and intersections. Use special-shaped units where shown, and as required for corner, jambs, sash, control joints, lintels, bond beams and other special conditions.

2. Maintain vertical continuity of core or cell cavities, which are to be reinforced and grouted, to provide minimum clear dimension indicated and to provide minimum clearance and grout coverage for vertical reinforcement bars. Keep cavities free of mortar. Solidly bed webs in mortar where adjacent to reinforced cores or cells.

3. Where horizontal reinforced beams (bond beams) are shown, use special units or modify regular units to allow for placement of continuous horizontal reinforcement bars. Place small mesh expanded metal lath or wire screening in mortar joints under bond beam courses over cores or cells of non-reinforced vertical cells, or provide units with solid bottoms.

#### C. Columns, Piers and Pilasters

1. Use CMU units of the size, shape and number of vertical core spaces shown. If not shown, use units that provide minimum clearances and grout coverage for number and size of vertical reinforcement bars shown.

2. Provide pattern bond shown, or if not shown, alternate head joints in vertical alignment.

3. Where bonded pilaster construction is shown, lay wall and pilaster units together to maximum pour height specified.

#### D. Grouting

1. Use "Fine Grout" per ASTM C 476 for filling spaces less than 4" in one or both horizontal directions.

END OF SECTION 04230

**DIVISION 5**

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**METALS**

## **SECTION 05520 MISCELLANEOUS METAL WORK**

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### **1. GENERAL**

#### **1.1 DESCRIPTION**

A. Work included: Furnish all miscellaneous metal work and related items necessary to complete the work as specified herein and as needed for a complete and proper installation.

1. Security bars, lintel angles, clip angles, and plates.

B. Related work:

1. Documents affecting work of this Section include, but are not necessarily limited to, General Conditions, Supplementary Conditions and Sections in Division 1 of these Specifications.

2. Section 09900: Painting.

#### **1.2 QUALITY ASSURANCE**

A. Use adequate numbers of skilled workmen who are thoroughly trained and experienced in the necessary crafts and who are completely familiar with the specified requirements and the methods needed for proper performance of the work of this Section.

B. Perform shop and/or field welding required in connection with the work of this Section in strict accordance with pertinent recommendations of the American Welding Society.

#### **1.3 SUBMITTALS**

A. Comply with pertinent provisions of Section 01340 and Section 01600.

B. Product data: Within 35 calendar days after Contractor has received Owner's Notice to Proceed, submit:

1. Shop Drawings including complete details and schedules for fabrication and shop assembly of members for all fabricated work.

2. Furnish manufacturer's literature, for approval for all manufactured goods.

#### **1.4 PRODUCT HANDLING**

A. Comply with pertinent provisions of Section 01600.

### **2. PRODUCTS**

#### **2.1 METALS**

A. Metals shall be new domestic manufacturer, free from defects, of best commercial quality for the purpose specified.

1. Structural properties shall be such to withstand the strains and stresses subjected by normal use.

2. Metals shall be true to detail, clean, straight and unless specifically noted, have smooth mill finished surfaces.

## 2.2 FASTENINGS

A. Make all exposed fastenings of the same material, color and finish as the metal to which fastenings are applied, unless shown otherwise.

1. Fastenings for aluminum shall be aluminum or stainless steel.

a. Finish shall be same as material to be fastened.

2. Fastenings for brass shall be brass, etc.

## 2.3 OTHER MATERIALS

A. Provide other materials not specifically described but required for a complete and proper installation, as selected by the Contractor subject to the approval of the Engineer of Record.

## 2.4 FABRICATION

A. Except as otherwise shown on the approved Shop Drawings, use materials of size, thickness, and type required to produce reasonable strength and durability in the work of this Section.

B. Fabricate with accurate angles and surfaces that are true to the required lines and levels, grinding exposed welds smooth and flush, forming exposed connections with hairline joints, and using concealed fasteners wherever possible.

C. Prior to shop painting or priming, properly clean metal surfaces as required for the applied finish and for the proposed use of the item.

D. On surfaces inaccessible after assembly or erection, apply two coats of the specified primer. Change color of second coat to distinguish it from the first.

## 2.5 FINISH

A. All exposed aluminum on the exterior shall be painted with a finish to match that of the surrounding areas, unless otherwise indicated, verify exact color with the Engineer of Record.

B. All steel and ironwork in the exterior wall shall be galvanized, and finished with Sherwin-Williams A41 Series All Surface Enamel, color as selected by Engineer of Record.

C. All stainless steel items on the exterior shall be polished.

D. All other metal shall be shop primed, if exposed to view it shall be finished with Sherwin-Williams A11 Series All Surface Enamel, or as directed by the Engineer of Record.

## 3. EXECUTION

### 3.1 SURFACE CONDITIONS

A. Examine the areas and conditions under which work of this Section will be performed. Correct conditions detrimental to timely and proper completion of the Work. Do not proceed until unsatisfactory conditions are corrected.

### 3.2 COORDINATION

A. Coordinate as required with other trades to assure proper and adequate provision in the work of those trades for interface with the work of this Section.

### 3.3 INSTALLATION

A. General:

1. Set work accurately into position, plumb, level, true and free from rack.
  2. Anchor firmly into position.
  3. Where field welding is required, comply with AWS recommended procedures of manual-shielded metal-arc welding for appearance and quality of weld and for methods to be used correcting welding work.
  4. Grind exposed welds smooth, and touch up shop prime coats.
  5. Do not cut, weld or abrade surfaces which have been hot-dip galvanized after fabrication and which are intended for bolted or screwed field connections.
- B. Immediately after erection, clean the field welds, bolted connections, and abraded areas of shop priming. Paint the exposed areas with same material used for shop priming.

END OF SECTION 05220

**DIVISION 6**

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**CARPENTRY**

## **SECTION 06100 ROUGH CARPENTRY**

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### **1. GENERAL**

#### **1.1 DESCRIPTION**

A. Work included: Provide wood products, nails, bolts, screws, framing anchors and other rough hardware, and other items needed, and perform rough carpentry as specified herein, and as needed for a complete and proper installation.

B. Related work:

1. Documents affecting work of this Section include, but are not necessarily limited to, General Conditions, Supplementary Conditions and Sections in Division 1 of these specifications.

### **2. Section 06190: Wood Trusses.**

#### **1.2 QUALITY ASSURANCE**

A. Use adequate numbers of skilled workmen who are thoroughly trained and experienced in the necessary crafts and who are completely familiar with the specified requirements and the methods needed for proper performance of the work of this Section.

B. Codes and standards:

1. In addition to complying with the pertinent codes and regulations of governmental agencies having jurisdiction, unless otherwise specifically directed or permitted by the Engineer of Record comply with:
  - a. "Product Use Manual" of the Western Wood Products Association (WWPA) for selection and use of Products included in that manual.
  - b. "APA Design/Construction Guide" of The Engineered Wood Association.
  - c. "Southern Pine Use Guide" of the Southern Forest Products Association (SFPA).

#### **1.3 SUBMITTALS**

A. Comply with pertinent provisions of Section 01340 and Section 01600.

B. Product Data: Within 35 calendar days after the Contractor has received the Owner's Notice to Proceed, submit:

1. Product Data for metal framing anchors.

- C. Material certificates for dimension lumber specified to comply with minimum allowable unit stresses. Indicate species and grade selected for each use and design values approved by the American Lumber Standards Committee's (ALSC) Board of Review.
- D. Wood treatment data as follows, including chemical treatment manufacturer's instructions for handling, storing, installing and finishing treated materials.
  - 1. For each type of preservative-treated wood product, include certificate by treating plant stating type of preservative solution and pressure process used, net amount of preservative retained, and compliance with applicable standards.
  - 2. For water-borne-treated products, include statement that moisture content of treated materials was reduced to levels indicated before shipment to Project site E. Warranty of chemical treatment manufacturer for each type of treatment.

#### 1.4 PRODUCT HANDLING

- A. Comply with pertinent provisions of Section 01600.
- B. Protection:
  - 1. Deliver the materials to the job site and store in a safe area out of the way of traffic. Keep materials under cover and dry. Protect from weather and contact with damp or wet surfaces. Stack lumber, plywood and other panels. Provide for air circulation within and around stacks and under temporary coverings.
  - 2. Identify framing lumber as to grades, and store each grade separately from other grades.
  - 3. Protect materials with adequate waterproof outer wrapping.
  - 4. Use extreme care in off-loading of lumber to prevent damage, splitting, and breaking of materials.

## 2. PRODUCTS

### 2.1 LUMBER, GENERAL

- A. Lumber Standards: Comply with DOC PS 20, "American Softwood Lumber Standard", and with applicable grading rules of inspection agencies certified by ALSC's Board of Review.
- B. Inspection Agencies: Inspection agencies, and the abbreviations used to reference them, include the following:



1. SPIB – Southern Pine Inspection Bureau.
2. WWPA – Western Wood Products Association.

## 2.2 GRADE STAMPS

A. Provide lumber with each piece factory marked with grade stamp of inspection agency evidencing compliance with grading rule requirements and identifying grading agency, grade, species, moisture content at time of surfacing, and mill. ROUGH CARPENTRY 06100 - 4

B. Where nominal sizes are indicated, provide actual sizes required by DOC PS 20 for moisture content specified. Where actual sizes are indicated, they are minimum dressed sizes for dry lumber.

1. Provide dry lumber with 19 percent maximum moisture content at time of dressing for 2- inch nominal thickness or less, unless otherwise indicated.

C. Identify plywood as to species, grade and glue type by the stamp of APA - The Engineered Wood Association.

D. Identify other materials of this Section by the appropriate stamp of the agency approved in advance by the Engineer of Record.

## 2.3 MATERIALS

A. General: Provide dimension lumber of grades indicated according to the ALSC National Grading Rule (NGR) provisions of the inspection agency indicated.

B. Provide materials in the quantities needed, meeting or exceeding the following standards of quality:

1. Horizontal framing members: Southern Pine, Table 5, number 2; Douglas Fir-Hemlock, Table 1, Construction grade.

2. Vertical framing members: Southern Pine, Table 1, Standard grade.

3. Plywood: Provide APA performance-rated sheathing panels of plywood or OSB.

a. Roof Sheathing: 5/8" or 19/32" thick APA Rated Sheathing, 40/20, C-D, Exposure 1, PS 1-95.

b. Ceiling Sheathing: 5/8" or 19/32" thick APA Rated Sheathing, 40/20, B-C, Group 1, Exposure 1, interior.

c. Wall Sheathing: 1/2" or 15/32" thick APA Rated Sheathing, 32/16, A-C, Group 1, Exposure 1, interior.

- d. Electrical and telephone backboards: 3/4" or 23/32" thick, B-C, Group 1, Exposure 1, interior.
- e. All plywood backboards shall be finished on all surfaces, (both sides and all edges), with intumescent paint, unless noted otherwise.
- 4. Building paper: Kraft paper complying with Fed Spec UU-B-790a.
- 5. Rough hardware:
  - a. (1) Comply with ASTM A7 or ASTM A36. (2) Use galvanized at all exterior locations.
  - b. Machine bolts: Comply with ASTM A307.
  - c. Lag bolts: comply with Fed Spec FF-N-1.
  - d. Nails:
    - (1) Use common except as otherwise noted.
    - (2) Comply with Fed Spec FF-N-1.
    - (3) Use galvanized at exterior locations.

#### 2.4 WOOD PRESERVATIVE-TREATED MATERIALS

- A. General: Where lumber or plywood is indicated as preservative treated or is specified to be treated, comply with applicable requirements of AWPA C2 (lumber) and AWPA C9 (plywood). Mark each treated item with the Quality Mark Requirements of an inspection agency approved by ALSC's Board of Review.
  - 1. Do not use chemicals containing chromium or arsenic.
  - 2. For exposed items indicated to receive stained finish, use chemical formulations that do not bleed through, contain colorants, or otherwise adversely affect finishes.
- B. Pressure treat above ground items with waterborne preservatives to a minimum retention of 0.25- lb./cu. ft. After treatment, kiln-dry lumber and plywood to maximum moisture content of 19 and 15 percent, respectively. Treat indicated items.
  - 1. Wood nailers, blocking and similar members in connection with roofing, flashing and waterproofing.
  - 2. Wood blocking, sleepers and similar concealed members in contact with masonry or concrete.

#### 2.5 OTHER MATERIALS

- A. Provide other materials not specifically described but required for a complete and proper installation, as selected by the Contractor subject to the approval of the Engineer of Record.

### 3. EXECUTION

#### 3.1 SURFACE CONDITIONS

- A. Examine the areas and conditions under which work of this Section will be performed. Correct conditions detrimental to timely and proper completion of the Work. Do not proceed until unsatisfactory conditions are corrected.

#### 3.2 DELIVERIES

- A. Stockpile materials sufficiently in advance of need to assure their availability in a timely manner for this Work.
- B. Make as many trips to the job site as are needed to deliver materials of this Section in a timely manner to ensure orderly progress of the Work.

#### 3.3 COMPLIANCE

- A. Do not permit materials not complying with the provisions of this Section to be brought onto or to be stored at the job site.
- B. Promptly remove non-complying materials from the job site and replace with materials meeting the requirements of this Section.

#### 3.4 WORKMANSHIP

- A. Produce joints that are tight, true, and well fastened with members assembled in accordance with pertinent codes and regulations.
- B. Selection of lumber pieces:
  - 1. Carefully select the members.
  - 2. Select individual pieces so that knots and obvious defects will not interfere with placing bolts or proper nailing, and will allow making of proper connections.
  - 3. Cut out and discard defects that render a piece unable to serve its intended function.
  - 4. The Engineer of Record may reject lumber, whether or not it has been installed, for excessive warp, twist, bow, crook, mildew, fungus, or mold, as well as for improper cutting and fitting.
- C. Do not shim any framing component.

#### 3.5 GENERAL FRAMING

A. General: Comply with (AFPA) American Forest and Paper Association's "Manual for Wood Frame Construction", unless otherwise indicated.

1. Set horizontal and sloped members with crown up.
2. Do not notch, cut, or bore members for pipes, ducts, or conduits, or for any other reasons except as specifically approved in advance by the Engineer of Record.
3. All framing material coming in contact with masonry or steel shall be pressure treated with wood preservative.

B. Bearings:

1. Make bearings full.
2. Finish bearing surfaces on which structural members are to rest so as to give sure and even support.
3. Where framing members slope, cut or notch the ends as required giving uniform bearing surface.

### 3.6 ALIGNMENT

A. On framing members to receive a finished surface, align the finish subsurface to vary not more than 1/8" from the plane of surfaces of adjacent furring and framing members.

### 3.7 INSTALLATION OF PLYWOOD SHEATHING

A. Placement:

1. Place plywood with face grain perpendicular to supports and continuously over at least two supports.

B. Protect plywood from moisture by use of waterproof coverings until the plywood in turn has been covered with the next succeeding component or finish.

END OF SECTION

## SECTION 06190 WOOD TRUSSES

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### 1. GENERAL

#### 1.1 DESCRIPTION

- A. Work included: Design, manufacture and install metal plate connected wood trusses as specified herein, and as needed for a complete and proper installation.
- B. Related work:
  - 1. Documents affecting work of this Section include, but are not necessarily limited to, General Conditions, Supplementary Conditions and Sections in Division 1 of these specifications.
  - 2. Section 06100: Rough Carpentry.

#### 1.2 QUALITY ASSURANCE

- A. Use adequate numbers of skilled workmen who are thoroughly trained and experienced in the necessary crafts and who are completely familiar with the specified requirements and the methods needed for proper installation and performance of the work of this Section.

#### 1.3 SUBMITTALS

- A. Comply with pertinent provisions of Section 01340 and Section 01600.
- B. Product data: Within 35 calendar days after the Contractor has received the Owner's Notice to Proceed, submit:
  - 1. Materials list of items proposed to be provided under this Section.
  - 2. Manufacturer's specifications and other data needed to prove compliance with the specified requirements.
  - 3. Manufacturer's recommended installation procedures, which when approved by the Engineer of Record, will become the basis for accepting or rejecting actual installation procedures used on the Work.
  - 4. Shop Drawings showing species, sizes and stress grades of lumber proposed to be used; pitch, span, camber configuration, and spacing of trusses; connector type, thickness, size, location and design value; and bearing details.

#### 1.4 DELIVERY, STORAGE AND HANDLING

- A. Comply with pertinent provisions of Section 01600.
- B. Provide water-resistant covering and wood cribbing for on site storage up off of grade. Water damaged trusses will be rejected for use.

## 2. PRODUCTS

### 2.1 WOOD TRUSS DESIGN

- A. Trusses shall be designed in accordance with these Specifications and where any applicable design feature is not specified herein, design shall be in accordance with applicable provisions of latest edition of National Design Specifications for Wood Construction (NDS) American Forest and Paper Association (AFPA), and Design Specifications for Metal Plate Connected Wood Trusses (ANSI/TPI 1), Truss Plate Institute (TPI), and code of jurisdiction.
- B. Truss manufacturer shall provide design drawings bearing seal and registration number of a structural engineer licensed in state where trusses are to be installed. Drawings shall be approved by Engineer of Record prior to fabrication.
- C. Truss Design Drawings shall include as minimum information:
  - 1. Span, slope or depth and spacing of trusses.
  - 2. Required bearing width(s).
  - 3. Design Loads as applicable:
    - a. Top chord live load.
    - b. Top chord dead load.
    - c. Bottom chord live load.
    - d. Bottom chord dead load.
    - e. Concentrated loads and their points of application.
    - f. Wind and seismic criteria.
  - 4. Adjustment to lumber and plate design loads for condition of use.
  - 5. Reaction forces, their points of occurrence and direction.
  - 6. Metal connector plate type, gauge, size and location of plate at each joint.
  - 7. Lumber size, species and grade for each member.
  - 8. Location of any required continuous lateral bracing.
  - 9. Calculated deflection ratio and/or maximum deflection for live and total load.

10. Maximum axial compressive forces in truss members.
11. Location of joints.
12. Connection requirements for:
  - a. Truss to truss girders.
  - b. Truss ply to ply.
  - c. Field splices/Field assembly of trusses.

## 2.2 MATERIALS

### A. Lumber:

1. Lumber used for truss members shall be in accordance with published Values of lumber rules writing agencies approved by board of review of American Lumber Standards Committee. Lumber shall be identified by Grade mark of an inspection bureau or agency approved by that Board, and shall be as shown on design drawings.
2. Moisture content of lumber shall be no less than 7 percent nor greater than 19 percent at time of fabrication.
3. Adjustment of values for duration of load or conditions of use shall be in accordance with National Design Specifications for Wood Construction (NDS).

### B. Metal Connector Plates:

1. Metal connector plates shall be manufactured by a Wood Council of America (WTCA) member plate manufacturer and shall not be less than .036 inches in thickness (20 gauge) and shall meet or exceed ASTM A653 grade 37, and shall be hot dipped galvanized according to ASTM A924, coating designation G60. Working stresses in steel are to be applied to effective ratios for plates as determined by test in accordance with ANSI/TPI 1.
2. In highly corrosive environments, special applied coatings or stainless steel may be required.
3. At the request of Engineer of Record, a WTCA member plate manufacturer shall furnish a certified record that materials comply with steel specifications.

## 2.3 MANUFACTURING

- A. Trusses shall be manufactured in a properly equipped facility of a permanent nature. Trusses shall be manufactured by experienced workmen, using precision cutting, jiggling and pressing equipment

meeting requirements of ANSI/TPI 1, Section 4. Truss members shall be accurately cut to length, angle and true to line to assure properly fitting joints within tolerances set forth in ANSI/TPI 1, Section 4, and proper fit with other work.

### 3. EXECUTION

#### 3.1 SURFACE CONDITIONS

- A. Examine the areas and conditions under which work of this Section will be performed. Correct conditions detrimental to timely and proper completion of the work. Do not proceed until unsatisfactory conditions are corrected.

#### 3.2 HANDLING, INSTALLATION AND BRACING

- A. Coordinate as required with other trades to assure proper and adequate provision in the work of those trades for interface with the work of this Section.
- B. Install the work of this Section in strict accordance with the original design, the approved Shop Drawings, pertinent requirements of governmental agencies having jurisdiction, and the manufacturer's recommended installation procedures as approved by the Engineer of Record, anchoring all components firmly into position.
- C. Trusses shall be handled during fabrication, delivery and at the job site so as not to be subjected to excessive bending.
- D. Trusses shall be unloaded in a manner so as to minimize lateral strain. Trusses shall be protected from damage that might result from onsite activities and environmental conditions. Trusses shall be handled in such a way so as to prevent toppling when banding is removed.
- E. Contractor shall be responsible for the handling, installation and temporary bracing of the trusses in a good workmanlike manner and in accordance with the recommendations set forth in WTCA's "Job Site Warning Poster" and WTCA's Truss Technology in Building "Always Diagonally Brace for Safety" and "Web Member Permanent Bracing: Brace it for Stability".
- F. Apparent damage to trusses, if any, shall be reported to Truss Manufacturer prior to installation.
- G. Trusses shall be set and secured level and plumb, and in correct location. Trusses shall be held in correct alignment until specified permanent bracing is installed.



- H. Cutting and altering of trusses is not permitted. If any truss should become broken, damaged, or altered, written concurrence and approval by a licensed design professional is required.
- I. Concentrated loads shall not be placed on top of trusses until all specified bracing has been installed and decking is permanently nailed in place. Specifically avoid stacking full bundles of decking or other concentrated loads on top of trusses.
- J. The Contractor shall provide truss Submittals and any supplementary information provided by the Truss Manufacturer to the individual or organization responsible for the installation of the trusses.
- K. Trusses shall be permanently braced in a manner consistent with good building practices and in accordance with the requirements of the Building Structural System Design Documents. Trusses shall furthermore be anchored or restrained to prevent out-of-plane movement so as to keep all truss members from simultaneously buckling together in the same direction. Such permanent lateral bracing shall be accomplished by (a) anchorage to solid end walls; (b) permanent diagonal bracing in the plane of the web members or (c) other suitable means.
- L. Contractor shall furnish materials used in temporary and permanent bracing.

END OF SECTION 06190

## **SECTION 06200 FINISH CARPENTRY**

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### **1. GENERAL**

#### **1.1 DESCRIPTION**

A. Work included: Install wood, nails, screws, and other items as needed, and perform finish carpentry as specified herein, and as needed for a complete and proper installation.

B. Related work:

1. Documents affecting work of this section include, but are not necessarily limited to, General Conditions, Supplementary Conditions and Sections in Division 1 of these Specifications.

2. Section 07920: Sealants and caulking.

3. Section 09900: Painting.

#### **1.2 QUALITY ASSURANCE**

A. Use adequate numbers of skilled workmen who are thoroughly trained and experienced in the necessary crafts and who are completely familiar with the specified requirements and the methods needed for proper performance of the work of this Section.

#### **1.3 SUBMITTALS**

A. Comply with pertinent provisions of Section 01340 and Section 01600.

B. Furnish Shop Drawings for approval of all off-site-fabricated work.

#### **1.4 PRODUCT HANDLING**

A. Comply with pertinent provisions of Section 01600.

### **2. PRODUCTS**

#### **2.1 GRADE STAMPS**

A. Identify lumber by the grade stamp of the Southern Pine Inspection Bureau; West Coast Lumber Inspection Bureau, or such other grade stamp as is approved in advance by the Engineer of Record.

B. Identify plywood as to species, grade, and glue type by the stamp of APA - The Engineered Wood Association.

#### **2.2 MATERIALS**

A. Provide materials in the quantities as needed for a complete and proper installation.

B. Exterior PVC Trim:..Provide Azek Trimboards cellular pvc trim products available in board and sheet dimensions as manufactured by Vycom Corporation, 801 Corey street, Moosic, PA 18507. Tel: (866) 549-6900 Website: [www.azek.com](http://www.azek.com)

1. Store trim products on a flat and level surface.

## 2.3 OTHER MATERIALS

A. Provide other materials, not specifically described but required for a complete and proper installation, as selected by the Contractor subject to the approval of the Engineer of Record.

## 3. EXECUTION

### 3.1 SURFACE CONDITIONS

A. Examine the areas and conditions under which work of this Section will be performed. Correct conditions detrimental to timely and proper completion of the work. Do not proceed until unsatisfactory conditions are corrected.

### 3.2 WORKMANSHIP

A. Produce joints that are true, tight, and well fastened.

B. Jointing:

1. Make joints to conceal shrinkage: miter exterior joints, cope interior joints, miter or scarf end-to-end joints.

2. Install trim in pieces as long as possible, jointing only where solid support is obtained.

C. Fastening:

1. Install items straight, true, level, plumb and firmly anchored in place.

2. Where blocking or backing is required, coordinate as necessary with all trades to insure placement of required backing and blocking in a timely manner.

3. Nail trim with finish nails of proper dimension to hold the member firmly in place without splitting the wood.

4. Nail exterior trim with galvanized nails, making joints to exclude water, and setting in waterproof glue or the sealant described in Section 07920 of these Specifications.

5. On exposed work, set nails for putty.

6. Screw, do not drive, wood screws.

### 3.3 INSTALLATION OF OTHER ITEMS

A. Install items in strict accordance with the recommended methods of the manufacturer as approved by the Engineer of Record, anchoring firmly into position at the prescribed locations, straight, plumb and level.

### 3.4 FINISHING

A. Sandpaper finished wood surfaces thoroughly as required to produce a uniformly smooth surface, always sanding in the direction of the grain; except do not sand wood which is designed to be left rough.

B. No coarse-grained sandpaper mark, hammer mark, or other imperfection will be accepted.

C. Site finish or mill finish work of this Section in accordance with pertinent provisions of Section 09900 of these Specifications.

### 3.5 CLEANING UP

A. Keep premises in a neat, safe, and orderly condition at all times during execution of this portion of the Work, free from accumulation of sawdust, cut-ends, and debris.

B. Sweeping:

1. At the end of each working day, and more often if necessary, thoroughly sweep surfaces where refuse from this portion of the work has settled.

2. Remove the refuse to the area of the job site set aside for its storage.

3. Upon completion of this portion of the work, thoroughly broom clean all surfaces.

END OF SECTION 06200

## **SECTION 06240 LAMINATED PLASTIC**

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### **1. GENERAL**

#### **1.1 DESCRIPTION**

A. Work included: Provide high-pressure decorative laminated plastic (HPDL) as specified herein, and needed for a complete and proper installation.

B. Related work:

1. Documents affecting work of this Section include, but are not necessarily limited to, General Conditions, Supplementary Conditions and Sections in Division 1 of these Specifications.

2. Section 06410: Custom Casework.

#### **1.2 QUALITY ASSURANCE**

A. Use adequate numbers of skilled workmen who are thoroughly trained and experienced in the necessary crafts and who are completely familiar with the specified requirements and the methods needed for proper performance of the work of this Section.

#### **1.3 SUBMITTALS**

A. Comply with pertinent provisions of Section 01340 and Section 01600.

B. Product data: Within 35 calendar days after the Contractor has received the Owner's Notice to Proceed, submit:

1. Materials list of items proposed to be provided under this Section.

2. Manufacturer's specifications and other data needed to prove compliance with the specified requirements.

3. Samples of the full range of colors and patterns available in each of the specified grades from the proposed manufacturer.

4. Manufacturer's recommended methods of installation which, when approved by the Engineer of Record, will become the basis for acceptance or rejection of actual installation procedures used on the Work.

#### **1.4 PRODUCT HANDLING**

A. Comply with pertinent provisions of Section 01600.

### **2. PRODUCTS**

#### **2.1 LAMINATED PLASTICS**

A. Acceptable manufacturers:

1. Wilsonart International, Inc.

2400 Wilson Place

Temple, Texas 76503-6110

(800) 433-3222.

2. Nevamar Corporation

8339 Telegraph Road

Odenton, Maryland 21113

(800) 638-4380.

3. Micarta Division of Westinghouse Electric Corporation

304 Hoover Street

Hampton, South Carolina 29924

(803) 943-2231.

4. Formica Corporation

Cincinnati, Ohio

(800) 367-6422

5. Others by prior approval of the Engineer of Record.

B. Colors and patterns: Provide "solid colors, textured finish" selected by the Engineer of Record from standard colors and finishes of the approved manufacturer.

C. Qualities and types: Provide general purpose type high-pressure decorative laminate complying with ANSI/NEMA LD 3-2000.

1. Horizontal surfaces other than tops: Grade GP-50, 0.050-inch nominal thickness.

2. Postformed surfaces: PF-42, 0.042-inch nominal thickness.

3. Vertical surfaces: GP-28, 0.028-inch nominal thickness.

## 2.2 ADHESIVES

A. For installation of laminated plastic use: "Rigid Set" (urea-resin), "semi-rigid set" PVA, "water based" contact cement or Phenolic Resin.

## 3. EXECUTION

### 3.1 SURFACE CONDITIONS

A. Examine the areas and conditions under which work of this Section will be performed. Correct conditions detrimental to timely and proper completion of the work. Do not proceed until unsatisfactory conditions are corrected.

### 3.2 INSTALLATION

A. Install the approved laminated plastic in strict accordance with the manufacturer's recommendations as approved by the Engineer of Record.

END OF SECTION 06240

## DIVISION 7

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### THERMAL AND MOISTURE PROTECTION

#### SECTION 07160 BITUMINOUS DAMPPROOFING

##### 1. GENERAL

##### 1.1 DESCRIPTION:

A. Work included: Provide solvent based fiber reinforced semi mastic bituminous dampproofing below grade on vertical surfaces of masonry construction as specified herein, and as needed for a complete and proper installation.

B. Related work:

1. Documents affecting work of this Section include, but are not necessarily limited to, General Conditions, Supplementary Conditions, and Sections in Division 1 of these Specifications.

2. Division 4: Masonry.

3. Division 7: Thermal and Moisture Protection.

##### 1.2 QUALITY ASSURANCE:

A. Use adequate numbers of skilled workmen who are thoroughly trained and experienced in the necessary crafts and who are completely familiar with the specified requirements and the methods needed for proper performance of the work of this Section.

B. Applicator: Shall have a minimum of five (5) years experience in the installation of the types of materials in this section, and shall provide a list of completed projects similar to the work of this section.

##### 1.3 SUBMITTALS:

A. Comply with pertinent provisions of Section 01340 and Section 01600.

B. Manufacturer's catalog, data sheets, details and application instructions.

C. Manufacturer's standard warranty.

D. Samples shall include Semi-Mastic, primer and other products as may be required.

##### 1.4 PRODUCTS DELIVERY, STORAGE AND HANDLING:

A. Comply with pertinent provisions of Section 01600.



B. Products shall be delivered in manufacturer's sealed containers, with seals and labels intact. Type of material and lot number shall appear on the container.

C. Store materials in an enclosed dry space protected from weather and out of direct rays of the sun. Maintain a temperature range of 40°F minimum to 90°F max.

## 2. PRODUCTS

### 2.1 BITUMINOUS DAMPPROOFING

A. Provide solvent type, fiber-reinforced semi mastic bituminous dampproofing for brush or towel application, Semi-Mastic as manufactured by Sonneborn Building Products, Chem Rex, Inc. Minneapolis, MN.

1. Semi-Mastic conforms to compliances of: ASTM-D-4479, Type I; ASTM-D-2823; Federal Specification SS-A-694D.

B. SUBSTITUTIONS: An equal system of manufacturers approved in advance by Engineer of Record under provisions on Division 1, including but not limited to the following:

1. W.R. Meadows, Inc., Sealmastic solvent type dampproofing, Semi-Mastic.

2. Tamms Industries, Inc., Dehydratine 10, solvent based dampproofing.

## 3. EXECUTION

### 3.1 APPLICATION:

A. Apply Semi-Mastic by trowel, three-knot roofing brush or spray to concrete masonry unit walls, (exterior surfaces), in strict accordance with the manufacturer's printed instructions.

B. Apply Semi-Mastic in two (2) coats, allowing the first coat to dry before applying second coat.

C. Fill all cracks, crevices, and grooves. Make sure coating is continuous and free from breaks and pinholes. Carry Semi-Mastic over exposed tops and outside edges of footing, forming a cove at junction of wall and footing. Spread around all joints, grooves, and slots and into all chases, corners, reveals, openings and soffits. BACKFILLING: Do not place backfill for at least 24 to 48 hours after application. Where possible, place backfill within approximately 7 days. Backfill should be placed in a manner that will not rupture or damage the film or displace the coating or membranes. In some applications, a protective board may be required.

D. On porous surfaces, such as cinder, lightweight, and concrete block, varied systems are recommended, the two techniques described are equally effective. Base selection upon local preference and available equipment.

1. Membrane system: Apply first coat as described above under dense surfaces. Within 4 hours, apply glass fabric membrane cloth vertically over all surfaces of Semi-Mastic, overlapping all edges at least 3". Press firmly into place without wrinkles. Within 24 hours, apply second coat of Semi-Mastic, allow to set and backfill as described above under Backfilling.

2. Parge coat system: Apply a parge coat of cement mortar to block wall, carrying the parge coat from the bottom of footings to grade level and forming a cove at the junction of the wall and footing. Cure and allow to dry.

#### E. COVERAGE:

1. Semi-Mastic 1/8" wet film: 8 to 9 gallons per 100 sq. ft.

#### F. SPRAY EQUIPMENT:

1. Use airless spray equipment like the Graco King 45:1 pump and 207-945 extension flo gun with a 208-176 spray adaptor and a 637 spray tip at 3300 psi with a 50 ft. 3/8" I.D. hose. Consult spray equipment manufacturer for complete recommendations. Clean all tools and equipment directly after use with Reducer 990, xylene, or mineral spirits.

#### G. SAFETY EQUIPMENT

1. Impervious gloves, goggles and if applied in areas of poor or inadequate ventilation, use NIOSH/MSHA approved organic vapor respirator.

#### H. PROTECTION OF OTHERS WORK:

1. The Contractor performing this portion of the work shall protect all installed items within and adjacent to the areas receiving bituminous dampproofing.

#### 3.2 ENVIRONMENTAL CONDITIONS:

A. Semi-Mastic shall be applied when the temperature is 40°F or above. Application at temperatures below 40°F shall be permitted only after written approval from the Technical Service Department of Sonneborn Building Products, ChemRex, Inc. and only after adequate precautions have been taken to assure dry and frost-free C.M.U. surfaces.

B. Do not apply during inclement weather.

#### 3.3 SURFACE CONDITIONS

A. Surface shall be clean, free of curing and parting compounds, wax or other foreign chemicals or materials.

B. Surfaces shall be smooth, sound and free of honeycombs.

#### 3.4 FIELD QUALITY CONTROL

A. Before the material attains final set, verify the applied thickness by use of a mill-thickness gauge as the work progresses. Take a reading every 100 sq. ft. of surface area. Where readings indicate a thickness less than specified, immediately apply additional membrane to produce required thickness. See 3.1.F.1 above.

#### 3.5 CLEANING

A. Upon completion of this work, all materials, containers, equipment and debris shall be removed. Area shall be left in clean condition.

END OF SECTION 07160

## **SECTION 07192 LAMINATED VAPOR BARRIER**

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### **1. GENERAL**

#### **1.1 DESCRIPTION**

A. Work included: Provide laminated vapor barrier as specified herein and as needed for a complete and proper installation.

B. Related work:

1. Documents affecting work of this Section include, but are not necessarily limited to, General Conditions, Supplementary Conditions and Sections in Division 1 of these Specifications.

2. Section 03310: Concrete Work.

#### **1.2 QUALITY ASSURANCE**

A. Use adequate numbers of skilled workmen who are thoroughly trained and experienced in the necessary crafts and who are completely familiar with the specified requirements and the methods needed for proper performance of the work of this Section.

#### **1.3 SUBMITTALS**

A. Comply with pertinent provisions of Section 01340 and Section 01600.

B. Product data: Within 35 calendar days after the Contractor has received the Owner's Notice to Proceed, submit:

1. Materials list of items proposed to be provided under this Section.

2. Manufacturer's specifications and other data needed to prove compliance with the specified requirements.

3. Manufacturer's recommended installation procedures which, when approved by the Engineer of Record, will become the basis for accepting or rejecting actual installation procedures used on the Work.

#### **1.4 PRODUCT HANDLING**

A. Comply with pertinent provisions of Section 01600.

### **2. PRODUCTS**

#### **2.1 LAMINATED VAPOR BARRIER**

A. Where required for a proper moisture vapor barrier under all concrete slabs, provide Fortifiber Corporation, "Moistop" or Glas-Kraft, Inc. "Ply-Bar Plus II", a membrane with a core of waterproof fiber reinforced kraft paper between two layers of inert polyethylene laminated vapor barrier bonded together by heat and pressure.

#### **2.2 OTHER MATERIALS**

A. Provide other materials, not specifically described but required for a complete and proper installation, as selected by the Contractor subject to the approval of the Engineer of Record.

### 3. EXECUTION

#### 3.1 SURFACE CONDITIONS

A. Examine the areas and conditions under which work of this Section will be performed. Correct conditions detrimental to timely and proper completion of the work. Do not proceed until unsatisfactory conditions are corrected.

B. Assure that all dressed fill under all concrete slabs has been filled, tamped and smoothed prior to installation.

#### 3.2 INSTALLATION

A. Except as may be modified with the advance approval of the Engineer of Record; install the work of this Section in strict accordance with the manufacturer's recommendations.

B. Apply membrane to finely dressed fill below all finished concrete slabs parallel to direct of flow of concrete, lapping and sealing all joints not less than 6".

C. Seal, with pressure-sensitive tape, at all pipes and breaks in membrane and at all lap joints.

1. Carefully seal all construction punctures.

END OF SECTION 07192

## **SECTION 07210 BUILDING INSULATION**

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### **1. GENERAL**

#### **1.1 DESCRIPTION**

A. Work included: Provide building insulation as specified herein, and as needed for a complete and proper installation.

B. Related work:

1. Documents affecting work of this Section include, but are not necessarily limited to, General Conditions, Supplementary Conditions and Sections in Division 1 of these specifications.

#### **1.2 QUALITY ASSURANCE**

A. Use adequate numbers of skilled workmen who are thoroughly trained and experienced in the necessary crafts and who are completely familiar with the specified requirements and the methods needed for proper performance of the work of this Section.

B. Upon completion of this portion of the Work, complete and post a certificate of insulation compliance in accordance with pertinent requirements of governmental agencies having jurisdiction.

#### **1.3 SUBMITTALS**

A. Comply with pertinent provisions of Section 01340 and Section 01600.

B. Product data: Within 35 calendar days after the Contractor has received the Owner's Notice to Proceed, submit:

1. Materials list of items proposed to be provided under this Section.

2. Manufacturer's specifications and other data needed to prove compliance with the specified requirements.

3. Manufacturer's recommended installation procedures which, when approved by the Engineer of Record, will become the basis for accepting or rejecting actual installation procedures used on the Work.

#### **1.4 PRODUCT HANDLING**

A. Comply with pertinent provisions of Section 01600.

B. Deliver all insulation materials and accessories to the project site in manufacturers' original, unopened, undamaged packaging, with all identification labels intact. Store in a safe place protected from dust, dirt, moisture and physical abuse before and during installation.

### **2. PRODUCTS**

#### **2.1 MATERIALS**

A. Provide the following building insulation meeting ASTM C 665, Type 1, as needed to achieve the degree of insulation required under pertinent regulations of governmental agencies having jurisdiction.

1. 3 5/8" thick un-faced glass fiber batts with an insulation-only value of R-11, snugly fitted.

2. 6 1/4" thick un-faced glass fiber batts with an insulation-only value of R-19, snugly fitted.

## 2.2 OTHER MATERIALS

A. Provide other materials not specifically described but required for a complete and proper installation, as selected by the Contractor subject to the approval of the Engineer of Record.

## 3. EXECUTION

### 3.1 SURFACE CONDITIONS

A. Examine the areas and conditions under which work of this Section will be performed. Correct conditions detrimental to timely and proper completion of the Work. Do not proceed until unsatisfactory conditions are corrected.

B. Remove, or protect against, projections in construction framing that may damage or prevent proper insulation.

### 3.2 INSTALLATION

A. Install the work of this Section in strict accordance with the original design, requirements of governmental agencies having jurisdiction and the manufacturer's recommended installation procedures as approved by the Engineer of Record, snugly fitted, anchoring all components firmly into position.

END OF SECTION 07210

## **SECTION 07311 ASPHALT SHINGLES**

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### **1. GENERAL**

#### **1.1 DESCRIPTION**

A. Work included: Provide granule surfaced asphalt roofing shingles, deck, eave, hip, valley, ridge protection membrane (leak barrier) and metal flashing associated with shingle roofing, ridge vents, and soffit vents as specified herein, and as needed for a complete and proper installation.

B. Related work:

1. Documents affecting work of this Section include, but are not necessarily limited to, General Conditions, Supplementary Conditions and Sections in Division 1 of these specifications.

2. Section 06100: Rough Carpentry.

3. Section 06190: Wood Trusses.

#### **1.2 REFERENCE STANDARDS**

A. ASTM B 209 – Standard Specification for Aluminum and Aluminum-Alloy Sheet and Plate.

B. ASTM D 3018 – Standard Specification for Class A Asphalt Shingles Surfaced with Mineral Granules.

C. ASTM D 3161 – Standard Test Method for Wind- Resistance of Asphalt Shingles (Fan-Induced Method).

D. ASTM D 3462 – Standard Specification for Asphalt Shingles Made from Glass Felt and Surfaced with Mineral Granules.

E. ASTM D 4586 – Standard Specification for Asphalt Roof Cement, Asbestos-Free.

F. UL 790 – Tests for Fire Resistance of Roof Covering Materials.

G. UL 997 – Wind Resistance of Prepared Roof Covering Materials.

#### **1.3 QUALITY ASSURANCE**

A. Use adequate numbers of skilled workmen who are thoroughly trained and experienced in the necessary crafts and who are completely familiar with the specified requirements and the methods needed for proper performance of the work of this Section.

B. Use products produced by manufacturers regularly engaged in manufacture of similar items and with a history of successful production acceptable to the Engineer of Record.

C. Maintain one copy of manufacturer's application instructions at project site.

#### **1.4 SUBMITTALS**

A. Comply with pertinent provisions of Section 01340 and Section 01600.



B. Product data: Within 35 calendar days after the Contractor has received the Owner's Notice to Proceed, submit:

1. Materials list of items proposed to be provided under this Section.
2. Manufacturer's specifications and other data needed to prove compliance with the specified requirements.
3. Samples showing full range of colors available in the proposed products.
4. Manufacturer's recommended installation procedures which, when approved by the Engineer of Record, will become the basis for accepting or rejecting actual installation procedures used on the Work.

#### 1.5 PRODUCT HANDLING

- A. Comply with pertinent provisions of Section 01600.
- B. Store products in manufacturer's unopened labeled packaging until ready for installation.
- C. Store products in a covered, ventilated area, at temperature not more than 110 degrees F; do not store near steam pipes, radiators, in sunlight.
- D. Store bundles on flat surface to maximum height recommended by manufacturer; store rolls on end.
- E. Store and dispose of solvent-based materials, in accordance with requirements of local authorities having jurisdiction.

#### 1.6 WARRANTY

- A. Provide manufacturer's Lifetime Limited Warranty.

### 2. PRODUCTS

#### 2.1 MANUFACTURERS

A. Super-heavyweight, granule surfaced, self sealing asphalt shingles with fiberglass reinforced core and a mineral granule surfacing specified herein is based upon products as manufactured by GAF Materials Corporation, 1361 Alps Road, Wayne NJ 07470. Tel: 1-888-532-5767 Website: [www.GAF.com](http://www.GAF.com).

B. Equal products as manufactured by the following manufacturers, or other manufacturers, fully conforming to these Specifications, when approved by the Engineer of Record.

1. CertainTeed Corporation, Engineer of Recordural Support Group, P.O. Box 860, Valley Forge, PA 19482.

Tel: 1-800-233-8990 Website:

[www.CertainTeed.com](http://www.CertainTeed.com).

2. Owens Corning World Headquarters

One Owens Corning Parkway

Toledo, OH 43659. Tel: 1-

800-438-7465

Website: [www.owenscorning.com](http://www.owenscorning.com).

## 2.2 MATERIALS

A. Shingles: Provide Lifetime Limited Warranty granular surfaced glass fiber mat reinforced algae-resistant two-piece laminated asphalt shingles complying with ASTM D 3018, ASTM D 3161 and ASTM D 3462; UL 790 Class A rated with UL 997 Wind Resistance Label

1. Style: GAF Timberline Ultra, with Timbertex Hip and Ridge shingles.

2. Weight: 310 pounds per square.

3. Color: As selected by Engineer of Record from manufacturer's standards.

B. Eave Protection Membrane Leak Barrier: Self adhesive rubberized asphalt sheet, with strippable release film.

1. Total Thickness: 60 mils.

2. Product: GAF StormGuard Ultra-Flex, bonded to skid-resistant polyethylene.

C. Roof Deck Underlayment Membrane Leak Barrier: Self-adhesive rubberized asphalt sheet, with strippable release film.

1. Total Thickness: 60 mils.

2. Product: GAF StormGuard Ultra-Flex, bonded to skid-resistant polyethylene.

### D. STARTER STRIP

1. Self-sealing starter course. Each strip measures 7" tall by 36" wide. One bundle covers approx. 33 lineal feet, Weatherstop Starter Strips by GAFMC.

E. Nails: Standard round wire shingle type, zinc coated steel or aluminum; 10 to 12 gauge, barbed or deformed shank, with heads 3/8 inch to 7/16 inch in diameter; length sufficient to penetrate at least 3/4 inch into solid wood or just through plywood or oriented strand board.

F. Asphalt Roofing Cement: ASTM D 4586, Type I or II.

G. Ridge Vent: Provide Lomanco "Omniridge" OR-4, shingle over design exhaust vent for roof ridge or Engineer of Record approved equal.

1. Net free ventilating area (NFVA) per lineal foot: 18 sq. in.

2. Color: As selected by Engineer of Record from manufacturer's standards.

H. Metal Flashing: 0.032-inch aluminum sheet, complying with ASTM B 209. Paint as directed by the Engineer of Record.

1. Provide metal flashing at:

a. Eave edges.

b. Rake edges.

c. Stepped flashing at sidewalls and dormers.

I. Plumbing Vent Boots: Lead when accepted by codes, aluminum when lead is not accepted by codes.

## 2.3 OTHER MATERIALS

A. Provide other materials, not specifically described but required for a complete and proper installation, as selected by the Contractor subject to the approval of the Engineer of Record.

## 3. EXECUTION

### 3.1 EXAMINATION

A. Do not begin installation until roof deck has been properly prepared.

B. If roof deck preparation is the responsibility of another installer, notify Engineer of Record of unsatisfactory preparation before proceeding.

### 3.2 PREPARATION

A. Clean deck surfaces thoroughly prior to installation of (leak barriers) deck underlayment membrane and eave protection membrane.

B. At areas to receive (leak barriers) deck underlayment membrane and eave protection membrane, fill knotholes and cracks with latex filler.

### 3.3 INSTALLATION OF MEMBRANE UNDERLAYMENTS (LEAK BARRIERS)

A. Install using methods recommended by manufacturer in accordance with local building code.

B. Eaves:

1. Place eave edge metal tight with fascia boards; lap joints 2 inches and seal with asphalt roofing cement; nail at top of flange.

2. Install eave protection membrane up the slope from eave edges a full 36 inches; lap ends 6 inches and bond.

C. Valleys:

1. Install eave protection membrane at least 36 inches wide centered on valley, lap ends 6 inches and seal.

D. Membrane Underlayment: Install one layer of roof deck membrane underlayment over entire deck area not protected by eave or valley membrane; run sheets horizontally lapped so water sheds; lap ends 6" and bond.

E. At vent pipes, install a 24 inch square piece of eave protection membrane lapping over roof deck membrane underlayment; seal tightly to pipe.

F. At vertical walls, install eave protection membrane extending at least 6 inches up the wall and 12 inches on to the roof surface lapping over roof deck membrane underlayment.

G. At rake edges, install metal edge flashing over eave protection membrane and roof deck membrane underlayment; set tight to rake boards; lap joints at least 2 inches and seal with asphalt roofing cement; secure with nails.

H. Install ridge vents along entire length of ridges per manufacturer's installation instructions.

1. Provide eave vents in sufficient quantity to equal or exceed the ridge vent areas.

a. Perforated vinyl soffit material specified at Section 07460 of these Specifications.

### 3.4 INSTALLATION OF SHINGLES

A. Install in accordance with manufacturer's instructions and requirements of local building code.

1. Avoid breakage of shingles by avoiding dropping bundles on edge, by separating shingles carefully (not by "breaking" over ridge or bundles), and by taking extra precautions in temperatures below 40° F.

2. Handle carefully in hot weather to avoid damaging shingle edges.

3. Secure with 4, 5, or 6 nails per shingle per manufacturer's instructions or local codes.

B. Make hips and ridges using shingles required by manufacturer.

C. At ridges, install ridge shingles over ridge vent material; use nails of specified length; do not drive nails home, leaving 3/4-inch slot open between ridge and roof shingles.

D. Make valleys using "closed cut valley" technique:

1. Run the first, and only the first, course of shingles from the higher roof slope across the valley at least 12 inches.

2. Run all courses of shingles from the lower roof slope across the valley at least 12 inches and nail not closer than 6 inches to center of valley.

3. Run shingles from the upper roof slope into valley and trim 2-inches from center of valley.

### 3.6 PROTECTION

A. Protect installed products until completion of project.

B. Do not permit traffic over finished roof surface.

END OF SECTION 07311

## **SECTION 07460 VINYL SOFFIT PANELS**

---

### **1. GENERAL**

#### **1.1 DESCRIPTION**

A. Work included: Provide all necessary labor, material and equipment for complete installation of premium vinyl soffit panels, accessories and trim as specified herein, and as needed for a complete and proper installation.

B. Related work:

1. Documents affecting work of this Section include, but are not necessarily limited to, General Conditions, Supplementary Conditions and Sections in Division 1 of these Specifications.

2. Section 06100: Rough Carpentry.

3. Section 07920: Sealants and Caulking.

#### **1.2 QUALITY ASSURANCE**

A. Use adequate numbers of skilled workmen who are thoroughly trained and experienced in the necessary crafts and who are completely familiar with the specified requirements and the methods needed for proper performance of the work of this Section.

B. Certification: Provide manufacturer's certification that vinyl soffit products comply with specified requirements.

#### **1.3 REFERENCES**

A. American Society for Testing and Materials (ASTM) D3679 – Standard Specification for Rigid Poly Vinyl Chloride (PVC) Siding.

B. Rigid Vinyl Siding Application Manual – Vinyl Siding Institute of the Plastics Industry.

C. Vinyl Siding Institute (VSI).

D. Underwriters Laboratories, Inc. (UL).

E. 2001 Florida Building Code (FBC).

#### **1.4 SUBMITTALS**

A. Comply with pertinent provisions of Section 01340 and Section 01600.

B. Product data: Within 35 calendar days after the Contractor has received the Owner's Notice to Proceed, submit:

1. Manufacturer's specifications, installation instructions, care and maintenance instructions and other data needed to prove compliance with the specified requirements.

2. Selection Samples: Submit manufacturer's standard color chips for selection of colors and textures.

3. Verification Samples: Submit 3 samples of soffit material, accessories and trim products in colors and textures specified, each not less than 12 inches in length.

#### 1.5 PRODUCT HANDLING

A. Comply with pertinent provisions of Section 01600.

B. Each box of soffit material to be clearly marked with the manufacturer's name, the soffit style, color and identifying lot number.

C. Prior to application, vinyl soffit panels and accessories shall be stored on level, elevated platforms in an area that is clean, dry and out of direct sunlight. Cover soffit panels and accessories only with clear plastic.

#### 1.6 WARRANTY

A. Upon completion of work of this section, provide manufacturer's written Transferable, Lifetime Limited Warranty.

### 2. PRODUCTS

#### 2.1 ACCEPTABLE MANUFACTURERS

A. Premium vinyl soffit panels, accessories and trim specified herein are based upon products as manufactured by Alside, Inc., Division of Associated Materials Incorporated, Cuyahoga Falls, Ohio; Tel: (800) 922-6009 Website: [www.alside.com](http://www.alside.com).

B. Equal products as manufactured by other manufacturers, fully conforming to these Specifications, when approved by the Engineer of Record.

#### 2.2 MATERIALS

A. Vinyl soffit panels, accessories and trim shall conform to all of the requirements established by ASTM Specification D 3679, developed in cooperation with the industry and published by the American Society for Testing and Materials. Manufacturer shall maintain rigorous production quality control standards to assure that Premium Vinyl Soffit Panels will perform as expected for its intended use. Soffit panels, accessories and trim shall be VSI certified.

B. Typical Compound Properties: Vinyl soffit panels accessories and trim are produced from Poly Vinyl Chloride (PVC) Compounds meeting the requirements of ASTM D 3679 for compound class number 2.

#### 2.3 SOFFIT PANELS

A. Description: Super Span – Deep V-groove profile, # 10-5012. Each 10-inch wide panel with 5/8" butt edge is nominally configured as two 5" aerated panels. Aerated panels shall be lanced. B. Style: Double 5" exposure, 10 inches wide, and 12 feet long.

C. Thickness: 0.044 inch per VSI Certification Standards.

D. Color and Texture: Subtle wood grain texture in low-gloss finish of color(s) as selected by Engineer of Record from manufacturer's standards.

## 2.5 ACCESSORIES AND TRIM

A. Accessories and Trim: Provide manufacturer's standard trim and finishing accessories as follows and as required for a complete installation. Color shall be matched or color coordinated to the soffit panels according to the Engineer of Record's color(s) selection. Accessories shall be produced from the same compound materials and with comparable properties as the soffit panels.

1. Soffit Trim: Premium 5/8" J-Channel, smooth texture, # 10-5107.

B. Fasteners: Provide corrosion-resistant fasteners as recommended by manufacturer of vinyl soffit products.

## 3. EXECUTION

### 3.1 SURFACE CONDITIONS

A. Examine the areas and substrate conditions under which work of this Section will be installed. Correct conditions detrimental to timely and proper installation and completion of the Work. Do not proceed until unsatisfactory substrate conditions are corrected.

B. Any substrate flaws or defects must be repaired before the vinyl soffit panels are installed. Vinyl soffit panels must be installed to substrates that are in plane and free from obstructions.

C. Commencement of soffit panel installation implies acceptance of the substrate conditions as suitable to accept soffit materials.

### 3.2 INSTALLATION

A. Install in strict accordance with the latest edition of the "How to Install Vinyl Siding and Soffit," published by Alside, Inc., or the "Rigid Vinyl Siding Application Manual". Included in the application should be any special details.

B. The vinyl soffit panels trim and accessories shall be installed in accordance with the best practice, with all joint members plumb and true."

C. After installation of soffits check all surfaces for obvious flaws or defects. Replace or repair any problem areas, paying close attention to the substrate for causes of the problem.

### 3.3 CLEANING

A. After the vinyl soffit panels, accessories and trim have been applied, clean as necessary to remove all fingerprints and soiled areas. Upon completion of the soffit panels, accessories and trim installation, the entire area is to be cleaned, removing all scrap, packaging and unused building materials from project site.

END OF SECTION 07460



## **SECTION 07600 FLASHING AND SHEET METAL**

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### **1. GENERAL**

#### **1.1 DESCRIPTION**

A. Work included: Provide flashing and sheet metal not specifically described in other Sections of these Specifications but required to prevent penetration of water through the exterior shell of the building.

B. Related work:

1. Documents affecting work of this Section include, but are not necessarily limited to, general Conditions, Supplementary Conditions and Sections in Division 1 of these Specifications.

2. Section 07610: Preformed Metal Roofing.

3. Section 07920: Sealants and Caulking.

4. Section 09900: Painting.

#### **1.2 QUALITY ASSURANCE**

A. Use adequate numbers of skilled workmen who are thoroughly trained and experienced in the necessary crafts and who are completely familiar with the specified requirements and the methods needed for proper performance of the work of this Section.

B. In addition to complying with pertinent codes and regulations, comply with pertinent recommendations contained in current edition of " Engineer of Recordural Sheet Metal Manual" published by the Sheet Metal and Air Conditioning Contractors National Association (SMACNA).

C. Standard commercial items may be used for flashing, trim, reglets, and similar purposes provided such items meet or exceed the quality standard specified.

#### **1.3 SUBMITTALS**

A. Comply with pertinent provisions of Section 01340 and Section 01600.

B. Product data: Within 35 calendar days after the Contractor has received the Owner's Notice to Proceed, submit:

1. Materials list of items proposed to be provided under this Section.

2. Manufacturer's specifications and other data needed to prove compliance with the specified requirements.

3. Shop Drawings in sufficient detail to show fabrication, installation, anchorage, and interface of the work of this Section with the work of adjacent trades.

4. Manufacturer's recommended installation procedures which, when approved by the Engineer of Record, will become the basis for accepting or rejecting actual installation procedures used on the work.

#### 1.4 PRODUCT HANDLING

A. Comply with pertinent provisions of Section 01600.

#### 2. PRODUCTS

##### 2.1 MATERIALS AND GAUGES

A. Where sheet metal is required, and no materials or gauges are indicated, provide the highest quality and gauge commensurate with the referenced standards.

##### 2.2 METALLIC FLASHING

A. Where metallic flashing is required, use stainless steel flashing.

B. Provide metallic flashing of Type 302/304 dead soft, fully annealed stainless steel (.0187"), No. 2D/No. 2B mill rolled finish.

C. Flashing system shall include inside and outside corners.

##### 2.3 FLUX

A. Where flux is required, use raw muriatic acid.

##### 2.4 SOLDER

A. Where solder is required, comply with ASTM B32.

##### 2.5 OTHER MATERIAL

A. Provide other materials, not specifically described but required for a complete and proper installation, as selected by the Contractor subject to the approval of the Engineer of Record.

#### 3. EXECUTION

##### 3.1 SURFACE CONDITIONS

A. Examine the areas and conditions under which work of this Section will be performed. Correct conditions detrimental to timely and proper completion of the Work. Do not proceed until unsatisfactory conditions are corrected.

##### 3.2 WORKMANSHIP

A. General:

1. Form flashing and sheet metal accurately and to the dimensions and shapes required, finishing molded and broken surfaces with true, sharp, and straight lines and angles and, where intercepting other members, coping to an accurate fit and soldering securely.

2. Unless otherwise specifically permitted by the Engineer of Record, turn exposed edges back 2".

B. Form, fabricate, and install sheet metal so as to adequately provide for expansion and contraction in the finished Work.

C. Weatherproofing:

1. Finish watertight and weather tight.
2. Make lock seam work flat and true to line, sweating full of solder.
3. Make lock seams and lap seams, when soldered, at least 1/2" wide.
4. Where lap seams are not soldered, lap according to pitch, but in no case less than 3".
5. Make flat and lap seams in the direction of flow.

D. Joints:

1. Provide suitable watertight expansion joints for runs of more than 40'-0", except where closer spacing is required for proper installation.

E. Nailing:

1. Whenever possible, secure metal by means of clips or cleats, without nailing through the exterior metal.
2. In general, space nails, rivets, and screws not more than 8" apart and, where exposed to the weather, use lead washers.
3. For nailing into wood, use barbed roofing nails 1-1/4" long by 11 gauge.
4. For nailing into concrete, use drilled plugholes and plugs.

### 3.3 EMBEDMENT

A. Embed metal in connection with roofs in a solid bed of sealant, using materials and methods described in Section 07920 of these Specifications or other materials and methods approved in advance by the Engineer of Record.

### 3.4 SOLDERING

A. General:

1. Thoroughly clean and tin the joint materials prior to soldering.
2. Perform soldering slowly; with a well-heated copper, in order to heat the seams thoroughly and too completely fill them with solder.
3. Perform soldering with a heavy soldering copper of blunt design, properly tinned for use.
4. Make exposed soldering on finished surfaces, neat, full flowing, and smooth.

B. After soldering, thoroughly wash acid flux with a soda solution.

### 3.5 TESTS

A. Upon request of the Engineer of Record, demonstrate by hose or standing water that the flashing and sheet metal are completely watertight.

END OF SECTION 07600

## SECTION 07920

## SEALANTS AND CAULKING

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### 1. GENERAL

#### 1.1 DESCRIPTION

##### A. Work included:

1. Throughout the Work, the Sealant Contractor shall seal all exterior joints as required to provide a positive barrier against passage of moisture and passage of air.
2. The Painting Subcontractor shall provide interior caulking specified herein. See Painting, Section 09900.

##### B. Related work:

1. Documents affecting work of this Section include, but are not necessarily limited to, General Conditions, Supplementary Conditions, and Sections in Division 1 of these Specifications.
2. Section 03310: Concrete Work
3. Section 09900: Painting

#### 1.2 QUALITY ASSURANCE

A. Use adequate numbers of skilled workmen who are thoroughly trained and experienced in the necessary crafts and who are completely familiar with the specified requirements and the methods needed for proper performance of the work of this Section.

B. Applicator shall have not less than five (5) years experience working with specified coatings and sealants and shall have executed not less than three (3) projects of similar magnitude.

C. Improperly placed or non-uniform runs of sealants or caulking compounds shall be removed and reinstalled in their entirety if so required by the Engineer of Record. Any and all adjacent work that is damaged by the application of poorly installed sealants or caulking shall be replaced to the satisfaction of the Engineer of Record at no additional expense to the Owner.

#### 1.3 SUBMITTALS

A. Comply with pertinent provisions of Section 01340 and Section 01600.

B. Product data: Within 35 calendar days after the Contractor has received the Owner's Notice to Proceed, submit:

1. Materials list of items proposed to be provided under this Section.
2. Manufacturer's specifications and other data needed to prove compliance with the specified requirements.
3. Manufacturer's recommended installation procedures which, when approved by the Engineer of Record, will become the basis for accepting or rejecting actual installation procedures used on the Work.

C. Samples: Accompanying the submittal described above, submit samples of each sealant, each backing material, each primer, and each bond breaker proposed to be used. Samples shall be 4" long, cured with color selections of each type for Engineer of Record's selection.

#### 1.4 WARRANTY

A. Upon completion of Work, and as a condition to its acceptance, deliver to the Engineer of Record two (2) copies of a warranty signed by an authorized representative of the installing Contractor agreeing:

1. To repair all damages to the Work caused by failure of material and/or workmanship for a period of five (5) years.

#### 1.5 PRODUCT HANDLING

A. Comply with pertinent provisions of Section 01600.

B. Delivery and Storage:

1. Deliver products in original sealed containers each bearing manufacturer's name and product designation.
2. Store products so as to prevent damage or contamination by foreign matter.

C. Do not retain at the job site material that has exceeded the shelf life recommended by its manufacturer.

### 2. PRODUCTS

#### 2.1 SEALANTS (EXTERIOR)

A. Except as specifically otherwise approved by the Engineer of Record, use only the types of sealants described in this Article.

1. Exterior sealant: One (1) component, non-sag, elastomeric sealant with joint movement capability (+100 to -50) per ASTM C 719.

a. Acceptable Products:

1. Sonneborn "Sonolastic 150 Tint Base"

2. Approved equal.

2. Concrete slab control joint sealant: Onepart self-leveling polyurethane sealant.

a. Acceptable Products:

1. Sonneborn "SL 1".

2. Approved equal.

B. Sealant color: Sealant color shall match adjacent surfaces color; provide samples for approval by the Engineer of Record.

## 2.2 PRIMERS

A. Use only those primers that are non-staining, have been tested for durability on the surfaces to be sealed, and specifically recommended for this installation by the manufacturer of the sealant used. Primer shall be clear liquid.

## 2.3 BACKUP MATERIALS

A. Use only those backup materials, which are specifically recommended for this installation by the manufacturer of the sealant used, which are non-absorbent, and which are non-staining.

B. Acceptable types:

1. Flexible rod, closed-cell polyethylene or open cell polyurethane material, 2 lbs. density. No adherence to sealant, less than 1% water absorption by weight and resistant to hydrocarbons. Thirty percent (30%) to fifty percent (50%) greater in diameter than the width of the joint. Acceptable.

a. Dow "Ethaform".

b. Hercules "Minicel".

c. Nomaco "Green Rod".

## 2.4 CAULKING COMPOUND (INTERIOR)

A. Compound shall comply with ASTM C-834.

1. Acceptable Products:

a. Sherwin-Williams "Acrylic Latex".

b. DAP "Acrylic Latex".

c. Gibson Homans "Acrylic Latex".

d. Pecora "Acrylic Latex".

e. Approved equal.

B. Caulking color: Caulking color shall match adjacent surfaces color; provide samples for approval by the Engineer of Record.

## 2.5 BOND-PREVENTATIVE MATERIALS

A. Use only one of the following as best suited for the application, and as recommended by the manufacturer of the sealant used.

1. Polyethylene tape, pressure-sensitive adhesive, with the adhesive required only to hold tape to the construction materials as indicated.

2. Aluminum foil complying with MIL-A-148E.

## 2.6 MASKING TAPE

A. For masking around joints, provide masking tape complying with Fed. Spec. UU-T-106c.

## 2.7 OTHER MATERIALS

A. Provide other materials, not specifically described but required for a complete and proper installation, as selected by the Contractor subject to the approval of the Engineer of Record.

## 3. EXECUTION

### 3.1 SURFACE CONDITIONS

A. Examine the areas and conditions under which work of this Section will be performed. Correct conditions detrimental to timely and proper completion of the Work. Do not proceed until unsatisfactory conditions are corrected.

1. Do not apply to damp surfaces (concrete less than 14 days old).

2. Do not apply when ambient temperature is 40°F or below.

### 3.2 PREPARATION

A. Cementitious and masonry surfaces:

1. Install only on surfaces that are dry, sound, and well brushed, wiping free from dust.

2. At open joints, remove dust by mechanically blown compressed air.

3. Use solvent to remove oil and grease, wiping the surfaces with clean rags.

4. Where surfaces have been treated, remove the surface treatment by sandblasting or wire brushing.

5. Remove laitance and mortar from joint cavities.

6. Where backstop is required, insert the approved backup material into the joint cavity to the required depth.

7. If required by sealant manufacturer, apply primer according to manufacturer's instructions and let dry.

B. Nonferrous metal surfaces:

1. NFM contact with sealant.

a. Remove temporary protective coatings, dirt, oil and grease with solvent and clean rags. Renew rags to prevent spreading of contamination.

b. When masking tape is used for protective cover, remove the tape just prior to applying the sealant.

2. Use only such solvents to remove protective coatings as are recommended for that purpose by the manufacturer of the NFM work, and which are non-staining.



C. Sealant and caulking schedule:

1. Sealant type and location.

a. Exterior sealant:

- (1) Perimeter sealant for door, window, and louver frames.
- (2) Horizontal or vertical joints in concrete, masonry, or metal up to 3/4" wide.
- (3) Horizontal or vertical joints at intersections of dissimilar materials.
- (4) Any other joints/spaces required for a complete waterproofing of project.

2. Caulking type and location:

a. Caulking compound: (1) Interior Joints.

D. Acceptance of surfaces: Inspect and examine surfaces of joints to be sealed and do not commence work until any defects that might harmfully affect work have been corrected. Where width of joint varies more than 1/8" from that indicated, do not proceed until such condition has been corrected or accepted by the Engineer of Record. Starting of work will be held as acceptance of surfaces and conditions.

### 3.3 INSTALLATION OF BACKUP MATERIAL

A. Use only the backup material recommended by the manufacturer of the sealant used, and approved by the Engineer of Record for the particular installation, compressing the backup material 30% to 50% to achieve a positive and secure fit.

B. When using backup of tube or rod stock, avoid lengthwise stretching of the material. Do not twist or braid hose or rod backup stock.

C. Select diameter of backup rod so that it will be, when installed, a snug and firm fit in the joint, and provide a firm backing for applying sealant, and which will not move when tooling the joint. Install backup without puncturing or stretching by the use of a blunt tool or roller.

D. Install backup to control depth of sealant as follows:

1. Joint less than 1/2" wide, sealant depth equal to width of joint, but not less than 1/4".
2. Joints less than 1" wide, sealant depth half the width of joint.
3. Over 1" wide, sealant depth no more than 1/2".
4. Sealant depth measured from top of back-up material to tooled surface of sealant. If necessary to prevent sealant adhesion to adjacent surfaces, apply masking tape to these surfaces.

### 3.4 PRIMING

A. Use only the primer recommended by the manufacturer of the sealant, and approved by the Engineer of Record for the particular installation, applying in strict accordance with the manufacturer's recommendations as approved by the Engineer of Record.

### 3.5 BOND-BREAKER INSTALLATION

A. Provide an approved bond-breaker where recommended by the manufacturer of the sealant, and where directed by the Engineer of Record, adhering strictly to the installation recommendations as approved by the Engineer of Record.

### 3.6 INSTALLATION OF SEALANTS

A. Prior to start of installation in each joint, verify the joint type and verify that the required proportion of width of joint has been secured.

B. Thoroughly and completely mask joints where the appearance of sealant on adjacent surfaces would be objectionable.

C. Apply sealant using pressure flow gun with nozzle of proper size and shape to suit width of joints. Apply with sufficient pressure to fill joint in one continuous operation, horizontally in one direction, and vertically from bottom to top (to avoid entrapment of air). Force sealant into joint with point of nozzle against back-up (to extrude sealant outward). Tool exposed surfaces firmly (to produce firm adhesion with joint surfaces). Finish surface slightly concave, smooth, free of wrinkles and flush with adjacent surfaces. Where joints are adjacent to painted surfaces, complete work before application of final coat of paint.

### 3.7 TESTS

A. Quality control: As work progresses, at four

(4) locations designated by the Engineer of Record, cut out and remove 8" long specimen strips of sealant. Where such sampling reveals faulty material or application, such as inadequate depth of sealant, remove additional sealant to determine extent of such condition. Remove faulty work and reseal joints properly at no additional cost to Owner. Where specimens are satisfactory, reseal joint immediately.

### 3.8 CLEANING UP

A. Remove masking tape immediately after joints have been tooled.

B. Remove excess sealant using Xylene, or product as recommended by manufacturer of sealant, as work progresses. Clean adjacent surfaces that may have been soiled and leave in unblemished condition.

END OF SECTION 07920

## **DIVISION 8**

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### **DOORS AND WINDOWS**

## **SECTION 08100 METAL DOORS AND FRAMES**

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### **1. GENERAL**

#### **1.1 DESCRIPTION**

A. Work included: Provide metal doors and metal door frames as specified herein and as needed for a complete and proper installation.

B. Fire-rated assemblies: Where fire-rated assemblies are indicated or required, provide fire-rated door and/or frame units that have been tested and comply with NFPA 80 "Standard for Fire Doors and Fire Windows". Items shall be labeled in accordance with NFPA 252, "Standard Methods of Fire Tests of Door Assemblies", and NFPA 257, "Standard on Fire Test for Windows and Glass Block Assemblies". Doors, Frames and Windows shall have a metal label or embossed label (UL or FM) showing compliance. Note: Fire doors must be factory prepared for hardware to maintain fire rating.

C. Related work:

1. Documents affecting work of this Section include, but are not necessarily limited to, General Conditions, Supplementary Conditions and Sections in Division 1 of these Specifications.

2. Section 07920: Sealants and caulking.

3. Section 08710: Finish Hardware.

4. Section 09900: Painting.

#### **1.2 QUALITY ASSURANCE**

A. Use adequate numbers of skilled workmen who are thoroughly trained and experienced in the necessary crafts and who are completely familiar with the specified requirements and the methods needed for proper performance of the work of this Section.

B. Provide products that meet the product approval requirements mandated by the State of Florida, certified by the Florida Building Commission.

C. Provide metal door and frame products that comply with the wind load design pressure requirements, as shown on drawings, for this building. Provide wind load design pressure documentation prepared and sealed by a licensed Florida P.E.

D. The Finish Hardware supplier shall furnish to the General Contractor all finishing hardware as specified herein or as obviously required to complete the project. Items not specifically mentioned but necessary to complete the work shall be furnished, matching in quality and finish to the items specified or described herein. Should an opening be omitted, this supplier shall provide finish hardware equal to that specified for similar or adjacent openings and as approved by the Engineer of Record for function and quality. No extras will be allowed for omitted but required items. Clarify all questions with the Engineer of Record in writing, prior to bid opening.

E. Unless specifically otherwise approved by the Engineer of Record, provide all products of this Section from

a single manufacturer.

F. Reference Standards:

1. American National Standard Institute (ANSI) A115 series on doors and frame preparation.
2. ANSI A151 1-1969 Performance Test for Standard Steel Doors, Frames, Anchors, Hinge Reinforcement and Exit Device Reinforcement.
3. Steel Door Institute; SDI-105, "Recommended Erection Instructions for Steel Frames" and SDI-110 "Standard Steel Doors and Frames For Modular Masonry Construction".

1.3 SUBMITTALS

A. Comply with pertinent provisions of Section 01340 and Section 01600.

B. Product data: Within 35 calendar days after the Contractor has received the Owner's Notice to Proceed, submit:

1. Materials list of items proposed to be provided under this Section.
2. Manufacturer's specifications and other data needed to prove compliance with the specified requirements.
3. Shop Drawings showing details of each frame type, elevations of door designs, details of openings, and details of construction, installation, and anchorage.
4. Manufacturer's recommended installation procedures which, when approved by the Engineer of Record, will become the basis for accepting or rejecting actual installation procedures used on the Work.

1.4 PRODUCT HANDLING

A. Comply with pertinent provisions of Section 01600.

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

2. PRODUCTS

2.1 METAL DOORS

A. Type and design:

1. Provide full flush design of 16 gauge for metal doors, properly reinforced for the finish hardware described in Section 08710 of these Specifications.

a. Doors shall be fabricated from galvanized steel.

b. Exterior doors shall have top of door closed with a channel welded in place "looking down" and filled to yield a "watertight" top.

B. Finish:

1. Pre-clean and shop prime each door for finish painting which will be performed at the job site under Section 09900 of these Specifications.

C. Acceptable manufacturers, provide all items from a single manufacturer, as indicated following or equal products of another manufacturer approved in advance by the Engineer of Record.

1. Curries Company.

2. Ceco Door Products Company.

3. Steelcraft Company.

D. Astragals:

1. Provide "Z" type astragals at all pairs of metal doors, which do not have mullions, unless not required by hardware items such as mulls, etc., as denoted at Section 08710, Hardware Schedule.

## 2.2 METAL FRAMES

A. Type and design:

1. Provide frames of 14 gauge galvanized steel, properly reinforced for the finish hardware described in Section 08710 of these Specifications. Furnish floor clips at all mullions.

2. All frames shall be continuously shop welded at face joints and ground smooth. Assembly "ear tabs" shall be ground off and tab-frame joint welded and ground smooth.

3. Interior frames shall be pre-drilled prior to galvanizing for receipt of rubber cone shaped silencers.

B. Finish:

1. Pre-clean and shop prime each frame for finish painting which will be performed at the job site under Section 09900 of these Specifications.

## 2.3 FINISH HARDWARE

A. Secure templates from the finish hardware supplier, and accurately install, or make provision for, all hardware at the factory.

## 3. EXECUTION

3.1 Examine the areas and conditions under which work of this Section will be performed. Correct conditions detrimental to timely and proper completion of the Work. Do not proceed until unsatisfactory conditions are corrected.

1. Metal door and frame installation procedures shall be as indicated by SDI-105, "Recommended Erection Instructions for Steel Frames" and SDI-110 "Standard Steel Doors and Frames For Modular Masonry Construction".

## 3.2 INSTALLATION

### A. Placing frames:

1. Place frames prior to construction of enclosing walls and ceilings.
2. Set frames accurately into position, plumbed, aligned, and braced securely until permanent anchors are set.
3. Fill frames in masonry construction with mortar, as masonry walls are laid-up.
4. After wall construction is completed, remove temporary braces and spreaders, leaving surfaces smooth and undamaged.
5. At in-place construction, set frames and secure to adjacent construction with machine screws and suitable anchorage devices. Provide "Z" fillers at each screw location.

## 3.3 ADJUST AND CLEAN

### A. Final adjustments:

1. Check and readjust operating finish hardware items in hollow metal work just prior to final inspection.
2. Leave work in complete and proper operating condition.
3. Remove defective work and replace with work complying with the specified requirements.

B. Immediately after erection, sand smooth all rusted and damaged areas of prime coat, and apply touchup of compatible air-drying primer.

END OF SECTION.08100

## **SECTION 08710 FINISH HARDWARE**

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### 1. GENERAL

#### 1.1 SUMMARY

A. Section includes items known commercially as Finish Hardware required for swing doors.

B. Related Documents: Drawings and general provisions of contract, including general and supplementary conditions and divisions, other specification sections, apply to work of this section.

C. Scope: The Finish Hardware Supplier shall furnish to the General Contractor all finish hardware as hereinafter specified or as obviously required to complete the project. Items not specifically mentioned but necessary to complete the work shall be furnished, matching in quality and finish to the items hereinafter specified. Should an opening be omitted this supplier shall provide hardware equal to that specified for similar or adjacent opening and as approved by Engineer of Record for function and quality. No extras will be allowed for omitted but required items. Clarify all questions with the Engineer of Record in writing prior to bid opening.

D. Provide products that meet the product approval requirements mandated by the State of Florida, products certified by the Florida Building Commission.

#### 1.2 REFERENCES

##### A. Door and Hardware Institute (DHI)

1. Keying Terminology.

2. Recommended Locations for Engineer of Record Hardware for Standard Steel Doors and Frames.

3. Recommended Locations for Engineer of Record Hardware for Flush Wood Doors.

4. Sequence and Format for Hardware Schedules.

5. Recommended Procedure for Processing Hardware Schedules and Templates.

##### B. National Fire Protection Association (NFPA)

1. NFPA 80 Fire Doors and Frames.

2. NFPA 101 Life Safety Code.

3. NFPA 105 Smoke and Draft Control Door Assemblies.

##### C. American National Standards Institute (ANSI)

1. A117.1 Providing Accessibility and Usability for Physically Handicapped People.

2. A156.18 Materials and Finishes.

#### 1.3 SUBMITTALS



A. Comply with pertinent provisions of Section 01340 and Section 01600.

B. Schedules: After the award of a formal contract, eight (8) complete typewritten copies of the proposed finish hardware schedule shall be submitted to the Engineer of Record for Approval. This schedule shall be similar to the Vertical Schedule Format as shown in "Sequence and format for the Hardware Schedule" as approved and recommended by the Door and Hardware Institute (DHI).

C. Product Data: When submitting schedules for approval, include two (2) manufacturers' cut sheets of each item of hardware proposed.

D. Samples: As part of this contract provide, if requested by the Engineer of Record, one sample of each item of Finish Hardware shall be sent to the Engineer of Record. Samples can be returned to the supplier at the end of the project, if so requested by the supplier at end of Job.

E. Templates: Upon receipt of approved schedules, submit the necessary hardware templates to those trades and/or manufactures with which hardware must be coordinated. Comply with procedures established in DHI Handbook, for "Recommended Procedure for Processing Hardware Schedules and Templates". Contractor is to request the Hardware Supplier to prepare and furnish templates to his office for his disbursement to proper fabricators.

#### 1.4 QUALITY ASSURANCE

A. Substitutions: Manufacturers and model numbers listed are to establish a standard of quality. Similar items by other manufacturers that are equal in design, function and quality will be accepted if proper evidence is received by the Engineer of Record in time for listing of any items approved in an addenda, this will allow all bidders to quote on an equal basis.

B. Suppliers Qualifications: In order to provide the proper service as required by this project, the hardware supplier is required to have his stocking builders hardware warehouse located within 50 miles of Escambia County, Florida. The consultant shall have experience in the preparation of Engineer of Record hardware specifications, detailing, ordering and servicing of all items supplied by these specifications. Those having experience supplying hardware in the project's vicinity for not less than three (3) years shall furnish hardware. A qualified Person from the supplier shall be available at reasonable times during the course of the project for consultation to the Owner, Engineer of Record and Contractor.

C. Approved Supplier: The supplier must have demonstrated willingness to coordinate field problems, assist Owner in any future problems and all aspects of service operations. He must have a reputation for supplying quality materials. Prebid approval is required. The following are accorded such approval in advance:

Jake J. Krauss, Jr., A.H.C.

Krauss Contract Sales, Inc.

6707 Lillian Highway

Pensacola, FL 32506

1-850-453-6657 Fax 1-850-453-4083

Bill Rogers, A.H.C.

Warren Hollow Metal Doors & Frames, Inc.

911 West Texar Drive

Pensacola, FL 32501

1-850-432-9821 Fax 1-850-432-9823

Rodney Slone

Slone Doors, Inc.

6109 Village Oaks Drive

Pensacola, FL 32504

1-850-494-7992 Fax 1-850-969-1278

D. Fire Rated Openings: Provide hardware for fire rated openings in compliance with NFPA Standard No. 80. Provide only hardware tested and listed by UL for types and sizes of doors required and shall comply with requirements of door and frame labels.

#### 1.5 DELIVERY, STORAGE AND HANDLING

A. Comply with pertinent provisions of Section 01600.

B. Marking and Packaging: Hardware shall be delivered to the project site in the manufacturer's original packages. Each article of hardware shall be individually packaged in the manufacturer's substantial commercial carton or container, properly marked or labeled to be readily identifiable with the permanent approved hardware schedule.

C. Delivery: All items of finish hardware shall be received at suppliers' warehouse, checked for correctness of product, strikes, brackets, screws and other miscellaneous items. Hardware is to be accumulated at the supplier's warehouse and as far as practical be delivered in one complete delivery by supplier's own personnel. Contractor is to refuse delivery from drop orders or factory shipments. Supplier is to check all items of hardware at the time of delivery with personnel from the Contractor's office.

D. Inventory: Hardware is to be inventoried jointly with representatives of the hardware supplier and the contractor's hardware installer until each is satisfied that the count is correct.

E. Storage: Contractor shall provide secure lockup for hardware delivered to the project, but not yet installed. Control of handling and installation of the hardware items so that the completion of work will not be delayed by hardware losses, both before and after installation.

#### 1.6 WARRANTY

A. Provide manufacturers' warranties on all items, except overhead closers, against failure due to defective materials and workmanship for a period of two (2) years commencing on the date of final acceptance. In the event of such failure, promptly repair or replace with no additional costs to Owner.

B. Provide manufacturer's warranties on overhead closers against failure to defective materials and workmanship for a period of five (5) years commencing on the date of final acceptance. In the event of such failure, promptly repair or replace the closer at no additional costs to Owner.

## 1.7 MAINTENANCE

A. Maintenance Service: Supplier shall have in his employment a qualified technician to be called upon to service all of the hardware items supplied.

B. Special Tools: Provide special tools, such as spanner wrenches, dogging keys and etc. required to service and adjust hardware items.

## 2. PRODUCTS

2.1 MANUFACTURERS LISTED AND APPROVED EQUALS: Provide products (doors, frames and finish hardware as a component package) that meet the product approval requirements mandated by the State of Florida.

### A. Hinges/Butts

1. McKinney Hager Bommer

TA2314 BB1199 BB5001

TA2714 BB1279 BB5000

T2714 1279 5000

### B. Locks

1. Sargent Schlage Corbin

8200 LNL L9000 06A ML2200 NSA

### C. Deadlocks

1. Sargent Schlage Corbin

4878 L400 DL4000

### D. Closers

1. Sargent LCN Corbin

1431 1400 DC6000

### E. Push Pull and Kickplates

1. Rockwood Hager

70 4" x 16" 30S 4" x 16"

107-70 33G 4" x 16"

.050 190S

#### F. Door Stops

##### 1. Rockwood Hager

406 233W

443 243F

#### G. Thresholds and Weatherstrip

##### 1. NGP Pemko

896V 1855AT

160V 303AV

C627A 3452CP

16V 346C

## 2.2 MATERIALS

A. Locks and Latches: Lock trim shall be supplied in compliance with A.D.A. Lever Design.

B. Panic Devices: All exit devices shall be of a brass, bronze or stainless steel base material, plated to the standard Engineer of Record finishes to match the balance of the door hardware. Painted or anodized aluminum finishes will not be considered acceptable for the heavy-duty usage on this project.

C. Closers: Door closing devices shall be installed and adjusted in accordance with the templates and printed instructions supplied by the manufacturer of the devices. Insofar as practical closers shall be mounted on the side of door that is less visible to people, example "Corridor to Rooms" mount closer in rooms. Closers for out swinging doors shall have parallel arms.

D. Flush Bolts: Lever extension flush bolts shall be installed at the top and bottom of the inactive leaf of pairs of doors. The bottom bolt shall operate into a dust-proof floor strike or threshold. Bottom bolt shall be approximately 12" off the floor and the top bolt shall be approximately 72" off the floor.

## 2.3 MANUFACTURER

A. Obtain each type of hardware (Latch and Locksets, Closers, Panic Devices, etc.) from a single manufacturer, although several may be indicated as offering products complying with requirements.

## 2.4 FINISHES

A. Provide matching finishes for hardware units at each door opening, to the greatest extent possible, and except as otherwise indicated. Reduce difference in color and texture as much as commercially possible where the base metal; or metal forming process is different for individual units of hardware exposed at the same door of opening. In general, match items to the manufacturer's standard finish for the latch and lock set (or push-pull units if no latch sets used) for color and texture.

B. Provide quality of finish, including thickness of plating or coating (if any), composition, hardness and other qualities complying with manufacturer's standards, but in no case less than specified for the applicable units of hardware by referenced standards.

C. The designations used in schedules and elsewhere to indicate hardware finishes are those listed in ANSI A156.18 "Materials and Finishes Standards", including coordination with the traditional U.S. Finishes shown by certain manufacturers for their products.

## 2.5 KEYING

A. Hardware Supplier shall consult with Engineer of Record and Owner to secure written approval of the complete keying layout prior to placing lock order with factory.

B. All master keys shall be identified for the specific project and be delivered to the Owner.

C. All locks shall be equipped with 7 pin Falcon Interchangeable Cores, Keyed to the Existing Escambia County Parks and Recreation 6 pin System (no substitutions).

1. Install all Falcon I.C. mortise (threaded) cylinders with proper interchangeable core installation tool (Tool #1407).

D. Supply temporary cores for use as a construction keying system. Temporary cores to be returned to Hardware Supplier after permanent cores are installed.

E. Owner's Representative to install permanent cores after the Owners acceptance of this project.

F. Hardware Supplier shall consult with Engineer of Record and Owner to secure written approval of the complete keying layout prior to placing lock order with factory.

## 2.6 FASTENINGS:

A. Fastenings of proper type, size, quality and finish shall be supplied with each article of hardware. Machine screws and expansion shields shall be used for attaching hardware to concrete or masonry.

B. Fastenings exposed to the weather in the finished work shall be brass, bronze or stainless steel.

C. Sex bolts, through bolts or machine screws and grommet nuts, where used on reverse-bevel exterior equipped with half-surface or full surface hinges, shall employ one-way screws or other approved tamperproof screws.

## 3. EXECUTION

### 3.1 INSTALLATION

A. Mount hardware units at heights indicated in "Recommended Locations for Engineer of Record Hardware for Standard Steel Doors and Frames" by Door and Hardware Institute (DHI), except as otherwise specifically indicated or to comply with requirements of governing regulations, requirements for the handicapped or if otherwise directed by the Engineer of Record.

B. All hardware shall be installed by tradesmen skilled in the application of commercial grade hardware.

C. Install each hardware item in compliance with the manufacturer's instructions and recommendations. Securely fasten all parts to be attached. Fit faces of mortised parts snug and flush. Make sure all operating parts move freely and smoothly without binding, sticking or excessive clearance. Wherever cutting and fitting is required to install hardware onto or into surfaces that are later to be painted or finished in another way, the hardware shall be removed and stored prior to the painting or finishing. Items shall than be reinstalled only when the finishes have been completed on the surface to which is to be applied.

D. Set units level, plumb and true to line and location. Adjust and reinforce the attachment substrate as necessary for proper installation and operation.

E. At exterior doors and elsewhere as indicated, set thresholds in a bed of sealant as specified in Section 07920 to completely fill concealed voids and exclude moisture from every source. Do not plug drain holes or block weeps. Remove excess sealant.

### 3.2 ADJUSTING AND CLEANING

A. Wherever hardware installation is made more than one month prior to acceptance or occupancy of a space or area, return to the work during the week prior to acceptance or occupancy, and make final check and adjustment of all hardware items in such space or area. Clean operating items as necessary to restore proper function and finish of hardware and doors. Adjust door control devices to compensate for final operation of and ventilating equipment.

### 3.3 PROTECTION

A. Whenever hardware is located in areas where it may be subject to damage during construction by handling, cleaning, etc., (i.e., painting, cleaning of masonry) it shall be protected and/or removed from its location until hazardous condition is terminated.

NOTE: Provide finish hardware products that comply with the wind load design pressure requirements as shown on drawings for this building. Provide wind load design pressure documentation prepared and sealed by a licensed Florida P.E. Exterior Openings to be wind coded. Items have been tested as a unit with Curries Hollow Metal. Miami-Dade NOA No. 03-0626.01 / Florida Building Code. Equals from Ceco and Steelcraft are approved subject to details submitted to Engineer of Record, hardware items would be the ones of same level and approved by testing by Ceco or Steelcraft.

END OF SECTION 08710

**DIVISION 9**

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**FINISHES**

## **SECTION 09260 GYPSUM BOARD SYSTEM**

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### **1. GENERAL**

#### **1.1 DESCRIPTION**

A. Work included: Provide gypsum drywall, acoustical insulation, acoustical sealants, and accessories as specified herein, and as needed for a complete and proper installation.

B. Related work:

1. Documents affecting work of this Section include, but are not necessarily limited to, General Conditions, Supplementary Conditions and Sections in Division 1 of these Specifications.

2. Section 06100: Rough Carpentry.

3. Section 07210: Building Insulation.

4. Section 09110: Metal Stud System.

#### **1.2 QUALITY ASSURANCE**

A. Use adequate numbers of skilled workmen who are thoroughly trained and experienced in the necessary crafts and who are completely familiar with the specified requirements and the methods needed for proper performance of the work of this Section.

B. Reference:

1. GA 216 - Recommended Specifications for the Application and Finishing of Gypsum Board.

2. GA 214 – Recommended Levels of Gypsum Board Finish.

C. Perform gypsum board system work in accordance with recommendations of ASTM C754 and GA 216 unless otherwise specified in this Section.

1. Keep copy of GA 216 and GA 214 in field office for duration of Project.

#### **1.3 SUBMITTALS**

A. Comply with pertinent provisions of Section 01340 and Section 01600.

B. Product data: Within 35 calendar days after the Contractor has received the Owner's Notice to Proceed, submit:

1. Materials list of items proposed to be provided under this Section.

2. Manufacturer's specifications and other data needed to prove compliance with the Specified requirements.

3. Manufacturer's recommended installation procedures which, when, approved by the Engineer of Record, will become the basis for accepting or rejecting actual installation procedures used on the work, include recommended locations for expansion/contraction control for Engineer of Record's review and approval.



### C. Mock-ups:

1. At an area on Site where approved by the Engineer of Record, provide a mock-up gypsum wallboard panel.
  - a. Make the panel approximately 4'-0" square.
  - b. Provide one (1) mock-up panel for each gypsum wallboard finish used on the work.
  - c. The mock-ups may be used as part of the work, and may be included in the finished work, when so approved by the Engineer of Record.
  - d. Revise as necessary to secure the Engineer of Record's approval.
2. The mock-up panels, when approved by the Engineer of Record, will be used as data points for comparison with the remainder of the work of this Section for the purpose of acceptance or rejection.
3. If the mock-up panels are not permitted to be part of the finished work, completely demolish and remove them from the Job Site upon completion and acceptance of the work of this Section.

### 1.4 PRODUCT HANDLING

- A. Comply with pertinent provisions of Section 01600.

### 2. PRODUCTS

#### 2.1 GYPSUM WALLBOARD

##### A. General:

1. Provide gypsum wallboard complying with recommendations of GA 216, in 48" widths and in such lengths as will result in a minimum of joints.
2. Abuse-Resistant wallboard: Ends square cut, tapered edges, 5/8" thick.
  - a. USG Sheetrock Brand Abuse-Resistant Gypsum Panels.
  - b. Approved equal.
3. Regular wallboard: Ends square cut, tapered edges, 5/8" thick.
4. Fire-retardant type "X" wallboard: UL approved, 5/8" thickness, maximum permissible lengths, square ends, tapered edges.

#### 2.2 GYPSUM BOARD ACCESSORIES

- A. Form from zinc-coated steel not lighter than 26 gauge, complying with Fed. Spec. QQ-S-775, type I, class d or e.

##### B. Casing beads:

1. Provide channel-shapes with an exposed wing, and with a concealed wing not less than 7/8" wide.

2. The exposed wing may be covered with paper cemented to the metal, but shall be suitable for joint treatment.

C. Corner beads: Provide angle shapes with wings not less than 7/8" wide and perforated for nailing and joint treatment or with combination metal and paper wings bonded together, not less than 1-1/4" wide and suitable for joint treatment.

D. Reinforcing tape, joint compound, adhesive, water and fasteners: GA 216.

E. Fiberglass reinforcing tape, between bedding compound.

### 2.3 JOINTING SYSTEM

A. Provide a jointing system, including reinforcing tape and jointing compound, designed as a system to be used together and as recommended for this use by the manufacturer of the gypsum wallboard approved for use on this work.

B. Jointing compound shall be used for finishing as recommended by the manufacturer.

### 2.4 FASTENING DEVICES

A. For fastening gypsum wallboard in place on metal studs and metal channels, use type "S" screws, shouldered, specially designed for use with power-driven tools, not less than 1" long, with self-tapping threads and self-drilling points.

B. For fastening gypsum wallboard in place on wood, use type "W" bugle-head screws, or use annular ring type nails complying with ASTM C514 and of the length required by governmental agencies having jurisdiction.

### 2.5 ACOUSTICAL ACCESSORIES

A. Acoustical insulation: Unfaced fiberglass batt insulation - See Section 07210. Install in all gypsum board walls, full thickness.

B. Acoustical Sealant: USG Acoustical Sealant.

### 2.6 OTHER MATERIALS

A. Provide other materials, not specifically described but required for a complete and proper installation, as selected by the Contractor subject to the approval of the Engineer of Record.

## 3. EXECUTION

### 3.1 SURFACE CONDITIONS

A. Examine the areas and conditions under which work of this Section will be performed. Correct conditions detrimental to timely and proper completion of the Work. Do not proceed until unsatisfactory conditions are corrected.

### 3.2 INSTALLATION

#### A. General:

1. Install the gypsum wallboard with the separate boards in moderate contact but not forced into place and in accordance with GA 216.
2. At internal and external corners, conceal the cut edges of the boards by the overlapping covered edges of the abutting boards.
3. Stagger the boards so that corners of any four (4) boards will not meet at a common point except in vertical corners.

#### B. Walls:

1. Install single layer standard gypsum board in direction most practical and economical, with ends occurring over firm bearing.
2. Install single and double layer fire rated gypsum board as required by governing authorities (U.L.), with edges and ends occurring over firm bearing.

#### C. Attaching:

1. Drive the specified screws with clutch-controlled power screwdrivers, spacing the screws 12" o.c. at ceilings and 16" on centers at walls.
2. Attach fire rated gypsum board in accordance with the pertinent codes and the manufacturer's recommendations as approved by the Engineer of Record.

### 3.3 JOINT TREATMENT

#### A. General:

1. Inspect areas to receive joint treatment, verifying that the gypsum wallboard fits snugly against supporting framework.
2. In areas where joint treatment and compound finishing will be performed, maintain a temperature of not less than 55°F for 24 hours prior to commencing the treatment and until joint and finishing compounds have dried.
3. Apply the joint treatment and finishing compound by machine or hand tool.
4. Provide a minimum drying time of 24 hours between coats, with additional drying time in poorly ventilated areas.

#### B. Embedding compounds:

1. Apply to gypsum wallboard joints and fasteners heads in a thin uniform layer.
2. Spread the compound not less than 3" wide at joints, center the reinforcing tape in the joint, and embed the tape in the compound. Then spread a thin layer of compound over the tape.

3. After this treatment has dried, apply a second coat of a thin uniform coat not less than 6" wide at joints, and feather edges.

4. Sandpaper between coats as required.

5. When thoroughly dry, sandpaper to eliminate ridges and high points.

C. Finishing compounds:

1. After embedding compound is thoroughly dry and has been completely sanded, apply a coat of finishing compound to joints and fastener heads.

2. Feather the finishing compound to not less than 12" wide.

3. When thoroughly dry, sandpaper to obtain a uniformly smooth surface, taking care to not scuff the paper surface of the wallboard.

### 3.4 CORNER TREATMENT

A. Internal corners: Treat as specified for joints, except fold the reinforcing tape lengthwise through the middle and fit neatly into the corner.

B. External corners:

1. Install the specified corner bead, fitting neatly over the corner and securing with the same type fasteners used for installing the wallboard into the framing or furring member.

2. Space the fasteners approximately 6" on centers, and drive through the wallboard into the framing or furring member.

3. After the corner bead has been secured into position, treat the corner with joint compound and reinforcing tape as specified for joints, feathering the joint compound out from 8" to 10" on each side of the corner.

### 3.5 OTHER METAL TRIM

A. General:

1. Provide all metal trim normally recommended by the manufacturer of the gypsum wallboard approved for use in this Work.

### 3.6 ACOUSTICAL ACCESSORIES

A. Place full thickness unfaced fiberglass batt insulation, in partitions tight within spaces, around cut openings, behind and around electrical and mechanical items passing through partitions, and as recommended by the system manufacturer's printed literature.

B. Place acoustical sealant within partitions in accordance with manufacturer's instructions. Install acoustical sealant at gypsum board perimeter at:

1. Metal framing: Two (2) beads.

2. Caulk all penetrations of partitions by conduit, pipe, ductwork rough-in-boxes, and others.

3. Set gypsum board panels at all walls with continuous beads of 1/4" diameter sealant, one (1) bead of sealant at top of the upper edge of the gypsum drywall panels, one (1) bead of sealant at bottom of the lower edge of gypsum drywall panels, two (2) beads of sealant at top of the upper metal runner track, and two (2) beads of sealant at the bottom of the lower metal runner track.

### 3.7 CLEANING UP

A. In addition to other requirements for cleaning, use necessary care to prevent scattering gypsum wallboard scraps and dust, and to prevent tracking gypsum and joint finishing compound onto floor surfaces.

B. At completion of each segment of installation on a room or space, promptly pick up and remove from the working area all scrap, debris and surplus materials of this Section.

END OF SECTION 09260

## **SECTION 09900 PAINTING**

---

### **1. GENERAL**

#### **1.1 DESCRIPTION**

##### **A. Work included:**

1. Paint, coat, and finish the exterior and interior exposed surfaces listed in the Painting Schedule in Part 3 of this Section, as specified herein, and as needed for a complete and proper installation, including plumbing, mechanical and electrical items except as specifically excluded hereinafter.

2. Items to be painted under this Section include, but are not limited to the following:

a. All exposed ferrous metals.

b. Interior walls, Gypsum board, CMU, Concrete, etc.

3. Interior caulking and sealant systems as specified in Sealants and Caulking, Section 07920 shall be part of the work of the Painting Subcontractor.

4. Shop painting for the following items is included under their respective sections and is in addition to the number of coats hereinafter specified.

a. Structural steel.

b. Miscellaneous metals.

c. Steel doors and steel door frames.

5. See also: Section 09260

##### **B. Work not included:**

1. Unless otherwise indicated, painting is not required on surfaces in concealed and inaccessible areas such as furred spaces, foundation spaces, utility tunnels, pipe chases, and duct shafts.

2. Do not paint moving parts of operating units; mechanical or electrical parts such as valve operators; linkages; sensing devices; and motor shafts; unless otherwise indicated.

3. Do not paint over required labels, U.L. labels or equipment identification, performance rating, name, or nomenclature plates.

4. Painting and finishing are not required on the following items, unless specifically noted otherwise:

a. Anodized or pre-finished aluminum.

b. Copper.

c. Plated metals, except galvanized.

d. Lighting fixtures.

e. Plumbing fixtures.

f. Hardware.

g. Floors.

h. Brick.

i. Factory finished items unless noted otherwise to be painted again.

j. Mechanical equipment with factory-finish unless noted otherwise to be painted again.

k. Glass.

5. Verify with the Engineer of Record if there is any question if an item is or is not to be painted.

C. Related work:

1. Documents affecting work of this Section include, but are not necessarily limited to, General Conditions, Supplementary Conditions and Sections in Division 1 of these Specifications.

D. Definitions:

1. "Paint", as used herein, means coating system materials including primers, emulsion, epoxy, enamel, sealers, fillers, and other applied materials whether used as prime, intermediate or finish coats.

## 1.2 QUALITY ASSURANCE

A. Use adequate numbers of skilled workmen who are thoroughly trained and experienced in the necessary crafts and who are completely familiar with the specified requirements and the methods needed for proper performance of the work of this Section.

B. All materials shall be delivered to the building in sufficient quantities so there will be no delay and shall be brought into the building in the manufacturer's original packages with labels intact and seals unbroken.

C. Paint touch-up shall be required, to the satisfaction of the Engineer of Record and the Owner, up to the Engineer of Record's final acceptance of the Project.

## 1.3 SUBMITTALS

A. Comply with pertinent provisions of Section 01340 and Section 01600.

B. Product data: Within 35 calendar days after the Contractor has received the Owner's Notice to Proceed, submit:

1. Materials list of items proposed to be provided under this Section.

2. Manufacturer's Specifications and other data needed to prove compliance with the specified requirements.

3. Manufacturer's recommended installation procedures which, when approved by the Engineer of Record, will become the basis for accepting or rejecting actual installation procedures used on the work.

4. All undercoats for wood, masonry, or metal surfaces shall be of the same manufacturer as the finish coats, unless otherwise specified. No thinners other than those specified by the manufacturer shall be used.

C. Colors: The Owner shall make final color selection for the type surface for which it is intended.

D. Samples:

1. Following the selection of colors and glosses by the Owner, as described under "Color Schedules" in Part 2 of this section, submit samples for the Owner's/ Engineer of Record's review.

a. Provide three (3) samples of each color and each gloss for each material on which the finish is specified to be applied.

b. Except as otherwise directed by the Engineer of Record, make samples approximately 8" X 10" in size.

c. If so directed by the Engineer of Record, submit samples during progress of the Work in the form of actual application of the approved materials on actual surfaces to be painted.

2. Revise and resubmit each sample as requested until the required gloss, color, and texture is achieved. Such samples, when approved, will become standards of color and finish for accepting or rejecting the work of this Section.

3. Do not commence finish painting until approved samples are on file at the Job Site.

E. Fungus control test:

1. All organic coatings shall show no fungus growth when tested as specified in Federal Test Method Standard NO. 141, Method 6271.1.

#### 1.4 PRODUCT HANDLING

A. Comply with pertinent provisions of Section 01600.

B. All materials used on the Job Site shall be stored in a single place designated by the Owner.

1. Such storage place shall be kept clean and all damage to it or to its surroundings shall be made good.

2. Any oily rags, waste, etc., must be removed from the building every night and every precaution taken to avoid the danger of fire.

#### 1.5 HAZARDOUS MATERIALS AND/OR HAZARDOUS WASTE

A. All Hazardous Materials and/or Hazardous Waste must be handled, stored, used, and disposed of according to federal, state, and/or local regulations that may govern said materials.

B. Hazardous Waste Information

1. The bidder must supply at the time of his bid the following information:



a. His Federal Identification Number issued by the Florida Department of Environmental Regulations for the disposal of hazardous waste.

b. The name, address, telephone number and a contact person for the company that he normally uses for disposal of hazardous waste.

c. A detailed, step-by-step, plan shall be submitted with his bid that describes how he will handle any hazardous waste his company will generate in performing the specified work. This plan should cover each step from the time a hazardous waste is generated until the product is picked up by a hazardous waste Contractor or otherwise disposed of. The plan must be specific as to the type containers he plans to use and how these containers will be labeled and the controls he will implement to assure the Owner that the hazardous waste storage and disposal methods will comply with all federal, state, and local regulations.

#### C. Hazardous Waste on the Construction Site

1. All hazardous waste generated will be removed from the Site at the end of each workday. Transportation of all hazardous waste from the Site will be the responsibility of the General Contractor and/or Subcontractor and will be done in a manner consistent with state and/or federal regulation governing the transportation of hazardous waste.

#### D. Hazardous Waste or Hazardous Material Spill

1. Whenever a hazardous waste or hazardous material is spilled on the Worksite or property of the Owner, the Owner's representative will be notified immediately. Any clean-up of a hazardous waste or hazardous material will be done in accordance with federal, state, and/or local regulations and the General Contractor and/or Subcontractor will be responsible for any and all related cost.

E. Compliance with OSHA Regulations for Hazardous Materials and/or Hazardous Waste and other related federal, state, and local Regulations involving employee training and right-to-know.

1. The General Contractor and Subcontractor must comply with all OSHA Regulations for hazardous material. The bidder must submit a copy of his company's "Hazcom Program" for Owner's review and must agree to have a copy of his "Hazcom Program: on file at the On- Site Construction Office.

2. The General Contractor and Subcontractor must maintain Material Safety Data Sheets (MSDS) on Site for all hazardous material brought on Site. In addition, a copy of the MSDS sheets shall be submitted with bids for the materials planned for use.

3. It is the responsibility of the General Contractor and/or any Subcontractor to make certain that their employees have been properly trained in accordance with training requirements under state, federal, and local laws which include but are not limited to employee safety, the safety of others on the Site, proper storage, use, and handling of any hazardous material or hazardous waste, the proper response and precautions to take in the event that an emergency may result involving a hazardous material or hazardous waste that is on Site and the responsibility of their company.

#### F. Inspection of Construction Site

1. It is the responsibility of the General Contractor and Subcontractor to regularly inspect the Worksite and make sure any hazardous material and/or hazardous waste is being properly handled and that employees are following the procedures outlined in their Hazcom Program and regulations that govern the storage, use, handling, and disposal of the material. A log that is kept by the General Contractor's designated supervisor, who is normally on the Job Site, shall document such inspections.

2. The Owner reserves the right to visit the Site and also any Off-Site facility used by the General Contractor or Subcontractor for the storage and disposal of hazardous waste generated in connection with this job.

#### 1.6 JOB CONDITIONS

A. Do not apply solvent-thinned paints when the temperature of surfaces to be painted and the surrounding air temperatures are below 45° F, unless otherwise permitted by the manufacturers printed instructions as approved by the Engineer of Record.

B. Weather conditions:

1. Do not apply paint in snow, rain, fog, or mist; or when the relative humidity exceeds 85% or to damp or wet surfaces, unless otherwise permitted by the manufacturers printed instructions as approved by the Engineer of Record.

2. Applications may be continued during inclement weather only within the temperature limits specified by the paint manufacturer as being suitable for use during application and drying periods.

C. Do not apply finish in areas where dust is being generated.

D. Protection:

1. Protect the finish work included herein, and in other divisions such as floors, walls, glass, installed equipment, etc., from damage due to dropping of paint and coating materials, and clean off all such materials dropped or spilled on such surfaces.

2. Post "Wet Paint" notices as required to protect newly painted surfaces from handling.

3. Oily rags and waste shall be kept in metal containers and shall not be allowed to accumulate in the building.

4. Close tightly the covers of paint and coating materials when not in use to avoid the danger of fire.

#### 1.7 EXTRA STOCK

A. Upon completion of the work of this Section, provide one (1) un-opened gallon of each type finish paint used on Project with formula attached and location used for Owner's stock.

### 2. PRODUCTS

#### 2.1 PAINT MATERIALS

A. Acceptable materials:

1. The painting Schedule in Part 3 of this Section is based on products of Sherwin- Williams Company.
2. Equal products as manufactured by other manufacturers, fully conforming to these specifications, when approved by the Engineer of Record.
3. Insofar as practicable, use undercoat, finish coat, and thinner material as parts of a unified system of paint finish.

## 2.2 COLOR SCHEDULES

- A. The Owner will prepare a color schedule for guidance in painting.

## 2.3 APPLICATION EQUIPMENT

- A. For application of the approved paint, use only such equipment as is recommended for application of the particular paint by the manufacturer of the particular paint, and as approved by the Owner.
- B. Prior to use of application equipment, verify that the proposed equipment is actually compatible with material to be applied, and that integrity of the finish will not be jeopardized by use of the proposed equipment.

## 2.4 OTHER MATERIAL

- A. Provide other materials not specifically described but required for a complete and proper installation, as selected by the Contractor subject to the approval of the Engineer of Record.

## 3. EXECUTION

### 3.1 SURFACE CONDITIONS

- A. Do not begin painting on any surface until it has been inspected and is in proper condition to receive the paint as specified.
  1. Should any surface be found unsuitable to produce a proper paint finish, the Engineer of Record shall be notified in writing and no materials shall be applied until the unsuitable surfaces have been made satisfactory.
    - a. Absence of such notification shall be construed as acceptance of such surface to receive work.
    - b. Later claims of defects in surfaces prior to painting shall not relieve the Contractor from his responsibility for compliance with the requirements of the Specifications.
  2. Concrete, stucco, plaster, etc. shall have a pH level of 10 or below before proceeding with painting, if painting is applicable.

### B. EXTERIOR IRON & STEEL

NEW OR UNPAINTED - Surfaces must be sound, clean, dry, and free of oil, grease, mildew, rust, scale and other foreign matter. Best results are obtained over a surface sandblasted to a Commercial Blast (SSPC-SP-

6). Wire brush, scrape or power tool clean to remove rust and scale. Clean surface with paint thinner and clean rags. Performance over hand or power-tool cleaned surfaces is dependent on the degree of cleaning.

#### C. EXTERIOR GALVANIZED METAL

NEW OR UNPAINTED - Surfaces must be sound, clean, dry, and free of oil, grease, mildew, rust, scale and other foreign matter. Clean surfaces with paint thinner or mineral spirits and clean rags. The use of a galvanized metal pre-treatment or weathering 6 months prior to painting improves.

#### D. EXTERIOR WOOD

NEW OR UNPAINTED - Surfaces must be sound, clean, dry, and free of oil, grease, mildew and other foreign matter. Counter sink nailheads. Sand rough areas smooth. Dust clean. Remove any mildew on the surface with a solution of 16 ounces of household bleach and 2 ounces of non-ammoniated liquid detergent per gallon of water. Rinse clean and allow to thoroughly dry. Spot prime knots with Sherwin-Williams A-100 Exterior Latex Wood Primer #B42W41. Caulk with latex-type caulk after priming entire surface.

#### E. EXTERIOR IRON & STEEL

REPAINT - Remove cracked and loose paint and repair any unsound elements of the substrate. Remove dust, dirt, chalk, grease, oil or other foreign matter. Dull glossy or slick areas by light sanding. Dust clean. Scrub heavily chalked areas and overhead areas such as eaves with soap and water. Rusted, abraded, blistered, cracked or peeling areas should be thoroughly hand or power tool cleaned. Remove any mildew on the surface with a solution of 16 ounces of household bleach and 2 ounces of non-ammoniated liquid detergent per gallon of water. Rinse surfaces clean and allow to thoroughly dry. Prime any exposed metal with the Sherwin-Williams metal primer specified in painting systems.

#### F. EXTERIOR GALVANIZED METAL

REPAINT - Remove cracked and loose paint and repair any unsound elements of the substrate. Remove dust dirt, chalk, grease, oil or other foreign matter. Dull glossy or slick areas by light sanding. Dust clean. Scrub heavily chalked areas and overhead areas such as eaves with soap and water. Remove any mildew on the surface with a solution of 16 ounces of household bleach and 2 ounces of non-ammoniated detergent per gallon of water. Rinse surfaces clean and allow to thoroughly dry. Rusted or abraded bare metal areas should be thoroughly hand or power cleaned and spot primed with Sherwin-Williams ferrous metal primer specified in painting systems in Section 09900 hereof. Spot prime bare galvanized surfaces with Sherwin-Williams galvanized metal primer specified in painting systems.

#### G. EXTERIOR ALUMINUM AND NON-FERROUS METALS

REPAINT - Remove cracked and loose paint and repair any unsound elements of the substrate. Remove, dust dirt, chalk, grease, oil or other foreign matter. Dull glossy or slick areas by light sanding. Dust clean. Scrub heavily chalked areas and overhead areas such as eaves with soap and water. Remove any mildew on the surface with a solution of 16 ounces of household bleach and 2 ounces of non-ammoniated detergent per gallon of water. Rinse surfaces clean and allow to thoroughly dry. Prime any exposed metal with the Sherwin-Williams metal primer specified in painting systems.

#### H. INTERIOR DRYWALL

NEW OR UNPAINTED - Surfaces must be sound, clean, dry, and free of oil, grease, dirt and other foreign matter. Sand joints smooth. All joint compounds must be thoroughly dry before priming. Dust walls to remove sanding dust with damp sponge. Steel corner beadings should be primed with Sherwin-Williams metal primer specified in painting systems before applying latex coatings.

#### I. INTERIOR WOOD

NEW OR UNPAINTED - Surfaces must be sound, clean, dry, and free of oil, grease, dirt and other foreign matter. Counter sink nails. Fill holes, cracks and joints with wood putty. Sand smooth and dust clean with a damp sponge.

#### J. INTERIOR WOOD

TO BE STAINED - Surfaces must be sound, clean, dry, and free of oil, grease, dirt and other foreign matter. Counter sink nails. Fill holes, cracks and joints with a colored wood putty. Sand to a uniform surface. Final sanding step should be with a 3/0 or finer sand paper. Dust or vacuum clean. Fill open grain woods with SherWood Natural Filler #D70T1 blended with the selected Sherwin-Williams WoodClassics Oil Stain #A48200 at the rate of one pint of stain per gallon.

#### K. INTERIOR IRON & STEEL

NEW OR UNPAINTED - Surfaces must be sound, clean, dry, and free of oil, grease, dirt, rust, scale and other foreign matter. Wire brush, scrape or power tool clean to remove rust and scale. Clean surface with paint thinner and clean rags.

#### L. INTERIOR GALVANIZED METAL

NEW OR UNPAINTED - Surfaces must be sound, clean, dry, and free of oil, grease, dirt, rust, scale and other foreign matter. Clean surfaces with paint thinner or mineral spirits and clean rags and/or with the use of a galvanized metal pre-treatment.

#### M. INTERIOR OR EXTERIOR CONCRETE BLOCK WALLS

NEW OR UNPAINTED - Mortar joints must be allowed to cure a minimum of 30 days and have a pH lower than 10.0 before painting. Surfaces must be sound, clean, dry, and free of oil, grease, efflorescence, loose aggregate, and other foreign matter. If efflorescence is present, remove by washing surface with a solution of 5% to 10% muriatic acid and water. Follow manufacturer's application and safety instructions. Before applying acid, always dampen the surface with clean water to prevent the acid from being absorbed deeply into the wall. Follow acid with a clean water rinse. Allow to thoroughly dry. If this is not practical, dry brush efflorescence salts off the surface prior to painting. Rinse and allow to thoroughly dry. In all cases, investigate and eliminate source of moisture causing the development of efflorescence.

#### N. INTERIOR PLASTER, CONCRETE WALLS OR CONCRETE

FLOORS NEW OR UNPAINTED: Surfaces must be dry, clean, free of oil, grease, Form Release Agents, Curing Agents, laitance, other foreign matter and be structurally sound. Concrete floors, poured concrete walls, concrete plaster - cure a min. of 30 days and acid etch. pH must be 10.0 or lower before painting. Prime with Tile Clad High Solids B62Z Series thinned 20% by volume on first coat with reducer #54 R7K54. Plaster,

drywall - allow plaster to cure 30 days before painting. Prime with PreRite 200 Latex Wall Primer #B28 W200. Steel, galvanized metal, aluminum, glazed brick - prime with Heavy Duty

Epoxy B67 Series.

#### O. EXTERIOR STUCCO (WHEN REQUIRED)

NEW SURFACES: remove all dirt, oil, grease, curing compounds, Form Release Agents, chalk and other foreign matter by high pressure water washing (minimum 2000 psi). Rinse clean. Cure at least 30 days. Previously Painted Surfaces: Remove heavy chalk, residue, and all loose or peeling paint back to a sound surface, by high-pressure water washing (minimum 2000 psi). Dull glossy areas: Wash mildewed surfaces with a solution of 16 oz. liquid household bleach and 2 fl. oz. Non-ammoniated liquid detergent per gallon of water. Rinse well with clean water.

CRACK & JOINTS: Any cracks larger than hairline must be "Vd" out before patching. Structural cracks with movement must be cut out to a minimum of 3/8" width before patching. Joints and seams must be dry, clean and free of dirt, loose coatings, and other foreign matter that may affect adhesion of caulking sealants. Damaged masonry must be removed to a sound substrate and patched with an appropriate stucco type repair.

#### P. EXTERIOR ALUMINUM

New - surfaces must be clean, dry, and free of oil, grease, dirt and other foreign matter. Lightly sand or use steel wool on all surfaces. Clean and allow to thoroughly dry. Prime all surfaces with Sherwin-Williams metal primer specified in painting systems.

### 3.2 PAINT APPLICATION

#### A. Mixing:

1. The proportions of all ingredients in all paints and stains mixed on the Site shall be in accordance with the recommendations of the paint manufacturer printed on the container applicable to the particular use for which the specific mixture is intended.
2. Screen out all lumps and impurities during mixing; use clean containers; and protect against dirt or trash entering the mix.
3. Stir until uniform consistency is procured.

#### B. Climatic conditions:

1. During the actual application and drying of

the paint, and until normal occupancy of the building occurs; a minimum temperature of 65° F shall be maintained.

2. This temperature shall be held as constant as possible to prevent condensation.

3. Adequate ventilation shall be provided at all times so that the humidity cannot rise above the dew point at the coldest wall.

4. Do not apply exterior paint in damp or rainy weather or until the surface has dried thoroughly from the effects of such weather.

C. Finish coats:

1. Finished work shall be uniform and of the approved color.
2. It shall completely cover, be smooth, and free from runs, sags, clogging, or excessive flooding.
3. Make edges of paint adjoining other materials or color, sharp and clean without overlapping.
4. Where high gloss enamel is used, lightly sand undercoats to obtain a smooth finish coat.
5. Where open cabinets or shelves occur, room finish on walls shall not be omitted. However, painting on walls will not be required back of permanently built-in cabinets with closed backs.
6. The insides of all cabinets shall be given one (1) coat of pigmented sealer.
7. The top and bottom edges of all doors shall be finished with a heavy coat of paint as used for the finish coat. Apply after fitting. Strictly adhere to the door manufacturer's printed instructions for finishing at the Job Site.

D. Color coordination:

1. Each coat of paint shall be of the same shade from preceding coat. Final coat shall not be applied until the Engineer of Record has approved the previous.
2. Access panels, registers, and grilles generally shall be painted the same color as adjacent walls or ceilings. Where adjacent surfaces do not require painting use color as directed by the Engineer of Record.
3. Exposed piping, conduit, ductwork, hangers, etc., generally, in finished spaces, shall be painted a color and texture to match walls or ceiling adjacent to it. Where adjacent surfaces are unpainted, use color as directed by the Engineer of Record.

E. Correction of work:

1. Correction of improper or damaged work may be by "spot touching" except that: a. In final coat corrections, a re-coating of the entire surface between corners, or "breaks" may be required without additional charge, where necessary to accomplish an acceptable finish.

### 3.3 PAINTING SCHEDULE

Trade names and numbers listed are:

Sherwin-Williams Company.

A. Painting schedule for Exposed Surfaces:

1. EXTERIOR UNPAINTED IRON & STEEL

1st Coat: A11W210, All Surface Enamel Alkyd Primer, (touch up on shop primed items only).

2nd Coat: A11 Series All Surface Gloss Enamel.

3rd Coat: A11 Series All Surface Gloss Enamel.

## 2. EXTERIOR UNPAINTED GALVANIZED METAL

1st Coat: A41W210, All Surface Enamel Latex Primer

2nd Coat: A41 Series, All Surface Gloss Enamel Latex.

3rd Coat: A41 Series, All Surface Gloss Enamel Latex.

## 3. EXTERIOR UNPAINTED PVC TRIM

Primer: B51W50 Anchor Bond Primer.

1st Coat: A8 Series, A-100 Exterior Acrylic Latex Gloss.

2nd Coat: A8 Series, A-100 Exterior Acrylic Latex Gloss.

## 4. PREVIOUSLY PAINTED EXTERIOR METAL

1st Coat: A11W210, All Surface Enamel Alkyd Primer, (touch up rusty areas only).

2nd Coat: A11 Series, All Surface Gloss Enamel.

3rd Coat: A11 Series, All Surface Gloss Enamel.

## 5. INTERIOR UNPAINTED DRYWALL: WALLS

1st Coat: B28W601, High Build Primer.

2nd Coat: B20 Series, ProMar 200 Interior Latex Eg-Shel Enamel.

3rd Coat: B20 Series, ProMar 200 Interior Latex Eg-Shel Enamel.

## 6. INTERIOR UNPAINTED DRYWALL: CEILINGS & SOFFITS

1st Coat: B28W601, High Build Primer.

2nd Coat: B30 Series, ProMar 200 Interior Latex Flat Wall Paint.

## 7. INTERIOR UNPAINTED WOOD: PLYWOOD CEILINGS AND TRIM

1st Coat: B49W2 PrepRite 200 Wall & Wood Primer.

2nd Coat: B34 Series, ProMar 200 Interior Alkyd Semi-Gloss Enamel.

3rd Coat: B34 Series, ProMar 200 Interior Alkyd Semi-Gloss Enamel.

## 8. INTERIOR UNPAINTED IRON & STEEL

1st Coat: A11W210, All Surface Enamel Alkyd Primer.



2nd Coat: B34 Series, ProMar 200 Interior Alkyd Semi-Gloss Enamel.

3rd Coat: B34 Series, ProMar 200 Interior Alkyd Semi-Gloss Enamel.

#### 9. INTERIOR UNPAINTED GALVANIZED METAL

1st Coat: A41W210, All Surface Enamel Latex Primer.

2nd Coat: B31 Series, ProMar 200 Interior Latex Semi-Gloss.

3rd Coat: B31 Series, ProMar 200 Interior Latex Semi-Gloss.

#### 10. INTERIOR UNPAINTED CONCRETE BLOCK

1st Coat: B42W46 Heavy Duty Block Filler.

2nd Coat: A89 Series, SuperPaint Exterior Latex Satin.

3rd Coat: A89 Series, SuperPaint Exterior Latex Satin.

#### 11. EXTERIOR ELASTOMERIC COATING ON CONCRETE BLOCK

1st Coat: B42W46 Heavy Duty Block Filler.

2nd Coat: A5W400 Series, Conflex XL Elastomeric High Build Coating.

3rd Coat: A5W400 Series, Conflex XL Elastomeric High Build Coating.

#### 12. EXTERIOR ALUMINUM

1st Coat: B71Y1, DTM Wash Primer.

2nd Coat: A41, Series, All Surface Enamel Gloss Latex.

3rd Coat: A41 Series, All Surface Enamel Gloss Latex.

#### 13. INTERIOR/EXTERIOR UNPAINTED CONCRETE FLOORS.

1st Coat: H & C Silicone Acrylic Concrete Sealer. (Thinned 20% 1st coat only) 2nd Coat: H & C Silicone Acrylic Concrete Sealer. (No thinning this coat)

14. INTERIOR UNPAINTED WOOD Flame Control No. 20-20 Flat Latex Intumescent Fire Retardant Paint: Prepare surfaces and apply in strict conformance with manufacturer's printed literature.

#### 3.4 CLEANING

A. Touch up and restore finish where damaged.

B. Removed spilled, splashed, or splattered paint from all surfaces.

C. Do not mar surface finish of item being cleaned.

D. Leave storage space clean and in condition required for equivalent spaces in Project.

E. Remove from Job Site all boxes, cans, and plastic sheets.

END OF SECTION 09900

**DIVISION 10**

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**SPECIALTIES**

## **SECTION 10165 TOILET COMPARTMENTS**

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### **1. GENERAL**

#### **1.1 DESCRIPTION**

A. Work included: Provide water-resistant, High Density Polyethelene (HDPE) toilet compartments and urinal screens as specified herein and as needed for a complete and proper installation.

B. Related work:

1. Documents affecting work of this Section include, but are not necessarily limited to, General Conditions, Supplementary Conditions and Sections in Division 1 of these Specifications.

2. Section 06100: Rough Carpentry.

3. Section 10800: Toilet Room Accessories.

#### **1.2 QUALITY ASSURANCE**

A. Use adequate numbers of skilled workmen who are thoroughly trained and experienced in the necessary crafts and who are completely familiar with the specified requirements and the methods needed for proper performance of the work of this Section.

#### **1.3 SUBMITTALS**

A. Comply with pertinent provisions of Section 01340 and Section 01600.

B. Product data: Within 35 calendar days after the Contractor has received the Owner's Notice to Proceed, submit:

1. Materials list of items to be provided under this Section.

2. Manufacturer's specifications and other data needed to prove compliance with the specified requirements.

3. Shop Drawings in sufficient detail to show fabrication, installation, anchorage, and interface of the work of this Section with the work of adjacent trades.

4. Color and pattern charts showing colors and patterns available in the specified products from the manufacturer.

5. Manufacturer's recommended installation procedures which, when approved by the Engineer of Record, will become the basis for accepting or rejecting actual installation procedures used on the work.

#### **1.4 PRODUCT HANDLING**

A. Comply with pertinent provisions of Section 01600.

### **2. PRODUCTS**

#### **2.1 TOILET COMPARTMENTS**

A. Provide water-resistant, High Density Polyethelene (HDPE) toilet compartments and urinal screens in colors and finishes selected by the Owner from the standard colors and finishes of the specified manufacturer.

## 2.2 ACCEPTABLE PRODUCTS

A. Provide OH Series: Overhead braced and floor anchored toilet compartments, and floor and wallanchored urinal screens, with stainless steel hardware as manufactured by Rockville Partitions, Inc., or equal products as manufactured by other manufacturers, fully conforming to these specifications, when approved by the Engineer of Record.

B. All continuos wall brackets, continuos panel connecting devices, door latches, coat hooks, continuos door hinges, stile shoe and all fasteners shall be type 304, satin finish, stainless steel.

## 2.3 OTHER MATERIALS

A. Provide other materials, not specifically described but required for a complete and proper installation, as selected by the Contractor subject to the approval of the Engineer of Record.

## 3. EXECUTION

### 3.1 SURFACE CONDITIONS

A. Examine the areas and conditions under which work of this Section will be performed. Correct conditions detrimental to timely and proper completion of the work. Do not proceed until unsatisfactory conditions are corrected.

### 3.2 BLOCKING

A. Install blocking and backing at walls as required for secure attachment of toilet compartments and urinal screens, See also, Section 06100 (3.5, A.1).

### 3.3 INSTALLATION

A. Coordinate as required with other trades to assure proper and adequate provision in the work of those trades for interface with the work of this Section.

B. Install the work of this Section in strict accordance with the original design, the approved Shop Drawings, pertinent requirements of governmental agencies having jurisdiction, and the manufacturer's recommended installation procedures as approved by the Engineer of Record, anchoring all components firmly into position for long life under hard use.

C. Adjust doors, except doors to handicapped compartments, to remain at a uniformly open position when unlocked.

D. Repair scratches and abrasions to make completely invisible to the unaided eye from a distance of five feet (5') or replace damaged panels if so directed by the Engineer of Record.

END OF SECTION 10165

## **SECTION 10210 STATIONARY GABLE LOUVERS**

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### 1. GENERAL

#### 1.1 DESCRIPTION

A. Work included: Provide all necessary labor, material and equipment for complete installation of extruded aluminum stationary gable louvers as specified herein, and as needed for a complete and proper installation.

#### B. Related work

1. Documents affecting work of this Section include, but are not necessarily limited to, General Conditions, Supplementary Conditions and Sections in Division 1 of these Specifications.

2. Section 06100 - Rough Carpentry.

3. Section 06190 – Wood Trusses.

4. Section 07311 – Asphalt Shingles.

5. Section 07600 - Flashing and Sheet Metal.

6. Section 07920 – Sealants and Caulking.

#### 1.2 QUALITY ASSURANCE

A. Louvers licensed to bear AMCA Certified Ratings Seal. Ratings based on tests and procedures performed in accordance with AMCA 511 and comply with AMCA Certified Ratings Program. AMCA Certified Ratings Seal applies to air performance and water penetration ratings.

B. Provide stationary gable louvers designed and installed to resist wind loads as determined by provisions of Section 1609 of the Florida Building Code.

#### STATIONARY GABLE LOUVERS 10210 - 2

C. Manufacturer shall provide ASCE 7 Wind Design Engineering based upon wind criteria shown in building plans. Report will be prepared and sealed by a licensed Florida P. E.

D. Provide products that meet the product approval requirements mandated by the State of Florida, certified by the Florida Building Commission.

#### 1.3 REFERENCES

A. AAMA 2605-98 - High Performance Organic Coatings on Engineer of Recordural Extrusions and Panels.

B. AMCA 500-L - Test Methods for Louvers.

C. AMCA 511 - Certified Ratings Program for Air Control Devices.

#### 1.4 SUBMITTALS

A. Comply with pertinent provisions of Section 01340 and Section 01600.

B. Product data: Within 35 calendar days after the Contractor has received the Owner's Notice to Proceed, submit:

1. Materials list of items proposed to be provided under this Section.
2. Manufacturer's specifications and other data needed to prove compliance with specified requirements.
3. Manufacturer's recommended installation procedures which, when approved by the Engineer of Record, will become the basis for accepting or rejecting actual installation procedures based on the Work.

E. Shop Drawings: Submit shop drawings indicating materials, construction, dimensions and installation details.

F. Samples: manufacturer's standard color chips for color selection by Engineer of Record.

#### 1.5 DELIVERY, STORAGE, AND HANDLING

A. Delivery: Deliver materials to site in manufacturer's original, unopened containers and packaging, with labels clearly indicating manufacturer and material.

B. Storage: Store materials in a dry area indoors, protected from damage and in accordance with manufacturer's instructions.

C. Handling: Protect materials and finishes during handling and installation to prevent damage.

### 2. PRODUCTS

#### 2.1 ACCEPTABLE MANUFACTURERS

A. Extruded aluminum stationary gable louvers specified herein are based upon products as manufactured by. Ruskin Manufacturing, 3900 Dr. Greaves Road, Kansas City, Missouri 64030. Phone (816) 761-7476. Fax (816) 765-8955.

B. Equal products as manufactured by other manufacturers, fully conforming to these Specifications, when approved by the Engineer of Record.

#### 2.2 EXTRUDED ALUMINUM STATIONARY GABLE LOUVERS

A. Louver Fabrication:

1. Model: ELF375XH (triangular-shaped).
2. Performance Ratings: AMCA licensed.
3. Frame:
  - a. Material: Extruded aluminum, Alloy 6063-T5.
  - b. Wall Thickness: 0.125 inch, nominal.
  - c. Depth: 4 inches.

d. Downspouts and caulking surfaces.

4. Blades:

a. Style: Non-Drainable.

b. Material: Extruded aluminum, Alloy 6063-T5.

c. Wall Thickness: 0.125 inch, nominal.

d. Angle: 37.5 degrees.

e. Centers: 5-3/32 inches, nominal.

5. Insect Screen:

a. Material: Aluminum, closely woven (18/14 mesh) aluminum wire.

b. Frame: Removable, rewireable.

6. Gutters: Drain gutter in head frame.

7. Downspouts: Downspouts in jambs to drain water from louver for minimum water cascade from blade to blade.

8. Vertical Supports: Hidden vertical supports to allow continuous line appearance.

9. Sill: Steeply angled integral sill eliminating areas of standing or trapped moisture where mold or mildew may thrive and effect indoor air quality.

10. Assembly: Provide factory assembled louver components of all welded construction.

B. Design Wind Load: Incorporate structural supports as required to withstand wind loads.

## 2.3 FACTORY LOUVER FINISH

A. Kynar 500 Fluoropolymer Coating:

1. Conform to AAMA 2605-98.

2. Apply coating following cleaning and pretreatment.

3. Cleaning: AA-C12C42R1X.

4. Dry louvers before final finish application.

5. Total Dry Film Thickness: Approximately 1.2 mils, when baked at 450 degrees F for 10 minutes.

6. Warranty: Limited 20-year warranty on standard colors.

B. Color for Fluoropolymer Coating: Color as selected by Engineer of Record from manufacturer's standard colors.



### 3. EXECUTION

#### 3.1 EXAMINATION

A. Inspect areas to receive units. Notify the Engineer of Record of conditions that would adversely affect the installation or subsequent utilization of the units. Do not proceed with installation until unsatisfactory conditions are corrected.

#### 3.2 INSTALLATION

A. Install units at locations indicated on the drawings and in accordance with manufacturer's instructions.

B. Install units plumb, level, in plane of wall, and in alignment with adjacent work.

C. Install joint sealants as specified in Section 07920.

#### 3.3 CLEANING

A. Clean louver surfaces in accordance with manufacturer's instructions.

B. Repair minor damaged surfaces as directed by Engineer of Record.

END OF SECTION 10210

## **SECTION 10426 SIGNAGE**

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### **1. GENERAL**

#### **1.1 DESCRIPTION**

A. Work included: Provide signage as specified herein, and as needed for a complete and proper installation.

B. Related work:

1. Documents affecting work of this Section include, but are not necessarily limited to, General Conditions, Supplementary Conditions and Sections in Division 1 of these specifications.

#### **1.2 QUALITY ASSURANCE**

A. Use adequate numbers of skilled workmen who are thoroughly trained and experienced in the necessary crafts and who are completely familiar with the specified requirements and the methods needed for proper performance of the work of this Section.

#### **1.3 SUBMITTALS**

A. Comply with pertinent provisions of section 01340 and Section 01600.

B. Product data: Within 35 calendar days after the Contractor has received the Owner's Notice to Proceed, submit:

1. Materials list of items proposed to be provided under this Section;

2. Manufacturer's specifications and other data needed to prove compliance with the specified requirements;

3. Details of installation and anchorage sufficient to enable proper interface of the work of this Section with the work of other trades;

4. Manufacturer's recommended installation procedures which, when approved by the Engineer of Record, will become the basis for accepting or rejecting actual installation procedures used on the Work.

#### **1.4 DELIVERY, STORAGE, AND HANDLING**

A. Comply with pertinent provisions of Section 01600.

### **2. PRODUCTS**

#### **2.1 MANUFACTURERS**

A. Signage specified herein is based upon products as manufactured by American Graphics, Inc., (800) 653-7982.

B. Equal products as manufactured by other manufacturers, fully conforming to these Specifications, when approved in advance by the Engineer of Record.

C. Except as otherwise approved by the Engineer of Record, provide all products of this Section from a single manufacturer.

## 2.2 SIGNAGE

A. Provide signage with the following attributes:

1. Materials: 1/8" thick acrylic with raised letters and grade 2 Braille, chemically weld 1/32" acrylic letters to back panel.
2. Size: 6" x 6" for room name and number signs 8" x 6" for restrooms.
3. Character size: 5/8".
4. Character Style: Helvetica Medium.
5. Corner Condition: radius.
6. Mounting: Mounting holes and screws.
7. All signs to have matte finish.

B. Color: To be selected by Engineer of Record.

C. Submit Sign Schedule for approval by Engineer of Record.

## 3. EXECUTION

### 3.1 SURFACE CONDITIONS

A. Examine the areas and conditions under which work of this Section will be performed. Correct conditions detrimental to timely and proper completion of the Work. Do not proceed until unsatisfactory conditions are corrected.

### 3.2 INSTALLATION

A. Install the work of this Section in strict accordance with the manufacturers' recommendations as approved by the Engineer of Record, using only the approved mounting materials, and locating all components firmly into position, level and plumb.

1. Mounting Location: 60" above finish floor to centerline of sign, adjacent to latch side of door or as directed by Engineer of Record.

END OF SECTION 10426

## **SECTION 10520 FIRE EXTINGUISHERS**

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### **1. GENERAL**

#### **1.1 DESCRIPTION**

A. Work included: Provide fire extinguishers and wall brackets as specified herein, and as needed for a complete and proper installation.

B. Related work:

1. Documents affecting work of this Section include, but are not necessarily limited to, General Conditions, Supplementary Conditions and Sections in Division 1 of these Specifications.

#### **1.2 QUALITY ASSURANCE**

A. Use adequate numbers of skilled workmen who are thoroughly trained and experienced in the necessary crafts and who are completely familiar with the specified requirements and the methods needed for proper performance of the work of this Section.

B. Conform to NFPA 10 requirements for portable fire extinguishers.

C. Provide fire extinguishers and accessories by a single manufacturer.

D. Conform to Americans with Disabilities Act 1990 on maximum projection of 4-inches into corridors where necessary.

#### **1.3 SUBMITTALS**

A. Comply with pertinent provisions of Section 01340 and Section 01600.

B. Product data: Within 35 calendar days after the Contractor has received the Owner's Notice to Proceed, submit:

1. Materials list of items proposed to be provided under this Section.

2. Manufacturer's specifications and other data needed to prove compliance with the specified requirements.

3. Dimensioned Drawings as needed to depict the space required for these items, and their interface with the work of other trades.

4. Manufacturer's recommended installation procedures which, when approved by the Engineer of Record, will become the basis for accepting or rejecting actual installation procedures used on the Work.

#### **1.4 PRODUCT HANDLING**

A. Comply with pertinent provisions of Section 01600.

### **2. PRODUCTS**

#### **2.1 FIRE EXTINGUISHERS**

A. Building: Fire Extinguishers shall be multipurpose dry chemical ABC, 10 lb. capacity, J.L. Industries "Cosmic 10E" (UL Rating 4A- 60BC) or equal products of other manufacturers when approved by the Engineer of Record. Submit complete product literature for approval.

B. Fire extinguishers shall be hung on wall brackets.

C. Service charge and tag each fire extinguisher not more than five (5) calendar days prior to the Date of Substantial Completion of the Work as that Date is established by the Engineer of Record.

D. Provide fire extinguishers at locations as shown on drawings.

### 3. EXECUTION

#### 3.1 SURFACE CONDITIONS

A. Examine the areas and conditions under which work of this Section will be performed. Correct conditions detrimental to timely and proper completion of the Work. Do not proceed until unsatisfactory conditions are corrected.

#### 3.2 INSTALLATION

A. Coordinate as required with other trades to assure proper and adequate provision in the work of those trades for interface with the work of this Section.

B. Install the work of this Section in strict accordance with the original design, the approved Shop Drawings, pertinent requirements of governmental agencies having jurisdiction, and the manufacturer's recommended installation procedures as approved by the Engineer of Record, anchoring all components firmly into position for long life under hard use.

END OF SECTION 10520

## **SECTION 10800 TOILET ROOM ACCESSORIES**

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### **1. GENERAL**

#### **1.1 DESCRIPTION**

A. Work included: Provide toilet room accessories as specified herein, and as needed for a complete and proper installation.

B. Related work:

1. Documents affecting work of this Section include, but are not necessarily limited to, General Conditions, Supplementary Conditions and Sections in Division 1 of these specifications.

2. Section 06100: Rough Carpentry.

#### **1.2 QUALITY ASSURANCE**

A. Use adequate numbers of workmen who are thoroughly trained and experienced in the necessary crafts and who are completely familiar with the specified requirements and the methods needed for proper performance of the work of this Section.

#### **1.3 SUBMITTALS**

A. Comply with pertinent provisions of section 01340 and Section 01600.

B. Product data: Within 35 calendar days after the Contractor has received the Owner's Notice to Proceed, submit:

1. Materials list of items proposed to be provided under this Section.

2. Manufacturer's specifications and other data needed to prove compliance with the specified requirements.

3. Manufacturer's data clearly defining the required support and other details of installation to enable proper interface with work of other trades.

4. Manufacturer's recommended installation procedures which, when approved by the Engineer of Record, will become the basis for accepting or rejecting actual installation procedures used on the Work.

#### **1.4 PRODUCT HANDLING**

A. Comply with pertinent provisions of Section 01600.

### **2. PRODUCTS**

#### **2.1 TOILET ROOM ACCESSORIES**

A. Anchors and fasteners:

1. Provide anchors and fasteners capable of developing a retaining force commensurate with the strength of the accessory to be mounted, well suited for use with the supporting construction anchoring all components firmly into position for long life under hard use.

2. Where exposed fasteners are permitted, provide oval head fasteners with finish matching the accessory.

B. Provide type 304 stainless steel with satin finish on all items of this Section.

C. Acceptable manufacturers:

1. Provide all items from a single manufacturer.

2. Toilet room accessories specified herein are based upon products as manufactured by Bobrick Washroom Equipment, Inc.

3. Equal products as manufactured by other manufacturers, fully conforming to these Specifications, when approved in advance by the Engineer of Record.

a. Bradley Corporation.

b. ASI.

## 2.2 OTHER MATERIALS

A. Provide other materials, not specifically described but required for a complete and proper installation, as selected by the Contractor subject to the approval of the Engineer of Record.

## 3. EXECUTION

### 3.1 SURFACE CONDITIONS

A. Examine the areas and conditions under which work of this Section will be performed. Correct conditions detrimental to timely and proper completion of the Work. Do not proceed until unsatisfactory conditions are corrected.

### 3.2 BLOCKING

A. Install blocking and backing as required to support wall mounted toilet room accessories. See also, Section 06100 (3.5, A.1).

### 3.3 INSTALLATION

A. Coordinate as required with other trades to assure proper and adequate provision in the work of those trades for interface with the work of this Section.

B. Install each item in its proper location, firmly anchored into position, level and plumb, and in accordance with the manufacturers recommendations.

C. Anchor all components firmly into position for ong life under hard use.

END OF SECTION 10800

**DIVISION 15**

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**MECHANICAL**



**PART 1 - GENERAL****1.1 REFERENCE TO OTHER SECTIONS**

A. General and Special Conditions, General Requirements and all other parts of the Contract Documents shall be binding upon Contractor and shall apply to all work specified in this Section.

**1.2 CODES AND REGULATIONS**

The work shall conform to the following listed codes and regulations:

A. O.S.H.A., National Electric Code, Southern Standard Mechanical Code, Southern Standard Plumbing Code, National Fire Protection Association, ASRE Code for Refrigeration Apparatus, ASA Codes for Refrigeration Equipment. Electric motors shall bear NEMA approval. Air conditioning units shall bear ARI and UL approval. Fans shall bear AMCA label. All electric wiring and electrical devices shall be UL approved. Welding shall be performed by ASME qualified welding mechanics in compliance with ASME Code for pressure piping together with addenda and supplements issued to date. Pressure vessels shall bear ASME label.

**1.3 DRAWINGS**

A. The drawings are diagrammatic and show generally the location of piping, fixtures and equipment and are not to be scaled. All dimensions shall be verified at the building site. Check job site prior to preparing bid.

**1.4 GUARANTEE**

A. Guarantee all material and workmanship to be as specified and make good without cost to the Owner any defect in material and workmanship for a period of one year after acceptance of work. Manufacturer's guarantee does not relieve the Contractor of responsibility. The Contractor will be held solely responsible. Guarantee air conditioning compressors for four (4) additional years.

**1.5 FEES AND PERMITS**

A. The Contractor shall obtain and pay for all permits, fees for inspection, and other charges that may be necessary for fully completing the work. The Contractor shall make all necessary tests required by City, County, or State authorities, legal regulations, and/or the Engineer of Record, and return to the Engineer of Record any certificates of approval issued in this district for plumbing work, etc. signed by the inspector in charge of each particular part of the work.

**1.6 RESPONSIBILITY OF BIDDER**

A. Each bidder shall visit the site of the proposed work and fully acquaint himself with conditions relating to the construction requirements so that he may fully understand the facilities, difficulties and restrictions contingent upon the execution of the work under this contract. The failure or omission of any bidder to receive or examine any form instrument, addendum or other document shall in no way relieve any bidder from his obligations with respect to his bid or the contract. The submission of a bid shall be taken as prima facia evidence of compliance with this paragraph and that he has included in his proposal every item of cost necessary for a complete installation strictly as planned, specified, and intended.

## 1.7 SUB-DIVISIONS OF WORK

A. Each sub-division of work includes furnishing and installing all materials to make that part of work complete, and shall comprise all auxiliaries, setting of equipment, sleeves through building construction where required and etc., all in complete coordination with General Contractor and in cooperation with other trades.

## 1.8 DRAWINGS

A. The drawings for this job are diagrammatic. The Contractor shall make his own measurements at the site and in the buildings during construction and install the systems as the work progresses in such a manner that the equipment, piping, conduit, panels, and ductwork will fit into the finished space provided maintaining headroom; and be neatly installed. All equipment and its interconnecting piping, ductwork, conduit, etc., shall be provided.

B. Due to differences between various manufacturers, it is not practicable to show exact dimensions of units, nor to show or specify all minor details of equipment. Contractor shall provide all valves, fittings and accessories as necessary for a complete installation, whether or not specifically mentioned or shown, and all equipment shall be installed so that adequate clearances are provided to allow convenient access for any servicing and maintenance.

C. Equipment shall not be acceptable if operated in excess of the recommended and published ratings of the manufacturer.

## 1.9 FOUNDATIONS

A. The Contractor shall furnish all special foundations and supports for equipment, ductwork and piping which he installs and which are separate and distinct from building construction as shown by Engineer of Record drawings.

## 1.10 SAFETY PROVISIONS

A. Contractor shall be required at all times to perform his work in strict accordance with the Williams-Steiger Occupational Health and Safety Act of 1970.

## 1.11 NOISE AND VIBRATION

A. The Mechanical Contractor shall be held responsible for elimination of all noises or vibrations transmitted to occupied areas from equipment, which he may install. This applies particularly to airborne noises in ductwork, vibration and noises in piping, and vibration from mechanical equipment transmitted through bases to building structure. Contractor shall furnish and install all flexible connectors for ductwork connected to motor driven equipment. Contractor shall closely coordinate work for location of mechanical equipment and roof openings.

## 1.12 MOTORS AND STARTERS

A. This Contractor shall be responsible for the furnishing in place of all electric motors required for the operation of all plumbing, heating, ventilating and air conditioning equipment. Electrical Contractor to provide all power wiring and conduit required for the operation of electrical motors as specified. Electric

motors shall be selected in sizes as required to properly operate the equipment furnished but in no case smaller than those indicated on Equipment Schedules. Verify all electrical characteristics from electrical drawings before releasing motors for shipment. Electric motors shall have a service factor of 1.15 and power factor in accordance with ASHRAE 90-75.

B. This Contractor shall furnish all magnetic motor starters required to operate heating, ventilating, and air conditioning equipment and turn over to the Electrical Contractor for installation. All motor starters shall be provided with: 1 thermal overload per phase leg.

A 110-volt coil and a hand-off-automatic switch, if motors are subject to electrical interlock unless otherwise specified.

C. If equipment is provided with R.L.A. in excess of design conditions the Mechanical Contractor shall stand the expense of associated electrical changes.

D. It is the responsibility of the Mechanical Contractor to provide thermal overloads of the proper size as required by the actual motor nameplate amps. Motor starters shall comply with the requirements of the latest edition of the National Electrical Code and the local utility service company.

#### 1.13 PAINTING

A. All equipment furnished without factory paint or galvanized finish shall be thoroughly cleaned and given a prime coat, then a finish coat of paint in a color as selected by Engineer of Record/Engineer. Any equipment finish that is damaged or chipped shall be spot painted to match existing surface. Any miscellaneous metals used by this Contractor that are not galvanized shall be given two coats of paint in color specified by Engineer of Record. Any rusty or corroded finishes shall be thoroughly cleaned and painted two coats of paint - one prime and one finish coat.

#### 1.14 SHOP DRAWINGS

A. Materials and equipment schedules shall be submitted as soon as practicable but not later than thirty (30) days after the date of award of contract, and before commencement of installation of any material or equipment. A complete schedule of the material and equipment proposed for installation shall be submitted for approval. The schedule shall include catalogs, cuts, diagrams, drawings, specifications and such other descriptive data as may be required by the Engineer. All materials required to be submitted for approval under this section shall be submitted at one time. Partial submittals will not be considered. They will be returned as "not approved".

#### 1.15 QUALITY OF MATERIALS AND EQUIPMENT

A. It is not the intent of these specifications to limit material and/or equipment selections to one manufacturer; however, the Engineer reserves the right to be the final and sole judge with regard to equals.

B. Approvals of equipment are based on capacities, equality of workmanship and components, or general and special construction features. Approval of equipment does not relieve the Contractor of coordination responsibility with other trades. Equipment shall fit within the physical space of equipment shown and have same general connection as that shown on drawings. Proper clearances shall be maintained for servicing and maintaining equipment.

C. Where equipment submitted varies from the general arrangement of that specified, Contractor shall submit detailed sheetmetal and equipment brochures. Shop drawings shall indicate any and all sheetmetal, electrical, piping and structural changes required to facilitate change. Any and all additional costs incurred by changes will be borne by this Contractor.

#### 1.16 OPERATING INSTRUCTIONS

A. One (1) framed copy of operating instructions, sequence of operation; control diagrams, maintenance and service data on all major items of equipment shall be mounted where directed. Owner shall be fully instructed in the operation of the air conditioning system and water heater in the most economical manner. Final payment will not be made until this has been accomplished and a letter received by the Engineer of Record signed by both parties that instructions have been given.

#### 1.17 MAINTENANCE AND SERVICE

A. Equipment installed under this contract shall be serviced by the Contractor for one (1) year at no additional cost. This service shall include emergency service caused by defective equipment or workmanship. Contractor will not be held responsible for damage to the equipment caused by misuse or abuse of the equipment by the Owner or for damage caused by windstorms, lightning, flood or fire not caused by defective equipment. Service shall include inspection and oiling of motors, cleaning strainers, checking compressor pressures, repairing of pipe leaks, cleaning air filters in air handling units, checking compressors for proper operation, and all motor/pulley belts. Contractor shall make four (4) such inspections and service calls at three (3) month intervals, not including any emergency service calls caused by defective equipment. At each inspection, an affidavit shall be filed with the Engineer of Record that service and inspection has been accomplished. Affidavit shall be signed by Owner's representative that inspection has been made and dated.

#### 1.18 CERTIFICATION

A. Initial start-up, testing and placing into operation of air conditioners, shall be performed by field representative of manufacturer, and manufacturer shall file with the Engineer of Record a certificate prepared on the letterhead of the manufacturer stating that the equipment has been installed in strict compliance with the manufacturer's recommendations and is operating properly. Manufacturer shall list equipment identifying it by model number, serial number and other means of identification.

#### 1.19 TESTING

##### A. HVAC

After balancing and adjusting equipment, system shall be given a 24-hour running test to prove system is in perfect operating condition. Test shall be started in the presence of Engineer of Record or his representative. A recording type thermometer shall be used, and a recording chart of the operation shall be sent to the Engineer of Record. Each zone shall be tested. Cost for testing shall be the responsibility of the Contractor. Air Conditioning test shall be made when the ambient temperature reaches 85 degrees or higher. Heating test shall be made when ambient temperature drops to +40 degrees or lower.

##### B. Plumbing

Test soil, waste, and vent piping by holding 12 feet head of water on highest fixture connection without loss of head for 4 hours. Test water piping at 100- PSI pressure for 4 hours without loss of pressure.

## PART 2 - PRODUCTS

### 2.1 STANDARD PRODUCTS

A. Equipment to be furnished under this specification will be essentially the standard product of the manufacturer. Where two or more units of same class of equipment are required, these units will be products of a single manufacturer.

### 2.2 PIPING, HANGERS AND INSERTS

A. Exposed piping inside of building to be installed parallel to building lines, unless otherwise indicated or specified. Install piping at uniform grade and support on multiple hangers wherever practical.

B. Hangers for all piping to be clevis type or split ring type, unless otherwise specified or indicated, with provisions for vertical adjustment, except the hangers supporting copper tubing may be copper plated steel, brass or bronze. When steel hangers are installed, copper tubing is to be cleaned and wrapped with plastic insulating tape at the point of contact of hanger. Hangers are to be supported by rods fastened to structure. (Wire or perforated strap iron will NOT be permitted for pipe or conduit supports.)

C. Trapeze pipe hangers may be used for multiple piping systems to be installed at same level and grade. Provide pipe clamps or pipe guides to maintain pipe/conduit spacing on trapeze hangers.

D. Hangers for 1 inch and smaller piping to be on not greater than 6 foot spacing. Hangers for 1-1/4" through 4" inclusive shall be on not greater than 10-foot spacing. Hangers for piping 5" and larger shall be not greater 12 foot spacing. Pipe hangers shall be located within 2 feet of all changes in pipe direction.

### 2.3 MARKINGS

A. All switches, controllers, starters, panels, and other pieces of equipment shall be identified with engraved plastic nameplates. "Dymo" tape is not acceptable.

### 2.4 DIELECTRIC UNIONS

A. Where it is necessary to join piping and/or equipment of dissimilar materials, install an insulating union.

## PART 3 - EXECUTION

### 3.1 DISINFECTION

A. Domestic water pipe shall be disinfected by introducing an HTH solution into system holding 50 ppm of available chlorine in system for 6 hours before flushing and returning to service.

### 3.2 INSTALLATION

A. Do all cutting, bracing and patching necessary for the installation of the material. Ductwork and piping shall be installed in a workmanlike manner, vertical pipes shall be plumb and horizontal pipes shall be level.

B. Do all excavation and backfilling necessary for the installation of this material.

C. Verify all measurements at the site, determine the exact location of all chases and openings, provide and set all sleeves, inserts and hangers required for the material to be installed.

D. Check the peculiarities and limitations of space available for the installation of all materials and make sure that valves, traps, cleanouts, and controls and all other apparatus can be readily accessible. The above applies in general to any part of the system, which requires service or maintenance for proper operation.

E. Access doors shall be provided at all locations of the concealed valves, cleanouts, shock absorbers, controls, motors, filters, or other apparatus servicing. They shall be Milcor Style A in acoustical tile, Style K for plastered surfaces and Style M for masonry or wood. No access door is required for lift-up type ceiling.

--End of Section--

**PART 1 - GENERAL****1.1 DESCRIPTION OF WORK**

A. Insulate domestic water piping.

**PART 2 - PRODUCTS****2.1 DOMESTIC WATER PIPE INSULATION**

A. Domestic hot and cold water pipe not exposed to view shall be insulated with 1/2" thick glass fiber with factory applied Universal jacket. Density shall be 4 pounds per cubic foot. Fittings shall be insulated according to manufacturer's recommendations. Insulation vapor barrier shall be lapped and cemented in accordance with manufacturer's recommendations.

B. Domestic hot and cold water pipe exposed to view shall be insulated same as where not exposed to view, except it shall be finished with a sized Universal jacket suitable for painting. Fitting shall be made of "Quickset" cement molded to fit and covered with 8 oz. canvas and finished with white vapor barrier cement, and have plastic molded fitting covers.

**2.2 INSULATION PRODUCTS**

A. Insulation shall be products of Owens-Corning, PPG, Certain/Teed, Armstrong, J.M., Knauf, or Pittsburgh-Corning.

**PART 3 - EXECUTION****3.1 INSTALLATION**

A. Insulate all domestic water piping, do not insulate cold water pipe installed beneath floor slab or underground.

B. Secure vapor barrier jackets tightly, cover fittings smoothly and wrap in neat manner.

C. Insulation shall be installed by experienced insulation mechanics regularly employed by a bona fide insulation contractor.

--End of Section--

**PART 1 - GENERAL****1.1 RELATED REQUIREMENTS**

Section 15010, "General Provisions," applies to this section, with the additions and modifications specified herein. Contractor shall furnish all rough-in items including chair carriers.

**1.2 SUBMITTALS**

Submit the following:

**1.2.1 Manufacturer's Catalog Data**

- a. Pipe and fittings
- b. Valves
- c. Plumbing fixtures
- d. Hot water heater
- e. Pipe supports (hangers)
- f. Drains
- g. Water hammer arresters

**1.2.2 Certificates of Compliance**

- a. Pipe and fittings
- b. Valves

**1.2.3 Operation and Maintenance Manuals**

- a. Hot water heater

**1.3 QUALITY ASSURANCE**

Plumbing systems including fixtures, equipment, materials, installation, and workmanship shall be in accordance with the FBC (Florida Building Code) Plumbing Code except as modified herein. In the Plumbing Code referred to herein, the advisory provisions shall be considered to be mandatory, as though the word "shall" had been substituted for the word "should" wherever it appears. Capacity of equipment shall be not less than that indicated.

**PART 2 - PRODUCTS****2.1 DRAIN, WASTE, AND VENT (DWV) PIPING**

Fittings shall be long radius fittings, except fittings in vent piping may be short radius fittings. Minimum size piping shall be 2 inches for buried piping and 1.5 inches for aboveground piping.



### 2.1.1 Buried Piping

Provide piping up to but not more than 6 inches above ground or floor slab on grade.

#### 2.1.1.1 Plastic Pipe, Fittings, and Solvent Cement

Polyvinyl Chloride (PVC) System: ASTM D 2665.

### 2.1.2 Aboveground Piping

#### 2.1.2.1 Cast-Iron Hubless Pipe and Fittings

CISPI 301 with CISPI 310 coupling joints.

#### 2.1.2.2 Cast-Iron Hub and Spigot Pipe and Fittings

ASTM A 74 with ASTM C 564 or CISPI HSN rubber compression gasket joints, or caulked and leaded joints.

2.1.2.3 Plastic Pipe, Fittings, and Solvent Cement Polyvinyl Chloride (PVC) System. ASTM D 2665 (Note: PVC will not be allowed in return air plenums).

### 2.1.3 Cleanouts

ANSI A112.36.2M; provide threaded bronze or thermoplastic cleanout plugs.

#### 2.1.3.1 Floor Cleanouts

Provide cast-iron floor cleanout with flange, adjustable height polished bronze, nickel bronze, rim and scoriated floor plate with "CO" cast in the plate, and countersunk screws for installing floor plate flush with finished floor.

#### 2.1.3.2 Wall Cleanouts

Provide polished stainless steel or chromium-plated copper alloy cover plate and secure to cleanout plug with countersunk stainless steel screw.

### 2.1.4 Drains

ANSI A112.21.1M; provide cast-iron drains and clamping rings for use with membrane waterproofing. Provide P-traps for each floor drain.

#### 2.1.4.1 Flush Strainer Floor Drains

Provide with double drainage flange, perforated or slotted cast bronze or nickel bronze strainer, and adjustable collar. Drains of sizes 2, 3, and 4 inches shall have strainers with minimum free drainage area of 5, 11, and 18 square inches, respectively. Provide trap primer connections on all floor drains.

## 2.2 DOMESTIC WATER PIPING

### 2.2.1 Buried Piping and Aboveground Piping

#### 2.2.1.1 Copper Tubing

ASTM B 88, Type K, with ANSI B16.18 or ANSI B16.22 solder joint fittings using silver solder and flux containing not more than 0.2 percent lead; or with ANSI B16.26 flared joint fittings. ASTM B 88, Type L may be provided for aboveground piping.

#### 2.2.1.2 Gate Valves

MSS SP-80, Class 125 (all valves shall be American made).

#### 2.2.1.3 Globe and Angle Valves

MSS SP-80, Class 125 (all valves shall be American made).

#### 2.2.1.4 Ball Valves

Full port design, copper alloy. Valves shall have two-position lever handles. (All valves shall be American made).

#### 2.2.1.5 Combination Pressure and Temperature Relief Valves

ANSI Z21.22 Test lever, and discharge capacity based on AGA temperature steam rating.

#### 2.2.2 Strainers

Class 125, Style Y, and shall have blow off outlet with pipe nipple and gate valve and discharge pipe nipple.

#### 2.2.3 Dielectric Connections

Provide at connections between copper and ferrous metal piping materials. ASTM F 441, Schedule 80, CPVC threaded pipe nipples, 4-inch minimum length, may be provided for dielectric connections in pipe sizes 2 inches and smaller.

#### 2.2.4 Water Hammer Arresters

PDI WH201, ANSI A112.26.1M, or ASSE 1010.

### 2.3 MISCELLANEOUS PIPING MATERIALS

#### 2.3.1 Pipe Nipples

ASTM A733, copper alloy for use in copper tubing and hot-dip galvanized Schedule 80 steel pipe for use in steel piping.

#### 2.3.2 Flanges

ANSI B16.1, Class 125, for use in ferrous piping; ANSI B16.22 or ANSI B16.24 for use in copper tubing; with full face flat type synthetic rubber gaskets.

#### 2.3.3 Escutcheon Plates

One piece or split hinge type metal plates for piping passing through floors, walls, and ceilings in exposed spaces, chromium-plated finish on copper alloy plates in finished spaces, paint finish on plates in unfinished spaces, and with set screws or other approved positive means to anchor plates in place securely.

#### 2.3.4 Solder

Use only silver solder for all copper fittings.

#### 2.3.5 Pipe Sleeves

2.3.5.1 Sleeves in Masonry and Concrete Walls, Floors, Roofs ASTM A 53, Schedule 40 or Standard Weight, hot-dip galvanized steel pipe sleeves. Core drilling of masonry and concrete may be provided in lieu of pipe sleeves when cavities in the core-drilled holes are completely grouted smooth.

2.3.5.2 Sleeves in Non-Masonry or -Concrete Walls, Floors, and Roofs Hot-dip galvanized steel sheet having a nominal weight of not less than 0.90 pound per square foot. Provide 26 gauge galvanized steel sheet.

#### 2.3.6 Pipe Hangers and Supports

Provide MSS SP-58 and MSS SP-69, Type 1 or 6, of the adjustable type, except as modified herein or indicated otherwise. Attachments to steel W or S beams shall be with Type 21, 28, 29, or 30 clamps. Attachments to steel angles and channels (with web vertical) shall be with Type 20 clamp with a beam clamp channel adaptor. Attachments to steel channel (with web horizontal) shall be with drilled hole on centerline and double nut and washer. Attachments to concrete shall be with Type 18 insert or a drilled hole with expansion anchor. Attachments to wood shall be as indicated. Hanger rods and attachments shall be full size of the hanger-threaded diameter. Provide Type 40 insulation protection shields for insulated piping. Provide steel support rods. Provide nonmetallic, hair felt, or plastic piping isolators between copper tubing and the hangers.

#### 2.3.7 Access Doors

Provide 12- by 12-inch factory prefabricated and primed flush face steel access doors including steel door frame with continuous hinges and turn-screw-operated latch. Doorframe shall be for installation in plaster and masonry walls. Furnish doors under this section to provide proper access to concealed valves; install doors under the appropriate section of this specification.

### 2.4 FIXTURES, FITTINGS, ACCESSORIES, AND SUPPLIES

Provide control-stop valves in each supply to each fixture. The finish of fittings, accessories, and supplies exposed to view shall be chromium-plated per ASME A112.18.1M. Centerset faucets shall be top-mounted with inlets on not greater than 4-inch centers. Provide special roughing-in for wheelchair fixtures. Fixtures shall be as scheduled on drawings or approved equal.

### 2.5 DOMESTIC WATER HEATERS (ELECTRIC)

UL 174, electric water heater with single or multiple heating elements, glass-lined steel tank, high efficiency type conforming to ASHRAE 90A requirements, with adjustable range thermostat to allow hot water settings between 110 and 160 degrees F.

## PART 3 - EXECUTION

### 3.1 INSTALLATION

Installation of plumbing systems including fixtures, equipment, materials, and workmanship shall be in accordance with SBCCI Standard Plumbing Code, except as modified herein. When fixtures require both hot water and cold water supplies, provide the hot water supply to the left of the cold water supply. Plastic piping shall not penetrate firewalls or fire floors and shall be used on one side of firewalls and fire floors not closer than 6 inches to the penetration. Plastic piping shall not be permitted within return air plenum spaces above suspended ceilings. All vents through the roof shall be flashed with stainless steel vent flashing as manufactured by S.B.C. Industries or approved equal.

#### 3.1.1 Threaded Connections

Jointing compound for pipe threads shall be polytetrafluoroethylene (PTFE) pipe thread tape, pipe cement and oil, or PTFE powder and oil; apply only on male threads. Provide exposed ferrous pipe threads with one coat of primer applied to a minimum dry film thickness of 1.0 mil.

#### 3.1.2 Solder End Valves

Remove stems and washers and other item subject to damage by heat during installation. Reassemble valve after soldering is completed. Valves without heat sensitive arts do not require disassembly but shall be opened at least two turns during soldering.

#### 3.1.3 Pipe Supports (Hangers)

Provide additional supports at the concentrated loads in piping between supports, such as for inline water pumps and flanged valves.

##### 3.1.3.1 Piping to Receive Insulation

Provide temporary wood spacers between the insulation protection shield and the pipe in order to properly slope the piping and to establish final elevations. Temporary wood spacers shall be of the same thickness as the insulation to be provided under Section 15250, "Insulation of Mechanical Systems."

##### 3.1.3.2 Maximum Spacing Between Supports

1. Vertical Piping: Support piping at each floor, but at not more than 10-foot intervals, with pipe riser clamps or offset pipe clamps.
2. Horizontal Piping: Support cast-iron piping at 5-foot intervals.

#### 3.1.4 Installation of Pipe Sleeves

Provide pipe sleeves where piping passes through walls, floors, roofs, and partitions. Secure sleeves in proper position and location during construction. Provide sleeves of sufficient length to pass through entire thickness of walls, floors, roofs, and partitions. Provide not less than 0.25-inch space between exterior of piping or pipe insulation and interior of sleeve or core-drilled hole. Firmly pack space with mineral wool insulation and caulk at both ends of the sleeve or core-drilled hole with plastic waterproof cement, which

will dry to a firm but pliable mass, or provide a mechanically adjustable segmented elastomeric seal. Seal both ends of penetrations through firewalls and fire floors to maintain fire resistive integrity with UL listed fill, void, or cavity material. Extend sleeves in floor slabs 3 inches above the finished floor, except sleeves are not required where DWV piping passes through concrete floor slabs located on grade.

## 3.2 FIELD QUALITY CONTROL

### 3.2.1 Inspections

Prior to initial operation, inspect piping system for compliance with drawings, specifications, and manufacturer's submittals.

### 3.2.2 Field Testing

Before final acceptance of the work, test each system as in service to demonstrate compliance with the contract requirements. Perform the following tests in addition to the tests specified in SBCCI Standard Plumbing Code, except as modified herein. Correct defects in the work provided by the Contractor, and repeat tests until work is in compliance with contract requirements.

#### 3.2.2.1 Domestic Water Piping

Before applying insulation, hydrostatically test each piping system at not less than 100 psig with no leakage or reduction in gauge pressure for 2 hours.

#### 3.2.2.2 DWV Piping

Before the installation of fixtures, cap ends of each system, fill piping with water to the roof, and allow to stand until a thorough inspection has been made. If the system is tested in sections, each opening shall be plugged and each section tested with not less than a 10-foot head of water. After plumbing fixtures have been set and their traps filled with water, subject the entire sanitary system to a final air pressure test of not more than 1.0 inch of water column. The entire system shall be proven absolutely tight under such test.

## 3.3 DISINFECTION

Disinfect new water piping in accordance with AWWA C651. Fill piping systems with solution containing minimum of 50 parts per million of available chlorine and allow solution to stand for minimum of 24 hours. Flush solution from the systems with clean water until maximum residual chlorine content is not greater than 0.2 parts per million or residual chlorine content of domestic water supply.

--End of Section--

## **SECTION 15450**

## **PLUMBING FIXTURES AND TRIM**

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### **PART 1 - GENERAL**

#### **1.1 DESCRIPTION OF WORK**

- A. Provide fixtures complete with trim.
- B. Provide connections to equipment installed in this contract. Connect to roughing indicated.

### **PART 2 - PRODUCTS**

#### **2.1 FIXTURE CONNECTIONS**

- A. Lavatory connections shall be 1-1/4" type M copper arm with 1-1/4" C-MIP adapter at stack.
- B. Sink connections shall be type M copper tube with wrought copper or brass fittings.

#### **2.2 PLUMBING FIXTURES**

- A. Furnish and install plumbing fixtures indicated or specified, complete with all equipment, fittings, trim and accessories indicated or specified.
- B. Exposed piping to fixtures:
  - 1. Exposed piping for water shall be chrome-plated brass, IPS.
- C. Stops shall be provided for all fixtures and equipment, and shall be Kohler, McGuire, Eljer, Chicago, Speakman or T&S.
- D. All faucets shall be American Standard, Delta, Kohler, Just, Eljer or Central Brass

### **PART 3 - EXECUTION**

#### **3.1 PROTECTION OF FIXTURES**

- A. Provide plastic cover over fixtures after installation to prevent spilling of paint, abuse by workmen or other defacing of fixtures.
- B. All chipped, cracked, deformed, scratched or defaced fixtures shall be replaced. Repaired or painted over enamel cracks or chipped places WILL NOT BE ACCEPTABLE.

#### **3.3 CLEANING OF FIXTURES**

- A. All fixtures shall be cleaned prior to final inspections. Remove all dirt, paint, grease, etc., from within water closet bowls, lavatories, urinals and sinks. Remove all stains from fixtures.
- B. Fixtures that are stained and cannot be cleaned shall be replaced.
- C. Clean all aerators and strainers.

#### **3.4 ADJUSTING FIXTURES**

A. Adjust water flow through all fixtures to provide proper flushing action with the least amount of water.

--End of Section--

## **SECTION 15501**

## **HEATING, VENTILATING, AND COOLING SYSTEMS**

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### **PART 1 - GENERAL**

#### **1.1 SYSTEM DESCRIPTION**

Provide new heating, ventilating, and cooling (HVAC) systems complete and ready for operation. HVAC systems include equipment, ducts, and piping which are located within, on, under, and adjacent to building.

#### **1.2 SUBMITTALS**

##### **A. Manufacturer's Catalog Data**

1. Exhaust fans
2. Metal duct system

##### **B. Manufacturer's Instructions**

C. Installation manual for each item of equipment.

##### **D. Operation and Maintenance Manuals**

1. Exhaust fans

### **PART 2 - PRODUCTS**

#### **2.1 EXHAUST FANS**

Sound rating per AMCA 300; statically and dynamically balanced, with air capacities, brake horsepowers, fan types, fan arrangement, sound power levels or loudness level, and static pressure, as indicated. Fan bearing life shall have a minimum average life of 200,000 hours at design operating conditions. Provide guard (bird) screens for outdoor inlets and outlets. Equip with automatic (backdraft) dampers. Have thermal overload protection in the operating disconnect switches within the building. Construct housings and fan wheels of aluminum, except as specified otherwise.

2.1.1 Ceiling Exhaust fans: AMCA 210 with AMCA seal and UL label. Each fan shall be designed for flush mounting in the ceiling with air entering through the grille and exiting through a discharge duct connection. The fan housing shall be minimum 24 gage-galvanized steel and shall be internally lined with 1/2-inch thick acoustical fibrous glass insulation. The discharge duct connection and fan wheel and drive assembly shall be easily field adaptable to the horizontal or vertical discharge positions. The discharge duct connection shall have an integral aluminum backdraft damper. The ceiling grille shall be minimum 14-gage aluminum with baked white enamel finish and shall be removable. The fan wheel shall be forward curved centrifugal type and shall be direct driven. The fan motor shall be permanently lubricated with built in thermal overload protection and shall be mounted on vibration isolators. Each fan shall be provided with a power cord with plug and a receptacle inside the housing for disconnecting the motor. The entire fan wheel and drive assembly shall be removable through the ceiling opening without disturbing the housing.

2.1.2 Upblast Kitchen Hood Exhaust Fan: UL 762 with UL label and AMCA seal, centrifugal fan in housings of corrosion-resistant spun aluminum. Units shall be provided with factory-fabricated roof curbs, hinged base,



vented extension and installed in accordance with NFPA 96. Fans shall be Cook Model VCR or approved equal.

2.1.3 Supply Fan: UL 705 with UL label and AMCA seal. Unit shall be roof-mounted, side intake, filtered supply air fan with direct drive, forward curved centrifugal blower. Motor shall have permanently lubricated sealed bearings. The housing shall be fabricated of heavy gauge painted steel. The fan shall have a galvanized steel hood of adequate size to prevent moisture from entering the building. Filters shall be of the permanent, one-inch, washable aluminum type and shall be easily removed for cleaning.

## 2.2 ELECTRICAL

Electrical motors, controllers, contactors, and disconnects: Furnish with respective pieces of equipment. Motors, controllers, contactors, and disconnects shall conform to electrical specifications. Provide controllers and contactors with maximum of 120-volt control circuits, and auxiliary contacts for use with controls furnished. When motors and equipment furnished are larger than sizes indicated, the cost of providing additional electrical service and related work shall be included under this section.

## 2.3 METAL DUCT SYSTEMS

A. Provide shop-fabricated, zinc-coated steel ducts conforming to ASTM A 525 or ASTM A 527/A 527M coating designation G60. Fabricate, construct, brace, reinforce, install, support, seal, and test ducts and accessories in accordance with SMACNA HVACDCS and SMACNA HVACALTM. Cover duct transverse joints with single component synthetic rubber type compound suitable for use with passivated coating on zinc-coated steel. Lap joints in direction of flow. Provide ducts straight and smooth on inside with neatly finished airtight joints. Provide air supply and return openings in ducts with air diffusers, registers, or grilles.

1. Flexible Duct Connectors: Provide airtight flexible duct connectors at duct connections to the air-handling unit. Support connectors at each end with metal angle frame bands, securely bolt in place. Provide not less than 20-ounce glass fabric duct connectors coated on both sides with neoprene.

2. Turning Vanes: Provide fabricated tees and square elbows in accordance with SMACNA HVACDCS for vane elbows.

3. Dampers: Provide opposed blade adjustable manual dampers where indicated. Provide damper shafts with 2-inch standoffs to clear 2 inches of duct insulation with bearings at both ends of the shafts. Provide adjustment quadrant with indicator and locking devices. Provide galvanized steel dampers one gage heavier than duct in which dampers are installed.

## PART 3 - EXECUTION

### 3.1 INSTALLATION

HVAC System: Installation of HVAC system including equipment, materials, installation, workmanship, fabrication, assembly, erection, examination, inspection, and testing shall be in accordance with ASME B31.1, ASME B31.5, and NFPA 70.

### 3.2 PIPING

Inspect, test, and approve piping before burying, covering, or concealing. Provide fittings for changes in direction of piping and for connections. Make changes in piping sizes through tapered reducing fittings; bushings will not be permitted.

1. Threaded connections: Provide polytetrafluoroethylene (PTFE) pipe thread paste only on male threads. Do not thread metal pipe into plastic piping.
2. Pipe hangers and supports: Provide additional pipe hangers and supports at the concentrated loads in piping, such as for in-line water pumps and flanged valves.
3. Cleaning of piping: Keep interior and ends of new piping and existing piping affected by Contractor's operations, cleaned of water and foreign matter during installation by using plugs or other approved methods. When work is not in progress, securely close open ends of pipe and fittings to prevent entry of water and foreign matter. Inspect piping before placing into position.
4. Demolition: Remove materials so as not to damage materials, which are to remain. Replace existing work damaged by Contractor's operations with new work of same construction.

### 3.3 ADJUSTMENTS

Adjust controls and equipment so as to give satisfactory operation. Air duct systems shall be adjusted and balanced so that air quantities at outlets are as indicated and so that distribution from supply outlets is free from drafts and has uniform velocity over the face of each outlet.

### 3.4 FIELD QUALITY CONTROL

Upon completion and before final acceptance of work, test each system in service to demonstrate compliance with the contract requirements. Adjust controls and balance systems for one year after final acceptance of completed systems. Test controls through every cycle of operation. Test safety controls to demonstrate performance of required function. Correct defects in work provided by Contractor and repeat tests.

1. Air Ducts. Clean and test ducts in accordance with SMACNA HVACDCS and SMACNA HVACALTM, and obtain approval before applying insulation.

--End of Section--

**DIVISION 16**

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**ELECTRICAL**

## **SECTION 16010**

## **ELECTRICAL - GENERAL PROVISIONS**

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### **PART 1 - GENERAL**

The General and Supplementary conditions, Section 1 and 2 of these specifications, shall apply to and form a part of this section as if written in full herein.

#### **1.1 APPLICABLE CODES AND STANDARDS**

All equipment, materials, installation, and workmanship shall be in accordance with the mandatory and advisory provisions of NFPA 70 (National Electrical Code), NFPA 72 (National Fire Alarm Code), NFPA 101 (Life Safety Code), other applicable NFPA standards and the Florida Building Code.

#### **1.2 SCOPE OF WORK**

The work covered by this section of the specifications shall include the furnishing of all labor, equipment, supplies, tools and materials, and the performance of all operations necessary for the installation of complete wiring systems, lighting, power, connections to equipment specified in other sections, electric service connections, and electrical equipment in strict accordance with this section of the specifications and applicable drawings.

#### **1.3 RELATED WORK SPECIFIED ELSEWHERE**

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#### **1.4 DEFINITIONS**

Provide means to furnish and install.

#### **1.5 SUBMITTALS AND WARRANTY**

The Contractor shall submit a list of principal material items, giving manufacturers' names and catalog cuts. Approval of the submittal data shall be obtained from the Engineer of Record before orders are placed. Submittals shall be furnished as required by the individual sections.

Material submittals shall be all-inclusive with all items requiring submittals being submitted at the same time. Individual submittals will not be accepted. Six sets of submittals are required.

Contractor shall fully instruct Owner in operation and maintenance of electrical system.

Contractor shall assemble and bind manufacturers' operation and maintenance literature for inclusion in Maintenance Manual. Literature shall include record shop drawings, wiring diagrams, instruction sheets, replacement parts list, warranties, and guarantee for all equipment furnished under this section of the specifications. Three sets of such literature shall be provided.

Contractor shall warrant all work for a period of two years from date of substantial completion. Contractor shall rectify any defects due to faulty materials or workmanship and pay for any damage to other work resulting therefrom, which occurs within, said period. Work shall be performed by journeyman skilled in trade involved and with new materials as approved by the Engineer of Record. The Owner will give notice of observed defects with reasonable promptness. The above warranty is in addition to any guarantee of

equipment by a manufacturer. Contractor shall furnish written warranty that all systems have been installed complete and are functioning properly and that all material and workmanship are free from defects.

The General Conditions and special conditions to the overall specifications are made a part of the electrical specifications where applicable.

## 1.6 DRAWINGS

The drawings are schematic showing relative locations and connections and shall not be scaled for exact locations. Unless specified dimensions are shown, the structural, Engineer of Record and site conditions shall govern the exact locations. Should any difficulty occur in the running of conduits, setting of cabinets, outlets, fixtures or any other devices or connections at the points shown, provide necessary minor deviations therefrom as approved without additional cost. Where conflicts occur between the requirements of the drawings, specifications, and applicable codes, the Contractor shall provide an installation that conforms with the most stringent requirement and the most expensive procedure.

## 1.7 AS-BUILT DRAWINGS AND RECORDS

Maintain a complete set of electrical prints for indicating all changes. Use a colored pen or pencil to mark changes at the time of execution. Deliver the set to the Owner's representative upon completion. Elevations and dimensioned locations of underground work shall be indicated. Dimension to permanent references.

## PART 2 - PRODUCTS

### 2.1 MATERIALS

Materials and equipment shall be new, standard current products of manufacturers regularly engaged in the production of such equipment, and shall be the manufacturer's latest design.

All materials shall bear the label of the Underwriter's Laboratory for the intended use or shall be materials approved by the code enforcing authorities and the Engineer of Record/Engineer.

Materials shall be delivered to the site in the manufacturer's original unopened containers except where prior approval and inspection is obtained from the Engineer of Record. Materials shall be inspected prior to storage. Damaged, defective, or improper equipment shall be replaced or repaired at the expense of the Contractor and in a manner meeting with approval of the Engineer of Record. Electrical cables shall be handled and stored carefully to avoid damage to the insulation and damage from weather. All metallic materials shall be suitably protected against corrosion. The Contractor shall coordinate sizes indicated for electrical components such as circuit breakers, disconnects, feeders and starters with requirements for equipment actually provided and shall notify the Engineer of Record if any item is inadequate in size for equipment installed or proposed. Contractor shall install as a minimum the size indicated unless he receives in writing from the Engineer of Record directions to reduce the component in size. When the equipment to be installed has a requirement, which is greater than shown, the Contractor shall increase the size of the electrical component as work under the section of this specification, which installs the equipment requiring the same.

### 2.2 HARDWARE

All hardware and accessory fittings shall be of a type designed, intended or appropriate for the use, and complement the items with which they are used, and shall have corrosion protection suitable for the atmosphere in which they are installed. All such hardware shall be U.S. Standard sizes.

### 2.3 EQUIPMENT

Equipment of a similar nature shall be identical. Example: All safety switches shall be of the same manufacturer and of the same style.

### 2.4 MATERIAL PROTECTIONS

Store and protect all materials from injury prior to installation. Materials shall not be stored directly on the ground or floor, shall be kept clean and dry as possible and free from damage or deteriorating elements. Damaged materials shall not be installed.

## PART 3 - EXECUTION

### 3.1 INSTALLATION

All work will be installed in accordance with regulations of the National Electrical Code and ordinances of the state and local governments. Contractor shall obtain all necessary permits and inspections as required and pay all charges for same, and shall turn over to the Engineer of Record Certificate of final inspection. Should any part of the design fail to comply with such requirements, discrepancy shall be called to the attention of the Engineer of Record prior to submission of bid. Follow the installation directions and recommendations of the material and equipment manufacturers. Materials damaged during installation shall be repaired to a new condition or shall be replaced. Finishes on equipment, which have been scratched or marred shall be touched up to match finish or shall be completely refinished.

### 3.2 SCHEDULING OF WORK

Electrical feeders, branch, wiring, signal wiring, or other similar work shall be scheduled to correspond with the sequence of work necessary to construct new work.

Electrical work shall be scheduled to provide an orderly installation without causing any delays in the overall construction of the project.

### 3.3 IDENTIFICATION

Identify all equipment as to its source, its use and what it serves and characteristics. Equipment includes safety switches, starters, transformers, panels, terminal boxes, motors and special outlets. Identification shall correspond to the terminology of the Contract Documents. Use Brady markers on conductors. Use Manufacturer's nameplates and directories where available. Use of Dymo Labels will not be permitted. Use phenolic nameplates 0.125-inch thick with ¼" white letters on black background. Nameplates shall be attached to equipment with screws.

### 3.4 TEMPORARY SERVICE AND SUPERVISION

Temporary power and construction lighting shall be provided as needed under this section of the specifications. Both shall be provided in a safe and sufficient manner for the orderly completion of the work.

The cost of power shall be paid for by the general contractor. All work shall be performed under the direct supervision of a journeyman electrician.

### 3.5 SITE VISIT

The Contractor is required to visit the proposed job site prior to bid, as modifications to existing facilities necessary to accommodate new work are part of this contract.

--End of Section--

## **SECTION 16402**

## **INTERIOR WIRING SYSTEMS**

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### **PART 1 - GENERAL**

#### **1.1 RELATED REQUIREMENTS**

Section 16010, "Electrical General Requirements," applies to this section with additions and modifications specified herein.

#### **1.2 SUBMITTALS**

Submit the following in accordance with Section "Submittals."

##### **A. Manufacturer's Catalog Data**

1. Receptacles
2. Circuit breakers
3. Switches
4. Conduit and fittings (each type)
5. Device plates
6. Insulated conductors
7. Outlet, junction boxes, and pull boxes

##### **B. Drawings**

1. Panelboards

##### **C. Field Test Reports**

1. 600-volt wiring test
2. Grounding System Test

#### **1.3 QUALITY ASSURANCE**

In each standard referred to herein, consider the advisory provisions to be mandatory, as though the word "shall" has been substituted for "should" wherever it appears. Interpret references in these standards to "authority having jurisdiction," or words of similar meaning, to mean The Engineer of Record.

### **PART 2 - PRODUCTS**

#### **2.1 MATERIALS AND EQUIPMENT**

Materials, equipment, and devices shall, as minimum, meet requirements of UL, where UL standards are established for those items, and requirements of NFPA 70.

#### **2.2 CONDUIT AND FITTINGS**



Shall be rigid steel (zinc-coated) conduit, rigid nonmetallic conduit, intermediate metal conduit (IMC), electrical metallic tubing (EMT), plastic coated rigid steel and IMC conduit, and flexible metal conduit, liquid tight flexible conduit, conforming to the following:

A. Rigid Steel Conduit (Zinc-coated)

ANSI C80.1, UL 6.

B. Rigid Nonmetallic Conduit

PVC Type EPC-40, in accordance with NEMA TC2.

C. Intermediate Metal Conduit (IMC)

UL 1242, zinc-coated steel only.

D. Electrical Metallic Tubing (EMT)

UL 797, ANSI C80.3.

E. Plastic-coated Rigid Steel and IMC Conduit NEMA RN1, Type 40 (40 mils thick).

F. Flexible Metal Conduit UL 1.

G. Liquid-tight Flexible Metal Conduit, Steel UL 360.

H. Fittings for Metal Conduit, EMT, and Flexible Metal Conduit UL 514B. Ferrous fittings shall be cadmium- or zinc-coated in accordance with UL 514B.

1. Fittings for Rigid Metal Conduit and IMC Threaded-type. Split couplings unacceptable.

2. Fittings for EMT

All steel Compression type. (set screw fittings will not be accepted).

3. Fittings for Rigid Nonmetallic Conduit NEMA TC3.

I. All conduit shall be color-coded every 10 feet.

2. CABINETS, JUNCTION BOXES, AND PULL BOXES

Volume greater than 100 cubic inches, UL 50, hot dip, zinc-coated, if sheet steel. All junction boxes shall have circuit numbers identified on cover and color-coded as follows:

White 240/120 volt

Blue Telephone

2.4 WIRES AND CABLES

Wires and cables shall meet applicable requirements of NFPA 70 and UL for type of insulation, jacket, and conductor specified or indicated. Wires and cables manufactured more than 12 months prior to date of delivery to site shall not be used.

#### A. Conductors

Conductors' No. 8 AWG and larger diameter shall be stranded. Conductors' no. 10 AWG and smaller diameter shall be solid, except that conductors for remote control and signal circuits, classes 1, 2, and 3, may be stranded. All conductors shall be copper.

##### 1. Minimum Conductor Sizes

Minimum size for branch circuits shall be No. 12 AWG; for Class 1 remote control and signal circuits, No. 14 AWG; and for Class 2 lowenergy, remote control and signal circuits, No. 16 AWG.

#### B. Color Coding

Provide for service, feeder, branch, control, and signaling circuit conductors. Color shall be green for grounding conductors and white for neutrals; except where neutrals of more than one system are installed in same raceway or box, other neutral shall be white with colored (not green) stripe. Color of ungrounded conductors in different voltage systems shall be as follows:

##### 1. 240/120 volt, 1-phase:

(a) Phase A - black

(b) Phase B - red

#### C. Insulation

Unless specified or indicated otherwise or required by NFPA 70, power and lighting wires shall be 600-volt, Type THWN conforming to -UL 83- or Type RHW conforming to -UL 44-, except that grounding wire may be Type TW conforming to -UL 83-; remote-control and signal circuits shall be Type TW or TF, conforming to UL 83. Where lighting fixtures require 90-degree Centigrade (C) conductors, provide only conductors with 90-degree C insulation or better.

#### D. Bonding Conductors

ASTM B1, solid bare copper wire for sizes No. 8 AWG and smaller diameter; ASTM B8, Class B, stranded bare copper wire for sizes No. 6 AWG and larger diameter.

## 2.5 SPLICES AND TERMINATION COMPONENTS

UL 486A for wire connectors and UL 510 for insulating tapes. Connectors for No. 10 AWG and smaller diameter wires shall be insulated, pressure-type in accordance with UL 486A or UL 486C (twist-on splicing connector). Provide solderless terminal lugs on stranded conductors.

## 2.6 DEVICE PLATES

Provide UL listed one-piece device plates for outlets and fittings to suit the devices installed. For metal outlets and fittings, plates on unfinished walls and on fittings shall be of zinc-coated sheet steel or cast metal having round or beveled edges. Plates on finished walls shall be satin finish stainless steel, minimum 0.03-inch thick. Screws shall be vandal-resistant machine-type with countersunk heads in color to match finish of plate. Sectional-type device plates will not be permitted. Plates installed in wet locations shall be gasketed and UL listed for "wet locations."

## 2.7 SWITCHES

### A. Toggle Switches

FS W-S-896 totally enclosed with bodies of thermosetting plastic and mounting strap. Handles shall be gray. Wiring terminals shall be screw-type, side-wired. Switches shall be rated quiet-type ac only, 120/277 volts, with current rating and number of poles indicated.

### B. Disconnect Switches

NEMA KS1. Provide heavy duty-type switches. Switches serving as motor disconnect means shall be horsepower rated. Provide switches in NEMA 1 or 3R, enclosure per -NEMA ICS 6-.

## 2.8 RECEPTACLES

UL 498 and NEMA WD1, specification grade, heavy-duty grounding-type. Ratings and configurations shall be as indicated. Dimensional requirements shall be per - NEMA WD 6. Provide screw-type, side-wired wiring terminals. Connect grounding pole to mounting strap. Devices shall be gray. Acceptable manufacturers are Hubbell, Leviton and Pass & Seymour Legrand.

### A. Weatherproof Receptacles

Provide in cast metal box with gasketed, weatherproof, cast-metal cover plate and gasketed cap over each receptacle opening. Provide caps with a spring-hinged flap. Provide UL listed receptacle in "wet locations."

### B. Ground-fault Circuit Interrupter (GFCI) Receptacles

UL 943, duplex type for mounting in standard outlet box. Device shall be capable of detecting current leak of 6 milliamperes or greater and tripping per requirements of UL 943 for Class A GFCI devices.

## 2.9 PANELBOARDS

UL 67 and UL 50. Panelboards for use as service disconnecting means shall additionally conform to UL 869. Panelboards shall be circuit breaker-equipped. Design shall be such that individual breakers can be removed without disturbing adjacent units or without loosening or removing supplemental insulation supplied as means of obtaining clearances as required by UL. Where "space only" is indicated, make provisions for future installation of breaker sized as indicated. Panelboard locks shall be keyed same. Directories shall indicate load served by each circuit of panelboard. Directories shall also indicate source of service to panelboard. Type directories and mount in holder behind transparent protective covering. All panelboards shall have door-in-door fronts. Acceptable manufacturers are Cutler- Hammer, Square D and GE.

### A. Panelboard Buses

Support bus bars on bases independent of circuit breakers. Main buses and back pans shall be designed so that breakers may be changed without machining, drilling, or tapping. Provide isolated neutral bus in each panel for connection of circuit neutral conductors. Provide separate ground bus identified as equipment grounding bus per UL 67 for connecting grounding conductors; bond to steel cabinet. In addition to equipment grounding bus, provide second "isolated" ground bus, where indicated. All bussing shall be copper.

## B. Circuit Breakers

FS W-C-375, UL 489, thermal magnetic-type with interrupting capacity as indicated. Breaker terminals shall be UL listed as suitable for type of conductor provided. Plug-in circuit breakers unacceptable.

### 1. Multipole Breakers

Provide common trip-type with single operating handle. Breaker design shall be such that overload in one pole automatically causes all poles to open. Maintain phase sequence throughout each panel so that any three adjacent breaker poles are connected to Phases A, B, and C, respectively.

## 2.10 GROUNDING AND BONDING EQUIPMENT

UL 467.

### 2.11 NAMEPLATES

FS L-P-387. Provide as specified in Section "Electrical General Provisions."

### 2.12 SOURCE QUALITY CONTROL

Provide firestopping around electrical penetrations in accordance with Section "Firestopping."

## PART 3 - EXECUTION

### 3.1 INSTALLATION

Electrical installations shall conform to requirements of NFPA 70 and to requirements specified herein.

#### A. Wiring Methods

Provide insulated conductors installed in conduit, except where specifically indicated or specified otherwise or required by NFPA 70 to be installed otherwise. Provide insulated, green equipment grounding conductor in feeder and branch circuits, including lighting circuits. Grounding conductor shall be separate from electrical system neutral conductor. Provide bare or insulated, green conductor for grounding conductors installed in conduit or raceways. Minimum conduit size shall be inch in diameter for lighting and power circuits.

#### 1. Restrictions Applicable to EMT:

- a. Do not install underground.
- b. Do not encase in concrete.

c. Do not use in areas subject to severe physical damage including but not limited to mechanical equipment rooms and electrical equipment rooms.

d. Do not use outdoors.

## 2. Nonmetallic Conduit

a. PVC Schedule 40 and PVC Schedule 80.

(1) Do not use above finished grade or floor slab.

## 3. Underground Conduit

Plastic-coated rigid steel; plastic-coated steel IMC; PVC, Type EPC- 40. Convert nonmetallic conduit to rigid steel conduit or steel IMC before rising through floor slab.

## 4. Conduit in Floor Slabs

Rigid steel; steel IMC; fiberglass, or PVC, Type EPC-40.

## B. Conduit Installation

Unless indicated otherwise, conceal conduit within finished walls, ceilings, and floors. Keep conduit minimum 6 inches away from parallel runs of flues and steam or hot water pipes. Install conduit parallel with or at right angles to ceilings, walls, and structural members where located above accessible ceilings and where conduit will be visible after completion of project. Run conduits in crawl space under slab as if exposed.

### 1. Conduit Through Floor Slabs

Where conduits rise through floor slabs, curved portion of bends shall not be visible above finish slab.

### 2. Conduit Support

Support conduit by 2-hole pipe straps, wall brackets, hangers, or ceiling trapeze. Fasten by wood screws to wood; by toggle bolts on hollow masonry units; by concrete inserts or expansion bolts on concrete or brick; and by machine screws, welded threaded studs, or spring-tension clamps on steelwork. Threaded C-clamps may be used on rigid steel conduit only. Do not weld conduits or pipe straps to steel structures. Load applied to fasteners shall not exceed one-fourth proof test load. Fasteners attached to concrete ceiling shall be vibration-resistant and shock-resistant. Holes cut to depth of more than 1 2 inches in reinforced concrete beams or to depth of more than: inch in concrete joints shall not cut main reinforcing bars. Fill unused holes. In partitions of light steel construction, use sheet metal screws. In suspended-ceiling construction, run conduit above ceiling. Do not support conduit by ceiling support system. Conduit and box systems must be supported independently of both (a) tie wires supporting ceiling grid system, and (b) ceiling grid system into which ceiling panels are placed. Supporting means shall not be shared between electrical raceways and mechanical piping or ducts. Installation shall be coordinated with above-ceiling mechanical systems to assure maximum accessibility to all systems. Where conduit crosses building expansion joints, provide suitable watertight expansion fitting that maintains conduit electrical continuity by bonding jumpers or other means.

### 3. Directional Changes in Conduit Runs

Make changes in direction of runs with symmetrical bends or cast metal fittings. Make field-made bends and offsets with hickey or conduit-bending machine. Do not install crushed or deformed conduits. Avoid trapped conduits. Prevent plaster, dirt, or trash from lodging in conduits, boxes, fittings, and equipment during construction. Free clogged conduits of obstructions.

### 4. Pull Wire

Install pull wires in empty conduits in which wire is to be installed by others. Pull wire shall be plastic having minimum 200-pound tensile strength. Leave minimum 12 inches of slack at each end of pull wire.

### 5. Conduit Installed in Concrete Floor Slabs

Locate so as not to adversely affect structural strength of slabs. Install conduit within middle one-third of concrete slab. Do not stack conduits. Space conduits horizontally not closer than three diameters, except at cabinet locations. Curved portions of bends shall not be visible above finish slab. Increase slab thickness as necessary to provide minimum one-inch cover over conduit. Where embedded conduits cross expansion joints, provide suitable watertight expansion fittings and bonding jumpers. Conduit larger than one-inch trade size shall be parallel with or at right angles to main reinforcement; when at right angles to reinforcement, conduit shall be close to one of supports of slab. Where nonmetallic conduit is used, raceway must be converted to rigid steel or steel IMC before rising above floor, unless specifically indicated otherwise.

### 6. Locknuts and Bushings

Fasten conduits to sheet metal boxes and cabinets with two locknuts where required by NFPA 70, where insulated bushings are used, and where bushings cannot be brought into firm contact with the box; otherwise, use at least minimum single locknut and bushing. Locknuts shall have sharp edges for digging into wall of metal enclosures. Install bushings on ends of conduits, and provide insulating type where required by NFPA 70.

### 7. Stub-ups

Provide conduits stubbed up through concrete floor for connection to freestanding equipment with adjustable top or coupling threaded inside for plugs, set flush with finished floor. Extend conductors to equipment in rigid steel conduit, except that flexible metal conduit may be used 6 inches above floor. Where no equipment connections are made, install screwdriver-operated threaded flush plugs in conduit end.

### 8. Flexible Connections

Provide flexible connections of short length, 6-foot maximum, for recessed and semirecessed lighting fixtures; for equipment subject to vibration, noise transmission, or movement; and for motors. Install flexible conduit to allow slack. Provide liquid-tight flexible conduit in wet locations. Provide separate ground conductor across flexible connections.

### C. Boxes, Outlets, and Supports

Provide boxes in wiring or raceway systems wherever required for pulling of wires, making connections, and mounting of devices or fixtures. Boxes for metallic raceways shall be cast-metal, hub-type when located in wet locations, when surface mounted on outside of exterior surfaces, when installed exposed up to 7 feet above interior floors. Boxes in other locations shall be sheet steel. Each box shall have volume required by NFPA 70 for number of conductors enclosed in box. Boxes for mounting lighting fixtures shall be minimum 4 inches square, or octagonal, except that smaller boxes may be installed as required by fixture configurations, as approved. Boxes for use in masonry-block or tile walls shall be square-cornered, tile-type, or standard boxes having square-cornered, tile-type covers. Provide gaskets for cast-metal boxes installed in wet locations and boxes installed flush with outside of exterior surfaces. Provide separate boxes for flush or recessed fixtures when required by fixture terminal operating temperature; fixtures shall be readily removable for access to boxes unless ceiling access panels are provided. Support boxes and pendants for surface-mounted fixtures on suspended ceilings independently of ceiling supports, or make adequate provisions for distributing load over ceiling support members in an approved manner. Fasten boxes and supports with wood screws on wood, with bolts and expansion shields on concrete or brick, with toggle bolts on hollow masonry units, and with machine screws or welded studs on steel. Threaded studs driven in by powder charge and provided with lockwashers and nuts or nail-type nylon anchors may be used in lieu of wood screws, expansion shields, or machine screws. In open overhead spaces, cast boxes threaded to raceways need not be separately supported except where used for fixture support; support sheet metal boxes directly from building structure or by bar hangers. Where bar hangers are used, attach bar to raceways on opposite sides of box, and support raceway with approved-type fastener maximum 24 inches from box. When penetrating reinforced concrete members, avoid cutting reinforcing steel.

#### 1. Boxes

Boxes for use with raceway systems shall be minimum 1 2 inches deep, except where shallower boxes required by structural conditions are approved. Boxes for other than lighting fixture outlets shall be minimum 4 inches square, except that 4-by-2-inch boxes may be used where only one raceway enters outlet.

#### 2. Pull Boxes

Construct of at least minimum size required by NFPA 70 of codegauge galvanized sheet steel, except where cast-metal boxes are required in locations specified herein. Furnish boxes with screwfastened covers. Where several feeders pass through common pull box, tag feeders to indicate clearly electrical characteristics, circuit number, and panel designation.

#### D. Mounting Heights

Mount panelboards, circuit breakers, and disconnecting switches so height of operating handle at its highest position is maximum 78 inches above floor. Mount lighting switches 44 inches above finished floor, receptacles 18 inches above finished floor, and other devices as indicated. Measure mounting heights of wiring devices and outlets to center of device or outlet.

#### E. Conductor Identification

Provide conductor identification within each enclosure where tap, splice, or termination is made. For conductors No. 6 AWG and smaller diameter, colorcoding shall be by factory-applied, color-impregnated

insulation. For conductors No. 4 AWG and larger diameter color-coding shall be by plasticcoated, self-sticking markers; colored nylon cable ties and plates; or heat shrink-type sleeves. Identify control circuit terminations in accordance with Section "Space Temperature Control Systems."

#### F. Splices

Make splices in accessible locations. Make splices in conductors No. 10 AWG and smaller diameter with insulated, pressure-type connector. Make splices in conductors No. 8 AWG and larger diameter with solderless connector, and cover with insulation material equivalent to conductor insulation.

#### G. Covers and Device Plates

Install with edges in continuous contact with finished wall surfaces without use of mats or similar devices. Plaster fillings are not permitted. Install plates with alignment tolerance of 1/16 inch. Use of sectional-type device plates are not permitted. Provide gasket for plates installed in wet locations.

#### H. Electrical Penetrations

Openings around electrical penetrations through fire resistance-rated walls, partitions or ceilings shall be sealed in accordance with Section "Firestopping."

#### I. Grounding and Bonding

In accordance with NFPA 70. Ground-exposed, non-current-carrying metallic parts of electrical equipment, metallic raceway systems, grounding conductor in metallic and nonmetallic raceways, and neutral conductor of wiring systems. Make ground connection at main service equipment.

##### 1. Grounding Conductor

Provide bare or insulated, green equipment grounding conductor in feeder and branch circuits, including lighting circuits. Grounding conductor shall be separate from electrical system neutral conductor. Provide bare or insulated, green conductor for grounding conductors installed in conduit or raceways.

##### 2 Resistance

Maximum resistance-to-ground of grounding system shall not exceed 25 ohms under dry conditions. Where resistance obtained exceeds 25 ohms, contact the Engineer of Record for further instructions.

#### 3.2 FIELD QUALITY CONTROL

Furnish test equipment and personnel and submit written copies of test results. Give Contracting Officer working days notice prior to each test.

##### A. Devices Subject to Manual Operation

Each device subject to manual operation shall be operated at least five times, demonstrating satisfactory operation each time.

##### B. 600-Volt Wiring Test



Test 600-volt wiring to verify that no short circuits or accidental grounds exist. Perform insulation resistance tests on wiring No. 6 AWG and larger diameter using instrument, which applies voltage of approximately 500 volts to provide direct reading of resistance. Minimum resistance shall be 250,000 ohms.

#### C. Grounding System Test

Test grounding system to ensure continuity and that resistance to ground does not exceed 25 ohms. Test each ground rod for resistance to ground before making connections to rod; tie grounding system together and test for resistance to ground. Make resistance measurements in dry weather, not earlier than 48 hours after rainfall. Submit written results of test to the Engineer of Record.

--End of Section--

## **SECTION 16510**

## **INTERIOR LIGHTING**

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### **PART 1 - GENERAL**

#### **1.1 RELATED DOCUMENTS**

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

#### **1.2 SUMMARY**

A. This Section includes interior lighting fixtures, lamps ballasts, emergency lighting units, and accessories. This Section covers also exterior fixtures mounted on building surfaces.

B. Related Sections: The following Division 16 Sections contain requirements that relate to this section:

1. Section 16010, "Electrical General Provisions," applies to this section, with the additions and modifications specified herein.

2. Materials not considered to be lighting equipment or lighting fixture accessories are specified in Section 16402, "Interior Wiring Systems."

#### **1.3 DEFINITIONS**

##### **A. Average Life**

Time after which 50 percent will have failed and 50 percent will have survived under normal conditions.

#### **1.4 SUBMITTALS**

Submit the following in accordance with Section "Submittals." Data, drawings, and reports shall employ the terminology, classifications, and methods prescribed by the IES LHBK, as applicable, for the lighting system specified.

##### **A. Manufacturer's Catalog Data**

1. Fluorescent lighting fixtures
2. Fluorescent lamps
3. Fluorescent ballasts
4. High-Intensity-Discharge (HID) lighting fixtures
5. HID Ballasts
6. Support hangers for lighting fixtures

### **PART 2 - PRODUCTS**

#### **2.1 FLUORESCENT LIGHTING FIXTURES UL 1570.**

##### **A. Fluorescent Lamps**

Provide the number, type, and wattage indicated. Energy-saving, rapid-start lamps shall be rated 32 watts, 2900 approximate initial lumens, 20,000 hours average rated life; CRI (Color Rendering Index) of 75 and Color Temperature of 3500 degrees K. Compact fluorescent lamps shall be rated as indicated 10,000 hours average rated life. Average rated life is based on 3 hours operating per start.

#### B. Fluorescent Solid-State Ballasts

Provide energy-saving, solid-state fluorescent ballast of the full light output type. Electromagnetic interference shall not be greater than that allowed by the FCC RR. Ballasts shall be able to withstand voltage transients in accordance with IEEE C 62.41, Category A, for normal and common modes. Minimum power factor shall not be less than 0.90. Ballasts shall operate at a frequency not less than 20,000 hertz. Ballast current third harmonic content shall be less than 33 percent.

### 2.2 HIGH-INTENSITY-DISCHARGE (HID) LIGHTING FIXTURES

UL 1572.

#### A. HID Ballasts

UL 1029 and ANSI C82.4 and shall be constant wattage auto-transformer (CWA) or regulator, high power factor type. Provide single-lamp ballasts, which shall have a minimum starting temperature of minus 30 degrees C. Ballasts shall be:

1. Designed to operate on the voltage system to which they are connected.
2. Designed for installation in a normal ambient temperature of 40 degrees C.
3. Constructed so that open circuit operation will not reduce the average life.

### 2.3 RECESS- AND FLUSH-MOUNTED FIXTURES

Provide type that can be relamped from the bottom. Access to ballast shall be from the bottom. Trim for the exposed surface of flush-mounted fixtures shall be as indicated.

### 2.4 SUSPENDED FIXTURES

Provide hangers capable of supporting twice the combined weight of the fixtures supported by the hangers. Hangers shall allow fixtures to swing within an angle of 20 degrees. Brace pendants 4 feet or longer to limit swinging. Single-unit suspended fluorescent fixtures shall have twin-stem hangers. Multiple-unit or continuous row fluorescent fixtures shall have a tubing or stem for wiring at one point and a tubing or rod suspension provided for each unit length of chassis, including one at each end. Rods shall be a minimum 3/16-inch diameter.

### 2.5 EXIT SIGNS

UL 924, NFPA 70, and NFPA 101. Exit signs shall be self-powered type.

## PART 3 - EXECUTION

### 3.1 INSTALLATION

Set lighting fixtures plumb, square, and level with ceiling and walls, in alignment with adjacent lighting fixtures, and secure in accordance with manufacturers' directions and approved drawings. The installation shall meet requirements of NFPA 70. Mounting heights specified or indicated shall be to bottom of fixture for ceiling-mounted fixtures and to center of fixture for wall-mounted fixtures. Obtain approval of the exact mounting for lighting fixtures on the job before commencing installation and, where applicable, after coordinating with the type, style, and pattern of the ceiling being installed. Recessed and semirecessed fixtures may be supported from suspended ceiling support system ceiling tees when the ceiling system support wires are provided at a minimum of four wires per fixture and located not more than 6 inches from each corner of each fixture. For recessed fixtures, provide support clips securely fastened to ceiling grid members, a minimum of one at or near each corner of each fixture. For round fixtures or fixtures smaller in size than the ceiling grid, provide a minimum of four wires per fixture and locate at each corner of the ceiling grid in which the fixture is located. Do not support fixtures by ceiling acoustical panels. Where fixtures of sizes less than the ceiling grid are indicated to be centered in the acoustical panel, support such fixtures independently or with at least two: -inch metal channels spanning, and secured to, the ceiling tees. Provide wires for lighting fixture support in this section.

#### A. Exit and Emergency Lights

Wire exit and emergency lights ahead of the switch to the normal lighting circuit located in the same room or area.

### 3.2 FIELD QUALITY CONTROL

Upon completion of the installation, conduct an operating test to show that equipment operates in accordance with requirements of this Section.

--End of Section--