



**INVITATION FOR BID  
(IFB) #11-1021-DS  
Coquina Concession Building Remodel  
Project 49643**

Manatee County, a political subdivision of the State of Florida, (hereinafter the "County") will receive sealed bids from individuals, corporations, partnerships, and other legal entities organized under the laws of the State of Florida or authorized to conduct business in the State of Florida.

**NON-MANDATORY INFORMATION CONFERENCE**

In order to insure that all prospective bidders have sufficient information and understanding of the County's needs, an **Information Conference** will be held **April 4, 2011 @ 10:30 AM** at the **Manatee County Administration Building, 1112 Manatee Avenue West, 4<sup>th</sup> Floor (Manatee Room) Bradenton Florida 34205**

Attendance is not mandatory, but is highly encouraged.

**NOTE:**

**Article B. 05, page 00020-2; Inspection of Site** – All potential contractors, it is mandatory that a site visit be performed at the location to familiarize yourselves with the full scope of the construction site. All potential contractors are to acknowledge in Section 00300, Bid Form page number 00300-1.

**Site Inspection:** **An inspection of the project site will take place at (9:00 AM) April 4, 2011 at the Coquina Beach Concession Building located at 2650 Gulf Drive South, Bradenton Beach, Florida 34217.**

**(Reference B.05, Inspection of Site)**

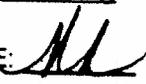
**A site inspection is a requirement to submit a Bid.**

**DEADLINE FOR CLARIFICATION REQUESTS:** **April 14, 2011 at 2:00 PM**  
(Reference Bid Article A.06)

**TIME AND DATE DUE:** **April 22, 2011 at 3:00 PM**  
Manatee County Purchasing, 1112 Manatee Avenue West, Suite 803, Bradenton, FL 34205

**Important Note:** Lobbying is prohibited (reference Bid Article A.08)

**FOR INFORMATION CONTACT:**  
**Donna M. Stevens (941) 749-3045**  
[donna.stevens@mymanatee.org](mailto:donna.stevens@mymanatee.org)

AUTHORIZED FOR RELEASE: 

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## SECTION 00010

**INFORMATION TO BIDDERS****A.01 OPENING LOCATION**

These bids will be **publicly opened** at **Manatee County Purchasing, 1112 Manatee Avenue West, Suite 803, Bradenton, Florida 34205** in the presence of County officials at the time and date stated, or soon thereafter. All bidders or their representatives are invited to be present.

Any bids received after the stated time and date will not be considered. It shall be the sole responsibility of the bidder to have their bid delivered to the Manatee County Purchasing Division for receipt on or before the stated time and date. If a bid is sent by U.S. Mail, the bidder shall be responsible for its timely delivery to the Purchasing Division. Bids delayed by mail shall not be considered, shall not be opened at the public opening, and arrangements shall be made for their return at the respondent's request and expense.

**A.02 SEALED & MARKED**

**One original and two copies** of your **signed bid** shall be submitted in one **sealed package**, clearly marked on the outside **"Sealed Bid #11-1021-DS, Coquina Concession Building Remodel"** with your company name.

**Address package to:** Manatee County Purchasing Division  
1112 Manatee Avenue West, Suite 803  
Bradenton, Florida 34205

**A.03 SECURING OF DOCUMENTS**

Complete individual copies of the bidding documents for the project and/or products can be obtained, free of charge, at the **Manatee County Purchasing Department located in the County Administration Building address: 1112 Manatee Avenue West Suite 803, Bradenton, FL 34205: 941-749-3014, between the hours of 8:00 AM to 4:00 PM, Monday through Friday, exception of holidays.** Complete set of the bidding document must be used in preparing bids. The County assumes no responsibility for errors and misinterpretations resulting from the use of incomplete sets of bidding document.

**A.04 BID DOCUMENTS**

**Bids** on <http://www.mymanatee.org> , Bid documents and the Notices of Source Selection related to those Bids are available for download in a portable document format (.PDF) file on the Manatee County web page on the Purchasing tab under "Bids." You may view and print these files using Adobe Acrobat software. You may download a free copy of this software (Adobe) from the Owner's web page if you do not have it.

**Manatee County collaborates with the Manatee Chamber of Commerce** on distributing solicitations using the RFP Tool web page on the Chambers website: <http://www.Manateechamber.com> to post Bid documents in a portable document

**A.04 BID DOCUMENTS (Continued)**

format (.PDF) file. This step is in addition to the posting on Manatee County Government web pages.

Manatee County may also use an internet service provider to distribute Bids. A link to that service, <http://www.DemandStar.com>, is provided on this website under the Tab "DemandStar". Participation in the DemandStar system is not a requirement for doing business with Manatee County.

Note: The County posts the Notice of Source Selection seven calendar days prior to the effective date of the award.

IT IS THE RESPONSIBILITY OF EACH VENDOR, PRIOR TO SUBMITTING THEIR BID, TO CONTACT THE MANATEE COUNTY PURCHASING OFFICE (see contact information on page one of this document) TO DETERMINE IF ADDENDA WERE ISSUED AND TO MAKE SUCH ADDENDA A PART OF THEIR BID .

**A.05 MODIFICATION OF BID SPECIFICATIONS**

If a bidder wishes to recommend changes to the bid specifications, the bidder shall furnish in writing, data and information necessary to aid the Owner in evaluating the request to modify the specifications. The Owner is not obligated to make any changes to the bid specifications. Unless an addendum is issued, the bid specifications shall remain unaltered. **Bidders must fully comply with the bid specifications, terms, and conditions.**

**A.06 DEADLINE FOR CLARIFICATION REQUESTS**

**April 14, 2011 at 2:00 PM** shall be the deadline to submit all inquiries, suggestions, or requests concerning interpretation, clarification or additional information pertaining to the Invitation for Bids to the Manatee County Purchasing Office.

This deadline has been established to maintain fair treatment for all potential bidders, while maintaining the expedited nature of the Economic Stimulus that the contracting of this work may achieve.

**A.07 CLARIFICATION & ADDENDA**

Each bidder shall examine all Invitation For Bid documents and shall judge all matters relating to the adequacy and accuracy of such documents. Any inquiries, suggestions or requests concerning interpretation, clarification or additional information pertaining to the Invitation for Bids shall be made through the Manatee County Purchasing Office. The County shall not be responsible for oral interpretations given by any County employee, representative, or others. The issuance of a written addendum is the only official method whereby interpretation, clarification or additional information can be given.

**A.07 CLARIFICATION & ADDENDA (Continued)**

If any addenda are issued to this Invitation for Bid, the County will Broadcast the addenda on the Demand Star distribution system to "Planholders" on this web service, and post the documents on the Purchasing Division's web page at <http://www.mymanatee.org> which can be accessed by clicking on the "Purchasing" button and then clicking on the "Bids" button. It shall be the responsibility of each bidder, prior to submitting their bid, to contact Manatee County Purchasing (see contact on page 1) to determine if addenda were issued and to make such addenda a part of their bid.

**A.08 LOBBYING**

After the issuance of any Invitation For Bid, prospective bidders, or any agent, representative or person acting at the request of such bidder shall not contact, communicate with or discuss any matter relating in any way to the Invitation For Bid with any officer, agent or employee of Manatee County other than the Purchasing Official or as directed in the Invitation For Bid. This prohibition begins with the issuance of any Invitation For Bid, and ends upon execution of the final contract or when the invitation has been canceled. Violators of this prohibition shall be subject to sanctions as provided in the Manatee County Purchasing Code.

The County reserves the right to amend or to add to the names listed as persons to contact. All amendments or additions to the names listed as persons to contact shall be issued by the Purchasing Division, in writing.

**A.09 UNBALANCED BIDDING PROHIBITED**

Manatee County recognizes that large and/or complex projects will often result in a variety of methods, sources and prices; however, where in the opinion of the County such variation does not appear to be justified, given bid specifications and industry and market conditions, the bid will be presumed to be unbalanced. Examples of unbalanced bids will include:

1. Bids showing omissions, alterations of form, additions not specified or required conditional or unauthorized alternate bids.
2. Bids quoting prices that substantially deviate, either higher or lower, from those included in the bids of competitive bidders for the same line item unit costs.
3. Bids where the unit costs offered are in excess of or below reasonable cost analysis values.

In the event the County determines that a bid is presumed unbalanced, it will request the opportunity to, and reserves the right to, review all source quotes, bids, price lists, letters of intent, etc., which the bidder obtained and upon which the bidder relied upon to develop the bid. The County reserves the right to reject as non-responsive any

A.09 UNBALANCED BIDDING PROHIBITED (Continued)

presumptive unbalanced bids where the bidder is unable to demonstrate the validity and/or necessity of the unbalanced unit costs.

A.10 FRONT END LOADING OF BID PRICING PROHIBITED

Prices offered for performance and/or acquisition activities to occur early in the project schedule, such as: mobilization, clearing and grubbing; or maintenance of traffic, that are substantially higher than pricing of competitive bidders within the same portion of the project schedule, will be presumed to be front end loaded. Front end loaded bids could reasonably appear to be an attempt to obtain unjustified early payments creating a risk of insufficient incentive for the Contractor to complete the work or otherwise creating an appearance of an under-capitalized bidder.

In the event the County determines that a bid is presumed to be front end loaded, it will request the opportunity to, and reserves the right to, review all source quotes, bids, price lists, letters of intent, etc., which the bidder obtained and upon which the bidder relied upon to develop the pricing or acquisition timing for these bid items. The County reserves the right to reject as non-responsive any presumptive front end loaded bids where the bidder is unable to demonstrate the validity and/or necessity of the front end loaded costs.

A.11 WITHDRAWAL OF OFFERS

Vendors may withdraw offers as follows: a) Mistakes discovered before the opening of a solicitation may be withdrawn by written notice from the bidder submitting the offer. This request must be received in the office designated for receipt of offers in the solicitation document prior to the time set for delivery and opening of the offers. A copy of the request shall be retained and the unopened offer returned to that vendor. b) After the responses to a solicitation are opened or a selection has been determined, but before a contract is signed, a vendor alleging a material mistake of fact may be permitted to withdraw their offer if: (1) the mistake is clearly evident on the solicitation document; or (2) the bidder submits evidence which clearly and convincingly demonstrates that a mistake was made. Request to withdraw an offer must be in writing and approved by the Purchasing Official.

A.12 IRREVOCABLE OFFER

Any bid may be withdrawn up until the date and time set for opening of the bid. Any bid not so withdrawn shall, upon opening, constitute an irrevocable offer for a period of 90 days to sell to Manatee County the goods or services set forth in the attached specifications until one or more of the bids have been duly accepted by the County.

A.13 BID EXPENSES

All expenses for making bids to the County are to be borne by the bidder.

#### A.14 RESERVED RIGHTS

The County reserves the right to accept or reject any and/or all bids, to waive irregularities and technicalities, and to request resubmission. Also, the County reserves the right to accept all or any part of the bid and to increase or decrease quantities to meet additional or reduced requirements of the County. Any sole response received by the first submission date may or may not be rejected by the County depending on available competition and current needs of the County. For all items combined, the bid of the lowest responsive, responsible bidder will be accepted, unless all bids are rejected. The lowest responsible bidder shall mean **that bidder who makes the lowest bid to sell goods and/or services of a quality which** conforms closest to or most exceeds the quality of goods and/or services set forth in the attached specifications or otherwise required by the County, and who is fit and capable to perform the bid as made.

To be responsive, a bidder shall submit a bid which conforms in all material respects to the requirements set forth in the Invitation For Bid. To be a responsible bidder, the bidder shall have the capability in all respects to perform fully the contract requirements, and the tenacity, perseverance, experience, integrity, reliability, capacity, facilities, equipment, and credit which will assure good faith performance. Also, the County reserves the right to make such investigation as it deems necessary to determine the ability of any bidder to furnish the service requested. Information the County deems necessary to make this determination shall be provided by the bidder. Such information may include, but shall not be limited to: current financial statements, verification of availability of equipment and personnel, and past performance records.

#### A.15 APPLICABLE LAWS

Bidder must be authorized to transact business in the State of Florida. All applicable laws and regulations of the State of Florida and ordinances and regulations of Manatee County will apply to any resulting agreement. Any involvement with any Manatee County procurement shall be in accordance with Manatee County Purchasing Code of Laws as amended. Any actual or prospective bidder who is aggrieved in connection with the solicitation or award of a contract may protest to the Board of County Commissioners of Manatee County as required in Section 2-26/61 of the Purchasing Code.

A protest with respect to this Invitation For Bid shall be submitted in writing prior to the scheduled opening date of this bid, unless the aggrieved person did not know and could not have been reasonably expected to have knowledge of the facts giving rise to such protest prior to the scheduled opening date of this bid. The protest shall be submitted within seven calendar days after such aggrieved person knows or could have reasonably been expected to know of the facts giving rise thereto.

#### A.16 COLLUSION

By offering a submission to this Invitation For Bid, the bidder certifies that he has not divulged, discussed or compared their bid with other bidder, and has not colluded with any other bidder or parties to this bid whatsoever. Also, bidder certifies, and in the case

A.16 COLLUSION (Continued)

of a joint bid each party thereto certifies as to their own organization, that in connection with this bid:

- a. any prices and/or cost data submitted have been arrived at independently, without consultation, communication, or agreement, for the purpose of restricting competition, as to any matter relating to such prices and/or cost data, with any other bidder or with any competitor;
- b. any prices and/or cost data quoted for this bid have not been knowingly disclosed by the bidder and will not knowingly be disclosed by the bidder, prior to the scheduled opening, directly or indirectly to any other bidder or to any competitor;
- c. no attempt has been made or will be made by the bidder to induce any other person or firm to submit or not to submit a bid for the purpose of restricting competition;
- d. the only person or persons interested in this bid, principal or principals is/are named therein and that no person other than therein mentioned has any interest in this bid or in the contract to be entered into; and
- e. no person or agency has been employed or retained to solicit or secure this contract upon an agreement or understanding or a commission, percentage, brokerage, or contingent fee excepting bona fide employees or established commercial agencies maintained by bidder for purpose of doing business.

A.17 CODE OF ETHICS

With respect to this bid, if any bidder violates or is a party to a violation of the Code of Ethics of Manatee County per Manatee County Purchasing Code Ordinance 08-43, Article 3, Ethics in Public Contracting, and/or the State of Florida per Florida Statutes, Chapter 112, Part III, Code of Ethics for Public Officers and Employees, such bidder may be disqualified from performing the work described in this bid or from furnishing the goods or services for which the bid is submitted and shall be further disqualified from submitting any future bids for work or for goods or services for Manatee County. The Owner anticipates that all statements made and materials submitted in a bid will be truthful. If a bidder is determined to be untruthful in its bid or any related presentation, such bidder may be disqualified from further consideration regarding this Invitation For Bid.

A.18 BID FORMS

Bids must be submitted on attached County forms, although additional pages may be attached.- **Bidders must fully complete all pages of the Bid Forms for both Bid A and Bid B. Bid Forms must be executed by an authorized signatory who has the legal authority to make the offer and bind the company. Bidders must fully comply with all bid specifications, terms and conditions.** Failure to comply shall result in contract default, whereupon, the defaulting vendor shall be required to pay for any and all re-procurement costs, damages, and attorney fees as incurred by the County.

**A.19 LEGAL NAME**

Bids shall clearly indicate the legal name, address and telephone number of the bidder. Bids shall be signed above the typed or printed name and title of the signer. The signer must have the authority to bind the bidder to the submitted bid.

**A.20 DRUG FREE WORK PLACE**

The Manatee County Board of County Commissioners adopted a policy regarding bidders maintaining a Drug Free Work Place, prohibiting the award of bids to any person or entity that has not submitted written certification to the County that it has complied with those requirements. A Drug Free Work Place Certification Form is attached to this bid for this purpose.

**A.21 PUBLIC CONTRACTING AND ENVIRONMENTAL CRIMES**

A person or affiliate who has been placed on the State's convicted vendor list following a conviction for a public entity crime, as that term is defined in Florida Statute § 287.133, may not submit a bid, proposal, or reply on a contract to provide any goods or services to a public entity; may not submit a bid, proposal, or reply on a contract with a public entity for the construction or repair of a public building or public work; may not submit bids, proposals or replies on leases of real property to a public entity; may not be awarded or perform work as a contractor, supplier, subcontractor, or consultant under a contract with any public entity; and may not transact business with any public entity in excess of the threshold amount provided in Florida Statute § 287.017 for CATEGORY TWO for a period of 36 months following the date of being placed on the convicted list.

In addition, the Manatee County Code prohibits the award of any contract to any person or entity who/which has, within the past 5 years, been convicted of, or admitted to in court or sworn to under oath, a public entity crime or of any environmental law that, in the reasonable opinion of the purchasing official, establishes reasonable grounds to believe the person or business entity will not conduct business in a responsible matter. To insure compliance with the foregoing, the Code requires all persons or entities desiring to contract with the County to execute and file with the purchasing official an affidavit, executed under the pain and penalties of perjury, confirming that person, entity and any person(s) affiliated with the entity, does not have such a record and is therefore eligible to seek and be awarded business with the County. In the case of a business entity other than a partnership or a corporation, such affidavit shall be executed by an authorized agent of the entity. In the case of a partnership, such affidavit shall be executed by the general partner(s). A Public Contracting and Environmental Crimes Certification is attached for this purpose.

**A.22 DISCOUNTS**

Any and all discounts must be incorporated in the prices contained in the bid and not shown separately. The prices as shown on the bid form shall be the price used in determining award.

**A.23 TAXES**

Manatee County is exempt from Federal Excise and State Sales Taxes. (F.E.T. Exempt Cert. No. 59-78-0089K; FL Sales Tax Exempt Cert. No. 85-8012622206C-6); therefore, the vendor is prohibited from delineating a separate line item in his bid for any sales or service taxes. Nothing herein shall affect the vendor's normal tax liability.

**A.24 DESCRIPTIVE INFORMATION**

Unless otherwise specifically provided in the specifications, all equipment, materials and articles incorporated in the work covered by this contract shall be new and of the most suitable grade for the purpose intended. Unless otherwise specifically provided in the specifications, reference to any equipment, material, article or patented process, by trade name, brand name, make or catalog number, shall be regarded as establishing a standard of quality and shall not be construed as limiting competition.

**A.25 AMERICANS WITH DISABILITIES ACT**

The Board of County Commissioners of Manatee County, Florida, does not discriminate upon the basis of any individual's disability status. This non-discrimination policy involves every aspect of the County's functions including one's access to, participation, employment, or treatment in its programs or activities. Anyone requiring reasonable accommodation for an **Information Conference** or **Bid Opening** should contact the person named on the first page of this bid document at least twenty-four (24) hours in advance of either activity.

**A.26 EQUAL EMPLOYMENT OPPORTUNITY CLAUSE**

Manatee County, in accordance with the provisions of Title VI of the Civil Rights Act of 1964 and the Regulations of the Department of Commerce (15 CFR, Part 8) issued pursuant to such Act, hereby notifies all vendors that it will affirmatively ensure that in any contract entered into pursuant to this advertisement, minority business enterprises will be afforded full opportunity to submit bids in response to this advertisement and will not be discriminated against on the grounds of race, color or national origin in consideration for an award.

**A.27 MBE/WBE**

The State of Florida, **Office of Supplier Diversity** provides the certification process and the database for identifying certified MBE/WBE firms. This service may be directly accessed at: <http://www.osd.dms.state.fl.us/iframe.htm>

If you have any questions regarding this State service, please contact their office at (850) 487-0915.

**A.28 MATHEMATICAL ERRORS**

In the event of multiplication/extension error(s), the unit price shall prevail. In the event of addition error(s) the extension totals will prevail. All bids shall be reviewed mathematically and corrected, if necessary, using these standards, prior to additional evaluation.

**A.29 DISCLOSURE**

Upon receipt, all inquires and responses to inquires related to this Invitation for Bid become "Public Records" and are subject to public disclosure consistent with Chapter 119, Florida Statutes.

**Bids become "Public Records" ten (10) days after the bid opening or if an award decision is made earlier than this time as provided by Florida Statute 119.071.** No announcement or review of the bid documents shall be conducted at the public opening of the bids.

Based on the above, Manatee County will receive bids at the date and time stated, and will make public at the opening the names of the business entities of all that submitted an offer and any amount presented as a total offer without any verification of the mathematics or the completeness of the offer. Upon the expiration of the statutory term for exemption the actual documents may be inspected or copied. When County staff have completed a mathematic validation and inspected the completeness of the offers, tabulation shall be posted on [www.mymanatee.org](http://www.mymanatee.org).

**NOTE: ANY OR ALL STATEMENTS CONTAINED IN THE FOLLOWING SECTIONS: BASIS OF AWARD, TERMS AND CONDITIONS OF THE CONTRACT, OR SPECIFICATIONS, WHICH VARY FROM THE INFORMATION TO BIDDERS, SHALL HAVE PRECEDENCE.**

**END OF SECTION A**

SECTION 00020  
**BASIS OF AWARD**

**B.01 BASIS OF AWARD**

Award shall be to the most responsive, responsible bidder meeting specifications and having the lowest Total Bid Price for **Bid "A"**, or the lowest Total Bid Price for **Bid "B"**, for the requirements listed on the Bid Form for the Work as set forth in this Invitation For Bid. Bid Prices shall include costs for furnishing all labor, equipment and/or materials for the completion of the Work in accordance with and in the manner set forth and described in the Contract Documents to the County's satisfaction within the prescribed time.

**Two schedules for Completion of the Work shall be considered. Each bid for completion by the specified stated time shall be offered as a separate "Total Bid Price". The County has the sole authority to select the bid based on the Completion Time which is in the best interest of the County. Only one award shall be made.**

In evaluating bids, the County shall consider the qualifications of the bidders; and if required, may also consider the qualifications of the subcontractors, suppliers, and other persons and organizations proposed. County may also consider the operating costs, maintenance requirements, performance data and guarantees of major items of materials and equipment proposed for incorporation in the Work.

Whenever two or more bids are equal with respect to price, quality and service, the bid received from a local business shall be given preference in award. Whenever two or more bids which are equal with respect to price, quality and service are received, and both bids and neither of these bids are received from a local business, the award shall be determined by a chance drawing conducted by the Purchasing Office and open to the public.

Local business is defined as a business duly licensed and authorized to engage in the sale of goods and/or services to be procured, which has a place of business in Manatee County with full time employees at that location.

**B.02 SUBCONTRACTORS**

Subcontractors shall be bound by the terms and conditions of this contract insofar as it applies to their Work, but this shall not relieve the prime contractor from the full responsibility of the County for the proper completion of all Work to be executed under this contract.

The employment of unauthorized aliens by any vendor is considered a violation of Section 274 (e) of the Immigration and Employment Act. If the vendor knowingly employs unauthorized aliens, such violation shall be cause for unilateral cancellation of this agreement.

**B.03 QUALIFICATIONS OF BIDDERS**

Each bidder must secure all licenses required (in accordance with Chapter 489 Florida Statutes) for the Work which is the subject of this bid; and, upon request, shall submit a true copy of all applicable licenses. The minimum license requirement for this project is a **Certified General Contractor's license. A copy of the Bidders General Contractor's license shall be submitted with this Bid.**

**Contractor shall have a minimum of three (3) years experience holding a valid/active Certified General Contractor's license.**

To demonstrate qualifications to perform the Work, each bidder must be prepared to submit within five days of County's request; written evidence such as financial data, previous experience, present commitments and other such data as may be requested. Bidder must be able to provide evidence of Bidder's qualification to do business in the state of Florida. Each bidder shall submit as a portion of their bid, a completed Contractor's Questionnaire included as Section 00430.

A complete list of all subcontractors proposed for any portion of the Work may be requested of any Bidder deemed necessary by the County. Subcontracts shall be awarded only to those subcontractors considered satisfactory by the County.

**B.04 PREPARATION OF CONTRACT**

A written notice confirming award or recommendation thereof will be forwarded to the Successful Bidder accompanied by the required number of unsigned counterparts of the Agreement. Within 10 days thereafter, Successful Bidder shall sign and deliver the required number of counterparts of the Agreement with any other required documents to County. (Note: Contract must be approved in accordance with the Manatee County Code of Laws, Chapter 2-26, Manatee County Purchasing Ordinance and the Standard and Procedures approved by the County Administrator).

**B.05 INSPECTION OF SITE**

Prior to submitting a Bid Form, each bidder shall examine the site and all conditions thereon fully familiarizing themselves with the full scope of the project. Failure to become familiar with site conditions will in no way relieve the successful bidder from the necessity of furnishing any materials or performing any work that is required to complete the project in accordance with the plans and specifications.

**END OF SECTION B**

SECTION 00030  
**GENERAL TERMS AND CONDITIONS OF THE CONTRACT**

**C.01 CONTRACT FORMS**

The agreement resulting from the acceptance of a bid shall be in the form of the agreement stated in this bid.

**C.02 ASSIGNMENT OF CONTRACT**

Contractor shall not assign, transfer, convey, sublet or otherwise dispose of this Contract or of his right, title, or interest therein, or his power to execute such Contract, or to assign any monies due or to become due there under to any other person, firm or corporation unless first obtaining the written consent of the County. The giving of such consent to a particular subcontractor assignment shall not dispense with the necessity of such consent to any further or other assignment.

**C.03 COMPLETION OF WORK**

The Work will be completed and ready for final inspection within the specified calendar days from the date the Contract Time commences to run. Two bids shall be considered based on **Bid "A" 180 calendar days** and **Bid "B" based on 120 calendar days**. The County has the sole authority to select the bid based on the Completion Time which is in the best interest of the County. Only one award shall be made.

**C.04 LIQUIDATED DAMAGES**

If the Contractor refuses or fails to prosecute the Work, or any separable part thereof, with such diligence as will hinder its completion within the time specified, the County may seek damages. The actual damages for delay will be impossible to determine and in lieu thereof, the Contractor shall pay to the County the sum of **\$580.00** as fixed, agreed, and liquidated damages for each calendar day of the delay until the Work is finally accepted by the County and the Contractor and his Surety shall be liable for the amount thereof.

**C.05 PAYMENT**

Contractor may apply for partial payment on monthly estimates, based on the amount of Work done or completed in compliance with the provisions of the Contract. Contractor shall submit an application, on a standard pay application form provided or approved by the County, of an approximate estimate of the proportionate value of the Work done, items and locations of the Work performed up to and including the last day of the period then ending. The County will then review said estimate and make any necessary revisions so that the estimate can receive approval for payment. If the Contractor and the County do not agree on the approximate estimate of the proportionate value of the Work done for any pay period, the determination of the County will be binding. The amount of said estimate after deducting any required retainage and all previous payments shall be due and payable to the Contractor, 20 business days if County is its own Engineer of Record (EOR) or 25 business days if outside agent approval is required after the pay estimate has been approved by the County.

C.05 PAYMENT (Continued)

Time allowed for development of punch list:

1. Awarded Contracts with an estimate cost of less than \$10 million will be within 30 calendar days after reaching substantial completion. Substantial completion is defined as reaching beneficial occupancy or use.
2. Awarded Contracts with a cost of \$10 million dollars or more will be within 30 calendar days OR if extended by contract: up to 60 calendar days after reaching substantial completion. Substantial completion is defined as reaching beneficial occupancy or use.

The final contract completion date must be at least 30 days after delivery of the list of items. If the list is not provided to the awarded contractor by the agreed upon date, the contract completion time must be extended by the number of days the County exceeds the delivery date.

It is the Contractor's responsibility for the care of the materials any damage to or loss of said materials is the full responsibility of the Contractor. Any Periodical Pay Estimate signed by the Contractor shall be final as to the Contractor for any or all work covered by the Periodical Pay Estimate.

Any requests for payment of materials stored on site must be accompanied with a paid receipt. The Contractor warrants and guarantees that title to all work, materials and equipment covered by any application for payment, whether incorporated in the project or not, will pass to the County at the time of payment free and clear of all liens, claims, security interests and encumbrances (hereafter referred to as "Liens").

The Contractor agrees to furnish an affidavit stating that all laborers, material men, and subcontractors have been paid on the project for Work covered by the application for payment and that a partial or complete release of lien, as may be necessary, be properly executed by the material men, laborers, subcontractors on the project for Work covered by the application for payment, sufficient to secure the County from any claim whatsoever arising out of the aforesaid Work.

When the Contractor has completed the Work in compliance with the terms of the Contract Documents, he shall notify the County in writing that the project is ready for final inspection. The County will then advise the Contractor as to the arrangements for final inspection and what Work, if any, is required to prepare the project or a portion thereof for final inspection. When the County determines the project or portion thereof is ready for final inspection, the County shall perform same. Upon completion of final inspection, the County will notify Contractor of all particulars in which this inspection reveals that the Work is incomplete or defective. Contractor shall immediately take such measures as are necessary to complete such Work or remedy such deficiencies. When all such errors have been corrected, a final re-inspection will be made. The process will be repeated until, in the opinion of the County, the project has been completed in compliance with the terms of the Contract Documents.

### C.05 PAYMENT (Continued)

When final acceptance has been made by the County, the County will make final payment of the Contract amount, plus all approved additions, less approved deductions and previous payments made. The Contract will be considered complete when all work has been finished, the final inspection made, approved as-builts received, and the project finally accepted in writing by the County. The Contractor's responsibility shall then terminate except as otherwise stated.

### C.06 RETAINAGE

A **retainage** of 2.5% of the total contract amount shall be withheld from payments after 75% completion of the Work. Upon substantial completion, this retainage shall be reduced to 1% of the total contract amount plus such amount as the County may reasonably deem necessary to repair, replace, complete or correct any damaged, defective, incorrect or incomplete work. Upon final acceptance, the remaining retainage shall be included in the final payment.

### C.07 WARRANTY AND GUARANTEE PROVISIONS

All work, materials, and equipment furnished as defined herein shall be guaranteed and warranted by the contractor for a minimum period of three (3) years, unless otherwise specified, from final acceptance by the County to be free from defects due either to faulty materials or equipment or faulty workmanship.

All materials, equipment, and workmanship furnished and installed by the contractor is warranted and guaranteed by the contractor to be such as to meet the required standards and to accomplish the purposes and functions required standards and to accomplish the purposes and functions of the project as defined, detailed, and specified herein.

The County shall, following discovery thereof, promptly give written notice to the contractor of faulty materials, equipment, or workmanship within the period of the guarantee and the contractor shall promptly replace any part of the faulty equipment, material, or workmanship at his own cost. These warranty and guarantee provisions create no limitations on the County as to any claims or actions for breach of guaranty or breach of warranty that the County might have against parties other than the contractor, and do not constitute exclusive remedies of the County against the contractor.

### C.8 ROYALTIES AND PATENTS

The contractor shall pay all royalties and license fees for equipment or processes in conjunction with the equipment and/or services being furnished. Contractor shall defend all suits or claims for infringement of any patent, trademark or copyright, and shall save the County harmless from loss on account thereof, including costs and attorney's fees.

**C.9 AUTHORIZED PRODUCT REPRESENTATION**

The contractor, by virtue of submitting the name and specifications of a manufacturer's product, will be required to furnish the named manufacturer's product. Failure to perform accordingly may, in the County's sole discretion, be deemed a breach of contract, and shall constitute grounds for the County's immediate termination of the contract.

**C.10 REGULATIONS**

It shall be the responsibility of the bidder to assure compliance with any OSHA, EPA and/or other federal or state of Florida rules, regulations or other requirements, as each may apply.

**C.11 CANCELLATION**

Any failure of the contractor to furnish or perform the Work (including, but not limited to, commencement of the Work, failure to supply sufficient skilled workers or suitable materials or equipment) in accordance with the contract, the County may order the stop of the Work, or any portion thereof, until the cause for such order has been eliminated. If the contractor persistently fails to perform the Work in accordance with the contract, the County reserves the right to terminate the contract and select the next qualified bidder or re-advertise this procurement in part or in whole. The County reserves the right to cancel all or any undelivered or unexecuted portion of this contract with or without cause.

**C.12 INDEMNIFICATION**

The contractor covenants and agrees to indemnify and save harmless the County, its agents and employees, from and against all claims, suits, actions, damages, causes of action, or judgments arising out of the terms of the resulting agreement for any personal injury, loss of life, or damage to the property sustained as a result of the performance or non-performance of services or delivery of goods; from and against any orders, judgments, or decrees, which may be entered against the County, its agents or employees; and from and against all costs, attorney's fees, expenses and other liabilities incurred in the defense of any such claim, suit or action, and the investigation thereof. Nothing in the award, resulting agreement, contract or Purchase Order shall be deemed to affect the rights, privileges and immunities of the County as set forth in Florida Statute Section 768.28.

**C.13 MANUALS, SCHEMATICS, HANDBOOKS (IF APPLICABLE)**

All manuals, schematics and handbooks shall be provided which are applicable to the equipment delivered. An operators manual, parts manual and technician manual must also be provided. Parts lists (manuals) must include OEM part numbers for items not manufactured by the bidder. Vendor shall furnish two (2) copies of each.

**C.14 INSURANCE**

The contractor will not commence work under a contract until all insurance under this section and such insurance coverage as might be required by the County has been obtained. The contractor shall obtain, and submit to purchasing within 10 calendar days of request, at his expense, the following minimum amounts of insurance (inclusive of any amounts provided by an umbrella or excess policy):

a. Workers' Compensation/Employers' Liability

Part One - There shall be no maximum limit (other than as limited by the applicable statute) for liability imposed by Florida Workers' Compensation Act or any other coverage required by the contract documents which are customarily insured under Part One of the standard Workers' Compensation Policy.

Part Two - The minimum amount of coverage required by the contract documents which are customarily insured under Part Two of the standard Workers' Compensation Policy shall be:

<u>\$100,000</u>	(Each Accident)
<u>\$500,000</u>	(Disease-Policy Limit)
<u>\$100,000</u>	(Disease-Each Employee)

b. Commercial General Liability

The limits are to be applicable only to work performed under this contract and shall be those that would be provided with the attachment of the Amendment of Limits of Insurance (Designated Project or Premises) endorsement (ISO Form CG 25 03) a Commercial General Liability Policy with the following minimum limits.

General Aggregate:

Products/Completed Operations Aggregate	<u>\$1,000,000</u>
Personal and Advertising Injury	<u>\$1,000,000</u>
Each Occurrence	<u>\$1,000,000</u>
Fire Damage (Any One Fire)	<u>\$Nil</u>
Medical Expense (Any One Person)	<u>\$Nil</u>

c. Business Auto Policy

Each Occurrence Bodily Injury and Property Damage Liability Combined	<u>\$300,000</u>
Annual Aggregate (if applicable):	<u>\$1,000,000</u>

**C.14 INSURANCE (Continued)**d. Owners Protective Liability Coverage

The minimum OPC Policy limits per occurrence and, if subject to an aggregate, annual aggregate to be provided by the contractor shall be the same as the amounts shown above as the minimum per occurrence and general policy aggregate limits respectively required for the Commercial General Liability coverage. The limits afforded by the OPC Policy and any excess policies shall apply only to the County and the County's officials, officers, agents and employees and only to claims arising out of or in connection with the work under this contract.

e. Property Insurance

**If this contract includes** construction of or additions to above ground buildings or structures, contractor shall provide "**Builder's Risk**" insurance with the minimum amount of insurance to be 100% of the value of such addition(s), building(s), or structure(s).

f. Installation Floater

**If this contract does not include** construction of or additions to above ground building or structures, **but does involve** the installation of machinery or equipment, contractor shall provide an "**Installation Floater**" with the minimum amount of insurance to be 100% of the value of such addition(s), building(s), or structure(s).

g. Certificates of Insurance and Copies of Policies

Certificates of Insurance in triplicate evidencing the insurance coverage specified in the six above paragraphs a., b., c., d., e., and f., shall be filed with the Purchasing Official before operations are begun. The required certificates of insurance shall name the types of policy, policy number, date of expiration, amount of coverage, companies affording coverage, and also shall refer specifically to the bid number, project title and location of project. Insurance shall remain in force at least one year after completion and acceptance of the project by the County, in the amounts and types as stated herein, with coverage for all products and services completed under this contract.

**ADDITIONAL INSURED:**

**County of Manatee shall be specifically named as additional insured on all policies.**

If the initial insurance expires prior to the completion of operations and/or services by the contractor, renewal certificates of insurance and required copies of policies shall be furnished by the contractor and delivered to the Purchasing Official thirty (30) days prior to the date of their expiration.

**C.14 INSURANCE (Continued)**

h. Certification Requirements – In order for the certificate of insurance to be accepted it must comply with the following:

1. The certificate holder shall be:  
**Manatee County Board of Commissioners**  
**P.O. Box 1000**  
**Bradenton, FL 34206-1000**
  
2. Certificate shall be mailed to:  
**Manatee County Purchasing**  
**1112 Manatee Avenue West 8<sup>th</sup> Fl**  
**Bradenton, FL 34205**  
**Attn: Donna M. Stevens**

Nothing herein shall in any manner create any liability of the County in connection with any claim against the contractor for labor, services, or materials, or of subcontractors; and nothing herein shall limit the liability of the contractor or contractor's sureties to the County or to any workers, suppliers, material men or employees in relation to this contract.

**C.15 BID BOND/CERTIFIED CHECK**

By offering a submission to this Invitation For Bid, the bidder agrees should the bidder's bid be accepted, **to execute the form of contract and present the same to Manatee County for approval within 10 days after being notified of the awarding of the contract.** The bidder further agrees that failure to execute and deliver said form of contract **within 10 days** will result in damages to Manatee County and as guarantee of payment of same a bid bond/certified check shall be enclosed within the submitted sealed bid in the amount of five (5%) percent of the total amount of the bid. The bidder further agrees that in case the bidder fails to enter into a contract, as prescribed by Manatee County, the bid bond/certified check accompanying the bid shall be forfeited to Manatee County as agreed liquidated damages. If the County enters into a contract with a bidder, or if the County rejects any and/or all bids, accompanying bond will be promptly returned.

**C.16 PERFORMANCE AND PAYMENT BONDS**

The successful bidder shall furnish surety bonds as security for faithful performance of the contract awarded as a result of this bid, and for the payment of all persons performing labor and/or furnishing material in connection therewith. Surety of such bonds shall be in an amount equal to the bid award (100% each) and from a duly authorized and nationally recognized surety company, authorized to do business in Florida, satisfactory to this County. The attorney-in-fact who signs the bonds must file with the bonds a certificate and effective dated copy of power-of-attorney. (Reference Florida Statute 255.05)

C.16 PERFORMANCE AND PAYMENT BONDS (Continued)

Furnishing the performance and payment bonds shall be requisite to execution of a contract with the County. Said performance and payment bonds will remain in force for the duration of the contract with the premiums paid by the contractor. Failure of successful bidder to execute such contract and to supply the required bonds shall be just cause for annulment of the award.

The County may then contract with another acceptable bidder or re-advertise this Invitation For Bid. If another bidder is accepted, and notice given within 90 days after the opening of bids, this acceptance shall bind the bidder as though they were originally the successful bidder.

Failure of the County at any time, to require performance by the contractor of any provisions set out in the contract will in no way affect the right of the County, thereafter, to enforce the provisions. **Bonds to remain in effect for one year after final payment becomes due.**

C.17 NO DAMAGES FOR DELAY

No claim for damages or any claim other than for an extension of time shall be made or asserted against the County by reason of any delays. The Contractor shall not be entitled to an increase in the Total Contract Price or payment or compensation of any kind from the County or direct, indirect, consequential impact or other costs, expenses for damages, including but not limited to costs of acceleration or inefficiency arising because of delay, disruption, interference or hindrance from any cause whatsoever; provided, however, that this provision shall not preclude recovery or damages by the Contractor for hindrance or delays due solely to fraud, bad faith, or active interference on part of the County or its agents. Otherwise, the Contractor shall only be entitled to extensions of the Contract Time as the sole and exclusive remedy for such resulting delay, in accordance with and to the extent specifically provided above.

C.18 NO INTEREST

Any monies not paid by the County when claimed to be due to the Contractor under this Contract shall not be subject to interest including prejudgment interest. Any monies not paid by the County when claimed to be due to the Contractor for damages awarded in the case of construction delays shall not be subject to prejudgment interest.

C.19 CONSTRUCTION OF CONTRACT

This Contract and the rights and responsibilities hereunder shall not be construed more strongly against either party, regardless of the extent to which such party may have participated in the preparation hereof.

**C.20 BE GREEN**

All Vendors/Bidders/Quoters/Proposers (*as applicable*) are encouraged to use as many **environmentally preferable** "green" products, materials, supplies, etc. as possible in order to promote a safe and healthy environment. **Environmentally preferable are products or services that have a reduced adverse effect on the environment.** Provide detail of your organization's initiative and its ability to meet the goal of environmental sustainability.

**END OF SECTION C**

**SECTION 00100  
BID SUMMARY**

**D.01 THE WORK**

The work included in this contract consists of the construction requirements of a demolition of existing structure and replacement of that structure with new construction, roughly 1300SF as shown on Contract Documents prepared by SCHENKELSHULTZ, dated October 22, 2010.

The Work consists of demolition of existing concrete structure and rebuilding the concessions building on the same footprint. New construction shall keep portion of the existing exterior walls, entire foundation system and utility connections per drawings and specifications.

1. The Work includes concrete, masonry walls, structural steel, pre-engineered wood trusses, metal roof, architectural woodwork, waterproofing, insulated roofing, roof accessories, sheet metal, overhead security grille doors, hollow metal doors and frames, hollow metal window frames, hardware, glazing, interior finishes and furnishings including vertical blinds, heating-ventilating-air conditioning, electrical systems, lighting, and plumbing.
2. Interior finishing and related construction, including interior partitions and permanent doors, counters, transaction window, service sink, hand washing sink, lift safety devices, toilet accessories, and fire extinguishers'.
3. The Work shall include wood deck all associated support, stairs and ramp.

The Work consists of all items as indicated on the Drawings and as specified in the Project Manual and those items of construction not indicated but normal and necessary and usual in the construction industry for construction of a building project.

The Contractor shall furnish all shop drawings, working drawings, labor, materials, equipment, tools, services and incidentals necessary to complete all work required by these Specifications, and as shown on the Contract Drawings.

The Contractor shall perform the work complete, in place and ready for continuous service and shall include any repairs, replacements, and/or restoration required as a result of damages caused prior to acceptance by the County.

The Contractor is responsible for any work and incidentals involved in obtaining any and all required permits. The Contractor shall furnish and install all materials, equipment and labor which are reasonably and properly inferable and necessary for

**D.01 THE WORK (Continued)**

the proper completion of the work, whether specifically indicated in the Contract Documents or not.

**D.02 SUBCONTRACTORS, SUPPLIERS AND OTHERS**

The identity of subcontractors, suppliers, and other persons and organizations (including those who are to furnish the principal items of material and equipment) may be requested by the County for each bid item from any of the Bidders; and the Bidder shall respond within five days after the date of such request. Such list shall be accompanied by an experience statement with pertinent information regarding similar projects and other evidence of qualification for each such subcontractor, supplier, persons or organization if requested by County. If County, after due investigation, has reasonable objection to any proposed subcontractor, supplier, other person or organization, County may, before the Notice of Award is given, request the apparent successful Bidder to submit an acceptable substitute without an increase in Contract Price or Contract Time.

If apparent successful Bidder declines to make any such substitution, County may award the contract to the next lowest qualified Bidder that proposes to use acceptable subcontractors, suppliers, and other persons who County does not make written objection to Contractor shall not be required to employ any subcontractor, supplier, other person or organization who Contractor has reasonable objection to.

Subcontractors shall be bound by the terms and conditions of this contract insofar as it applies to their Work, but this shall not relieve the prime contractor from the full responsibility to the County for the proper completion of all Work to be executed under this contract.

**D.03 BIDS**

Bids are to be submitted in triplicate, one original and two copies, upon the County supplied forms. All blank spaces must be filled in as noted with amounts extended and totaled and no changes shall be made in the wording of the forms or in the items mentioned therein. In the event a change is made in your submittal, the Bidder shall write its initials by the change. Any bid may be rejected which contains any omissions, alterations, irregularities of any kind, or which shall in any manner fail to conform to bid requirements.

A bid made by an individual, either in his/her own or proper person or under a trade or firm name, shall be executed under the individual's signature. If made by a partnership, the bid shall be executed by two or more of the general partners. If made by a corporation, the bid shall be executed by its President or other legally authorized corporate officer or agent.

**D.04 EXAMINATION OF CONTRACT DOCUMENTS AND SITE**

It is the responsibility of each Bidder before submitting a Bid, to (a) examine the Bid Documents thoroughly; (b) visit the site to become familiar with local conditions that may affect cost, progress, performance, or furnishing of the Work; (c) consider federal, state, and local codes, laws, and regulations that may affect costs, progress, performance, or furnishing of the Work; (d) study and carefully correlate Bidder's observations with the Bid Documents; and (e) notify County of all conflicts, errors, or discrepancies in the Bid Document.

The accuracy of the existing utility locations shown on the plans is approximate and without express or implied warranty. Each Bidder may, at Bidder's own expense, make or obtain any additional examinations, investigations, explorations, tests and studies, and obtain any additional information and data which pertain to the physical conditions at or contiguous to the site or otherwise which may affect cost, progress, performance or furnishing of the Work and which Bidder deems necessary to determine his Bid for performing and furnishing the Work in accordance with the time, price and other terms and conditions of the Contract Documents.

County will provide each Bidder access to the site to conduct such explorations and tests. Bidder shall fill all holes, clean up and restore the site to its former condition upon completion of such explorations. The lands upon which the Work is to be performed, rights-of-way and easements for access thereto, and other lands designated for use by Contractor in performing the Work are identified in the Contract Documents. All additional lands and access thereto required for temporary construction facilities or storage of materials and equipment are to be provided by Contractor. Easements for permanent structures or permanent changes in existing structures are to be obtained and paid for by County unless otherwise provided in the Contract Documents.

**D.05 MATERIALS AND WORKMANSHIP**

All materials and apparatus required for this Work, except as specifically specified otherwise, shall be new, of first class quality, and shall be furnished, delivered, connected and finished in every detail. Construction shall be prescribed by good industry practice and in accordance with manufacturer's recommendations for the type being installed.

Use skilled workman trained and experienced in the necessary trades and who are completely familiar with the specified requirements and the methods needed for proper performance of the Work of this section.

**D.06 REGULATIONS AND MATERIAL DISPOSAL**

It shall be the responsibility of the contractor to assure compliance with any OSHA, EPA, federal, state, and/or local rules, regulations or other requirements as each may apply.

**D.07 PROJECT CLOSE-OUT**

Clean construction site and remove any and all excess materials. Correct any damages to property that may have occurred as a result of installation and/or delivery. Repair and patch all surfaces cut for installation. The Contractor shall remedy any deficiencies promptly should the County determine any work is incomplete or defective.

When the County determines the Work is acceptable in accordance with this Invitation for Bid, the Contractor shall provide the close out submittals, including but not necessarily limited to the following:

- |       |                                   |                   |
|-------|-----------------------------------|-------------------|
| 1 set | Certificate of warranties         |                   |
| 1 set | Manufacturer's product literature | (when applicable) |
| 1 set | Project Record Drawings           |                   |
| 1 set | Subcontractor Information         | (when applicable) |

**D.08 DISCRETIONARY WORK**

This Bid Item entails minor increases (that may be directed by staff) to existing bid item quantities or minor modification items not bid which were unforeseen and necessary during the construction to provide a safe, complete project in accordance with Bid Documents. (This will not affect the requirement for change orders

involving major modifications to the project.) Payment for all Work under this item shall be made only at the County's discretion in order to satisfactorily complete the project. In general, this item is for unanticipated conflicts and/or design changes

required during construction which are necessary to complete the project without changing the initial scope of Work and without costly delays.

**D.09 PROGRESS REQUIREMENTS**

The awarded contractor will at the scheduled Pre-Construction meeting provide to the County representative (s) the construction schedule for review and acceptance.

**END OF SECTION D**

## SECTION 00150

**MANATEE COUNTY LOCAL PREFERENCE LAW AND VENDOR REGISTRATION****E.01 Vendor Registration**

All vendors are encouraged to register with Manatee County using the on-line "Vendor Registration" web page on [www.mymanatee.org](http://www.mymanatee.org).

Enclosed are a copy of the current Manatee County law that details the County's Local Preference and the County's definition of a Local Business.

If you assert that your firm meets the stated definition of a Local Business, we ask that in addition to registering on the County's Web page, you fill out the attached "**Affidavit As To Local Business Form**" that is included in this section, have the completed document notarized, and mail the original to the following address: Manatee County Administration Center, 1112 Manatee Avenue West, Suite 803, Bradenton, FL 34205.

Your cooperation in registering your business with Manatee County will enhance our opportunities to identify sources for goods and services, plus identify Local Businesses. This information is used for soliciting quotations up to \$250,000.00 and for competitive solicitations of larger purchases.

You will note that Manatee County collaborates with the Manatee Chamber of Commerce, posting bids on [www.manateechamber.com](http://www.manateechamber.com) as well as using the same vendor categories for registration.

Our staff can assist you with your registration as needed. Our office hours are 8:00 A.M. to 5:00 P.M., Monday through Friday on regular business days. Please call (941) 749-3014 if you wish to have a purchasing staff member assist you.

**Quick steps to registration:**                      **[www.mymanatee.org](http://www.mymanatee.org)**

A link to "Purchasing" is listed under "Quick Links" on page one of the County Web Site.

On the left hand side of the Purchasing Web page, click on "Vendor Registration".

This will bring up the Vendor Registration form for on-line input. Please note that the definition of a "Local Business" changed on March 17, 2009. The Web page will be updated to include the current Law which has been provided in this section of the bid.

Thank you for reviewing this information and considering registering your business with Manatee County. Registration is not mandatory; however, by taking the time to register, you are helping the County to provide timely notifications of quotation, bid and proposal opportunities to your business.

**E.02 Section 2-26-6. Local preference, tie bids, local business defined.**

(a) Whenever a responsible local business bidder and a responsible non-local business bidder are found, upon the opening of bids, to have both submitted the lowest responsive bid, the bid of the local bidder shall be awarded the contract. Should more than one responsible local business bidder match the responsible non-local business bidder's lowest responsive bid, or should no responsible local business bidder match the lowest responsive bid but two or more responsible non-local business bidders submit lowest responsive bids for equal amounts, then the award of the contract shall be determined by a chance drawing, coin toss, or similar tie-breaking method conducted by the purchasing office and open to the public. Any bidders seeking to be recognized as local businesses for purposes of this local business preference provision may be required by the terms of the bid announcement to certify they meet the definition of local business set forth in this section, and to register as a local business with the County in the manner prescribed by the County to facilitate the County's ability to track the award of contracts to local businesses and to allow the County to provide future notifications to its local businesses concerning other bidding opportunities.

(b) Nothing herein shall be deemed to prohibit the inclusion of requirements with respect to operating and maintaining a local place of business in any invitation for bids when the bidder's location materially affects the provisions of the services or supplies that are required by the invitation.

**(c) Local business is defined as a business legally authorized to engage in the sale of the goods and/or services to be procured, and which certifies within its bid that for at least six (6) months prior to the announcement of the solicitation of bids it has maintained a physical place of business in Manatee, Desoto, Hardee, Hillsborough, Pinellas or Sarasota County with at least one full-time employees at that location.**

(d) Each solicitation for bids made by the County shall contain terms expressly describing the local business preference policies of the County, and shall provide that by electing to submit a bid pursuant to a request for bids, all bidders are deemed to understand and agree to those policies.

(e) For all contracts for architecture, professional engineering, or other professional services governed by Florida Statute § 287.055, the Consultants' Competitive Negotiation Act, the County shall include the local business status of a firm among the factors considered when selecting which firms are "most highly qualified." In determining which firm is the "most qualified" for purposes of negotiating a satisfactory contract, preference shall be given to a local business where all other relevant factors are equal.

(f) Local preference shall not apply to the following categories of contracts:

1. Goods or services provided under a cooperative purchasing agreement or similar "piggyback" contract;
2. Contracts for professional services subject to Florida Statute § 287.055, the Consultants' Competitive Negotiation Act, except as provided for in subsection (e) above;

**E.02 Section 2-26-6. Local preference, tie bids, local business defined. (Continued)**

3. Purchases or contracts which are funded, in whole or in part, by a governmental or other funding entity, where the terms and conditions of receipt of the funds prohibit the preference;
  4. Purchases or contracts made pursuant to a non-competitive award process, unless otherwise provided by this section;
  5. Any bid announcement which specifically provides that the general local preference policies set forth in this section are suspended due to the unique nature of the goods or services sought, the existence of an emergency as found by either the County commission or County administrator, or where such suspension is, in the opinion of the County attorney, required by law.
- (g) To qualify for local preference under this section, **a local business must certify to the County that it:**
1. Has not within the five years prior to the bid announcement admitted guilt or been found guilty by any court or state or federal regulatory enforcement agency of violation of any criminal law, or a law or administrative regulation regarding fraud;
  2. Is not currently subject to an unresolved citation or notice of violation of any Manatee County Code provision, except citations or notices which are the subject of a current legal appeal, as of the date of the bid announcement;
  3. Is not delinquent in the payment of any fines, liens, assessments, fees or taxes to any governmental unit or taxing authority within Manatee County, except any such sums which are the subject of a current legal appeal.

Ref: Ordinance 09-21 and 09-23 **PASSED AND DULY ADOPTED** in open session, with a quorum present and voting, on the 17<sup>th</sup> day of March, 2009.

**END OF SECTION 00150 (E)**

**MANATEE COUNTY GOVERNMENT  
AFFIDAVIT AS TO LOCAL BUSINESS  
(Complete and Initial Items B-F)**

**A. Authorized Representative**

I, [name] \_\_\_\_\_, am the [title] \_\_\_\_\_

and the duly authorized representative of: [name of business] \_\_\_\_\_

\_\_\_\_\_, and that I possess direct personal knowledge to make informed responses to these certifications and the legal authority to make this Affidavit on behalf of myself and the business for which I am acting; and by electing to submit a bid pursuant to this Invitation for Bids, shall be deemed to understand and agree to the local business preference policies of Manatee County; and that I have the direct knowledge to state that this firm complies with all of the following conditions to be considered to be a Local Business as required by the Manatee County Code of Law, Section 2-26-6.

**B. Place of Business:** I certify that the above business is legally authorized to engage in the sale of goods and/or services and has a physical place of business in Manatee, DeSoto, Hardee, Hillsborough, Pinellas or Sarasota County with at least one (1) fulltime employee at that location. The physical address of the location which meets the above criteria is: \_\_\_\_\_ [Initial] \_\_\_\_\_

**C. Business History:** I certify that business operations began at the above physical address with at least one fulltime employee on [date] \_\_\_\_\_ [Initial] \_\_\_\_\_

**D. Criminal Violations:** I certify that within the past five years of the date of this Bid announcement, this business has not admitted guilt nor been found guilty by any court or local, state or federal regulatory enforcement agency of violation of any criminal law or administrative regulation regarding fraud. [Initial] \_\_\_\_\_

**E. Citations or Code Violations:** I certify that this business is not currently subject to any unresolved citation or notice of violation of any Manatee County Code provision, with the exception of citations or notices which are the subject of a legal current appeal within the date of this bid announcement. [Initial] \_\_\_\_\_

**F. Fees and Taxes:** I certify that within this business is not delinquent in the payment of fines, liens, assessments, fees or taxes to any governmental unit or taxing authority within Manatee County, with the exception of those which are the subject of a legal current appeal. [Initial] \_\_\_\_\_

*Each of the above certifications is required to meet the qualification of "Local Business" under Manatee County Code of Law, 2-26-6.*

Signature of Affiant \_\_\_\_\_

STATE OF FLORIDA

COUNTY OF \_\_\_\_\_

Sworn to (or affirmed) and subscribed before me this \_\_\_\_ day of \_\_\_\_\_, 2011, by (name of person making statement).

(Notary Seal) Signature of Notary: \_\_\_\_\_

Name of Notary (Typed or Printed) \_\_\_\_\_

Personally Known \_\_\_\_ OR Produced Identification \_\_\_\_ Type of Identification Produced \_\_\_\_\_

**Submit executed copy to Manatee County Purchasing, Suite 803, 1112 Manatee Avenue W., Bradenton, FL 34205.**

**BID FORM  
SECTION 00300  
(SUBMIT IN TRIPLICATE)**

**For: Coquina Concession Building Remodel  
Manatee County Project No. 49643**

<b>TOTAL BID PRICE "A": \$ _____</b>
Based on a Completion Time of <b>180</b> calendar days
<b>TOTAL BID PRICE "B": \$ _____</b>
Based on a Completion Time of <b>120</b> calendar days

Two schedules for Completion of the Work shall be considered. Each bid for completion by the specified stated time shall be offered as a separate "Total Bid Price". The County has the sole authority to select the bid based on the Completion Time which is the best interest of the County. Only one award shall be made.

We, the undersigned, hereby declare that we have carefully reviewed the bid documents, and with full knowledge and understanding of the aforementioned herewith submit this bid, meeting each and every specification, term, and condition contained in the Invitation for Bids.

We understand that the bid technical specifications, terms, and conditions in their entirety shall be made a part of any agreement or contract between Manatee County and the successful bidder. Failure to comply shall result in contract default, whereupon, the defaulting contractor shall be required to pay for any and all re-procurement costs, damages, and attorney fees as incurred by the County.

Communications concerning this Bid shall be addressed as follows:

Person's Name: \_\_\_\_\_

Address: \_\_\_\_\_ Phone: \_\_\_\_\_

Date: \_\_\_\_\_ FL Contractor License# \_\_\_\_\_

Bidder is a WBE/MBE Vendor? \_\_\_\_\_ Certification \_\_\_\_\_

COMPANY'S NAME: \_\_\_\_\_

**AUTHORIZED SIGNATURE(S):** \_\_\_\_\_

Name and Title of Above Signer(s) \_\_\_\_\_

CO. MAILING ADDRESS: \_\_\_\_\_

STATE OF INCORPORATION \_\_\_\_\_ (if applicable)

TELEPHONE: (\_\_\_\_\_) \_\_\_\_\_ FAX: (\_\_\_\_\_) \_\_\_\_\_

Email address: \_\_\_\_\_

I, \_\_\_\_\_ on \_\_\_\_\_ visited the project site to  
(name) (date)

familiarize myself with the full scope of work required for the bid.

Acknowledge Addendum No. \_\_\_\_\_ Dated: \_\_\_\_\_ Acknowledge Addendum No. \_\_\_\_\_ Dated: \_\_\_\_\_

Acknowledge Addendum No. \_\_\_\_\_ Dated: \_\_\_\_\_ Acknowledge Addendum No. \_\_\_\_\_ Dated: \_\_\_\_\_

Acknowledge Addendum No. \_\_\_\_\_ Dated: \_\_\_\_\_ Acknowledge Addendum No. \_\_\_\_\_ Dated: \_\_\_\_\_

**BID FORM**  
(Submit in Triplicate)

**BID "A"**

Section 00300  
**(IFB) #11-1021-DS**  
**Coquina Concession Building Remodel**  
**Project 49643**

**BID "A" Based on Completion time of 180 calendar days**

ITEM NO.	DESCRIPTION	QTY	U/M	BID PRICE PER UNIT	TOTAL BID PRICE
1	MOBILIZATION	1	LS	\$	\$
2	TEMPORARY ERROSION CONTROL	1	LS	\$	\$
3	DEMOLITION	1	LS	\$	\$
4	SITE WORK - COMPLETE	1	LS	\$	\$
5	LANDSCAPE AND IRRIGATION	1	LS	\$	\$
6	BUILDING - COMPLETE	1	LS	\$	\$
7	DISCRETIONARY WORK				\$ <b>30,000.00</b>
<b>TOTAL CONSTRUCTION COST</b>					\$
8	HAZARDOUS MATERIAL REMOVAL	1	CY	\$	\$
<b>TOTAL BID PRICE "A"</b> <b>Based on Completion Time of 180 Calendar Days.</b>					

BIDDER (FIRM NAME): \_\_\_\_\_

AUTHORIZED SIGNATURE: \_\_\_\_\_

BID "A"

**BID FORM**  
(Submit in Triplicate)

**BID "B"**

Section 00300  
(IFB) #11-1021-DS  
Coquina Concession Building Remodel  
Project 49643

**BID "A" Based on Completion time of 120 calendar days**

ITEM NO.	DESCRIPTION	QTY	U/M	BID PRICE PER UNIT	TOTAL BID PRICE
1	MOBILIZATION	1	LS	\$	\$
2	TEMPORARY EROSION CONTROL	1	LS	\$	\$
3	DEMOLITION	1	LS	\$	\$
4	SITE WORK - COMPLETE	1	LS	\$	\$
5	LANDSCAPE AND IRRIGATION	1	LS	\$	\$
6	BUILDING - COMPLETE	1	LS	\$	\$
7	DISCRETIONARY WORK				\$ 30,000.00
	<b>TOTAL CONSTRUCTION COST</b>				\$
8	HAZARDOUS MATERIAL REMOVAL	1	CY	\$	\$
<b>TOTAL BID PRICE "B"</b> Based on Completion Time of 120 Calendar Days.					

BIDDER (FIRM NAME): \_\_\_\_\_

AUTHORIZED SIGNATURE: \_\_\_\_\_

BID "B"

**SWORN STATEMENT  
THE FLORIDA TRENCH SAFETY ACT**

THIS FORM MUST BE SIGNED IN THE PRESENCE OF A NOTARY PUBLIC OR BY AN OFFICER AUTHORIZED TO ADMINISTER OATHS.

1. This Sworn Statement is submitted with IFB No. #11-1021-DS
2. This Sworn Statement is submitted by \_\_\_\_\_  
whose business address is \_\_\_\_\_  
and, if applicable, its Federal Employer Identification Number (FEIN) is \_\_\_\_\_. If  
the entity has no FEIN, include the Social Security Number of the individual signing this  
sworn statement \_\_\_\_\_.
3. Name of individual signing this Sworn Statement is: \_\_\_\_\_,  
Whose relationship to the above entity is: \_\_\_\_\_.
4. The Trench Safety Standards that will be in effect during the construction of this project shall include, but are not limited to: Laws of Florida, Chapters 90-96, TRENCH SAFETY ACT, and OSHA RULES AND REGULATIONS 29 CFR 1926.650 Subpart P, effective October 1, 1990.
5. The undersigned assures that the entity will comply with the applicable Trench Safety Standards and agrees to indemnify and hold harmless the County and Engineer, and any of their agents or employees from any claims arising from the failure to comply with said standard.
6. The undersigned has appropriated the following costs for compliance with the applicable standards:

<u>Trench Safety Measure (Description)</u>	<u>Units of Measure (LF, SY)</u>	<u>Unit Quantity</u>	<u>Unit Cost</u>	<u>Extended Cost</u>
a. _____	_____	_____	\$ _____	_____
b. _____	_____	_____	\$ _____	_____
c. _____	_____	_____	\$ _____	_____
d. _____	_____	_____	\$ _____	_____

7. The undersigned intends to comply with these standards by instituting the following procedures:  
\_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_.

THE UNDERSIGNED, in submitting this Bid, represents that they have reviewed and considered all available geotechnical information and made such other investigations and tests as they may deem necessary to adequately design the trench safety system(s) to be utilized on this project.

\_\_\_\_\_  
(AUTHORIZED SIGNATURE / TITLE)

SWORN to and subscribed before me this \_\_\_\_ day of \_\_\_\_\_, 2011.  
(impress official seal)

\_\_\_\_\_  
Notary Public, State of Florida  
My commission expires: \_\_\_\_\_

SECTION 00430  
**CONTRACTOR'S QUESTIONNAIRE**  
(Submit in Triplicate)

The Bidder warrants the truth and accuracy of all statements and answers herein contained. (Include additional sheets if necessary.)

THIS QUESTIONNAIRE MUST BE COMPLETED AND SUBMITTED WITH YOUR BID/QUOTE.

1. LICENSE #: \_\_\_\_\_  
 COMPANY'S NAME: \_\_\_\_\_  
 \_\_\_\_\_  
 CO. PHYSICAL ADDRESS \_\_\_\_\_  
 \_\_\_\_\_  
 CITY \_\_\_\_\_  
 \_\_\_\_\_ (STATE of INCORPORATION, IF APPLICABLE)  
 \_\_\_\_\_ (ZIP CODE)  
 (\_\_\_\_) \_\_\_\_\_ TELEPHONE NUMBER: (\_\_\_\_) \_\_\_\_\_ FAX  
 EMAIL ADDRESS: \_\_\_\_\_

2. Bidding as an individual \_\_\_ a partnership: \_\_\_ a corporation; \_\_\_ a joint venture \_\_\_

3. If a partnership: list names and addresses of partners; if a corporation: list names of officers, directors, shareholders, and state of incorporation; if joint venture: list names and address of ventures' and the same if any venture are a corporation for each such corporation, partnership, or joint venture:  
 \_\_\_\_\_  
 \_\_\_\_\_  
 \_\_\_\_\_  
 \_\_\_\_\_

4. Your organization has been in business (under this firm's name) as a  
 \_\_\_\_\_  
 \_\_\_\_\_  
 for how many years? \_\_\_\_\_

\_\_\_\_\_ **Years holding a Certified General Contractors license.**

**Contractor shall have a minimum of three (3) years experience holding a valid/active Certified General Contractor's license.**

Has license ever been suspended, revoked, removed or under investigation?  
 \_\_\_\_\_  
 \_\_\_\_\_

5. Describe and give the date and County of the last three government projects you've completed which are similar in cost, type, size, and nature as the one proposed (for a public entity), include contact name and phone number. Provide the Budget, Actual Cost, Size and Summary of Work for each project. "Attach additional pages as necessary".

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6. Have you ever been assessed liquidated damages under a contract during the past five (5) years? If so, state when, where (contact name, address, and phone number) and why.

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7. Have you ever failed to complete work awarded to you? If so, state when, where (Contact name, address, phone number) and why?

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8. Have you ever been debarred or prohibited from bidding on a governmental entity's construction project? If yes, name the entity and describe the circumstances:

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9. Name three individuals, governmental entities, or corporations for which you have performed similar work and to which you refer. Include contact name and phone number:

- 1. \_\_\_\_\_
- 2. \_\_\_\_\_
- 3. \_\_\_\_\_

10. What specific steps have you taken to examine the physical conditions at or contiguous to the site, including but not limited to, the location of existing underground facilities?

Have you visited the site \_\_\_\_\_

Provide date (s) of site visit: \_\_\_\_\_

\_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_

11. What specific physical conditions, including, but not limited to, the location of existing underground facilities have you found which will, in any manner, affect cost, progress, performance, or finishing of the work?

\_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_

12. Will you subcontract any part of this Work? If so, describe which major portion(s):

\_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_

13. If any, list (with contract amount) WBE/MBE to be utilized:

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14. What equipment do you own to accomplish this Work?

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15. What equipment will you purchase/rent for the Work? (Specify which)

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16. Concisely summarize your organization's process to meet the "Be Green" initiative encouraged in note in C.20 "Be Green"

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17. List the following in connection with the Surety which is providing the Bond(s):

Surety's Name: \_\_\_\_\_

Surety's Address: \_\_\_\_\_

Surety's Address: \_\_\_\_\_

Name, address and phone number of Surety's resident agent for service of process in Florida:

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Phone: (\_\_\_\_\_) \_\_\_\_\_

Email \_\_\_\_\_

**PUBLIC CONTRACTING AND ENVIRONMENTAL CRIMES CERTIFICATION**

**SWORN STATEMENT PURSUANT TO ARTICLE 6,  
MANATEE COUNTY PURCHASING CODE**

**THIS FORM MUST BE SIGNED AND SWORN TO IN THE PRESENCE OF A NOTARY PUBLIC OR OTHER OFFICIAL AUTHORIZED TO ADMINISTER OATHS.**

This sworn statement is submitted to the Manatee County Board of County Commissioners by

\_\_\_\_\_ [print individual's name and title]

\_\_\_\_\_ for \_\_\_\_\_ [print name of entity submitting sworn statement]

whose business address is: \_\_\_\_\_

and (if applicable) its Federal Employer Identification Number (FEIN) is \_\_\_\_\_. If the entity has no FEIN, include

the Social Security Number of the individual signing this sworn statement: \_\_\_\_\_

I understand that no person or entity shall be awarded or receive a county contract for public improvements, procurement of goods or services (including professional services) or a county lease, franchise, concession or management agreement, or shall receive a grant of county monies unless such person or entity has submitted a written certification to the County that it has not:

- (1) been convicted of bribery or attempting to bribe a public officer or employee of Manatee County, the State of Florida, or any other public entity, including, but not limited to the Government of the United States, any state, or any local government authority in the United States, in that officer's or employee's official capacity; or
- (2) been convicted of an agreement or collusion among bidders or prospective bidders in restraint of freedom of competition, by agreement to bid a fixed price, or otherwise; or
- (3) been convicted of a violation of an environmental law that, in the sole opinion of the County's Purchasing Director, reflects negatively upon the ability of the person or entity to conduct business in a responsible manner; or
- (4) made an admission of guilt of such conduct described in items (1), (2) or (3) above, which is a matter of record, but has not been prosecuted for such conduct, or has made an admission of guilt of such conduct, which is a matter of record, pursuant to formal prosecution. An admission of guilt shall be construed to include a plea of nolo contendere; or
- (5) where an officer, official, agent or employee of a business entity has been convicted of or has admitted guilt to any of the crimes set forth above on behalf of such and entity and pursuant to the direction or authorization of an official thereof (including the person committing the offense, if he is an official of the business entity), the business shall be chargeable with the conduct herein above set forth. A business entity shall be chargeable with the conduct of an affiliated entity, whether wholly owned, partially owned, or one which has common ownership or a common Board of Directors. For purposes of this Form, business entities are affiliated if, directly or indirectly, one business entity controls or has the power to control another business entity, or if an individual or group of individuals controls or has the power to control both entities. Indicia of control shall include, without limitation, interlocking management or ownership, identity of interests among family members, shared organization of a business entity following the ineligibility of a business entity under this Article, or using substantially the same management, ownership or principles as the ineligible entity.

(Cont'd.)

Any person or entity who claims that this Article is inapplicable to him/her/it because a conviction or judgment has been reversed by a court of competent jurisdiction shall prove the same with documentation satisfactory to the County's Purchasing Director. Upon presentation of such satisfactory proof, the person or entity shall be allowed to contract with the County.

I UNDERSTAND THAT THE SUBMISSION OF THIS FORM TO THE CONTRACTING OFFICER FOR MANATEE COUNTY IS VALID THROUGH DECEMBER 31 OF THE CALENDAR YEAR IN WHICH IT IS FILED. I ALSO UNDERSTAND THAT ANY CONTRACT OR BUSINESS TRANSACTION SHALL PROVIDE FOR SUSPENSION OF PAYMENTS, OR TERMINATION, OR BOTH, IF THE CONTRACTING OFFICER OR THE COUNTY ADMINISTRATOR DETERMINES THAT **SUCH PERSON OR ENTITY HAS MADE FALSE CERTIFICATION.**

\_\_\_\_\_  
[Signature]

STATE OF FLORIDA  
COUNTY OF \_\_\_\_\_

Sworn to and subscribed before me this \_\_\_\_ day of \_\_\_\_\_, 2011 by \_\_\_\_\_

Personally known \_\_\_\_\_ OR Produced identification \_\_\_\_\_  
[Type of identification]

\_\_\_\_\_  
Notary Public Signature My commission expires \_\_\_\_\_

\_\_\_\_\_  
[Print, type or stamp Commissioned name of Notary Public]

**Signatory Requirement** - In the case of a business entity other than a partnership or a corporation, this affidavit shall be executed by an authorized agent of the entity. In the case of a partnership, this affidavit shall be executed by the general partner(s). In the case of a corporation, this affidavit shall be executed by the corporate president.

**SECTION 00491  
Drug Free Work Place Certification**

SWORN STATEMENT PURSUANT TO SECTION 6-101(7) (B),  
MANATEE COUNTY PURCHASING CODE

**THIS FORM MUST BE SIGNED AND SWORN TO IN THE PRESENCE OF A NOTARY PUBLIC OR OTHER OFFICIAL AUTHORIZED TO ADMINISTER OATHS.**

This sworn statement is submitted to the Manatee County Board of County Commissioners'

by \_\_\_\_\_  
[Print individual's name and title]

\_\_\_\_\_ for \_\_\_\_\_  
(print name of entity submitting sworn statement)

Whose business address is \_\_\_\_\_

and (if applicable) its Federal Employer Identification Number (FEIN) is \_\_\_\_\_

(If the entity has no FEIN, include the Social Security Number of the individual signing this sworn statement:  
\_\_\_\_\_

I understand that no person or entity shall be awarded or receive a county contract for public improvements, procurement of goods or services (including professional services) or a county lease, franchise, concession or management agreement, or shall receive a grant of county monies unless such person or entity has submitted a written certification to the County that it will provide a drug free work place by:

(1) providing a written statement to each employee notifying such employee that the unlawful manufacture, distribution, dispensation, possession or use of a controlled substance as defined by § 893.02(4), Florida Statutes, as the same may be amended from time to time, in the person's or entity's work place is prohibited specifying the actions that will be taken against employees for violation of such prohibition. Such written statement shall inform employees about:

- (i) the dangers of drug abuse in the work place;
- (ii) the person's or entity's policy of maintaining a drug free environment at all its work places, including but not limited to all locations where employees perform any task relating to any portion of such contract, business transaction or grant;
- (iii) any available drug counseling, rehabilitation, and employee assistance programs; and
- (iv) the penalties that may be imposed upon employees for drug abuse violations.

(2) Requiring the employee to sign a copy of such written statement to acknowledge his or her receipt of same and advice as to the specifics of such policy. Such person or entity shall retain the statements signed by its employees. Such person or entity shall also post in a prominent place at all of its work places a written statement of its policy containing the foregoing elements (i) through (iv).

(3) Notifying the employee in the statement required by subsection (1) that as a condition of employment the employee will:

- (i) abide by the terms of the statement; and

ATTACHMENT B (Cont'd.)

(ii) notify the employer of any criminal drug statute conviction for a violation occurring in the work place no later than five (5) days after such a conviction.

(4) Notifying the County within ten (10) days after receiving notice under subsection (3) from an employee or otherwise receiving actual notice of such conviction.

(5) Imposing appropriate personnel action against such employee up to and including termination; or requiring such employee to satisfactorily participate in a drug abuse assistance or rehabilitation program approved for such purposes by a federal, state, or local health, law enforcement, or other appropriate agency.

(6) Making a good faith effort to continue to maintain a drug free work place through implementation of sections (1) through (5) stated above.

I UNDERSTAND THAT THE SUBMISSION OF THIS FORM TO THE CONTRACTING OFFICER FOR MANATEE COUNTY IS VALID THROUGH DECEMBER 31 OF THE CALENDAR YEAR IN WHICH IT IS FILED. I ALSO UNDERSTAND THAT ANY CONTRACT OR BUSINESS TRANSACTION SHALL PROVIDE FOR SUSPENSION OF PAYMENTS, OR TERMINATION, OR BOTH, IF THE CONTRACTING OFFICER OR THE COUNTY ADMINISTRATOR DETERMINES THAT:

- (1) Such person or entity has made false certification.
- (2) Such person or entity violates such certification by failing to carry out the requirements of sections (1), (2), (3), (4), (5), or (6) or subsection 3-101(7)(B); or
- (3) Such a number of employees of such person or entity have been convicted of violations occurring in the work place as to indicate that such person or entity has failed to make a good faith effort to provide a drug free work place as required by subsection 3-101(7) (B).

\_\_\_\_\_  
[Signature]

STATE OF FLORIDA  
COUNTY OF \_\_\_\_\_

Sworn to and subscribed before me this \_\_ day of \_\_\_\_\_, 2011 by \_\_\_\_\_

Personally known \_\_\_\_\_ OR Produced identification \_\_\_\_\_  
[Type of identification]

\_\_\_\_\_  
Notary Public Signature My commission expires \_\_\_\_\_

\_\_\_\_\_  
[Print, type or stamp Commissioned name of Notary Public]

**Signatory Requirement** - In the case of a business entity other than a partnership or a corporation, this affidavit shall be executed by an authorized agent of the entity. In the case of a partnership, this affidavit shall be executed by the general partner(s). In the case of a corporation, this affidavit shall be executed by the corporate president.

SECTION 00500  
FORM OF AGREEMENT  
BETWEEN THE  
COUNTY OF MANATEE, FLORIDA  
AND THE CONTRACTOR AS IDENTIFIED BELOW  
ON THE BASIS OF A STIPULATED UNIT COST CONTRACT PRICE

THIS AGREEMENT is made and entered into by and between the COUNTY OF MANATEE, a political subdivision of the state of Florida, hereinafter referred to as the "OWNER" and XXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXX hereinafter referred to as the "CONTRACTOR," duly authorized to transact business in the state of Florida, with offices located at XXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXX

Phone: (    ) \_\_\_\_\_

**Article 1. WORK**

CONTRACTOR shall furnish all labor, materials, supplies, and other items required to complete the Work for IFB No. 11-1021-DS Coquina Concession Building Remodel in strict accordance with Contract Documents and any duly authorized subsequent addenda thereto, all of which are made a part hereof.

**Article 2. ENGINEER**

The County of Manatee, Project Management Department, is responsible as the OWNER and Mr. Drazen Ahmedic, AIA of SCHENKELSHULTZ ARCHITECTURE hereinafter referred to as "ENGINEER," designed this project and is responsible for technical/engineering reviews and decisions. The ENGINEER is a member of the OWNER'S project management team which is collectively responsible in ensuring the Work is completed in accordance with the Contract Documents. All communications involving this project will be addressed to:

County of Manatee  
Property Management Department  
Attn: Mr. Darin Cushing  
Project Manager  
IFB# 11-1021-DS  
1112 Manatee Avenue West Suite 803  
Bradenton, FL 34205  
Phone (941) 748-4501, Ext 3063

Schenkel Shultz Architecture  
677 North Washington Blvd  
Attn: Mr. Drazen Ahmedic, AIA  
Project Engineer  
IFB# 11-1021-DS  
677 N. Washington Blvd, Suite 37  
Sarasota Florida 34236  
Phone (941) 952-5875

**Article 2. ENGINEER (Continued)**

Where the terms ENGINEER and/or OWNER are used in the Contract Documents, it shall mean the OWNER'S project management team.

**Article 3. CONTRACTOR'S REPRESENTATIONS**

In order to induce OWNER to enter into this Agreement, CONTRACTOR makes the following representations:

- 3.1 CONTRACTOR has familiarized itself with the nature and extent of the Bid Documents, Work, site, locality and all local conditions and laws and regulations that in any manner may affect cost, progress, performance or furnishing of the Work.
- 3.2 CONTRACTOR has studied carefully all drawings of the physical conditions upon which CONTRACTOR is entitled to rely.
- 3.3 CONTRACTOR has obtained and carefully studied (or assumes responsibility for obtaining and carefully studying) all such examinations, investigations, explorations, tests, reports and studies which pertain to the physical conditions at or contiguous to the site or which otherwise may affect the cost, progress, performance or furnishing of the Work as CONTRACTOR considers necessary for the performance or furnishing of the Work at the Contract Price, within the Contract Time and in accordance with the other terms and conditions of the Bid Documents; and no additional examinations, investigations, explorations, tests, reports, studies or similar information or data are or will be required by CONTRACTOR for such purposes.
- 3.4 CONTRACTOR has reviewed and checked all information and data shown or indicated on the Bid Documents with respect to existing underground facilities at or contiguous to the site and assumes responsibility for the accurate location of said underground facilities. Any additional examinations, investigations, explorations, tests, reports, studies or similar information or data in respect of said underground facilities conducted by the CONTRACTOR will be done at the CONTRACTOR'S expense.

- 3.5 CONTRACTOR has correlated the results of all such observations, examinations, investigations, explorations, tests, reports and studies with the terms and conditions of the Bid.
- 3.6 CONTRACTOR has given OWNER written notice of all conflicts, errors or discrepancies that have been discovered in the Bid Documents and the written resolution thereof by OWNER is acceptable to CONTRACTOR.
- 3.7 CONTRACTOR shall schedule and perform the Work subject to OWNER'S approval and shall hold OWNER harmless from all liabilities incurred due to CONTRACTOR'S failure to coordinate with the OWNER.

#### **Article 4. CONTRACT DOCUMENTS**

The Contract Documents which comprise the entire Agreement between OWNER and CONTRACTOR concerning the Work consist of the following:

- 4.1 This Agreement and Bid Document **IFB#11-1021-DS**
- 4.2 Performance and/or other Bonds and Insurance Certificate(s)
- 4.3 Drawings (not attached)
- 4.4 Addenda numbers \_\_\_\_\_ to \_\_\_\_\_, inclusive.
- 4.5 CONTRACTOR'S Bid Form and any other information submitted by Contractor prior to Notice of Award.
- 4.6 The following which may be delivered or issued after the effective date of the Agreement and are not attached hereto: all written Change Orders and other documents amending, modifying, or supplementing the Contract Documents.
- 4.7 The documents listed in paragraphs above are attached to this Agreement (except as noted otherwise above). There are no Contract Documents other than those listed above in this Article 4.

**Article 5. MISCELLANEOUS**

- 5.1 Terms used in this Agreement are defined in Article 1 of the General Conditions.
- 5.2 No assignment by a party hereto of any rights under or interest in the Contract Documents will be binding on another party hereto without the written consent of the party sought to be bound; and specifically but without limitation, monies that may become due and monies that are due may not be assigned without such consent (except to the extent that the effect of this restriction may be limited by law); and unless specifically stated to the contrary in any written consent to an assignment, no assignment will release or discharge the assignee from any duty or responsibility under the Contract Documents.
- 5.3 OWNER and CONTRACTOR each binds itself, its partners, successors, assigns and legal representatives to the other party hereto, its partners, successors, assigns and legal representatives in respect of all covenants, agreements and obligations contained in the Contract Documents.

The OWNER will pay, and the CONTRACTOR will accept in full consideration for the performance of the Work (IFB No. #11-1021-DS, Coquina Concession Building Remodel subject to additions and deductions as provided therein, the sum of Dollars and xxxxxxxxxxxxxxxx Cents (\$ xxxxxxxxxxxxxxxx ) for Bid " X " based on Completion Time of xxx calendar days and the sum of **\$580.00** as liquidated damages for each calendar day of delay.

**CONTRACTOR**

By: \_\_\_\_\_

Print Name: \_\_\_\_\_

Title: \_\_\_\_\_

Date: \_\_\_\_\_

**MANATEE COUNTY GOVERNMENT**

BY: \_\_\_\_\_ For the County  
Signature

R. C. "Rob" Cuthbert, C.P.M.; CPPO, Purchasing Official  
Name and Title of Signer

Date: \_\_\_\_\_

SECTION 00700  
GENERAL CONDITIONS

ARTICLE I - DEFINITIONS

Whenever used in the Bid Documents, the following terms have the meaning indicated which are applicable to both the singular and plural thereof:

Addendum - Written or graphic instruments issued prior to the opening of bids which clarify or change the bidding documents or the contract documents.

Agent – Project architect, project engineer, or other agency or person acting on behalf of Manatee County.

Agreement - The written Agreement between Owner and Contractor covering the Work to be performed; other contract documents are attached to the Agreement and made a part thereof as provided therein.

Application for Payment - The form accepted by Project Representative which is to be used by Contractor in requesting progress or final payments and which is to include such supporting documentation as is required by the contract documents.

Award - Acceptance of the bid from the person, firm, or corporation which in the Owner's sole and absolute judgment will under all circumstances best serve the public interest. Award shall be made in accordance with Manatee County Code of Laws.

Bid - The offer of the bidder submitted on the prescribed form setting forth the prices for the Work to be performed.

Bidder - One who submits a bid directly to the Owner, as distinct from a sub-bidder, who submits a bid to a Bidder.

Bidding Documents - Consists of the Invitation For Bid, which includes but is not limited to: the bid form, drawings, technical specifications, terms and conditions, and the proposed contract documents (including all Addenda issued prior to receipt of bids); and becomes a part of the Agreement.

Bonds - Performance and payment bonds and other instruments of security.

Change Order - A document recommended by Project Representative which is signed by Contractor and Owner and authorizes an addition, deletion, or revision in the Work or an adjustment in the contract price or the contract time, issued on or after the effective date of the Agreement.

Compensable Delay - Any delay beyond the control and without the fault or negligence of the Contractor resulting from Owner-caused changes in the Work, differing site conditions, suspensions of the Work, or termination for convenience by Owner

Contract Documents - The Agreement, Addenda (which pertain to the contract documents), Contractor's bid (including documentation accompanying the bid and any post-bid documentation submitted prior to the Notice of Award), the bonds, the specifications and the drawings, together with all amendments, modifications and supplements issued on or after the effective date of the Agreement.

Contract Price - The monies payable by Owner to Contractor under the contract documents as stated in the Agreement.

Contract Time - The number of days or the date stated in the Notice to Proceed for the completion of the Work.

Contractor - The person, firm or corporation with whom Owner has entered into an Agreement.

Days - All references to days are to be considered calendar days except as specified differently.

Defective - An adjective which when modifying the work refers to work that is unsatisfactory, faulty or deficient, or does not conform to the contract documents, or does not meet the requirements of any inspection, reference standard, test or approval referred to in the contract documents, or has been damaged prior to Project Representative's recommendation of final payment (unless responsibility for the protection thereof has been assumed by Owner).

Discretionary - Payment for all work that shall be made only at the Owner's discretion in order to satisfactorily complete the project in accordance with the Plans and Specifications.

Drawings - The drawings which show the character and scope of the Work to be performed and which have been prepared or approved by Engineer and are referred to in the bidding and contract documents.

Effective Date of the Agreement - The date indicated in the Agreement on which it becomes effective (date of execution).

Excusable Delay - Any delay beyond the control and without the negligence of the Contractor, the Owner, or any other contractor caused by events or circumstances such as, but not limited to, acts of God or of the public enemy, fires, floods, freight embargoes, acts of government other than Owner or epidemics. Labor disputes and above average rainfall shall give rise only to excusable delays.

Final Completion: The point in which all Work is complete and all other Agreement requirements have been satisfied.

Float or Slack Time - The time available in the progress schedule during which an unexpected activity can be completed without delaying substantial completion of the Work.

Inexcusable Delay - Any delay caused by events or circumstances within the control of the Contractor, such as inadequate crewing, slow submittals, etc., which might have been avoided by the exercise of care, prudence, foresight, or diligence on the part of the Contractor.

Non-prejudicial Delay - Any delay impacting a portion of the Work within the available total float or slack time and not necessarily preventing completion of the Work within the contract time.

Notice of Award - The written notice to the successful bidder stating Award has been approved by the Board of County Commissioners; or by the Purchasing Official in accordance with Manatee County Purchasing Code of Law, Chapter 2-26, Manatee County Purchasing Ordinance.

Notice of Intent to Award - The written notice to the apparent low bidder stating Award has been recommended with final Award to be authorized by the Board of County Commissioners.

Notice to Proceed - Written notice by Owner (after execution of contract) to Contractor fixing the date on which the contract time will commence to run and on which Contractor shall start to perform (ten (10) days from date of such notice) Contractor's obligations under the contract documents.

Owner - Manatee County, Florida, Board of County Commissioners.

Preconstruction Conference - Prior to starting the Work, a meeting scheduled by Owner with Contractor to review the Work schedules, to establish procedures for handling shop drawings and other submissions, for processing periodical pay estimates, and such other matters as may be pertinent to the project.

Prejudicial Delay - Any excusable or compensable delay impacting the Work and exceeding the total float available in the progress schedule, thus preventing completion of the Work within the contract time unless the Work is accelerated.

Pre-operation Testing - All field inspections, installation checks, water tests, performance tests and necessary corrections required of Contractor to demonstrate that individual components of the work have been properly constructed and do operate in accordance with the contract documents for their intended purposes.

Project - The total construction of which the Work to be provided under the contract documents may be the whole or a part as indicated elsewhere in the contract documents.

Project Representative - The authorized representative of Owner who is assigned to the project or any part thereof.

Punch List - The written compilation of those items identified by the Engineer after Substantial Completion is achieved, which are required to render complete, satisfactory and acceptable the Project (or phase of a Project)

Shop Drawings - All drawings, diagrams, illustrations, schedules and other data which are specifically prepared by or for Contractor to illustrate some portion of the Work and all illustrations, brochures, standard schedules, performance charts, instructions, diagrams and other information prepared by a supplier and submitted by Contractor to illustrate material or equipment for some portion of the Work.

Specifications - Those portions of the contract documents consisting of written technical descriptions of materials, equipment, construction systems, standards and workmanship as applied to the Work and certain administrative details applicable thereto.

Subcontractor - An individual or corporation having a direct contact with Contractor or with any other subcontractor for the performance of a part of the Work at the site. Such person or firm has contractual relations with the Contractor, not with the Owner.

Substantial Completion - The Work (or a specified part thereof) has progressed to the point when, in the opinion of the Engineer as evidenced by Engineer's definitive certificate of Substantial Completion, it is sufficiently complete in accordance with contract documents so that the work can be utilized for the purposes for which it is intended; or if there be no such certificate issued, when final payment is due. The County shall have the right to exclude the Contractor from these portions of the Work designated as complete after the inspection, however, the Contractor will have reasonable access to complete or correct items on the punch list. The punch list shall be completed by the Engineer within the timeframes provided by Florida Statute Section 218.735 (7) (a).

Successful Bidder - The lowest qualified, responsible and responsive bidder to whom an award is made.

Supplier - A manufacturer, fabricator, supplier, distributor, materialman or vendor.

Underground Facilities - All pipelines, conduits, ducts, cables, wires, manholes, vaults, tanks, tunnels or other such facilities or attachments and any encasement containing such facilities which have been installed underground to furnish any of the following services or materials: electricity, gases, steam, liquid petroleum products, telephone or other communications, cable television, sewage and drainage removal, traffic or other control systems or water.

Unit Price Work - Work to be paid for on the basis of unit prices.

Written Amendment - A written amendment of the contract documents, signed by Owner and Contractor on or after the effective date of the Agreement and normally dealing with the non-engineering or non-technical rather than strictly work related aspects of the contract documents.

Work - The entire completed construction or the various separately identifiable parts thereof required to be furnished under the contract documents. Work is the result of performing services, furnishing labor and furnishing and incorporating materials and equipment into the construction, all as required by the contract documents.

Work Directive Change - A written directive to contractor, issued on or after the effective date of the Agreement and signed by Owner and recommended by Project Representative ordering an addition, deletion or revision in the Work, or responding to differing or unforeseen physical conditions under which the Work is to be performed or to emergencies. A work directive change may not change the contract price or the contract time; but is evidence that the parties expect that the change directed or documented by a work directive change will be incorporated in a subsequently issued change order following negotiations by the parties as to its effect, if any, on the contract price or contract time.

## ARTICLE 2 - PRELIMINARY MATTERS

Computation of Time: When time is referred to in the contract documents by days, it will be computed to exclude the first and include the last day of such period. If the last day of any such period falls on a Saturday or Sunday or legal holiday, such day will be omitted from the computation.

- 2.1 The Contractor must submit a proposed schedule of the Work at the preconstruction conference. The purpose of this schedule is to enable the Owner to govern the Work, to protect the functions of the local government and its citizens and to aid in providing appropriate surveillance. The Owner shall have the right to reschedule work provided such rescheduling is in accord with the remainder of terms of the contract. The schedule shall show, as a minimum, the approximate dates on which each segment of the work is expected to be started and finished, the proposed traffic flows during each month, the anticipated earnings by the Contractor for each month and the approximate number of crews and equipment to be used. The Owner, after necessary rescheduling and obtaining additional information for specific purposes, shall review and approve the schedule. The Contractor shall also forward to the Owner, as soon as practicable after the first day of each month, a summary report of the progress of the various parts of the work under the contract, in fabrication and in the field, stating the existing status, estimated time of completion and cause of delay, if any. Together with the summary report, the Contractor shall submit any necessary revisions to the original schedule for the Owner's review and approval. In addition, more detailed schedules may be required by the Owner for daily traffic control.
- 2.2 A Notice to Proceed may be given at any time within thirty (30) days after the effective date of the Agreement. The contract time will commence at the time specified in such notice. Contractor shall start to perform the Work on the date specified in the notice to proceed, but no work shall be done at the site prior to the date on which the contract time commences to run.
- 2.3 If at any time the materials and appliances to be used appear to the Owner as insufficient or improper for securing the quality of work required or the required rate of progress, the Owner may order the Contractor to increase his efficiency or to improve the character of his work and the Contractor shall conform to such an order. The failure of the Owner to demand any increase of such efficiency of any improvement shall not release the Owner from his obligation to secure the quality of work or the rate of progress necessary to complete the Work within the limits imposed by the contract.

## 2.3 (Continued)

The Owner may require the Contractor to remove from the Work such employees as the Owner deems incompetent, careless, insubordinate or otherwise objectionable, or whose continued employment on the Work is deemed to be contrary to the Owner's interest.

- 2.4 The Owner reserves the right to let other Contracts in connection with this Work. The Contractor shall afford other Contractors reasonable opportunity for the introduction and storage of their materials and execution of their Work, and promptly connect and coordinate the Work with theirs.

## ARTICLE 3 - CONTRACT DOCUMENTS: INTENT, AMENDING, RE-USE

- 3.1 The contract documents comprise the entire Agreement between Owner and Contractor concerning the work. The contract documents are complementary; what is called for by one is as binding as if called for by all. The contract documents will be construed in accordance with the laws and ordinances of the State of Florida and Manatee County.

Should a conflict exist within the contract documents, the precedence in ascending order of authority are as follows: 1) Standard Printed Contract Documents, 2) Special Conditions, 3) General Conditions and 4) Drawings. Note: Computed dimensions shall govern over scaled dimensions.

- 3.2 It is the intent of the contract documents to describe a functionally complete project (or part thereof) to be constructed in accordance with the contract documents. Any work, materials or equipment that may reasonably be inferred from the contract documents as being required to produce the intended result will be supplied whether or not specifically called for. When words which have a well-known technical or trade meaning are used to describe work, materials, or equipment, such words shall be interpreted in accordance with that meaning. Reference to standard specifications, manuals or codes of any technical society, organization or association, or to the laws or regulations of any governmental authority, whether such reference be specific or by implication, shall mean the latest standard specification, manual, code or laws or regulations in effect at the time of opening of bids, except as may be otherwise specifically stated. However, no provision of any referenced standard specification, manual or code (whether or not specifically incorporated by reference in the contract documents) shall be effective to change the duties and responsibilities of Owner, Contractor or Engineer, or any of their agents or employees from those set forth in the Contract Documents.
- 3.3 The contract documents may be amended to provide for additions, deletions and revisions in the Work or to modify the terms and conditions thereof in one or more of the following ways:
- 3.3.1 A Formal Written Amendment
  - 3.3.2 A Change Order
  - 3.3.3 Administrative Contract Adjustment (ACA)

- 3.4 In addition, the requirements of the contract documents may be supplemented and minor variations and deviations in the Work may be authorized in one or more of the following ways:
- 3.4.1 Discretionary Work – Field Directive
  - 3.4.2 Engineer's approval of a Shop Drawing or sample.

#### ARTICLE 4 - CONTRACTOR'S RESPONSIBILITIES

- 4.1 Contractor shall keep on the Work at all times during its progress a competent resident superintendent; who shall be the Contractor's representative at the site and shall have authority to act on behalf of Contractor. All communications given to the superintendent shall be as binding as if given to Contractor.
- 4.2 Contractor shall provide competent, suitable qualified personnel to survey and lay out the Work and perform construction as required by the contract documents. Contractor shall at all times maintain good discipline and order at the site. Except in connection with the safety or protection of persons or the Work or property at the site or adjacent thereto and except as otherwise indicated in the contract documents, all Work at the site shall be performed during regular working hours and Contractor will not permit overtime work or the performance of work on Saturday, Sunday or legal holiday without Owner's written consent given after prior notice to Engineer (at least 72 hours in advance).
- 4.2.1 Contractor shall pay for all additional engineering charges to the Owner for any overtime work which may be authorized. Such additional engineering charges shall be a subsidiary obligation of Contractor and no extra payment shall be made by Owner on account of such overtime work. At Owner's option, overtime costs may be deducted from Contractor's monthly payment request or Contractor's retainage prior to release of final payment.
- 4.3 Unless otherwise specified, Contractor shall furnish and assume full responsibility for all bonds, insurance, materials, equipment, labor, transportation, construction equipment and machinery, tools, appliances, fuel, power, light, heat, telephone, water, sanitary facilities, temporary facilities and all other facilities and incidentals necessary for the furnishing, performance, testing, start-up and completion of the Work.
- 4.4 All materials and equipment shall be of good quality and new, except as otherwise provided in the contract documents. If required by Engineer, Contractor shall furnish satisfactory evidence (including reports of required tests) as to the kind and quality of materials and equipment. All materials and equipment shall be applied, installed, connected, erected, used, cleaned and conditioned in accordance with the instruction of the applicable supplier except as otherwise provided in the contract documents.
- 4.5 Contractor shall be fully responsible to Owner for all acts and omissions of the subcontractors, suppliers and other persons and organizations performing or furnishing any of the Work under a direct or indirect contract with Contractor just as Contractor is responsible for Contractor's own acts and omissions.

## ARTICLE 4 - CONTRACTOR'S RESPONSIBILITIES

## 4.5 (Continued)

Nothing in the Contract Documents shall create any contractual relationship between Owner or Engineer and any such subcontractor, supplier or other person or organization, nor shall it create any obligation on the part of Owner to pay or to see to the payment of any monies due any such subcontractor, supplier or other person or organization.

- 4.6 Permits: Unless otherwise provided, Contractor shall obtain and pay for all construction permits and licenses. Owner shall assist Contractor, when necessary, in obtaining such permits and licenses. Contractor shall pay all governmental charges and inspection fees necessary for the prosecution of the Work.
- 4.7 During the progress of the Work, Contractor shall keep the premises free from accumulation of waste materials rubbish and other debris resulting from the Work. At the completion of the Work, Contractor shall remove all waste materials, rubbish and debris from and about the premises as well as all tools, appliances, construction equipment and machinery and surplus materials and shall leave the site clean and ready for occupancy by Owner. Contractor shall restore to original conditions all property not designated for alteration by the Contract Documents.
- 4.8 Contractor shall not load nor permit any part of any structure to be loaded in any manner that will endanger the structure, nor shall Contractor subject any part of the Work or adjacent property to stresses or pressures that will endanger it.
- 4.9 Safety and Protection: Contractor shall comply with the Florida Department of Commerce Safety Regulations and any local safety regulations. Contractor shall be responsible for initiating, maintaining and supervising all safety precautions and programs in connection with the Work. Contractor shall take all necessary precautions for the safety of and shall provide the necessary protection to prevent damage, injury or loss to:
- 4.9.1 all employees on the work and other persons and organizations who may be affected thereby;
  - 4.9.2 all the work and materials and equipment to be incorporated therein, whether in storage on or off the site; and
  - 4.9.3 other property at the site or adjacent thereto, including trees, shrubs, lawns, walks, pavements, roadways, structures, utilities and underground facilities not designated for removal, relocation or replacement in the course of construction.

Contractor shall comply with all applicable laws and regulations of any public body having jurisdiction for the safety of persons or property or to protect them from damage, injury or loss; and shall erect and maintain all necessary safeguards for such safety and protection. Contractor shall provide and maintain all passageways, guard fences, lights and other facilities for the

## ARTICLE 4 - CONTRACTOR'S RESPONSIBILITIES (Continued)

protection required by public authority or local conditions. Contractor shall provide reasonable maintenance of traffic way for the public and preservation of the Owner's business, taking into full consideration all local conditions. Contractor's duties and responsibilities for the safety and protection of the work shall continue until such time as all the work is completed.

- 4.10 Emergencies: In emergencies affecting the safety or protection of persons or the work or property at the site or adjacent thereto, Contractor, without special instruction or authorization from Engineer or Owner, is obligated to act to prevent threatened damage, injury or loss. Contractor shall give Owner prompt written notice if Contractor believes that any significant changes in the work or variations from the contract documents have been caused thereby. If Owner determines that a change in the contract documents is required because of the action taken in response to an emergency, a Work Directive Change or Change Order will be issued to document the consequences of the changes or variation.
- 4.11 For substitutes not included with the bid, but submitted after the effective date of the Agreement, Contractor shall make written application to Engineer for acceptance thereof, certifying that the proposed substitute will perform adequately the functions and achieve the results called for by the general design, be similar and of equal substance to that specified and be suited to the same use as that specified. The application will also contain an itemized estimate of all costs and delays or schedule impacts that will result directly or indirectly from review, acceptance and provisions of such substitute, including costs of redesign and claims of other contractors affected by the resulting change, all of which will be considered by the Engineer in evaluating the proposed substitute. Engineer may require Contractor to furnish at Contractor's expense, additional data about the proposed substitute. In rendering a decision, Owner/Engineer and Contractor shall have access to any available float time in the construction schedule. In the event that substitute materials or equipment not included as part of the bid, but proposed after the effective date of the agreement, are accepted and are less costly than the originally specified materials or equipment, then the net difference in cost shall be credited to the Owner and an appropriate change order executed.
- 4.11.1 If a specific means, method, technique, sequence of procedure of construction is indicated in or required by the contract documents, Contractor may furnish or utilize a substitute means, method, sequence, technique or procedure of construction acceptable to Engineer if Contractor submits sufficient information to allow Engineer to determine that the substitute proposed is equivalent to that indicated or required by the contract documents.
- 4.11.2 Engineer will be allowed a reasonable time within which to evaluate each proposed substitute. Engineer will be the sole judge of acceptability and no substitute will be ordered, installed or utilized without Engineer's prior written acceptance which will be evidenced by either a change order or an approved shop drawing. Owner may require Contractor to furnish at Contractor's expense a special performance guarantee or other surety with respect to any substitute.

## ARTICLE 4 - CONTRACTOR'S RESPONSIBILITIES (Continued)

- 4.11.3 Contractor shall reimburse Owner for the charges of Engineer and Engineer's Consultants for evaluating each proposed substitute submitted after the effective date of the Agreement and all costs resulting from any delays in the work while the substitute was undergoing review.
- 4.12 The Contractor shall furnish, free of charge, all labor, stakes, surveys, batter boards for structures, grade lines and other materials and supplies and shall set construction stakes and batter boards for establishing lines, position of structures, slopes and other controlling points necessary for the proper prosecution of the construction work. Where rights-of-way, easements, property lines or any other conditions which make the lay-out of the project or parts of the project critical are involved, the Contractor will employ a competent surveyor who is registered in the State of Florida for lay-out and staking. These stakes and marks shall constitute the field control by and in accord with which the Contractor shall govern and execute the work. The Contractor will be held responsible for the preservation of all stakes, marks and if for any reason any of the stakes or marks or batter boards become destroyed or disturbed, they will be immediately and accurately replaced by the Contractor.
- 4.13 The Contractor has, by careful examination, satisfied himself as to the nature and location of the work and all other matters which can in any way affect the work under this contract, including, but not limited to details pertaining to boring, as shown on the drawings, are not guaranteed to be more than a general indication of the materials likely to be found adjacent to holes bored at the site of the work, approximately at the locations indicated. The Contractor shall examine boring data, where available, and make his own interpretation of the subsoil investigations and other preliminary data, and shall base his bid on his own opinion of the conditions likely to be encountered. In no event shall an extension of time be considered for any conditions that existed at the time of bidding, nor shall the Contractor receive extra compensation for completion of the project as intended by the drawings and in keeping with the contract documents. No verbal agreement or conversation with any officer, agent or employee of the Owner, before or after the execution of this contract, shall affect or modify any of the terms or obligations herein contained.
- 4.14 If the Contractor, in the course of the work, finds that the drawings and/or Contract Documents cannot be followed, he shall immediately inform the Owner in writing, and the Owner shall promptly check the accuracy of the information. Any work done after such discovery, until any necessary changes are authorized, will be done at the Contractor's risk.

## ARTICLE 5 - OWNER'S RESPONSIBILITIES

- 5.1 Owner shall furnish the data required of Owner under the contract documents promptly and shall make payments to the Contractor within a reasonable time (no more than 45 days) after the Work has been accepted by the Owner. The form of all submittals, notices, change orders and other documents permitted or required to be used or transmitted under the contract documents shall be determined by the Owner/Engineer. Standard County forms shall be utilized.
- 5.2 The Owner shall provide the lands upon which the Work under this contract is to be done, except that the Contractor shall provide all necessary additional land required for the erection of temporary construction facilities and storage of his materials, together with right of access to same.
- 5.3 The Owner shall have the right to take possession of and use any completed portions of the work, although the time for completing the entire work or such portions may not have expired, but such taking possession and use shall not be deemed an acceptance of any work not completed in accordance with the Contract Documents.

## ARTICLE 6 - CHANGES IN THE WORK

- 6.1 Without invalidating the Agreement and without notice to any surety, Owner may, at any time, order additions, deletions or revisions in the Work. These will be authorized by a written amendment, a change order, or a work directive change. Upon receipt of any such document, Contractor shall promptly proceed with the Work involved which will be performed under the applicable conditions of the contract documents (except as otherwise specifically provided).
- 6.2 Contractor shall not be entitled to an increase in the contract price or an extension of the contract time with respect to any Work performed that is not required by the contract documents as amended, modified and supplemented.
- 6.3 Owner and Contractor shall execute appropriate change orders (or written amendments) covering changes in the Work which are ordered by Owner, or which may be required because of acceptance of defective Work.
- 6.4 At any time Engineer may request a quotation from Contractor for a proposed change in the Work and within twenty-one (21) calendar days after receipt, Contractor shall submit a written and detailed proposal for an increase or decrease in the contract price or contract time for the proposed change. Engineer shall have 21 calendar days after receipt of the detailed proposal to respond in writing. The proposal shall include an itemized estimate of all costs and time for performance that will result directly or indirectly from the proposed change. Unless otherwise directed, itemized estimates shall be in sufficient detail to reasonably permit an analysis by Engineer of all material, labor, equipment, subcontracts, overhead costs and fees, and shall cover all Work involved in the change, whether such Work was deleted, added, changed or impacted. Notwithstanding the request for quotation, Contractor shall carry on the Work and maintain the progress schedule. Delays in the submittal of the written and detailed proposal will be considered non-prejudicial.

## ARTICLE 7 - CHANGE OF CONTRACT PRICE

- 7.1 The contract price constitutes the total compensation (subject to authorized adjustments) payable to Contractor for performing the Work. All duties, responsibilities and obligations assigned to or undertaken by Contractor shall be at his expense without change in the contract price.
- 7.2 The contract price may only be changed by change order or by a written amendment. Any claim for an increase or decrease in the contract price shall be based on written notice delivered by the party making the claim to the other party. Notice of the amount of the claim with supporting data shall be delivered within ten (10) days from the beginning of such occurrence and shall be accompanied by claimant's written statement that the amount claimed covers all known amounts (direct, indirect and consequential) to which the claimant is entitled as a result of the occurrence of said event.
- 7.3 The value of any Work covered by a change order or of any claim for an increase or decrease in the contract price shall be determined in one of the following ways (at Owner's discretion):
- 7.3.1 Where the Work involved is covered by unit prices contained in the contract documents, cost will be determined by application of such unit prices to the quantities of the items involved.
  - 7.3.2 By mutual acceptance of lump sum.
  - 7.3.3 On the basis of the cost of the Work, plus a 20% Contractor's fee for overhead and profit. (Contractor shall submit an itemized cost breakdown together with supporting data.)
- 7.4 Either Owner or Contractor may make a claim for an adjustment in the contract price. The unit price of an item of unit price Work shall be subject to re-evaluation and adjustment under the following conditions:
- 7.4.1 If the total cost of a particular item of unit price Work amounts to 5% or more of the contract price and the variation in the quantity of the particular item of unit price Work performed by Contractor differs by more than 15% from the estimated quantity of such item indicated in the Agreement; and
  - 7.4.2 If there is no corresponding adjustment with respect to any other item of Work; and
  - 7.4.3 If a Contractor believes that it has incurred additional expense as a result thereof; or
  - 7.4.4 If Owner believes that the quantity variation entitles it to an adjustment in the unit price; or
  - 7.4.5 If the parties are unable to agree as to the effect of any such variations in the quantity of unit price Work performed.

**ARTICLE 8 - CHANGE OF CONTRACT TIME**

- 8.1 Contract time may only be changed by a change order or a written amendment. Any claim for an extension or shortening of the contract time shall be based on written notice delivered by the party making the claim to the other party. Notice of the extent of the claim with supporting data shall be delivered within fifteen (15) days from detection or beginning of such occurrence and shall be accompanied by the claimant's written statement that the adjustment claimed is the entire adjustment to which the claimant has reason to believe it is entitled as a result of the occurrence of said event.
- 8.2 The contract time will be extended in an amount equal to time lost due to delays beyond the control of Contractor. Such delays shall include, but not be limited to, acts or neglect by Owner or others performing additional work; or to fires, floods, epidemics, abnormal weather conditions or acts of God.
- 8.3 All time limits stated in the contract documents are of the essence.

**ARTICLE 9 - WARRANTY, TEST/INSPECTION, CORRECTION**

- 9.1 Contractor warrants (for a minimum period of three years or as otherwise stated herein) and guarantees to Owner that all work will be in accordance with the contract documents and will not be defective; that Owner, representatives of Owner, governmental agencies with jurisdictional interests will have access to the work at reasonable time for their observation, inspecting and testing (Contractor shall give Engineer timely notice of readiness of the work for all required approvals and shall assume full responsibility, including costs, in obtaining required tests, inspections, and approval certifications and/or acceptance, unless otherwise stated by Owner).
- 9.2 If any work (including work of others) that is to be inspected, tested, or approved is covered without written concurrence of Engineer, it must, if requested by Engineer, be uncovered for observation. Such uncovering shall be at Contractor's expense unless Contractor has given Engineer timely notice of Contractor's intention to cover the same and Engineer has not acted with reasonable promptness in response to such notice. Neither observations by Engineer nor inspections, tests, or approvals by others shall relieve Contractor from Contractor's obligations to perform the work in accordance with the contract documents.
- 9.3 If the work is defective, or Contractor fails to supply sufficient skilled workers, or suitable materials or equipment, or fails to furnish or perform the work in such a way that the completed work will conform to the contract documents, Owner may order Contractor to stop the work, or any portion thereof and terminate payments to the Contractor until the cause for such order has been eliminated. Contractor shall bear all direct, indirect and consequential costs for satisfactory reconstruction or removal and replacement with non-defective work, including, but not limited to fees and charges of engineers, architects, attorneys and other professionals and any additional expenses experienced by Owner due to delays to other Contractors performing additional work and an appropriate deductive change order shall be issued. Contractor shall further bear the responsibility for maintaining schedule and shall not be entitled to an extension of the contract time and the recovery of delay damages due to correcting or removing defective work.

- 9.3.1 If Contractor fails within seven (7) days after written notice to correct defective work, or fails to perform the work in accordance with the contract documents, or fails to comply with any other provision of the contract documents, Owner may correct and remedy any such deficiency. To the extent necessary to complete corrective and remedial action, Owner may exclude Contractor from all or part of the site, take possession of all or part of the work, Contractor's tools, construction equipment and machinery at the site or for which Owner has paid Contractor but which are stored elsewhere. All direct, indirect and costs of Owner in exercising such rights and remedies will be charged against Contractor in an amount approved as to reasonableness by Engineer and a change order will be issued incorporating the necessary revisions.
- 9.3.2 If within three years after the date of completion or such longer period of time as may be prescribed by laws or regulations or by the terms of any applicable special guarantee required by the contract documents, any work is found to be defective, Contractor shall promptly, without cost to Owner and in accordance with Owner's written instructions, either correct such defective work or if it has been rejected by Owner, remove it from the site and replace it with non-defective work. If Contractor does not promptly comply with the terms of such instruction, Owner may have the defective work corrected/removed and all direct, indirect and consequential costs of such removal and replacement will be paid by Contractor.

#### ARTICLE 10 - SUSPENSION/TERMINATION OF WORK

- 10.1 Owner may, at any time and without cause, suspend the work or any portion thereof for a period of not more than ninety (90) days by written notice to Contractor, which will fix the date on which work will be resumed. Contractor shall be allowed an increase in the contract price or an extension of the contract time, or both, directly attributable to any suspension if Contractor makes an approved claim therefore.
- 10.2 Owner may terminate the contract if Contractor commences a voluntary case under any chapter of the Bankruptcy Code or any similar action by filing a petition under any other federal or state law relating to the bankruptcy or insolvency; if a petition is filed against the Contractor under any chapter of the Bankruptcy Code or similar relief under any other federal or state law; if Contractor persistently fails to perform the work in accordance with the contract documents; if Contractor disregards laws or regulations of any public body having jurisdiction or the Engineer; or otherwise violates in any substantial way any provisions of the contract.

## ARTICLE 10 - SUSPENSION/TERMINATION OF WORK

10.2.1 Owner may, after giving Contractor (and the surety, if there is one) seven (7) days written notice and to the extent permitted by laws and regulations, terminate the services of Contractor; exclude Contractor from the site and take possession of the work and of all Contractor's tools, construction equipment and machinery at the site and use the same to the full extent they could be used (without liability to Contractor for trespass or conversion); incorporate in the work all materials and equipment stored at the site or for which Owner has paid Contractor but which are stored elsewhere, and finish the work as Owner may deem expedient. In such case, Contractor shall not be entitled to receive any further payment beyond an amount equal to the value of material and equipment not incorporated in the work, but delivered and suitably stored, less the aggregate of payments previously made. If the direct and indirect costs of completing the work exceed the unpaid balance of the contract price, Contractor shall pay the difference to Owner. Such costs incurred by Owner shall be verified by Owner and incorporated in a change order; but in finishing the work, Owner shall not be required to obtain the lowest figure for the work performed. Contractor's obligations to pay the difference between such costs and such unpaid balance shall survive termination of the Agreement.

10.3 If, through no act or fault of Contractor, the work is suspended for a period of more than ninety (90) days by Owner or under an order of court or other public authority, or Engineer fails to act on any application or fails to pay Contractor any sum finally determined to be due; then Contractor may, upon seven (7) days written notice to Owner terminate the Agreement and recover from Owner payment for all work executed, any expense sustained plus reasonable termination expenses. In lieu of terminating the Agreement, if Engineer has failed to act on any application of payment or Owner has failed to make any payment as aforesaid, Contractor may upon seven (7) days written notice to Owner stop the work until payment of all amounts then due.

## ARTICLE 11 - CONTRACT CLAIMS

11.1 The rendering of a decision by Engineer with respect to any such claim, dispute or other matter (except any which have been waived by the making or acceptance of final payment) will be a condition precedent to any exercise by Owner or Contractor of such right or remedies as either may otherwise have under the contract documents or by laws or regulations in respect of any such claim, dispute or other matter. No action, either at law or at equity, shall be brought in connection with any such claim, dispute or other matter later than thirty (30) days after the date on which Owner/Engineer has rendered such written decision in respect thereof. Failure to bring an action within said thirty (30) day period shall result in Engineer's decision being final and binding on the Contractor. In no event may any such action be brought after the time at which instituting such proceedings would be otherwise barred by the applicable statute of limitations.

- 11.2 Before bringing any action in court pertaining to any claim, dispute or other matter in question(s) arising out of or relating to the contract documents or the breach thereof, or Engineer's final decision, except for claims which have been waived by the making and acceptance of final payment, the Contractor shall first submit written notice(s) of contract claims to the Purchasing Official for a decision; within the earlier of sixty (60) days after the last date on which the contractor provided any goods or services required by the contract or after the date on which the contractor knew or should have known such a claim existed. The Manatee County Code of Law section 2-26-63 Contract Claims details the requirements and process for such a claim.

## ARTICLE 12 - RESIDENT PROJECT REPRESENTATIVE - DUTIES, RESPONSIBILITIES

- 12.1 Resident Project Representative is Engineer/Owner's Agent, who will act as directed by and under the supervision of the Engineer, and who will confer with Owner/Engineer regarding his actions. Resident Project Representative's dealing in matters pertaining to the on-site work shall, in general, be only with the Owner/Engineer and Contractor and dealings with subcontractors shall only be through or with the full knowledge of Contractor.
- 12.2 Resident Project Representative will:
- 12.2.1 Review the progress schedule, schedule of shop drawing submissions and schedule of values prepared by Contractor and consult with Owner/Engineer concerning their acceptability.
  - 12.2.2 Attend preconstruction conferences. Arrange a schedule of progress meetings and other job conferences as required in consultation with Owner/Engineer and notify those expected to attend in advance. Attend meetings and maintain and circulate copies of minutes thereof.
  - 12.2.3 Serve as Owner/Engineer's liaison with Contractor, working principally through Contractor's superintendent and assist him in understanding the intent of the contract documents. As requested by Owner/Engineer, assist in obtaining additional details or information when required at the job site for proper execution of the Work.
  - 12.2.4 Receive and record date of receipt of shop drawings and samples, receive samples which are furnished at the site by Contractor and notify Owner/Engineer of their availability for examination.
  - 12.2.5 Advise Owner/Engineer and Contractor or his superintendent immediately of the commencement of any work requiring a shop drawing or sample submission if the submission has not been approved by the Owner/Engineer.

- 12.2.6 Conduct on-site observations of the work in progress to assist Owner/Engineer in determining if the work is proceeding in accordance with the contract documents and that completed work will conform to the contract documents.
- 12.2.7 Report to Owner/Engineer whenever he believes that any work is unsatisfactory, faulty or defective or does not conform to the contract documents, or does not meet the requirements of any inspections, tests or approvals required or if work has been damaged prior to final payment; and advise Owner/Engineer when he believes work should be corrected or rejected or should be uncovered of observation or requires special testing, inspection or approval.
- 12.2.8 Verify that tests, equipment and system start-ups and operating and maintenance instructions are conducted as required by the contract documents and in the presence of the required personnel, and that Contractor maintains adequate records thereof; observe, record and report to Engineer appropriate details relative to the test procedures and start-ups.
- 12.2.9 Accompany visiting inspectors representing public or other agencies having jurisdiction over the project; record the outcome of these inspections and report to Owner/Engineer.
- 12.2.10 Transmit to Contractor, Owner/Engineer's clarifications and interpretations of the contract documents.
- 12.2.11 Consider and evaluate Contractor's suggestions or modifications in drawings or Contract Documents and report them with recommendations to Owner/Engineer.
- 12.2.12 Maintain at the job site orderly files for correspondence, reports of job conferences, shop drawings and sample submissions, reproductions of original contract documents including all addenda, change orders, field orders, additional drawings issued subsequent to the execution of the contract, Owner/Engineer's clarifications and interpretations of the contract documents, progress reports and other project related documents.
- 12.2.13 Keep a diary or log book, recording hours on the job site, weather conditions, data relative to questions of extras or deductions; list of visiting officials and representatives or manufacturers, fabricators, suppliers and distributors; daily activities, decisions, observations in general and specific observations in more detail as in the case of observing test procedures. Send copies to Owner/Engineer.
- 12.2.14 Record names, addresses and telephone numbers of all Contractors, subcontractors and major suppliers of materials and equipment.

- 12.2.15 Furnish Owner/Engineer periodic reports as required of progress of the work and Contractor's compliance with the approved progress schedule and schedule of shop drawing submissions.
- 12.2.16 Consult with Owner/Engineer in advance of scheduling major tests, inspections or start of important phases of the work.
- 12.2.17 Report immediately the occurrence of any accident.
- 12.2.18 Review applications for payment with Contractor for compliance with the established procedure for their submission and forward them with recommendations to Owner/Engineer, noting particularly their relation to the schedule of values, work completed and materials and equipment delivered at the site but not incorporated in the work.
- 12.2.19 During the course of the work, verify that certificates, maintenance and operations manuals and other data required to be assembled and furnished by Contractor are applicable to the items actually installed, and deliver this material to Owner/Engineer for his review prior to final acceptance of the work.
- 12.2.20 Before Owner/Engineer issues a Certificate of Substantial Completion, submit to Contractor a list of observed items requiring completion or correction.
- 12.2.21 Conduct final inspection in the company of Owner/Engineer and Contractor and prepare a final list of items to be completed or corrected.
- 12.2.22 Verify that all items on final list have been completed or corrected and make recommendations to Owner/Engineer concerning acceptance.
- 12.3 Except upon written instructions of Owner/Engineer, Resident Project Representative.
  - 12.3.1 Shall not authorize any deviation from the contract documents or approve any substitute materials or equipment;
  - 12.3.2 Shall not exceed limitations on Owner/Engineer's authority as set forth in the contract documents;
  - 12.3.3 Shall not undertake any of the responsibilities of Contractor, Subcontractors or Contractor's Superintendent, or expedite the work;
  - 12.3.4 Shall not advise on or issue directions relative to any aspect of the means, methods, techniques, sequences or procedures of construction unless such is specifically called for in the contract documents;

- 12.3.5 Shall not advise on or issue directions as to safety precautions and programs in connection with the work;
- 12.3.6 Shall not authorize Owner to occupy the project in whole or in part; and
- 12.3.7 Shall not participate in specialized field or laboratory tests.

#### ARTICLE 13 - APPRENTICES

13.1 If Successful Contractor employees Apprentices, he shall be governed and comply with the provisions of Florida State Statute 446.011.

NOTE: The form of all submittals, notices, change orders and other documents permitted or required to be used or transmitted under the Contract shall be determined by the Owner. Standard County forms shall be utilized.

**END OF SECTION**

LABEL TO AFFIX TO OUTSIDE OF SEALED BID PACKAGE

Cut along the outside border and affix this label to your sealed bid envelope to identify it as a "Sealed Bid". Be sure to include the name of the company submitting the bid where requested.

LABEL TO AFFIX TO OUTSIDE OF SEALED BID PACKAGE

SEALED BID - DO NOT OPEN

CONTRACTOR: \_\_\_\_\_

SEALED BID NO: 11-1201-DS

BID TITLE: Coquina Concession Building Remodel

DUE DATE/TIME: **APRIL XX, 2011 @ 3:00 PM**



# Project Manual

## **Coquina Beach Concessions Building Remodeling**

for

manatee county government  
bradenton, florida

issued:                    october 22, 2010

commission no.:    0920829

### **100% Construction Documents**

**Divisions 01 thru 26**

**SCHENKELSHULTZ**  
□ □ □ ARCHITECTURE □ □ □

677 north washington blvd.  
suite 37  
sarasota, florida 34236  
phone (941) 952 5875  
fax (941) 957 3630  
schenkelshultz.com



## TITLE PAGE

### COQUINA BEACH CONCESSIONS BUILDING REMODELING

#### OWNER

##### **Manatee County Government**

1112 Manatee Avenue West  
Bradenton, Florida 34208

#### ARCHITECT

##### **SCHENKELSHULTZ**

677 N. Washington Blvd., Suite 37  
Sarasota, Florida 34236  
Phone (941) 952 5875  
Fax (941) 957 3630

#### STRUCTURAL CONSULTANT

##### **Karins Engineering Group**

2017 Fiesta Drive  
Sarasota, FL 34231  
Phone: (941) 927 8525  
Fax (941) 927 8075

#### MECHANICAL/ELECTRICAL CONSULTANT

##### **ME3 Consulting Engineers, LLC**

11065 Gatewood Dr. Suite 104  
Bradenton, FL 34211  
Phone (941) 748 1319  
Fax (941) 748 1349





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REQUIREMENTS GROUP





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SECTION 00 43 20  
 FLORIDA TRENCH SAFETY ACT

FLORIDA TRENCH SAFETY ACT  
 CERTIFICATE OF COMPLIANCE

I as bidder, on this project, acknowledge that included in the various items of the proposal and in the Total Bid Price are costs for complying with the Florida Trench Safety Act (90-96, Laws of Florida) effective October 1, 1990. I as bidder, further identify the costs to be as summarized below:

		<u>QUANTITY</u>	<u>UNIT COST</u>	<u>AMOUNT</u>
1.	Trench Safety Act Compliance	_____	LF _____	=
2.	Special Shoring	_____	SF _____	=

Identify method of compliance for item #1:

\_\_\_\_\_.

Identify or attach a copy of the Special Shoring requirements for item #2:

\_\_\_\_\_.

The undersigned certifies that he/she is the contractor who will perform the trench excavation for this Project, and hereby gives written assurance that he/she will comply with the applicable Trench Safety Standards specifically set forth in Florida's Trench Safety Act, Laws of Florida, 90-96.

FIRM:

BY:

NAME:

TITLE:



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Sworn to and subscribed before me this \_\_\_\_\_ day of \_\_\_\_\_, 20 \_\_\_\_.

NOTARY PUBLIC

My Commission Expires:

END OF SECTION 00 43 20



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SECTION 00 73 00  
SUPPLEMENTARY CONDITIONS

1 - GENERAL PROVISIONS

1.1 BASIC DEFINITIONS

Add the following definitions or sentences to the General Conditions Section

Engineer – Engineer or Architect of record.

Engineering – Professional work done by either a registered Engineer or an Architect.

Work – (Add the following sentence to the end of the Subparagraph) "...The Contractor acknowledges and agrees that the Contract Documents are sufficient to provide for the completion of the Work and include Work, whether or not shown or described, which reasonably may be inferred to be required or useful for the completion of the Work in accordance with applicable laws, codes, and customary standards of the construction industry."

Supplier –(Add the following sentence to the end of the Subparagraph) "... The term "supplier" as used herein, includes a firm or organization furnishing or delivering products directly to the jobsite, and because of such direct delivery, could be construed under the lien laws of the State in which the work is being performed as having lien rights against the funds due the Contractor. Suppliers of material and equipment, delivering to Contractor or Subcontractor on an open account basis and not having lien rights on the Work, will not be considered suppliers within the meaning of the Contract Documents.

1.2 MISCELLANEOUS DEFINITIONS

- A. The term "product" as use herein includes materials, systems, and equipment.
- B. A bidder selected to enter into a Contract with the Owner for Work included under the bidder's proposal is termed an "Awardee," until such time as he is awarded a Contract and becomes the Contractor.
- C. Where "complete" is used, it shall mean "complete with connections, supports, attachments and incidental items necessary for a finished and properly operating assembly or installation."
- D. The term "furnish" - to supply (only) to another party for their use of installation, including cost of delivery and unloading at the jobsite.
- E. The term "install" - to distribute, uncrate, assemble, and fix into the intended final positions, the installer to provide all miscellaneous hardware and supplies required to anchor and support securely, clean-up, and dispose of rubbish.
- F. The term "connect" - to bring service(s) to point of installation and make final connections to the service(s) to the installed equipment, and to provide miscellaneous auxiliary appurtenances necessary to make operable for its intended use.



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- G. The term "provide" - to furnish, install, and connect complete.
- H. The term "or equal" means an equal approved in writing by the Architect at least 10 days prior to bid receipt, and listed in an Addendum.

1.3 CORRELATION AND INTENT OF THE CONTRACT DOCUMENTS

The intent of Contract Documents is to include all items necessary for the proper execution and completion of the Work by the contractor. The contract documents are complementary, and what is required by one shall be as binding as if required by all. If there should be a conflict between two or more of the Contract Documents, the following order of interpretation shall apply:

- A. The terms and conditions as set forth in the Bidding Requirements, including legal advertisement thereof, shall have full force and effect until such time as the Standard Form of Agreement between Owner and Contractor is executed between the Owner and the Awardee.
- B. Where there is a conflict between the Bidding Requirements and the Contract Documents, the Contract Documents shall govern.
- C. Where there is conflict between the requirements of the General Conditions of the Contract and the Supplementary Conditions, the requirements of the Supplementary Conditions shall govern, except where the requirements set forth in the Supplementary Conditions are contrary to law, in which case the legal requirements shall govern. The General Conditions of the Contract shall take precedence over other Contract Documents.
- D. Where there is conflict between the Drawings and Specifications and conflict within the Drawings or within the Specifications, the conflict, where applicable, shall be resolved by providing better quality or greater quantity as indicated in the Contract Documents.
- E. It is the intent of the Contract Documents to accomplish a complete and first-grade installation in which there shall be installed new products of the latest and best design and manufacturer, and workmanship shall be thoroughly first class, executed by competent and experienced workmen.
- F. Details of preparation, construction, installation, and finishing encompassed by the Contract Documents shall conform to the best practices of the respective trades, and that workmanship, construction methods, shall be of first class quality so as to accomplish a neat and first class finished job.
- G. Where specific recognized standards are mentioned in the Specifications, it shall be interpreted that such requirements shall be complied with.
- H. The intent of the Contract Documents is to include all labor, equipment, and materials necessary for the proper and timely execution and completion of the Work, even though such labor, equipment, materials are not expressly included in the Contract Documents.
- I. The Contract Documents are complimentary, and what is required by one will be as binding as if required by all.



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- J. The Contractor will be required to perform all parts of the Work, regardless of whether the parts of the Work are described in Sections of the Contract Documents applicable to other trades.

**2 - OWNER**

**2.1 INFORMATION AND SERVICES REQUIRED OF THE OWNER**

- A. Owner shall secure and pay for necessary approvals, easements, assessments and charges required for construction, use or occupancy of permanent structures or for permanent changes in existing structures including those charges and costs related to zoning changes, environmental impact statements, and similar requirements related to use of the site."
- B. The Owner shall not be responsible for furnishing surveys (unless required for the execution of the Work and requested by the Contractor in writing) or other information as to the physical characteristics of, legal limitations of, or utility locations for the Project site, but as necessary for the Work, shall furnish or cause to be furnished to the Contractor a legal description of the project site, which shall not constitute one of the Contract Documents. The Contractor shall confirm the location of each utility; shall relocate or dispose of each on-site utility and shall cap each utility as required by the Work or the Specifications. The Contractor shall not be entitled to additional compensation resulting from its failure to confirm the location of the site utilities or existing structures prior to the opening of its bid.

**3 - CONTRACTOR**

**3.1 REVIEW OF CONTRACT DOCUMENTS AND FIELD CONDITIONS BY CONTRACTOR**

- A. The Contractor shall not be relieved of obligations to perform the Work in accordance with the Contract Documents either by activities or duties of the Architect in the Architect's administration of the Contract, or by tests, inspections or approvals required or performed by persons or entities other than the Contractor.
- B. Where there is a conflict in or between the Drawings and Specifications, the Contractor shall be deemed to have estimated on the more expensive way of doing the Work and the larger quantity required. Only changes or interpretations covered by Addenda or written from the Architect will be permitted during construction of the Work. The Contractor shall perform no portion of the Work at any time without Contract Documents or where required, received Shop Drawings, Product Data, or Samples for such portion of the Work.
- C. Because the Contract Documents are complimentary, the Contractor shall, before starting each portion of the Work, carefully study and compare the various Contract Documents relative to the portion of the Work, as well as the information furnished by the Owner as it applies to the scope of work. Contractor shall be responsible for field measurements and shall take notice of all site conditions effecting the project and project scope. Contractor



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shall inform the Owner and Architect of such observations and their impact on the project in its entirety. The Contractor shall promptly inform the Architect of any errors, omissions, or inconsistencies in the Contract Documents discovered through review, request for information, change orders, or any other means in a format that Architect defines with a clear description of the item and its impact on the project scope. Before ordering material or performing any Work, the contractor shall verify all measurements at the Project site. Any differences between dimensions on the Drawings and actual measurements shall be brought to the Architect's attention for consideration before the Work proceeds. Where actual measurements require more material and work than the Drawings call for, such material and Work shall be supplied at the cost of the Contractor. No extra compensation will be allowed because of difference between actual measurements and dimensions indicated on the Drawings. The Contractor shall assume full responsibility for accuracy of measurements obtained at the work site.

- D. If the Contractor believes that additional cost or time is involved because of clarifications or instructions the Architect issues in response to the Contractor's notices or requests for information the Contractor shall make Claims per specifications and inform the Architect in writing. If the Contractor fails to perform this obligation in a timely manner adequate for a reasonable response and adjustments by the Architect/Owner, the Contractor shall pay for such costs of damages to the Owner.
- E. Mechanical and Electrical Drawings are diagrammatic only. Actual work involved shall be installed from received Shop Drawings with all measurements obtained at the Project Site by the Contractor.
- F. Dimensions which are lacking from the Drawings shall be obtained from the Architect or field verified. In no case will the Contractor assume that the Drawings are scaled.
- G. General contractor is responsible for securing all permits and for permit fees. Contractor is responsible for all permits, fees, licenses, and inspections by government agencies necessary for proper execution and completeness of the Work that are customarily secured after execution of the Contract and legally required at the time bids are received or negotiations concluded. Certain permits have been obtained by the Owner, it is the responsibility of the Contractor to coordinate with the Owner and determine the outstanding permit requirements and balance of fees associated with the permits.

### 3.2 WARRANTY AND LABOR AND MATERIALS

- A. Unless otherwise provided in the Contract Documents, the Contractor shall provide and pay for labor, materials, equipment, tools, construction equipment and machinery, water, heat, utilities, transportation, and other facilities and services necessary for proper execution and completion of Work.
- B. The Contractor shall be responsible for inspection of portions of Work already performed to determine that such portions are in proper conditions to receive subsequent Work. Architect shall reserve a right to inspection of construction to assure compliance to the Contract Documents. Contractor shall be responsible for Work compliance to the Contractor Documents.
- C. The Contractor warrants to the Owner and Architect that materials and equipment furnished under the Contract will be of good quality and new unless the Contract



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Documents require or permit otherwise. The Contractor further warrants that the Work will conform to the requirements of the Contract Documents and will be free of defects. In addition to any other warranties, guarantees, or obligations set forth in the Contract Documents or applicable as a matter of law and not in limitation of the terms of the Contract Documents, the Contractor warrants and guarantees that:

1. The Owner will have good title to the Work and materials and equipment incorporated into the Work will be new.
  2. The Work and materials and equipment incorporated into the Work will be free from defects, including defects in the workmanship or materials.
  3. The Work and equipment incorporated into the Work will be fit for the purpose for which they are intended.
  4. The Work and materials and equipment incorporated into the Work will be merchantable.
  5. The Work and materials and equipment incorporated into the Work will conform in all respects to the Contract Documents.
- D. The Contractor shall, upon completion of the Work, assign to the Owner all warranties obtained or obtainable by, the Contractor from manufacturers and suppliers of equipment and materials incorporated into the Work by written instrument of assignment in a form acceptable to the Owner.
- E. For a period of three years from the date of final completion and acceptance of the Work by the Owner, as evidenced by the date of the Substantial Completion, the Contractor warrants to the Owner all movable windows, apparatus, machinery, mechanical and electrical equipment. For the same period, the Contractor warrants to Owner to make good, at his own expense, any defects, shrinkages, warpages or other faults in Work required under this Contract arising out of defective materials or workmanship, ordinary wear and tear excepted.
- F. As part of the above warranty, it is expressly understood and agreed that the Contractor warrants that the Contractor's portion of the Work shall be waterproof and weatherproof in every respect for a period of three (3) years from the Date of Substantial Completion.
- G. The Contractor warrants and represents to the Owner that the Drawings and Specifications for the Work are suitable and adapted for said Work, and guarantees the sufficiency of said Drawings and Specifications for their intended purpose and agrees that it will perform said construction work and complete same to the entire satisfaction of the Owner and Architect.
- H. In addition to all of Contractor's warranties and obligations to correct defective Work provided by law or as set forth in any of the Contract Documents, the Contractor agrees, upon notice from Owner or Architect, immediately to repair, restore, correct and cure, at Contractor's expense, all defects and omissions in workmanship and materials and all failures to comply with the Contract Documents which appear within three (3) years from the Date of Substantial Completion. Contractor shall pay for, and if requested, correct, repair, restore and cure any damage or injury, whenever the same shall occur or appear, resulting from any defects, omissions or failure in workmanship and materials, and indemnify, hold harmless, and defend Owner against any and all claims, losses, costs, damages and expenses, including attorney's fees, suffered by Owner as a result of such damage or injury, whenever such damage or injury shall occur or appear.



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- I. The foregoing guarantees and warranties shall not shorten any longer warranty or liability period provided for by law or in the plans, drawings or specifications or otherwise received from Contractor or any subcontractor, material supplier or manufacturer of Contractor nor supersede the terms of any liability for defective Work, but shall be in addition thereto, and shall be in addition to all manufacturer's and factory warranties.
- J. All guarantees or warranties upon any Work, labor, materials, or equipment by any subcontractor or material supplier of Contractor shall be deemed made by Contractor to Owner. All guarantees and warranties shall survive Owner's final acceptance of the Project. Neither the acceptance of any of the Work by Owner, in whole or in part, nor any payment, either partial or final, by Owner to Contractor, shall constitute a waiver by Owner of any claims against Contractor for defects in the Work, whether latent or apparent, and no such payment or acceptance of the Work by Owner shall release or discharge Contractor or Contractor's surety from any such claims for breach of such warranties.
- K. The Contractor shall employ a competent superintendent and necessary assistants who shall be in attendance at the project site during the performance of the Work. The superintendent shall represent the Contractor and communication given by the superintendent shall be as binding as if they were given by the Contractor. The Superintendent shall be satisfactory to the Architect and the Owner, and the Architect and Owner shall have the right to require the Contractor to remove a Superintendent and replace with a Superintendent who is satisfactory to the Architect and Owner. The Contractor shall not replace the Superintendent without the consent of the Architect and Owner, except with another Superintendent who is satisfactory to the Architect and Owner.
- L. The Contractor shall comply with and give notices required by applicable laws, statutes, ordinances, codes, rules and regulations, and lawful orders of public authorities applicable to perform the Work. If the Contractor performs Work knowing it to be contrary to applicable laws, statutes, ordinances, codes, rules and regulations, or lawful orders of public authorities, the Contractor shall assume appropriate responsibility for such Work and shall bear the costs attributed to corrections.
- M. All observed or uncovered conditions on site that differ than those anticipated by the Contract Documents shall be reported to the Architect for investigation and direction. The Contractor shall inform the Architect of such conditions no later than 21 days after the first observance of such conditions.
- N. The Contractor shall submit a schedule of Work to the Owner and Architect promptly after the contract award.
- O. The Contractor shall perform Work so as not to interfere with the Owner's ongoing activities and so as not to create any hazards to the Owner's employees or members of the public using the Owner's property.
- P. Upon notice of award, the Contractor shall immediately apply for all applicable permits not previously obtained by the Owner to do the work from the appropriate governmental agency or agencies. No work shall commence until all applicable permits have been obtained and copies delivered to the Engineer. The costs for obtaining all permits shall be borne by the Contractor.



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- Q. Within 30 days of the date of Notice to Proceed, the Contractor shall submit to the Engineer and Owner a Hurricane Preparedness Plan. The plan should outline the necessary measures which the Contractor proposes to perform at no additional cost to the Owner in case of a hurricane warning.
- R. In the event of inclement weather, or whenever Engineer shall direct, Contractor shall insure that he and his Subcontractors shall carefully protect work and materials against damage or injury from the weather. If, in the opinion of the Engineer, any portion of work or materials is damaged due to the failure on the part of the Contractor or Subcontractors to protect the work, such work and materials shall be removed and replaced at the expense of the Contractor.
- S. The Contractor shall do all groundwater pumping necessary to prevent flotation of any part of the work during construction operations with his own equipment. The Contractor shall pump out water and wastewater which may seep or leak into the excavations for the duration of the Contract and with his own equipment. He shall dispose of this water in an appropriate manner.
- T. The Contractor shall not create a public nuisance including but not limited to encroachment on adjacent lands, flooding of adjacent lands, excessive noise or dust. Sound levels must meet Manatee County Ordinance #87-34, (which amends Ordinance 81-3, The Manatee County Noise Control Ordinance) or latest edition of the ordinances. Sound levels in excess of such ordinance are sufficient cause to have the work halted until equipment can be quieted to these levels. Work stoppage by the Engineer or County f or excessive noise shall not relieve the Contractor of the other portions of this specification including, but not limited to contract time and contract price. No extra charge may be made for time lost due to work stoppage resulting from the creation of a public nuisance.

**3.3 PROTECTION OF PROPERTY AND PERSONS**

- A. The Contractor shall be responsible for initiating, maintaining and supervising all safety precautions and programs in connection with the performance of the Work under this Contract. The Contractor shall promptly remedy any damages and loss caused to the property or persons.
- B. The Contractor shall take reasonable precautions for safety of, and shall provide reasonable protection to prevent damage, injury or loss to:
  - .1 employees on the Work and other persons who may be affected.
  - .2 the Work and materials and equipment to be incorporated therein, whether in storage on or off the site, under care, custody or control of the Contractor or the Contractor's Subcontractors or Sub-subcontractors; and
  - .3 other property at the site or adjacent thereto, such as trees, shrubs, lawns, walks, pavements, roadways, structures and utilities not designated for removal, relocation or replacement in the course of Construction.

**4 - ARCHITECT**



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4.1 GENERAL

- A. The term "Architect," "Architect/Engineer," or "Engineer" as used herein means the Architect or his authorized representative.
- B. To the fullest extent permitted by law the Contractor shall indemnify and hold harmless the Owner, Architect, Architect's consultants, and agents and employees of any of them from and against claims, damages, losses and expenses, including but not limited to attorney's fees, arising out of or resulting from performance of the Work or any site safety responsibilities which are the responsibility of the Contractor. Contractor shall further indemnify the above agents from any unforeseen damages to the Work or materials due to accidental causes or natural causes. The Contractor shall also indemnify the above stated agents from all royalty and patent rights, all associated fees for royalty and patents shall be the responsibility of the Contractor.
- C. The Architect shall provide administration of the Contract as described in the Contract Documents and will be an Owner's representative during the construction until the date the Architect issues the final Certificate For Payment. The Architect shall have the authority to act on behalf of the Owner only to the extent provided in the Contract Documents. The Architect shall not be held responsible for construction means, methods, technique, sequences or procedures of any safety precautions.
- D. Based on the Architect's evaluations of the Contractor's Application for Payment, the Architect shall review and certify the amounts due to the Contractor and will issue Certificates for Payment in such amounts. See Submittals section in the specifications for more info on Certificates of Payment procedures.
- E. Architect has authority to reject Work that does not comply with the Contract Documents. Architect shall have the authority to require inspections or testing of the Work whether or not such Work is fabricated, installed or completed. However, neither this authority of the Architect nor a decision made in good faith either to exercise or not to exercise such authority shall give rise to a duty or responsibility of the Architect to the Contractor or any other subcontractors, suppliers, installers or their agents or employees, or any entities performing portions of Work.
- F. Interpretations and decisions of the Architect will be consistent with the intent of the Construction Documents and will be made in writing or drawing format. The Architect will endeavor to secure faithful performance by both the Owner and Contractor, will not show partiality to either and will not be liable for results of interpretations or decisions rendered in good faith.

5 - SUBCONTRACTORS

5.1 AWARD OF SUBCONTRACTORS AND OTHER CONTRACTS FOR PORTIONS OF THE WORK

- A. The Contractor shall furnish to the Architect in writing the names of the persons or entities (including those who are to furnish materials or equipment fabricated to a special design) proposed for each of the principal portions of the Work, in accordance with the requirements under Specification Section 01300, Submittals, in a form acceptable to the Architect, for review by the Owner and the Architect.



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- B. The Contractor shall not substitute a Subcontractor, person or entity previously selected if the Owner or Architect makes reasonable objections to such substitution. The Owner may require the Contractor to change a Subcontractor or Sub-subcontractor previously approved, and, if at such time the Contractor is not in default under this Agreement, the Contract sum shall be increased or decreased by the difference in the cost resulting from the change.
- C. Any part of the Work performed for the Contractor by a Subcontractor or its Sub-subcontractor shall be pursuant to a written Subcontract between the Contractor and such Subcontractor (or the Subcontractor and its Sub-subcontractor at any tier). Architect will assume no responsibility for reviewing, monitoring, or verifying activities or relationships involving a Subcontractor or its Sub-subcontractor.

**5.2 DELAYS AND EXTENSION OF TIME**

- A. If the Contractor is delayed at any time in its progress of the Work by one of the delays for which an extension of time is permitted and gives the Architect written notice specifically describing the delay within 48 hours of its commencement, the date for the Substantial Completion of the Work will be extended by Change Order for such reasonable time as the Architect may determine. The failure to give such notice will constitute an irrevocable waiver of the contractor's right to seek an extension of the time for completion will be delays caused by the i) Architect, or the Owner, ii) physical damage to the Project over which the Contractor has no control, iii) labor disputes beyond the control of the Contractor, and iv) unusually severe weather conditions not reasonably anticipated (temperature, rain, or other precipitation within a range of twenty percent (20%) of normal amounts for the time of the year covered by the Agreement shall not be considered unusually severe weather conditions). Extensions of time will only be granted pursuant to the procedures for Change Orders set forth in the General Conditions. The Contractor agrees not to make claims for compensation for delays or acceleration in the performance of the Work resulting from acts or failure to act by the Owner, the Architect, or the employees, agents, or representatives of the Owner, or the Architect and agrees that such claim shall be fully compensated by an extension of time to complete the Work, regardless of when granted.
- B. If in the opinion of the Architect the Work is behind where it is supposed to be in the Project Time Schedule or it is likely that the Work will not be substantially complete by the applicable date for Substantial Completion, the Contractor upon written notice from the Architect and without additional cost or compensation will increase its work force and, if requested by the Architect, work such overtime to make up for the delay. Should the Contractor fail to increase its work force, work overtime, or proceed to make up for the delay to the satisfaction of the Architect or the Owner, the Architect or the Owner, in addition to other remedies under this Agreement and other Contract Documents, will have the right to cause other Contractors to work overtime and to take whatever other action is deemed necessary to avoid delay in the Substantial Completion of the Work and of the Project, and the cost and expense of such overtime and other action will be borne by the Contractor and may be set off against sums due the Contractor.

**6 - UNCOVERING AND CORRECTION OF WORK**



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6.1 CORRECTION OF WORK

- A. Within 48 hours after written notices from the Architect, or the Owner (except such period shall be 7 days when notice is given after final payment) that the work does not conform to the Contract Documents, or immediately upon oral notice, if the nonconformance constitutes a threat to the safety of persons or property, the Contractor, without waiting for the resolution of disputes that may exist i) shall commence to correct such nonconformance, ii) shall thereafter use its best efforts to where an extension of time is granted in writing by the Owner, shall complete necessary corrections so that the nonconformance is eliminated to the satisfaction of the Architect, and the Owner within 7 days of such notice. The Contractor shall bear all costs of correcting the nonconformance, including additional testing and inspections and additional service fees of the Architect. The notice provided for in this Subparagraph may be given at any time. It is the intent that the obligations under this Subparagraph shall continue to apply after final completion and final payment.
- B. If the Contractor fails to correct nonconforming Work the Owner may correct it in accordance with Contract. If the Subcontractor does not proceed with correction of such nonconforming Work as provided in the Contract, the Owner may remove it and store the salvageable materials or equipment at the Contractor's expense.

6.2 ACCEPTANCE OF NONCONFORMING WORK

- A. The acceptance of nonconforming Work by the Owner shall be by written Change Order, signed by the Owner's authorized representative. No person has authority to accept nonconforming work except pursuant to such written Change Order.

7 – CONTRACT CLOSEOUT

7.1 SUBSTANTIAL COMPLETION

- A. The Contractor shall submit the following items when the Contractor considers the work to be substantially complete:
1. A written notice that the work, or designated portion thereof, is substantially complete.
  2. A list of items to be completed or corrected.
- B. Within a reasonable time after receipt of such notice, the Architect and Owner shall make an inspection to determine the status of completion.
- C. Project record documents and operations and maintenance manuals must be submitted before the project shall be considered substantially complete.
- D. If the Architect determines that the work is not substantially complete:
1. The Architect shall notify the Contractor in writing, stating the reasons.



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2. The Contractor shall remedy the deficiencies in the work and send a second written notice of substantial completion to the Architect.
  3. The Architect shall re-inspect the work.
- E. When the Architect finds that the work is substantially complete:
1. He shall prepare and deliver to the Owner a tentative Certificate of Substantial Completion with a tentative list of the items to be completed or corrected before final payment.
  2. The Architect shall consider any objections made by the Owner as provided in Conditions of the Contract. When the Architect considers the work substantially complete, he will execute and deliver to the Owner and the Contractor a definite Certificate of Substantial Completion with a revised tentative list of items to be completed or corrected.

**7.2 FINAL INSPECTION**

- A. When the Contractor considered the work to be complete, he shall submit written certification stating that:
1. The Contract Documents have been reviewed.
  2. The work has been inspected for compliance with Contract Documents.
  3. The work has been completed in accordance with Contract Documents.
  4. The equipment and systems have been tested in the presence of the Owner's representative and are operational.
  5. The work is completed and ready for final inspection.
- B. The Architect shall make an inspection to verify the status of completion after receipt of such certification.
- C. If the Architect determines that the work is incomplete or defective:
1. The Architect shall promptly notify the Contractor in writing, listing the incomplete or defective work.
  2. The Contractor shall take immediate steps to remedy the stated deficiencies and send a second written certification to Architect that the work is complete.
  3. The Architect shall re-inspect the work.
- D. Upon finding the work to be acceptable under the Contract Documents, the Engineer shall request the Contractor to make closeout submittals.
- E. For each additional inspection beyond a total of three (3) inspections for substantial and final completion due to the incompleteness of the work, the Contractor shall reimburse the Owner for the Architect's fees.



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7.3 CONTRACTOR'S CLOSOUT SUBMITTALS TO ARCHITECT

- A. Project Record Documents (prior to substantial completion).
- B. Operation and maintenance manuals (prior to substantial completion).
- C. Warranties and Bonds.
- D. Evidence of Payment and Release of Liens: In accordance with requirements of General and Supplementary Conditions.
- E. Certificate of Insurance for Products and Completed Operations.
- F. Final Reconciliation, Warranty Period Declaration, and Contractor's Affidavit.

7.4 FINAL ADJUSTMENT OF ACCOUNTS

- A. Submit a final statement of accounting to the Architect.
- B. Statement shall reflect all adjustments to the Contract Sum.
- C. Project Management shall prepare a final Change Order, reflecting approved adjustments to the Contract Sum which were not previously made by Change Orders.
- D. Final application for payment shall be made per contract document procedures.

END OF SECTION 00 73 00



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SECTION 00 73 10  
 FLORIDA STATUTES

SWORN STATEMENT PURSUANT TO SECTION 287.133(3)(a),  
FLORIDA STATUTES, ON PUBLIC ENTITY CRIMES

THIS FORM MUST BE SIGNED AND SWORN TO IN THE PRESENCE OF A NOTARY PUBLIC OR OTHER OFFICIAL AUTHORIZED TO ADMINISTER OATHS.

1. This sworn statement is submitted to \_\_\_\_\_ (Owner's Name) \_\_\_\_\_  
 By \_\_\_\_\_  
 [print individual's name and title]  
 for \_\_\_\_\_  
 [print name of entity submitting sworn statement]  
 whose business address is \_\_\_\_\_  
 and (if applicable) its Federal Employer Identification Number (FEIN) is \_\_\_\_\_.

If the entity has no FEIN, include the Social Security Number of the individual signing this sworn statement. \_\_\_\_\_ - - \_\_\_\_\_.

2. I understand that a "public entity crime" as defined in Paragraph 287.133(1)(g), Florida Statutes, means a violation of any state or federal law by a person with respect to and directly related to the transaction of business with any public entity or with an agency or political subdivision of any other state or of the United States, including, but not limited to, any bid or contract for goods or services to be provided to any public entity or an agency or political subdivision of any other state or of the United States and involving antitrust, fraud, theft, bribery, collusion, racketeering, conspiracy, or material misrepresentation.
3. I understand that "convicted" or "conviction" as defined in Paragraph 287.133(1)(b), Florida Statutes, means a finding of guilt or a conviction of a public entity crime, with or without an adjudication of guilt, in any federal or state trial court of record relating to charges brought by indictment or information after July 1, 1989, as a result of a jury verdict, nonjury trial, or entry of a plea of guilty or nolo contendere.
4. I understand that an "affiliate" as defined in Paragraph 287.133(1)(a), Florida Statutes, means:
  1. A predecessor or successor of a person convicted of a public entity crime; or
  2. An entity under the control of any natural person who is active in the management of the entity and who has been convicted of a public entity crime. The term "affiliate" includes those officers, directors, executives' partners, shareholders, employees, members, and agents who are active in the management of an affiliate. The ownership by one person of shares constituting a controlling interest in another person, or pooling of equipment or income among persons when not for fair market value under an arm's length agreement, shall be a prima facie case that one person controls another person. A person who knowingly enters into a joint venture with a person who has been convicted of a public entity crime in Florida during the proceeding 36 months shall be considered an affiliate.



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5. I understand that a "person" as defined in Paragraph 287.133 (1)(e), Florida Statutes, means any natural person or entity organized under the law of any state or of the United States with the legal power to enter into a binding contract and which bids or applies to bid on contracts for the provision of goods or services let by a public entity. The term "person" includes those officers, directors, executives, partners, shareholders, employees, members, and agents who are active in management of an entity.
6. Based on information and belief, the statement which I have marked below is true in relation to the entity submitting this sworn statement.

[Indicate which statement below applies.]

\_\_\_\_\_ Neither the entity submitting this sworn statement, nor any of its officers, directors, executives, partners, shareholders, employees, members, or agents who are active in the management of the entity, nor any affiliate of the entity has been charged with and convicted of a public entity crime subsequent to July 1, 1989.

\_\_\_\_\_ The entity submitting this sworn statement, or one or more of its officers, directors, executives, partners, shareholders, employees, members, or agents who are active in the management of the entity, or an affiliate of the entity has been charged with and convicted of a public entity crime subsequent to July 1, 1989.

\_\_\_\_\_ The entity submitting this sworn statement, or one or more of its officers, directors, executives, partners, shareholders, employees, members or agents who are active in the management of the entity, or an affiliate of the entity has been charged with and convicted of a public entity crime subsequent to July 1, 1989. However, there has been a subsequent proceeding before a Hearing Officer of the State of Florida, Division of Administrative Hearings and the Final Order entered by the Hearing Officer determined that it was not in the public interest to place the entity submitting this sworn statement on the convicted vendor list. [attach a copy of the final order]

I UNDERSTAND THAT THE SUBMISSION OF THIS FORM TO THE CONTRACTING OFFICER FOR THE PUBLIC ENTITY IDENTIFIED IN PARAGRAPH 1 (ONE) ABOVE IS FOR THAT PUBLIC ENTITY ONLY AND, THAT THIS FORM IS VALID THROUGH DECEMBER 31 OF THE CALENDAR YEAR IN WHICH IT IS FILED. I ALSO UNDERSTAND THAT I AM REQUIRED TO INFORM THE PUBLIC ENTITY PRIOR TO ENTERING INTO A CONTRACT IN EXCESS OF THE THRESHOLD AMOUNT PROVIDED IN SECTION 287.017, FLORIDA STATUTES FOR CATEGORY TWO OF ANY CHANGE IN THE INFORMATION CONTAINED IN THIS FORM.

\_\_\_\_\_  
 [signature]

\_\_\_\_\_  
 [date]

(OFFICIAL SEAL)

STATE OF \_\_\_\_\_ COUNTY OF \_\_\_\_\_.



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Sworn to and subscribed before me this \_\_\_\_\_ day of \_\_\_\_\_, 20\_\_\_\_.

by \_\_\_\_\_ who is personally known to me

or who has produced \_\_\_\_\_ as identification.

\_\_\_\_\_  
Signature of Notary Public

\_\_\_\_\_  
Typed, Printed or Stamped Name of Notary

\_\_\_\_\_  
My Commission Expires

\_\_\_\_\_  
Notary Public Commission Number

END OF SECTION 00 73 10



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SECTION 00 80 00  
MEASUREMENT, PAYMENT AND COMPLETION

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

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

1.2 SUMMARY

- A. This Section specifies The scope of this section of the Contract Documents is to further define the items included in each Bid Item in the Bid Form section of the Contract Documents. Payment will be made based on the specified items included in the description in this section for each bid item.
- B. All contract prices included in the Bid Form section will be full compensation for all shop drawings, working drawings, labor, materials, tools, equipment and incidentals necessary to complete the construction as shown on the Drawings and/or as specified in the Contract Documents to be performed under this Contract. Actual quantities of each item bid on a unit price basis will be determined upon completion of the construction in the manner set up for each item in this section of the Specifications. Payment for all items listed in the Bid Form will constitute full compensation for all work shown and/or specified to be performed under this Contract.
- C. The quantities shown are approximate and are given only as a basis of calculation upon which the award of the Contract is to be made. The Owner/Engineer docs not assume any responsibility for the final quantities, nor shall the Contractor claim misunderstanding because of such estimate of quantities Final payment will be made only for satisfactorily completed quantity of each item.
- D. No payment will be made for work constructed outside the authorized limits of work.
- E. Unless otherwise specified for the particular items involved, all measurements of distance shall be taken horizontally or vertically.
- F. Where payment for items is shown to be paid for on a lump sum basis, no separate payment will be made for any item of work required to complete the lump sum items. Lump sum contracts shall be complete, tested and fully operable prior to request for final payment. Contractor may be required to provide a break-down of the lump sum totals.

1.3 UNIT PRICE

- A. Separate payment will be made for the items of work described herein and listed on the Bid Form. Any related work not specifically listed, but required tor satisfactory completion of the work shall be considered to be included in the scope of the appropriate listed work items.



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- B. No separate payment will be made for the following items and the cost of such work shall be included in the applicable pay items of work. Final payments shall not be requested by the Contractor or made by the Owner until as-built (record) drawings have been submitted and approved by the Engineer.
1. Shop Drawings, Working Drawings.
  2. Clearing, grubbing and grading except as hereinafter specified.
  3. Trench excavation, including necessary pavement removal and rock removal, except as otherwise specified.
  4. Dewatering and disposal of surplus water.
  5. Structural fill, backfill, and grading.
  6. Replacement of unpaved roadways, and shrubbery plots.
  7. Cleanup and miscellaneous work.
  8. Foundation and borrow materials, except as hereinafter specified.
  9. Testing and placing system in operation.
  10. Any material and equipment required to be installed and utilized for the tests.
  11. Pipe, structures, pavement replacement, asphalt and shell driveways and/or appurtenances included within the limits of lump sum work, unless otherwise shown.
  12. Maintaining the existing quality of service during construction.
  13. Maintaining or detouring of traffic.
  14. Appurtenant work as required for a complete and operable system.
  15. Seeding and hydromulching.
  16. As-built Record Drawings.

### 1.4 BID ITEM DESCRIPTIONS

- A. Bid Items are described in a greater detail below.

**Bid Item No. 1: MOBILIZATION** MOBILIZATION/DEMOBILIZATION shall be paid for at a lump sum price. The contract lump sum price paid for MOBILIZATION/DEMOBILIZATION shall include full compensation for furnishing all labor, materials, tools, equipment, and incidentals and for doing all the work in this category. MOBILIZATION shall include but not be limited to: obtaining bonds, insurance and financing, movement of equipment, materials and personnel, supervision, field office, certificates, permits, submittals, utilities, site maintenance, cleanup, dust control and all other work incidental to the contract per drawings and specifications. The cost for MOBILIZATION/DEMOBILIZATION shall not exceed five (5) percent of the total bid.

**Bid Item No. 2: TEMPORARY EROSION CONTROL** TEMPORARY EROSION CONTROL shall be paid for at a lump sum price. The contract lump sum price paid for TEMPORARY EROSION CONTROL shall include full compensation for furnishing all labor, materials, tools, equipment, and incidentals to install, maintain, and remove all required TEMPORARY EROSION CONTROL, including drainage inlet protection, fiber rolls, erosion control fencing, tree protection, construction entrances, and any other temporary erosion control measures as may be required by the Project permits or permitting agencies, as shown on the plans, as specified herein, and as directed by the Architect.



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**Bid Item No. 3: DEMOLITION** Payment for all work under DEMOLITION shall be paid for at a lump sum price. The contract price paid for DEMOLITION shall include all work and materials per plans and specifications. Sum shall include full compensation for furnishing all labor, materials, tools, equipment, and incidentals and for doing all the work involved in DEMOLITION. This sum shall be inclusive of entire project scope per plans and specifications for materials, installation/labor, storage, maintenance, testing and all other aspects of work associated with DEMOLITION. Scope shall include but not be limited to: all demolition, material removal, temporary shoring and temporary structure. See drawings and specifications for complete scope of work.

**Bid Item No. 4: SITE WORK - COMPLETE** Payment for all work under SITE WORK - COMPLETE shall be paid for at a lump sum price. The contract price paid for SITE WORK - COMPLETE shall include all work and materials per plans and specifications. Sum shall include full compensation for furnishing all labor, materials, tools, equipment, and incidentals and for doing all the work involved in SITE WORK - COMPLETE. This sum shall be inclusive of entire project scope per plans and specifications for materials, installation/labor, storage, maintenance, testing and all other aspects of work associated with SITE WORK - COMPLETE. Scope shall include but not be limited to: excavation, fences, gates, and miscellaneous concrete. See drawings and specifications for complete scope of work.

**Bid Item No. 5: LANDSCAPE AND IRRIGATION** Payment for all work under LANDSCAPE AND IRRIGATION shall be paid for at a lump sum price. The contract price paid for LANDSCAPE AND IRRIGATION shall include all work and materials per plans and specifications. Sum shall include full compensation for furnishing all labor, materials, tools, equipment, and incidentals and for doing all the work involved in LANDSCAPE AND IRRIGATION. This sum shall be inclusive of entire project scope per plans and specifications for materials, installation/labor, storage, maintenance, testing and all other aspects of work associated with LANDSCAPE AND IRRIGATION. See drawings and specifications for complete scope of work.

**Bid Item No. 6: BUILDING - COMPLETE** Payment for all work under BUILDING - COMPLETE shall be paid for at a lump sum price. The contract price paid for BUILDING - COMPLETE shall include all work and materials per plans and specifications. Sum shall include full compensation for furnishing all labor, materials, tools, equipment, and incidentals and for doing all the work involved in BUILDING - COMPLETE. This sum shall be inclusive of entire project scope per plans and specifications for material removal, labor, clean up, and all other aspects of work associated with BUILDING - COMPLETE. Scope shall include but not be limited to: all building systems and components as described in drawings and specifications, exterior envelope, roof, all interior components, painting, finishes, casework, and all other scope not covered by other bid sections. See drawings and specifications for complete scope of work.

**Bid Item No. 7: DISCRETIONARY WORK** Payment for all work under DISCRETIONARY WORK shall be made only at the Owner's discretion in order to satisfactorily complete the project in accordance with the Plans and Specifications.



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**Bid Item No. 8: HAZARDOUS MATERIAL REMOVAL** HAZARDOUS MATERIAL REMOVAL price shall be provided to the owner and shall not be part of the total bid price. This bid item is reserved to be used if any hazardous materials are discovered at the site and need to be mitigated in order to complete the Work per drawings and specifications. Contractor shall price 1 cubic yard or hazardous material removal and replacement of that material with a healthy material as needed to complete the Work as drawn and specified. Contractor shall price all work associated with removal and replacement of such material including but not limited to: all associated labor, equipment, transportation, healthy material replacement, and any associated price change in any work affected by this bid item as it pertains to completion of Work as drawn and specified. Contractor shall not add this price to the bid amount and shall use this unit price (CY) amount only if hazardous materials are discovered at the site. No work under this bid item shall be furnished without the written approval and agreement from the Owner. Contractor shall use this price for any (small or large) amount of work to be done under this bid item.

1.5 APPLICATIONS FOR PAYMENT

- A. Applications for payment shall be made at approximately 30 day intervals in accordance with the dates established in the Standard Form of Agreement Between Owner and Contractor. At least 15 days before each progress payments falls due, the Contractor shall submit to the Architect, in quintuplet, an itemized Application for Payment, supported by such data sustaining the Contractor's right to payment as the Owner, or the Architect may require. The form of Application for Payment shall be AIA Document G702 - Application and Certification for Payment, supported by AIA Document G703 - Continuation Sheet. No other forms of Application for Payment will be acceptable. Continuation Sheet G703 shall be prepared the same as in the Schedule of Values submitted by the Contractor. Contractor's payment will be made within twenty-five (25) days after the Contractor's payment application is approved by the County.
- B. Contractor shall submit with each monthly Application for Payment, 1) an affidavit that payrolls, bills for materials and equipment, and other indeptness connected with the Work for which the previous Application, was submitted and the Owner or his property might in any way be responsible, have been paid or otherwise satisfied, and 2) release or waivers of liens arising out of the Contract from each Subcontractor, materialmen, supplier, and laborer of the Contractor in the form of Partial Lien Waiver provided with the Contract Documents or such other form as may be approved by the Architect and Owner, and 3) County of Manatee Claims Form available from the city/county Clerk's office.
- C. For Schedule of Values requirements please see section 01 33 00.
- D. Unless otherwise indicated in Contract Documents, payments shall be made on account of materials and equipment delivered and suitably stored at the site. If previously agreed upon by the Owner, payments may similarly be made for materials and equipment stored off the site at a location previously agreed upon in writing. Contractor shall comply with all conditions of off site storage agreement as indicated by the Owner prior to proceeding with arrangements for such conditions. Payment to Contractor for materials stored off site is discouraged. Where circumstances indicate that the Owner's best interest is



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served by off-site storage, the Contractor shall make written request to the Architect for approval to include such material costs in his next progress payment. The Contractor's request shall include the following information:

1. A list of the fabricated materials consigned to the project (which shall be clearly identified), giving the place of storage, together with copies of invoices and reasons why materials cannot be delivered to the site.
  2. Certification that items have been tagged for delivery to the project and that they will not be used for another purpose.
  3. A letter from the Bonding Company indicating agreement to the arrangements and that payment to the Contractor shall not relieve either party or their responsibility to complete the facility.
  4. Evidence of adequate insurance covering the material in storage, which shall name the Owner as additionally insured.
  5. Costs incurred by the Architect to inspect material in off-site storage shall be paid by the Contractor.
  6. Subsequent pay requests shall itemize the materials and their cost which were approved on previous pay requests and remain in off-site storage
- E. The Contractor warrants the title to all Work covered by an Application for Payment will pass to the Owner no later than the time of payment and is free and clear of all liens and encumbrances. The Contractor will indemnify the Owner and the Owner's property from any liens, claims, security interests or encumbrances in favor of the Contractor, Subcontractors or their Sub-subcontractors, regardless of tier, material suppliers, or other persons or entities making a claim by reason of having provided labor, materials, equipment, services or supplies relating to the Work, and from all cost and expenses, including attorneys' and consultants' fees incurred by the Owner in evaluating or defending against such liens, claims, security interests or encumbrances. Partial payments to the Contractor for labor performed under either a unit or lump sum price Contract shall be made at the rate of 90 percent (90%) of the Contract Sum.
- F. When the payment is made on account of materials or equipment not yet incorporated into the Project, such materials and equipment will become the property of the Owner; provided that if such materials or equipment are stolen, destroyed, or damaged before being fully incorporated into the Project, the Contractor will be required to replace them at its own expense, if not covered by builder's risk policy.
- G. A retainage of 2.5% of the total contract amount shall be withheld from payments after 75% completion of the Work. Upon substantial completion, this retainage shall be reduced to 1% of the total contract amount plus such amount as the Owner may reasonably deem necessary to repair, replace, complete or correct any damaged, defective, incorrect or incomplete work. Upon final acceptance, the remaining retainage shall be included in the final payment.



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1.6 CERTIFICATES FOR PAYMENT

- A. The Architect will, within fifteen days, after receipt of the Contractor's Application for Payment, either issue to the owner a Certificate for Payment, with a copy to the Contractor, for such amounts as the Architect deems is properly due, or notify the Contractor and the Owner of the Architect's reason for withholding certification in whole or in part as provided in paragraph .1, section 3 of ARTICLE 6.
- B. The issuance of a Certificate for Payment will constitute a representation by the Architect to the Owner, based on the Architect's evaluation of the Work and the data in the Application for Payment that to the best of the Architect's knowledge, information, and belief, the Work has progressed to the point indicated on the Application for Payment. The issuance of a Certificate for Payment will not be a representation that the Architect has (a) made exhaustive or continuous on site inspections to check the quality or quantity of the Work, (b) reviewed construction means, methods, techniques, sequences or procedures, (c) reviewed copies of requisitions received from Subcontractors and material suppliers and other data requested by the Owner to substantiate the Contractor's right to payment, or (d) made examination to ascertain how or for what purpose the Contractor has used the money previously paid on account of the Contract Sum.

1.7 DECISIONS TO WITHHOLD CERTIFICATION

- A. The Architect may withhold a Certificate for Payment in whole or in part, to the extent reasonably necessary to protect the Owner, if in Architect's opinion the representation to the Owner required by the above section can not be made. If an Architect is unable to certify payment in the amount of the Application, the Architect will notify the Contractor and Owner as indicated above. If the Contractor and Architect cannot agree on a revised amount, the Architect will promptly issue a Certificate for Payment for the amount for which the Architect is able to make such representations to the Owner. The Architect may also withhold a Certificate for Payment or may nullify the whole or a part of a Certificate for Payment previously issued, to such extent as may be necessary in the Architect's opinion to protect the Owner from loss for which the Contractor is responsible, including loss resulting from acts and omissions described in specifications and because of:
  - 1. The Contractor is in default of the performance of any of its obligations under the Contract Documents, including, but not limited to: failure to provide sufficient skilled workers; work, including equipment or materials, which is defective or otherwise does not conform to the Contract Documents; failure to conform to the Project Time Schedule; or failure to follow the directions of or instructions from the Architect or Owner.
  - 2. The Contractor is in default of the performance of any of its obligations under another Contract, which it has with the Owner.
  - 3. The filing of the third party claims or reasonable evidence that third party claims have been or will be filed.



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4. The Work has not proceeded to the extent set forth in the Application for Payment.
  5. Representations made by the Contractor are untrue.
  6. The failure of the Contractor to make payments to its Subcontractors, materialmen, or laborers.
  7. Damage to the Owner's property or the property of another Contractor or person.
  8. The determination by the Architect that there is a substantial possibility that the Work cannot be completed for the unpaid balance of the Contract Sum.
  9. Liens filed or reasonable evidence indicating the probable filing of such liens with respect to the Project.
- B. When the above reasons for withholding certifications are removed, certification will be made for the amounts previously withheld. If the Owner makes payments by joint check, the Owner shall notify the Architect in order to reflect such payments on the next Certification for Payment.
- C. Contractor's application for a payment shall reflect an equal percentage amount (within 2-3 percent) for labor and materials for Work completed. The Architect may adjust applications where labor exceeds materials or where materials exceed labor quantities in the Work completed columns.
- D. If the Contractor disputes a determination by the Architect with regard to Certificate of Payment, and during any related dispute resolution, litigation, or other proceeding, the Contractor nevertheless shall continue to execute the Work as described in the Contract Documents.

### 1.8 PROGRESS PAYMENTS

- A. After issuance of Certificate for Payment, Owner shall make payment in the manner and within the time provided in the Contract Documents, and shall notify the Architect.
- B. The Contractor shall pay each Subcontractor no later than seven days after receipt of payment from the Owner the amount to which the Subcontractor is entitled, reflecting percentages actually retained from payments to the Contractor on account of the Subcontractor's portion of the Work. The Contractor shall require each Subcontractor to make payments to Sub-subcontractors in a similar manner.
- C. The Owner has the right to request written evidence that the Contractor has paid all Subcontractors and material and equipment suppliers amounts paid by the Owner to the Contractor. If the Contractor does not provide adequate evidence within seven days, Owner shall have the right to contact the Subcontractors and obtain the information required. Neither an Owner or Architect shall have an obligation to pay or to see to the payment of money to a Subcontractor, except as may otherwise be required by law. Payments to material and equipment suppliers shall follow similar rules as stated above.



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- D. A Certificate for Payment, a progress payment, or partial or entire use or occupancy of the Project by the Owner shall not constitute acceptance of Work.

1.9 FAILURE OF PAYMENT

- A. If the Architect does not issue a Certificate for Payment, through no fault of the Contractor, within fourteen days after receipt, or if the Owner does not pay the contractor within fourteen days after the date established in the Contract the amount certified by the Architect the Contractor may upon fourteen additional days of written notice to the Owner and Architect stop the Work until payment of the owed amount is received. The Contract time shall be extended appropriately and the Contract Sum shall be increased by the amount of the Contractor's reasonable cost of shut down, delay, start up, plus interest as provided for in the Contract.

1.10 SUBSTANTIAL COMPLETION

- A. Substantial Completion is the stage in the progress of the Work when the Work or designated portion thereof is sufficiently complete in accordance with the Contract Documents and when all required occupancy permits, if any, have been issued so that the Owner can occupy or utilize the Work for its intended use.
- B. When the Contractor considers that the Work, or a portion thereof which the Owner agrees to accept separately, is substantially complete, the Contractor shall prepare and submit to the Architect a comprehensive list of items to be completed or corrected prior to final payment. Failure to include an item on such list does not alter the responsibility of the Contractor to complete all Work. The time fixed by the Architect for the completion of all items on the list accompanying the Certificate of Substantial Completion shall not be greater than 30 days. The Contractor shall complete items on the list within such 30 day period. If the Contractor fails to do so, the Owner in its discretion may perform the Work by itself or others and the cost thereof shall be charged against the Contractor. If more than one inspection by the Architect for the purpose of evaluating corrected work is required by the subject list of items to be completed or corrected, it will be performed at the Contractor's expense.
- C. Upon the receipt of the Contractor's list, the Architect will make an inspection and designate the Work qualified to be substantially complete. If any Work on the list or any additional Work required for utilization of the Work by the Owner is incomplete or not correct, the Contractor shall complete such Work before issuance of the Certificate of Substantial Completion. In such case the Contractor shall submit a request for another inspection by the Architect upon completion of the Work required for Substantial Completion.
- D. At the time the Architect commences the Substantial Completion Inspection, if the Architect discovers excessive additional items requiring completion or correction, the Architect may decline to continue the inspection, instructing the Contractor as to the general classification of deficiencies which must be corrected before the Architect will resume the Substantial Completion Inspection. If the Contractor fails to pursue the Work so as to make it ready for Substantial Completion Inspection in a timely fashion, the Architect shall, after notifying the Contractor, conduct inspections and develop a list of items to be completed or corrected. This list of items shall be furnished to the Contractor



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who shall proceed to correct such items within 7 days. The Architect will conduct additional inspections. The Architect will involve the Owner for 1) The cost of inspections between the termination of the initial Substantial Completion Inspection and the commencement of the satisfactory Substantial Completion Inspection, 2) The cost of inspection or review after the 7 day period established for the completion of the list by the Contractor. The Contractor shall reimburse the Owner for such cost, and the Owner may offset the amounts payable to the Architect for such services from the amounts due the Contractor under the Contract Documents.

- E. When the Work is designated portion thereof is substantially complete, the Architect shall prepare a Certificate of Substantial Completion that shall establish the date of Substantial completion, shall establish responsibilities of the Owner and Contractor for security, maintenance, heat, utilities, damage to the Work and insurance, and shall fix the determine the time within which the Contractor shall finish all items on the list accompanying the Certificate. Warranties required by the Contract shall commence on the date of Substantial Completion of the Work or designated portion thereof unless otherwise provided in the Certificate of Substantial Completion.
- F. The Certificate of Substantial Completion shall be submitted to the Owner and Contractor for their written acceptance of responsibilities assigned to them in such Certificate. Upon acceptance, the Owner shall make payment of retainage applying to such Work or designated portion thereof.
- G. The Contractor shall fully complete all Work under its Contract within thirty (30) days of receiving a Certificate of Substantial Completion with attached list of items required to be completed or corrected. Failure to do so may serve as cause for the Owner to declare the Contractor in default and terminate the Contractor pursuant to ARTICLE 10 of these Supplementary General Conditions.

### 1.11 PARTIAL OCCUPANCY OR USE

- A. Owner shall have an option for partial occupancy or use upon a written agreement between the Contractor and Owner to determine the responsibilities of each party. Partial occupancy does not constitute acceptance of Work not complying with the requirements of the Contract Documents.
- B. Immediately prior to such partial occupancy or use, Owner, Architect, and Contractor shall inspect the area to be occupied to record the conditions of the Work.
- C. Agreements as to the acceptance of the Work not complying with the requirements of the Contract Documents shall be in writing.

### 1.12 FINAL COMPLETION AND FINAL PAYMENT

- A. Upon receipt of Contractor's written notice that the Work is ready for final inspection and upon receipt of the final Application for Payment the Architect shall timely make such inspection determine if the Work is acceptable per Contract Documents. If the Work is acceptable, the Architect shall issue a final Certificate for Payment stating that to the Architect's best knowledge and presented information the work has been completed in



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accordance to the Contract Documents.

- B. Final payment and all remaining retainage shall become due only when the following items are submitted to the Architect:
1. An Affidavit that all payrolls, bills for all items connected with the Work, and any other indebtedness have been paid (less amount owed by the final Payment and retainage withheld by the Owner).
  2. Evidence in writing or a certificate that the required insurance by the Contract Documents will not be canceled or that the insurance will not expire until at least thirty (30) days written notice has been given to the Owner.
  3. Written notice that the Contractor knows of no potential reasons that the insurance will not be renewable to fulfill the Contract Document requirements.
  4. Consent of surety to final payment.
  5. Any other documents, releases and waivers of liens, claims, receipts, copies of the expenditure, or any other items required by the Owner to assure no legal problems shall follow the Completion of the Contract. If a subcontractor refuses to furnish such a release or waiver required by the Owner, the Contractor may furnish a bond satisfactory to the Owner to indemnify the Owner against such lien. If such lien remains unresolved for the Owner after the payments have been made, the Contractor shall refund the Owner all money associated with resolution of such lien including all costs and reasonable attorney's fees.
- C. The Contractor shall furnish such evidence as may be necessary to show that any out-of-state subcontractor or supplier has fully met the requirements of payment of taxes as established in any law of the State or local subdivision thereof which may be in effect at the time of final payment. The Owner will require the submission of such proof or evidence before final payment will be approved or made. The following must be submitted to the Architect before approval of final payment:
1. Affidavit of payment as required under this Paragraph shall be in the form of AIA Document G706 - Contractor's Affidavit of Payment of Debt and Claims.
  2. Release of liens as required under this Paragraph shall be in the form of AIA Documents G706A - Contractor's Affidavit of Release of Liens, or as may otherwise be reasonably requested or required to comply with Indiana law.
  3. Consent of Surety as required under this Paragraph shall be in the form of AIA Document G707 - Consent of Surety Company to Final Payment.
  4. Submit releases and final unconditional waivers of lien from major subcontractor and supplier.
  5. Submit certification stating that no materials containing asbestos were



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incorporated into the Work.

6. Submit certification that all punch list items have been completed.
- D. If upon Substantial Completion final completion is delayed through no fault of the Contractor or by issuance of change orders adjusting/affecting the final completion date and if the Architect confirms the conditions be eligible for payment for Work completed without termination of the Contract. Final Payment, constituting the unpaid balance of the Contract Sum, shall be paid to the Contractor in full, including retainage or escrowed principal and escrowed income by the escrow agent, no less than 61 days following the date of Substantial Completion. If at that time there are remaining uncompleted items, an amount equal to 200 percent of the value of each item as determined by the Architect shall be withheld until said items are completed, and a Final Certificate of Payment issued by the Architect.
  - E. Making of the final payment shall constitute a waiver of claims by the Owner except those arising from liens, claims, security interest, failure to comply with the Contract Documents or terms of special warranties.

1.13 REQUEST FOR PAYMENT

- A. Submit Applications for Payment to the Project Manager or as directed at the pre-construct i on meeting, in accordance with the schedule established by Conditions of the Contract and Agreement between Owner and Contractor.
- B. Submit payment requests in the form provided by the Owner with itemized data typed in accordance with the Bid Form .
- C. Provide construction photographs in accordance with Contract Documents.
- D. Submit Applications for Payment to the Project Manager or as directed at the pre-construct i on meeting, in accordance with the schedule established by Conditions of the Contract and Agreement between Owner and Contractor.
- E. Submit three (3) copies of each application; all signed and certified by the Contractor. .

1.14 SUBSTANTIATING DATA FOR PROGRESS PAYMENTS

- A. When the Owner or the Engineer requires substantiating data, Contractor shall submit suitable information with a cover letter.
- B. Submit one copy of data and cover letter for each copy of application.

PART 2 - PRODUCTS (NOT USED)

PART 3 - EXECUTION (NOT USED)

END OF SECTION 00 80 00



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SECTION 00 80 10  
CHANGES IN THE WORK

PART 1 - GENERAL

- 1.1 Changes in the Work may be accomplished after execution of the Contract, and without invalidating the Contract, by Change Order ordering a minor change in the Work, subject to the limitations as may be stated elsewhere in the Contract Documents.
- 1.2 A Change Order shall be based upon agreement among the Owner, Contractor and Architect.
- 1.3 A Change Order is a written instrument prepared by the Architect and signed by the Owner, Contractor and Architect stating their agreement upon all of the following:
  - .1 The change in the Work;
  - .2 The amount of the adjustment, if any, in the Contract Sum; and
  - .3 The extent of the adjustment, if any, in the Contract Time.
- 1.4 Upon receipt of a Change Order, the Contractor shall promptly proceed with the change in the Work involved.
- 1.5 A Change Order signed by the Contractor indicates the Contractor's agreement therewith, including adjustment in Contract Sum and Contract Time or the method for determining them. Such agreement shall be effective immediately.
- 1.6 Unless otherwise provided elsewhere in the Contract Documents, costs for the purposes of Change Orders shall be limited to the following:
  - .1 Costs of labor, including social security, old age and unemployment insurance, fringe benefits required by agreement or custom, and workers' compensation insurance;
  - .2 Costs of materials, supplies and equipment, including cost of transportation, whether incorporated or consumed;
  - .3 Rental costs of machinery and equipment, exclusive of hand tools, whether rented from the Contractor or others;
  - .4 Costs of premiums for all bonds and insurance, permit fees, and sales, use or similar taxes related to the Work; and
  - .5 Additional costs of supervision and field office personnel directly attributable to the change.
- 1.7 The amount of credit to be allowed by the Contractor to the Owner for a deletion or change that results in a net decrease in the Contract Sum shall be actual net cost as confirmed by the Architect. When both additions and credits covering related Work or substitutions are involved in a change, the allowance for overhead and profit shall be figured on the basis of net increase, if any, with respect to that change.
- 1.8 The cost of the Contractors overhead and profit on any Change Order shall be:
  - .1 For extra Work completed by the Contractor with his own labor, 10 percent (10%) shall be added as the allowance for overhead and profit.
  - .2 For extra Work completed by Subcontractors of the Contractor, 10 percent (10%) shall be added as the allowance for overhead and profit.



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- .3 For Work deleted which would have been completed by Subcontractors of the Contractor, 10 percent (10%) shall be credited to the Owner as the allowance for overhead and profit.
  - .4 For Work deleted which would have been completed by Subcontractors of the Contractor, 5 percent (5%) shall be credited to the Owner by the Contractor as the allowance for overhead and profit."
- 1.9 When both additions and deletions are involved in any one change, the allowance for overhead and profit shall be figured on the basis of net increase or decrease, if any.
- 1.10 In order to facilitate checking of quotations for extras or credits, proposals, (except those so minor that their propriety can be seen by inspection), shall be accompanied by a complete itemization of costs including labor, materials, and Subcontractors. Labor and materials shall be itemized in the manner prescribed above. Where major cost items are Subcontracts, they shall be itemized also. In no case will a change involving over \$500 be approved without such itemization. The Contractor shall submit same to the Architect within 14 days after receipt of proposal request.

END OF SECTION 00 80 10



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SECTION 00 80 50  
HAZARDOUS MATERIALS

PART 1 - GENERAL

- 1.1 The Contractor is responsible for compliance with any requirements included in the Contract Documents regarding hazardous materials. If the Contractor encounters a hazardous material or substance not addressed in the Contract Documents and if reasonable precautions will be inadequate to prevent foreseeable bodily injury or death to persons resulting from a material or substance, including but not limited to asbestos or polychlorinated biphenyl (PCB), encountered on the site by the Contractor, the Contractor shall, upon recognizing the condition, immediately stop Work in the affected area and report the condition to the Owner and Architect in writing.
- 1.2 Upon receipt of the Contractor's written notice, the Owner shall obtain the services of a licensed laboratory to verify the presence or absence of the material or substance reported by the Contractor and, in the event such material or substance is found to be present, to cause it to be rendered harmless. Unless otherwise required by the Contract Documents, the Owner shall furnish in writing to the Contractor and Architect the names and qualifications of persons or entities who are to perform tests verifying the presence or absence of such material or substance or who are to perform the task of removal or safe containment of such material or substance. The Contractor and the Architect will promptly reply to the Owner in writing stating whether or not either has reasonable objection to the persons or entities proposed by the Owner. If either the Contractor or Architect has an objection to a person or entity proposed by the Owner, the Owner shall propose another to whom the Contractor and the Architect have no reasonable objection. When the material or substance has been rendered harmless, Work in the affected area shall resume upon written agreement of the Owner and Contractor. By Change Order, the Contract Time shall be extended appropriately and the Contract Sum shall be increased in the amount of the Contractor's reasonable additional costs of shut-down, delay and start-up.
- 1.3 To the fullest extent permitted by law, the Owner shall indemnify and hold harmless the Contractor, Subcontractors, Architect, Architect's consultants and agents and employees of any of them from and against claims, damages, losses and expenses, including but not limited to attorneys' fees, arising out of or resulting from performance of the Work in the affected area if in fact the material or substance presents the risk of bodily injury or death as described herein and has not been rendered harmless, provided that such claim, damage, loss or expense is attributable to bodily injury, sickness, disease or death, or to injury to or destruction of tangible property (other than the Work itself), except to the extent that such damage, loss or expense is due to the fault or negligence of the party seeking indemnity.
- 1.4 The Owner shall not be responsible for materials or substances the Contractor brings to the site unless such materials or substances are required by the Contract Documents. The Owner shall be responsible for materials or substances required by the Contract Documents, except to the extent of the Contractor's fault or negligence in the use and handling of such materials or substances.
- 1.5 The Contractor shall indemnify the Owner for the cost and expense the Owner incurs (1) for remediation of a material or substance the Contractor brings to the site and negligently handles, or (2) where the Contractor fails to perform its obligations, except to the extent that the cost and expense are due to the Owner's fault or negligence.



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- 1.6 If, without negligence on the part of the Contractor, the Contractor is held liable by a government agency for the cost of remediation of a hazardous material or substance solely by reason of performing Work as required by the Contract Documents, the Owner shall indemnify the Contractor for all cost and expense thereby incurred.

END OF SECTION 00 80 50

# **Division 01**

## General Requirements





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SECTION 01 10 05  
GENERAL REQUIREMENTS

PART 1 - GENERAL

1.1 SCOPE AND INTENT

- A. Description: The work to be done consists of the furnishing of all labor, materials and equipment, and the performance of all work included in this Contract.
- B. Work Included
1. The Contractor shall furnish all labor, superintendence, materials, plant, power, light, heat, fuel, water, tools, appliances, equipment, supplies, shop drawings, working drawings and other means of construction necessary or proper for performing and completing the work. He shall obtain and pay for all required permits necessary for the work, other than those permits such as the DEP permit and railroad permit which may have already been obtained. He shall perform and complete the work in the manner best calculated to promote rapid construction consistent with safety of life and property and to the satisfaction of the Engineer, and in strict accordance with the Contract Documents. The Contractor shall clean up the work and maintain it during and after construction, until accepted, and shall do all work and pay all costs incidental thereto. He shall repair or restore all structures and property that may be damaged or disturbed during performance of the work.
  2. The cost of incidental work described in these General Requirements, for which there are no specific Contract Items, shall be considered as part of the general cost of doing the work and shall be included in the prices for the various Contract Items. No additional payment will be made therefor.
  3. The Contractor shall provide and maintain such modern plant, tools, and equipment as may be necessary, in the opinion of the Engineer, to perform in a satisfactory and acceptable manner all the work required by this Contract. Only equipment of established reputation and proven efficiency shall be used. The Contractor shall be solely responsible for the adequacy of his workmanship, materials and equipment, prior approval of the Engineer notwithstanding.
- C. Public Utility Installations and Structures
1. Public utility installations and structures shall be understood to include all poles, tracks, pipes, wires, conduits, house service connections, vaults, manholes and all other appurtenances and facilities pertaining thereto whether owned or controlled by the Owner, other governmental bodies or privately owned by individuals, firms or corporations, used to serve the public with transportation, traffic control, gas, electricity, telephone, sewage, drainage, water or other public or private property which may be affected by the work shall be deemed included hereunder.
  2. The Contractor shall protect all public utility installations and structures from damage during the work. Access across any buried public utility installation or structure shall be made only in such locations and by means approved by the Engineer. The Contractor shall so arrange his operations as to avoid any damage to these facilities. All required protective devices and construction shall be provided by the Contractor at his expense. All existing public utilities damaged by the Contractor which are shown on the Plans or have been located in the field by the utility shall be repaired by the Contractor, at his expense, as approved by the Engineer. No separate payment shall be made for such protection or repairs to public utility installations or structures.



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3. Public utility installations or structures owned or controlled by the Owner or other governmental body, which are required by this contract to be removed, relocated, replaced or rebuilt by the Contractor not identified in any separate bid item shall be considered as a part of the general cost of doing the work and shall be included in the prices bid for the various contract items. No separate payment shall be made therefor.
4. Where public utility installations or structures owned or controlled by the Owner or other governmental body are encountered during the course of the work, and are not indicated on the Plans or in the Specifications, and when, in the opinion of the Engineer, removal, relocation, replacement or rebuilding is necessary to complete the work under this Contract, such work shall be accomplished by the utility having jurisdiction, or such work may be ordered, in writing by the Engineer, for the contractor to accomplish. If such work is accomplished by the utility having jurisdiction, it will be carried out expeditiously and the Contractor shall give full cooperation to permit the utility to complete the removal, relocation, replacement or rebuilding as required. If such work is accomplished by the Contractor, it will be in accordance with the General and Supplemental General Conditions.
5. The Contractor shall give written notice to Owner and other governmental utility departments and other owners of public utilities of the location of his proposed construction operations, at least forty-eight hours in advance of breaking ground in any area or on any unit of the work. This can be accomplished by making the appropriate contact with the "Sunshine State One-Call of Florida, Inc. Call Center ("Call Sunshine") and per all requirements provided for in the Florida Underground Facilities Damage Prevention and Safety Act (Florida Statutes, Title XXXIII, Chapter 556).
6. The maintenance, repair, removal, relocation or rebuilding of public utility installations and structures, when accomplished by the Contractor as herein provided, shall be done by methods approved by the Engineer.

1.2 PLANS AND SPECIFICATIONS

- A. Plans: When obtaining data and information from the Plans, figures shall be used in preference to scaled dimensions, and large scale drawings in preference to small scale drawings.
- B. Copies Furnished to Contractor: The Contractor shall furnish each of the subcontractors, manufacturers, and material men such copies of the Contract Documents as may be required for their work. Additional copies of the Plans and Specifications, when requested, may be furnished to the Contractor at cost of reproduction.
- C. Supplementary Drawings: When, in the opinion of the Engineer, it becomes necessary to explain more fully the work to be done or to illustrate the work further or to show any changes which may be required, drawings known as Supplementary Drawings, with specifications pertaining thereto, will be prepared by the Engineer and five paper prints thereof will be given to the Contractor.
- D. Contractor to Check Plans and Data: The Contractor shall verify all dimensions, quantities and details shown on the Plans, Supplementary Drawings, Schedules, Specifications or other data received from the Engineer, and shall notify him of all errors, omissions, conflicts, and discrepancies found therein. Failure to discover or correct errors, conflicts or discrepancies shall not relieve the Contractor of full responsibility for unsatisfactory work, faulty construction or improper operation resulting therefrom nor from rectifying such conditions at his own expense. He will not be allowed to take advantage of any errors or



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omissions, as full instructions will be furnished by the Engineer, should such errors or omissions be discovered. All schedules are given for the convenience of the Engineer and the Contractor and are not guaranteed to be complete. The Contractor shall assume all responsibility for the making of estimates of the size, kind, and quality of materials and equipment included in work to be done under the Contract.

- E. Specifications: The Technical Specifications consist of three parts: General, Products and Execution. The General Section contains General Requirements which govern the work. Products and Execution modify and supplement these by detailed requirements for the work and shall always govern whenever there appears to be a conflict.
- F. Intent
  - 1. All work called for in the Specifications applicable to this Contract, but not shown on the Plans in their present form, or vice versa, shall be of like effect as if shown or mentioned in both. Work not specified in either the Plans or in the Specifications, but involved in carrying out their intent or in the complete and proper execution of the work, is required and shall be performed by the Contractor as though it were specifically delineated or described.
  - 2. The apparent silence of the Specifications as to any detail, or the apparent omission from them of a detailed description concerning any work to be done and materials to be furnished, shall be regarded as meaning that only the best general practice is to prevail and that only material and workmanship of the best quality is to be used, and interpretation of these Specifications shall be made upon that basis.
  - 3. The inclusion of the Related Requirements (or work specified elsewhere) in the General part of the specifications is only for the convenience of the Contractor, and shall not be interpreted as a complete list of related Specification Sections.

### 1.3 MATERIALS AND EQUIPMENT

- A. Manufacturer
  - 1. The names of proposed manufacturers, material men, suppliers and dealers who are to furnish materials, fixtures, equipment, appliances or other fittings shall be submitted to the Engineer for approval. Such approval must be obtained before shop drawings will be checked. No manufacturer will be approved for any materials to be furnished under this Contract unless he shall be of good reputation and have a plant of ample capacity. He shall, upon the request of the Engineer, be required to submit evidence that he has manufactured a similar product to the one specified and that it has been previously used for a like purpose for a sufficient length of time to demonstrate its satisfactory performance.
  - 2. All transactions with the manufacturers or subcontractors shall be through the Contractor, unless the Contractor shall request, in writing to the Engineer, that the manufacturer or subcontractor deal directly with the Engineer. Any such transactions shall not in any way release the Contractor from his full responsibility under this Contract.
  - 3. Any two or more pieces or material or equipment of the same kind, type or classification, and being used for identical types of services, shall be made by the same manufacturer.
- B. Delivery: The Contractor shall deliver materials in ample quantities to insure the most speedy and uninterrupted progress of the work so as to complete the work within the allotted time. The Contractor shall also coordinate deliveries in order to avoid delay in, or



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impediment of, the progress of the work of any related Contractor.

C. Tools and Accessories

1. The Contractor shall, unless otherwise stated in the Contract Documents, furnish with each type, kind or size of equipment, one complete set of suitably marked high grade special tools and appliances which may be needed to adjust, operate, maintain or repair the equipment. Such tools and appliances shall be furnished in approved painted steel cases, properly labeled and equipped with good grade cylinder locks and duplicate keys.
2. Spare parts shall be furnished as specified.
3. Each piece of equipment shall be provided with a substantial nameplate, securely fastened in place and clearly inscribed with the manufacturer's name, year of manufacture, serial number, weight and principal rating data.

D. Installation of Equipment.

1. The Contractor shall have on hand sufficient proper equipment and machinery of ample capacity to facilitate the work and to handle all emergencies normally encountered in work of this character.
2. Equipment shall be erected in a neat and workmanlike manner on the foundations at the locations and elevations shown on the Plans, unless directed otherwise by the Engineer during installation. All equipment shall be correctly aligned, leveled and adjusted for satisfactory operation and shall be installed so that proper and necessary connections can be made readily between the various units.
3. The Contractor shall furnish, install and protect all necessary anchor and attachment bolts and all other appurtenances needed for the installation of the devices included in the equipment specified. Anchor bolts shall be as approved by the Engineer and made of ample size and strength for the purpose intended. Substantial templates and working drawings for installation shall be furnished.
4. The Contractor shall, at his own expense, furnish all materials and labor for, and shall properly bed in non-shrink grout, each piece of equipment on its supporting base that rests on masonry foundations.
5. Grout shall completely fill the space between the equipment base and the foundation. All metal surfaces coming in contact with concrete or grout shall receive a coat of coal tar epoxy equal to Koppers 300M.

- E. Service of Manufacturer's Engineer: The Contract prices for equipment shall include the cost of furnishing (as required by equipment specifications sections) a competent and experienced engineer or superintendent who shall represent the manufacturer and shall assist the Contractor, when required, to install, adjust, test and place in operation the equipment in conformity with the Contract Documents. After the equipment is placed in permanent operation by the Owner, such engineer or superintendent shall make all adjustments and tests required by the Engineer to prove that such equipment is in proper and satisfactory operating condition, and shall instruct such personnel as may be designated by the Owner in the proper operation and maintenance of such equipment.

## 1.4 INSPECTION AND TESTING

A. General

1. Inspection and testing of materials will be performed by the Owner unless otherwise specified.



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2. For tests specified to be made by the Contractor, the testing personnel shall make the necessary inspections and tests and the reports thereof shall be in such form as will facilitate checking to determine compliance with the Contract Documents. Three (3) copies of the reports shall be submitted and authoritative certification thereof must be furnished to the Engineer as a prerequisite for the acceptance of any material or equipment.
3. If, in the making of any test of any material or equipment, it is ascertained by the Engineer that the material or equipment does not comply with the Contract, the Contractor will be notified thereof and he will be directed to refrain from delivering said material or equipment, or to remove it promptly from the site or from the work and replace it with acceptable material, without cost to the Owner.
4. Tests of electrical and mechanical equipment and appliances shall be conducted in accordance with recognized test codes of the ANSI, ASME, or the IEEE, except as may otherwise be stated herein.
5. The Contractor shall be fully responsible for the proper operation of equipment during tests and instruction periods and shall neither have nor make any claim for damage which may occur to equipment prior to the time when the Owner formally takes over the operation thereof.

**B. Costs**

1. All inspection and testing of materials furnished under this Contract will be performed by the Owner or duly authorized inspection engineers or inspections bureaus without cost to the Contractor, unless otherwise expressly specified.
2. The cost of shop and field tests of equipment and of certain other tests specifically called for in the Contract Documents shall be borne by the Contractor and such costs shall be deemed to be included in the Contract price.
3. Materials and equipment submitted by the Contractor as the equivalent to those specifically named in the Contract may be tested by the Owner for compliance. The Contractor shall reimburse the Owner for the expenditures incurred in making such tests on materials and equipment which are rejected for non-compliance.

**C. Inspections of Materials:** The Contractor shall give notice in writing to the Engineer, at least two weeks in advance of his intention to commence the manufacture or preparation of materials especially manufactured or prepared for use in or as part of the permanent construction. Such notice shall contain a request for inspection, the date of commencement and the expected date of completion of the manufacture or preparation of materials. Upon receipt of such notice, the Engineer will arrange to have a representative present at such times during the manufacture as may be necessary to inspect the materials or he will notify the Contractor that the inspection will be made at a point other than the point of manufacture, or he will notify the Contractor that inspection will be waived. The Contractor must comply with these provisions before shipping any material. Such inspection shall not release the Contractor from the responsibility for furnishing materials meeting the requirements of the Contract Documents.

**D. Certificate of Manufacture:** When inspection is waived or when the Engineer so requires, the Contractor shall furnish to him authoritative evidence in the form of Certificates of Manufacture that the materials to be used in the work have been manufactured and tested in conformity with the Contract Documents. These certificates shall be notarized and shall include copies of the results of physical tests and chemical analyses, where necessary, that have been made directly on the product or on similar products of the manufacturer.



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- E. Shop Tests of Operating Equipment
1. Each piece of equipment for which pressure, duty, capacity, rating, efficiency, performance, function or special requirements are specified shall be tested in the shop of the maker in a manner which shall conclusively prove that its characteristics comply fully with the requirements of the Contract Documents. No such equipment shall be shipped to the work until the Engineer notifies the Contractor, in writing, that the results of such tests are acceptable.
  2. Five copies of the manufacturer's actual test data and interpreted results thereof, accompanied by a certificate of authenticity sworn to by a responsible official of the manufacturing company, shall be forwarded to the Engineer for approval.
  3. The cost of shop tests and of furnishing manufacturer's preliminary and shop test data of operating equipment shall be borne by the Contractor.
- F. Preliminary Field Tests: As soon as conditions permit, the Contractor shall furnish all labor, materials, and instruments and shall make preliminary field tests of equipment. If the preliminary field tests disclose any equipment furnished under this Contract which does not comply with the requirements of the Contract Documents, the Contractor shall, prior to the acceptance tests, make all changes, adjustments and replacements required. The furnishing Contractor shall assist in the preliminary field tests as applicable.
- G. Final Field Tests
1. Upon completion of the work and prior to final payment, all equipment and piping installed under this Contract shall be subjected to acceptance tests as specified or required to prove compliance with the Contract Documents.
  2. The Contractor shall furnish labor, fuel, energy, water and all other materials, equipment and instruments necessary for all acceptance tests, at no additional cost to the Owner. The Supplier shall assist in the final field tests as applicable.
- H. Failure of Tests
1. Any defects in the materials and equipment or their failure to meet the tests, guarantees or requirements of the Contract Documents shall be promptly corrected by the Contractor. The decision of the Engineer as to whether or not the Contractor has fulfilled his obligations under the Contract shall be final and conclusive. If the Contractor fails to make these corrections or if the improved materials and equipment, when tested, shall again fail to meet the guarantees of specified requirements, the Owner, notwithstanding its partial payment for work, and materials and equipment, may reject the materials and equipment and may order the Contractor to remove them from the site at his own expense.
  2. In case the Owner rejects any materials and equipment, then the Contractor shall replace the rejected materials and equipment within a reasonable time. If he fails to do so, the Owner may, after the expiration of a period of thirty (30) calendar days after giving him notice in writing, proceed to replace such rejected materials and equipment, and the cost thereof shall be deducted from any compensation due or which may become due the Contractor under his Contract.
- I. Final Inspection: During such final inspections, the work shall be clean and free from water. In no case will the final pay application be prepared until the Contractor has complied with all requirements set forth and the Engineer has made his final inspection of the entire work and is satisfied that the entire work is properly and satisfactorily constructed in accordance with the requirements of the Contract Document.



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1.5 TEMPORARY STRUCTURES

- A. Temporary Fences: If, during the course of the work, it is necessary to remove or disturb any fence or part thereof, the Contractor shall, at his own expense, if so ordered by the Engineer, provide a suitable temporary fence which shall be maintained until the permanent fence is replaced. The Engineer shall be solely responsible for the determination of the necessity for providing a temporary fence and the type of temporary fence to be used.

1.6 TEMPORARY SERVICES

- A. First Aid: The Contractor shall keep upon the site, at each location where work is in progress, a completely equipped first aid kit and shall provide ready access thereto at all times when people are employed on the work.

1.7 LINES AND GRADES

- A. Grade: All work under this Contract shall be constructed in accordance with the lines and grades shown on the Plans, or as given by the Owner/Engineer. The full responsibility for keeping alignment and grade shall rest upon the Contractor.
- B. Safeguarding Marks
1. The Contractor shall safeguard all points, stakes, grade marks, monuments and bench marks made or established on the work, bear the cost of reestablishing them if disturbed, and bear the entire expense of rectifying work improperly installed due to not maintaining or protecting or removing without authorization such established points, stakes and marks.
  2. The Contractor shall safeguard all existing and known property corners, monuments and marks adjacent to but not related to the work and, if required, shall bear the cost of reestablishing them if disturbed or destroyed.
- C. Datum Plane: All elevations indicated or specified refer to the Mean Sea Level Datum of the NGVD 1929 Datum and/or NAVD 1988.

1.8 ADJACENT STRUCTURES AND LANDSCAPING

- A. Responsibility
1. The Contractor shall also be entirely responsible and liable for all damage or injury as a result of his operations to all other adjacent public and private property, structures of any kind and appurtenances thereto met with during the progress of the work. The cost of protection, replacement in their original locations and conditions or payment of damages for injuries to such adjacent public and private property and structures affected by the work, whether or not shown on the Plans, and the removal, relocation and reconstruction of such items called for on the Plans or specified shall be included in the various Contract Items and no separate payments will be made therefore. Where such public and private property, structures of any kind and appurtenances thereto are not shown on the Plans and when, in the opinion of the Engineer, additional work is



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deemed necessary to avoid interference with the work, payment therefore will be made as provided for in the General Conditions.

2. Contractor is expressly advised that the protection of buildings, structures, tunnels, tanks, pipelines, etc. and related work adjacent and in the vicinity of his operations, wherever they may be, is solely his responsibility. Conditional inspection of buildings or structures in the immediate vicinity of the project which may reasonably be expected to be affected by the Work shall be performed by and be the responsibility of the Contractor.
3. Contractor shall, before starting operations, make an examination of the interior and exterior of the adjacent structures, buildings, facilities, etc., and record by notes, measurements, photographs, etc., conditions which might be aggravated by open excavation and construction. Repairs or replacement of all conditions disturbed by the construction shall be made to the satisfaction of the Owner and to the satisfaction of the Engineer. This does not preclude conforming to the requirements of the insurance underwriters. Copies of surveys, photographs, reports, etc., shall be given to the Engineer.
4. Prior to the beginning of any excavations, the Contractor shall advise the Engineer of all buildings or structures on which he intends to perform work or which performance of the project work will affect.

**B. Protection of Trees**

1. All trees and shrubs shall be adequately protected by the Contractor with boxes and otherwise and in accordance with ordinances governing the protection of trees. No excavated materials shall be placed so as to injure such trees or shrubs. Trees or shrubs destroyed by negligence of the Contractor or his employees shall be replaced by him with new stock of similar size and age, at the proper season and at the sole expense of the Contractor.
2. Beneath trees or other surface structures, where possible, pipelines may be built in short tunnels, backfilled with excavated materials, except as otherwise specified, or the trees or structures carefully supported and protected from damage.
3. The Owner may order the Contractor, for the convenience of the Owner, to remove trees along the line or trench excavation. If so ordered, the Owner will obtain any permits required for removal of trees. Such tree removal ordered shall be paid for under the appropriate Contract Items.

**C. Lawn Areas:** Lawn areas shall be left in as good condition as before the starting of the work. Where sod is to be removed, it shall be carefully removed, and later replaced, or the area where sod has been removed shall be restored with new sod in the manner described in the Workmanship and Materials Paragraph in Section 02485, Seeding & Sodding.

**D. Restoration of Fences:** Any fence, or part thereof, that is damaged or removed during the course of the work shall be replaced or repaired by the Contractor and shall be left in as good a condition as before the starting of the work. The manner in which the fence is repaired or replaced and the materials used in such work shall be subject to the approval of the Engineer. The cost of all labor, materials, equipment, and work for the replacement or repair of any fence shall be deemed included in the appropriate Contract Item or items, or if no specific Item is provided therefore, as part of the overhead cost of the work, and no additional payment will be made therefore.



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1.9 PROTECTION OF WORK AND PUBLIC

- A. Barriers and Lights: During the prosecution of the work, the Contractor shall put up and maintain at all times such barriers and lights as will effectually prevent accidents. The Contractor shall provide suitable barricades, red lights, "danger" or "caution" or "street closed" signs and watchmen at all places where the work causes obstructions to the normal traffic or constitutes in any way a hazard to the public, in accordance with state and local requirements.
- B. Smoke Prevention: A strict compliance with ordinances regulating the production and emission of smoke will be required. No open fires will be permitted.
- C. Noise
  - 1. Contractor shall eliminate noise to as great an extent as practicable at all times. Air compressing plants shall be equipped with silencers and the exhaust of all engines or other power equipment shall be provided with mufflers. In the vicinity of hospitals and schools, special care shall be used to avoid noise or other nuisances. The Contractor shall strictly observe all local regulations and ordinances covering noise control.
  - 2. Except in the event of an emergency, no work shall be done between the hours of 7:00 P.M. and 7:00 A.M., or on weekends. If the proper and efficient prosecution of the work requires operations during the night or weekends, the written permission of the Owner shall be obtained before starting such items of the work.
- D. Access to Public Services: Neither the materials excavated nor the materials or plant used in the construction of the work shall be so placed as to prevent free access to all fire hydrants, valves or manholes.
- E. Dust prevention: The Contractor shall prevent dust nuisance from his operations or from traffic by keeping the roads and/or construction areas sprinkled with water at all times.

1.10 CUTTING AND PATCHING

- A. The Contractor shall do all cutting, fitting or patching of his portion of the work that may be required to make the several parts thereof join and coordinate in a manner satisfactory to the Engineer and in accordance with the Plans and Specifications. The work must be done by competent workmen skilled in the trade required by the restoration.
- B. Refer to Section 01 10 45 for provisions on this subject.



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1.11 CLEANING

- A. During Construction: During construction of the work, the Contractor shall, at all times, keep the site of the work and adjacent premises as free from material, debris and rubbish as is practicable and shall remove the same from any portion of the site if, in the opinion of the Engineer, such material, debris, or rubbish constitutes a nuisance or is objectionable. The Contractor shall remove from the site all of his surplus materials and temporary structures when no further need therefore develops.
- B. Final Cleaning
  - 1. At the conclusion of the work, all equipment, tools, temporary structures and materials belonging to the Contractor shall be promptly taken away, and he shall remove and promptly dispose of all water, dirt, rubbish or any other foreign substances.
  - 2. The Contractor shall thoroughly clean all equipment and materials installed by him and shall deliver such materials and equipment undamaged in a bright, clean, polished and new operating condition.

1.12 MISCELLANEOUS

- A. Protection Against Siltation and Bank Erosion
  - 1. The Contractor shall arrange his operations to minimize siltation and bank erosion on construction sites and on existing or proposed water courses and drainage ditches.
  - 2. The Contractor, at his own expense, shall remove any siltation deposits and correct any erosion problems as directed by the Engineer which results from his construction operations.
- B. Protection of Wetland Areas: The Contractor shall properly dispose of all surplus material, including soil, in accordance with Local, State and Federal regulations. Under no circumstances shall surplus material be disposed of in wetland areas as defined by the Florida Department of Environmental Protection or Southwest Florida Water Management District.
- C. Existing Facilities: The work shall be so conducted to maintain existing facilities in operation insofar as is possible. Requirements and schedules of operations for maintaining existing facilities in service during construction shall be as described in the Special Provisions.
- D. Use of Chemicals: All chemicals used during project construction or furnished for project operation, whether herbicide, pesticide, disinfectant, polymer, reactant, or of other classification, must show approval of either EPA or USDA. Use of all such chemicals and disposal of residues shall be in strict conformance with instructions.

PART 2 - PRODUCTS (NOT USED)



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PART 3 - EXECUTION (NOT USED)

END OF SECTION 01 10 05



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SECTION 01 11 00  
SUMMARY OF WORK

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

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

1.2 PROJECT DESCRIPTION

- A. The Project consists of demolition of existing structure and replacement of that structure with new construction, roughly 1,300sf, as shown on Contract Documents prepared by **SCHENKELSHULTZ**, dated October 22<sup>nd</sup>, 2010.
- B. The Work consists of demolition of existing concrete structure and rebuilding the concessions building on the same footprint. New construction shall keep portion of the existing exterior walls, entire foundation system and utility connections per drawings and specifications.
1. The Work includes concrete, masonry walls, structural steel, pre-engineered wood trusses, metal roof, architectural woodwork, waterproofing, insulated roofing, roof accessories, sheet metal, overhead security grille doors, hollow metal doors and frames, hollow metal windows, hardware, glazing, interior finishes and furnishings including vertical blinds, heating-ventilating-air conditioning, electrical systems, lighting, and plumbing.
  2. Interior finishing and related construction, including interior partitions and permanent doors, counters, transaction window, service sink, hand washing sink, life safety devices, toilet accessories, and fire extinguishers.
  3. The Work shall include exterior wood deck, all associated support, stairs and ramp.
- C. The Work consists of all items as indicated on the Drawings and as specified in the Project Manual and those items of construction not indicated but normal and necessary and usual in the construction industry for construction of a building project.

1.3 WORK UNDER SINGLE CONTRACT

- A. The intent of this Section to indicate the Work required by the Contractors and to provide information regarding the duties, responsibilities, and cooperation required by the Contractors, with similar requirements for the subcontractors and suppliers.
- B. Prime Contracts are defined to include the following contract described in the Schedule of Contract Responsibilities; and each is recognized to be a major part of project, with Work to be performed concurrently and in close coordination with Work of other Prime Contracts.
- C. The "Contract Documents," as defined in the General Conditions, include "the Drawings." Although Drawings are grouped and identified by classification of the Work, Contractors shall be responsible for their Work as specified herein and as indicated on the Drawings.



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Although the majority of the Drawings are "to scale," Contractors are directed to use indicated dimensions for determining material quantities and for other reasons. No additional monies will be allowed due to Contractors using "scale instruments" to determine material quantities or for other reasons.

- D. A single contract will be awarded as per the attached "Schedule of Contract Responsibilities" in this Section. Contractors shall include Work required by the Specifications and Drawings for each contract area defined in the Schedule.
- E. Work for the complete construction of the Project will be under a single contract with the Owner.

### 1.4 WORK SEQUENCE

- A. The Work will be conducted in phases to provide the least possible interference to the activities of the Owner's personnel and to permit an orderly transfer of personnel and equipment to the new facilities.

### 1.5 ADMINISTRATIVE RESPONSIBILITIES OF PRIME CONTRACTOR

- A. The General Contractor shall be responsible for the maintenance of the Construction Schedule and the general supervision of every phase of the Work.
  - 1. Requirements for a specific trade of contract will generally be described in that portion of the Specifications or Drawings related to that trade or contract. Such requirements may, however, be described in other Sections of the Contract Documents. Contractors will be held responsible for having carefully examined all Drawings and read all Divisions of the Specifications and all Contract Documents, to avoid omissions or duplications, and to ensure a complete job.
  - 2. Each Contractor must be fully informed about conditions relating to the construction of the Project and the employment of labor thereon. Failure to do so will not relieve a Contractor of his obligation to furnish all material and labor necessary to carry out the provisions of his Contract.
  - 3. Contractors shall cooperate with the General Contractor in notifying him when the Work is at a stage to require the services of other contractors and shall notify the General Contractor in the event that such other Contractors do not carry out their responsibilities in connection with such notification.
- B. Contractors shall cooperate with and assist the General Contractor in the preparation of construction progress and procedures, schedule of product deliveries, and their effect on the overall project progress and completion. Other Contractors shall cooperate in getting their Work and the Work of their subcontractors completed according to the schedule as prepared and maintained by the General Contractor. Each Contractor shall immediately notify the General Contractor of a delay in delivery of products or the scheduled date of completion that may affect the total progress of construction.
- C. The Owner will furnish the topographical survey, either as a part of these Drawings or separately, giving the general topographical lines existing at the site and the property lines.



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- D. Contractors required to make connections to existing utilities, especially sewerage where gravity flow occurs, shall verify grades and locations at points of such connections and shall notify the Architect of circumstances which would adversely affect the proper flow or connection to such facilities.

1.6 CONTRACTOR USE OF PREMISES

- A. General: During the construction period the Contractors shall have full use of the premises for construction operations, including use of the site. The Contractor's use of the premises is limited only by the Owner's right to perform construction operations with its own forces or to employ separate contractors on portions of the project.
- B. Limit use of the premises to construction activities in areas indicated or as directed by the Project Manager or Owner's authorized representative.
  - 1. Confine operations to areas within Contract limits indicated. Portions of the site beyond areas in which construction operations are indicated are not to be disturbed.
  - 2. Keep driveways and entrances serving the premises clear and available to the Owner and the Owner's employees at all times. Do not use these areas for parking or storage of materials. Schedule deliveries to minimize space and time requirements for storage of materials and equipment on site.
  - 3. Burial of Waste Materials: Prior to final grading and landscape development, the existing grade depression near the southwest corner of the site, as indicated, may be used for disposal of inert waste material from the construction process. Do not dispose of organic and hazardous material on site, either by burial or by burning.
- C. Use of the Existing Building/Property: Maintain the existing building in a weathertight condition throughout the construction period. Repair damage caused by construction operations. Take all precautions necessary to protect the building and its occupants during the construction period.
- D. Each Contractor shall limit his use of the premises for work and for storage, to allow for work by other Contractors and Owner occupancy of adjacent buildings or building areas.
- E. Coordinate use of the premises, under direction of the General Contractor.
- F. Each Contractor shall assume complete responsibility for the protection and safekeeping of products under this Contract, stored on the site.
- G. Each Contractor shall move his stored products which interfere with operation of the Owner or separate Contractor.
- H. Each Contractor shall obtain and pay for the use of additional storage of work areas needed for operation.

1.7 OWNER OCCUPANCY



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- A. Full Owner Occupancy: The Owner will occupy the site and existing building during the entire construction period. Cooperate with the Owner during construction operations to minimize conflicts and facilitate Owner usage. Perform the Work so as not to interfere with the Owner's operations.
  
- B. Partial Owner Occupancy: The Owner reserves the right to occupy and to place and install equipment in completed areas of the building, prior to Substantial Completion provided that such occupancy does not interfere with completion of the Work. Such placing of equipment and partial occupancy shall not constitute acceptance of the total Work.
  - 1. A Certificate of Substantial Completion will be executed for each specific portion of the Work to be occupied prior to Owner occupancy.
  - 2. Obtain a Certificate of Occupancy from local building officials prior to Owner occupancy.
  - 3. Prior to partial Owner occupancy, mechanical and electrical systems shall be fully operational. Required inspections and tests shall have been successfully completed. Upon occupancy the Owner will provide operation and maintenance of mechanical and electrical systems in occupied portions of the building.

### 1.8 PRE-ORDERED PRODUCTS

- A. General: If the Owner has negotiated purchase orders with suppliers of material and equipment to be incorporated into the Work. These purchase orders are assigned to the Contractor and costs for receiving, handling, storage, if required, and installation are included in the Contract Sum.
  - 1. The Contractor's responsibilities are the same as if the Contractor negotiated purchase orders, including responsibility to renegotiate purchase if necessary and to execute final purchase order agreements.

### 1.9 OWNER-FURNISHED ITEMS/WORK BY OWNER

- A. The Owner will provide furniture for office areas and fabrication equipment for production processes. The Work includes providing support systems to receive Owner's equipment, and mechanical and electrical connections.
  - 1. The Owner will arrange and pay for delivery of Owner-furnished items in accordance with the Contractor's Construction Schedule, and will inspect deliveries for damage.
  - 2. If Owner-furnished items are damaged, defective or missing, the Owner will arrange for replacement. The Owner will also arrange for manufacturer's field services, and the delivery of manufacturer's warranties and bonds to the Contractor.
  - 3. The Contractor is responsible for designating the delivery dates of Owner-furnished items in the Contractor's Construction Schedule and for receiving, unloading and handling Owner-furnished items at the site. The Contractor is responsible for protecting Owner-furnished items from damage, including damage from exposure to the elements, and to repair or replace items



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damaged as a result of his operations.

- B. The Owner intends to complete the following items of Work outside the provisions of these Contract Documents. Contractors shall not restrict or interfere with the Owner's right to the Project to accomplish this Work.
  - 1. Equipment and furniture except as scheduled and specified under Divisions 11 and 12 and shown on the Drawings.
  - 2. Other such items which may be deleted from Contractors for Work as required by the Contract Documents.
  - 3. The purchase and supplying of certain materials as noted in the Project Manual.

1.40 GRADES, LINES, LEVELS

- A. Information pertaining to preliminary investigations, such as test borings, location of utilities, existing structures, and existing grades appear in the Project Manual or on the Drawings. While such data has been collected with reasonable care, there is no expressed or implied guarantee that conditions so indicated are entirely representative of those actually existing or that unforeseen developments may not occur. The Contractor must put his own interpretation on results of such investigation and shall satisfy himself as to materials to be excavated and materials upon which fill or other work may be placed. Where underground services, utilities, structures, etc., are located on the Drawings or given at the site, they are based on available records, but are not guaranteed to be complete or correct. They are merely given to assist each Contractor.
- B. The General Contractor shall immediately, upon entering the site for the purpose of beginning work, locate general reference points and take such action as is necessary to prevent their destruction. The Contractor shall lay out his own work and be responsible for all lines, elevations, and measurements of the building, utilities, and other work executed by him under the Contract. He must exercise proper precaution to verify figures on the Drawings before laying out work and will be held responsible for any error resulting from his failure to exercise such precaution.
- C. Using datum furnished by the Owner, the lot lines and present levels have been established as shown on the Site Plan. Other grades, lines levels, and bench marks shall be established and maintained by the Contractors who shall be responsible for them.
- D. Each Contractor shall provide required stake-out and grade staking for all work from reference points provided. Each Contractor shall establish all grades, lines, levels, and elevations required for his work from on-site reference points.
- E. Each Contractor shall make provision to preserve property line stakes, bench marks, or datum point. If any are lost, displaced, or disturbed through neglect of any other Contractor or Subcontractor, Contractor causing damage shall pay for the cost of restoration.
- F. Each Contractor, as it applies to his contract, shall verify grades, lines, levels, locations, and dimensions as shown on Drawings, and report any errors or inconsistencies to the Architect before commencing work. Starting of work by the Contractor shall signify his acceptance.



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1.51 TAXES

- A. Taxes which the Contractor must pay which are legally enacted at the time bids are received, whether or not effective, shall be paid by the Contractor.

1.62 PERMITS, FEES, AND NOTICES

- A. The General Contractor will secure the general building permit for the Owner. Each Contractor shall secure and pay for other permits, governmental fees, and licenses necessary for the proper execution and completion of his Work, which are applicable at the time the bids are also received. Fees to relocate utilities on Owner's property shall be included in the bid of the Contractor doing the relocation. Each Contractor shall be responsible for contacting the local governing agency for such cost information and requirements.
- B. Utility Tie-Ins: Shall be arranged with local utility company and other involved parties for minimum interruption of service.
- C. Inspections of installed work shall be performed by the governing authority as arranged for by the Contractor. Work shall not be covered until approved.
- D. Each Contractor shall give notices and comply with laws, ordinances, rules, regulations, and orders of public authorities bearing on the performance of his Work. If a Contractor observes that the Contract Documents are at variance therewith, he shall promptly notify the Architect in writing, and necessary changes shall be adjusted by appropriate notification. If a Contractor performs Work knowing it to be contrary to such laws, ordinances, rules, and regulations, and without such notice to the Architect, he shall assume full responsibility therefore and shall bear the costs attributable thereto.

1.13 LABOR AND MATERIALS

- A. Unless otherwise specifically noted, each Contractor shall provide and pay for labor, materials, equipment, tools, construction equipment and machinery, water, heat, utilities, transportation, and other facilities and services necessary for the proper execution and completion of his Work, whether temporary or permanent and whether or not incorporated or to be incorporated at the Work.
- B. Each Contractor shall enforce strict discipline and good working order among his employees or other persons carrying out Work of his Contract and shall not permit employment of unfit person or persons or anyone not skilled in the task assigned to them.

1.74 CUTTING AND PATCHING UNDER SEPARATE CONTRACTS

- A. Refer to Section 01 73 29 for provisions on this subject.



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1.15 PROJECT MANAGEMENT

- A. The general contractor shall provide full-time, on site a competent Project Coordinator and a Superintendent approved by the Owner to coordinate all aspects of his work with the Project Manager, Owner and Designer and other General contractors' work. It shall be the full responsibility of the General contractor and each subcontractor to coordinate all aspects of construction with all phases of Architectural, Structural, Mechanical (including Plumbing, Heating Ventilation and Sheet Metal Trades), Electrical Work, Site Work, and other Bid Package Work. All subcontractors shall fully cooperate with each other, the General contractor, Project Manager, Owner and Designer.
  - 1. The General contractor shall provide a full-time, on-site, Project Coordinator, whose responsibilities include, but are not limited to, full coordination of all Bid Package Work. The Project Coordinator's position shall be for coordination purposes only, and shall not be for any other purpose. The Superintendent shall represent the general contractor.
  - 2. The Project Coordinator of all Bid Packages must attend all scheduled meetings required by the Owner, Designer or Project Manager.
- B. The General contractor shall coordinate the performance of his subcontractors in the utilization of the site, as well as in the actual performance of their contractual obligations.
- C. The General contractor shall verify all dimensions shown on the Drawings and obtain all measurements required for proper execution of Work.

1.16 PROJECT COORDINATION

- A. Each Contractor shall provide full-time, on-site supervision including a competent project coordinator and competent Superintendent to coordinate all aspects of his Work with other Contractors' Work. It shall be the full responsibility with all phases of Architectural, Structural, Mechanical (including Plumbing, Heating, Ventilation, and Sheet Metal Trades), Electrical Work, Site Work, Special Equipment, Kitchen Equipment, and other separate Contract Work. All Separate Contractors shall fully cooperate with each other and the Architect.
- B. Each Contractor shall coordinate the performance of his subcontractors in the utilization of the site, as well as in the actual performance of their contractual obligations to the Owner.
- C. Each Contractor shall cooperate with the General Contractor and all other Contractors employed by the Owner.
- D. Each Contractor shall verify all dimensions shown on the Drawings and obtain all measurements required for proper execution of Work.
- E. Each Contractor shall see that sleeves and inserts for pipes, conduits, and similar items shall be correctly placed and kept in their proper positions in forms, walls, partitions, and



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floors, and not displaced by the placing of concrete or other construction work. All items shall be placed in ample time so as not to delay concrete operations or other work. Do not place sleeves so they pass vertically through beams, girders, and similar construction, unless locations are approved by the Architect. Locations of chases are indicated in the mechanical and electrical drawings. The separate Contractor and/or Subcontractor of the Work involved shall be responsible for inclusion of these items in the work, and shall advise the Contractor and Architect of all required changes.

- F. Before commencing work, each Contractor shall examine all spaces, surfaces, and areas indicated on the Drawings to receive their Work. Report necessary corrections in writing immediately to the General Contractor and the Architect. Do not proceed until corrections (if any required) have been made. Commencing work signifies this Contractor's acceptance of said spaces, surfaces, and areas, and of job conditions.
- G. Special Equipment, Other Equipment
1. Copies of Equipment Specifications and Drawings shall be made available to the Architectural Trade Contractors, Mechanical Contractor, and Electrical Contractor for information by which they shall determine the amount of Work to be done as described herein.
  2. As the building project nears completion, certain rooms may be made ready to accept the equipment intended for them.
  3. The Contractor shall cooperate with the suppliers' installation personnel by providing unobstructed areas in which they may assemble and install equipment. These areas shall be adequately heated and lighted with temporary or permanent power available for tools or testing purposes.
  4. The responsibilities of the Electrical and Mechanical Work Contractors shall be as follows:
    - a. Final connections of equipment to building electrical and mechanical rough-ins will be made by the Electrical and Mechanical Work Contractors (interconnection between items of equipment will be done by the installing personnel, not by the Electrical or Mechanical Work Contractors). Equipment requiring only plug-in connections shall have floor outlets installed in accordance with these documents.
- H. Temporary Omission of Work
1. If any materials and finish are of such nature that it is necessary to temporarily omit certain portions of work (as illustrated on Drawings or specified in Specifications) in order to make final installation, the Contractor whose work is involved shall omit such parts of this work or finish as necessary until other said work and/or materials have been installed and shall then return and install such omitted parts of his work as part of this Contract and without additional cost to the Owner.

### 1.17 TESTS AND ADJUSTMENTS

- A. If the Contract Documents, laws, ordinances, rules, regulations, or orders of any public authority having jurisdiction require any portion of the Work to be inspected, tested, or approved, the contractor shall give the Architect 48 hours advance notice so he may



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observe such inspection, testing, or approval. The Contractor shall bear all costs of such inspections, tests, or approvals conducted by or for public authorities.

- B. The complete installation of piping, wiring, and working components, including all operating equipment and systems, shall be subjected to test at full operating conditions. The Contractor shall make all necessary adjustments and/or replacements which are necessary to fulfill the requirements of the Contract Documents, and to comply with all codes and regulations which may apply to the entire installation. The complete installation shall be left ready in all respects for use by the Owner. The Contractor shall bear all costs of such testing and adjustments.
- C. Unless otherwise provided, the Owner shall bear all costs of other inspections, tests, and approvals.
  - 1. The General contractor shall bear all costs for scheduled pick ups or tests if the Testing agency makes a trip to the site and material or work is not ready for pick up or tests.

### 1.18 VERIFICATIONS OF EXISTING DIMENSIONS

- A. When verification of existing dimensions is required, the Contractor requiring said verification for the construction or fabrication of his material shall be the Contractor responsible for procurement of the field information.

### 1.19 PROJECT SECURITY

- A. The General Contractor shall be responsible for developing and conducting a security program, specifically oriented for the protection of preventing damage, injury, or loss to the entire project site and other property at the site or adjacent thereto. This shall be acceptable to the Owner and Architect, and shall remain in effect through Substantial Completion of the Project.
- B. Each Contractor shall be responsible for securing his work and equipment at the close of each workday.

## PART 2 - PRODUCTS (NOT USED)

## PART 3 - EXECUTION

### 3.1 SCHEDULE OF CONTRACT RESPONSIBILITIES

- A. Scope
  - 1. Contractors shall submit their proposals abased on the Work included under each contract area as listed herein. Include Work necessary for a complete project, as shown on the Drawings and called for in the Specifications.
  - 2. Questions concerning the phasing or "Schedule of Contract Responsibilities"



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should be directed to the General Contractor, who will be the interpreter and be responsible for this Schedule of Contract Responsibilities and Contract Breakdown, prior to submitting proposals and during construction.

3. The requirements of Division 1 are a part of the Work if each and every contract area. The Contractor for any one contract area shall be familiar with the Work and requirements of all other contract areas.
4. Certain Specification Sections describe Work to be performed under several contract areas. Provide Work of this nature are required for each contract area whether or not enumerated in the Schedule of Contract Responsibilities.
5. The following contract areas are broken down by Specifications Section conforming basically to the CSI format.
6. The Drawings and Specifications as furnished for each of the Contracts is for the convenience of the Contractor in preparing a proposal for this Project. However, each Contractor is responsible to review the complete set of Drawings and Specifications to assure that Work required to be installed to complete his phase of the Work is included in his proposal. This "Schedule of Contract Responsibilities" is a definition of the work as it is to be bid, but is normally inherent to a trade, or is included in the scope of the applicable technical revision, (it will be the responsibility of that Contractor to include the Work in his proposal.
7. This "Schedule of Contract Responsibilities" is to aid each Contractor defining the Scope of Work to be included in his proposal. However, omissions from this "Schedule of Responsibilities" do not relieve the Contractor from including in his proposal that Work which will be required to complete his Contract. Each Contractor should read the "Schedule of Contract Responsibilities" completely to familiarize himself with the Work of other Contractors that may have Work in adjacent areas ad to coordinate the interfacing problems that may occur as the work is assembled and constructed.
8. Where specific Work is to be completed under a particular phase of the Project and the Work is wholly or partially completed by other trades because of the type of work involved or jurisdictional trade agreements, the Contractor will be responsible to subcontract the Work as necessary to complete the Work included in his Contract. No delay in the Work will be allowed due to the failure of the Contractor to subcontract related work required by jurisdictional trade agreements.

**B. Coordination of Work**

1. Each Contractor is responsible to coordinate his Work of other trades and other Contractors and requirements of the County. The Contractor must make space allowance for Work of other Contractors; provide necessary openings where indicated or implied by the Drawings and Specifications. Each Contractor is responsible to protect his own Work.

END OF SECTION 01 11 00



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SECTION 01 26 13  
REQUESTS FOR INFORMATION (RFI) PROCEDURES

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

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

1.2 SUMMARY

- A. This Section specifies Requests for Information (RFI) procedures.

1.3 DEFINITIONS

- A. Drawing/Plan Clarification: An answer from the Architect, on behalf of the Owner, in response to an inquiry from the contractor, intended to make some requirement(s) of the drawings or plans clearly understood. Drawing/plan clarifications may be sketches, drawings, or in narrative form and will not change any requirements of the drawings or plans. Responses to contractor inquiries shall be as outlined in "Requests for Information" as specified herein.
- B. Non-Conformance Notice: A notice issued by the Architect, on behalf of the Owner, documenting that the Work or some portion thereof has not been performed in accordance with the requirements of the Contract Documents. Payment shall not be made on any portion of the Work for which a Non-Conformance Notice has been issued and the Work not corrected to the satisfaction of the Architect and Owner.
1. Upon receipt of a Non-Conformance Notice, the Contractor shall provide a written Response to Non-Conformance Notice within five (5) working days after receipt of the Notice. The contractor's response shall detail either (a) why they believe that the work was performed in accordance with the contract documents or (b) what corrective action they intend to take, at their sole expense, to correct the non-conforming work.
  2. If the Contractor disputes the issuance of the Non-Conforming Notice, the Construction Manager or Architect, on behalf of the Owner, has five (5) working days to respond by either (a) withdrawing the Non-Conformance Notice or (b) directing the Contractor to correct such Work. Such determination by the Construction Manager or Architect, on behalf of the Owner, shall be final and conclusive.
  3. If directed to correct the Work, the Contractor shall do so within five (5) working days after receipt of such direction from the Construction Manager or Architect, on behalf of the Owner, or such other time as may be agreed to.
- C. Project Communications: Routine written communications between the Architect, Owner, and Contractor which are in letter, field memo, or fax format. Such communications shall not be identified as Requests for Information nor shall they substitute for any other written requirement pursuant to the provisions of these Contract Documents.



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- D. Requests for Information: A request from the Contractor or one of its subcontractors, to the Architect, on behalf of the Owner, seeking an interpretation or a clarification of some requirement of the Contract Documents. The contractor shall clearly and concisely set forth the issue for which it seeks clarification or interpretation and why a response is needed. The contractor shall, in the written request, set forth its interpretation or understanding of the contract's requirements along with reasons why it has reached such an understanding.
1. Responses from the Architect, on behalf of the Owner, will not change any requirements of the Contract Documents. Responses to RFI's will be as further defined herein.

1.4 REQUESTS FOR INFORMATION

- A. In the event the contractor or subcontractor, at any tier, determines that some portion of the drawings, specifications, or other contract documents requires clarification or interpretation, the contractor shall submit a Request for Information in writing. Requests for Information shall only be submitted by the Prime Contractor and shall only be submitted on the Request for Information form provided.
1. The contractor shall clearly and concisely set forth the issue for which clarification or interpretation is sought and why a response is needed. In the Request for Information, the contractor shall set forth an interpretation or understanding of the requirement along with reasons why such an understanding was reached.
- B. The Architect, on behalf of the Owner, will review all Requests for Information to determine whether they are Requests for Information as defined in the Contract Documents. If it is determined that the document is not an RFI, it will be returned to the contractor, unreviewed as to content, for resubmittal on the proper form in the proper manner.
- C. Responses to Requests for Information shall be issued within five (5) working days of receipt of the request from the contractor, unless the Architect determines that a longer time is needed to provide an adequate response. If a longer time is deemed necessary by the Architect, then the Architect shall, within five (5) working days of the receipt of the request, notify the contractor of the anticipated response time.
1. If the contractor submits a Request for Information on an activity with five (5) working days or less of float on the current project schedule, the contractor shall not be entitled to any time extension due to the time it takes the Architect, on behalf of the Owner, to respond to the request provided that the Architect responds within the five (5) working days set forth above.



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- D. Responses from the Architect, on behalf of the Owner, will not change any requirements of the Contract Documents. In the event that the contractor believes the response to a Request for Information will cause a change to the requirements of the Contract Documents, the contractor shall immediately give written notice that the contractor considers the response to be a Change Order. Failure to give such written notice immediately shall waive the contractor's right to seek additional time or cost under the provisions set forth in the General Conditions.

PART 2 - PRODUCTS (NOT USED)

PART 3 – EXECUTION (NOT USED)

END OF SECTION 01 26 13



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SECTION 01 26 14  
PROPOSAL REQUEST (PR) PROCEDURES

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

- A. Drawings and General Provisions of Contract, including General Conditions, and other Division-1 Specification Sections, apply to the Work of this Section and all Sections in the Project Manual whether or not specifically indicated.

1.2 SUMMARY

- A. This section includes administration and procedural requirements for proposal requests.
- B. Measurement and payment criteria applicable to work required.

1.3 DEFINITION

- A. A Proposal Request is a written direction in the form of an AIA Document from the Architect, Contractor and Owner used to document changes in Scope of work and to identify the cost impact of the change.

1.4 CAUSE FOR PROPOSAL REQUESTS

- A. Changes in Scope of work may be affected by:
  - 1. As a result of Design Changes that are cost related changes in order to complete or enhance the scope of the change in question and results in added value to the Owner.
  - 2. As an Owner requested change that is a cost related change in scope that is initiated by the Owner.
  - 3. As a unforeseen change that is a cost related change in scope that is most generally related to existing site conditions or existing facility that could not have been known at Bid time and clearly unidentifiable.
  - 4. As a value engineering change that is a cost related change that after identifying or solving techniques the required function at the lowest or lower cost achieved.
  - 5. As a construction change that is a cost related change that is closely related to a design change but is brought to the attention of the Architect due to installation means and method or construction clarification.

1.5 PROCEDURES

- A. The Architect shall issue written direction through a Proposal Request (AIA Document G-709) which will include detailed information, drawings or sketches and changes in scope of work to the Contract Document.



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- B. The Contractor shall review the Proposal Request and submit their cost Proposal for the cost related changes.
  - 1. Contractor shall indicate if the cost is an add to or deduct from the Contract Sum. Proposal requests may be issued for deduct cost items as well.
- C. The Contractor shall submit their cost proposal within ten (10) working days or state in writing when the Proposal will be returned based on the given circumstances. Each proposal shall include a material and labor breakdown for all work performed by their own forces, or subcontractor's forces. Any supporting time sheets for time and material work and subcontractors cost proposals shall be included in the Prime Contractors' Proposal. All of these items shall be included in deduct proposal requests as well.
- D. Each Proposal issued by the Contractor shall specifically address any required additional or deducted contract time. If no mention is made it is assumed that none is required. No consideration of additional time will be given for previously approved Proposals without specific written approval from the Owner or Architect.
- E. The maximum aggregate increased cost for combined overhead and profit shall be as noted in the General and Supplementary Conditions. This combined overhead and profit as specified shall be used in deduct proposal requests as well.
- F. The value of any scope of work change shall be determined by mutual acceptance of a lump sum, by unit prices or by time and material basis not to exceed plus the appropriate mark-up.
- G. The Architect shall review the contractors cost proposal and provide a recommendation to the Owner.
- H. The Owner reserves the right to reject the contractors cost proposal associated with the Proposal Request.
- I. The Owner shall review the recommendations of the Architect and if appropriate approve the contractors cost proposal. A memorandum shall be issued to the contractor notifying the contractor of approval with any clarifications.
- J. The approved Proposal Request shall become a part of the contract documentation when issued in a Change Order. The Owner reserves the right to include multiple Proposal Requests in one Change Order.
- K. For payment purposes, the Contractor may list each Change Order by number with a listing of each Proposal Request on the schedule of values submitted with each Pay Application. The Owner will pay for approved percentages of each Proposal Request until completed.
- L. The Contractor shall carry out the scope of work changes after notification of approval. Work related to the Proposal Request shall be carried out within a reasonable time in order to not delay other work or to cause increased cost because of other work. The Contractor shall have ten (10) working days in which to respond to Proposal Request or to notify the Architect in writing of the date on which the Proposal is anticipated. These requirements apply to deduct proposal requests as well.



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- M. If the contractor fails to respond to the Proposal Request or notify the Architect within (10) calendar days, this lack of action shall be construed as no additional cost for the Proposal Request.
- N. If the contractor's cost proposal is rejected by the Architect, all parties shall review the scope of work and cost proposal and agree to an acceptable cost.
- O. If the Contractor and Architect can not come to an agreement on an acceptable cost, the Contractor may be directed to proceed with the scope of work changes on a time and material basis not to exceed the Contractor's cost Proposal. The Contractor shall be required to submit daily time sheets for the Architect to review and approve. The Owner shall review and approve the final costs upon recommendation of the Architect.

### 1.6 CHANGE ORDERS

- A. The Architect shall assemble the Change Order by Proposal Request or by grouping a number of Proposal Requests.
- B. Two original copies of the Change Order shall be printed for signatures. Upon completion of the signature process an original copy will be forwarded to the Contractor.
- C. The Contractor shall provide a new non-collusion affidavit with the return of the Change Order after signing.
- D. Payment for the Change Order will be possible after signatures are obtained from the Architect, the Contractor and the Owner and upon acceptance by the Owner.

### 1.7 AS-BUILT DOCUMENTATION

- A. It is imperative that the Contractor update their as-built documents in the field for each and every Proposal Request that changes the content of the Document. The Owner reserves the right to inspect the Contractor's as-built document prior to each Pay Application. The status of the Contractors as-builts may result in withheld payment for that portion of the work.

PART 2 - PRODUCTS (NOT USED)

PART 3 – EXECUTION (NOT USED)

END OF SECTION 01 26 14



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SECTION 01 31 13  
PROJECT COORDINATION

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

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

1.2 SUMMARY

- A. This Section specifies administrative and supervisory requirements necessary for Project coordination including, but not necessarily limited to:
1. Coordination.
  2. Administrative and supervisory personnel.
  3. General installation provisions.
  4. Cleaning and protection.
- B. Field engineering is included in Section 01 10 50, Field Engineering and Surveying.
- C. Progress meetings, coordination meetings and pre-installation conferences are included in Section 01 31 19, Project Meetings.
- D. Requirements for the Contractor's Construction Schedule are included in Section 01 33 00, Submittals.

1.3 COORDINATION

- A. Coordination: Construction Manager shall coordinate construction activities included under various Sections of these Specifications to assure efficient and orderly installation of each part of the Work. Coordinate construction operations included under different Sections of the Specifications that are dependent upon each other for proper installation, connection, and operation.
1. Where installation of one part of the Work is dependent on installation of other components, either before or after its own installation, schedule construction activities in the sequence required to obtain the best results.
  2. Where availability of space is limited, coordinate installation of different components to assure maximum accessibility for required maintenance, service and repair.
  3. Make adequate provisions to accommodate items scheduled for later installation.
- B. Where necessary, prepare memoranda for distribution to each party involved outlining special procedures required for coordination. Include such items as required notices, reports, and attendance at meetings.
1. Prepare similar memoranda for the Owner and separate Contractors where coordination of their Work is required.
- C. Administrative Procedures: Construction Manager shall coordinate scheduling and timing



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of required administrative procedures with other construction activities to avoid conflicts and ensure orderly progress of the Work. Such administrative activities include, but are not limited to, the following:

1. Preparation of schedules.
  2. Installation and removal of temporary facilities.
  3. Delivery and processing of submittals.
  4. Progress meetings.
  5. Project Close-out activities.
- D. Conservation: Construction Manager shall coordinate construction activities to ensure that operations are carried out with consideration given to conservation of energy, water, and materials.
1. Salvage materials and equipment involved in performance of, but not actually incorporated in, the Work. Refer to other sections for disposition of salvaged materials that are designated as Owner's property.

### 1.4 SUBMITTALS

- A. Coordination Drawings: Construction Manager shall prepare and submit coordination Drawings where close and careful coordination is required for installation of products and materials fabricated off-site by separate entities, and where limited space availability necessitates maximum utilization of space for efficient installation of different components, and as may be directed or requested by the Architect.
1. Show the interrelationship of components shown on separate Shop Drawings.
  2. Indicate required installation sequences.
  3. Comply with requirements contained in Section 01 33 00, Submittals.
  4. Refer to Division-23 Section "Basic Mechanical Requirements," and Division-26 Section "Basic Electrical Requirements" for specific coordination Drawing requirements for mechanical and electrical installations.
- B. Staff Names: Within 15 days of Notice to Proceed, submit a list of the Contractor's principal staff assignments, including the Superintendent and other personnel in attendance at the site; identify individuals, their duties and responsibilities; list their addresses and telephone numbers.
1. Post copies of the list in the Project meeting room, the temporary field office, and each temporary telephone.

### PART 2 - PRODUCTS (Not Used)

### PART 3 - EXECUTION

#### 3.1 GENERAL INSTALLATION PROVISIONS

- A. Inspection of Conditions: Require the Installer of each major component to inspect both the substrate and conditions under which Work is to be performed. Do not proceed until unsatisfactory conditions have been corrected in an acceptable manner.



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- B. Manufacturer's Instructions: Comply with manufacturer's installation instructions and recommendations, to the extent that those instructions and recommendations are more explicit or stringent than requirements contained in Contract Documents.
- C. Inspect materials or equipment immediately upon delivery and again prior to installation. Reject damaged and defective items.
- D. Provide attachment and connection devices and methods necessary for securing Work. Secure Work true to line and level. Allow for expansion and building movement.
- E. Visual Effects: Provide uniform joint widths in exposed Work. Arrange joints in exposed Work to obtain the best visual effect. Refer questionable choices to the Architect for final decision.
- F. Recheck measurements and dimensions, before starting each installation.
- G. Install each component during weather conditions and Project status that will ensure the best possible results. Isolate each part of the completed construction from incompatible material as necessary to prevent deterioration.
- H. Coordinate temporary enclosures with required inspections and tests, to minimize the necessity of uncovering completed construction for that purpose.
- I. Mounting Heights: Where mounting heights are not indicated, install individual components at standard mounting heights recognized within the industry for the particular application indicated. Refer questionable mounting height decisions to the Architect for final decision.

### 3.2 CLEANING AND PROTECTION

- A. During handling and installation, clean and protect construction in progress and adjoining materials in place. Apply protective covering where required to ensure protection from damage or deterioration before or at Substantial Completion.
- B. Clean and maintain completed construction as frequently as necessary through the remainder of the construction period. Adjust and lubricate operable components to ensure operability without damaging effects.
- C. Limiting Exposures: Supervise construction activities to ensure that no part of the construction, completed or in progress, is subject to harmful, dangerous, damaging, or otherwise deleterious exposure during the construction period. Where applicable, such exposures include, but are not limited to, the following:
  - 1. Excessive static or dynamic loading.
  - 2. Excessive internal or external pressures.
  - 3. Excessively high or low temperatures.
  - 4. Thermal shock.
  - 5. Excessively high or low humidity.
  - 6. Air contamination or pollution.



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7. Water or ice.
  8. Solvents.
  9. Chemicals.
  10. Light.
  11. Radiation.
  12. Puncture.
  13. Abrasion.
  14. Heavy traffic.
  15. Soiling, staining and corrosion.
  16. Bacteria.
  17. Rodent and insect infestation.
  18. Combustion.
  19. Electrical current.
  20. High speed operation,
  21. Improper lubrication,
  22. Unusual wear or other misuse.
  23. Contact between incompatible materials.
  24. Destructive testing.
  25. Misalignment.
  26. Excessive weathering.
  27. Unprotected storage.
  28. Improper shipping or handling.
  29. Theft.
  30. Vandalism.
  31. Mold.
  32. Mildew.
- D. Refer to Section 01 74 13 for additional construction cleaning requirements.

END OF SECTION 01 31 13



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SECTION 01 31 19  
PROJECT MEETINGS

PART 1 - GENERAL

1.1 SUMMARY

- A. This Section specifies administrative and procedural requirements for project meetings including but not limited to:
  - 1. Pre-Construction Conference.
  - 2. Coordination Meetings.
  - 3. Progress Meetings.
- B. Construction schedules are specified in another Division-1 Section.

1.2 PRE-CONSTRUCTION CONFERENCE

- A. The Contractor shall schedule a pre-construction conference and organizational meeting at the Project site or other convenient location no later than 15 days after execution of the Agreement and prior to commencement of construction activities. Conduct the meeting to review responsibilities and personnel assignments.
- B. Attendees: The Owner, Architect and their consultants, the Contractor and its superintendent, major subcontractors, manufacturers, suppliers and other concerned parties shall each be represented at the conference by persons familiar with and authorized to conclude matters relating to the Work.
- C. Agenda: Discuss items of significance that could affect progress including such topics as:
  - 1. Tentative construction schedule.
  - 2. Critical Work sequencing.
  - 3. Designation of responsible personnel.
  - 4. Procedures for processing field decisions and Change Orders.
  - 5. Procedures for processing Applications for Payment.
  - 6. Distribution of Contract Documents.
  - 7. Submittal of Shop Drawings, Product Data and Samples.
  - 8. Preparation of record documents.
  - 9. Use of the premises.
    - a. Owner's requirements.
  - 10. Office, Work and storage areas.
  - 11. Equipment deliveries and priorities.
  - 12. Safety procedures.
  - 13. First aid.
  - 14. Security.
  - 15. Housekeeping.
  - 16. Working hours.



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1.3 COORDINATION MEETINGS

- A. The Contractor shall conduct Project coordination meetings at regularly scheduled times convenient for all parties involved. Project coordination meetings are in addition to specific meetings held for other purposes, such as regular progress meetings and special pre-installation meetings.
- B. Request representation at each meeting by every party currently involved in coordination or planning for the construction activities involved.
- C. Record meeting results and distribute copies to everyone in attendance and to others affected by decisions or actions resulting from each meeting.

1.4 PROGRESS MEETINGS

- A. The Contractor shall conduct progress meetings at the Project site at regularly scheduled intervals. Notify the Owner and Architect of scheduled meeting dates. Coordinate dates of meetings with preparation of the payment request.
- B. Attendees: In addition to representatives of the Owner and Architect, Contractor, subcontractor, supplier or other entity concerned with current progress or involved in planning, coordination or performance of future activities shall be represented at these meetings by persons familiar with the Project and authorized to conclude matters relating to progress.
- C. Agenda: Review and correct or approve minutes of the previous progress meeting. Review other items of significance that could affect progress. Include topics for discussion as appropriate to the current status of the Project.
  - 1. Contractor's Construction Schedule: Review progress since the last meeting. Determine where each activity is in relation to the Contractor's Construction Schedule, whether on time or ahead or behind schedule. Determine how construction behind schedule will be expedited; secure commitments from parties involved to do so. Discuss whether schedule revisions are required to ensure that current and subsequent activities will be completed within the Contract Time.
  - 2. Review the present and future needs of each entity present, including such items as:
    - a. Interface requirements.
    - b. Time.
    - c. Sequences.
    - d. Deliveries.
    - e. Off-site fabrication problems.
    - f. Access.
    - g. Site utilization.
    - h. Temporary facilities and services.
    - i. Hours of Work.
    - j. Hazards and risks.
    - k. Housekeeping.



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- I. Quality and Work standards.
  - m. Change Orders.
  - n. Documentation of information for payment requests.
- D. Reporting: No later than 3 days after each progress meeting date, distribute copies of minutes of the meeting to each party present and to other parties who should have been present. Include a brief summary, in narrative form, of progress since the previous meeting and report.
- 1. Schedule Updating: Revise the construction schedule after each progress meeting where revisions to the schedule have been made or recognized. Issue the revised schedule concurrently with the report of each meeting.

PART 2 - PRODUCTS (Not Used)

PART 3 - EXECUTION (Not Used)

END OF SECTION 01 31 19



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SECTION 01 33 00  
SUBMITTALS

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

- A. The Work of this Section shall be included as a part of the Contract Documents of each Contractor on this Project.

1.2 SUBMITTAL PROCEDURES

- A. Submittals, including those specified herein to be submitted to the Architect, excluding those directed to a specific individual, shall be submitted directly to the Contractor for his review. Contractor will forward required submittals to the Architect for his review and approval.

1. **Contractors shall submit shop drawings in electronic format.** All electronic format drawing submittals shall be in Adobe Acrobat pdf format. All electronic format product data or other information shall be submitted in Adobe Acrobat pdf format. Coordinate with Architect prior to submitting.

- B. Contractors on this Project shall provide submittals in accordance with the requirements of this Section. Where a submittal is required by a Contractor but assistance from others, Contractors shall participate and cooperate to expedite each submittal.

- C. Where submission of samples, shop drawings, or other items are required from suppliers or subcontractors, it shall be the responsibility of the Contractor for whom the subcontractor is executing the Work to see that the submittal items required are complete and properly submitted, and corrected and resubmitted at the time and in the order required so as not to delay the progress of the Work. Submittals shall be made through the Contractor.

- D. The Contractor shall check all shop drawings, samples, and other submittals and submit them to the Architect with a letter of transmittal giving his approval, comments, and suggestions. Each transmittal shall include the following information:

1. Date Submitted.
2. Project title and number.
3. Contractor's name and address.
4. **Identification by Specification Section and quantity submitted for each submittal including name of subcontractors, manufacturer, or supplier.**
5. Notification of deviations from the Contract Documents for each submittal.
6. Contractor's written approval marked on each submittal. If contractor's submittals are not stamped and reviewed by the contractor prior to submitting for review, submittals will be sent back to the contractor.
7. If there is more than one building in the project, shop drawings are to be submitted and packaged for each building and submitted in packages for each separate building. Shop drawings not submitted in this fashion may be rejected.

- E. The Contractor shall prepare, review, and stamp with his approval and submit, with reasonable promptness or within the specified time periods and in orderly sequence so as



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to cause no delay in the Work or in the Work of another contractor, submittals required by these Contract Documents or subsequently required by modifications.

1. If the product is not as specified or approved by Addenda, it will be rejected by the Architect. Contractor shall not make submittals if the product manufacturer is not specified or listed in the Addenda. This will delay the submittal process and the contractor shall assume full responsibility for any delays caused by unapproved manufacturer submittals.
- F. The Contractor and Architect shall review and take action on submittals with reasonable promptness, so as to cause no delay in the progress. A reasonable period of time for review of and action taken on submittals shall be as specified herein, but in no case shall it be more than 14 calendar days from the time it is received by the Architect until the time the submittal is marked and forwarded or returned. Contractors shall allow sufficient mailing time for submittals.
- G. The same submittal will only be reviewed a maximum of two (2) times. If the same submittal is not correct within the two (2) submittal limit for the same item, the contractor will be charged for the additional reviews required. The Architect's additional time will be on an hourly basis, which amount will be deducted from the contractor's Contract Sum by Change Order.
- H. Identification of Submittals: Submittals, including re-submittals, shall be numbered with a Submittal Number. The Submittal Number shall consist of the applicable specification section number followed by a suffix number in consecutive order matching the numbers on the Submittal Log. The form of Submittals Numbers shall be as follows: ## ## ## - ### (example: 09 90 01-01).

### 1.3 REQUIRED SUBMITTALS

#### A. Construction Schedules

1. A linear bar chart time control schedule shall be provided by the Contractor.
  - a. Each Contractor shall work overtime nights, and weekends, if necessary to maintain his portion of the schedule at no additional cost to the Owner.
  - b. Each Contractor is responsible to expedite approvals and deliveries of material so as not to delay job progress.
  - c. Each Contractor shall begin each phase of his work as quickly as physically possible, but not to impede or jeopardize the Work of other Contractors.
  - d. Each Contractor shall cooperate fully with the Contractor in the coordination of the Work with other Contractors and the convenience of the Owner as indicated in the Specifications.
  - e. Each Contractor shall participate in the updating of the schedule on a bi-weekly basis during the entire life of his contract.
    - 1) Contractor's schedule shall be updated bi-weekly and submitted to the Architect and other involved parties at least 2 days prior to the bi-weekly progress meeting.



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- f. The Project Construction Schedule will be updated reflecting Contractor's revised schedule and progress meeting results.

**B. Schedule of Values**

1. Contractor shall prepare and submit to the Architect a Schedule of Values for approval within 7 days after notice is given to proceed with Work. The Schedule of Values shall consist of a complete breakdown of the Contractor's contract sum showing the various items of the Work, divided so as to facilitate the approval of payments to the Contractor for Work completed. In addition to and conjunctive with the division of various items of work, the breakdown shall separate individual buildings within the Project, shall separate sitework from building(s) components and shall separate remodeling/renovation work from new construction work. The Schedule of Values shall be prepared on AIA Document G703, Continuation Sheet, showing the breakdown of items of Work and supported by such data to substantiate its correctness as the Architect may require.
2. Schedule of Values shall be coordinated with the Construction Schedules such that the percentages of Work completed closely relates to the values for the Work shown on the request for payments. At the beginning of the Project, each Contractor shall prepare a schedule of monthly progress payments showing the amount the Contractor may require for the Work proposed to be completed. The purpose of this schedule is to allow the Owner to determine what amounts of funds he will be required to have available each month during the progress of construction for progress payments.

**C. Project Use Site Plan**

1. The Contractor, in cooperation with other Contractors on this Project, shall prepare a proposed project use of the site plan.
2. Contractors shall confine operations at the site to areas within the areas indicated and as approved on the use of the site plan, and as permitted by law, ordinances, and permits. Site shall not be unreasonably encumbered with materials, products, or construction equipment.

**D. Shop Drawings and Product Data**

1. Shop drawings are drawings, diagrams illustrations, schedules, performance charts, brochures, and other data which are prepared by the Contractor or subcontractor, manufacturer, supplier, or distributor to illustrate some portion of the Work.
  - a. Advertising brochures will not be accepted as shop drawings.
  - b. Erection and setting drawings as referred to in these Specifications will be considered as shop drawings and shall be submitted along with detailed shop drawings.
  - c. Where schedules are required to indicate locations, they shall be submitted as part of the shop drawing package for that item.
  - d. Shop drawings and schedules shall repeat the identification shown on the Contract Drawings.



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2. Product data are illustrations, standard schedules, performance charts, instructions, brochures, diagrams, and other information furnished by the Contractor to illustrate a material, product, or system for some portion of the Work.
  - a. Clearly mark each copy to identify pertinent materials.
  - b. Show dimensions and clearance required.
  - c. Show performance and characteristics and capacities.
  - d. Show wiring diagrams and controls.
  - e. Note variances from the Contract Documents including manufacturer's recommended changes to sequencing and to piping and control diagrams.
3. 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 Architect's "Action" marking. Package each submittal appropriately for transmittal and handling. Submittals which are received from sources other than through the Contractor will be returned "without action", which does not mean approval.
4. By approving and submitting shop drawings, the Contractor thereby represents that he has determined and verified field measurements, field construction criteria, materials, catalog numbers, and similar data, and that he has checked and coordinated each shop drawing with the requirements of the Work and of the Contract Documents prior to submitting to the Architect.
5. The Contractor shall make corrections required by the Architect and shall resubmit the required number of corrected copies of shop drawings until approved. The Contractor shall direct specific attention in writing or on resubmitted shop drawings to revisions other than the corrections requested by the Architect on previous submissions.
6. The Architect will review shop drawings only for conformance with the design concept of the Project and with the information given in the Contract Documents. The Architect's review of a separate item shall not indicate review of an assembly in which the item functions.
7. The Architect's review of shop drawings shall not relieve the Contractor of responsibility for any deviation from the requirements or the Contracts documents unless the Contractor has informed the Architect in writing of such deviation at the time to submission and the Architect has given written approval to the specific deviation, nor shall the Architect's action relieve the Contractor from responsibility for errors or omissions in the shop drawings.
8. Notations and remarks added to shop drawings by the Architect are to insure compliance to Drawings and Specifications and do not imply a requested or approved change to contract cost.
9. Should deviations, discrepancies, or conflicts between shop and contract drawings and Specifications be discovered, either prior to or after review, Contract Documents shall control and be followed.
10. The following number of shop drawings and product data submittals shall be made on this Project. Where an insufficient number of copies are submitted, no action will be taken until proper number of copies have been received. Additional copies beyond the number required will be discarded.



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Schedule of Required Shop Drawings and Product Data

11. Architectural/Structural/Mechanical/Electrical/Civil
  - a. Upload to ftp site as instructed by the Architect.
12. Shop drawings will be marked as follows: Contractors shall take the following action for each respective marking:
  - a. "REVIEWED AND RELEASED" - Copies will be distributed as indicated under above schedule.
  - b. "REVIEWED AND RELEASED WITH CORRECTIONS" - Contractor may proceed with fabrication, taking into account the necessary corrections. Corrected shop drawings shall be resubmitted before fabrication of this Work is completed. Only shop drawings marked "REVIEWED AND RELEASED" by Architect will be permitted on the project site.
  - c. "REVISE AND RESUBMIT" - Contractor will be required to resubmit shop drawings in their entirety. No fabrication or installation shall be started until shop drawings so marked have been completely revised, resubmitted, and marked by Architect according to preceding Paragraphs 1. or 2.
13. Where re-submittal is required, submittal and distribution shall be as specified in subparagraph 11 above.
14. One set of shop drawings marked by Architect "REVIEWED AND RELEASED" be filed on the project site at all times. Shop drawing file may be electronic and accessible by the Architect and Owner on the on-site project computer. No installation of equipment, materials, or products is to be incorporated into the Project until shop drawings marked by Architect "REVIEWED AND RELEASED" have been received on the Project.

E. Samples

1. The Contractor shall submit to the Architect triplicate (3) samples to illustrate materials or workmanship, colors, and textures, and establish standards by which the Work will be judged. A complete list of required samples will be submitted to the Contractor for use as a check list.
2. By approving and submitting samples, the Contractor thereby represents that he has determined and verified materials, catalog numbers, and similar data, and that he has checked and coordinated each sample with the requirements of the Work and of the Contract Documents prior to submitting to the Architect.
3. The Contractor shall resubmit the required number of correct or new samples until approved. The Contractor shall direct specific attention in writing or on resubmitted samples to revisions other than the changes requested by the Architect on previous submissions.
4. The Architect will review samples but only for conformance with the design concept of the Project and with the information given in the Contract Documents. The Architect's approval of a separate item shall not indicate approval of an assembly in which the item functions.
5. The Architect's action shall not relieve the Contractor of responsibility for deviations from the requirements of the Contract Documents unless the



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Contractor has informed the Architect in writing of the deviation at the time of submission and the Architect has given written approval to the specific deviation, nor shall the Architect's action relieve the Contractor from responsibility for errors or omissions in the samples.

6. Unless otherwise specified, samples shall be in triplicate and of adequate size to show function, equality, type, color, range, finish, and texture of material. When requested, full technical information and certified test data shall be supplied.
  - a. Each sample shall be labeled, bearing material name and quality, the Contractor's name, date, project name, and other pertinent data.
  - b. Transportation charges to and from the Architect's office must be prepaid on samples forwarded. Approved samples shall be retained by the Architect until the Work for which they were submitted has been accepted.
7. Materials shall not be ordered until approval is received. Materials shall be furnished, equal in every respect to approved samples. Where color or shade cannot be guaranteed, the maximum deviation shall be indicated by the manufacturer. Work shall be in accordance with the approved samples.

F. List of A.I.A. Documents (Contractors Source)

1. The following documents are required in the Project Manual to be furnished and executed by the Contractor(s) and submitted to the Architect at various stages of the Project Work. Refer to Supplementary Conditions and Division 1.
  - G702 - Application and Certification for Payment
  - G703 - Continuation Sheet
  - G705 - Certificate of Insurance
  - G706 - Contractor's Affidavit of Payment of Debt and Claims
  - G706A - Contractor's Affidavit of Release of Liens
  - G707 - Consent of Surety Company to Final Payment, if required
  - G707A - Consent of Surety to Reduction in or Partial Release of Retainage, if required.
2. Special documents, which may be required, will be furnished by the Architect.

G. Operation and Maintenance Data

1. Typed or printed instruction covering the operation and maintenance of each item of equipment furnished, shall be prepared and placed in a notebook by the Contractor and submitted to the Architect for review and transmittal to the Owner. The instructions, as applicable, shall include the following:
  - a. Any schematic piping and wiring diagrams;
  - b. Any valve charts and schedules;
  - c. Any lubrication charts and schedules;
  - d. Guides for troubleshooting;
  - e. Pertinent diagrams of equipment with main parts identification;
  - f. Manufacturer's data on all equipment;
  - g. Operating and maintenance instructions for all equipment;



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- h. Manufacturer's parts list; and,
- i. Any testing procedures for operating tests.
  - 1) Three (3) copies of the above instruction books shall be furnished prior to Final Payment. The books shall describe the information to be covered clearly and in detail and shall be in form and content satisfactory to the Owner.
- 2. The Contractor shall instruct the Owner's operating personnel in the proper use, care and emergency repair of all equipment installed by it before Final Payment. The Contractor shall call particular attention to any safety measures that should be followed. The instruction shall be adequate to train the Owner's operating personnel in the proper use, care and emergency repair of such equipment.
- H. The work shall be furnished and installed in accordance with the Drawings, Specifications and as additionally required by the manufacturer's instructions, and where a conflict occurs between the Drawings or Specifications and the manufacturer's instructions, the contractor shall request clarification from the Architect prior to commencing the work and shall follow the interpretations given by the Architect.

1.4 MATERIAL SAFETY DATA SHEETS

- A. In compliance with the OSHA Hazard Communication Standard (1910.1200, 08-24-1987) contractors are required to have on the site, MSDS (Material Safety Data Sheets) for ALL products classified as hazardous that their firm has knowledge that they will be furnishing, using, or storing on the jobsite during the duration of this Project. MSDS sheets are not part of the shop drawing review process.
  - 1. The Contractor at completion of the Work shall provide the Owner with the MSDS sheets for the hazardous products used on the Project site during construction.

PART 2 - PRODUCTS (NOT USED).

PART 3 - EXECUTION (NOT USED).

END OF SECTION 01 33 00



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SECTION 01 35 00

PRECEDENCE AND CONFLICT PROCEDURES AND INTENT

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

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

1.2 SUMMARY

- A. This Section specifies special precedence and conflict procedures and intent.

1.3 PRECEDENCE AND CONFLICT PROCEDURES

- A. If there should be a conflict between two or more of the Contract Documents, the following order of interpretation shall apply:

1. The terms and conditions as set forth in the Bidding Requirements, including legal advertisement thereof, shall have full force and effect until such time as the Standard Form of Agreement between Owner and Contractor is executed between the Owner and the Awardee.
2. Where there is a conflict between the Bidding Requirements and the Contract Documents, the Contract Documents shall govern.
3. Where requirements specifically set forth in the Standard Form of Agreement Between Owner and Contractor and the Supplementary Conditions and other specifications requirements are in conflict, the Standard Form of Agreement Between Owner and Contractor shall govern.
- 4.. Where there is conflict between the Drawings and Specifications and conflict within the Drawings or within the Specifications, the conflict, where applicable, shall be resolved by providing better quality or greater quantity as further provided herein.

- B. Where there is a conflict in or between the Drawings and Specifications, the Contractor shall be deemed to have estimated on the more expensive way of doing the Work and the larger quantity required. Only changes or interpretations covered by Addenda or written from the Architect will be permitted during construction of the Work. The Contractor shall perform no portion of the Work at any time without Contract Documents or where required, received Shop Drawings, Product Data, or Samples for such portion of the Work.

1.4 INTENT

- A. It is the intent of the Contract Documents to accomplish a complete and first-grade installation in which there shall be installed new products of the latest and best design and manufacturer, and workmanship shall be thoroughly first class, executed by competent and experienced workmen.



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1. Details of preparation, construction, installation, and finishing encompassed by the Contract Documents shall conform to the best practices of the respective trades, and that workmanship, construction methods, shall be of first class quality so as to accomplish a neat and first class finished job.
2. Where specific recognized standards are mentioned in the Specifications, it shall be interpreted that such requirements shall be complied with.
3. The intent of the Contract Documents is to include all labor, equipment, and materials necessary for the proper and timely execution and completion of the Work, even though such labor, equipment, materials are not expressly included in the Contract Documents.
4. The Contract Documents are complimentary, and what is required by one will be as binding as if required by all.
5. The Contractor will be required to perform all parts of the Work, regardless of whether the parts of the Work are described in Sections of the Contract Documents applicable to other trades.

PART 2 - PRODUCTS (NOT USED)

PART 3 – EXECUTION (NOT USED)

END OF SECTION 01 35 00



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SECTION 01 42 19  
REFERENCE STANDARDS AND DEFINITIONS

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

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

1.2 DEFINITIONS

- A. "Reviewed": The term "reviewed," when used in conjunction with the Architect's/Engineer's action on the Contractor's submittals, applications, and requests, is limited to the Architect's/Engineer's duties and responsibilities as stated in the Conditions of the Contract.
- B. "Contractor": The term "contractor," "Contractor," "construction manager," or "Construction Manager " describes to entity who has a signed agreement with the Owner as the primary entity contracted to perform the Work. The terms are used interchangeably within this document.
- C. "Directed": Terms such as "directed," "requested," "authorized," "selected," "reviewed," "required," and "permitted" mean directed by the Architect/Engineer, requested by the Architect/Engineer, and similar phrases.
- D. "Furnish": The term "furnish" means to supply and deliver to the Project site, ready for unloading, unpacking, assembly, installation, and similar operations.
- E. "Indicated": The term "indicated" refers to graphic representations, notes, or schedules on the Drawings; or to other paragraphs or schedules in the Specifications and similar requirements in the Contract Documents. Terms such as "shown," "noted", "scheduled," and "specified" are used to help the user locate the reference. Location is not limited.
- F. "Install": The term "install" describes operations at the Project site including the actual unloading, unpacking, assembling, erecting, placing, anchoring, applying, working to dimension, finishing, curing, protecting, cleaning, and similar operations.
- G. "Installer": An installer is the Contractor or another entity engaged by the Contractor, either as an employee, subcontractor, or contractor of lower tier, who performs a particular activity including installation, erection, application, or similar operations. Installers are required to be experienced in the operations they are engaged to perform.
- H. "Project site" is the space available to the Contractor for performing installation activities, either exclusively or in conjunction with others performing work as part of the Project.
- I. "Provide": The term "provide" means to furnish and install, complete and ready for the intended use.
- J. "Regulations": The term "regulations" includes laws, ordinances, statutes, and lawful orders issued by authorities having jurisdiction, as well as rules, conventions, and agreements within the industry that control performance of the Work.



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1. The term "experienced," when used with the term "installer," means having successfully completed a minimum of 5 previous projects similar in size and scope to this Project; being familiar with the special requirements indicated; and having complied with requirements of authorities having jurisdiction.
  2. Trades: Using terms such as "carpentry" does not imply that certain construction activities must be performed by accredited or unionized individuals of a corresponding generic name, such as "carpenter." It also does not imply that requirements specified apply exclusively to tradespeople of the corresponding generic name.
- K. "Testing Agencies": A testing agency is an independent entity engaged to perform specific inspections or tests, either at the Project site or elsewhere, and to report on and, if required, to interpret results of those inspections or tests.

### 1.3 SPECIFICATION FORMAT AND CONTENT EXPLANATION

- A. Specification Format: These Specifications are organized into Divisions and Sections based on the Construction Specifications Institute's "MasterFormat" system.
- B. Specification Content: These Specifications use certain conventions for the style of language and the intended meaning of certain terms, words, and phrases when used in particular situations. These conventions are as follows:
1. Abbreviated Language: Language used in the Specifications and other Contract Documents is abbreviated. Words and meanings shall be interpreted as appropriate. Words implied, but not stated, shall be interpolated as the sense requires. Singular words will be interpreted as plural and plural words interpreted as singular where applicable as the context of the Contract Documents indicates.
  2. Imperative mood and streamlined language are generally used in the Specifications. Requirements expressed in the imperative mood are to be performed by the Contractor. At certain locations in the Text, subjective language is used for clarity to describe responsibilities that must be fulfilled indirectly by the Contractor or by others when so noted.
    - a. The words "shall," "shall be," or "shall comply with," depending on the context, are implied where a colon (:) is used within a sentence or phrase.

### 1.4 INDUSTRY STANDARDS

- A. Applicability of Standards: Unless the Contract Documents include more stringent requirements, applicable industry standards have the same force and effect as if bound or copied directly into the Contract Documents to the extent referenced. Such standards are made a part of the Contract Documents by reference.
- B. Publication Dates: Comply with the standards in effect as of the date of the Contract Documents, unless otherwise indicated.



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- C. **Conflicting Requirements:** Where compliance with 2 or more standards is specified and the standards establish different or conflicting requirements for minimum quantities or quality levels, comply with the most stringent requirement. Refer uncertainties and requirements that are different but apparently equal to the Architect/Engineer for a decision before proceeding.
  - 1. **Minimum Quantity or Quality Levels:** The quantity or quality level shown or specified shall be the minimum provided or performed. The actual installation may comply exactly with the minimum quantity or quality specified, or it may exceed the minimum within reasonable limits. To comply with these requirements, indicated numeric values are minimum or maximum, as appropriate, for the context of the requirements. Refer uncertainties to the Architect/Engineer for a decision before proceeding.
  
- D. **Copies of Standards:** Each entity engaged in installation on the Project must be familiar with industry standards applicable to its installation activity. Copies of applicable standards are not bound with the Contract Documents.
  - 1. Where copies of standards are needed to perform a required installation activity, obtain copies directly from the publication source and make them available on request.
  
- E. **Abbreviations and Names:** Trade association names and titles of general standards are frequently abbreviated. Where abbreviations and acronyms are used in the Specifications or other Contract Documents, they mean the recognized name of the trade association, standards-generating organization, authorities having jurisdiction, or other entity applicable to the context of the text provision. Refer to Gale Research Inc.'s "Encyclopedia of Associations," which is available in most libraries.

1.5 **SUBMITTALS**

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

PART 2 - PRODUCTS (Not Used)

PART 3 - EXECUTION (Not Used)

END OF SECTION 01 42 19



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SECTION 01 45 00  
QUALITY CONTROL AND TESTING LABORATORY SERVICES

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

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

1.2 SUMMARY

- A. Definitions: Quality control services include inspections and tests, and sections related thereto including reports, but do not include contract enforcement activities performed directly by Architect. Quality control services include those inspections and tests and related actions performed by independent agencies and governing actions performed by independent agencies and governing authorities, as well as directly by Contractor.
- B. Inspections, tests, and related actions specified in this Section and elsewhere in Contract Documents are not intended to limit contractors quality control procedures which facilitate compliance with requirements of Contract Documents.
- C. Requirements for quality control services by Contractor, as requested or to be requested by Architect, Owner, governing authorities, or other authorized entities are not limited by provisions of this Section.
- D. Contractors shall review and become familiar with the requirements of the General Conditions covering the provisions for testing of the Work.
- E. The General Contractor shall employ and pay for services of an independent testing laboratory to perform specified inspection, sampling, and testing services. The Prime Contractor will be required to coordinate all testing requirements with the testing laboratory service.
- F. Inspections and testing required by laws, ordinances, rules, regulations, or orders of public authorities and General Conditions.
- G. Certification of products and mill test reports: Respective Specification Sections.
- H. Test, adjust, and balance of equipment.
- I. Inspection, sampling, and testing: Soils, asphalt, and concrete.
- J. Mock-up requirements as specified herein. Refer to the individual specification sections for detail mockup requirements. General mockup requirements are specified herein.



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1.3 CONTRACTOR RESPONSIBILITIES

- A. Inspections, tests, and similar quality control services including those specified to be performed by independent agency are the Owner's responsibility, and costs thereof are not to be included in the Contract Sum.
- B. Retest Responsibility: Where results of required inspection, test, or similar service are unsatisfactory (do not indicate compliance of related work with requirements of Contract Documents), retests are the responsibility of the Contractor; except, first retest is responsible party if retest results are satisfactory. Retesting of work revised or replaced by Contractor is Contractor's responsibility, where required tests were performed on original work.
- C. Responsibility for Associated Services: Contractor is required to cooperate with independent agencies performing required inspections, tests, and similar services. Provide auxiliary services as reasonably requested, including access to work, the taking of samples or assistance with the taking of samples, delivery of samples to test laboratories, and security and protection for samples and test equipment at project site.
- D. Coordination: Contractor and each engaged independent agency performing inspections, tests, and similar services for project are required to coordinate and sequence activities so as to accommodate required services with minimum delay of work and without the need for removal/replacement of work to accommodate inspections and tests. Scheduling of times for inspections, tests, taking of samples, and similar activities is Contractor's responsibility.
- E. Sampling and testing is required, but not limited to, the following Sections of Work:
1. 03 20 00 Concrete Reinforcement
  2. 03 30 00 Cast-In-Place Concrete
  3. 04 05 13 Mortar
  4. 04 05 16 Masonry Grout
  5. 04 20 00 Unit Masonry
  6. 05 12 00 Structural Steel
  7. All other Sections and requirements as may be specified in the Project Manual. Contractor is responsible to review all specification sections and comply with all quality control and testing procedures as specified in each section.
- F. Test procedures to be used shall be submitted for approval of the Architect where other than those specified are recommended by the testing agency.
- G. Cooperate with laboratory personnel to provide access to Work and to manufacturer's operations.
- H. Assist laboratory personnel in obtaining samples at the site.



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- I. Notify laboratory sufficiently in advance of operations to allow for his assignment of personnel and scheduling of tests.
- J. Should the contractor fail to schedule laboratory services or fail to cancel laboratory services, if the need arises, all additional cost shall be borne by the Contractor.
- K. Employ, and pay for, services of a separate, equally qualified independent testing laboratory to perform additional inspections, sampling and testing required when initial tests indicate work does not comply with Contract Documents.
  - 1. Separate laboratory shall be approved by the Owner and the Architect.

1.4 QUALIFICATION OF LABORATORY

- A. The testing laboratory shall meet "Recommended Requirements of Independent Laboratory Qualifications," published by American Council of Independent Laboratories. For concrete and steel the laboratory shall comply with the basic requirements of ASTM E 329, "Standards of Recommended Practice for Inspection and Testing Agencies for Concrete and Steel as Used in Construction."
- B. Submit a copy of report of inspection of facilities made by Materials Reference Laboratory of National Bureau of Standards during most recent tour of inspection; with memorandum of remedies of deficiencies reported by inspection.
- C. Testing equipment shall be calibrated at maximum 12 month intervals by devices of accuracy traceable to either:
  - 1. National Bureau of Standards.
  - 2. Accepted values of natural physical constants.
  - 3. Submit copy of certificate of calibration, made by accredited calibration agency.
- D. Submit documentation of specified requirements. Submit 2 copies to the Architect.

1.5 SUBMITTALS

- A. Submit 3 copies of test reports directly to the Superintendent, from the approved testing service, with one copy to the Prime Contractor and one copy to the Architect.
- B. Submit copies of the daily logs to the Superintendent.
- C. Daily logs and test reports shall be submitted in electronic format in lieu of hard copies. Electronic format shall be Adobe Acrobat 5.0 or higher, in PDF format. Electronic submittals shall be emailed directly to the General Contractor and the Architect.

1.6 LABORATORY DUTIES, LIMITATIONS OF AUTHORITY

- A. Provide qualified personnel promptly on notice.



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- B. Perform specified inspections, sampling, and testing of materials and methods of construction.
  - 1. Comply with specified standards; ASTM, other recognized authorities and as specified.
  - 2. Ascertain compliance with requirements of Contract Documents.
- C. Promptly notify the Architect and the General Prime Contractor of irregularities or deficiencies of Work which are observed during performance of services.
- D. Promptly submit electronic copy of reports of inspections and tests to the Architect, and submit one (1) copy direct to the General Prime Contractor, including the following information, as applicable:
  - 1. Date issued.
  - 2. Project title and number.
  - 3. Testing laboratory name and address.
  - 4. Name and signature of inspector.
  - 5. Date of inspection or sampling.
  - 6. Record of temperature and weather.
  - 7. Date of test.
  - 8. Identification of product and specification.
  - 9. Location in project.
  - 10. Type of inspection or test.
  - 11. Observations regarding compliance with Contract Documents.
- E. Perform additional services as required by Owner on a unit cost, as submitted.
- F. Laboratory is not authorized to:
  - 1. Release, revoke, alter, or enlarge on requirements of Contract Documents.
  - 2. Approve or accept portion of Work.
  - 3. Perform duties of the Contractor.

PART 2 - PRODUCTS (NOT USED)

PART 3 - EXECUTION

3.1 REPAIR AND PROTECTION

- A. Upon completion of inspection, testing, sample-taking, and similar services performed on Work, protect work, repair damaged Work and restore substrates and finishes to eliminate deficiencies, including defects in visual qualities of exposed finishes. Protect Work exposed by or for service activities and protect repaired Work. Repair and protection is Contractor's responsibility, regardless of assignment or responsibility for inspection, testing, or similar service. Work disturbed or altered after completion of testing, sample taking and similar service shall be re-inspected or retested by the same testing agency with the cost borne by the Contractor.

END OF SECTION 01 45 00



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SECTION 01 50 00  
TEMPORARY FACILITIES

PART 1 - GENERAL

1.1 REFERENCE

- A. All applicable requirements of other portions of the Contract Documents apply to the Work of this Section.

1.2 GENERAL

- A. Furnish labor, materials, tools, equipment, and services for temporary facilities, including maintenance and their subsequent removal, in accordance with provisions of the contract Documents and as required for the progress and completion of the Project.
- B. Pay applicable costs unless specifically stated otherwise.
- C. Coordinate temporary facilities work with other trades and the Owner. Rerouting or relocation expenses shall be paid by the responsible Contractor doing the Work if the temporary work has not been coordinated with other trades and the Owner. Routing or relocations of temporary facilities shall also be reviewed by the Architect and Owner before installation.
- D. Provide, maintain, and remove supplementary or miscellaneous item, appurtenances, and devices incidental to, or necessary for, a sound, secure, and complete installation.
- E. Contractors shall provide and maintain temporary facilities as required for the progress and completion of his contract except as otherwise noted.
- F. Repair, as required, work that has been interfered with or damaged as a result of temporary facilities work.
- G. The cost for repair of temporary facilities due to abuse or misuse of said facilities by other Contractors will be the financial responsibility of the responsible Contractor that abused or misused that temporary facility.
- H. Provide every protection to temporary facilities as required.

NOTE: Temporary services will not commence until that Contractor responsible for such temporary services start their field work and place the temporary services into operation.

- I. Temporary facilities are to be maintained and kept in good operating condition. Maintenance personnel necessary to perform this Work shall be provided. Maintenance work and repair shall be done in a timely manner causing minimal interference to other trades.
- J. Temporary services shall be placed into operations by Contractor in an expedient manner as required by job conditions.



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- K. Additional costs for providing temporary services beyond the time period provided, shall be at the expense of that contractor requiring that extended service time period.
- L. Provide and maintain temporary facilities in compliance with governing rules, regulations, codes, ordinances, and laws of agencies and utility companies having jurisdiction over work involved in project.
- M. Each Contractor is responsible for temporary work provided, and shall obtain necessary permits and inspections for such work.
- N. Do not interfere with normal use of roads in vicinity of project site except as authorized by the City of Orlando, Florida, Traffic Division and all other authorities having jurisdiction.
  - 1. Permits that need to be obtained for streets that need to be partially closed or closed due to demolition operations shall be paid for and obtained by the General Contractor.
- O. Each Contractor shall provide at his own expense, normal weather protection as required to carry on his work expeditiously during inclement weather and to protect his work and materials from damage by the weather unless stated otherwise herein.

### 1.3 TEMPORARY FIELD OFFICE

- A. The General Contractor shall provide his own field office for his staff and for the Architect, for their use on the project site.
- B. General Contractor's and Owner's Representative's Field Office
  - 1. The General Contractor shall provide a secure office approximately 12' w x 40' long (minimum) and facilities to accommodate field personnel, storage of field documents, layout space for Drawings and computer for production of as-built drawings for both the General Contractor and the Architect.
  - 2. Costs associated with General Contractor's and Architect's field office are the responsibility of the General Contractor.
  - 3. Field office shall be heated and air-conditioned with lockable doors, operable windows and serviceable finishes.
  - 4. Provide the Owner's Representative a partitioned office area, minimum 12' x 10' furnished with the following items:
    - a. Desk, chair, filing cabinet and telephone and telephone line. (Telephone service shall be provided.)
    - b. Lighting.
    - c. Layout table. (36" x 48" minimum.)
    - d. Tackboard.
    - e. Copier.
    - f. Fax machine.
    - g. Laptop computer. Minimum 1 GHz, 15" display, 100 GB hard drive, 56K V.90 modem and dedicated phone line for the computer modem, disk drive and Windows XP.





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- C. Locate and erect sign where directed by the Architect or Owner's Representative.
- D. Signage may be printed on Tyvek and wrapped around plywood.

1.6 TEMPORARY UTILITIES

A. General

1. Codes and Standards

- a. National Electric Code (ANSI C1).
- b. National Electric Safety Code.
- c. National Fire Protection Association Pamphlet.
- d. Federal and State Requirements.
- e. Utility Company Regulations.
- f. OSHA

2. Permanently Enclosed and Partially Enclosed

- a. "Permanently Enclosed" shall mean that permanent exterior walls and roofs are in place and weathertight, windows are in place and glazed, and all entrance enclosures are either permanently in place or are provided with suitable temporary enclosures. The Architect shall determine when the building is permanently enclosed.
- b. "Partially Enclosed" shall mean that permanent exterior walls (excluding caulking) and concrete floor(s) or roof is in place; windows are temporarily sealed; and entrances are temporarily sealed off. The Architect shall determine when the building or partial building is partially enclosed.

- B. The General Contractor and subcontractors shall provide at his own expense, weather protection as required to carry on his work expeditiously during inclement weather and to protect his work and materials from damage by the weather unless stated otherwise herein.

C. Description of Temporary Systems

1. Temporary Electricity – Electrical Subcontractor or General Contractor

- a. The Electrical Subcontractor shall to provide temporary electric service as detailed below.
- b. The Electrical Subcontractor shall comply with NEC and OSHA.
- c. Each subcontractor shall provide their own grounded, UL listed extension cords and other accessories to point of operation.
- d. The General Contractor and subcontractors who require primary power, secondary power centers, or service connections in excess of the specified minimum shall make arrangements with the Electrical Subcontractor\ and pay costs thereof.
- e. Refer to additional requirements specified in this Section.



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2. Temporary Lighting – Electrical Subcontractor or General Contractor
  - a. Safety Lighting: Provide safety lighting in all construction areas and temporary walkways at all times.
  - b. Lamps shall be covered with safety guard or deeply recessed in reflector. Do not suspend by their electrical cords unless cord and fixture are designed for that purpose.
  - c. Circuits for power are to be separate from circuits used for lighting.
  - d. Refer to additional requirements specified in this Section.
  
3. Temporary Water – General Contractor
  - a. For construction purposes:
    - General Contractor shall supply adequate water hoses from hose bibbs to point of his operations.
    - Provide protection against freezing of the temporary water system.
    - The temporary water service shall be removed when directed by the Architect.
  - b. Maintain adequate volume of water for required purposes.
  - c. The General Contractor and subcontractors are to provide drinking water and ice for his own forces.
  - d. The Plumbing Subcontractor or General Contractor shall provide the temporary water line from the meter to the building work areas.
  
4. Temporary Toilets – General Contractor
  - a. The General Contractor shall provide and maintain temporary toilet facilities, including toilet paper for the use of all workmen and authorized parties throughout construction period.
  - b. Provide the following minimum number of approved enclosed combination toilet and urinal units for construction personnel:
    - For less than 20 employees: 1
    - For 20 or more employees: 2 per 40 workers.
    - Computation of men and women present included men and women of all contractors.
  - c. Location
    - Within the project site where directed by the Architect and General Contractor.
    - Secluded from public observation.
  - d. Moving of portable chemical toilets for installation, cleaning, and removal shall be done during normal working hours.
  
5. Temporary Fire Protection – The General Contractor and each subcontractor.
  - a. Each contractor shall provide, maintain, and perform protection and prevention of fire or fire hazards during the construction period for the



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protection of construction materials and personnel in accordance with Owner's Underwriter's recommendation, laws, and regulations. This includes but is not limited to, fire extinguishers, special signs, and removal of combustible materials.

### D. Cost of Installation, Operation and Maintenance

1. The General Contractor and the appropriate subcontractor shall provide and maintain specified temporary utilities until date of Substantial Completion unless otherwise indicated. Pay costs of installation, operation and maintenance of temporary utilities until Date of Substantial Completion.
  - a. Temporary Lighting: Electrical Subcontractor or General Contractor.
  - b. Temporary Toilets: General Contractor.
  - c. Temporary Fire Protection: All contractors.

### E. Cost of Utility Consumption

1. Designated Contractor responsible for costs of consumables for temporary utilities unless otherwise indicated:
  - a. Temporary Electricity - Electrical Energy during construction: By General Contractor or electrical subcontractor.
  - b. Temporary Water - Water: By General Contractor or plumbing subcontractor.
  - c. Temporary Telephone: Telephone (by each contractor).

### F. Monitor Temporary Utilities

1. Parties designated to provide a temporary utility shall be responsible for damage to his Work or to that of other contractors caused by a defect in such utility.
  - a. Enforce compliance with applicable codes and standards.
  - b. Enforce safe practices.
  - c. Prevent abuse of services and utilities.
  - d. Prevent damage to finishes.
2. Do not allow wasteful use of consumables.

### G. Use of Permanent Systems for Construction Purposes

1. Obtain prior written authorization for use of systems from the Architect. Indicate the following:
  - a. Conditions and reasons for use.
  - b. Provisions relating to equipment warranties.
2. Modify and extend system as necessary to meet temporary utility requirements.
3. Upon completion of Work, or when required by the Architect, restore permanent system to specified condition prior to Substantial Completion.



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- a. Replace burned out or defective lamps (General Contractor or electrical subcontractor).
  - b. Repair or restore damaged parts or components.
4. Refer to additional requirements specified in this Section.

### H. Materials

#### 1. General

- a. May be new or used, but must be adequate for purpose intended. Must not create unsafe or unsanitary conditions, nor violate requirements of applicable codes. Comply with applicable Federal and State regulations.
- b. Must be removed when Project is completed.

#### 2. Temporary Lighting (General Contractor or electrical subcontractor)

- a. Comply with Division 16 and as specified above.
- b. Receptacles, fixtures:
  - Standard products, meeting UL requirements.
  - Provide heavy duty guards on fixtures.
  - Provide appropriate types of fixtures and receptacles for environment in which used, in accordance with NNEC, NEMA, and OSHA standards.

- c. Refer to additional requirements specified in this Section.

#### 3. Temporary Toilets (by General Contractor)

- a. Comply with Division 15.
- b. Equipment: Standard products, meeting code requirements. Toilet Facilities: Self ventilated portable chemical toilets.
- c. Toilet Tissue: Provide at each toilet, on suitable dispenser, with adequate reserve supply. Monitor daily.

### I. Installation

#### 1. General

- a. Comply with applicable section of Divisions 15 and 16 and Federal and State regulations.
- b. Install work in neat and orderly manner.
- c. Make structurally, mechanically, and electrically sound throughout.
- d. Maintain to give safe, continuous service, and to provide safe working conditions.
- e. Modify and extend systems as work progress requires.



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2. Temporary Lighting
  - a. Control lighting at secondary power centers unless otherwise specified.
  - b. Install exterior security lighting.
    - Illuminate project site as specified.
  - c. Refer to additional requirements specified in this Section.
3. Temporary Telephone
  - a. Service and distribution wiring may be overhead or under ground.
4. Temporary Toilets
  - a. Erect securely
  - b. Service as often as necessary to prevent accumulation of wastes and creation of unsanitary conditions.

1.7 SPECIAL PRECAUTIONS AND REQUIREMENTS

- A. Do not block required exits.
- B. Conform to all Owner's and Architect's rules and regulations.
- C. Do not interfere with normal use of existing active utility services, except as absolutely necessary to execute required work involving such services, and then only after proper arrangements have been made through the proper authority.
- D. Each contractor is responsible in the performance of his work for protection of existing active utility services.
  1. Notification of proposed interruption of service must be made 2 days in advance with the Owner.

1.8 SAFETY AND PROTECTION

- A. General
  1. The General Contractor and each subcontractor must erect and maintain, as required by existing conditions and progress of the Work, every reasonable safeguard for safety and protection, including, but not limited to, posting danger signs and other warnings against hazards, promulgating safety regulations, and notifying owners and users of adjacent utilities.
  2. The General Contractor and each subcontractor must provide protection at all times against damage with vandalism, theft, weather, and other causes to completed Work, materials, and apparatus.



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3. The General Contractor and each subcontractor shall take every appropriate precaution to prevent damage to his work and workers of other contractors. Damage which is caused to another contractor's Work will be repaired or replaced at the damaging contractor's expense.
  4. The General Contractor and each subcontractor shall protect existing trees, planting, structures, road, and walks during progress to the Work.
  5. The General Contractor and each subcontractor shall submit 3 copies of Contractor(s)' Safety Program and designate a responsible employee at the site whose duty shall be the prevention of accidents. The person shall be the Contractor's Superintendent unless otherwise designated by the contractor in writing to the Architect.
  
  6. No contractor shall load or permit any part of the Work to be loaded so as to endanger its safety.
  7. The General Contractor shall have a full-time, dedicated and qualified Safety Person for the Project to inspect job for safety hazards of all trades. This person will hold and record safety meetings once a week at the Superintendent Meeting. The Safety Person shall point out immediately to each Contractor each safety hazard he finds. Each Contractor shall correct the safety problem immediately.
    - a. If safety problems are not corrected by appropriate trade, then the Safety Person shall take corrective action and charge the appropriate parties.
    - b. This Safety Person shall record all accidents for the Project.
  
  8. The General Contractor and each subcontractor shall provide safety protection at each area which, because of his operation, creates a safety hazard.
  9. The General Contractor shall take every appropriate safety precaution to prevent damage to the work or injury to the workers of other contractors. This includes, but not limited to, overhead protection.
  10. In an emergency affecting the safety of life, the work or adjoining property, the contractor, without special instruction or authorization from the Architect, or Owner, shall take the action necessary to prevent such threatened loss of injury.
  11. The General Contractor and each subcontractor shall provide at the site first aid supplies for minor injuries. All injuries must be reported immediately to the job office, and the Superintendent of the General Contractor shall make a written report thereof. A copy of same shall be sent to the Architect.
  12. Owner reserves the right to personally inspect and or employ a third party inspector to make periodic inspection of the site to determine extent of compliance to safety conditions. Any observed safety conditions would be forwarded immediately in written format to the Safety Representative of the General Contractor for corrective action.
- B. Water Control
1. The General Contractor shall be responsible for erosion control, dewatering, pumping, and removal of all water until mass excavation has been completed unless otherwise noted.
- C. Safety Devices



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1. The General Contractor shall provide fences, barricades, bridges, railings, and guards for protection of construction personnel and the public, and to provide protection of his Work installed.
2. The General Contractor shall provide additional protection as may be required if additional protection is needed at a different time.

### D. Streets and Sidewalks

1. The General Contractor shall be responsible to keep public streets adjacent to project site free of mud, debris, and other foreign materials resulting from all project construction and vehicular traffic leaving site, to the satisfaction of governing public authorities regulating such conditions and Architect.
2. Do not interfere with normal use of streets in vicinity of project site except as indicated or as absolutely necessary to execute required work, and then only after proper arrangements have been made with authorities having jurisdiction including traffic control as applicable.

### E. Hazardous Materials

1. When the use of storage of hazardous materials or equipment is necessary for the execution of the Work, the contractor shall exercise the utmost care and shall carry on such activities under the supervision of properly qualified personnel. Such use and storage shall also be in accordance with governing authority. The use of explosives shall not be permitted.

F. Protect existing property from damage during the work required by these Contract Documents. Any damage done to existing property shall be repaired satisfactorily to the approval of the Superintendent and/or Owner.

G. Existing property includes, but shall not be limited to, buildings, sidewalks, curbs, lawns, grass, trees and shrubs.

H. In the event of temporary suspension of work for inclement weather or for any other reasons, the Contractor shall protect all work and materials against damage or injury. If damage or injury results from failure to protect, such work and materials shall be removed and replaced at no additional cost to the Owner.

I. All existing water and gas pipe, sewers, drains, electrical ducts, telecom duct, and other duly authorized structures shall be properly supported and protected by and at the expense of the Contractor during the construction of work under or near them and so as not to interfere with their use. They shall be left in as good condition on completion of the work as when found by the Contractor.

## 1.9 TEMPORARY FIRST AID FACILITIES

A. The General Contractor and all subcontractors shall provide first aid facilities as required by Federal, State, or Local Safety Regulations.



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1.10 TEMPORARY STORAGE

- A. The General Contractor and each subcontractor shall provide suitable storage facilities for materials delivered to site and protect materials from weather and damage.
  - 1. Temporary storage of materials at site shall not interfere with the Work of other contractors or the Work and property of the Owner. If necessary or as directed by the Architect, stored materials shall be relocated or removed.
  - 2. Location on site for storage facilities shall be in designated areas as approved by the Architect and Owner.

1.11 TEMPORARY ROADS, ACCESS, AND DELIVERY

- A. The General Contractor shall provide and maintain a temporary access on site as necessary for vehicles and equipment of all contractors requiring access. Remove temporary roads as directed by Owner or Architect.
- B. Each contractor shall repair damage to existing pavement or other construction and landscaping when damage results from operations under his Contract.
- C. The General Contractor shall provide and maintain a secure and smooth area around the building perimeter to allow all trades to work efficiently. Graveled areas for "lay-down" and staging shall be provided and maintained by the General Contractor.

1.12 OPENINGS FOR ELECTRICAL, MECHANICAL, AND OTHER TRADES

- A. Temporary openings not called for on the Drawings, which may be required for the purpose of bringing equipment into the buildings or for placing same, shall be performed as approved by the Architect. The contractor shall perform the Work of providing and maintaining such openings and of restoring the structure.
- B. The contractor whose equipment or work requires temporary openings is to bear the cost involved in providing such openings and restoring the structure. Ample notice shall be given of size and location of such openings by the contractor requiring same.
- C. Holes provided in general construction work to permit installation of lines for temporary mechanical and electrical services shall be restored by the contractor doing the affected construction work, after removal of such lines, at no extra cost.

1.13 SAFETY AND HEALTH REGULATIONS FOR CONSTRUCTION

- A. These Construction Documents and the construction hereby contemplated shall be governed by applicable provisions of Federal, State, and local regulations for construction safety in the State in which the project is located.



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1. The General Contractor and each subcontractor shall be responsible for the safety and health of persons and property affected by the contractor's performance of the Work including work performed by subcontractors. This requirement shall apply continuously during the entire contract period and shall not be limited to normal working hours.
  2. The General Contractor and each subcontractor shall designate a qualified safety and health representative to be responsible for the administration of the Contractor's Safety and Health program.
- B. Each contractor shall be responsible for compliance with the above aforesaid safety and health regulations for construction as applicable to the Contractor's Contract and the Contractor's construction means and methods. The General Contractor shall be liable for violations as may be cited or charged against the subcontractor by authorities governing the safety and health regulations for construction.
1. Each subcontractor shall comply with the General Contractor's Safety Program.

1.14 UTILITY PROTECTION

- A. Existing utility lines and structures indicated or known, and utility lines constructed for this Project shall be protected from damage during demolition and construction operations.
- B. Locate and flag lines and structures before beginning demolition and other related operations.
- C. When utility lines and structures that are to be removed or relocated are encountered within the area of operations, notify the Architect and affected utility in ample time for the necessary measures to be taken to prevent interruption of the services.
- D. Damage to existing utility lines or structures not indicated or known shall be reported immediately to the Superintendent and the affected utility.

1.15 ENVIRONMENTAL PROTECTION

- A. In order to prevent and to provide for abatement and control of environmental pollution arising from the demolition activities of the contractor and his subcontractors in the performance of this Contract, they shall comply with applicable federal, state, and local laws, and regulations concerning environmental pollution control and abatement as well as the specific requirements stated elsewhere in the Contract Documents.
- B. Items having apparent historical or archaeological interest which are discovered in the course of demolition activities shall be carefully preserved. The contractor shall leave the archaeological find undisturbed and shall immediately report the find to the Architect so that the proper authorities may be notified.



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- C. No Contractor shall pollute water resources with fuels, oils, bitumens, calcium chloride, acids or harmful materials. It is the responsibility of each contractor to investigate and comply with applicable federal, state, county, and municipal laws concerning pollution of rivers and streams. Work under this Contract shall be performed in such a manner that objectionable conditions will not be created in water resources through or adjacent to the project areas.
1. Spillages: Throughout the year, special measures shall be taken to prevent chemicals, fuels, oils, grease, bituminous materials, waste washings, herbicides and insecticides, and cement from entering water resources.
  2. Disposal: If waste material is dumped in unauthorized areas, the Contractor shall remove the material and restore the area to the condition of the adjacent undisturbed area. If necessary, contaminated ground shall be excavated, disposed of as directed by the Architect, and replaced with suitable fill material, compacted and finished with topsoil, at the expense of the Contractor.

1.16 TEMPORARY ELECTRICAL POWER AND LIGHT

- A. The General Contractor shall pay for the cost of electrical energy used on this Project.
- B. The General Contractor or electrical subcontractor shall make arrangements for and pay for installation of temporary metered service including one time utility company "up/down" charges. Charges for connections to mains, extensions, furnishing of meters or equipment and accessories shall be included in the General Contractor's or electrical subcontractors bid. Regardless of whether the Owner may have to sign with the utility company for these services, the electrical contractor shall include in his proposal fees, inspection charges, permit charges, work charges, and other charges and shall be ready to deposit with the utility company said fees when required at time of Owner's signing for utility service.
- C. The General Contractor or electrical subcontractor, shall provide, maintain, and connect the temporary electric service for the project offices, temporary lighting and power tool usage during the construction and shall include service poles, main disconnect means, wiring, and distribution equipment.
- D. The General Contractor or electrical subcontractor shall provide the following temporary lighting and power distribution system for this Project.
1. Provide ninety circuit center panel with 408 amp main disconnect and with a minimum of ninety 20 ampere receptacles (one per circuit) at the point of service.
  2. Provide 60 ampere, three wire plus ground circuit with appropriate outlets at the point of service for miscellaneous power taps.
  3. Provide 60 ampere, three wire plus ground circuit from the point of service to each corridor with load center panels and a sufficient quantity of 20 ampere receptacles and 60 ampere, three wire plus ground receptacles along each corridor as directed by Architect. It is intended that power distribution points are located so that extension cords will not have to be over 100 feet long.
    - a. Provide over-current protective device at point of service.



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4. Provide lighting outlets, protected by 20 ampere circuits, 30 foot candles for each corridor. Outlets shall be lamped with not less than 200 watt fluorescent lamps.
  5. Extend temporary lighting into all rooms for lighting of work spaces.
  6. Circuits and feeders shall be protected by appropriately rated ground fault detection and interruption devices.
  7. In addition to the preceding temporary power and lighting, provide and subsequently remove for:
    - a. Temporary safety lighting and security lighting. Security light to work at hours of darkness and include exterior floodlights; safety lighting shall be continuous during working hours.
    - b. Project office: Reconnect existing Contractor's trailers and offices into new temporary power.
- E. Lamps for temporary lighting shall be provided and maintained by the General Contractor or electrical subcontractor at his expense. Every temporary lamp outlet must be properly lamped throughout the construction; dark or burned-out lamps shall be immediately replaced.
- F. Wiring of contractors' offices, trailers, storage facilities, and equipment used during construction, shall be the responsibility of the General Contractor or the electrical subcontractor.
- G. Where a contractor requires the use of energy at places other than those herein specified or of an amount greater than would be available from the specified temporary service, the contractor shall make independent arrangements with the General Contractor or electrical subcontractor for the service at his own expense.
- H. When permanent facilities are approved by the Architect and Owner as ready for operation, they may be used for temporary light and power. The General Contractor shall arrange with the utility for removal of the temporary metering and shall bear the cost involved in the changeover.
- I. Upon approval of use and completion of the changeover to the permanent system, the General Contractor or electrical subcontractor shall remove the temporary electrical service, including power and lighting, distribution and utilization, equipment and wiring.

### 1.17 TEMPORARY HEATING - PRIOR TO BUILDING ENCLOSURE

- A. The building shall not be considered enclosed until the permanent specified building shell is essentially completed with exterior openings, windows, and doors closed by permanent or temporary closures.
- B. The General Contractor, until the building is enclosed, shall provide heating for all materials to afford protection of water bearing material against injury by frost or freezing and to permit construction to continue and progress uninterrupted. The General Contractor shall maintain such temporary heating until danger of frost or freezing has past.



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1. The General Contractor shall also be required to install temporary coverings over windows and other openings to retain the heat.
- C. Salamanders and electric heaters will not be permitted; however, portable direct fired heaters, fired with LP gas, kerosene, #1, or #2 fuel oil will be allowed. When such heaters are employed, the contractor shall observe safety precautions necessary; and in no case shall LP gas fired heaters be used in low places of construction, such as pits, tunnels, etc., which can collect heavier than air gas or fumes. Portable heaters must be UL approved.
- D. Equipment producing carbon monoxide shall not be used where fumes will contact freshly placed concrete or mortar.
- E. The General Contractor shall pay for fuel, maintenance, and related costs for these units until the permanent building is enclosed. Temporary heating equipment shall be subject to the approval of the Architect.

### 1.18 TEMPORARY HEATING - AFTER BUILDING ENCLOSURE

- A. The building shall be considered enclosed when the permanent specified building shell is essentially completed with exterior openings, windows, and doors closed by permanent or temporary closures.
- B. Heating required after enclosure of the additions or designated portion thereof shall be done by the General Contractor or mechanical subcontractor. Temporary heating facilities shall have adequate capacity based upon the following:
  1. When incorporating special materials into the construction, maintain space temperatures in strict accordance with the manufacturer's instructions.
  2. The following temperatures shall be maintained: 50 degrees minimum during working and non-working hours. For a period of 14 days prior to interior finishing (painting, resilient tile, acoustical ceilings, etc.) and until final acceptance or occupancy by the Owner, spaces shall be kept 60 degrees F. minimum.
  3. Maintain constantly in heated areas when the space temperature is once raised above 60 degrees F., a minimum space temperature of 60 degrees F. to prevent thermal shock to the structure.
  4. Preheat materials in accordance with manufacturer's instructions and accepted trade practice.
- C. After the building or designated portion have been enclosed and temporary heat is required, as directed by the Architect, the General Contractor or mechanical subcontractor shall provide temporary heat using the following method:
  1. Use of the Permanent Heating System
    - a. The permanent heating system may be used for temporary heating where available and if approved by the Architect and Owner. If the permanent system is used, the General Contractor or mechanical subcontractor shall have installed in their permanent location such fan



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- systems, heating coils, convectors, etc., as approved by the Architect. Provide necessary insulated piping to the enclosed space when the boiler is remotely located.
- b. Temporary filters shall be used in the permanent system. Provide bases, shields, etc., around heating elements where required to prevent too rapid drying of adjacent concrete, masonry, or plaster. Some of the permanent heating system equipment may require relocation by the HVAC Subcontractor as required during construction, to prevent interference with continuing construction, where authorized by the Architect. Equipment so used shall be cleaned and restored to new conditions except for ordinary wear, prior to final acceptance, and its use shall in no way negate the Owner's one year warranty specified to commence on the date of Substantial Completion.
  - c. If the permanent system is not fully operable or does not have sufficient controls to maintain the necessary heat in light of existing conditions, the General Contractor or mechanical subcontractor shall furnish, install, and maintain temporary units connected to the permanent system. Each unit shall be installed complete with safety controls, venting, power and fuel connections, room thermostat and necessary ductwork, and piping approved by the Architect. Portions of the temporary heating system shall be removed by the General Contractor or mechanical subcontractor after they are no longer necessary. The temporary heating equipment shall be relocated by the General Contractor or mechanical subcontractor as required during construction to prevent interference with continuing construction.
  - d. The start of the warranty on the permanent heating equipment and system(s) will not start until Substantial Completion is issued for complete HVAC Base Bid Work.
- D. The cost of fuel and energy used for the operation of the temporary heating system after the building is enclosed shall be paid for by the General Contractor.
- 1. Beginning at the Date of Substantial Completion, the Owner will pay the cost of utilities and heating, HVAC. If portions of the building are occupied with a temporary Certificate of Occupancy by legal jurisdiction, prior to the completion of the entire facility, the Owner will pay utility usage charges based on a mutually agreed upon prorated square foot basis.

### 1.19 VENTILATION - AFTER BUILDING ENCLOSURE

- A. The General Contractor shall provide and pay for ventilation of the enclosed space as needed for their own workmen in accordance with applicable laws. Contractor shall also provide ventilation of the enclosed space as required to facilitate drying of plaster, poured decks and floors, or other materials requiring ventilation in accordance with manufacturer's directions.
- B. If the permanent ventilation system is used, the General Contractor shall assume full responsibility for maintenance of the permanent equipment and shall keep the system clean, furnish and change filters as needed, and turn the complete new heating-



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ventilation system over to the Owner in a clean condition when the project is completed. Permanent equipment shall not be used for temporary ventilation unless maintained and operated as follows:

1. Return air ducts shall not be used.
2. Supply air to reach unit shall be filtered.
3. Filters shall be constantly checked and changed when necessary.
4. Operation of permanent equipment for ventilation shall not negate the Owner's one year warranty specified to commence on the date of Substantial Completion.
5. Provide MERV filters in all ventilation equipment if allowed to be used during construction. Replace with specified filters just prior to substantial completion.

### 1.20 TEMPORARY CONSTRUCTION FENCE

- A. The General Contractor shall provide a 8'-0" temporary chain-link construction fence to completely surround the contractor's staging areas and the building construction.
- B. Posts for the temporary construction fence shall be temporarily installed but shall be of a permanent type of installation to keep vehicles and unauthorized personnel out of the project site work areas.
- C. Temporary chain-link fence shall surround the entire building site. Refer to the Site Plan.
- D. Chain-link construction fence may be new or used.
- E. Lockable vehicle gates will be required.

PART 2 - PRODUCTS (NOT USED)

PART 3 - EXECUTION (NOT USED)

END OF SECTION 01 50 00



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SECTION 01 56 00  
TEMPORARY PROTECTION

PART 1 - GENERAL

1.1 SUMMARY

- A. This section specified requirements for protection.
- B. Protection facilities required include, but are not limited to:
  - 1. Barricades, warning signs, lights.

1.2 QUALITY ASSISTANCE

- A. Regulations: Comply with industry standards and applicable laws and regulations if authorities having jurisdiction, including but not limited to:
  - 1. Building Code requirements.
  - 2. Health and safety regulations.
  - 3. Utility company regulations.
  - 4. Police, Fire Department and Rescue Squad rules.
  - 5. Environmental protection regulations.
- B. Standards: Comply with NFPA Code 241, "Building Construction and Demolition Operations", ANSI-A10 Series standards for "Safety Requirements for Construction and Demolition", and NECA Electrical Design Library "Temporary Electrical Facilities."
  - 1. Refer to "Guidelines for Bid Conditions for Temporary Job Utilities and Services", prepared jointly by AGC and ASC, for industry recommendations.
  - 2. Electrical Service: Comply with NEMA, NECA and UL standards and regulations for temporary electric service. Install service in compliance with National Electric Code (NFPA 70).
- C. Inspections: Arrange for authorities having jurisdiction to inspect each disconnected utility. Obtain required certifications and permits.

PART 2 -PRODUCTS

2.1 EQUIPMENT

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



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PART 3 - EXECUTION

3.1 PROTECTION FACILITIES INSTALLATION

- A. Temporary Fire Protection: Comply with NFPA 10 "Standard for Portable Fire Extinguishers," and NFPA 241 "Standard for Safeguarding Construction, Alterations, and Demolition Operations."
1. Locate fire extinguishers where convenient and effective for their intended purpose, but not less than one extinguisher on each floor at or near each usable stairwell.
  2. Store combustible materials in containers in fire-safe locations.
  3. Maintain unobstructed access to fire extinguishers, fire hydrants, temporary fire protection facilities, stairways and other access routes for fighting fires. Prohibit smoking in hazardous fire exposure areas.
- B. Barricades, Warning Signs and Lights: Comply with standards and code requirements for erection of structurally adequate barricades. Paint with appropriate colors, graphics and warning signs to inform personnel and the public of the hazard being protected against. Where appropriate and needed provide lighting, including flashing red or amber lights.
- C. Environmental Protection: Provide protection, operate temporary facilities and conduct construction in ways and by methods that comply with environmental regulations, and minimize the possibility that air, waterways and subsoil might be contaminated or polluted, or that other undesirable effects might result. Avoid use of tools and equipment which produce harmful noise. Restrict use of noise making tools and equipment to hours that will minimize complaints from persons or firms near the site.

END OF SECTION 01 56 00



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SECTION 01 60 00  
PRODUCTS, MATERIALS, AND EQUIPMENT

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

- A. The Work of this Section shall be included as a part of the Contract Documents of each contractor on this Project.

1.2 SUMMARY

- A. It is the intent of the Specifications and Drawings to accomplish a complete and first-grade installation in which there shall be installed new materials and products of the latest and best design and manufacturer. Workmanship shall be thoroughly first-class and complete, executed by competent and experienced workmen.
- B. Equipment, specialties, and similar items shall be checked for compliance and fully approved prior to installation. Contractors are cautioned that work or equipment installed without approval is subject to condemnation, removal, and subsequent replacement with an approved item without extra compensation.

1.3 DEFINITIONS

- A. Definitions used in this Article are not intended to change the meaning of other terms used in the Contract Documents, such as "specialties," "systems," "structures," "finishes," "accessories," and similar terms. Such terms and definitions are self-explanatory and have well recognized meanings in the construction industry.
1. "Products" are items purchased for incorporation in the Work, whether purchased for the Project or taken from previously purchased stock. The term "product" includes the terms "material," "equipment," "system," and terms of similar intent.
- a. "Named Products" are items identified by manufacturer's product name, including make or model designation, indicated in the manufacturer's published product literature that is current as of the date of the Contract Documents.
- b. "Foreign Products", as distinguished from "domestic products," are items substantially manufactured (50 percent or more of value) outside of the United States and its possessions; or produced or supplied by entities substantially owned (more than 50 percent) by persons who are not citizens or nor living within the United States and its possessions.
2. "Materials" are products that are substantially shaped, cut, worked, mixed, finished, refined or otherwise fabricated, processed, or installed to form a part of the Work.



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

PART 2 - PRODUCTS

2.1 PRODUCT STANDARD AND QUALITY - SUBSTITUTIONS

- A. The Contract is based on the materials, equipment, and methods described in the Contract Documents.
  1. All product manufacturers for panel walls, exterior doors, roofing products, skylights, windows, shutters, structural components and products comprising a building's envelope introduced as a result of new technology, whether or not listed or specified, shall comply with Rule 9B-72 of the Florida Administrative Code and shall comply with the 2007 Florida Building Code with the 2009 Supplements.
  2. If certain manufacturers listed are not approved, the product manufacturer shall be responsible to obtain approvals in accordance with Rule 9B-72 of the Florida Administrative Code prior to submitting product data or shop drawings for this project. Otherwise, if not approved by the State, the manufacturer will not be acceptable for use on this project.
- B. Where in the Drawings and Specifications certain products, manufacturer's tradenames, or catalog numbers are given, it is done for the expressed purpose of establishing a basis of design, quality, durability, and efficiency of design in harmony with the work outlined and is not intended for the purpose of limiting competition.
- C. The Architect will consider proposals for substitutions of materials, equipment, and methods only when such proposals are accompanied by full and complete technical data and all other information required by the Architect to evaluate the proposed substitution.
- D. Do not substitute materials, equipment, or methods unless such substitution has been specifically approved for this Work by the Architect.
- E. "Or equal":
  1. Where the phrase "or equal" or "or equal as approved by the Architect" occurs in the Contract Documents, do not assume that material, equipment, or methods will be approved as equal by the Architect unless the item has been specifically approved for this Work by the Architect.
  2. The decision of the Architect shall be final.
- F. Availability of Specified Items:
  1. Verify prior to bidding that specified items will be available in time for installation during orderly and timely progress of the Work.



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2. In the event specified item or items will not be so available, so notify the Architect prior to receipt of bids.
  3. Costs of delays because of non-availability of specified items, when such delays could have been avoided by the contractor, will be back charged as necessary and shall not be borne by the Owner.
- G. Where the questions of appearance, artistic effect, or harmony of design are concerned, the Architect reserves the right to refuse approval of substituted products proposed to be substituted for that specified, if in his opinion the item to be substituted is not harmonious to the finished effect and appearance desired, as portrayed in the Drawings and Specifications. The Architect's said refusal to approve, established by this paragraph, is final and not subject to arbitration.
- H. Products of other manufacturers will be considered for acceptance provided they equal or exceed the material requirements and functional qualities of the specified product. Requests for Architect's approval and complete technical data for evaluation must be received at least 10 days prior to bid due date. Additional approved manufacturers will be issued by Addendum.

### 2.2 MANUFACTURER'S DIRECTIONS

- A. Manufactured products shall be applied, installed, connected, erected, used, cleaned and conditioned in accordance with the manufacturer' printed directions, unless herein specified to the contrary. Where manufacturer's printed directions are available and where reference is made to manufacturer's directions in the Specification, the contractor shall submit 2 copies of such directions to the Architect prior to the beginning of Work covered thereby.
- B. Where specific installation instructions are not part of these Specifications and Drawings, equipment shall be installed in strict accordance with instructions from the respective manufacturers. Where installation instructions included in these Specifications or Drawings are at a variance with instructions furnished by the equipment manufacturer, the contractor shall make written request for clarification from the Architect.
- C. In accepting or assenting to the use of apparatus or material, or make, or arrangement thereof, the Architect in no way waives the requirements of these specifications or the warranty embodied therein.

### 2.3 WARRANTIES

- A. Specific warranties or bonds called for in the Contract Documents, in addition to that falling under the general warranty as set forth in General Conditions, shall be furnished in accordance with the requirements of the Specifications.



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- B. Each contractor shall and does hereby agree to warrant for a period of one year, or for longer periods, where so provided in the Specifications, as evidenced by the date of Substantial Completion issued by the Architect, products installed under the Contract to be of good quality in every respect and to remain so for periods described herein.
- C. Should defects develop in the aforesaid Work within the specified periods, due to faults in products or their workmanship, the contractor hereby agrees to make repairs and do necessary Work to correct defective Work to the Architect's satisfaction, in accordance with the Supplementary Conditions. Such repairs and corrective Work, including costs of making good other Work damaged by or otherwise affected by making repairs or corrective Work, shall be done without cost to the Owner and at the entire cost and expense of the contractor within 14 days after written notice to the contractor by the Owner.
- D. Nothing herein intends or implies that the warranty shall apply to Work which has been abused or neglected or improperly maintained by the Owner or his successor in interest.
- E. Where service on products is required under this Article, it shall be promptly provided when notified by the Owner and no additional charge shall be made, unless it can be established that the defect or malfunctioning was caused by abuse or accidental damage not to be expected under conditions of ordinary wear and tear.
- F. In the event movement in the adjoining structure or components causes malfunctioning, the contractor responsible for the original installation of the adjoining structure or components shall provide such repair, replacement, or correction necessary to provide for proper functioning to bring the equipment back into the same operating condition as approved at the completion of the building.
- G. The manufacturer and supplier expressly warrants that each item of equipment furnished by him and installed in this Project is suitable for the application shown and specified in the Contract documents and includes features, accessories, and performing characteristics listed in the manufacturer's catalog in force on the date bids are requested for the Work. This warranty is intended as an assurance by the manufacturer that his equipment is not being misapplied and is fit and sufficient for the service intended. This warranty is in addition to and not in limitation of other warranties or remedies required by law or by the Contract Documents. It shall be the responsibility of the contractor for the particular equipment to obtain this warranty in writing.
- H. In case the contractor fails to do Work so ordered, the Owner may have work done and charge the cost thereof against monies retained as provided for in the Agreement and, if said retained monies is available, the contractor and his Sureties shall agree to pay to the Owner the cost of such Work.



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2.4 MATERIAL DELIVERY AND RESPONSIBILITIES

- A. Each contractor shall be responsible for materials he orders for delivery to the jobsite. Responsibility includes, but is not limited to, receiving, unloading, storing, protecting, and setting in place; ready for final connections. Each contractor will coordinate jobsite storage with the Design-Builder.
  - 1. The Owner will not be responsible for deliveries related to the construction or operation of the contractor. The Owner cannot sign delivery forms for the contractor.
- B. Contractors shall insure that products are delivered to the Project in accordance with the Construction Schedule of the Project. In determining date of delivery, sufficient time shall be allowed for shop drawings and sample approvals, including the possibility of having to resubmit improperly prepared submittals or products other than those specified and the necessary fabrication or procurement time along with the delivery method and distance involved.

2.5 PROTECTION

- A. Each contractor shall protect building elements and products when subject to damage. Should workmen or other persons employed or commissioned by one contractor be responsible for damage, the entire cost of repairing said damage shall be assumed by said individual contractor. Should damage be done by a person or persons not employed or commissioned by a contractor, the respective contractors shall make repairs and charge the cost to the guilty person or persons. The affected contractors shall be responsible for collecting such charges. If the person or persons responsible for damage cannot be discovered, full and satisfactory repairs shall be made by the respective contractor, and the cost of Work shall be prorated against each contractor.
- B. The respective contractors shall protect their products prior to installation and final acceptance. Storage shall be dry, clean, and safe. Materials or equipment damaged, deteriorated, rusted or defaced due to improper storage, shall be repaired, refinished, or replaced, as required by the Architect. Products lost through theft or mishandling shall be replaced by the contractor without cost to the Owner.

2.6 ACCEPTANCE OF EQUIPMENT OR SYSTEMS

- A. The Owner will not accept the start of the warranty period on systems or equipment until Substantial Completion is issued to the respective contractor(s) for Owner's occupancy of the building, in part or whole. Each contractor shall make such provisions as required to extend the manufacturer's warranty from time of initial operation of systems or equipment until Substantial Completion is given in writing.

PART 3 - EXECUTION (NOT USED)

END OF SECTION 01 60 00



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SECTION 01 60 10  
PRODUCT SUBSTITUTIONS

PART 1 - GENERAL

1.1 DEFINITIONS

- A. Definitions used in this Article are not intended to change or modify the meaning of other terms used in the Contract Documents.
- B. Substitutions: Requests for changes in products, materials, equipment, and methods of construction required by Contract Documents proposed by the Contractor after award of the Contract are considered requests for "substitutions." The following are not considered substitutions:
  - 1. Revisions to Contract Documents requested by the Owner or Architect.
  - 2. Specified options of products and construction methods included in Contract Documents.
  - 3. The Contractor's determination of and compliance with governing regulations and orders issued by governing authorities.

1.2 SUBMITTALS

- A. Substitution Request Submittal: Request for product substitution shall be submitted to the Architect no later than ten (10) days prior to bid due date. Requests received after this time may not be considered.
  - 1. Substitutions after the bid date may be accepted and will be reviewed on a case-by-case basis.
- B. Contractor's Substitution Request Form: Submit substitution requests to the Architect (through Design-Builder) on the "Contractor Substitution Request Form" attached at the end of this Section.
- C. Substitutions shall include product data, samples and shop drawings as required to evaluate the proposed product. Submittals shall also include specified product (some additional engineering may be required with specific materials) with a line-by-line comparison of the products.

PART 2 - PRODUCTS

2.1 SUBSTITUTIONS

- A. Conditions: The Contractor's substitution request will be received and considered by the Owner when one or more of the following conditions are satisfied, as determined by the Owner; otherwise requests will be returned without action except to record noncompliance with these requirements.
  - 1. Extensive revisions to Contract Documents are not required.
  - 2. Proposed changes are in keeping with the general intent of Contract Documents.



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3. The request is timely, fully documented and properly submitted.
  4. The request is directly related to an "or equal" clause or similar language in the Contract Documents.
  5. The specified product or method of construction cannot be provided within the Contract Time. The request will not be considered if the product or method cannot be provided as a result of failure to pursue the Work promptly or coordinate activities properly.
  6. The specified product or method of construction cannot receive necessary approval by a governing authority, and the requested substitution can be approved.
  7. A substantial advantage is offered the Owner, in terms of cost, time, energy conservation or other considerations of merit, after deducting offsetting responsibilities the Owner may be required to bear. Additional responsibilities for the Owner may include additional compensation to the Architect for redesign and evaluation services, increased cost of other construction by the Owner or separate Contractors, and similar considerations.
  8. The specified product or method of construction cannot be provided in a manner that is compatible with other materials, and where the Contractor certifies that the substitution will overcome the incompatibility.
  9. The specified product or method of construction cannot be coordinated with other materials, and where the Contractor certifies that the proposed substitution can be coordinated.
  10. The specified product or method of construction cannot provide a warranty required by the Contract Documents and where the Contractor certifies that the proposed substitution provide the required warranty.
- C. The Contractor's submittal and the Architect's acceptance of Shop Drawings, Product Data or Samples that relate to construction activities not complying with the Contract Documents does not constitute an acceptable or valid request for substitution, nor does it constitute approval.

PART 3 - EXECUTION (NOT USED)



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**CONTRACTOR'S REQUEST FOR SUBSTITUTION**

PROJECT: \_\_\_\_\_ DATE: \_\_\_\_\_

SPECIFICATION SECTION: \_\_\_\_\_ ITEM(S): \_\_\_\_\_

SPECIFIED MANUFACTURER: \_\_\_\_\_

SPECIFIED MODEL NO: \_\_\_\_\_

PROPOSED MANUFACTURER: \_\_\_\_\_  
\_\_\_\_\_

PROPOSED MODEL NO: \_\_\_\_\_

REASON/S FOR \_\_\_\_\_  
\_\_\_\_\_

REQUEST FOR \_\_\_\_\_  
\_\_\_\_\_

SUBSTITUTION \_\_\_\_\_  
\_\_\_\_\_

Attach complete technical data, including laboratory tests, if applicable, in duplicate.

A. Will approval affect dimensions shown on Drawings in any way? No \_\_\_\_\_ Yes \_\_\_\_\_  
Explain (Attach drawings if necessary): \_\_\_\_\_  
\_\_\_\_\_

B. Will the Contractor pay for any changes to the building design, including engineering and detailing costs caused by the approval? No \_\_\_\_\_ Yes \_\_\_\_\_  
Explain: \_\_\_\_\_  
\_\_\_\_\_

C. Will approval affect the work of other trades? No \_\_\_\_\_ Yes \_\_\_\_\_  
Explain: \_\_\_\_\_  
\_\_\_\_\_

D. Manufacturer's guarantees of the proposed and specified items are: Same \_\_\_\_\_ Different \_\_\_\_\_  
Explain: \_\_\_\_\_  
\_\_\_\_\_

E. Does the proposed item meet all applicable Codes, Ordinances and regulations for this specific application? No \_\_\_\_\_ Yes \_\_\_\_\_  
Explain: \_\_\_\_\_  
\_\_\_\_\_



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- F. Has proposed item been used locally in similar applications? No \_\_\_\_\_ Yes \_\_\_\_\_  
Explain: \_\_\_\_\_  
\_\_\_\_\_
- G. If approved, will the Owner receive a credit for the proposed alternate material? No \_\_\_\_\_ Yes \_\_\_\_\_  
Explain: \_\_\_\_\_  
\_\_\_\_\_
- H. Does the proposed alternate material meet the same applicable standards (ASTM, ANSI, UL, FS.)  
as the specified item? No \_\_\_\_\_ Yes \_\_\_\_\_  
Explain: \_\_\_\_\_  
\_\_\_\_\_

It is the Contractor's responsibility to provide all information necessary to determine the proposed alternate material is equal or better than the specified item. This includes any test reports, product data, manufacturer's specifications, color samples, product samples or the like as may be required for an evaluation.

The Architect and Owner will not be required to prove any product is not equal or suitable to the Project.

SUBMITTED BY: \_\_\_\_\_

Firm: \_\_\_\_\_

Address: \_\_\_\_\_  
\_\_\_\_\_

Signature: \_\_\_\_\_

Date: \_\_\_\_\_

FOR ARCHITECT'S USE:

Not Acceptable \_\_\_\_\_

No Exceptions Taken \_\_\_\_\_

By: \_\_\_\_\_

Date: \_\_\_\_\_

END OF SECTION 01 60 10



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SECTION 01 60 20  
 FLORIDA PRODUCT APPROVAL FORM

PART 1 - GENERAL

1.1 FLORIDA PRODUCT APPROVAL FORM

**Location:** \_\_\_\_\_ **Project Name:** \_\_\_\_\_

As required by Florida Statute 553.842 and Florida Administrative Code 9B-72, please provide the information and the product approval number(s) on the building components listed below if they will be utilized on the construction project for which you are applying for a building permit on or after November 22, 2006. We recommend you contact your local product supplier should you not know the product approval number for any of the applicable listed products. More information about statewide product approval can be obtained at [www.floridabuilding.org](http://www.floridabuilding.org)

Category/Subcategory	Manufacturer	Product Description	Approval Number(s)
<b>A. EXTERIOR DOORS</b>			
1. Swinging			
2. Sliding			
3. Sectional			
4. Roll up			
5. Automatic			
6. Other			
<b>B. WINDOWS</b>			
1. Single hung			
2. Horizontal Slider			
3. Casement			
4. Double Hung			
5. Fixed			
6. Awning			
7. Pass -through			
8. Projected			
9. Mullion			
10. Wind Breaker			
11. Dual Action			
12. Other			
13. Other			
<b>C. PANEL WALL</b>			
1. Siding			
2. Soffits			
3. EIFS			
4. Storefronts			
5. Curtain walls			



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6. Wall louver			
7. Glass block			
8. Membrane			
9. Greenhouse			
10. Other			
<b>D. ROOFING PRODUCTS</b>			
1. Asphalt Shingles			
2. Underlayments			
3. Roofing Fasteners			
4. Non-structural Metal Roof			
5. Built-Up Roofing			
6. Modified Bitumen			
7. Single Ply Roofing System			
8. Roofing Tiles			
9. Roofing Insulation			
10. Waterproofing			
11. Wood shingles /shakes			
12. Roofing Slate			
13. Liquid Applied Roof System			
14. Cements-Adhesives – Coatings			
15. Roof Tile Adhesive			
16. Spray Applied Polyurethane Roof			
17. Other			
<b>E. SHUTTERS</b>			
1. Accordion			
2. Bahama			
3. Storm Panels			
4. Colonial			
5. Roll-up			
6. Equipment			
7. Others			
<b>F. SKYLIGHTS</b>			
1. Skylight			
2. Other			
<b>G. STRUCTURAL COMPONENTS</b>			
1. Wood connector/anchor			
2. Truss plates			
3. Engineered lumber			
4. Railing			
5. Coolers-freezers			



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6. Concrete Admixtures			
7. Material			
8. Insulation Forms			
9. Plastics			
10. Deck-Roof			
11. Wall			
12. Sheds			
13. Other			
14. Other			
<b>H. NEW EXTERIOR ENVELOPE PRODUCTS</b>			
1.			
2.			

The products listed below did not demonstrate product approval at plan review. I understand that at the time of inspection of these products, the following information must be available to the inspector on the jobsite; 1) copy of the product approval, 2) the performance characteristics which the product was tested and certified to comply with, 3) copy of the applicable manufacturers installation requirements.

I understand these products may have to be removed if approval cannot be demonstrated during inspection.

Product Name	Manufacturer

Contractor or Contractor's Authorized Agent Signature	Print Name	Date
---	------------	------

Site Address	Permit #
--------------	----------

END OF SECTION 01 60 20



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SECTION 01 70 00  
PROJECT CLOSEOUT

PART 1 - GENERAL

1.1 SUMMARY

- A. 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 parts of the Work are specified in Sections of Divisions 2 through 26. Time of closeout is directly associated to Date of Substantial Completion.

1.2 PREREQUISITES TO SUBSTANTIAL COMPLETION

- A. Prior to requesting Architect review for Certificate of Substantial Completion, (for either entire Work or portions thereof), complete the following and list known exceptions in request.
1. Advise Owner of pending insurance changeover requirements.
  2. Submit specific warranties, workmanship/maintenance bonds, maintenance agreements, agreements, final certifications, and other required closeout documents.
  3. Obtain and submit release enabling Owner's full and unrestricted use of the Work and access to services and utilities, including occupancy permits, operating certificates, and other similar required releases.
  4. Deliver tools, spare parts, extra stocks of materials, and similar physical items as specified to the Owner. Obtain receipts for deliveries.
  5. Make final changeover of locks and transmit keys to Owner and advise Owner's personnel of changeover in security provisions.
  6. Complete start-up testing of systems and instruction of Owner's operating/maintenance personnel. Discontinue and remove from project site temporary facilities and service, construction tools and facilities, mock-ups, and other construction elements.
  7. Complete final cleaning up requirements as specified in Section 01 74 13.

1.3 PREREQUISITES TO FINAL PAYMENTS

- A. Prior to requesting Architect final review for certification of final payment, complete the following:
1. Refer to the Supplementary Conditions.
  2. Submit final payment request with required closeout attachments.
  3. Submit copy of Architect's final punch list of itemized Work to be completed or corrected, stating that each and every item has been completed or otherwise resolved for acceptance.
  4. Submit record drawings, maintenance manuals, and similar final record information as specified.
  5. Submit certification of code compliance.
  6. Submit certification stating that no materials containing asbestos were incorporated into the Work.



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7. Plumbing Contractor shall submit certification stating that no flux or solder used for drinking water piping containing more than 0.2 percent lead, and that no pipe or fittings used for drinking water piping contained no more than 0.8 percent lead.

PART 2 - PRODUCTS (NOT USED)

PART 3 - EXECUTION

3.1 PUNCH LIST

- A. Prior to the Architect's preparation of a Project Punch List, each Contractor shall prepare his own punch list and submit to the Architect and General Contractor, for use by the Architect to facilitate completion of the Work.
- B. The Contractor's inspection shall be as thorough as possible, in accordance with his aspiration to provide first-class workmanship and maintain good reputation and shall include Work under his Contract, including that of his subcontractors.
- C. The Architect shall observe the Work, providing that the Work on the Contractor's punch list has been completed, and prepare the Project Punch List for use by Contractors and their subcontractors to expedite proper completion of the Work.
- D. The Architect will only perform two (2) punch list inspections. The Architect will do the first inspection prior to issuing the Substantial Completion certificate and will do a second inspection within 30 days of the first inspection to verify that the contractor has completed the outstanding items on the first inspection punch list. Additional inspections above and beyond as specified herein are at additional cost to the Contractor and the cost of such additional inspections will be deducted from the Contract by Change Order.

3.2 WARRANTY - CORRECTION OF THE WORK

- A. Architect will check to see if additional Work by the Contractor(s) is needed to make good the warranties. An itemized list will be furnished to the Contractor for corrective or replacement work.
  1. At approximately one month prior to the one year warranty expiration, the Owner, Architect, and a representative of the Contractor shall visit the site and prepare the warranty punch-list.
- B. This Work shall be completed immediately by the Contractor(s) after receiving notification.

3.3 CERTIFICATION OF CODE COMPLIANCE

- A. Prior to final payment, the contractor indicated below shall submit to the Architect (in duplicate), letters of certification of code compliance as follows:
  1. The Subcontractor(s) for Division 22, 23, 24, Mechanical Work, shall submit a



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letter certifying that mechanical installations comply with current applicable Codes.

2. The Subcontractor(s) for Division 26, 27, 28 Electrical Work, shall submit letters certifying that electrical wiring complies with NEC current applicable editions.
3. The Subcontractor for Division 26, 27, 28, Electrical Work, shall submit letters certifying that alarm systems and smoke and heat detection systems comply with State of Indiana Codes and Regulations, current applicable conditions.

### 3.4 MAINTENANCE AND OPERATING MANUALS

- A. Prior to Date of Substantial Completion, and a requirement prior to receiving final payment, each Contractor shall submit to the Architect three (3) copies of a comprehensive Maintenance and Operating Manual presenting complete directions and recommendations for the proper care and maintenance of visible surfaces as well as maintenance and operating instructions for equipment items which he has provided. Operation and Maintenance Manuals shall include the following:
  1. Schematic and piping and wiring diagrams.
  2. Valve charts and schedules.
  3. Lubrication charts and schedules.
  4. Guides for troubleshooting.
  5. Pertinent diagrams of equipment with main parts identification.
  6. Manufacturer's data on all equipment.
  7. Operating and maintenance instructions for all equipment.
  8. Manufacturer's parts list.
  9. Any testing procedures for operating tests.
- B. Operating instructions shall include necessary printed directions for correct operations, adjustments, servicing, and maintenance of movable parts. Also included shall be suitable parts lists, approved shop drawings, and diagrams showing parts location and assembly.
- C. Upon Architect's approval and prior to issuance of final payment(s), each contractor shall submit three (3) corrected and completed copies of Operating and Maintenance Manuals to the Architect.
- D. Finished manuals shall be loose-leaf type with hardboard covers and titled tabs identifying each particular portion or item of the Work.
- E. For each titled item or portion of the Work, manual must provide the names, addresses, and phone numbers of the following parties:
  1. Contractor/installer
  2. Manufacturer
  3. Nearest dealer/supplier
  4. Nearest agency capable of supplying parts and service
- F. For each manual label on front cover or spine, indicate the following information:
  1. Project name and address



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2. Owner's name
  3. Name and address of Architect
  4. Name and address of all contractors and their contacts
  5. Date of submission
- G. The contractor(s) shall instruct the Owner's operating personnel in the proper use, care and emergency repair of all equipment installed before final payment. The contractor(s) shall call particular attention to any safety measures that should be followed. The instruction shall be adequate to train the Owner's operating personnel in the proper use, care, and emergency repair of such equipment.
- H. Refer to Section 01 30 00 for additional requirements.

### 3.5 CHARTS AND LOCATIONS OF CONCEALED WORK

- A. The contractor(s) for Mechanical Work shall prepare suitable charts identifying and locating each concealed control or other concealed item requiring repair, adjustment, and maintenance. Charts shall be mounted in suitable frames with glass covers secured to wall where directed.
- B. Charts shall list each item, together with its function, item number and location.
- C. Locations throughout the building shall be identified on the wall or ceiling by permanent, non-obstructive plates, labels, or other approved means secured in a permanent manner.
- D. Chart details, identification methods, locations, and methods of attachment shall be specified or approved by the Architect at the jobsite upon full submission of proposed procedures and proper execution of same.

END OF SECTION 01 70 00



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SECTION 01 71 23  
FIELD ENGINEERING

PART 1 - GENERAL

1.1 SUMMARY

- A. General: This Section specifies administrative and procedural requirements for field engineering services, including, but not necessarily limited to, the following:
  - 1. Land survey Work.
  - 2. Civil engineering services.
  - 3. Structural engineering services.

1.2 SUBMITTALS

- A. Certificates: Submit a certificate signed by the Land Surveyor or Professional Engineer certifying that the location and elevation of improvements comply with the Contract Documents.
- B. Final Property Survey: Submit 10 copies of the final property survey.
- C. Project Record Documents: Submit a record of Work performed and record survey data as required under provisions of Sections 01 33 00, Submittals, and 01 70 00, Project Closeout.

1.3 QUALITY ASSURANCE

- A. Surveyor: Engage a Registered Land Surveyor registered in the State where the project is located, to perform land surveying services required.
- B. Engineer: Engage a Professional Engineer of the discipline required, registered in the state in which the Project is located, to perform required engineering services.

PART 2 - PRODUCTS (Not Applicable)

PART 3 - EXECUTION

3.1 EXAMINATION

- A. The Owner will identify existing control points and property line corner stakes.
- B. Verify layout information shown on the Drawings, in relation to the property survey and existing benchmarks before proceeding to layout the Work. Locate and protect existing benchmarks and control points. Preserve permanent reference points during construction.



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1. Do not change or relocate benchmarks or control points without prior written approval. Promptly report lost or destroyed reference points, or requirements to relocate reference points because of necessary changes in grades or locations.
  2. Promptly replace lost or destroyed project control points. Base replacements on the original survey control points.
- C. Establish and maintain a minimum of two permanent benchmarks on the site, referenced to data established by survey control points.
1. Record benchmark locations, with horizontal and vertical data, on Project Record Documents.
- D. Existing utilities and equipment: The existence and location of underground and other utilities and construction indicated as existing are not guaranteed. Before beginning sitework, investigate and verify the existence and location of underground utilities and other construction.
1. Prior to construction, verify the location and invert elevation at points of connection of sanitary sewer, storm sewer and water service piping.

### 3.2 PERFORMANCE

- A. Working from lines and levels established by the property survey, establish benchmarks and markers to set lines and levels at each story of construction and elsewhere as needed to properly locate each element of the Project. Calculate and measure required dimensions within indicated or recognized tolerances. Do not scale Drawings to determine dimensions.
1. Advise entities engaged in construction activities, of marked lines and levels provided for their use.
  2. As construction proceeds, check every major element for line, level and plumb.
- B. Surveyor's Log: Maintain a surveyor's log of control and other survey Work. Make this log available for reference.
1. Record deviations from required lines and levels, and advise the Architect when deviations that exceed indicated or recognized tolerances are detected. On Project Record Drawings, record deviations that are accepted and not corrected.
  2. On completion of foundation walls, major site improvements, and other Work requiring field engineering services, prepare a certified survey showing dimensions, locations, angles and elevations of construction and sitework.
- C. Site Improvements: Locate and lay out site improvements, including pavements, stakes for grading, fill and topsoil placement, utility slopes and invert elevations by instrumentation and similar appropriate means.



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- D. Building Lines and Levels: Locate and lay out batter boards for structures, building foundations, column grids and locations, floor levels and control lines and levels required for mechanical and electrical Work.
- E. Existing Utilities: Furnish information necessary to adjust, move or relocate existing structures, utility poles, lines, services or other appurtenances located in, or affected by construction. Coordinate with local authorities having jurisdiction.
- F. Final Property Survey: Before Substantial Completion, prepare a final property survey showing significant features (real property) for the Project. Include on the survey a certification, signed by the Surveyor, to the effect that principal metes, bounds, lines and levels of the Project are accurately positioned as shown on the survey.
  - 1. Recording: At Substantial Completion, have the final property survey recorded by or with local governing authorities as the official "property survey".

END OF SECTION 01 71 23



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SECTION 01 73 29  
CUTTING AND PATCHING

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

- A. The Work of this Section shall be included as a part of the Contract Documents of each Contractor on this Project. Where such Work applies to only one Contractor, it shall be defined as to which Contractor the Work belongs.

1.2 SUMMARY

- A. This Section specifies administrative and procedural requirements for cutting and patching.
- B. Refer to other Sections for specific requirements and limitations applicable to cutting and patching individual parts of the Work.
1. Requirements of this Section apply to plumbing/mechanical and electrical installations. Refer to Divisions 22, 23 and 26 Sections, respectfully, for other requirements and limitations applicable to cutting and patching mechanical and electrical installations.
- C. Demolition of selected portions of the building for alterations is included in Section 02 41 19, Building Demolition.
- D. Cutting and patching shall be the responsibility of the contractor (trade) requiring the cutting and patching.

1.3 SUBMITTALS

- A. Cutting and Patching Proposal: Where approval of procedures for cutting and patching is required before proceeding, submit a proposal to the Architect describing procedures well in advance of the time cutting and patching will be performed and request approval to proceed. Include the following information, as applicable, in the proposal:
1. Describe the extent of cutting and patching required and how it is to be performed; indicate why it cannot be avoided.
2. Describe anticipated results in terms of changes to existing construction; include changes to structural elements and operating components as well as changes in the building's appearance and other significant visual elements.
3. List products to be used and firms or entities that will perform Work.
4. Indicate dates when cutting and patching is to be performed.
5. List utilities that will be disturbed or affected, including those that will be relocated and those that will be temporarily out-of-service. Indicate how long service will be disrupted.



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6. Where cutting and patching involves addition of reinforcement to structural elements, submit details and engineering calculations to show how reinforcement is integrated with the original structure.
7. Approval by the Architect to proceed with cutting and patching does not waive the Architect's right to later require complete removal and replacement of a part of the Work found to be unsatisfactory.

### 1.4 QUALITY ASSURANCE

- A. Requirements for Structural Work: Do not cut and patch structural elements in a manner that would reduce their load-carrying capacity or load-deflection ratio.
  1. Obtain approval from the Architect and Engineer of the cutting and patching proposal before cutting and patching the following structural elements:
    - a. Foundation construction.
    - b. Bearing and retaining walls.
    - c. Structural concrete.
    - d. Structural steel.
    - e. Lintels.
    - f. Timber and primary wood framing.
    - g. Structural decking.
    - h. Stair systems.
    - i. Miscellaneous structural metals.
    - j. Exterior curtain wall construction.
    - k. Equipment supports.
    - l. Piping, ductwork, vessels and equipment.
    - m. Structural systems of special construction in Division-13.
- B. Operational and Safety Limitations: Do not cut and patch operating elements or safety related components in a manner that would result in reducing their capacity to perform as intended, or result in increased maintenance, or decreased operational life or safety.
  1. Obtain approval of the cutting and patching proposal before cutting and patching the following operating elements or safety related systems:
    - a. Shoring, bracing, and sheeting.
    - b. Primary operational systems and equipment.
    - c. Air or smoke barriers.
    - d. Water, moisture, or vapor barriers.
    - e. Membranes and flashings.
    - f. Fire protection systems.
    - g. Noise and vibration control elements and systems.
    - h. Control systems.
    - i. Communication systems.
    - j. Conveying systems.
    - k. Electrical wiring systems.
    - l. Special construction specified by Division-13 Sections.



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- C. Visual Requirements: Do not cut and patch construction exposed on the exterior or in occupied spaces, in a manner that would, in the Architect's opinion, reduce the building's aesthetic qualities, or result in visual evidence of cutting and patching. Remove and replace Work cut and patched in a visually unsatisfactory manner.
1. If possible, retain the original installer or fabricator to cut and patch the following categories of exposed Work, or if it is not possible to engage the original installer or fabricator, engage another recognized experienced and specialized firm:
    - a. Processed concrete finishes.
    - b. Stonework and stone masonry.
    - c. Ornamental metal.
    - d. Matched-veneer woodwork.
    - e. Preformed metal panels.
    - f. Window wall system.
    - g. Stucco and ornamental plaster.
    - h. Acoustical ceilings.
    - i. Terrazzo.
    - j. Finished wood flooring.
    - k. Fluid-applied flooring.
    - l. Carpeting.
    - m. Aggregate wall coating.
    - n. Wall covering.
    - o. Swimming pool finishes.
    - p. HVAC enclosures, cabinets or covers.

### PART 2 - PRODUCTS

#### 2.1 MATERIALS

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

### PART 3 - EXECUTION

#### 3.1 INSPECTION

- A. Before cutting existing surfaces, examine surfaces to be cut and patched and conditions under which cutting and patching is to be performed. Take corrective action before proceeding, if unsafe or unsatisfactory conditions are encountered.
1. Before proceeding, meet at the site with parties involved in cutting and patching, including mechanical and electrical trades. Review areas of potential interference and conflict. Coordinate procedures and resolve potential conflicts before proceeding.



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3.2 PREPARATION

- A. Temporary Support: Provide temporary support of Work to be cut.
- B. Protection: Protect existing construction during cutting and patching to prevent damage. Provide protection from adverse weather conditions for portions of the Project that might be exposed during cutting and patching operations.
- C. Avoid interference with use of adjoining areas or interruption of free passage to adjoining areas.
- D. Take all precautions necessary to avoid cutting existing pipe, conduit or ductwork serving the building, but scheduled to be removed or relocated until provisions have been made to bypass them.

3.3 PERFORMANCE

- A. General: Employ skilled workmen to perform cutting and patching. Proceed with cutting and patching at the earliest feasible time and complete without delay.
  - 1. Cut existing construction to provide for installation of other components or performance of other construction activities and the subsequent fitting and patching required to restore surfaces to their original condition.
- B. Cutting: Cut existing construction using methods least likely to damage elements to be retained or adjoining construction. Where possible review proposed procedures with the original installer; comply with the original installer's recommendations.
  - 1. In general, where cutting is required use hand or small power tools designed for sawing or grinding, not hammering and chopping. Cut holes and slots neatly to size required with minimum disturbance of adjacent surfaces. Temporarily cover openings when not in use.
  - 2. To avoid marring existing finished surfaces, cut or drill from the exposed or finished side into concealed surfaces.
  - 3. Cut through concrete and masonry using a cutting machine such as a carborundum saw or diamond core drill.
  - 4. Comply with requirements of applicable Sections of Division-2 where cutting and patching requires excavating and backfilling.
  - 5. By-pass utility services such as pipe or conduit, before cutting, where services are shown or required to be removed, relocated or abandoned. Cut-off pipe or conduit in walls or partitions to be removed. Cap, valve or plug and seal the remaining portion of pipe or conduit to prevent entrance of moisture or other foreign matter after by-passing and cutting.
- C. Patching: Patch with durable seams that are as invisible as possible. Comply with specified tolerances.



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1. Where feasible, inspect and test patched areas to demonstrate integrity of the installation.
  2. Restore exposed finishes of patched areas and extend finish restoration into retained adjoining construction in a manner that will eliminate evidence of patching and refinishing.
  3. Where removal of walls or partitions extends one finished area into another, patch and repair floor and wall surfaces in the new space to provide an even surface of uniform color and appearance. Remove existing floor and wall coverings and replace with new materials, if necessary to achieve uniform color and appearance.
    - a. Where patching occurs in a smooth painted surface, extend final paint coat over entire unbroken containing the patch, after the patched area has received primer and second coat.
  4. Patch, repair or rehang existing ceilings as necessary to provide an even plane surface of uniform appearance.
- D. Plaster Installation: Comply with manufacturer's instructions and install thickness and coats as indicated.
1. Unless otherwise indicated provide 3-coat Work.
  2. Finish gypsum plaster with smooth-troweled finish. Sand lightly to remove trowel marks and arises.
  3. Cut, patch, point-up and repair plaster to accommodate other construction and to restore cracks, dents and imperfections.

### 3.4 CLEANING

- A. Thoroughly clean areas and spaces where cutting and patching is performed or used as access. Remove completely paint, mortar, oils, putty and items of similar nature. Thoroughly clean piping, conduit and similar features before painting or other finishing is applied. Restore damaged pipe covering to its original condition.

END OF SECTION 01 73 29



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SECTION 01 74 13  
CONSTRUCTION CLEANING

PART 1 - GENERAL

1.1 RELATED WORK

- A. The Work of this Section shall be included as a part of the Contract Documents of each Contractor of this Project.

1.2 SUMMARY

- A. The Architect reserves the right to act on behalf of the Owner pertaining to the clean-up responsibilities that are a part of each Contractor's Work.

1.3 PURPOSE - DAILY CLEANING

- A. Define and emphasize the responsibility of each Contractor to remove his rubbish and debris from the construction site to guard against fire and safety hazards as well as to provide a more efficient construction operation for all Contractors. If this cleaning is not performed to the satisfaction of the Owner and the Architect, it will be performed for the Contractor at his expense.

1.4 PURPOSE - ROUTINE CLEANING

- A. Each Friday afternoon, and more often if necessary, each Contractor shall perform an overall cleanup of the entire site, including a broom cleaning of appropriate surfaces. The trades shall remove their rubbish and debris from the building site to the rubbish collection location promptly upon its accumulation and in no event later than the regular Friday general cleanup.

1.5 RUBBISH CONTAINER

- A. The General Contractor shall provide dumpster type rubbish container with lid, sized adequate for the Project waste, debris, and rubbish for the life of the Project.
- B. Dispose of container contents weekly or at more frequent intervals if required by inadequate container capacity.

1.6 SAFETY REQUIREMENTS

- A. Hazards Control (By each Contractor)
1. Store volatile wastes in covered metal containers, and remove from the premises daily.
  2. Prevent accumulation of wastes, which create hazardous conditions.
  3. Provide adequate ventilation during use of volatile or noxious substances.



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- B. Conduct cleaning and disposal operations to comply with local ordinances and anti-pollution laws.
  - 1. Do not burn or bury rubbish and waste materials on project site.
  - 2. Do not dispose of volatile wastes such as mineral spirits, oil, or paint thinner in storm or sanitary drains.
  - 3. Do not dispose of wastes into streams or waterways.

### PART 2 - PRODUCTS

#### 2.1 MATERIALS

- A. Use only cleaning materials recommended by manufacturer of surface to be cleaned.
- B. Use cleaning materials only on surface recommended by cleaning material manufacturer.

### PART 3 - EXECUTION

#### 3.1 DAILY CLEANING

- A. Each Contractor shall execute daily cleaning to ensure that building, grounds, and public properties are maintained free from accumulations of waste materials and rubbish.
- B. Wet down dry materials and rubbish to lay dust and prevent blowing dust.
- C. Daily, during progress of work, clean site and public properties and dispose of waste materials, debris, and rubbish in dumpster type rubbish container provided under this Section.
- D. Handle materials in a controlled manner with as few handlings as possible; do not drop or throw materials from heights.
- E. Schedule cleaning operations so that dust and other contaminants resulting from cleaning process will not fall on wet, newly painted surfaces.
- F. Place no new work on dirty surfaces.

#### 3.2 ROUTINE CLEANING

- A. Employ experienced workmen for cleaning.
- B. Remove dirt, mud, and other foreign materials from sight exposed interior and exterior surfaces.
- C. Each Friday, or at more frequent intervals, if work activities justify same, perform the following cleaning. This includes all dirt, dust, and debris not identifiable as part of a Contract. Broom clean floor and paved surfaces; rake clean other surfaces of ground.



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- D. Maintain adjacent roads free from the accumulation of mud, rocks, rubbish, litter and debris resulting from construction activities.
- E. Remove litter, rubbish and debris from chases, whether the chases will be accessible or not.
- F. Maintain cleaning throughout the life of the Project.
- G. Should the Contractor fail in the performance of this Work, the Owner may perform such Work in accordance with Article 3 of the General Conditions.

### 3.3 FINAL CLEANING (Each Contractor)

- A. Each Contractor shall perform his respective final clean-up and shall leave the Work of the complete Project in clean, neat condition. The following are examples, but not by way of limitation, of cleaning levels required.
  - 1. Remove labels which are not required as permanent labels.
  - 2. Clean transparent materials, including mirrors and window/door glass, to a polished condition, removing substances which are noticeable as vision-obscuring materials. Replace broken glass and damaged transparent materials.
  - 3. Clean exposed exterior and interior hard surfaces 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.
  - 4. Wipe surfaces of mechanical and electrical equipment clean; remove excess lubrication and other substances.
  - 5. Remove debris and surface dust from limited access spaces including roofs, plenums, shafts, trenches, equipment vaults, manholes, attics, and similar spaces.
  - 6. Clean concrete floors in nonoccupied spaces broom clean.
  - 7. Vacuum clean carpeted surfaces and similar soft surfaces.
  - 8. Clean plumbing fixtures to a sanitary condition, free of stains, including those resulting from water exposure.
  - 9. Clean food service equipment to a condition, free of stains, including those resulting in water exposure.
  - 10. Clean light fixtures and lamps so as to function with full efficiency. Replace all lamps that are burnt out and/or flickering.
  - 11. 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 which are neither planted nor paved to a smooth, even textured surface.

END OF SECTION 01 74 13



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SECTION 01 74 15  
PEST CONTROL (DURING CONSTRUCTION)

PART 1 - GENERAL

1.1 SUMMARY

- A. Provide treatment for pest control, as herein specified.
  - 1. Apply to all interior floor to wall corners and around building perimeter at existing grades during construction.

1.2 SUBMITTALS

- A. Product Data: Submit manufacturer's technical data and application instructions in accordance with Division 01 requirements.
- B. Submit specific product warranty as specified herein.

1.3 QUALITY ASSURANCE

- A. In addition to requirements of these specifications, comply with manufacturer's instructions and recommendations for work, including preparation of substrate application.
- B. Engage a professional pest control operator, licensed in accordance with regulations of governing authorities for application of soil treatment solution.
- C. Use only chemicals that bear a Federal registration number of the U.S. Environmental Protection Agency.

1.4 SPECIFIC PRODUCT WARRANTY

- A. Furnish written warranty, certifying that applied insecticide treatment will prevent infestation of common household insects such as cockroaches, ants, and fleas. If insect activity is discovered during warranty period, Contractor will re-treat.

PART 2 - PRODUCTS

2.1 PEST CONTROL SOLUTION

- A. Use an emulsible concentrated insecticide for dilution with water, specially formulated to prevent infestation by insects. Fuel oil will not be permitted as a diluent. Provide a solution consisting of one of following chemical elements and concentrations:
  - 1. "Demon", by Zenica, Wilmington, Delaware.
  - 2. Home Defense Indoor Insect Killer 5, Bifenthrin by The Solaris Group, San Ramon, California



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- B. Other solutions may be used as recommended by Applicator if also acceptable to Architect and approved for intended application by jurisdictional authorities. Use only insecticide treatment solutions that are not injurious to planting.

**PART 3 - EXECUTION**

**3.1 APPLICATION**

- A. Surface Preparation: Remove foreign matter that could decrease treatment effectiveness on areas to be treated.
- B. Application Rates: Mix chemicals (from sealed containers) with water, at the job-site, then apply concentrate solution only at rates described by the manufacturer on the product label and in compliance with State of Florida laws.
- C. Post signs in areas of application to warn workers that insecticide treatment has been applied. Remove signs when areas are covered by other construction.
- D. Re-apply concentrate solution to areas disturbed by construction activities following application.
- E. Applicator shall mix all treatment on-site and mixing shall be witnessed by the Owner's representative.
- F. The applicator shall treat all buildings on a frequency of once per month starting when the building is dried in with windows, doors and roofing in place. The last two treatments shall be applied at substantial completion and at 30 days after substantial completion.
- G. Applicator shall treat all interior spaces of buildings including but not limited to each side of bottom of interior walls, interior side of exterior walls, bottom of vinyl bases, Perimeter of windows, bottom of exterior side of exterior wall, and any other areas/ openings on exterior side of building.

END OF SECTION 01 74 15



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SECTION 01 74 19  
CONSTRUCTION WASTE MANAGEMENT AND DISPOSAL

PART 1 - GENERAL

1.1 WASTE MANAGEMENT GOALS FOR THE PROJECT

- A. This Project shall minimize the creation of construction and demolition waste on the job site. Factors that contribute to waste, such as over packaging, improper storage, ordering error, poor planning, breakage, mishandling, and contamination, shall be minimized. Of the inevitable waste that is generated, as many of the waste materials as economically feasible shall be reused, salvaged, or recycled. Waste disposal in landfills shall be minimized.
- B. Diversion Goals: A minimum 50% of total Project waste shall be diverted from landfill. Records shall be kept to attempt for verification. The following waste categories, at a minimum, shall be diverted from landfill:
1. Land-clearing debris
  2. Clean dimensional wood, pallet wood
  3. Plywood, OSB, and particleboard
  4. Concrete
  5. Bricks
  6. Concrete Masonry Units (CMU)
  7. Asphaltic concrete
  8. Electrical wiring
  9. Cardboard, paper, packaging
  10. Aluminum
  11. Steel
  12. Gypsum drywall (unpainted)
  13. Paint
  14. Glass
  15. Plastics
  16. Carpet and pad
  17. Beverage containers

1.2 REFERENCES, RESOURCES

- A. *WasteSpec*, Triangle J Council of Governments, PO Box 12276, Research Triangle Park, NC 27709
- B. California Integrated Waste Management Board, 916/255-2296, e-mail: opa@ciwmb.ca.gov

1.3 WASTE MANAGEMENT PLAN

- A. Produce and submit a Waste Management Plan. The Plan shall contain the following:
1. Estimate of total Project waste to be generated, name of the landfill(s) where Project waste would normally be disposed of, tipping fees, and estimated cost of disposing of Project waste in landfill(s).



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- a. Provide the name of the landfill(s) where trash will be disposed of, the applicable landfill tipping fee(s), and the projected cost of disposing of all Project waste in the landfill(s).
  - b. Identify licensed haulers and processors of recyclables for categories of materials to be separated.
2. Estimate of total tons of the following waste category to be diverted from landfill:
- a. Concrete
  - b. Asphaltic Concrete
  - c. Brick
  - d. Other
3. Estimate of total cubic yards of the following waste categories to be diverted from landfill:
- a. Clean dimensional wood, pallet wood
  - b. Plywood, OSB, and particleboard
  - c. Cardboard, paper, packaging
  - d. Other
4. Estimate of amounts (weight, feet, square yards, gallons, etc.) of the following waste categories:
- a. Aluminum
  - b. Steel
  - c. Copper
  - d. Carpet
  - e. Paint
  - f. Other
5. Estimate of net cost savings or additional costs resulting from separating and recycling (versus landfilling) each material. "Net" means that the following have been subtracted from the cost of separating and recycling:
- a. Revenue from the sale of recycled or salvaged materials
  - b. Landfill tipping fees saved due to diversion of materials from the landfill

**1.4 WASTE MANAGEMENT PLAN IMPLEMENTATION**

- A. Provide on-site instruction of appropriate separation, handling, and recycling, salvage, reuse, and return methods to be used at the appropriate stages of the Project.
- B. Conduct Construction Waste Management meetings.
- C. Separation Facilities: Designate a specific area or areas to facilitate separation of materials for potential reuse, salvage, recycling, and return. Recycling and waste bin areas are to be kept neat and clean and clearly marked in order to avoid commingling of materials. Bins shall be protected during non-working hours from off-site contamination.



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1. Separate, store, protect, and handle at the site identified recyclable and salvageable waste products in order to prevent contamination of materials and to maximize recyclability and salvageability of identified materials.
  
- D. Materials Handling Procedures: Materials to be recycled shall be protected from contamination and shall be handled, stored, and transported in a manner that meets the requirements set by the designated facilities for acceptance.
  
- E. Transportation: A description of the means of transportation of the recyclable materials (whether materials will be site-separated and self-hauled to designated centers, or whether mixed materials will be collected by a waste hauler and removed from the site) and destination of materials. Provide an estimate of how often bins will need to be emptied.
  
- F. Hazardous Wastes: Hazardous wastes shall be separated, stored, and disposed of according to local regulations.
  1. Recycle any thermostats to be discarded to Thermostat Recycling Corporation (703) 841 3249 or [www.nema.org/trc](http://www.nema.org/trc)
  
- G. Application for Progress Payments: Submit with each Application for Progress Payment a Summary of the Project waste generated. Failure to submit this information may render the Application for Payment incomplete and may delay Progress Payment. The Summary shall contain the following information:
  1. The amount (in tons or cubic yards) of material landfilled from the Project, the identity of the landfill, the total amount of tipping fees paid at the landfill, and the total disposal cost. Include manifests, weight tickets, receipt, and invoices.
  2. For each material recycled, reused, or salvaged from the Project, include the amount (in tons or cubic yards, pounds, feet, square yards, gallons, etc.), the date removed from the job site, the receiving party, the transportation cost, the amount of any money paid or received for the recycled or salvaged material, and the net total cost or savings of salvage or recycling each material. Attach manifests, weight tickets, receipts, and invoices.

PART 1 - PRODUCTS (Not Used)

PART 2 - EXECUTION (Not Used)

END OF SECTION 01 74 19



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SECTION 01 78 33  
WARRANTIES AND BONDS

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

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

1.2 SUMMARY

- A. This Section specifies general administrative and procedural requirements for warranties and bonds required by the Contract Documents, including manufacturers standard warranties on products and special warranties.
  - 1. Refer to the General Conditions for terms of the Contractor's special warranty of workmanship and materials.
  - 2. General closeout requirements are included in Section 01 70 00, Project Closeout.
  - 3. Specific requirements for warranties for the Work and products and installations that are specified to be warranted, are included in the individual Sections of Divisions 02 through 33.
  - 4. Certifications and other commitments and agreements for continuing services to Owner are specified elsewhere in the Contract Documents.
- B. Disclaimers and Limitations: Manufacturer's disclaimers and limitations on product warranties do not relieve the Contractor of the warranty on the Work that incorporates the products, nor does it relieve suppliers, manufacturers, and subcontractors required to countersign special warranties with the Contractor.
- C. Separate Prime Contracts: Each prime Contractor is responsible for warranties related to its own Contract.

1.3 DEFINITIONS

- A. Standard Product Warranties are preprinted written warranties published by individual manufacturers for particular products and are specifically endorsed by the manufacturer to the Owner.
- B. Special Warranties are written warranties required by or incorporated in the Contract Documents, either to extend time limits provided by standard warranties or to provide greater rights for the Owner.



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1.4 WARRANTY REQUIREMENTS

- A. Related Damages and Losses: When correcting warranted Work that has failed, remove and replace other Work that has been damaged as a result of such failure or that must be removed and replaced to provide access for correction of warranted Work.
- B. Reinstatement of Warranty: When Work covered by a warranty has failed and been corrected by replacement or rebuilding, reinstate the warranty by written endorsement. The reinstated warranty shall be equal to the original warranty with an equitable adjustment for depreciation.
- C. Replacement Cost: Upon determination that Work covered by a warranty has failed, replace or rebuild the Work to an acceptable condition complying with requirements of Contract Documents. The Contractor is responsible for the cost of replacing or rebuilding defective Work regardless of whether the Owner has benefited from use of the Work through a portion of its anticipated useful service life.
- D. Owner's Recourse: Written warranties made to the Owner are in addition to implied warranties, and shall not limit the duties, obligations, rights and remedies otherwise available under the law, nor shall warranty periods be interpreted as limitations on time in which the Owner can enforce such other duties, obligations, rights, or remedies.
  - 1. Rejection of Warranties: The Owner reserves the right to reject warranties and to limit selections to products with warranties not in conflict with requirements of the Contract Documents.
- E. The Owner reserves the right to refuse to accept Work for the Project where a special warranty, certification, or similar commitment is required on such Work or part of the Work, until evidence is presented that entities required to countersign such commitments are willing to do so.

1.5 SUBMITTALS

- A. Submit written warranties to the Architect prior to the date certified for Substantial Completion. If the Architect's Certificate of Substantial Completion designates a commencement date for warranties other than the date of Substantial Completion for the Work, or a designated portion of the Work, submit written warranties upon request of the Architect.
  - 1. When a designated portion of the Work is completed and occupied or used by the Owner, by separate agreement with the Contractor during the construction period, submit properly executed warranties to the Architect within fifteen days of completion of that designated portion of the Work.



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- B. When a special warranty is required to be executed by the Contractor, or the Contractor and a subcontractor, supplier or manufacturer, prepare a written document that contains appropriate terms and identification, ready for execution by the required parties. Submit a draft to the Owner through the Architect for approval prior to final execution.
- C. Forms for special warranties are included at the end of this Section. Prepare a written document utilizing the appropriate form, ready for execution by the Contractor, or the Contractor and subcontractor, supplier or manufacturer. Submit a draft to the Owner through the Architect for approval prior to final execution.
  - 1. Refer to individual Sections of Divisions 02 through 33 for specific content requirements, and particular requirements for submittal of special warranties.
- D. Form of Submittal: At Final Completion compile two copies of each required warranty and bond properly executed by the Contractor, or by the Contractor, subcontractor, supplier, or manufacturer. Organize the warranty documents into an orderly sequence based on the table of contents of the Project Manual.
- E. Bind warranties and bonds in heavy-duty, commercial quality, durable 3-ring vinyl covered loose-leaf binders, thickness as necessary to accommodate contents, and sized to receive 8-1/2" by 11" paper.
  - 1. Provide heavy paper dividers with celluloid covered tabs for each separate warranty. Mark the tab to identify the product or installation. Provide a typed description of the product or installation, including the name of the product, and the name, address and telephone number of the installer.
  - 2. Identify each binder on the front and the spine with the typed or printed title "WARRANTIES AND BONDS, the Project title or name, and the name of the Contractor.
  - 3. When operating and maintenance manuals are required for warranted construction, provide additional copies of each required warranty, as necessary, for inclusion in each required manual.

PART 2 - PRODUCTS (Not Applicable).

PART 3 - EXECUTION

3.1 SCHEDULE OF WARRANTIES

- A. General Contractor shall submit to the Architect a Schedule of Warranties.

END OF SECTION 01 78 33



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**Division 02**  
Existing Conditions





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SECTION 02 41 13  
SELECTIVE DEMOLITION

PART 1 - GENERAL

1.1 SUMMARY

- A. Selective demolition work requires the selective removal and subsequent offsite disposal of the following kinds of elements:
  - 1. Portions of existing building indicated on drawings and as required to accommodate new construction.
  - 2. Removal of interior partitions.
  - 3. Removal of doors and frames.
  - 4. Removal of existing windows.
  - 5. Removal of roof system.
- B. Removal Work Specified Elsewhere: Cutting nonstructural concrete floors and masonry walls for piping, ducts, and conduits is included with the work of the respective plumbing, mechanical and electrical specification sections in Divisions 22, 23 and 26.

1.2 SUBMITTALS

- A. Submit in accordance with Division 01 requirements.
- B. Submit schedule indicating proposed sequence of operations for selective demolition work to Architect for review prior to start of work. Include coordination for shutoff, capping, and continuation of utility services as required, together with details for dust and noise control protection.
  - 1. Provide detailed sequence of demolition and removal work to ensure uninterrupted progress of Owner's on-site operations.
- C. Submit a minimum of 24 digital photographs in JPEG format of existing conditions of structure surfaces, equipment, and adjacent improvements that might be misconstrued as damage related to removal operations. File with Architect prior to start of work.

1.3 PROJECT CONDITIONS

- D. Occupancy: Owner will not occupy the building areas during selective demolition.
- E. Condition of Structures: Owner assumes no responsibility for actual condition of items or structures to be demolished.
- F. Partial Demolition and Removal: Items indicated to be removed but of salvageable value to Contractor may be removed from structure as work progresses. Transport salvaged items from site as they are removed.
- G. Damages: Promptly repair damages caused to adjacent facilities by demolition work.



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- E. Traffic: Conduct selective demolition operations and debris removal to ensure minimum interference with roads, streets, walks, and other adjacent occupied or used facilities.
  - 1. Do not close, block, or otherwise obstruct streets, walks, or other occupied or used facilities without written permission from authorities having jurisdiction. Provide alternate routes around closed or obstructed traffic ways if required by governing regulations.
- F. Flame Cutting: Do not use cutting torches for removal until work area is cleared of flammable materials. At concealed spaces, such as interior of ducts and pipe spaces, verify condition of hidden space before starting flame-cutting operations. Maintain portable fire suppression devices during flame-cutting operations.
- G. Utility Services: Maintain existing utilities indicated to remain in service and protect them against damage during demolition operations.
  - 1. Do not interrupt utilities serving occupied or used facilities, except when authorized in writing by authorities having jurisdiction. Provide temporary services during interruptions to existing utilities, as acceptable to governing authorities.
- H. Environmental Controls: Use water sprinkling, temporary enclosures, and other methods to limit dust and dirt migration. Comply with governing regulations pertaining to environmental protection.
  - 1. Do not use water when it may create hazardous or objectionable conditions such as ice, flooding, and pollution.
- I. Explosives: Use of explosives will not be permitted.

### PART 2 - PRODUCTS (NOT USED)

### PART 3 - EXECUTION

#### 3.1 DEMOLITION

- A. Perform selective demolition work in a systematic manner. Use such methods as required to complete work indicated on Drawings in accordance with demolition schedule and governing regulations.
  - 1. Demolish concrete and masonry in small sections. Cut concrete and masonry at junctures with construction to remain using power-driven masonry saw or hand tools; do not use power-driven impact tools.
  - 2. Locate demolition equipment throughout structure and promptly remove debris to avoid imposing excessive loads on supporting walls, floors, or framing.
  - 3. Provide services for effective air and water pollution controls as required by local authorities having jurisdiction.
  - 4. For interior slabs on grade, use removal methods that will not crack or structurally disturb adjacent slabs or partitions. Use power saw where possible.



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5. Completely fill below-grade areas and voids resulting from demolition work. Provide fill consisting of approved earth, gravel, or sand, free of trash and debris, stones over 6 inches in diameter, roots, or other organic matter.
- B. If unanticipated mechanical, electrical, or structural elements that conflict with intended function or design are encountered, investigate and measure both nature and extent of the conflict. Submit report to Architect in written, accurate detail. Pending receipt of directive from Architect, rearrange selective demolition schedule as necessary to continue overall job progress without undue delay.

### 3.2 DISPOSAL OF DEMOLISHED MATERIALS

- A. Remove from building site debris, rubbish, and other materials resulting from demolition operations. Transport and legally dispose off site.
  1. If hazardous materials are encountered during demolition operations, comply with applicable Federal, State, and local regulations, laws, and ordinances concerning removal, handling, and protection against exposure or environmental pollution. Stop work immediately and notify Architect.
  2. Burning of removed materials is not permitted on project site.

### 3.3 CLEANUP AND REPAIR

- A. Upon completion of demolition work, remove tools, equipment, and demolished materials from site. Remove protections and leave interior areas broom clean.
  1. Repair demolition performed in excess of that required. Return elements of construction and surfaces to remain to condition existing prior to start operations. Repair adjacent construction or surfaces soiled or damaged by selective demolition work.

END OF SECTION 02 41 13



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**Division 03**  
Concrete





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SECTION 03 35 00  
CONCRETE FLOOR SEALERS

PART 1 - GENERAL

1.1 SUMMARY

- A. Furnish all necessary materials, labor and equipment required to provide and install the concrete floor sealer, as specified herein and as indicated on the Drawings.

1.2 SUBMITTAL

- A. **Product Data:** Submit manufacturer's specification or specific products of the concrete floor sealer, including physical properties and performance properties and all tests described herein and submit all Material Safety Data sheets. Each individual component of the system will be evaluated on the basis of these standards. For any of the tests not listed in the manufacturer's standard nationally published data, the manufacturer must supply the missing data from an independent test laboratory tested according to the referenced standard. Manufacturer's standard color chart shall also be submitted and must afford the Architect color selection from at least 12 standard colors.
- B. The concrete floor sealing specialist shall submit a 6" x 6" system sample for verification purposes and finish texture approval.
- C. **Contractor Experience:** The concrete floor sealing specialist shall furnish a list of three (3) projects using either specified material or another material pre-approved for this project that they have installed during the last five years. Information shall include: project name, square footage, contract name with owner's address and phone number. Also, the concrete floor sealer specialist shall furnish resumes detailing the experience of key project personnel including supervisors and technicians.
- D. Submit in accordance with Division 01 requirements.
- E. Submit warranty as specified herein.

1.3 QUALITY ASSURANCE

- A. **Manufacturer's Qualifications:** Obtain concrete floor sealer materials from a single manufacturer.
- B. **Applicator's Qualifications:** Installation shall be performed by an concrete floor sealer specialist with skilled mechanics having not less than three (3) years of satisfactory experience in the application of the type and complexity of system as specified in this section. The concrete floor sealer specialist shall be approved in writing by the manufacturer of the concrete floor sealer as specified herein.
- C. All products shall be V.O.C. compliant and shall meet the new EPA requirements effective September 13, 1999.



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- D. All concrete surfaces scheduled to receive the concrete floor sealer shall be free from curing membranes or bond breakers and clear of any debris or construction latents directly prior to application of concrete floor sealer.

#### 1.4 MATERIAL DELIVERY, HANDLING AND STORAGE

- A. Primary system materials shall be delivered in the manufacturer's undamaged, unopened containers. Each container shall be clearly marked with the following:
  - 1. Product Name.
  - 2. Manufacturer's Name.
  - 3. Component designation (A or B, etc.).
  - 4. Ratio of component mixture.
- B. Provide equipment and personnel to handle the materials by methods which prevent damage.
- C. The concrete floor sealer specialist shall promptly inspect all direct jobsite deliveries to assure that quantities are correct and that materials comply with requirements and are not damaged.
- D. The concrete floor sealer specialist shall be responsible for all materials furnished by him, and he shall replace, at his own expense, all such material that is found to be defective in manufacturing or that has become damaged in transit, handling or storage.
- E. Store materials in strict accordance with manufacturer's instructions, with seals and labels intact and legible.
- F. Proper concrete protection from staining must be observed. Steel must not be placed on slab to avoid staining. Diaper hydraulic powered equipment to avoid oil and gasoline staining. Pipe cutting machines shall not be used on the concrete slabs where the clear sealers are scheduled. Any rubber tired traffic shall be kept at a minimum and shall be protected with drop cloths.

#### 1.5 JOB CONDITIONS

- A. The concrete floor sealer specialist shall visit the jobsite prior to beginning the application of the concrete floor sealer to evaluate substrate condition, including concrete moisture content, and the extent of repairs required, if any. Concrete floors shall be tested to verify that the moisture content of the substrate does not exceed that as recommended by the manufacturer.
- B. The concrete floor sealer specialist should exercise care during surface preparation and system application to protect surrounding substrates and surfaces, as well as in place equipment. The concrete floor sealer specialist shall use his discretion as to the physical means used for preparation and protection. Any costs incurred for resultant damage from negligence or inadequate protection shall be the sole responsibility of the concrete floor sealer specialist.



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- C. Job area shall be free of other trades during floor installation, and for a period of 24 hours upon completion.
- D. Where natural ventilation is inadequate, provide ventilation by use of fans or other devices.
- E. Do not install at temperatures below 35 degrees F.

1.6 WARRANTY

- A. The concrete floor sealer specialist shall furnish the manufacturer's standard warranty of the concrete floor sealer for a period of twenty (20) years after the Date of Substantial Completion.

PART 2 – PRODUCTS

2.1 ACCEPTABLE MANUFACTURERS

- A. Basis of Design: "Ashford Formula," Curecrete Chemical Company, Springville, Utah; [www.ashfordformula.com](http://www.ashfordformula.com).
  - 1. Products of the following manufacturers are approved provided compliance with all technical requirements as specified herein:
    - a. "Seal Hard," L & M Construction Chemicals, Omaha, Nebraska; [www.lmcc.com](http://www.lmcc.com)

2.2 MATERIALS

- A. Colorless, transparent, penetrating liquid.
- B. Contains no silicone.
- C. Highly resistant to oils, greases and acids.
- D. Technical Properties:
  - 1. Abrasion – Taber abrasion test: 30.7% increase in abrasion resistance.
  - 2. Bonding – per ASTM D3359, latest edition: 17% increase in epoxy adhesion. No change for polyurethane adhesion.
  - 3. Curing – 94% greater moisture loss from untreated samples during critical, initial 24 hour curing period.
  - 4. Hardening – per ASTM C42, latest edition: 40% increase in compressive strength at 7 days, 38% increase at 28 days over untreated samples. ASTM C805, latest edition, Schmidt hammer: 13.3% increased impact resistance.
  - 5. Permeability – The seepage rate using a 7 inch head of water on a 4.91 square inch area treated was 0.0083cc per hour.
  - 6. Weathering – per ASTM G23, latest edition: ultraviolet light and water spray exposure had no adverse effect.



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- E. Non-toxic, non-combustible, and non-flammable. Shall not harm lungs or hands. Shall comply with all V.O.C. regulations in effect at the time of manufacture.

**PART 3 - EXECUTION**

**3.1 SURFACE CONDITIONS**

- A. Examine concrete after wet curing a minimum of three (3) days and removal of any curing covering. Coordinate with Section 03 30 00, Cast-In-Place Concrete. Notify the Architect of any deficiencies prior to proceeding with the Work of this Section.

**3.2 INSTALLATION**

- A. Upon removal of curing cover, mechanically clean the concrete to remove contaminants, form oils, bond breakers, and staining from the wet cure operation. All cleaning compounds shall be removed in their entirety and the concrete surface shall be neutralized.
- B. Avoid contact with glass, aluminum, plant life, asphaltic concrete and finished surfaces.
- C. First Application:
  - 1. As soon as possible after curing cover removal, spray product with a low pressure sprayer at a rate of 200-250 square feet per gallon.
  - 2. Keep the entire surface wet for 30 to 40 minutes by re-spraying dry spots or moving material from wet areas to dry areas with nylon push brooms.
  - 3. When the wet product becomes slippery underfoot, lightly sprinkle the surface with water to aid penetration and prevent surface drying.
  - 4. As the product begins to dry into the surface and again becomes slippery underfoot, flush the surface with water and squeegee the surface dry, removing all excess product, water, alkali and other impurities from the surface.
- D. NOTE: Before turning the facility over to the Owner, aggressively soap and water clean the concrete to remove construction contaminants and prepare the floor for the final application.
- E. Finish Application:
  - 1. Apply sealer with a low pressure sprayer or drop sealer with a floor scrubbing machine at 50 – 600 square feet per gallon.
  - 2. Lambs wool or fine bristle broom the sealer evenly across the concrete surface or use a squeegee on the floor scrubbing machine to evenly spread a thin film.
- F. Final Polishing
  - 1. It is necessary that the floor sealer be applied adequately if the sheen is to come up. Therefore, if the floor does not shine when polished/burnished, the floor may need to have another standard treatment application of the concrete floor sealer specified herein.



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2. Prior to final inspection and date of substantial completion, all exposed concrete floors sealed with products specified in this Section, shall be polished as follows:
  - a. Step 1: Use high-speed propane polishing/burnishing equipped with an abrasive 3M Black stripping pad.
  - b. Step 2: "Buff" the surface by working the machine side to side and back to back so as to create a wax-like sheen.
  - c. Step 3: Repeat step 2 utilizing a 3M Red pad to increase the intensity of the sheen.
  
- G. Provide all items and accessories as required for a complete installation in every respect.

END OF SECTION 03 35 00



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# **Division 04**

Masonry





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SECTION 04 05 13  
MORTAR

PART 1 - GENERAL

1.1 SUMMARY

- A. This Section specifies the mortar for unit masonry materials specified in the following Sections:
1. Concrete masonry units, Section 04 20 00

1.2 SUBMITTALS

- A. Submit in accordance with Division 01 requirements.
- B. All required submittals shall be approved prior to the start of masonry construction.
- C. Approved manufacturer's published complete product data for proposed prepared masonry cement.
- D. Proposed mortar mix design(s) including complete identities and proportions of ingredients as well as adherence to standards where so specified.
- E. Test results from mortar cube breaks reporting compressive strength of mortar to be used.
- F. Contractor shall receive from supplier and provide to Architect certification, in writing, that materials meet requirements of ASTM C1142, latest edition.
- G. Samples for Verification: Accessories embedded in the masonry.
- H. Submit mortar test reports indicating mortar property requirements in accordance with ASTM C270, latest edition.

1.3 QUALITY ASSURANCE

- A. Codes and Specifications: Comply with the provisions of the latest editions for the following codes, specifications, and standards.
1. ACI 530/ASCE 5 Building Code Requirements for Masonry Structures.
  2. ACI 530.1/ASCE 6 Specifications for Masonry Structures.
  3. NCMA-TEK 20B Mortars for Concrete Masonry.
  4. ASTM C144, Aggregate for Masonry Mortar.
  5. ASTM C150, Portland Cement
  6. ASTM C207, Hydrated Lime for Masonry Purposes.
  7. ASTM C270, Mortar for Unit Masonry.
  8. ASTM E514, Standard Test Method for Water Penetration and Leakage Through Masonry.



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- B. Field Quality Control.
  - 1. Materials may require testing and re-testing, as directed by the Architect, during the progress of the Work. Allow free access to material stockpiles and facilities. Tests shall be performed at the Contractor's expense.
  - 2. Do not change source or brands of masonry mortar material during the course of the Work. If changes become necessary, resubmit data for material being changed and for tests of materials in which the changed material is and ingredient.
  - 3. Mortar properties shall comply with ASTM C270, latest edition.
- C. Submit a copy of certification that the integral water repellent admixture for the mortar was added in amounts according to the manufacturers written installation instructions.
- D. Source Limitations for Mortar Materials: Obtain mortar ingredients of a uniform quality, including color for exposed masonry, from one manufacturer for each cementitious component and from one source or producer for each aggregate.

### 1.4 MATERIAL STORAGE, DELIVERY, AND HANDLING

- A. Store mortar materials off the ground, under cover, using tarpaulins, felt paper, or polyethylene sheets in a dry location.
- B. Deliver and store manufactured products in original unopened containers.
- C. Store cementitious ingredients in weather-tight enclosures and protect against contamination. Store on platforms, under cover, and in a dry location.
- D. Stock piles and handle aggregates to prevent contamination from foreign materials.
- E. Deliver preblended, dry mortar mix in moisture-resistant containers designed for lifting and emptying into dispensing silo. Store preblended, dry mortar mix in delivery containers on elevated platforms, under cover, and in a dry location or in a metal dispensing silo with weatherproof cover.

### 1.5 TESTS FOR MORTAR

- A. Test for compressive strength by the methods of sampling and testing of ASTM C109 and ASTM C780, latest editions.
  - 1. Provide a minimum of one set of cubes of testing per 5,000 sq. ft. of masonry wall construction, maximum.
- B. Submit written reports for each material sampled and tested. Provide the project identification name and number, date of report, name of Contractor, name of testing service, source of aggregates, material manufacturer and brand name for manufactured materials, values specified in the referenced specification for each material, and test results. Indicate whether or not material is acceptable for intended use.



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- C. If the compressive strength tests fail to meet the minimum requirements specified, the mortar represented by such tests will be considered deficient in strength.
- D. Deficient mortar shall be removed and replaced by the Contractor without additional cost to the Owner.

### 1.6 PROJECT CONDITIONS

- A. To assure mortar temperatures between 40 degrees F and 120 degrees F until used heat mixing water or aggregates when air temperature is between 32 degrees F and 40 degrees F. When the air temperature is between 25 degrees F and 32 degrees F, heat both water and aggregate.
- B. Produce subsequent mortar batches within plus or minus 10 degrees of first batch.
- C. Do not heat water or sand above 160 degrees F.
- D. Stain Prevention: Prevent mortar and soil from staining the face of masonry to be left exposed or painted. Immediately remove mortar, and soil that come in contact with such masonry.
  - 1. Protect sills, ledges, and projections from mortar droppings.
  - 2. Protect surfaces of window and door frames, as well as similar products with painted and integral finishes, from mortar droppings.
  - 3. Turn scaffold boards near the wall on edge at the end of each day to prevent rain from splashing mortar and dirt onto completed masonry.

### 1.7 ENVIRONMENTAL REQUIREMENTS

- A. To assure mortar temperatures between 40 degrees F and 120 degrees F until used heat mixing water or aggregates when air temperature is between 32 degrees F and 40 degrees F. When the air temperature is between 25 degrees F and 32 degrees F, heat both water and aggregate.
- B. Produce subsequent mortar batches within plus or minus 10 degrees of first batch.
- C. Do not heat water or sand above 160 degrees F.

## PART 2 - PRODUCTS

- 2.1 MATERIALS - Comply with the provisions of the latest editions for the following codes, specifications, and standards:
  - A. Portland Cement: ASTM C150, Type I, non-staining, without air entertainment and of natural color or white, to produce the required color of mortar or grout.
  - B. Masonry Cement: Current ASTM C91, non-staining, with 12 to 22 percent air content by volume.



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- C. Hydrated Lime: ASTM C207, Type S.
- D. Aggregates: ASTM C144, except for joint less than 1/4 inch, use aggregate graded with 100 percent passing the No. 16 sieve.
- E. Water: Clean, free of deleterious materials which would impair strength or bond.
- F. Ready Mixed Mortar: ASTM C270, latest edition, Standard Specification for ready mixed mortar for unit masonry.

2.2 MORTAR MIXES

- A. Do not lower the freezing point of mortar by use of admixture or anti-freeze agents.
  - 1. Do not use calcium chloride in mortar.
- B. Mortar for Unit Masonry: Comply with ASTM C270, latest edition, Property Specification, Proportion Specifications, or ASTM C1142, latest edition.
  - 1. Type M: 2500 psi average compressive strength at 28 days for masonry in contact with the earth.
  - 2. Type S: 1800 psi average compressive strength at 28 days for other masonry conditions.
- C. Use gray (non-colored) mortar for interior and non-exposed concrete block masonry.

PART 3 - EXECUTION

3.1 INSTALLATION

- A. Refer to Section 04 20 00, Unit Masonry.

END OF SECTION 04 05 13



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SECTION 04 05 16  
MASONRY GROUT

PART 1 - GENERAL

1.1 SUMMARY

- A. This Section specifies the masonry grout for unit masonry materials specified in the following Sections:
  - 1. Concrete masonry units, Section 04 20 00
- B. The types of masonry grout required include the following:
  - 1. Fine grout.
  - 2. Coarse grout.
- C. This Section also specifies the grout for use in hollow metal frames. Install in all hollow metal frames installed in concrete and CMU walls, interior and exterior.

1.2 SUBMITTALS

- A. Submit in accordance with Division 01 requirements.
- B. Approved manufacturer's published complete product data for: Proposed Portland cement.
- C. Proposed grout mix designs for both fine and coarse grouts including complete identities and proportions of ingredients as well as adherence to standards where so specified. All grout shall be plant-mix.
- D. Compression test results from an independent certified testing laboratory from grout samples made from the proposed grout mix design. Test reports may be from previous Projects within the previous 6 months.
- E. Submit grout test reports indicating grout compressive strength property requirements in accordance with ASTM C476, latest edition.

1.3 QUALITY ASSURANCE

- A. Codes and Standards: Comply with the provisions of the latest edition for following codes, specifications, and standards, except as otherwise shown or specified:
  - 1. ACI 530/ASCE 5 Building Code Requirements for Masonry Structures.
  - 2. ACI 530.1/ASCE 6 Specifications for Masonry Structures.
  - 3. NCMA-TEK 23-A Grouting for Concrete Masonry Walls.
- B. Field Quality Control
  - 1. Materials may require testing and re-testing, as directed by the Architect, during



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the progress of the Work. Allow free access to material stockpiles and facilities. Tests will be performed at the Contractor's expense.

2. Do not change source or brand of masonry grout materials during the course of the Work. If changes become necessary, resubmit data for material being changed and for tests of materials in which the changed material is an ingredient.
  3. Provide grout in mock-ups as required in Section 04 20 00, Unit Masonry.
- C. Provide grout in mock-ups as required in Section 04 20 00, Unit Masonry.

### 1.4 MATERIAL STORAGE

- A. Store grout materials off the ground, under cover, using tarpaulin, felt paper, or polyethylene sheets and in a dry location.

### 1.5 TESTS FOR GROUT

- A. Gout for filling reinforced or un-reinforced concrete masonry cores or brick cavities test for compressive strength by methods as described in Section 04 05 16.
1. Provide a minimum of one set of 3 test specimens for testing per 5000 square feet of masonry wall construction, maximum.
- B. Submit written reports for each material sampled and tested. Provide the project identification name and number, date of report, name of Contractor, name of testing service, source of aggregates, material manufacturer and brand name for manufactured materials, valves specified in the referenced specification for each material, specific location where material represented by sample is used and test results. Indicate whether or not material is acceptable for intended use.
- C. If the compressive strength tests fail to meet the minimum requirements specified, the grout represented by such tests shall be considered deficient in strength.
- D. Deficient grout shall be removed and replaced by the Contractor without additional cost to the Owner.

## PART 2 - PRODUCTS

### 2.1 MATERIALS

- A. Masonry Cement: ASTM C 91.
- B. Hydrated Lime: ASTM C 207, Type S.
- C. Aggregate for Grout: ASTM C 144, except for joints less than 1/4 inch use aggregate graded with 100 percent passing the No. 16 sieve.
1. White Mortar Aggregates: Natural white sand or ground white stone



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- D. Water: Clean and potable.

## 2.2 GROUT MIXES

- A. Do not lower the freezing point of grout by use of admixtures or anti-freeze agents.
1. Do not use calcium chloride in grout.
- B. Grout for Unit Masonry and Hollow Metal Frames: Comply with ASTM C476, latest edition.
1. Fine Grout: 2000 psi average compressive strength at 28 days for 6 inches and smaller hollow concrete masonry units and between 2 wythes of masonry where space is less than 2 inches in width.
  2. Coarse Grout: 2000 psi average compressive strength at 28 days for 8 inches and larger hollow concrete masonry units and between 2 wythes of masonry where space is 2 inches in width or wider.
  3. Fine grout shall be used in hollow metal frames.
- C. Grout Proportions (by volume): Comply with Table 1, ASTM C476, latest edition.
1. Fine Grout: 1 part Portland cement, 0 to 1/10 part hydrated lime or lime putty, 2 ¼ to 3 parts fine aggregate.
  2. Coarse Grout: 1 part Portland cement, 0 to 1/10 part hydrated lime or lime putty, 2 ¼ parts fine aggregate, 1 to 2 parts coarse aggregate.
- D. Grout Slump: Properly proportioned grout shall have a slump of 8 to 11 inches as measured according to ASTM C 143.

## PART 3 - EXECUTION

### 3.1 INSTALLATION

- A. Refer to Section 04 20 00, Unit Masonry.
- B. Install fine grout in all steel frames installed in concrete and CMU walls. Do not install until asphaltic emulsion coating is installed in frames and has dried. Refer to Section 08 11 00 for additional requirements.

### 3.2 SAMPLING AND TESTING

- A. Sampling and Testing of Grout: NCMA-TEK 107, latest edition.
1. Place a piece of wood 1-5/8 inch thick and 3 inches by 3 inches on a level surface. Four masonry units with permeable paper, such as absorptive paper toweling, taped to one face shell are placed around the wood block to form the mold. The resulting mold is approximately 3 inches square by 6 inches high. Pour grout into the mold in two layers. Rod each layer 25 times with a 1 x 2 wood



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puddling stick to eliminate air bubbles. Puddle the bottom layer throughout its depth. Distribute the strokes uniformly over the cross-section of the mold. For the upper layer, allow the stick to penetrate about ½ inch into the underlying layer. After the second lift has been puddled, level the top of the prism with a trowel and immediately cover the prism with wet burlap or similar material to keep it damp. Protect the prisms against extreme changes in temperature, and after 48 hours, remove the masonry units and carefully pack the samples for transport to the laboratory where they will be stored in a moist room until tested.

2. Cap the specimens in accordance with the applicable provisions of "Method of Capping Cylindrical Concrete Specimens," ASTM C617, latest edition. The sample should be tested in a damp condition in accordance with the applicable provisions of ASTM C39 "Methods of Test Compressive Strength of Molded Concrete Cylinders", latest edition.
3. Three test samples shall be made and tested for each type of grout to be used in the work.

END OF SECTION 04 05 16



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SECTION 04 05 23  
MASONRY ACCESSORIES

PART 1- GENERAL

1.1 SUMMARY

- A. This Section specifies the masonry accessories for unit masonry materials specified in the following Sections:
  - 1. Concrete masonry units, Section 04 20 00.
- B. The types of masonry accessories required include, but may not be limited to, the following:
  - 1. Continuous horizontal wire reinforcing and ties.
  - 2. Reinforcing bars in masonry lintel block and hollow metal door frame heads.
  - 3. Vertical bars for concrete masonry.
  - 4. Grouted anchor bolts.
  - 5. Preformed expansion joint material.
  - 6. Caging devices and centering clips

1.2 SUBMITTALS

- A. Submit in accordance with Division 01 requirements.
- B. All submittals shall be approved prior to the start of masonry construction.
- C. Approved manufacturer's published, complete product data, with particular items to be provided, clearly marked thereon, for:
  - 1. Proposed masonry joint reinforcement.
- D. Complete shop drawings by approved fabricator for:
  - 1. Proposed masonry lintel and wall reinforcement. Shop drawings shall conform to Section 03 20 00 requirements.
  - 2. Show reinforcing steel in masonry walls in elevation.
- E. Submit samples of all masonry accessories for verification.

1.3 QUALITY ASSURANCE

- A. Provide accessories in mock-ups as required in Section 04 20 00, Unit Masonry.

1.4 DELIVERY, STORAGE AND HANDLING

- A. Store masonry accessories, including metal items, to prevent corrosion and accumulation of dirt and oil.





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load-bearing walls at 90 degrees shall be wire mesh wall ties made of 1/2 inch mesh by 16 gauge hot dip mill-galvanized wire, 1 inch less in width than width of wall.

- D. Caging Devices and Centering Clips
  - 1. In hollow concrete masonry cores or brick cavities to be reinforced with vertical reinforcing steel bars and filled with grout, provide 9 gauge galvanized steel caging devices. The following products are acceptable:
    - a. Rebar Positioner AA239, AA Wire Products Company, Chicago, IL
    - b. Rebar Positioner 3400, Masonry Reinforcing of America, Charlotte, NC
    - c. Spider Type Rebar Positioner, National Wire Products Industries, Baltimore, MD
- E. Grouted Anchor Bolts
  - 1. In hollow concrete masonry units: HILTI HIT C20 Renovation Anchors, Hilti, Inc., Tulsa, Oklahoma; <http://www.us.hilti.com>; or Architect approved equal.
  - 2. In solid or grouted masonry units: HILTI HIT HY150 Adhesive Anchor System, Hilti, Inc., Tulsa, Oklahoma; <http://www.us.hilti.com>; or Architect approved equal.
- F. Preformed Expansion Joint Material: Provide closed cell polyethylene expansion joints equal to "Expansion-Joint Filler" as manufactured by BASF The Chemical Company; [www.buildingsystems.basf.com](http://www.buildingsystems.basf.com) or Architect approved equal.

### PART 3 - EXECUTION

#### 3.1 INSTALLATION

- A. See Section 04 20 00, Unit Masonry, for installation of masonry accessories specified under this Section.

END OF SECTION 04 05 23



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SECTION 04 20 00  
UNIT MASONRY

PART 1 - GENERAL

1.1 SUMMARY

- A. Provide labor, materials, and equipment necessary for complete installation of unit masonry as shown on the Drawings and specified herein.
- B. Work installed under this Section, but materials or products furnished under the following Divisions or Sections:
  - 1. Masonry mortar furnished under the Work of Section 04 05 13.
  - 2. Masonry grout furnished under the Work of Section 04 05 16.
  - 3. Masonry accessories furnished under the Work of Section 04 05 23.
  - 4. Anchor bolts, steel plates, and steel lintels; refer to Structural Drawings.
  - 5. Wood blocking and nailing blocks in masonry construction; refer to Section 06 10 00.
- C. Cooperate with other trades requiring items of equipment or services to be installed within or in conjunction with Unit Masonry Work.
- D. Products installed, but not furnished, under this Section include the following:
  - 1. Hollow-metal frames in unit masonry openings, furnished under Division 8 Section "Steel Doors and Frames."

1.2 SUBMITTALS

- A. Submit in accordance with Division 1 requirements.
- B. Upon regular presentation within past 6 months of representative units by approved manufacturer, a test report from an independent laboratory showing resultant weight, compressive strength (based on net area), and water absorption properties, as well as adherances to standards where so specified, for:

Name of Manufacturer  
Date of Manufacture of Test Specimen  
Dimension Measurements (in.)  
Calculated Gross Area (sq.in.)  
Calculated Net Area (sq.in.)  
Total Load (lbs.)  
Net Unit Load (psi)  
Sample Weight (lbs.)  
Dry Weight (lbs.)  
Wet Weight (lbs.)  
Immersed Weight (lbs.)  
Density (pcf)  
Moisture Content (%)  
Absorption (%)



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- C. Letter from approved manufacturer certifying that provided units will meet or exceed qualities of tested representative units for:
  - 1. Each proposed type of concrete masonry unit.
- D. A test report from an independent testing laboratory showing compressive strength of concrete masonry prisms constructed from the concrete masonry units and mortar to be used in the masonry work for:
  - 1. Each proposed type and size of concrete masonry unit as required on the Reinforced Masonry Plans in the Drawings.
- E. Installer's examination report.
- F. Product Data: For each different masonry unit, accessory, and other manufactured product specified.
- G. Shop Drawings: Show fabrication and installation details for the following:
  - 1. Reinforcing Steel: Detail bending and placement of unit masonry reinforcing bars. Comply with ACI 315, "Details and Detailing of Concrete Reinforcement", latest edition. Show elevations of reinforced walls.
- H. Samples for Verification: Any accessories embedded in the masonry.
- I. Material Certificates: Signed by manufacturers certifying that each of the following items complies with requirements:
  - 1. Each type of masonry unit required.
  - 2. Include test data, measurements, and calculations establishing net-area compressive strength of masonry units.
  - 3. Each cement product required for mortar and grout, including name of manufacturer, brand, type, and weight slips at time of delivery.
  - 4. Each combination of masonry unit type and mortar type. Include statement of net-area compressive strength of masonry units, mortar type, and net-area compressive strength of masonry determined according to Tables 1 and 2 in ACI 530.1/ASCE 6/TMS 602, latest editions.
  - 5. Each material and grade indicated for reinforcing bars.
  - 6. Each type and size of joint reinforcement.
  - 7. Each type and size of anchor, tie, and metal accessory.

### 1.3 QUALITY ASSURANCE

- A. Codes and Standards: Comply with the provisions of the latest editions for the following codes, specifications, and standards, except as otherwise shown or specified:
  - 1. ACI 530/ASCE 5 Building Code Requirements For Masonry Structures.
  - 2. ACI 530.1/ASCE 6 Specifications for Masonry Structures.
  - 3. NCMA-TEK 70A Concrete Masonry Prism Strength.



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4. NCMA-TEK 132
  5. NCMA-TEK 23A Grouting for Concrete Masonry Walls.
  6. NCMA-TEK 65 Field Inspection of Engineered Concrete Masonry.
  7. ASTM C140 Standard Methods of Sampling and Testing Concrete Masonry Units.
  8. Comply with ALL NCMA-TEK Standards.
- B. Changes in the source or brand of masonry materials during construction will require resubmission and re-testing at the Contractor's expense.
- C. Concrete Masonry Inspection
1. Refer to Division 01 for additional requirements.
    - a. Masonry inspection is required for those masonry elements where it is imperative that construction produces elements which can attain high design strengths. These masonry elements include, but are not limited to, grout filled CMU walls, CMU bearing walls, and grout filled and vertically reinforced CMU walls, and other walls as may be indicated on the Drawings.
    - b. The Contractor responsible for this Section 04 20 00 of the Work, is responsible for the masonry inspections. Masonry inspections shall be by an independent laboratory as specified in Division 1. Submit reports as specified herein.
  2. Submit written reports for each section of wall inspected to include:
    - a. Project identification name and number.
    - b. Name of Masonry Contractor.
    - c. Name of inspecting service.
    - d. Date of report.
    - e. Specific location of work inspected.
    - f. Horizontal joint reinforcing size, type, spacing, and lap.
    - g. Preparation of cores and cavities to be grouted. Inspect every core and cavity.
    - h. Vertical reinforcing centering clip size, type, spacing, and proper alignment.
    - i. Size spacing and lap of vertical reinforcing and installation in centering clips.
    - j. Installation and vibration of grout in cores and cavities.
    - k. Remarks as to general conditions pertinent to the strength and quality of the masonry work.
  3. Inspection shall use NCMA-TEK 65 Field Inspection of Engineered Concrete Masonry and NCMA-TEK 132 Inspector's Guide for Concrete Masonry Construction as guidelines.
  4. The masonry inspection agency shall be selected prior to the pre-masonry conference and shall have the inspector who will inspect this project attend the conference.
  5. The contractor for the work of this Section shall be responsible for the masonry inspection to be performed by an independent testing laboratory.



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- D. Definitions:
  - 1. Reinforced Masonry: Masonry containing reinforcing steel in grouted cells.
  - 2. CMU: Concrete masonry unit.
- E. Source Limitations for Masonry Units: Obtain exposed masonry units of a uniform texture and color, or a uniform blend within the ranges accepted for these characteristics, through one source from a single manufacturer for each product required.

### 1.4 DELIVERY, STORAGE, AND HANDLING

- A. Deliver masonry materials to project in undamaged condition.
- B. Store and handle masonry units off the ground, under cover, and in a dry location to prevent their deterioration or damage due to moisture, temperature changes, contaminants, corrosion, and other causes. If units become wet, do not place until units are in an air-dried condition.
- C. Store cementitious materials off the ground, under cover, and in dry location.
- D. Store aggregates where grading and other required characteristics can be maintained and contamination avoided.
- E. Store masonry accessories including metal items to prevent corrosion and accumulation of dirt and oil.

### 1.5 TESTS OF CONCRETE MASONRY PRISMS

- A. For grout filled and reinforced or un-reinforced concrete masonry or brick masonry wall construction tests for the compressive strength of prisms as described in ASTM E 447, latest edition.
  - 1. Provide a minimum of one set of 3 masonry prisms for testing per each 5000 square feet of masonry wall construction as required on the Structural Masonry Plan in the Drawings.
- B. Submit written reports for each prism tested. Provide the project identification name and number, date of report, name of Contractor, name of Testing service, name of material suppliers, specific location where masonry represented by the prism is used, test results, and values specified in the referenced specification. Indicate whether or not tested prism is acceptable for intended use.
- C. If the compressive strength tests fail to meet the minimum requirements specified, the concrete masonry represented by such tests shall be considered deficient in strength.
- D. Deficient masonry construction shall be removed and replaced by the Contractor without additional cost to the Owner. In lieu of removal and replacement, additional cores may be grouted as required and directed by the Architect without additional cost to the Owner.



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1.6 PROJECT CONDITIONS

- A. Protect partially complete masonry against weather, when Work is not in progress, by covering top of walls with strong, waterproof, non-staining membrane. Extend membrane at least 2 foot down both sides of walls and anchor securely in place.
- B. Protect partially complete masonry walls against wind damage by bracing as required until support of walls is integral with the building structure.
- C. Protect masonry against freezing when the temperature of the surrounding air is 40 degrees F and falling. Heat materials and provide temporary protection of complete portions of masonry work. Comply with the requirements of the governing code and with the "Construction and Protection Recommendations for Cold Weather Masonry Construction" of the Technical Notes of Brick and Tile Construction by the Brick Institute of America (BIA).
- D. Stain Prevention: Prevent grout, mortar, and soil from staining the face of masonry to be left exposed or painted. Remove immediately any grout, mortar, and soil that come in contact with such masonry.
  - 1. Protect base of walls from rain-splashed mud and mortar splatter by means of coverings spread on ground and over wall surface.
  - 2. Protect sills, ledges, and projections from mortar droppings.
  - 3. Protect surfaces of window and door frames, as well as similar products with painted and integral finishes from mortar droppings.
- E. Hot-Weather Construction: Comply with referenced unit masonry standard.

1.7 MASONRY INSPECTION

- A. The Contractor for the Work of this Section is responsible for all masonry inspections and reports as specified herein.
- B. Provide masonry construction inspection of concrete masonry walls indicated as requiring inspection on the Masonry Plans to insure that masonry construction is in conformance with the Contract Documents. Masonry inspection is required for those masonry elements which must be constructed to attain high design strengths, such as, but not limited to, vertically reinforced grouted CMU walls, grouted CMU wall, and load-bearing CMU walls.
- C. Qualification of Inspection Agency: Refer to Division 1 requirements.
- D. Inspection shall use NCMA-TEK 65 Field Inspection of Engineered Concrete Masonry and NCMA-TEK 132 Inspector's Guide for Concrete Masonry Construction as guidelines.
- E. The individual or individuals who will perform the masonry inspection shall be present for the Pre-masonry Conference.



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- F. The masonry inspector shall prepare a written report or reports for each day of inspection.
- G. The masonry inspector shall be present and observe all grouting operations in walls requiring inspection. The masonry inspector shall be present at the project site within sufficient time, in advance of grouting operations, to inspect the construction to insure its conformance to the contract Documents and that grouting may proceed. Periodically, the masonry inspector shall be present during the placing of masonry units and reinforcement. No grouting shall be permitted unless the masonry inspector is present and has indicated that the masonry construction is properly prepared for the grouting operation.

### 1.8 PERFORMANCE REQUIREMENTS

- A. Provide unit masonry that develops the following net-area compressive strengths (f'm) at 28 days. Determine compressive strength of masonry from net-area compressive strengths of masonry units and mortar types according to Tables 1 and 2 in ACI 530.1/ASCE 6/TMS 602, latest edition.
- B. Provide unit masonry that develops the following net-area compressive strengths (f'm) at 28 days. Determine compressive strength of masonry by testing masonry prisms according to ASTM C 1314, latest edition.
  - 1. For Concrete Unit Masonry: f'm = 1500 psi.

## PART 2 - PRODUCTS

### 2.1 MATERIALS, GENERAL

- A. Comply with referenced unit masonry standard and other requirements specified in this Section applicable to each material indicated.

### 2.2 MASONRY UNITS

- A. Obtain masonry units from one manufacturer for uniform texture and color for each kind required, for each continuous area and visually related areas.
- B. Concrete Masonry Units (CMU) (NOTE: All CMU on this PROJECT to have minimum compressive strength of 1900 psi on net area.)
  - 1. Manufacturer: Shall be member of the National Concrete Masonry Association.
  - 2. Size: Manufacturer's standard units with face dimensions of 15-5/8 by 7-5/8 inches (actual).
  - 3. Special Shapes: Provide, where shown and where required, lintels, inside and outside corners, jambs, sash, control joints, headers, bond beams, bullnoses, and other special conditions.
    - a. Provide bullnose corners at all exposed external corners (except at heads), and sills.



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4. Hollow Load-Bearing (HL) CMU: Provide units complying with ASTM C90, latest edition, 2N Class Designation for the aggregates, with a minimum compressive strength of 1900 psi on the net section.
5. Normal Weight Units: ASTM C33, latest edition, concrete aggregates for a dry net weight of not less than 125 pounds per cu. ft. Strength shall be as indicated above.
6. Curing: Cure units in a non-moisture controlled atmosphere to comply with ASTM C90, latest edition, Type II.
7. Exposed Face: Manufacturer's standard color and texture. Smooth face.
8. All exterior CMU, fluted and smooth, shall contain integral color from L.M. Scofield, as selected by Architect and integral water repellent additive, "Dry-Block" by W.R. Grace; or Architect approved equal. Integral water repellent additive shall be as specified herein. 15. Provide masonry lintels at all openings greater than 1'-0" in width that occur in CMU walls.

## 2.3 MASONRY CLEANERS

- A. Job-Mixed Detergent Solution: Solution of trisodium phosphate (1/2-cup dry measure) and laundry detergent (1/2-cup dry measure) dissolved in one gallon of water.

## 2.4 SOURCE QUALITY CONTROL

- A. Concrete Masonry Unit Tests: For each type, class, and grade of concrete masonry unit indicated, units will be tested by qualified independent testing laboratory for strength, absorption, and moisture content per ASTM C 140, latest edition.

## PART 3 - EXECUTION

### 3.1 EXAMINATION

- A. Examine conditions, with Installer present, for compliance with requirements for installation tolerances and other specific conditions, and other conditions affecting performance of unit masonry.
  1. For the record, prepare written report, endorsed by Installer, listing conditions detrimental to performance of unit masonry.
- B. Examine rough-in and built-in construction to verify actual locations of piping connections prior to installation.
- C. Do not proceed until unsatisfactory conditions have been corrected.

### 3.2 INSTALLATION

- A. Comply with referenced unit masonry standard and other requirements indicated applicable to each type of installation included in Project.



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- B. Thickness: Build cavity and composite walls and other masonry construction to the full thickness shown. Build single-wythe walls to the actual thickness of the masonry units, using units of nominal thickness indicated.
- C. Build chases and recesses as shown or required to accommodate items specified in this and other Sections of the Specifications. Provide not less than 8 inches of masonry between chase or recess and jamb of openings and between adjacent chases and recesses.
- D. Leave openings for equipment to be installed before completion of masonry. After installation of equipment, complete masonry to match construction immediately adjacent to the opening.
- E. Cut masonry units with motor-driven saws to provide clean, sharp, unchipped edges. Cut units as required to provide continuous pattern and to fit adjoining construction. Use full-size units without cutting where possible.
- F. Matching Existing Masonry: Match coursing, bonding, color, and texture of new masonry with existing masonry.

### 3.3 CONSTRUCTION TOLERANCES

- A. Variation from Plumb: For vertical lines and surfaces of columns, walls and arises do not exceed 1/4" in 10", or 3/8" in a story height not to exceed 20', nor 1/2" in 40' or more. For external corners, expansion joints, control joints and other conspicuous lines, do not exceed 1/4" in any story or 20' maximum, nor 1/2" in 40' or more. For vertical alignment of head joints do not exceed plus or minus 1/4" in 10', 1/2" maximum.
- B. Variation from Level: For bed joints and lines of exposed lintels, sills, parapets, horizontal grooves and other conspicuous lines, do not exceed 1/4" in any bay or 20' maximum, nor 1/2" in 40' or more. For top surface of bearing walls do not exceed 1/8" between adjacent floor elements in 10' or 1/16" within width of a single unit.
- C. Variation of Linear Building Line: For position shown in plan and related portion of columns, walls and partitions, do not exceed 1/2" in any bay or 20' maximum, nor 3/4" in 40' or more.
- D. Variation in Cross-Sectional Dimensions: For columns and thicknesses of walls, from dimensions shown, do not exceed minus 1/4" nor plus 1/2".
- E. Variation in Mortar Joint Thickness: Do not exceed bed joint thickness indicated by more than plus or minus 1/8", with a maximum thickness limited to 1/2". Do not exceed head joint thickness indicated by more than plus or minus 1/8"

### 3.4 LAYING MASONRY WALLS

- A. Lay out walls in advance for accurate spacing of surface bond patterns with uniform joint widths and for accurate locating of openings, movement-type joints, returns, and offsets.



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Avoid the use of less-than-half-size units at corners, jambs, and where possible at other locations.

- B. Lay up walls to comply with specified construction tolerances, with courses accurately spaced and coordinated with other construction.
  - 1. For the first and second block courses above and below apertures, run reinforcing continuous or extend two feet back from aperture edge. Refer to notes on Structural drawings.
- C. Lay-up walls plumb and true and with courses level, accurately spaced and coordinated with other work. Do not wedge partitions tight against structural ceiling or beams, but provide a caulk or insulation filled joint between top of masonry and the structural roof deck, structural steel framing or structural floor deck. Stop masonry a minimum of 1/2 inch from vertical, horizontal and sloped steel surfaces.
- D. Pattern Bond: Lay concrete masonry units in running bond.
- E. Weight Requirements for CMU Units: Normal Weight: All CMU.
- F. Stopping and Resuming Work: In each course, rack back 1/2-unit length for one-half running bond or 1/3-unit length for one-third running bond; do not tooth. Clean exposed surfaces of set masonry, wet clay masonry units lightly (if required), and remove loose masonry units and mortar prior to laying fresh masonry.
- G. Built-In Work: As construction progresses, build-in items specified under this and other Sections of the Specifications. Fill in solidly with masonry around built-in items.
  - 1. Fill space between hollow metal frames and masonry solidly with mortar, unless otherwise indicated.
  - 2. Where built-in items are to be embedded in cores of hollow masonry units, place a layer of metal lath in the joint below and rod mortar or grout into core.
  - 3. Fill cores in hollow concrete masonry units with grout 3 courses (24 inches) under bearing plates, beams, lintels, posts, and similar items, unless otherwise indicated.
  - 4. Install adjustable hollow metal frame anchors, locating anchors on jambs in horizontal bed courses near the top and bottom of each frame and at intermediate points not over 24 inches apart.
  - 5. Fill jambs and heads of all hollow metal door and window frames installed in CMU or concrete walls solid with grout.
  - 6. Rake joints around exterior side of exterior hollow metal door frames for sealant under Division 07.
  - 7. Where hollow metal frames do not wrap around masonry jambs and heads, rub exposed corners of block to remove sharp, irregular edges.
  - 8. Wash brick veneer prior to installing aluminum window units.
- H. Intersecting Masonry Walls: Where interior nonload-bearing masonry partition or wall intersects an exterior or interior load-bearing masonry wall at 90 degrees, stop horizontal joint reinforcing in interior partition 4 inches short of intersection. Horizontal joint reinforcing in exterior or interior load-bearing wall shall run continuous. In the same courses as horizontal reinforcing, install wire mesh extending 8 inches minimum into



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interior partition and projecting into the exterior wall to within 2 inches of exterior face of wall. Install wire mesh reinforcing in horizontal joints 16 inches o.c. vertically.

- I. Grout masonry walls where indicated on drawings.

### 3.5 MORTAR BEDDING AND JOINTING

- A. Mix mortar ingredients for a minimum of 5 minutes in a mechanical batch mixer. Use water clear and free of deleterious materials which would impair the work. Each mortar batch is allowed only one retempering. Do not use mortar which has begun to set after the first re-tempering or if more than 2-1/2 hours has elapsed since initial mixing.
- B. Lay brick and other solid masonry units with completely filled bed and head joint; butter ends with sufficient mortar to fill head joints and shove into place. Butter ends of brick in hand and in the wall at closures. Do not slush head joints.
- C. Lay hollow concrete masonry units with full mortar coverage on horizontal and vertical face shells; also bed webs in mortar in starting course on footings and foundation walls and in all courses of piers, columns and pilasters, and where adjacent to cells or cavities to be reinforced or to be filled with concrete or grout.
- D. Joints: Maintain joint widths shown, except for minor variations required, to maintain joint alignment. Lay walls with 3/8 inch joints. Cut joints flush for masonry walls which are to be concealed or to be covered by other materials. For exposed masonry, provide joints as follows:
  1. All Exposed Joints: Concave tooled.
  2. All Concealed Joints: Struck flush.
- E. Remove masonry units disturbed after laying; clean and relay in fresh mortar. Do not pound corners at jams to fit stretcher units which have been set in position. If adjustments are required, remove units, clean off mortar, and reset in fresh mortar.

### 3.6 HORIZONTAL JOINT REINFORCEMENT

- A. Provide continuous horizontal joint reinforcing as shown and specified. Fully embed longitudinal side rods in mortar for their entire length with a minimum cover of 5/8 inch on exterior side of walls and 1/2 inch at other locations. Lap reinforcement a minimum of 6 inches at ends of units. Do not bridge control and expansion joints with reinforcing. Provide continuity at corners and wall intersections by use of prefabricated "L" and "T" sections. Cut and bend units as directed by manufacturers for continuity at returns, offsets, column fireproofing, pipe enclosures, and other special conditions.
- B. Space continuous horizontal reinforcing as specified in Section 04 05 23.
- C. Reinforce masonry openings greater than 1 foot wide, with horizontal joint reinforcing placed in 2 horizontal joints approximately 8 inches apart, both immediately above the lintel and immediately below the sill. Extend reinforcing a minimum of 2 foot beyond jambs of the opening except at control joints.



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- D. Cut or interrupt joint reinforcement at control and expansion joints, unless otherwise indicated.
- E. Provide continuity at corners and wall intersections by use of prefabricated "L" and "T" sections. Cut and bend reinforcement units as directed by manufacturer for continuity at returns, offsets, column fireproofing, pipe enclosures, and other special conditions.

### 3.7 LINTELS

- A. Install steel lintels where indicated and/or as required for masonry openings.
- B. Provide masonry lintels where shown and wherever openings of more than 1'-0" for brick size units and 2'-0" for block size units are shown without structural steel or other supporting lintels. Provide formed-in-place masonry lintels. Temporarily support formed-in-place lintels.
  - 1. For hollow concrete masonry unit walls, use specially formed bond beam units with reinforcement bars placed as indicated and filled with coarse grout.
- C. Provide minimum bearing of 8 inches at each jamb, unless otherwise indicated.
- D. For all openings in non-load bearing CMU or brick, with lintels not shown on Structural Drawings, provide the following lintels:
  - 1. CMU Lintel: Use bond beam lintel block. Fill with concrete or grout. All lintel block shall be 8" nominal height by the wall thickness. Extend lintel 24" into wall on each side of opening. Concrete or grout shall have a minimum of  $f'c = 4000$  psi. Provide 2 - #5 rebar top and bottom. Lintel shall be shored in the center for 28 days. Maximum lintel clear span = 10'-0".

### 3.8 INSTALLATION OF REINFORCED UNIT MASONRY

- A. Install reinforced unit masonry to comply with requirements of referenced unit masonry standard.
- B. Temporary Formwork: Construct formwork and shores to support reinforced masonry elements during construction.
  - 1. Construct formwork to conform to shape, line, and dimensions shown. Make sufficiently tight to prevent leakage of mortar and grout. Brace, tie, and support forms to maintain position and shape during construction and curing of reinforced masonry.
- C. Do not place grout until entire height of masonry to be grouted has attained sufficient strength to resist grout pressure.
- D. Do not remove forms and shores until reinforced masonry members have hardened sufficiently to carry their own weight and other temporary loads that may be placed on them during construction.



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3.9 VERTICAL REINFORCED CONCRETE MASONRY

- A. Where grout filled or steel reinforced concrete block masonry foundations or masonry walls are called for on the Drawings, they shall be reinforced and grouted in accordance with the Drawings and details. All cells to be grouted shall be clean and free of mortar protrusions and droppings in the cells.
- B. The low-lift grouting procedure shall be used as described in the Drawings and in NCMA-TEK 23A Grouting for Masonry Walls. Maximum height of grouting shall be 4 feet.
- C. 3000 psi grout (slump 8-9 inches) shall be installed in the block cavities so as to completely fill each cavity with homogenous grout, extending from the lowest course to the top of the reinforced portion of the foundation or wall. Concrete or mortar shall not be used as grout for CMU.
- D. After the grout is placed, it shall be consolidated with a small vibrator. The top of the grout filling shall be stopped 1-1/2 inches below the top of the concrete block, except for the top course in the wall where the grout shall be struck flush with the top. If highly absorptive masonry units are used, the grout shall be re-vibrated after it has begun to stiffen.
- E. Aggregate used in the grout shall be small enough not to interfere with placement and plasticity. Water-cement ratio shall be maintained so compressive strength at 28 days shall not be less than 3000 lbs. per sq.in.
- F. Caging devices and centering clips shall be spaced vertically such that every section of vertical reinforcing steel bar is restrained by 2 clips or devices, one near its top and one near its bottom.

3.10 REPAIRING, POINTING, AND CLEANING

- A. Remove and replace masonry units that are loose, chipped, broken, stained, or otherwise damaged or if units do not match adjoining units. Install new units to match adjoining units and in fresh mortar or grout, pointed to eliminate evidence of replacement.
- B. Pointing: During the tooling of joints, enlarge any voids or holes, except weep holes, and completely fill with mortar. Point-up all joints including corners, openings, and adjacent construction to provide a neat, uniform appearance, prepared for application of sealants.
- C. Final Cleaning: After mortar is thoroughly set and cured, clean exposed masonry as follows:
  - 1. Remove large mortar particles by hand with wooden paddles and nonmetallic scrape hoes or chisels.
  - 2. Test cleaning methods on sample wall panel; leave 1/2 panel uncleaned for comparison purposes. Obtain Architect's approval of sample cleaning before proceeding with cleaning of masonry.



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3. Protect adjacent stone and non-masonry surfaces from contact with cleaner by covering them with liquid strippable masking agent, polyethylene film, or waterproof masking tape.
  4. Wet wall surfaces with water prior to application of cleaners; remove cleaners promptly by rinsing thoroughly with clear water.
  5. Clean brick by means of bucket and brush hand-cleaning method described in BIA "Technical Note No. 20 Revised" using the following masonry cleaner:
    - a. Job-mixed detergent solution.
  6. Clean concrete masonry by means of cleaning method indicated in NCMA TEK 8-2A applicable to type of stain present on exposed surfaces.
  7. Clean all exposed concrete masonry of efflorescence in strict accordance with NCMA TEK 8-3A.
- D. Protection: Provide final protection and maintain conditions, in a manner acceptable to Installer, that ensure unit masonry is without damage and deterioration at time of Substantial Completion.

END OF SECTION 04 20 00



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**Division 06**  
Wood, Plastics and Composites





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SECTION 06 10 00  
ROUGH CARPENTRY

PART 1 - GENERAL

1.1 SUMMARY

A. Section includes:

1. Wood grounds, nailers, blocking, and sleepers
2. Plywood Backer Panels
3. Roof sheathing.

B. Wood Grounds, Nailers and Blocking

1. All wood used in roof construction shall be non-treated wood blocking.
2. All wood used in contact with concrete, masonry, and foundations shall be pressure treated with stainless steel fasteners.

1.2 REFERENCES

- A. Lumber Standard: Comply with PS-20 and with applicable rules of the respective grading and inspecting agencies for species and products indicated.
- B. Plywood Product Standards: Comply with PS 1 (ANSI A199.1) or, for products not manufactured under PS 1 provisions, with applicable APA Performance Standard PRP-108 for type of panel indicated.

1.3 DEFINITIONS

- A. Rough carpentry includes carpentry work not specified as part of other Sections and generally not exposed, unless otherwise specified.

1.4 SUBMITTALS

A. Product Data:

1. Chemical treatment manufacturer's instructions for handling, storing, installation, and finishing of treated material
2. Treating plant's certification of compliance stating type of preservative used and method of treatment employed, net amount of preservative retained, and compliance with applicable standards
3. For water-borne treated products include statement that moisture content of treated materials was reduced to levels indicated prior to shipment to project site.

- B. Certification that chemical treatment complies with specification for each type of treatment.

1.5 JOB CONDITIONS

- A. Examine substrates and supporting structure and the conditions under which work is to



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be installed. Do not proceed with the installation until unsatisfactory conditions have been corrected.

### 1.6 DELIVERY, STORAGE, AND HANDLING

- A. Keep materials under cover and dry. Protect against exposure to weather and contact with damp or wet surfaces. Stack lumber as well as plywood and other panels; provide for air circulation within and around stacks and under temporary coverings including polyethylene and similar materials.
  - 1. For pressure treated lumber and plywood, place spacers between each bundle to provide air circulation.

### 1.7 QUALITY ASSURANCE

- A. Ensure all preservative is adequately fixed in wood. Reject lumber with surface residues of white salts. Provide wood that is kiln-dried after treatment or prefinished with a sealer.
- B. Obtain approvals from Building Official for alternative wood preservative treatment.
- C. No products used within the interior of the building shall contain urea formaldehyde glue.

## PART 2 - PRODUCTS

### 2.1 LUMBER, GENERAL

- A. Lumber Standards: Furnish lumber manufactured to comply with PS 20 "American Softwood Lumber Standard" and with applicable grading rules of inspection agencies certified by American Lumber Standards Committee's (ALSC) Board of Review.
- B. Inspection Agencies: SPIB - Southern Pine Inspection Bureau.
- C. Grade Stamps: 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.
- D. Nominal sizes are indicated, except as shown by detail dimensions. Provide actual sizes as required by PS 20, for moisture content specified for each use.
  - 1. Provide dressed lumber, S4S, unless otherwise indicated.
  - 2. Provide seasoned lumber with 19 percent maximum moisture content at time of dressing and shipment for sizes 2 inches or less in nominal thickness, unless otherwise indicated.
  - 3. "Standard" grade.
  - 4. Southern Pine graded under SPIB rules.



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2.2 WOOD GROUNDS, NAILERS, BLOCKING, AND SLEEPERS

- A. Provide lumber for support or attachment of other construction including rooftop equipment curbs and support bases, cant strips, bucks, nailers, blocking, furring, grounds, stripping, and similar members.
- B. Fabricate miscellaneous lumber from dimension lumber of sizes indicated and into shapes shown.
- C. Grade: "Standard" grade light-framing-size lumber of any species or board-size lumber as required. No. 2 Boards per SPIB rules.
- D. Wood grounds, nailers, and sleepers shall be pressure treated as specified herein.

2.3 PLYWOOD PANELS

- A. Construction Panel Standards: Comply with PS 1 "U.S. Product Standard for Construction and Industrial Plywood" for plywood construction panels and, for products not manufactured under PS 1 provisions, with APA PRP-108.
- B. Trademark: Furnish construction panels that are each factory-marked with APA trademark evidencing compliance with grade requirements.
- C. Electrical or Telephone Equipment Backing Panels: DOC PS-1, Exposure 1 CD Plugged, fire retardant treated, Thickness: Minimum 15/32 inch. Paint per Division 15.
- D. Roof Sheathing: APA RATED SHEATHING. See Structural Drawings.

2.4 FASTENERS

- A. Provide fasteners of size and type indicated that comply with requirements specified in this article for material and manufacture.
  - 1. Where rough carpentry is exposed to weather, in ground contact, or in area of high relative humidity, provide fasteners of AISI Type 304 stainless steel.
- B. Nails, Wire, Brads, and Staples: FS FF-N-105.
- C. Power Driven Fasteners: National Evaluation Report NER-272.
- D. Wood Screws: ASME B18.6.1.
- E. Lag Bolts: ASME B18.2.1.
- F. Bolts: Steel bolts complying with ASTM A 307, Grade A; with ASTM A 563 hex nuts and where indicated, flat washers.



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2.7 PRESSURE TREATMENT OF WOOD

A. Preservative Treatment

1. ACQ - Ammoniacal copper quarternary compound: Pressure-injected
2. Use 0.25 lb/cu ft retention
3. Kiln dry after treatment to 19 percent maximum moisture content for lumber and 18 percent for plywood
4. Optional Preservative Treatment: CDDC: Copper hydroxide sodium dimethyldithiocarbamate

B. Other acceptable products:

1. NatureWood by Osmose, Inc., Griffin, Georgia

PART 3 - EXECUTION

3.1 INSTALLATION, GENERAL

- A. Discard units of material with defects that impair quality of rough carpentry construction and that are too small to use in fabricating rough carpentry with minimum joints or optimum joint arrangement.
- B. Set rough carpentry to required levels and lines, with members plumb and true to line and cut and fitted.
- C. Fit rough carpentry to other construction; scribe and cope as required for accurate fit. Coordinate location of furring, nailers, blocking, grounds, and similar supports to allow attachment of other construction.
- D. Securely attach rough carpentry work to substrate by anchoring and fastening as indicated.
- E. Use screws, unless otherwise indicated. Select fasteners of size that will not penetrate members where opposite side will be exposed to view or will receive finish materials. Make tight connections between members. Install fasteners without splitting of wood; pre-drill as required.

3.2 WOOD GROUNDS, NAILERS, BLOCKING, AND SLEEPERS

- A. Install wood grounds, nailers, blocking, and sleepers where shown and where required for screeding or attachment of other work. Form to shapes as shown and cut as required for true line and level of work to be attached.
- B. Attach to substrates as required to support applied loading. Countersink bolts and nuts flush with surfaces, unless otherwise indicated. Build into masonry during installation of masonry work. Where possible, anchor to formwork before concrete placement.



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

### 3.3 INSTALLATION OF CONSTRUCTION PANELS

- A. Comply with applicable recommendations contained in Form No. E30, "APA Design/Construction Guide - Residential & Commercial," for types of construction panels and applications indicated.
- B. Fastening: Plywood Backing Panels: Nail, bolt, or screw to supports.

END OF SECTION 06 10 00



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SECTION 06 41 00  
MILLWORK

PART 1 - GENERAL

1.1 SUMMARY

- A. Section includes, but not limited, to the following:
  - 1. Plastic laminate cabinets
  - 2. Solid surfacing countertops

1.2 DEFINITIONS

- A. Exposed Surfaces:
  - 1. Surfaces visible when doors and drawers are closed.
  - 2. Bottoms of cases more than 4 feet above floor.
  - 3. Visible members in open cases or behind glass doors
- B. Semi-Exposed Surfaces:
  - 1. Members behind opaque doors, such as shelves, divisions, interior faces of ends, case back, drawer sides, backs and bottoms, and back face of doors.
  - 2. Tops of cases 6'-6" or more above floor.
- C. Concealed Surfaces: Surfaces not visible after installation.

1.3 SUBMITTALS

- A. Product Data: Maintenance recommendations
- B. Shop Drawings:
  - 1. Details and sizes including methods of attachment
  - 2. Type and locations for support within walls
  - 3. Field verified dimensions
  - 4. Indicate utility locations to be coordinated with other trades
- C. Samples
  - 1. Full range of colors, textures, and patterns available for plastic laminate, edging and solid surfacing.
  - 2. Pull
- D. Sample Guarantee

1.4 JOB CONDITIONS

- A. Take field measurements. Show measurements on Shop Drawings.



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- B. Deliver casework only after wet work is complete and relative humidity is maintained within manufacturer's recommended range for one week. Store in ventilated spaces. Protect against damage during installation through the Date of Substantial Completion.

### 1.5 QUALITY ASSURANCE

- A. Defective workmanship or damaged components shall be corrected, repaired, or replaced as requested by the Architect, without further cost to the Owner.
- B. Manufacturer Qualifications: Minimum 7 years experience in the manufacturer and installation of the type of cabinets specified.
- C. Installer Qualifications: Minimum 5 years experience in the installation of the type of cabinets specified.
- D. Coordinate delivery of templates and other similar items from other trades necessary for the construction of required casework units.
- E. Coordinate submittals with construction schedule ensuring timely review to avoid delays from installation.
- F. Coordinate required in-wall blocking for adjustable shelving.
- G. Casework shall be manufactured and install to meet the requirements of the 2007 Florida Building Code with the 2009 Supplement and the Florida Fire Prevention Code 2004.
- H. Comply with Section 1600 – Modular Cabinets of the Architectural Woodwork Institute's Architectural Woodwork Quality Standards.

### 1.6 GUARANTEE

- A. 3 years from the Date of Substantial Completion against defects in material and workmanship. Cover repair or replacement, without cost to the Owner, of items that become defective within the 3-year period. Exception: Damage caused by improper operation or misuse.

### 1.7 FLORIDA ACCESSIBILITY CODE FOR BUILDING CONSTRUCTION

- A. Casework shall conform with the Accessibility Requirements Manual from the Florida Department of Community Affairs, Florida Board of Building Codes and Standards.

## PART 2 - PRODUCTS

### 2.1 GENERAL WORKMANSHIP

- A. Coordinate with other trades for required dimensions of items to be built into casework.



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- B. Provide removable or false backs for access or concealment of heating or plumbing items.

2.2 MATERIALS

A. Plastic Laminate

- 1. Acceptable Manufacturers: Wilsonart, Pionite, Formica, and Nevamar
- 2. Decorative Laminates
  - a. High-pressure decorative laminate VGS (.028), NEMA LD 3-1995
  - b. High-pressure decorative laminate HGS (.048), NEMA LD 3-1995
  - c. High-pressure cabinet liner CLS (.020), NEMA LD 3-1995
  - d. High-pressure backer BKH (.028) NEMA LD 3-1995
- 3. Exposed horizontal surfaces: HGS
- 4. Exposed, interior and exterior vertical surfaces: VGS
- 5. Backing sheet for concealed surfaces: BKH or CLS for balanced panel.
- 6. Backing sheet for semi-exposed surfaces: BKH
- 7. Color (all surfaces): Selected by Architect.

B. Edging Material

- 1. High impact PVC extrusion, with satin finish
- 2. Door and Drawer Fronts: 3mm, machine profile to 1/8 inch radius
- 3. Horizontal and Vertical Front Cabinet Members: 1mm thick
- 4. Colors: Selected by Architect

C. Core Materials:

1. Formaldehyde-Free Particleboard

- a. Cabinets: Provide Premium Industrial Grade, minimum 47 pound density, conforming to ANSI A208.1 – 1999, M3, formaldehyde-free particleboard.
- b. Particle board Specifications

1)	Modules or Rupture, lb. per sq.in. ....	2500
2)	Modulus of Elasticity, lb. per sq. in. ....	450000
3)	Internal Bond, lb. per sq. in. ....	100
4)	Thickness Swell (24 hr immerse).....	4%
5)	Moisture Content % by weight.....	6.0
6)	Screw Holding Face.....	330
7)	Screw Holding Edge.....	250
8)	Surface Strength lb. per sq. in. ....	275
9)	Hardness lb. ....	900

- 2. Hardboard: ANSI A135.4, Class 1 tempered, smooth, 2 sides equal to "Duron" by U.S. Gypsum Company.

3. Hardwood and Hardwood Plywood

- a. Solid lumber or plywood concealed members; solid wood to be hardwood, kiln dried, select Poplar, Fir, or mill option lumber and plywood shall be Baltic Birch 7-ply, cabinet grade.



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## D. Adjustable shelving:

1. Standards: Knape & Vogt #85
2. Brackets: Knape & Vogt #185 with # 106 Shelf Rest
3. Finish: As selected by Owner
4. Provide flathead screws for mounting.

## E. Solid Surfacing Countertops

1. Homogeneous filled acrylic; not coated, laminated or of composite construction; meeting ANSI Z124.3 & 6, Type Six, and Fed. Spec. WW-P-541E/GEN.
2. Material shall have minimum physical and performance properties specified.
3. Superficial damage to a depth of 0.010" shall be repairable by sanding and polishing.
4. Performance Properties
  - a. Tensile Strength.....6000 psi per ASTM D 638
  - b. Flexural Strength.....7890 psi per ASTM D 790
  - c. Elongation.....0.4% per ASTM D 638
  - d. Wear and Cleanability.....passes ANSI Z 124.3
  - e. Stain Resistance.....passes ANSI Z124.3
5. Accessories
  - a. Joint adhesive shall be manufacturer's standard, two-part adhesive.
  - b. Panel adhesive shall be manufacturer's standard neoprene based panel adhesive meeting ANSI A 136.1 UL listed.
  - c. Sealant shall be mildew resistant silicone.
6. Manufacturer: "Corian" as manufactured by DuPont; or Owner approved equal.

## 2.3 HARDWARE AND MISCELLANEOUS

### A. Hinges

1. Steel, institutional 5 knuckle with interlaying leaves, 270-degree swing, hospital tipped with non-removable pins fastened with 4 screws each leaf into faces. No edge fastening allowed.
2. Thickness .090 inch minimum
3. Doors 48 inches and over shall have 3 hinges per leaf
4. Finish: Powder coat baked-on enamel, color as selected by Architect.

### B. Pulls

1. Bent wire type, solid anodized aluminum or stainless steel.
2. Accurately position on drawer and door fronts
3. Through fastened with machine screws

### C. Drawer Slides

1. Manufacturer's standard, epoxy coated metal, nylon rollers, 100 pounds dynamic



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- load (or) European style, bottom mounted, captive profile, epoxy finished, nylon rollers, and 100 pounds dynamic loading with positive in-stop and out-stop.
  2. Provide full extension at designated drawers
  3. Provide outstop and outkeeper to maintain drawer in 80 percent open position.
  4. File drawers and paper storage drawers: Same as above except full extension and load rating static position to be no less than 125 pounds, Blum No. BS 430E.
- D. Adjustable Shelf Supports: Manufacturer's standard stainless steel or cadmium plated, 2 pin, anti-lift, minimum 200 pounds capacity support clip. Support to accept either 3/4 inch or 1-inch thick shelf.
- E. Catches: Magnetic type, adjusted for maximum 5-pound pull. Attach with screws and slotted for adjustment.

## 2.4 CABINET CONSTRUCTION

- A. Cabinet Base: 4-inch high, 3/4 inch CDX pressure-treated plywood. Provide additional center support for cabinets over 24 inches wide.
- B. Cabinets
1. Sides, bottom, and top: Constructed of glued and spline doweled 3/4 inch formaldehyde-free particleboard providing balanced construction, surfaced with cabinet liner CLS for semi-exposed and vertical grade laminate for exposed locations.
  2. Back panel: Constructed of minimum 1/4 inch prefinished tempered hard board, surfaced with CLS for semi-exposed and vertical grade laminate for exposed locations, inset and glued into sides, bottom, and top.
  3. Exposed backs: Constructed of 3/4 inch formaldehyde-free particleboard, surfaced with vertical grade laminate of balanced construction for semi-exposed locations, glued and spline doweled, and mechanically attached if required.
  4. Intermediate support rail: Minimum 3/4 inch formaldehyde-free particleboard, surfaced with vertical grade laminate of balanced construction, glued and doweled into cabinet sides.
  5. Hanger rails: Two located at top and bottom of cabinet back, 3 on tall cabinets, locate at top, bottom, and center of 3/4 inch particleboard.
- C. Fixed and Adjustable Shelves and Dividers
1. One inch formaldehyde-free particleboard shelves.
  2. Exposed Locations: Vertical grade plastic laminate both sides. Color to match cabinet exterior plastic laminate or as selected by Architect.
  3. Semi-exposed locations: VGS or CLS
  4. Front and back leading edges shall be edged with flat 1mm thick high impact PVC edging to match shelf color.
  5. Number of adjustable shelves provided, unless indicated otherwise on the Drawings or on the Schedule
    - a. Low and tall cabinets

1 up to 24 inches	4 up to 72 inches
2 up to 36 inches	5 up to 84 inches
3 up to 60 inches	6 up to 96 inches



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- b. Wall hung cabinets
    - 0 up to 24 inches
    - 1 up to 30 inches
    - 2 up to 36 inches
    - 3 up to 40 inches
  - 6. Adjustable dividers: 1/4-inch minimum thickness, prefinished tempered hardboard or plywood, smooth both faces, retained by molded plastic support clip.
  - 7. Fixed dividers: Constructed of 3/4 inch formaldehyde-free particleboard, surfaced with vertical grade laminate, providing balanced construction; glued and spline doweled. PVC edged to match laminate or adjacent PVC edging.
- D. Cabinet Doors
- 1. 3/4 inch formaldehyde-free particleboard
  - 2. High pressure plastic vertical grade laminate exterior and interior.
  - 3. Doors 48 inches and less in length shall have 2 hinges per door; doors over 48 inches in length shall have 3 hinges per door.
  - 4. Corners: Square with radiused edges, 3mm PVC edging.
- E. Drawers
- 1. Manufacturers standard construction of minimum components listed below; or high density formaldehyde-free fiber board; glued and doweled or dovetail jointed; surfaced with vertical grade laminate of balanced construction. Bottoms constructed of minimum 1/4-inch tempered hardboard, surfaced to match drawer sides, inset and glued to four sides.
  - 2. Drawer Bodies: 1/2-inch construction.
  - 3. Drawer Face
    - a. Constructed of minimum 3/4-inch formaldehyde-free particleboard, surfaced with VGS, screw attached to the drawer box.
      - 1) Corners: To match doors.
      - 2) Edging: To match doors.
      - 3) Plastic Laminate: To match doors.
  - 4. File Drawers: File drawers shall be constructed in accordance with standard drawers specified above with the following: Include front-to-back and side-to-side hanger file capability with hanger channel for letter size files integral with file drawer sides and 3/16-inch by 1/2-inch removable steel channel to span side-to-side for legal size hanging files.
- F. Counter tops and backsplashes are all Corian solid surfacing.
- 1. Provide 1 inch beveled edges at all countertops.
- G. Sealants: Fully bed and seal splashes to tops and to other splashes with Dow Corning 786 Mildew Resistant Silicone Sealant, clear; or Architect approved equal.



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PART 3 - EXECUTION

3.1 PREPARATION

- A. Examine conditions under which casework will be installed. Do not proceed with installation until all unsatisfactory conditions have been corrected.
- B. Condition casework to conditioned space prior to installation.

3.2 INSTALLATION

- A. Erect casework, plumb, level, true, and straight without distortion.
- B. Countertops shall be installed flush against wall. Provide clear sealant at top and around ends of countertops, endsplashes, and backsplashes where they meet wall surfaces. Installed to within 1/8-inch of level in a 10-foot length in any direction. Seams to be flush.
  - 1. Scribe tops and backsplashes to walls and other adjoining vertical surfaces.
- C. Use filler sections and scribe panels to fit cabinetwork to required dimensions.
- D. Provide all items and accessories as required for a complete installation in every respect.
- E. Upper cabinets shall always be aligned with base cabinets unless otherwise approved by Architect.

3.3 ADJUSTMENT

- A. Adjust casework and hardware so that doors and drawers operate smoothly and within accessibility requirements.
- B. End cabinets placed against corners or where they tee into other cabinets or obstacles shall be provided with chain or bracket stops on the inside of the doors to prevent the door or door handles from hitting the obstruction.

3.4 CLEANING

- A. Exposed surfaces, edges, and cabinet interior shall be cleaned, and construction and installation marks removed prior to acceptance by Owner.

3.5 GENERAL INSTALLATION PROVISIONS

- A. Inspect both the substrate and conditions under which Work is to be performed. Do not proceed until unsatisfactory conditions have been corrected in an acceptable manner.
- B. Comply with manufacturer's installation instructions and recommendations, to the extent that those instructions and recommendations are more explicit or stringent than requirements contained in Contract Documents.



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- C. Inspect materials or equipment immediately upon delivery and again prior to installation. Reject damaged and defective items.
- D. Provide attachment and connection devices and methods necessary for securing Work. Secure Work true to line and level. Allow for expansion and building movement.
- E. Visual Effects: Provide uniform joint widths in exposed Work. Arrange joints in exposed Work to obtain the best visual effect. Refer questionable choices to the Architect for final decision.
- F. Recheck measurements and dimensions, before starting each installation.
- G. Install each component during Project status that will ensure the best possible results. Isolate each part of the completed construction from incompatible material as necessary to prevent deterioration.
- H. Mounting Heights: Where mounting heights are not indicated, install individual components at standard mounting heights recognized within the industry for the particular application indicated. Refer questionable mounting height decisions to the Architect for final decision.

END OF SECTION 06 41 00

**Division 07**  
Thermal and Moisture Protection





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SECTION 07 11 16  
CEMENTITIOUS DAMPPROOFING

PART 1 - GENERAL

1.1 SUMMARY

- A. This Section includes cementitious dampproof coating on exterior side of CMU walls as substrate to exterior stucco finish.

1.2 SUBMITTALS

- A. Submit in accordance with Division 01 requirements.
- B. Product Data: Include data substantiating that materials comply with specified requirements for dampproofing material specified.

1.3 QUALITY ASSURANCE

- A. Installer Qualifications: Engage an experienced installer who has completed bituminous dampproofing work similar in material, design, and extent to that indicated for Project and that has resulted in construction with a record of successful in-service performance.
- B. Single-Source Responsibility: Obtain primary dampproofing materials and primers from a single manufacturer. Provide secondary materials only as recommended by manufacturer of primary materials.

1.4 PROJECT CONDITIONS

- A. Substrate: Proceed with dampproofing work only after substrate construction and penetrating work have been completed. Starting work means acceptance of substrate.
- B. Weather: Proceed with dampproofing work only when existing and forecast weather conditions will permit work to be performed in accordance with manufacturer's recommendations.
- C. Ventilation: Provide adequate ventilation during application of solvent-based components in enclosed spaces. Maintain ventilation until dampproofing membrane has thoroughly cured.

PART 2 - PRODUCTS

2.1 MANUFACTURER

- A. Material for cementitious dampproof coating shall be cementitious material of a consistency suitable for application by troweling.
  - 1. Basis of Design: "Super Thoroseal" by Thoro Consumer Products, BASF Construction Chemicals, Cleveland, Ohio



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- B. Products from manufacturers are also acceptable provided compliance with all technical requirements as specified herein and as approved by the Architect.

PART 3 - EXECUTION

3.1 PREPARATION OF SUBSTRATE

- A. Clean substrate of projections and substances detrimental to work, including existing paint removal; complying with recommendations of manufacturer.
- B. Install cant strips and similar accessories as shown and as recommended by prime materials manufacturer even though not shown.
- C. Fill voids, seal joints, and apply bond breakers (if any) as recommended by prime materials manufacturer, with particular attention at construction joints.
- D. Install separate flashings and corner protection stripping as recommended by prime materials manufacturer, where indicated to precede application of dampproofing. Comply with details shown and manufacturer's recommendations. Give particular attention to requirements at building expansion joints, if any.
- E. Prime substrate as recommended by prime materials manufacturer.
- F. Protection of Other Work: Do not allow liquid and mastic compounds to enter and clog drains and conductors. Prevent spillage and migration onto other surfaces of work, by masking or otherwise protecting adjoining work.
- G. Before applying dampproofing, fill cracks, holes, voids, and open areas in surfaces. Surfaces shall be dry and free of dirt, grease, excess mortar, or other foreign matter that might interfere with adhesion and penetration of the coating. Surface shall be dry and free of dust or loose particles.

3.2 INSTALLATION

- A. Comply with manufacturer's recommendations for brushed application, except where more stringent requirements are indicated or specified and where project conditions require extra precautions or provisions to ensure satisfactory performance of work.
- B. Install in strict accordance with the manufacturers written installation instructions.
- C. Provide all items and accessories as required for a complete installation in every respect.

3.3 APPLICATION

- A. Apply in two (2) coats in strict accordance with the manufacturers written installation instructions.



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3.4 PROTECTION

- A. After the mastic has set, cover dampproofing mastic with a protective board course. As soon as solvents have left the mixture, apply one board layer over the entire surface of the mastic, holding in place with spots of additional mastic.

3.5 GENERAL INSTALLATION PROVISIONS

- A. Inspection of Conditions: Require the Installer of each major component to inspect both the substrate and conditions under which Work is to be performed. Do not proceed until unsatisfactory conditions have been corrected in an acceptable manner.
- B. Manufacturer's Instructions: Comply with manufacturer's installation instructions and recommendations, to the extent that those instructions and recommendations are more explicit or stringent than requirements contained in Contract Documents.
- C. Inspect materials or equipment immediately upon delivery and again prior to installation. Reject damaged and defective items.
- D. Provide attachment and connection devices and methods necessary for securing Work. Secure Work true to line and level. Allow for expansion and building movement.
- E. Visual Effects: Provide uniform joint widths in exposed Work. Arrange joints in exposed Work to obtain the best visual effect. Refer questionable choices to the Architect for final decision.
- F. Recheck measurements and dimensions, before starting each installation.
- G. Install each component during weather conditions and Project status that will ensure the best possible results. Isolate each part of the completed construction from incompatible material as necessary to prevent deterioration.
- H. Coordinate temporary enclosures with required inspections and tests, to minimize the necessity of uncovering completed construction for that purpose.

END OF SECTION 07 11 16



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SECTION 07 21 00  
BUILDING INSULATION

PART 1 - GENERAL

1.1 SUMMARY

- A. This Section includes the following types of insulation:
1. Miscellaneous stuffing insulation.
  2. Kraft-faced batt insulation.
  3. High PSI rigid insulation

1.2 SUBMITTALS

- A. Submit in accordance with Division 1 requirements.
- B. Submit complete product data for each material proposed to be provided.
- C. Submit complete manufacturers installation instructions for each type of insulation as specified.
- D. Submit manufacturer's certificate certifying that insulation meets or exceeds specified requirements.

1.3 QUALITY ASSURANCE

- A. Insulation shall be legibly marked with the following data:
1. Its "R" value per inch and the mean test temperature
  2. The manufacturer's name
  3. The insulation type and its trade name
  4. Water vapor transmission (perm inch average)
  5. UL rating - flame spread, fuel contribution, smoke developed (ASTM E84 and D1692, latest edition)
- B. The "R" values indicated are for the insulation tested at 75 degrees F mean temperature. It shall be for the total thickness of the insulation and shall exclude surface resistance. Manufacturers shall certify that their insulation complies with these requirements.
- C. Insulation delivered to the job without this identification or being less efficient than the insulation specified will be rejected.
- D. Fire-Test-Response Characteristics: Provide insulation and related materials with the fire-test-response characteristics indicated, as determined by testing identical products per test method indicated below by UL or another testing and inspecting agency acceptable to authorities having jurisdiction. Identify materials with appropriate markings of applicable testing and inspecting agency. Comply with the provisions of the latest editions for the following codes, specifications, and standards:
1. Surface-Burning Characteristics: ASTM E 84.



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2. Combustion Characteristics: ASTM E 136.
- E. Toxicity/Hazardous Materials: Products containing urea-formaldehyde will not be permitted.

1.4 DELIVERY, STORAGE AND HANDLING

- A. Protect insulation materials from physical damage and from deterioration by moisture, soiling, and other sources. Store inside and in a dry location. Comply with manufacturer's written instructions for handling, storing, and protecting during installation.
- B. Protect plastic insulation as follows:
1. Do not expose to sunlight, except to extent necessary for period of installation and concealment.
  2. Protect against ignition at all times. Do not deliver plastic insulating materials to Project site before installation time.
  3. Complete installation and concealment of plastic materials as rapidly as possible in each area of construction.

PART 2 - PRODUCTS

2.1 MISCELLANEOUS STUFFING INSULATION

- A. Shall be inorganic (nonasbestos) mineral wool insulation without facing, for the purpose of filling and stuffing openings in walls around pipes, structural components, conduits, expansion joints to eliminate noise transfer and to insulate. Use to seal top of interior walls, not fire rated walls, between masonry and roof deck, or as otherwise indicated. Use at expansion joints as detailed or as otherwise indicated. Insulation shall have a flame spread rating of 15 or less, and a smoke development rating of 0; per ASTM E84, latest edition. Approved manufacturers are as follows:
1. "Industrial Bulk Wool" packing wool fibers by Thermafiber Corporation, Wabash, Indiana; [www.thermafiber.com/](http://www.thermafiber.com/)
  2. Rock Wool Manufacturing Company, Leeds, Alabama; [www.deltainsulation.com/](http://www.deltainsulation.com/)
  3. Roxul AFB, Milton, Ontario, [www.roxul.com](http://www.roxul.com)

2.2 FOIL-FACED BATT INSULATION

- A. Foil-faced preformed formaldehyde-free glass fiber batt insulation conforming to ASTM C665, Type III, Class B, Category 1. Foil facing shall have a perm rating of 0.5. Flame spread shall be 25, smoke developed 50 in accordance with ASTM E136 and ASTM C84. Approved manufacturers are as follows:
1. JohnsManville, Denver, Colorado; <http://www.jm.com/>
  2. Other manufacturers are acceptable provided they can provide a formaldehyde-free glass fiber batt insulation. Submit request for product approval at least 10 days prior to bid due date to the Architect.



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2.3 HIGH PSI RIGID INSULATION

- A. Extruded polystyrene rigid insulation shall conform to ASTM C578, latest edition, Type V, minimum 100 psi compressive strength. Board edges shall be tongue and groove. Thickness shall be 2" or as otherwise indicated. Minimum aged R value of 5.0 per inch. Approved manufacturers are as follows:
  - 1. Basis of Design: Dow Styrofoam Highload 100, Dow Chemical Corporation;  
[www.dow.com/styrofoam](http://www.dow.com/styrofoam)
- B. Products from manufacturers are also acceptable provided compliance with all technical requirements as specified herein and as approved by the Architect.
- C. Provide limited 15 year warranty that insulation's actual thermal resistance will not vary by more than ten percent from its published aged R-value.

PART 3 - EXECUTION

3.1 PREPARATION

- A. Prepare surfaces and areas to receive insulation material as required by the manufacturer. Do not install materials in unsatisfactory areas or to improperly prepared surfaces.

3.2 GENERAL INSTALLATION

- A. Coordinate application of insulation with the appropriate building trades involved.
- B. The installer doing the insulation work shall furnish adhesives or attaching means, if required, so that insulation material will be properly held in alignment and permanently attached to the surfaces which they are to be applied without damaging surface.
- C. Apply insulation units to substrates by method indicated, complying with manufacturer's written instructions. If no specific method is indicated, bond units to substrate with adhesive or use mechanical anchorage to provide permanent placement and support of units.
- D. Comply with insulation manufacturer's written instructions applicable to products and application indicated.
- E. Install insulation that is undamaged, dry, and unsoiled and that has not been left exposed at any time to ice and snow.
- F. Extend insulation in thickness indicated to envelop entire area to be insulated. Cut and fit tightly around obstructions and fill voids with insulation. Remove projections that interfere with placement.
- G. Water-Piping Coordination: If water piping is located on inside of insulated exterior walls, coordinate location of piping to ensure that it is placed on warm side of insulation and insulation encapsulates piping.



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- H. Apply single layer of insulation to produce thickness indicated, unless multiple layers are otherwise shown or required to make up total thickness.

### 3.3 MINERAL WOOL INSULATION

- A. Where the Drawings call for interior walls to extend to deck or roof, openings in walls between rooms above the ceiling shall be sealed with mineral wool placed or stuffed in openings to eliminate noise transfer and air movement. Mineral wool insulation shall be provided at other building locations indicated or requiring minor fill to eliminate air movement.
  - 1. Also use mineral wool stuffing at the transition between rigid and semi-rigid insulations where the GWB ends within the interstitial space above the ceiling on exterior tilt wall applications

### 3.4 BATT INSULATIONS

- A. Install in areas as indicated. Install in strict accordance with the manufacturers written installation instructions. Install in all exterior wall voids, behind beams, and concealed locations in the exterior walls and roof areas of the building whether or not indicated. All gaps shall be filled with batt insulation.
- B. Install thermal insulation as follows:
  - 1. Erect insulation vertically and hold in place with Z-furring members spaced 24 inches o.c.
  - 2. Except at exterior corners, securely attach narrow flanges of furring members to wall with concrete stub nails, screws designed for masonry attachment, or powder-driven fasteners spaced 24 inches o.c.
  - 3. At exterior corners, attach wide flange of furring members to wall with short flange extending beyond corner; on adjacent wall surface, screw attach short flange of furring channel to web of attached channel. Start from this furring channel with standard width insulation panel and continue in regular manner. At interior corners, space second member no more than 12 inches from corner and cut insulation to fit.
  - 4. Until gypsum board is installed, hold insulation in place with 10-inch staples fabricated from 0.0625-inch (16-gage)-diameter tie wire and inserted through slot in web of member.
- C. Kraft-faced batt insulation shall be taped and sealed continuous and full height at all locations. The kraft-face forms the vapor barrier. Seal all penetrations and overlap side laps of kraft-face to form a continuous vapor barrier.
- D. All voids in the perimeter of the building shell shall be filled and closed with batt insulation or miscellaneous mineral wool stuffing insulation, whether or not indicated or shown. This includes behind all steel beams, wide flange beams, channels, CMU, miscellaneous framing, etc.



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3.5 RIGID INSULATIONS

- A. Install with adhesive as recommended by the manufacturer with all edges butted tightly. Gaps greater than 1/16" will not be allowed. Seal all edges with sealant as recommended by the manufacturer. Install in strict accordance with the manufacturers written installation instructions.

3.6 CLEAN UP

- A. Clean up all wrappings, scrap, and cut material waste at the end of each day's work. Refer to Section 01 74 13 for additional requirements.

3.7 GENERAL INSTALLATION PROVISIONS

- A. Inspection of Conditions: Require the Installer of each major component to inspect both the substrate and conditions under which Work is to be performed. Do not proceed until unsatisfactory conditions have been corrected in an acceptable manner.
- B. Manufacturer's Instructions: Comply with manufacturer's installation instructions and recommendations, to the extent that those instructions and recommendations are more explicit or stringent than requirements contained in Contract Documents.
- C. Inspect materials or equipment immediately upon delivery and again prior to installation. Reject damaged and defective items.
- D. Provide attachment and connection devices and methods necessary for securing Work. Secure Work true to line and level. Allow for expansion and building movement.
- E. Recheck measurements and dimensions, before starting each installation.
- F. Install each component during weather conditions and Project status that will ensure the best possible results. Isolate each part of the completed construction from incompatible material as necessary to prevent deterioration.

3.7 PROTECTION

- A. Protect installed insulation from damage due to harmful weather exposures, physical abuse, and other causes. Provide temporary coverings or enclosures where insulation is subject to abuse and cannot be concealed and protected by permanent construction immediately after installation.

END OF SECTION 07 21 00



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SECTION 07 40 13  
PREFORMED METAL ROOFING AND SIDING

PART 1 - GENERAL

1.1 SUMMARY

- A. Preformed metal roofing, siding and soffit panels with related Work as specified herein, and as required for a complete and watertight installation. Work under this Section includes, but is not limited to:
1. Metal roofing, siding and soffit panels.
  2. Flashing, closures, and cap trim.
  3. Vent roof jacks.
  4. Clips, accessories, and fasteners.
  5. Sealants for components under this Section.
  6. Membrane underlayment.
- B. Related Sections: Section 07 60 00 - Flashing and Sheet Metal for metal fascias wrapped over pressure treated wood.

1.2 SUBMITTALS

- A. Submit complete manufacturer prepared shop drawings for approval in accordance with Division 1 requirements. Shop drawings shall show profile and gage of items, location and type of fasteners; location, gage, shape, and method of attachment of trim; and other details as may be required for a weathertight installation.
1. Do not proceed with manufacture prior to review of shop drawings. Do not use Drawings prepared by Architect for shop or erection drawings.
  2. Shop drawings shall show methods of erection, elevations, and plans of roof panels, sections, and details, anticipated loads, flashings, roof curbs, vents, sealants, interfaces with materials not supplied, and proposed identification of components parts and their finishes.
- B. Submit 3 copies of appropriate color selection materials.
- C. Submit pre-roofing conference meeting minutes.
- D. Submit warranties as specified herein.

1.3 QUALITY ASSURANCE

- A. Applicable standards – Comply with the provisions of the latest editions for the following codes, specifications, and standards:
1. AISC: "Steel Construction Manual," American Institute of Steel Construction.
  2. AISI: "Cold Form Steel Design Manual," American Iron and Steel Institute.
  3. ASTM A792-AZ55: "Standard Specification for Steel Sheet, 55% Aluminum-Zinc Alloy- Coated by the Hot-Dip Process."



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4. ASTM E 1680: "Standard Test Method for Rate of Air Leakage through Exterior Metal Roof Systems."
  5. ASTM E 1646: "Standard Test for Water Penetration of Exterior Metal Roof Panel Systems by Uniform Static Air Pressure Differential."
  6. ASTM A 653: "Standard Specifications for Steel Sheet, Zinc-Coated (Galvanized) Steel or Zinc-Iron Alloy-Coated (Galvanized) by Hot-Dip Process."
- B. **Manufacturer's Qualifications:** Manufacturer shall have a minimum of 10 years successful experience in manufacturing panels of this nature, in a permanent, stationary, indoor production facility.
- C. **Installer's Qualifications:** Installer shall have been actively installing the type of metal roofing, siding and soffit panel systems defined in these Specifications for a minimum of 5 years and be approved by the manufacturer of the system being installed.
- D. **Design:** The preformed metal roof system shall be designed to sustain the specified loads in accordance with governing building codes in the county and state which this Project is located in. Components of the preformed metal roof system shall meet the design loads and applied in load combinations as specified in governing building codes, without exceeding the allowable working stresses.
1. The wind load design shall be based upon the requirements of ASCE/SEI 7, latest edition with the wind velocity as indicated on the Structural Drawings.
  2. UL580 Class 90 - Uplift Test
  3. UL 2218 - Class 4 Impact Resistance
- E. When tested in accordance with ASTM E 1680 and ASTM E 1646, the roof panel assembly shall show no more than 0.01 cfm/ft<sup>2</sup> of air infiltration at 6.24 psf test pressure and no water leakage at 12 psf test pressure for 15 minutes with a volume spray of 5 gallons per hour.
- F. **Structural:** Uniform load capacity shall be determined by testing in accord with the principles of ASTM E 330 adapted to testing of formed sheet panels by clarifying specific sections of this standard as follows:
1. Roof test specimens shall be representative of the main body of the roof, free from influence of perimeter conditions. The setup shall be continuous over one or more supports and contain at least 5 panel widths.
  2. No roof attachments are permitted at the sides other than the standard gable or rake condition. For uplift tests, at least one end seal shall be flexible and in no way restrain the crosswise distortion of panels. One end may simulate an eave condition if at least 12 feet away from the mid-roof clip under evaluation.
  3. Roofing panels and accessories shall be production material of the same type and thickness proposed for use on the Project.
  4. Longitudinal seals or plastic film shall not span any crevice or cracks that may tend to separate under pressure (e.g. plastic films used to seal the chamber must be applied into the side seam of the panel so as to apply a uniform static pressure to the entire cross section of the panel).
  5. Design capacity for conditions of gage, span or loading other than those tested may be determined by the interpolation of test results in accord with the AISI Cold Formed Steel Manual. Extrapolation outside the range of the tests is not



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acceptable. In addition to the clarified ASTM 330 testing, the system, as installed, shall carry an Underwriters Laboratory Wind Uplift Class 90 rating in addition to and not in lieu of other performance criteria set forth by this specification.

- G. Weathertightness: When tested in accord with the principles of NAAM TM-1, the roof system without sealant in the ribs shall show no leakage when exposed to dynamic rain and wind velocity up to 70 mph for 5 minutes.
- H. Thermal Cycle Test: An assembly consisting of clips, 3 or more panels in width, and spanning 3 or more supports with clips positively loaded to 10 pounds shall resist 100,000 thermal cycles and show no visible signs of wear from the exterior and erode no more than 25 percent of the panel of clip material from the underside (non-exposed surfaces).
- I. Roof and siding system shall comply with ASTM E 1592, "Standard Test Method for Structural Performance of Sheet Metal Roof and Siding Systems by Uniform Static Air Pressure Difference", latest edition.

### 1.4 DELIVERY, STORAGE, AND HANDLING

- A. Delivery: Deliver panels to job site properly packaged to provide against transportation damage.
- B. Handling: Exercise extreme care in unloading, storing, and erecting panels to prevent banding, warping, twisting, and surface damage.
- C. Storage: Store materials and accessories above ground on well skidded platforms. Store under waterproof covering. Provide proper ventilation to panels to prevent condensation build-up between panels.

### 1.5 JOB CONDITIONS

- A. Pre-Roofing Conference: Before installation of the roofing and associated work, meet at the Project site with the installer, the installer of each component of associated work, the installers of deck or substrate construction to receive roofing work, the installers of other work in and around roofing that must follow the roofing work (including Mechanical Work), the Architect, and other representatives directly concerned with performance of the work, including (where applicable) insurers, test agencies, product manufacturers, governing authorities, and the Owner. Record (by Contractor) the discussions of the conference and the decisions and agreements (or disagreements) reached and furnish a copy of the record to each party attending. Review foreseeable methods and procedures related to the roofing work including, but not necessarily limited to, the following:
  - 1. Review Project requirements (Drawings, Specifications, and other Contract Documents).
  - 2. Review required submittals, both completed and yet to be completed.
  - 3. Review status of substrate work (not by the Metal Roofing Installer), including drying, structural loading limitations, and similar considerations.
  - 4. Review required inspection, testing, certifying, and accounting procedures.



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5. Review regulations concerning code compliance, environmental protection, health, safety, fire, and similar considerations.
6. Consider each party's extant judgment, as advanced in the interest of successful completion of Work.

### 1.6 WARRANTY

- A. General: Guarantees/warranties shall include, but not be limited to, preformed metal roofing, fascias, roof insulations, flashings, cap flashings, closures and trims, fasteners, accessories, sealants, gutters, and watertight connection to downspouts.
  1. Guarantee/warranty period shall begin on the Date of Substantial Completion for the Project or such date that the roof is accepted by the Architect and Owner.
- B. Installer's Material and Workmanship Warranty: The Contractor shall furnish to the Owner a written guarantee covering the roofing, siding, soffit and flashing work including the installation of products furnished by others and installed under this Section of the Work against defects in materials and workmanship for indicated warranty period. Guarantees are not intended to serve as protection against poor workmanship or inferior or improper materials at the time the roof is installed, but are for the purpose of protecting the Owner against future failures during the intended life of the roof covering.
  1. Warranty Period: 5 years from Date of Substantial Completion.
- C. Manufacturer's Finish Warranty: Preformed metal roofing manufacturer shall furnish to the Owner a written guarantee covering the finish of exposed coated metal surfaces against blistering, peeling, cracking, flaking, checking, chipping, rusting, and excessive chalking and color change for indicated warranty period.
  1. Warranty Period: 20 years from Date of Substantial Completion.
- D. Manufacturer's Weathertightness Warranty: Provide manufacturer's weathertightness warranty equal to Industry Standard weathertightness warranty for indicated warranty period.
  1. Repairs required, either permanent or temporary, to preformed metal roofing or roof flashings under this guarantee to keep the roof watertight shall be started within 3 days after notice of the need for repairs. Should the Contractor fail to make such repairs within a reasonable time period, the Owner may have such repairs made and charge the cost to the Contractor.
  2. Warranty Period: 20 years from Date of Substantial Completion.

## PART 2 - PRODUCTS

### 2.1 MANUFACTURER

- A. Roof Panel Basis of Design: 5-V Crimp Metal Roof Panel as manufactured by McElroy Metals, Inc., Bossier City, Louisiana; [www.mcelroymetal.com](http://www.mcelroymetal.com)



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- B. Wall and Soffit Panel Basis of Design: Marquee-Lok Metal Wall and Soffit Panel as manufactured by McElroy Metals, Inc., Bossier City, Louisiana; [www.mcelroymetal.com](http://www.mcelroymetal.com)
- C. Products of other manufacturers will be considered providing their products equal or exceed the quality specified; and they can provide products of the type, size, function, and arrangement required and as approved by the Architect.
- D. Finish to be factory applied one mil thick full strength Kynar 500 fluorocarbon based coating over thoroughly cleaned and pretreated galvanized coated steel in single custom color as selected by the Architect. Coating to be applied before fabrication of roofing components.
- E. Metal sheets or coils selected for forming into panels must be cut to size before receipt of finish coating or have cut edges specially coated with similar film of same applied finish after being sized. Actual finish and coating method intended for provision must appear on submitted shop drawings.

### 2.2 MATERIALS – ROOF PANELS

- A. Panels shall be fabricated in full lengths from ridge to eave without end laps. Panels shall be 24 inches wide maximum with exposed anchors that resist wind uplift yet permit expansion and contraction with temperature changes. Individual panels shall be removable for replacement of damaged material. Panels shall be prefinished 50 ksi steel per ASTM A 792, latest edition, ("Standard Specification for Steel Sheet, 55% Aluminum-Zinc Alloy-Coated by the Hot-Dip Process") in 26 gauge minimum.
  - 1. 24 gauge "Galvalume" panels finished with full strength Kynar 500 coating as specified above are acceptable.
  - 2. Galvalume sheet shall be produced in accordance with ASTM A792/A792M and shall have a coating designation of AZ 50.
  - 3. Provide regular spangle surface without chemical treatment.
  - 4. Oil coating shall be kept at a minimum. Clean panels of all oil before shipment.
  - 5. Use clean, dry gloves during handling and installation.
  - 6. Care shall be exercised to prevent the roofing panels from sliding over each other during shipment and installation.
- B. Exposed fasteners shall be self tapping, stainless steel screws designed for substrate roof system will be attached to. Provide self drilling, self tapping screws where required by conditions.
- C. Roofing panels shall be manufactured in continuous lengths to eliminate perpendicular panel end laps. End laps will not be allowed.
- D. Roof System Accessories:
  - 1. Ridge Cap:
    - a. Closure strips formed to fit the roof panel profile shall be provided as required. The closure shall be closed cell "EPDM" synthetic rubber or factory formed metal closure to match roofing panel, or manufacturer's standard watertight detail and components.





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- c. Extrudable sealant, nondrying (but skinning) and nonmigratory synthetic elastomer base material, conforming to the performance requirements of Federal Specification TT-C-598-b Type 1. Use at the following locations:
  - 1) Sealing ridge channels.
  - 2) Sealing exposed seams, butts, and laps at roof curbs.
4. Pipe Flashings: Provide (ethylene propylene diene monomer) rubber flashings for vent pipe penetrations in metal roof. Provide clamping rings, sealant, and fasteners as recommended by manufacturer.
5. Membrane Underlayment: Provide one of the following:
  - a. "WinterGuard HT," CertainTeed Corp., Valley Forge, Pennsylvania.
  - b. "Grace Ultra," Grace Construction Products, Cambridge, Massachusetts; [www.grace.com](http://www.grace.com)
  - c. "TW Metal and Tile Underlayment," Tamko Roofing Products, Joplin, Missouri; [www.tamko.com](http://www.tamko.com)
6. Provide manufacturers standard valley flashing for valleys. Gauge and finish shall match roof panels as a minimum. All valleys shall be watertight and shall be included in the manufacturer's standard roof watertightness warranty. Provide all items as required for a complete installation in every respect.
7. Provide all required accessories necessary for a complete enclosed roof system.

### 2.3 MATERIALS – WALL AND SOFFIT PANELS

- A. Wall Panels: Shall be roll formed, 12 inches wide by 1 inch deep with flat smooth faces with concealed fasteners. Provide full length pieces formed of 22 gauge Galvalume steel with full strength Kynar 500 coating. Color selected by the Architect.
- B. Soffit Panels: Shall be roll formed, 12 inches wide by 1 inch deep with flat smooth faces with concealed fasteners. Provide full length pieces formed of 24 gauge Galvalume steel with full strength Kynar 500 coating. Color selected by the Architect.
  1. Provide full perforated panels per code for ventilation in the soffits.
- C. Panels are to be manufactured "cut to length," eliminating need for field cutting
- D. Metal Flashings and Closures: Shall be factory formed to configurations indicated on the Drawings from the same type and gauge material as the panels.
- E. Fasteners: Shall be self tapping screws, concealed wherever possible. Type, length, quantity, and location of fasteners shall be as recommended by the manufacturer. Indicate fastening on shop drawings.
- F. Protective Coating: Similar "Peelcote" plastic strippable coating shall be applied to finished surfaces.
- G. Provide all required accessories necessary for a complete wall and soffit system.



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PART 3 - EXECUTION

3.1 INSTALLATION

- A. Substrate shall be completely secured and free of dirt and debris.
- B. The Contractor shall give written notice to the Architect of defects in substrate that would be detrimental to metal roofing installation before start of Work.
- C. Start of metal roofing, siding and soffit installation shall constitute acceptance of substrates by the Contractor.
- D. Membrane Roof Underlayment: Install completely over plywood substrate..

3.2 METAL ROOFING INSTALLATION

- A. Erection of the preformed metal roofing system shall be performed in accordance with the manufacturer's erection drawings and in strict accordance with the panel manufacturer's written instructions.
- B. Preformed metal roofing and fascia work shall be watertight and weathertight, lines and angles sharp and true, plain surfaces free from waves and buckles. Workmen shall be experienced in the trade and thoroughly capable of performing the Work in accordance with these requirements.
- C. Fasteners are to be concealed wherever possible. Exposed fasteners shall be stainless steel painted to match.
- D. Brake formed cap, trim, closure, and flashing sections are to be furnished with a minimum of joints.
  - 1. Brake formed members with exposed corner intersections shall have corner pieces shop fabricated. Other miscellaneous trim corners may be field cut, mitered, or butted.
  - 2. Trim shall be of the same material as, and have a finish to match, the metal roofing panels.
- E. Install roof jacks at pipe penetrations in metal roofing and roof curbs at all roof mounted equipment indicated on the Drawings. Provide required fastened, foam rods, plastic cement, and other sealant or material to provide watertight and weathertight construction.
- F. Use appropriate clips, fasteners, braces, and anchors as indicated on the Drawings and any other items required for a complete installation and as recommended by manufacturer.
- G. Make repairs and perform additional work necessary to provide a roof watertight and acceptable to the Architect prior to start of roofing guarantee.
- H. The installation shall be designed to safely resist the positive and negative loads.



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- I. Roof panel and flashing attachments shall be designed to accommodate the thermal expansion and contraction of the exterior material through a total of 150 degrees F. temperature change.
- J. Factors of safety on design loads to ultimate strength of fasteners shall be as stated in the industry standard for the material into which the fastener is driven.
  - 1. AISI for steel
- K. Provide all items and accessories as required for a complete installation in every respect.

### 3.3 METAL WALL AND SOFFIT PANEL INSTALLATION

- A. Preformed metal siding and soffit work shall be watertight and weathertight, lines and angles sharp and true; plain surfaces free from waves and buckles. Workmen shall be experienced in the trade and thoroughly capable of performing the Work in accordance with these requirements.
- B. Exposed fasteners are to be colored to match material they are attaching.
- C. Brake formed sill, trim, and closure sections are to be furnished with a minimum of butt joints. Where butt joints occur, provide concealed splice plates with sealant to insure watertightness while allowing for movement from thermal expansion and contraction.
- D. Install panels and accessories in strict accordance with the panel manufacturer's written instructions and the shop drawings. Attach panels to framing members per the manufacturer's written instructions. Show connections and method of installation on the shop drawings.

### 3.4 GENERAL INSTALLATION PROVISIONS

- A. Inspection of Conditions: Require the Installer of each major component to inspect both the substrate and conditions under which Work is to be performed. Do not proceed until unsatisfactory conditions have been corrected in an acceptable manner.
- B. Manufacturer's Instructions: Comply with manufacturer's installation instructions and recommendations, to the extent that those instructions and recommendations are more explicit or stringent than requirements contained in Contract Documents.
- C. Inspect materials or equipment immediately upon delivery and again before installation. Reject damaged and defective items.
- D. Provide attachment and connection devices and methods necessary for securing Work. Secure Work true to line and level. Allow for expansion and building movement.
- E. Visual Effects: Provide uniform joint widths in exposed Work. Arrange joints in exposed Work to obtain the best visual effect. Refer questionable choices to the Architect for final decision.



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- F. Recheck measurements and dimensions, before starting each installation.
- G. Install each component during weather conditions and Project status that will ensure the best possible results. Isolate each part of the completed construction from incompatible material as necessary to prevent deterioration.

END OF SECTION 07 40 13



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SECTION 07 60 00  
FLASHING AND SHEET METAL

PART 1 - GENERAL

1.1 SUMMARY

- A. This Section includes the following:
1. Metal wall flashing.
  2. Flexible flashing system.
  3. Exposed metal trim/fascia units.
  4. Miscellaneous sheet metal accessories.
  5. Sealants and bonding agents between components of this Section and between the roof and other materials.
- B. Provide all accessories and items essential for the completeness of the sheet metal installation. Such items, unless otherwise shown on the Drawings or specified, shall be the same kind of materials as the item to which applied. Nails, screws, and bolts shall be of the types suited for the purpose intended, and shall be compatible with the metal to which it will contact.
- C. Forming and assembling of sheet metal components shall be performed using methods that will not void the manufacturer's finish warranties.
- D. All flashing and sheet metal items shall be provided and installed to provide for a complete watertight and weathertight installation in every respect.

1.2 SUBMITTALS

- A. Submit in accordance with Division 1 requirements.
- B. Product Data, Flashing, Sheet Metal, and Accessories: Manufacturer's technical product data, installation instructions and general recommendations for each specified sheet material and fabricated product.
- C. Samples of the following flashing, sheet metal, and accessory items:
1. 8-inch-square samples of specified sheet materials to be exposed as finished surfaces.
  2. 12-inch-long samples of factory-fabricated products exposed as finished work. Provide complete with specified factory finish.
- D. Shop drawings showing layout, profiles, methods of joining, and anchorages details. Provide plan layouts at 1/4-inch scale and details at 3-inch scale, for all sheet metal pieces and accessories.

1.3 QUALITY ASSURANCE

- A. Except as otherwise shown on Drawings or specified, the workmanship of sheet metal



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work, method for forming joints, anchoring, cleating and provisions for expansion shall conform to the standard details and recommendations of the Copper and Brass Research Association; and workmanship shall be of the best quality, in accordance with best trade practice and the recommendations and specifications of the Sheet Metal and Air Conditioning Contractors National Association, Inc. (SMACNA).

- B. Where pre-engineered manufactured systems are specified, other field fabricated or shop fabricated substitutions will not be accepted.
- C. All sheet metal flashings shall conform to the criteria of SMACNA "Architectural Sheet Metal Manual" whether or not detailed as such.
- D. Fabricator and installer shall be a company specializing in sheet metal work and installation with five (5) years documented experience.

### 1.4 PROJECT CONDITIONS

- A. Coordinate work of this section with interfacing and adjoining work for proper sequencing of each installation. Ensure best possible weather resistance and durability of work and protection of materials and finishes.

### 1.5 PERFORMANCE REQUIREMENTS

- A. General: Install sheet metal flashing and trim to withstand wind loads, structural movement, thermally induced movement, and exposure to weather without failing, rattling, leaking, and fastener disengagement.
- B. Thermal Movements: Provide sheet metal flashing and trim that allow for thermal movements resulting from the following maximum change (range) in ambient and surface temperatures by preventing buckling, opening of joints, hole elongation, overstressing of components, failure of joint sealants, failure of connections, and other detrimental effects. Provide clips that resist rotation and avoid shear stress as a result of sheet metal and trim thermal movements. Base engineering calculation on surface temperatures of materials due to both solar heat gain and nighttime-sky heat loss.
  - 1. Temperature Change (Range): 120 deg F, ambient; 180 deg F, material surfaces.
- C. Water Infiltration: Provide sheet metal flashing and trim that do not allow water infiltration to building interior.

### 1.6 GUARANTEE

- A. The equipment support curbs shall be guaranteed to be free from defects in materials and workmanship for a period of fifteen (15) years from the Date of Substantial Completion.



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PART 2 - PRODUCTS

2.1 MATERIALS

- A. The type and locations of the various kinds, gages, thickness, and finish of sheet metal to be used is specified hereinafter under the individual items. Where sheet metal is indicated on Drawings and kind or type of metal is not definitely specified, sheet metal shall match the type as used on the rest of the project.
- B. Stainless Steel: AISI Type 316L, complying with the latest edition of ASTM A 167, 2D annealed finish, soft, except where harder temper required for forming or performance; 0.0156-inch thick (28 gauge) except as otherwise indicated.
- C. Lead: ASTM B 749, latest edition, Type L51121, copper-bearing sheet lead, minimum 4 lb/sq ft (0.0625-inch thick) except not less than 6 lb/sq ft (0.0937-inch thick) for burning (welding) unless otherwise indicated.
- D. Flexible Flashing System: Bituthene® 3000 composite membrane with a thickness of 1.5mm (0.060 in), consisting of 1.4mm (0.056 in.) of rubberized asphalt and 0.1 mm (0.004 in.) of cross laminated, high density polyethylene film. It is self-adhesive and cold applied, used with Bituthen Primers.
  - 1. Install over existing floor slab and turned up 24 inches to terminate at existing CMU walls per Drawings.
- E. Metal termination bar shall be 1/8 inch by one inch aluminum bar. Used to terminate flexible flashing system.
- F. Shop fabricated aluminum fascia shall be fabricated to configurations indicated on the Drawings.
  - 1. Fabricate from nominal, .060 inch thick aluminum sheet.
  - 2. Fascia shall be provided with concealed splice plates for joints 10 feet on center.
  - 3. Provide air-dried Kynar finish, shop applied. Color selected by the Architect.

2.2 MISCELLANEOUS MATERIALS AND ACCESSORIES

- A. Solder: For use with steel or copper, provide 50 - 50 tin/lead solder (ASTM B 32, latest edition), with rosin flux.
- B. Solder: For use with stainless steel, provide 60 - 40 tin/lead solder (ASTM B 32, latest edition), with acid-chloride type flux, except use rosin flux over tinned surfaces.
- C. Fasteners: Same metal as flashing/sheet metal or other non- corrosive metal as recommended by sheet manufacturer. Match finish of exposed heads with material being fastened.
- D. Bituminous Coating: SSPC - Paint 12, solvent-type bituminous mastic, nominally free of sulfur, compounded for 15-mil dry film thickness per coat.



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- E. Mastic Sealant: Polyisobutylene; nonhardening, nonskinning, non-drying, nonmigrating sealant.
- F. Elastomeric Sealant: Generic type recommended by manufacturer of metal and fabricator of components being sealed and complying with requirements for joint sealants as specified in Section 07 92 00, Sealants and Caulking.
- G. Epoxy Seam Sealer: 2-part noncorrosive metal seam cementing compound, recommended by metal manufacturer for exterior/interior nonmoving joints including riveted joints.
- H. Adhesives: Type recommended by flashing sheet manufacturer for waterproof/weather-resistant seaming and adhesive application of flashing sheet.
- I. Paper Slip Sheet: 5-lb. rosin-sized building paper.
- J. Polyethylene Underlayment: Minimum 6-mil carbonated polyethylene film resistant to decay when tested in accordance with ASTM E 154, latest edition.
- K. Reglets: Metal or plastic units of type and profile indicated, compatible with flashing indicated, noncorrosive.
- L. Metal Accessories: Provide sheet metal clips, straps, anchoring devices, and similar accessory units as required for installation of work, matching or compatible with material being installed, noncorrosive, size and gage required for performance.
- M. Elastic Flashing Filler: Closed-cell polyethylene or other soft closed-cell material recommended by elastic flashing manufacturer as filler under flashing loops to ensure movement with minimum stress on flashing sheet.
- N. Roofing Cement: ASTM D 4586, latest edition, asbestos-free.
- O. Flux: Use resin type flux for pretinned surfaces.

### 2.3 FABRICATION

- A. General Metal Fabrication: Shop-fabricate work to greatest extent possible. Comply with details shown and with applicable requirements of SMACNA "Architectural Sheet Metal Manual" and other recognized industry practices. Fabricate for waterproof and weather-resistant performance, with expansion provisions for running work, sufficient to permanently prevent leakage, damage, or deterioration of the work. Form work to fit substrates. Comply with material manufacturer instructions and recommendations for forming material. Form exposed sheet metal work without excessive oil-canning, buckling, and tool marks, true to line and levels indicated, with exposed edges folded back to form hems.
- B. Seams: Fabricate nonmoving seams in sheet metal with flat-lock seams. For metal other than aluminum, tin edges to be seamed, form seams, and solder. Form aluminum seams with epoxy seam sealer; rivet joints for additional strength where required.



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- C. Expansion Provisions: Where lapped or bayonet-type expansion provisions in work cannot be used or would not be sufficiently water/weatherproof, form expansion joints of intermeshing hooked flanges, not less than 1 inch deep, filled with mastic sealant (concealed within joints).
- D. Sealant Joints: Where movable, non-expansion type joints are indicated or required for proper performance of work, form metal to provide for proper installation of elastomeric sealant, in compliance with SMACNA standards.
- E. Separations: Provide for separation of metal from non-compatible metal or corrosive substrates by coating concealed surfaces at locations of contact, with bituminous coating or other permanent separation as recommended by manufacturer/fabricator.

### PART 3 - EXECUTION

#### 3.1 INSPECTION

- A. The Installer must examine substrates and conditions under which metal flashings will be installed, and notify Contractor in writing of unsatisfactory conditions. Do not proceed with installation until unsatisfactory conditions have been corrected in a manner acceptable to Installer.

#### 3.2 PREPARATION

- A. Separate dissimilar metals from each other by painting each metal surface in area of contact with a heavy application of bituminous coating.

#### 3.3 INSTALLATION REQUIREMENTS

- A. General: Comply with recommendations with SMACNA "Architectural Sheet Metal Manual." Anchor units of work securely in place by methods indicated, providing for thermal expansion of metal units; conceal fasteners where possible, and set units true to line and level as indicated. Install work with laps, joints, and seams that will be permanently watertight and weatherproof.
- B. Install work with provisions for thermal expansion of flashings, gravel stops, and other items exposed for more than 15 feet continuous length. Maintain a watertight installation at expansion seams. Locate expansion seams where shown, or if not shown, in conformance with applicable recommendations of "Architectural Sheet Metal Manual" by SMACNA.
- C. Sheet metal work shall be watertight and weathertight; lines, arises, and angles sharp and true; plain surfaces free from waves and buckles. Workmen shall be experienced in the trade and thoroughly capable of performing the Work in accordance with these requirements.
- D. Underlayment: Where stainless steel is to be installed directly on cementitious or wood substrates, install a slip sheet of red rosin paper and a course of polyethylene underlayment.



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- E. Bed flanges of work in a thick coat of bituminous roofing cement where required for waterproof performance.
- F. Install flexible flashing in accordance with manufacturer's recommendations. Where required, provide for movement at joints by forming loops or bellows in width of flashing. Locate cover or filler strips at joints to facilitate complete drainage of water from flashing. Seam adjacent flashing sheets with adhesive, seal and anchor edges in accordance with manufacturer's recommendations.
- G. Flashing at Roof Penetrations (Miscellaneous)
  - 1. Work under this Section shall include the flashing of roof penetrations not otherwise specified under other Sections.
  - 2. Flashing at roof penetrations not detailed on the Drawing shall be performed according to the recommendations and specifications of the Sheet Metal and Air Conditioning Contractors National Association, Inc. (SMACNA), subject to approval by the Architect.
- H. Aluminum Fascia
  - 1. Aluminum fascia to be wrapped over pressure treated wood in configuration as indicated on the drawings.
  - 2. Joints and splices shall be installed with sealant materials as required for watertight installation.
  - 3. Fasteners and accessories shall be as recommended for proper installation.

### 3.4 CLEANING AND PROTECTION

- A. Clean exposed metal surfaces, removing substances that might cause corrosion of metal or deterioration of finishes.
- B. Protection: Advise Contractor of required procedures for surveillance and protection of flashings and sheet metal work during construction to ensure that work will be without damage or deterioration other than natural weathering at time of Substantial Completion.

### 3.5 GENERAL INSTALLATION PROVISIONS

- A. Inspection of Conditions: Require the Installer of each major component to inspect both the substrate and conditions under which Work is to be performed. Do not proceed until unsatisfactory conditions have been corrected in an acceptable manner.
- B. Manufacturer's Instructions: Comply with manufacturer's installation instructions and recommendations, to the extent that those instructions and recommendations are more explicit or stringent than requirements contained in Contract Documents.
- C. Inspect materials or equipment immediately upon delivery and again prior to installation. Reject damaged and defective items.



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- D. Provide attachment and connection devices and methods necessary for securing Work. Secure Work true to line and level. Allow for expansion and building movement.
- E. Visual Effects: Provide uniform joint widths in exposed Work. Arrange joints in exposed Work to obtain the best visual effect. Refer questionable choices to the Architect for final decision.
- F. Recheck measurements and dimensions, before starting each installation.
- G. Install each component during weather conditions and Project status that will ensure the best possible results. Isolate each part of the completed construction from incompatible material as necessary to prevent deterioration.

END OF SECTION 07 60 00



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SECTION 07 92 00  
SEALANTS AND CAULKING

PART 1 - GENERAL

1.1 SUMMARY

- A. Provide labor, materials, and equipment necessary to complete sealant work, both interior and exterior of the Project. The extent of each type of sealant and caulking work is indicated on the Drawings and specified herein.
1. Work of this Section is to be subcontracted to a single firm specializing in sealant and caulking installation.
  2. Install in exterior joints in vertical surfaces and non-traffic horizontal surfaces as indicated below:
    - a. Joints between different materials listed above.
    - b. Perimeter joints between materials listed above and frames of doors and windows.
    - c. Control and expansion joints in ceiling and overhead surfaces.
    - d. Other joints as indicated or required.
  3. Install in exterior joints in horizontal traffic surfaces as indicated below:
    - a. Control, expansion, and isolation joints in cast-in-place concrete slabs.
    - b. Other joints as indicated or required.
  4. Install in interior joints in vertical surfaces and horizontal non-traffic surfaces as indicated below:
    - a. Perimeter joints of exterior openings where indicated.
    - b. Joints between tops of non-load-bearing unit masonry walls and underside of cast-in-place concrete slabs and beams.
    - c. Vertical control joints on exposed surfaces of interior unit masonry and concrete walls and partitions.
    - d. Perimeter joints between interior wall surfaces and frames of interior doors, and windows.
    - e. Other joints as indicated or required.
  5. Install in interior joints in horizontal traffic surfaces as indicated below:
    - a. Control and expansion joints in cast-in-place concrete slabs.
    - b. Other joints as indicated or required.
  6. The Work of this Section also includes the preparation of the sealant joint substrates and the installation of the sealant joint backings.
- B. Surface Hardness: Provide types of sealant to withstand anticipated abrasive or possible indentation as recommended by manufacturer.
- C. Compatibility: Provide materials that are compatible with the joint surfaces, joint fillers, and other materials in the joint system.



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- D. VOC limits for sealants and adhesives.

1.2 SYSTEM PERFORMANCE REQUIREMENTS

- A. Provide interior and exterior elastomeric joint sealants that have been produced and installed to establish and to maintain watertight and airtight continuous seals without causing staining or deterioration of joint substrates.
- B. Provide joint sealants for interior applications that have been produced and installed to establish and maintain airtight continuous seals that are water resistant and cause no staining or deterioration of joint substrates.

1.3 SUBMITTALS

- A. Submit in accordance with Division 1 requirements.
- B. Product data from manufacturers for each joint sealant product required.
  - 1. Certification by joint sealant manufacturer that sealants plus the primers and cleaners required for sealant installation comply with local regulations controlling use of volatile organic compounds.
    - a. Refer to Section 09 68 00 Series for VOC limits with regards to adhesives for use with carpet products
    - b. Refer to Section 09 91 00 Series for VOC limits with regards to paints and coatings
- C. Samples for initial selection purposes in form of manufacturer's standard bead samples, consisting of strips of actual products showing full range of colors available, for each product exposed to view.
- D. Samples for verification purposes of each type and color of joint sealant required. Install joint sealant samples in 1/2-inch-wide joints formed between two 6-inch-long strips of material matching the appearance of exposed surfaces adjacent to joint sealants.
- E. Certificates from manufacturers of joint sealants attesting that their products comply with specification requirements and are suitable for the use indicated.
- F. Qualification data complying with requirements specified in "Quality Assurance" article. Include list of completed projects with project names addresses, names of Architects and Owners, plus other information specified.
- G. Compatibility and adhesion test reports from elastomeric sealant manufacturer indicating that materials forming joint substrates and joint sealant backings have been tested for compatibility and adhesion with joint sealants. Include sealant manufacturer's interpretation of test results relative to sealant performance and recommendations for primers and substrate preparation needed to obtain adhesion.



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- H. Product test reports for each type of joint sealants indicated, evidencing compliance with requirements specified based on comprehensive testing of current product formulations.
- I. Pre-construction field test reports indicating which products and joint preparation methods demonstrate acceptable adhesion to joint substrates.
- J. Submit sealant warranties as specified herein.

### 1.4 QUALITY ASSURANCE

- A. Obtain elastomeric materials only from manufacturers who will, if required, send a qualified technical representative to project site for the purpose of advising the Installer of proper procedures and precautions for the use of the materials.
- B. Installer Qualifications: Engage an experienced Installer who has completed joint sealant applications similar in material, design, and extent to that indicated for Project that have resulted in construction with a record of successful in-service performance.
  - 1. Shall be a sealant and caulking subcontractor with a minimum of 5 years of successful experience in the application of the types of materials required, and who agrees to employ only skilled tradesmen for the Work.
- C. Testing Laboratory Qualifications: To qualify for acceptance, an independent testing laboratory must demonstrate to Architect's satisfaction, based on evaluation of laboratory-submitted criteria conforming to ASTM E 699, latest edition, that it has the experience and capability to conduct satisfactorily the testing indicated without delaying progress of the Work.
- D. Single Source Responsibility for Joint Sealant Materials: Obtain joint sealant materials from a single manufacturer for each different product required.
- E. Preconstruction Compatibility and Adhesion Testing: Submit joint sealant manufacturers samples of materials that will contact or affect joint sealants for compatibility and adhesion testing as indicated below:
  - 1. Use test methods standard with manufacturer to determine if priming and other specific joint preparation techniques are required to obtain rapid, optimum adhesion of joint sealants to joint substrates.
    - a. Perform tests under normal environmental conditions that will exist during actual installation.
  - 2. Submit not less than 9 pieces of each type of material, including joint substrates, shims, joint sealant backings, secondary seals, and miscellaneous materials.
  - 3. Schedule sufficient time for testing and analysis of results to prevent delay in the progress of the Work.
  - 4. Investigate materials failing compatibility or adhesion tests and obtain joint sealant manufacturer's written recommendations for corrective measures, including use of specially formulated primers.
  - 5. Testing will not be required when joint sealant manufacturer is able to submit joint preparation data required above that are acceptable to Architect and are based



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on previous testing of current sealant products for adhesion to, and compatibility with, joint substrates and other materials matching those submitted.

F. Product Testing: Provide comprehensive test data for each type of joint sealant based on tests conducted by a qualified independent testing laboratory on current product formulations within a 24-month period preceding date of Contractor's submittal of test results to Architect.

1. Test elastomeric sealants for compliance with requirements specified by reference to ASTM C 920. Include test results for hardness, stain resistance, adhesion and cohesion under cyclic movement (per ASTM C 719), low-temperature flexibility, modulus of elasticity at 100 percent strain, effects of heat aging, and effects of accelerated weathering.
2. Include test results performed on joint sealants after they have cured for 1 year.
3. VOC Limits (Regulation 8, Rule 51 of the Bay Area Air Quality Management District. [www.baaqmd.gov](http://www.baaqmd.gov)):

a. Sealants

1)	Architectural	250 g/L
2)	Roadways	250 g/L
3)	Roofing Material Installation	450 g/L
4)	PVC Welding	480 g/L
5)	Other	420 g/L

b. Sealant Primers:

1)	Architectural (Non-Porous)	250 g/L
2)	Architectural (Porous)	775 g/L
3)	Other	750 g/L

4. VOC Limits (South Coast Air Quality Management District Rule 1168. <http://www.aqmd.gov/rules>):

a. Adhesives (Welding and Installation):

1)	Non-Vinyl Backed Installation	150 g/L
2)	Carpet Pad Installation	150 g/L
3)	Wood Flooring Installation	150 g/L
4)	Ceramic Tile Installation	130 g/L
5)	Dry Wall and Panel Installation	200 g/L
6)	Subfloor Installation	200 g/L
7)	Rubber Floor Installation	150 g/L
8)	VCT and Asphalt floor tile installation	150 g/L
9)	PVC Welding	510 g/L
10)	CPVC Welding	490 g/L
11)	ABS Welding	400 g/L
12)	Plastic Cement Welding	350 g/L
13)	Cove Base Installation	150 g/L
14)	Adhesive Primer for Plastic	650 g/L
15)	All Others	250 g/L



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b. Adhesives (Substrates)

1)	Metal to Metal	30 g/L
2)	Plastic Foams	120 g/L
3)	Porous Material Except Wood	120 g/L
4)	Wood	30 g/L
5)	Fiberglass	200 g/L

G. Preconstruction Field Testing: Prior to installation of joint sealants, field-test their adhesion to joint substrates as follows:

1. Locate test joints where indicated or, if not indicated, as directed by Architect.
2. Conduct field tests for each application indicated below:
  - a. Each type of elastomeric sealant and joint substrate indicated.
  - b. Each type of non-elastomeric sealant and joint substrate indicated.
3. Notify Architect one week in advance of the dates and times when mock-ups will be erected.
4. Arrange for tests to take place with joint sealant manufacturer's technical representative present.
5. Test Method: Test joint sealants by hand pull method described below:
  - a. Install joint sealants in 5-foot joint lengths using same materials and methods for joint preparation and joint sealant installation required for completed Work. Allow sealants to cure fully before testing.
  - b. Make knife cuts horizontally from one side of joint to the other followed by 2 vertical cuts approximately 2 inches long at side of joint and meeting horizontal cut at top of 2-inch cuts. Place a mark 1 inch from top of 2-inch piece.
  - c. Use fingers to grasp 2-inch piece of sealant just above 1-inch mark; pull firmly down at a 90-degree angle or more while holding a ruler along side of sealant. Pull sealant out of joint to the distance recommended by sealant manufacturer for testing adhesive capability, but not less than that equaling specified maximum movement capability in extension; hold this position for 10 seconds.
  - d. For joints with dissimilar substrates, check adhesion to each substrate separately. Do this by extending cut along one side, checking adhesion to opposite side, and then repeating this procedure for opposite side.
6. Report whether or not sealant in joint connected to pulled-out portion failed to adhere to joint substrates or tore cohesively. Include data on pull distance used to test each type of product and joint substrate.
7. Evaluation of Field Test Results: Sealants not evidencing adhesive failure from testing, in absence of other indications of noncompliance with requirements, will be considered satisfactory. Do not use sealants that fail to adhere to joint substrates during testing.



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1.5 DELIVERY, STORAGE, AND HANDLING

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

1.6 PROJECT CONDITIONS

- A. Environmental Conditions: Do not proceed with installation of joint sealants under the following conditions:
  - 8. When ambient and substrate temperature conditions are outside the limits permitted by joint sealant manufacturer.
  - 9. When ambient and substrate temperature conditions are outside the limits permitted by joint sealant manufacturer or below 40 deg F (4.4 deg C).
  - 10. When joint substrates are wet.
  - 4. Where joint widths are less than allowed by joint sealant manufacturer for application indicated.
  - 5. Until contaminants capable of interfering with adhesion are removed from joint substrates.
- B. Joint Width Conditions: Do not proceed with installation of joint sealants where joint widths are less than allowed by joint sealant manufacturer for application indicated.
- C. Joint Substrate Conditions: Do not proceed with installation of joint sealants until contaminants capable of interfering with their adhesion are removed from joint substrates.
- D. Preparation of joint surfaces, backing, and the conditions under which the sealant and caulking is to be installed shall conform to manufacturer's recommendations.
  - 1. Use of bond break tape is prohibited without the expressed permission of the Architect. Each situation will be evaluated with regard to inability to properly use backer rod to prevent adhesion.

1.7 SEQUENCING AND SCHEDULING

- A. Sequence installation of joint sealants to occur not less than 21 nor more than 30 days after completion of waterproofing, unless otherwise indicated.

1.8 WARRANTIES

- A. All exterior and building envelope weathertight and watertight sealants shall be warranted by the sealant manufacturer for a period of twenty (20) years from the Date of Substantial



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Completion. Include coverage for installed sealants and accessories which fail to achieve a watertight seal, exhibit loss of adhesion or cohesion, and or do not cure.

PART 2 - PRODUCTS

2.1 GENERAL

- A. Compatibility: Provide joint sealants, joint fillers, and other related materials that are compatible with one another and with joint substrates under conditions of service and application, as demonstrated by sealant manufacturer based on testing and field experience.
- B. Colors: Provide color of exposed joint sealants to comply with the following:
1. Sealants in exterior vertical expansion and control joints in face brick shall match the face brick color. Custom color may be required. An exact match in color is required as selected by the Architect.
  2. Sealants in exterior horizontal control and relieving joints in face brick shall match the mortar color. Custom color may be required.
  3. Provide manufacturer's complete line of standard and custom colors for Architect's selection. If standard colors do not match the Architect's selection, custom colors will be required at no extra cost.

2.2 MATERIALS

- A. General
1. Where the term "Acceptable Standard" is used within this Section, it refers to the manufacturer and product listed, which is specified as the type and quality required for this Project.
  2. Products of other manufacturers will be considered, providing their products equal or exceed the quality specified, and they can provide products of the type and quality required.
  3. Single source responsibility for joint sealer materials: Obtain joint sealer materials from a single manufacturer for each different product required.
  4. Compatibility: Provide joint sealers, joint fillers, and other related materials that are compatible with on another and with joint substrates under conditions of service and application, as demonstrated by sealant manufacturer based on testing and final experience.
- B. Caulking Compounds (Acrylic Latex Sealant)
1. Latex rubber modified, acrylic emulsion polymer sealant compound; manufacturer's standard, one part, non-sag, mildew resistant, acrylic emulsion sealant complying with ASTM C834, latest edition, formulated to be paintable and recommended for exposed applications on interior locations involving joint movement of not more than plus or minus 5 percent.



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2. Acceptable Standard
  - a. "Sonolac"; Sonneborn Building Products, Inc.
  - b. "Acrylic Latex 834"; Tremco, Inc.
  - c. "Acrylic Latex Caulk with Silicone"; DAP, Dayton, Ohio
- C. One-Part Elastomeric Sealant (Silicone) Exterior 20 year warranty:
  1. One component elastomeric sealant, complying with ASTM C920, latest edition, Class 25, Type NS (non-sag), unless Type S (self-leveling) recommended by manufacturer for the application shown.
    - a. Acceptable Standard
      - 1) "Pecora 864 Architectural Silicone Sealant; Pecora Corp.
      - 2) "Dow Corning 795"; Dow Corning Corp.
      - 3) "Silpruf"; General Electric
      - 4) "Omniseal"; Sonneborn Building Products, Inc.
      - 5) "Spectrem 2"; Tremco Mfg. Co.
      - 6) Dow Corning 790; Dow Corning Corp. (Dow Corning 791 with Kynar)
      - 7) Spectrem 1; Tremco Mfg. Co.
    2. One-part mildew resistant silicone sealant: (Around countertops and backsplashes and other wet interior locations.)
      - a. Acceptable Standard
        - 1) "Rhodorsil 6B White"; Rhone-Poulenc Inc.
        - 2) "Dow Corning 786"; Dow Corning Corp.
        - 3) "Sanitary 1700"; General Electric
        - 4) "Proglaze White"; Tremco
      3. All exterior precast concrete panel joints above and below grade: Basis of Design: "Dymeric 240" by Tremco. Color as selected by the Architect. Multi-component, chemically cured, polyurethane sealant. Non-sag.
  - D. One-part self-leveling polyurethane sealant, (for traffic areas and slabs-on-grade)
    1. One component polyurethane self-leveling sealant, complying ASTM C920, Type S, Grade P, Class 25.
      - a. Acceptable Standard
        - 1) "Sonolastic SL 1"; Sonneborn Building Products, Inc.
        - 2) "NR-201 Urexpan"; Pecora Corp.
        - 3) "Vulkem 45 SSL"; Tremco
      2. Install in all horizontal control joints in concrete slabs-on-grade.



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- E. Miscellaneous Materials
1. Provide joint cleaner and joint primer sealer as recommended by the sealant or caulking compound manufacturer.
  2. Primer: Provide type recommended by joint sealer manufacturer where required for adhesion of sealant to joint substrates indicated, as determined from preconstruction joint sealer substrate tests and field tests.
  3. Cleaners for Nonporous Surfaces: Provide non-staining, chemical cleaners of type which are acceptable to manufacturers of sealants and sealant backing materials, which are not harmful to substrates and adjacent nonporous materials, and which do not leave oily residues or otherwise have a detrimental effect on sealant adhesion or in service performance.
  4. Masking Tape: Non-staining, nonabsorbent material compatible with joint sealants and surfaces adjacent to joints.

### 2.3 JOINT SEALANT BACKING

- A. Provide sealant backings of material and type that are non-staining; are compatible with joint substrates, sealants, primers and other joint fillers; and are approved for applications indicated by sealant manufacturer based on field experience and laboratory testing.
- B. Plastic Foam Joint Fillers: ASTM C 1330, latest edition, preformed, compressible, resilient, non-staining, non-waxing, non-extruding strips of flexible plastic foam of material indicated below and of size, shape, and density to control sealant depth and otherwise contribute to producing optimum sealant performance:
1. Closed-cell polyethylene foam, nonabsorbent to liquid water and gas, non-outgassing in unruptured state.
  2. Type C: Closed-cell material with a surface skin
- C. Bond-Breaker Tape: Polyethylene tape or other plastic tape recommended by sealant manufacturer. Provide self adhesive tape where applicable.

### 2.4 MISCELLANEOUS MATERIALS

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



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2.5 MANUFACTURER'S WEB ADDRESSES

A. Web Sites:

1. DAP, Dayton, Ohio; <http://www.dap.com/>
2. Dow Corning Corp. <http://www.dowcorning.com>
3. General Electric Co. <http://www.gesilicones.com>
4. Pecora Corp. <http://www.pecora.com>
5. Rhone-Poulenc Inc.
6. Degussa Building Systems <http://degussabuildingsystems.com>
7. Tremco Inc. <http://biznet.maximizer.com/roofing/index.html>

PART 3 - EXECUTION

3.1 EXAMINATION

- A. Examine joints indicated to receive joint sealants, with Installer present, for compliance with requirements for joint configuration, installation tolerances, and other conditions affecting joint sealant performance. Do not proceed with installation of joint sealants until unsatisfactory conditions have been corrected.

1. Insure all slab penetrations are sealed or will receive sealant

3.2 PREPARATION

- A. Surface Cleaning of Joints: Clean out joints immediately before installing joint sealants to comply with recommendations of joint sealant manufacturer and the following requirements:

1. Remove all foreign material from joint substrates that could interfere with adhesion of joint sealant, including dust, paints (except for permanent, protective coatings tested and approved for sealant adhesion and compatibility by sealant manufacturer), old joint sealants, oil, grease, waterproofing, water repellents, water, surface dirt, and frost.
2. Clean concrete, masonry, unglazed surfaces of ceramic tile, and similar porous joint substrate surfaces by brushing, grinding, blast cleaning, mechanical abrading, or a combination of these methods to produce a clean, sound substrate capable of developing optimum bond with joint sealants. Remove loose particles remaining from above cleaning operations by vacuuming or blowing out joints with oil-free compressed air.
3. Remove laitance and form release agents from concrete.
4. Clean metal, glass, porcelain enamel, glazed surfaces of ceramic tile, and other nonporous surfaces with chemical cleaners or other means that do not stain, harm substrates, or leave residues capable of interfering with adhesion of joint sealants.

- B. Joint Priming: Prime joint substrates where indicated or where recommended by joint sealant manufacturer based on preconstruction joint sealant-substrate tests or prior



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

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

### 3.3 SELECTION OF MATERIAL

- A. Caulking compounds shall be used for interior nonmoving joints and at locations specifically indicated on Drawings.
- B. One component elastomeric silicone sealants shall be used at exterior and interior joints where thermal or dynamic movement is anticipated including, but not limited to, the following locations:
  - 1. Metal to metal joints.
  - 2. Sheet metal flashings, copings, preformed metal caps, fascias, extenders, trim, and panels.
  - 3. Glass to glass joints.
  - 4. Glass to metal joints.
- C. One part self-leveling polyurethane sealants shall be used for exterior and interior horizontal joints subject primarily to pedestrian traffic and light and moderated vehicular traffic, and in all control joints in slab-on-grade; interior.

### 3.4 INSTALLATION OF JOINT SEALANTS

- A. General: Comply with joint sealant manufacturer's printed installation instructions applicable to products and applications indicated, except where more stringent requirements apply.
  - 1. Interior joints which require caulking are to be caulked with the specified caulking compound, unless noted otherwise.
  - 2. Exterior joints which require sealant are to be filled with one of the specified sealants even though the note may read "Caulked".
  - 3. Joints to be filled shall be thoroughly dry and free from dust, dirt, oil, and grease at the time of application or caulks or sealants.
  - 4. Expansion and control joints in exterior walls shall have the joint filler material built into the wall, or between wall and slab, at the time of construction.
  - 5. Masking: Metal shall be masked with masking tape, as well as other surfaces where its required to prevent the sealant smearing the adjacent surface. Upon completion of the caulking, remove the tape.
- B. Sealant Installation Standard: Comply with recommendations of ASTM C 1193, latest edition, for use of joint sealants as applicable to materials, applications, and conditions indicated.



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- C. Installation of Sealant Backings: Install sealant backings to comply with the following requirements:
  - 1. Install joint fillers of type indicated to provide support of sealants during application and at position required to produce the cross-sectional shapes and depths of installed sealants relative to joint widths that allow optimum sealant movement capability.
    - a. Do not leave gaps between ends of joint fillers.
    - b. Do not stretch, twist, puncture, or tear joint fillers.
    - c. Remove absorbent joint fillers that have become wet prior to sealant application and replace with dry material.
- D. Installation of Sealants: Install sealants by proven techniques that result in sealants directly contacting and fully wetting joint substrates, completely filling recesses provided for each joint configuration, and providing uniform, cross-sectional shapes and depths relative to joint widths that allow optimum sealant movement capability. Install sealants at the same time sealant backings are installed.
- E. Tooling of Non-sag Sealants: Immediately after sealant application and prior to time skinning or curing begins, tool sealants to form smooth, uniform beads of configuration indicated, to eliminate air pockets, and to ensure contact and adhesion of sealant with sides of joint. Remove excess sealants from surfaces adjacent to joint. Do not use tooling agents that discolor sealants or adjacent surfaces or are not approved by sealant manufacturer.
  - 1. Provide concave joint configuration per Figure 5A in ASTM C 1193, latest edition, unless otherwise indicated.

### 3.5 CLEANING

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

### 3.6 PROTECTION

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

### 3.7 GENERAL INSTALLATION PROVISIONS

- A. Inspection of Conditions: Require the Installer of each major component to inspect both



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the substrate and conditions under which Work is to be performed. Do not proceed until unsatisfactory conditions have been corrected in an acceptable manner.

- B. Manufacturer's Instructions: Comply with manufacturer's installation instructions and recommendations, to the extent that those instructions and recommendations are more explicit or stringent than requirements contained in Contract Documents.
- C. Inspect materials or equipment immediately upon delivery and again prior to installation. Reject damaged and defective items.
- D. Provide attachment and connection devices and methods necessary for securing Work. Secure Work true to line and level. Allow for expansion and building movement.
- E. Visual Effects: Provide uniform joint widths in exposed Work. Arrange joints in exposed Work to obtain the best visual effect. Refer questionable choices to the Architect for final decision.
- F. Recheck measurements and dimensions, before starting each installation.
- G. Install each component during weather conditions and Project status that will ensure the best possible results. Isolate each part of the completed construction from incompatible material as necessary to prevent deterioration.

END OF SECTION 07 92 00



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# **Division 08**

Openings





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SECTION 08 11 00  
STEEL DOORS AND FRAMES

PART 1 - GENERAL

1.1 SUMMARY

- A. Section includes hollow metal doors, frames and borrow lites. Furnish materials and equipment necessary for complete installation of hollow metal doors, frames, and related items necessary to complete the Work indicated on Drawings and specified herein.
- B. Coordination: Refer to Section 08 81 00 to obtain glass thickness requirements. Provide properly sized stops and bead to house the specified glass according to the glass manufacturer's recommendations and as indicated.
- C. The Work of this Section also includes asphaltic emulsion coating for the backside of all steel frames installed in CMU or concrete walls.

1.2 SUBMITTALS

- A. Product Data: Details of construction, materials, dimensions, hardware preparation, core, label compliance, sound ratings, profiles, and finishes.
- B. Shop Drawings:
  - 1. Show elevations, details and methods of assembling sections, hardware locations and installation methods, dimensions, shapes of materials, anchorage and fastening methods, wall opening construction details, and weatherstripping.
  - 2. Provide schedule of doors and frames using same reference numbers for details and openings as those on Contract Drawings and Schedules.
  - 3. Shop drawings shall be signed and sealed by a licensed engineer registered in the State of Florida.
  - 4. Calculations for wind load design shall be stamped, sealed and signed by a Professional Engineer in the State of Florida verifying compliance with ASCE/SEI 7, latest edition.
  - 5. Sample of Approved Product Label and location of attachment to assembly.
  - 6. Submit current Miami-Dade NOA for all exterior door and window units.
- C. Obtain approval of shop drawings prior to proceeding with manufacturing
- D. Sample warranty

1.3 QUALITY ASSURANCE

- A. Provide doors and frames complying with Steel Door Institute "Recommended Specifications for Standard Steel Doors and Frames" ANSI/SDI-100 and as herein specified.
- B. Hollow metal supplier shall be a qualified direct distributor of products to be furnished. In addition, the distributor shall have in their regular employment an A.H.C./C.D.C. who will



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be available at reasonable times to consult with the Architect regarding matters affecting the door and frame openings.

- C. Exterior steel doors and frames shall be designed to meet wind-loading requirements for the 2007 Florida Building Code with the 2009 Supplement. Refer to Structural Drawings for wind velocity.
  - 1. Exterior Door Assembly Labeling: Each exterior door assembly that has a glass lite in the assembly shall be tested by an approved independent testing laboratory and have an "approved product label" affixed to the assembly per FBC Chapter 17.
  - 2. Door assemblies shall resist the cyclic pressures, static pressures and missile impact loads as detailed in Florida Building Code test protocols TAS 201, TAS 202 and TAS 203.
- D. Positive Pressure Test: Where fire rated assembly is required, provide doors that comply with UL 10C, Category A, per the 2004 Florida Building Code with the 2006 Annual Interim Code Amendment (Final) and 2005 Supplement.

### 1.4 DELIVERY, STORAGE, AND HANDLING

- A. Deliver doors and frames cardboard-wrapped or crated to provide protection during transit and job storage. Provide additional protection to prevent damage to finish.
- B. Inspect doors and frames upon delivery for damage. Minor damages may be repaired provided refinished items are equal in all respects to new work and acceptable to Architect; otherwise, remove and replace damaged items as directed.
- C. Store doors and frames at building site under cover. Place units on minimum 4-inches high wood blocking. Avoid use of non-vented plastic or canvas shelters that could create humidity chamber. If cardboard wrapper on door becomes wet, remove carton immediately. Provide 1/4-inches spaces between stacked doors to promote air circulation.

### 1.5 WARRANTY

- A. Hollow metal doors and frames shall be supplied with a one (1) year warranty from the Date of Substantial Completion, against defects in materials and workmanship.

## PART 2 - PRODUCTS

### 2.1 ACCEPTABLE MANUFACTURERS

- A. Except as otherwise specified herein or specifically approved by the Architect, hollow metal doors and frames shall be products of one of the following manufacturers subject to compliance with Specification requirements.
  - 1. Amweld Building Products, Garrettsville, Ohio; [www.amweld.com](http://www.amweld.com)
  - 2. Ceco Door Products, An ASSA ABLOY Group Co., Milan, TN; [www.cecodoor.com](http://www.cecodoor.com)



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3. Steelcraft Door and Frame Products, Cincinnati, Ohio; [www.steelcraft.com](http://www.steelcraft.com)
4. Curries Company, An ASSA ABLOY Group Co., Mason City, Iowa; [www.curries.com](http://www.curries.com)
5. Fleming Steel Doors and Frames, Ajax, Ontario, Canada; [www.flemingdoor.com](http://www.flemingdoor.com)
6. Mesker Door, Inc., Huntsville, Alabama; [www.meskerdoor.com](http://www.meskerdoor.com)
7. Firedoor Corporation, Miami, Florida; [www.firedoorcorp.com](http://www.firedoorcorp.com)

### 2.2 MATERIALS

- A. Cold-Rolled Steel Sheets: Commercial quality carbon steel, complying with ASTM A 1008.
- B. Galvanized Steel Sheets: Hot dipped galvanized in accordance with ASTM A 653, with A60 coating designation, mill phosphatized.
- C. Supports and Anchors: Fabricate of not less than 18-gage galvanized sheet steel.
- D. Inserts, Bolts, and Fasteners: Manufacturer's standard units. Where items are to be built into exterior walls, hot-dip galvanize in compliance with ASTM A 153, Class C or D as applicable.
- A. Primer:
  1. Primer: Rust-inhibitive enamel or paint, either air-drying or baking, suitable as a base for specified finish paints complying with ANSI A250.10, "Test Procedure and Acceptance Criteria for Prime Painted Steel Surfaces for Steel Doors and Frames."
  2. Primer: Galvanized steel doors or frames – factory applied, air-dried, rust inhibitive touch-up primer complying with ANSI A250.10 where galvanizing has been removed during fabrication.
  3. Shop applied primers shall be compatible with finish paint specifications as specified in Section 09 91 00, Painting. Primers shall be as specified in Section 09 91 00, or letter of compatibility must accompany the shop drawings. Contractor shall be responsible to coordinate all required items for the proper installation of the finish paint and primers as specified. Ascertain compatibility during bidding period. If compatibility is not ascertained, the painting contractor will be required to provide and install all primers as specified in Section 09 91 00, Painting.

### 2.3 FABRICATION, GENERAL

- A. Fabricate steel door and frame units to be rigid, neat in appearance, and free from defects, warp, or buckle. Accurately form metal to required sizes and profiles. Wherever practicable, fit and assemble units in the manufacturer's plant. Clearly identify work that cannot be permanently factory assembled before shipment, to assure proper assembly at the project site. Lock edges of doors shall be beveled 1/8 inch in 2 inches.
- B. Panels and edge channels of exterior doors shall be fabricated from galvanized sheet steel. Panels and edge channels of interior doors shall be fabricated from cold rolled or galvanized sheet steel. Sizes, types, and assemblies shall be as indicated on the Drawings, Door Hardware Schedule, and as specified herein.



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- C. Fabricate concealed stiffeners, reinforcement, edge channels, and moldings from either cold rolled or hot rolled steel (at fabricator's option).
- D. Exposed Fasteners: Unless otherwise indicated, provide countersunk flat Phillips heads for exposed screws and bolts.
- E. Door Hardware Preparation:
  - 1. Prepare hollow metal units to receive mortised and concealed door hardware, including cutouts, reinforcing, drilling, and tapping in accordance with final door hardware schedule and templates provided by hardware supplier. Comply with applicable requirements of ANSI A115 "Specifications for Door and Frame Preparation."
  - 2. Reinforce hollow metal units to receive surface applied hardware. Drilling and tapping for surface applied door hardware may be done at project site.
  - 3. Locate finish hardware as shown on final shop drawings, or if not shown, in accordance with recommended hardware locations specified in "S.D.I. 100-91, Recommended Specifications, Standard Steel Doors and Frames," as published by the Steel Door Institute.
  - 4. Reinforce all steel doors and frames to receive surface mounted closers, whether or not scheduled to receive them.
- F. Shop Painting
  - 1. Clean, treat, and shop paint all surfaces of fabricated hollow metal doors and frames, including galvanized surfaces plus back prime of all hollow metal frames.
  - 2. Clean steel surfaces of mill scale, rust, oil, grease, dirt, and other foreign materials before the application of the shop coat of paint.
  - 3. Apply shop coat of prime paint of even consistency to provide a uniformly finished surface ready to receive field applied paint.
- G. Asphaltic Emulsion Coating: Apply on the frames in the fabricator's shop; field application is not acceptable.

### 2.4 DOOR TYPES

- A. The following door types shall conform to the Steel Door Institute Standards as described in SDI 100 and ANSI A250.8.
- B. Exterior doors shall be Grade III, 1-3/4 inches extra heavy duty, 16 gage galvanized, Model 2, seamless design.
  - 1. Coordinate gage with tested assemblies required for wind loading at exterior locations.
- C. Interior doors shall be Grade II, 1-3/4 inch heavy duty, 18 gage cold rolled or galvanized, Model 1, full flush, hollow steel construction.
  - 1. Door face sheets shall be formed from one sheet of metal with not face seams.



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Seams on vertical door edges shall be tight, smooth, and devoid of irregularities. A kraft resin impregnated honeycomb core or rigid polystyrene slab shall be permanently bonded to both door skins with adhesive as recommended by the manufacturer.

- D. Lock edge of interior and exterior doors shall be beveled 1/8 inch in 2 inches.
- E. Seamless construction by welding and filling at factory only.

### 2.5 FRAME TYPES

- A. Frames for exterior door openings shall be 14 gauge, fabricated from galvanized sheet steel.
- B. Frames for interior door openings and borrowed lights shall be 16 gauge, fabricated from cold rolled or galvanized sheet steel.
- C. Welded Frames: Weld flush face joints continuously, grind, fill, dress, and make smooth, flush and invisible.

### 2.6 FRAME ASSEMBLIES

- A. Frame Anchors
  - 1. Wall anchors for frame attachment to masonry construction: Masonry anchors, adjustable, flat, corrugated or perforated 'T' shaped anchors with leg not less than 2 inches wide by 10 inches long or masonry "wire" type not less than 3/16 inch diameter.
  - 2. All frame jamb anchors to be provided; on each jamb per 30 inches of frame height or fraction thereof.
  - 3. Floor anchors: Angle clip type
    - a. 16 gage minimum.
    - b. To receive 2 fasteners per jamb.
    - c. Welded to the bottom of each jamb.
  - 4. In place masonry or concrete:
    - a. 3/8 inch countersunk flat head stove bolt expansion shields.
    - b. Weld pipe spacers or other type of spacers per manufacturer's standard design in back of frame soffit to protect frame profile during tightening of bolts and anchors.
- B. Stops and Beads: Furnish 20 gauge metal glazing beads with the hollow metal frames and transoms, side lights, interior glazed panels, and other locations where beads are indicated in pressed steel frames. Glazing beads shall be on the interior side of exterior frames of transoms and side lights.



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- C. Plaster Guards: Provide 26 gage steel plaster guards or mortar boxes, welded to the frame, at back of door hardware cutouts where mortar or other materials might obstruct hardware operation.
- D. Door Silencers: Drill stops and install 3 silencers on strike jambs of single swing frames and 2 silencers on heads of double swing frames.

### 2.7 ASPHALTIC EMULSION COATING

- A. Emulsion coating for steel door frames shall be water-based, brush applied, emulsion dampproofing.
  - 1. Sonneborn Hydrocide 700B by BASF Construction Chemicals, LLC; [www.buildingsystems.basf.com](http://www.buildingsystems.basf.com)
  - 2. Sealastic by W.R. Meadows. [www.wrmeadows.com](http://www.wrmeadows.com)
  - 3. Karnak #100 by Karnak, Clark, New Jersey. [www.karnakcorp.com](http://www.karnakcorp.com)
- B. Install in all exterior and interior steel door frames installed in CMU or concrete walls.

## PART 3 - EXECUTION

### 3.1 PROTECTION

- A. Protect doors and frames from damage during transportation and at the job site; store at the site under cover on wood blocking or suitable floors.
- B. After installation, protect doors and frames from damage during subsequent construction activities.

### 3.2 INSTALLATION

- A. Install standard steel doors, frames, and accessories in accordance with final shop drawings, manufacturer's data, and as herein specified.
- B. Placing Frames: Comply with provisions of SDI-105 "Recommended Erection Instructions For Steel Frames," unless otherwise indicated.
  - 1. Except for frames located at existing concrete, masonry or drywall installations, place frames prior to construction of enclosing walls and ceilings. Set frames accurately in position, plumbed, aligned, and braced securely until permanent anchors are set. After wall construction is completed, remove temporary braces and spreaders leaving surfaces smooth and undamaged.
  - 2. In masonry construction, locate 3 wall anchors per jamb adjacent to hinge location on hinge jamb and at corresponding heights on strike jamb. Acceptable anchors include masonry wire anchors and masonry Tee anchors.
  - 3. At existing masonry construction, provide 3 completed opening anchors per jamb adjacent to hinge location on hinge jamb and at corresponding heights on strike jamb, set frames and secure to adjacent construction with bolts and masonry anchorage devices.



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4. In metal stud partitions, install at least 3 wall anchors per jamb at hinge and strike levels. In closed steel stud partitions, attach wall anchors to studs with screws.
  5. Set frames in position; plumb, align, and brace securely until permanent anchors are set. Anchor bottom of frames to floors with expansion bolts or with power fasteners. Where frames require ceiling struts or other structural overhead bracing, they shall be anchored securely to ceilings or structural framing above, as indicated or specified.
  6. The finished work shall be rigid, neat in appearance, and free from defects. Form molded members straight and true with joints coped or mitered, well formed, and in true alignment. Welded joints on exposed surfaces shall be dressed smooth so they are invisible after finishing.
  7. Grouting of metal frames is included in the Work of Section 04 20 01. Spot grouting of metal frames in gypsum wallboard partitions is included in the Work of Section 09 29 00.
  8. Where anchor bolts are used in concrete or masonry openings, the bolt head shall be recessed, filled with bondo and sanded smooth.
  9. Provide filler plate at all hardware preps, such as hinge and strike preps, that are unused.
- C. Door Installation: Fit hollow metal doors accurately in frames, within clearances specified in ANSI/SDI-100.
- D. Install asphaltic emulsion coating on inside (concealed) faces of all frames installed in CMU or concrete walls. Apply at 1/8" thick minimum and allow to dry prior to the installation of the grout.
- E. Provide all items and accessories as required for a complete installation in every respect.

### 3.3 GENERAL INSTALLATION PROVISIONS

- A. Inspection of Conditions: Require the Installer of each major component to inspect both the substrate and conditions under which Work is to be performed. Do not proceed until unsatisfactory conditions have been corrected in an acceptable manner.
- B. Manufacturer's Instructions: Comply with manufacturer's installation instructions and recommendations, to the extent that those instructions and recommendations are more explicit or stringent than requirements contained in Contract Documents.
- C. Inspect materials or equipment immediately upon delivery and again prior to installation. Reject damaged and defective items.
- D. Provide attachment and connection devices and methods necessary for securing Work. Secure Work true to line and level. Allow for expansion and building movement.
- E. Visual Effects: Provide uniform joint widths in exposed Work. Arrange joints in exposed Work to obtain the best visual effect. Refer questionable choices to the Architect for final decision.
- F. Recheck measurements and dimensions, before starting each installation.



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- G. Install each component during weather conditions and Project status that will ensure the best possible results. Isolate each part of the completed construction from incompatible material as necessary to prevent deterioration.

3.4 ADJUST AND CLEAN

- A. Prime Coat Touch-up: Immediately after erection, sand smooth any rusted or damaged areas of prime coat and apply touch-up of compatible air-drying primer.
- B. Protection Removal: Immediately prior to final inspection, remove protective plastic wrappings from prefinished doors.
- C. Final Adjustments: Check and readjust operating hardware items, leaving steel doors and frames undamaged and in complete and proper operating condition.

3.5 FIELD QUALITY CONTROL

- A. Damaged work will be rejected and shall be replaced with new work at no additional cost to the Owner or Architect.
- B. After installation, protect doors and frames from damage during subsequent construction activities.

END OF SECTION 08 11 00



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SECTION 08 31 00  
ACCESS DOORS

PART 1 - GENERAL

1.1 SUMMARY

- A. Provide labor, materials, and equipment necessary for installation of access doors.
- B. Install as needed to the size required, the locking requirements of the Owner, and meeting applicable code requirements.

1.2 SUBMITTALS

- A. Submit in accordance with Division 01 requirements.
- B. Product Data: Submit manufacturer's technical data and installation instructions for each type of access door assembly, including setting drawings, templates, instructions, and directions for installation of anchorage devices.
- C. Include complete schedule, including types, general locations, sizes, wall and ceiling construction details, finishes, latching, or locking provisions, and other data pertinent to installation.
- D. Verification: Obtain specific locations and sizes for required access doors from trades requiring access to concealed equipment, and indicate on submittal schedule.

PART 2 - PRODUCTS

2.1 MANUFACTURERS

- A. Subject to compliance with requirements, provide access doors by one of the following:
  - 1. Bar-Co., Inc., Enterprise, AL; [www.alfabinc.com](http://www.alfabinc.com)
  - 2. Cesco Products, Florence, KY; [www.cescoproducts.com](http://www.cescoproducts.com)
  - 3. J. L. Industries, Inc., Bloomington, MN; [www.jlindustries.com](http://www.jlindustries.com)
  - 4. Karp Associates, Inc., Maspeth, NY; [www.karpinc.com](http://www.karpinc.com)
  - 5. Milcor, Inc., A Gibraltar Co., Holland, OH; [www.milcorinc.com](http://www.milcorinc.com)
  - 6. Nystrom, Inc., Minneapolis, MN; [www.nystrom.com](http://www.nystrom.com)

2.2 MATERIALS AND FABRICATION

- A. Furnish each access door assembly manufactured as an integral unit, complete and ready for installation.
- B. Gypsum Board Ceilings: For gypsum board walls and ceilings, furnish perforated frames with drywall bead. Access door face shall be recessed to accept a single layer of 5/8 inch gypsum board. 16 gauge cold rolled steel frame with galvanized drywall taping bead



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attached to all four sides. Hinges shall be cold rolled with stainless steel pin, continuous piano type. Size: 36 x 24 inch, unless indicated otherwise.

- C. Latching Devices: Furnish flush, screwdriver operated cam locks of number required to hold door in flush, smooth plane when closed.
- D. Provide one key-operated cam lock per access door. Furnish 2 keys per lock. Key locks alike, unless otherwise scheduled.
  - 1. If only one latching device is required, then it shall be a key operated cam lock.
- E. Access doors and frames shall be factory primed with manufacturers standard primer paint.
- F. Field paint by Section 09 91 00, Painting.

### PART 3 - EXECUTION

#### 3.1 INSTALLATION

- A. Comply with manufacturer's instructions for installation of access doors and panels.
- B. Coordinate installation with work of other trades.
- C. Coordinate locking requirements with the Owner.
- D. Set frames accurately in position and securely attach to supports with face panels plumb or level in relation to adjacent finish surfaces.
- E. Provide all items and accessories as required for a complete and thorough installation in every respect.

#### 3.2 ADJUST AND CLEAN

- A. Adjust hardware and panels after installation for proper operation.
- B. Remove and replace panels or frames which are warped, bowed, or otherwise damaged.

#### 3.3 GENERAL INSTALLATION PROVISIONS

- A. Inspection of Conditions: Require the Installer of each major component to inspect both the substrate and conditions under which Work is to be performed. Do not proceed until unsatisfactory conditions have been corrected in an acceptable manner.
- B. Manufacturer's Instructions: Comply with manufacturer's installation instructions and recommendations, to the extent that those instructions and recommendations are more explicit or stringent than requirements contained in Contract Documents.



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- C. Inspect materials or equipment immediately upon delivery and again prior to installation. Reject damaged and defective items.
- D. Provide attachment and connection devices and methods necessary for securing Work. Secure Work true to line and level. Allow for expansion and building movement.
- E. Visual Effects: Provide uniform joint widths in exposed Work. Arrange joints in exposed Work to obtain the best visual effect. Refer questionable choices to the Architect for final decision.
- F. Recheck measurements and dimensions, before starting each installation.
- G. Install each component during weather conditions and Project status that will ensure the best possible results. Isolate each part of the completed construction from incompatible material as necessary to prevent deterioration.
- H. Mounting Heights: Where mounting heights are not indicated, install individual components at standard mounting heights recognized within the industry for the particular application indicated. Refer questionable mounting height decisions to the Architect for final decision.

END OF SECTION 08 31 00



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SECTION 08 33 13  
COILING COUNTER DOORS

PART 1 - GENERAL

1.1 SUMMARY

- A. Provide labor, materials, and equipment necessary for complete installation of the coiling counter doors as shown on the Drawings and specified herein.

1.2 SUBMITTALS

- A. Submit in accordance with Division 01 requirements.
- B. Shop Drawings: Shop drawings shall show elevations of each door type, door construction details and methods of assembling sections, hardware locations and installation methods, dimensions and shapes of materials, anchorage and fastening methods, door frame types and details, wall opening construction details, weatherstripping, and finish requirements.
- C. Submit current Miami-Dade NOA for exterior coiling door.
- D. Submit warranties as specified herein.

1.3 QUALITY ASSURANCE

- C. All exterior overhead coiling doors (located in exterior walls) shall be designed to withstand 20 PSF windload. Endlocks/windlocks shall be installed on every slat on doors over 14 feet wide.
- B. All exterior overhead coiling doors (located in exterior walls) shall be designed to withstand 100 MPH wind (x 1.10 importance factor) per ASCE/SEI 7, latest edition.
- C. Overhead coiling doors shall be designed to a standard maximum of 25 cycles per day and an overall maximum of 25,000 operating cycles for the life of the door.

1.4 WARRANTY

- A. Provide manufacturers warranty of one (1) year from the Date of Substantial Completion against effects in workmanship and materials.

PART 2 - PRODUCTS

2.1 MANUFACTURER

- A. Basis of Design: Coiling counter doors shall be the products of The Cookson Co., San Francisco, California; specified as the type, size, function, and quality of the products required.



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- B. Products of the following manufacturers will be considered, providing their products equal or exceed the quality specified, and they can provide products of the type, size, function, and arrangement required.
1. Kinneer Division of Marsco Corp., Columbus, Ohio
  2. North American of W-D Door Inc., Lindenhurst, New York
  3. Cornell Iron Works Inc., Mountaintop, Pennsylvania
  4. Atlas Door, Cincinnati, Ohio
- C. Types: CD8-1, push-up, face of wall mounted, curtain: Stainless steel with #4 finish.

### 2.2 STAINLESS STEEL MATERIALS AND CONSTRUCTION

- A. Curtains: Interconnected strip stainless steel slats. 22 gauge, 1-1/4" high by 3/8" deep stainless steel slats with a #4 finish.
- B. Bottom bar shall be constructed of tubular stainless steel, 2" high by 1-1/4" deep with a foam astragal on the bottom edge. Finish shall be #4.
- C. Guides shall be constructed of stainless steel angle and channel, 1-7/8" square. The guides shall have a #4 finish.
- D. Brackets shall be 3/16" thick die cast aluminum and shall have stainless steel end covers.
- E. All gears shall be cast iron with teeth cast from machine cut patterns. The pinion gear shall not be less than 3" pitch diameter. The gear ratio shall be designed for a maximum effort of not more than 30 pounds.
- F. The barrel shall be steel tubing of not less than 4" diameter. Provide oil tempered torsion springs for counterbalancing the weight of the curtain. Finish on the barrel shall be rust-inhibiting prime paint.
- G. The hood shall be 24 gauge stainless steel with a #4 finish and shall be formed to fit the square brackets.
- H. Operation: Hand crank.
1. Operate with a removable awning type handle through shafting and precision cast iron reduction gearing.
- I. Locking: Equip doors for locking with slide bolts operable from coil side.

### 2.3 OPERATION

- A. Manual Push-Up operation: Push-Up doors shall open and close with a maximum for 30 pounds of effort utilizing finger lifts in the bottom bar.



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2.4 MISCELLANEOUS

- A. Locking: Equip doors for locking with slide bolts operable from coil side.
- B. Weatherseal: Provide manufacturer's standard weather seals for counter doors exposed to the exterior. Coordinate exact units with Architect.

PART 3 - EXECUTION

3.1 INSTALLATION

- A. The coiling counter doors shall be erected by the manufacturer or his authorized representative in compliance with detailed instructions of the manufacturer.
- B. Install assemblies to provide a rigid, permanent attachment to the building according to supplier's instructions, approved shop drawings, and Architect's Drawings.
- C. Provide all items and accessories as required for a complete and operating installation in every respect.

3.2 ADJUSTMENT AND CLEANING

- A. After installation moving parts shall be properly adjusted to give free, effortless operation.
- B. Take every precaution to properly protect the assemblies during and after installation.
- C. After installation clean exposed surfaces and demonstrate to the Architect that components are in proper working order.

END OF SECTION 08 33 13



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SECTION 08 51 15  
PASS THROUGH WINDOWS

PART 1 - GENERAL

1.1 SUMMARY

- A. Provide labor, materials, and equipment necessary for the complete installation of interior sliding pass through window with stainless steel shelf as specified herein and as indicated on the drawings.

1.2 SUBMITTALS

- A. Submit the following in accordance with Division 01 requirements.
1. Product data, including:
    - a. Construction details and fabrication methods.
    - b. Profiles and dimensions of individual components.
    - c. Data on hardware, accessories, and finishes.
    - d. Recommendations for maintenance and cleaning of exterior surfaces.
  2. Shop drawings: Include information not fully detailed in manufacturer's standard product data and the following:
    - a. Layout and installation details, including anchors
    - b. Typical window unit elevations at 3/4-inch scale.
    - c. Full-size section details of typical composite members, including reinforcement
    - d. Hardware including operators
    - e. Glazing details
    - f. Accessories
- B. Submit warranty as specified herein.

1.3 QUALITY ASSURANCE

- A. Installer Qualifications: Engage an experienced Installer who has completed installation of pass through windows similar in design and extent to those required for the project and whose work has resulted in construction with a record of successful in-service performance.

1.4 PROJECT CONDITIONS

- A. Field Measurements: Check actual window openings by accurate field measurement before fabrication. Show recorded measurements on final shop drawings. Coordinate fabrication schedule with construction progress to avoid delay of work.



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1.5 WARRANTY

- A. Submit a written warranty, agreeing to repair or replace window units that fail in materials or workmanship within the specified warranty period. Failures include but are not limited to:
  - 1. Structural failures including excessive deflection.
  - 2. Faulty operation of sash and hardware.
  - 3. Deterioration of metals, metal finishes, and other materials beyond normal weathering.
- B. Warranty Period: Five (5) years from the Date of Substantial Completion.

PART 2 - PRODUCTS

2.1 ACCEPTABLE MANUFACTURERS

- A. Basis of Design: Series E Horizontal Sliding Window with Stainless Steel Shelf as manufactured by Nissen & Company, Inc., South El Monte, California. Refer to Drawings for actual window size.
- B. Products of the following companies are also acceptable provided compliance with all technical requirements as specified herein:
  - 1. Creative Industries, Inc., Indianapolis, Indiana.

2.2 PRODUCTS/MATERIALS

- A. Aluminum Extrusions: Provide alloy and temper recommended by the window manufacturer for the strength, corrosion resistance, and application of required finish, but not less than 22,000-psi ultimate tensile strength and not less than 0.062 inch thick.
- B. Provide with stainless steel shelf, built-in tray and talk through device.
- C. Glass: 1/4-inch tempered. If tempered glass is not available in the unit submitted, provide the least bullet resistant glazing.
- D. Stainless Steel Shelf: 18 inch depth, 18 gauge, Type 316 stainless steel.

2.3 HARDWARE

- A. Provide manufacturer's standard hardware for horizontal sliding window unit.

2.4 FABRICATION

- A. Pre-glazed Fabrication: Pre-glaze window units at the factory with 1/4" tempered glass. Comply with glass and glazing requirements of Section 08 81 00 of these specifications and AAMA 101.



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- B. All frame and vent joints shall be factory sealed with sealant conforming to AAMA 800.

2.5 FINISHES

- A. General: Comply with NAAMM "Metal Finishes Manual" for recommendations relative to application and designations of finishes. Apply on clean extrusions free from surface blemishes or scratches.
- B. Finish designations prefixed by "AA" conform to the system established by the Aluminum Association for designating aluminum finishes.
- C. AAMA 607 clear anodized finish conforming to AAM10C22A41 Class I, .7 mils thick.
- D. Stainless Steel Shelf: Provide stainless steel with a brushed finish.

PART 3 - EXECUTION

3.1 INSPECTION

- A. Inspect openings before beginning installation. Verify that rough or masonry opening is correct and the sill plate is level.

3.2 INSTALLATION

- A. Install per manufacturer's recommendations.

3.3 CLEANING

- A. Clean aluminum surfaces promptly after installation of windows. Exercise care to avoid damage to protective coatings and finishes. Remove excess glazing and sealant compounds, dirt, and other substances. Lubricate hardware and other moving parts.
- B. Clean glass of preglazed units promptly after installation of windows.

3.4 PROTECTION

- A. Initiate and maintain protection and other precautions required through the remainder of the construction period, to ensure that, except for normal weathering, window units will be free of damage or deterioration at the time of Substantial Completion.

END OF SECTION 08 51 15



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SECTION 08 71 00  
FINISH HARDWARE

PART 1 - GENERAL

1.01 WORK INCLUDED

- A. The work in this section shall include furnishing of all items of finish hardware as hereinafter specified or obviously necessary to complete the building, except those items that are specifically excluded from this section of the specification.

1.02 RELATED WORK SPECIFIED ELSEWHERE

- A. Hollow Metal Doors and Frames

1.03 DESCRIPTION OF WORK

- A. Furnish labor and material to complete hardware work indicated, as specified herein, or as may be required by actual conditions at building.
- B. Include all necessary screws, bolts, expansion shields, other devices, if necessary, as required for proper hardware application. The hardware supplier shall assume all responsibility for correct quantities.
- C. Hardware shall meet the requirements of Federal, State and Local codes having jurisdiction over this project, notwithstanding any real or apparent conflict therewith in these specifications.
- D. Hurricane Openings: Provide hardware for hurricane openings in compliance with local jurisdiction. This requirement takes precedence over other requirements for such hardware. Provide only hardware that has been tested and listed by local authority for the types and sizes of doors required, and complies with the requirements of the door and door frame.
- E. Fasteners:
  - 1. Hardware as furnished shall conform to published templates generally prepared for machine screw installation.
  - 2. Furnish each item complete with all screws required for installation. Typically, all exposed screws installation.
  - 3. Insofar as practical, furnished concealed type fasteners for hardware units that have exposed screws shall be furnished with Phillips flat head screws, finished to match adjacent hardware.
  - 4. Door closers and exit devices to be installed with closed head through bolts (sex bolts).

1.04 QUALITY ASSURANCE

- A. The supplier to be a directly franchised distributor of the products to be furnished and have in their employ an AHC (Architectural Hardware Consultant). This person is to be available for consultation to the architect, owner and the general contractor at reasonable times during the course of work.
- B. The finish hardware supplier shall prepare and submit to the architect six (6) copies of a complete schedule identifying each door and each set number, following the numbering system and not



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creating any separate system himself. He shall submit the schedule for review, make corrections as directed and resubmit the corrected schedule for final approval. Approval of schedule will not relieve Contractor of the responsibility for furnishing all necessary hardware, including the responsibility for furnishing correct quantities.

- C. No manufacturing orders shall be placed until detailed schedule has been submitted to the architect and written approval received.
- D. After hardware schedule has been approved, furnish templates required by manufacturing contractors for making proper provisions in their work for accurate fitting, finishing hardware setting. Furnish templates in ample time to facilitate progress of work.
- E. Hardware supplier shall have an office and warehouse facilities to accommodate the materials used on this project. The supplier must be an authorized distributor of the products specified.
- F. The hardware manufactures are to supply both a pre-installation class as well as a post-installation walk-thru. This is to insure proper installation and provide for any adjustments or replacements of hardware as required.

1.05 DELIVERY, STORAGE, AND HANDLING

- A. Wrap, protect finishing hardware items for shipment. Deliver to manufacturing contractors hardware items required by them for their application; deliver balance of hardware to job; store in designated location. Each item shall be clearly marked with its intended location.

1.06 WARRANTY

- A. The material furnished shall be warranted for one year after installation or longer as the individual manufacturer's warranty permits.
- B. Overhead door closers shall be warranted in writing by the manufacturer against failure due to defective materials and workmanship for a period of ten (10) years commencing on the Date of Final Completion and Acceptance, and in the event of failure, the manufacture is to promptly repair or replace the defective with no additional cost to the Owner.

PART 2 - PRODUCTS

2.01 ACCEPTABLE MANUFACTURERS

- A. To the greatest extent possible, obtain each kind of hardware from only one manufacturer.
- B. All numbers and symbols used herein have been taken from the current catalogues of the following manufacturers.

PRODUCT	ACCEPTABLE MANUFACTURER	ACCEPTABLE SUBSTITUTE
1. Hinges	Ives	Hager, Stanley , Bommer
2. Locks & Latches	Schlage	None (Owners standard)
3. Cylinders, Keys, Keying	Schlage Everest	None (Owners standard)



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4.	Exit Devices	Von Duprin	None (Owners standard)
5.	Door Closers	LCN	None (Owners standard)
6.	OH Stops/ HOLDERS	Glynn Johnson	Rixson
7.	Magnetic Hold Opens	LCN	Dor-O-Matic
8.	Wall Stops/Floor Stops, Flushbolts	Ives	Rockwood, G J
9.	Kick Plates	Ives	Quality, Rockwood
10.	Threshold/Weather-strip	National Guard	Pemko, Zero
11.	Silencers	Ives	Rockwood, GJ
12.	Key Cabinet	Lund	Key Control

C. If material manufactured by other than that specified or listed herewith as an equal, is to be bid upon, permission must be requested from the architect seven (7) days prior to bidding. If substitution is allowed, it will be so noted by addendum.

2.02 FINISH OF HARDWARE:

A. Exterior Hinges to be Stainless Steel (32D), Interior Hinges to be Satin Chrome (26D). Door Closers to be Aluminum. Locks to be Satin Chrome (26D), Exit Devices to be Satin Chrome (26D). Overhead Holders to be Satin Chrome (26D), Flat Goods to be Satin Chrome (26D) or Stainless Steel (32D) and the Thresholds to be Mill Finish Aluminum.

2.03 HINGES AND PIVOTS:

- A. Exterior butts shall be Stainless Steel. Butts on all out swinging doors shall be furnished with non-removable pins (NRP).
- B. Interior butts shall be as listed.
- C. Doors 5' or less in height shall have two (2) butts. Furnish one (1) additional butt for each 2'6" in height or fraction thereof. Dutch door shall have two (2) butts per leaf.

2.04 KEYING:

- A. All locks and cylinders shall be Schlage Everest key system, all bittings shall be issued by Schlage Lock.
- B. Provide Two (2) each change keys per lock and Six (6) each grand master and master keys. All keys to be Patent Restricted.
- C. Hardware supplier to provide temporary cylinders or cores during the construction phase. The contractor is to change out the temporary cylinders for the permanent cylinders.

2.05 LOCKSETS:

- A. Locksets shall be Heavy Duty Cylindrical type, unless specified otherwise, in "ND" series and "AL", design as manufactured by Schlage.
  - 1. Acceptable substitutions: None (Owners standard)



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2.06 EXIT DEVICES:

- A. All devices shall be Von Duprin 98 Series in types and functions specified. All devices must be listed under "Panic Hardware" in accident equipment list of Underwriters Laboratories. All labeled doors with "Fire Exit Hardware" must have labels attached and be in strict accordance with Underwriters Laboratories.
- B. All exit devices shall be tested to ANSI/BHMA A156.3 test requirements by a BHMA certified testing laboratory. A written certification showing successful completion of a minimum of 1,000,000 cycles must be provided.
- C. All surface strikes shall be roller type and come complete with a plate underneath to prevent movement. And shall be provided with a dead-latching feature to prevent latchbolt tampering.
  - 1. Acceptable substitutions: None (Owners standard)

2.07 DOOR CLOSERS:

- A. All closers shall be LCN 4000 series having non-ferrous covers, forged steel arms separate valves for adjusting backcheck, closing and latching cycles and adjustable spring to provide up to 50% increase in spring power. Closers shall be furnished with parallel arm mounted on all doors opening into corridors or other public spaces and shall be mounted to permit 180 degrees door swing wherever wall conditions permit. Furnish with non-hold open arms unless otherwise indicated.
- B. Door closer cylinders shall be of high strength cast iron construction to provide low wear operating capabilities of internal parts throughout the life of the installation. All door closers shall be tested to ANSI/BHMA A156.4 test requirements by a BHMA certified testing laboratory. A written certification showing successful completion of a minimum of 10,000,000 cycles must be provided.
- C. Door closers shall utilize temperature stable fluid capable of withstanding temperature ranges of 120 degrees Fahrenheit to -30 degrees Fahrenheit, without requiring seasonal adjustment of closer speed to properly close the door. Closers for fire-rated doors shall be provided with temperature stabilizing fluid that complies with the standards UBC 7-2 (1997) and UL 10C.
- D. Door closers shall incorporate tamper resistant non-critical screw valves of V-slot design to reduce possible clogging from particles within the closer. Closers shall have separate and independent screw valve adjustments for latch speed, general speed, and hydraulic backcheck. Backcheck shall be properly located so as to effectively slow the swing of the door at a minimum of 10 degrees in advance of the dead stop location to protect the door frame and hardware from damage. Pressure relief valves (PRV) are not acceptable.
  - 1. Acceptable substitutions: None (Owners standard)

2.08 TRIM AND PLATES:

- A. Kick plates, mop plates, and armor plates, shall be .050 gauge with 630 finish. Kick plates to be 10" high, mop plates to be 4" high. All plates shall be two (2) inches less full width of door.



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- B. Push plates, pull plates, door pulls, and miscellaneous door trim shall be shown in the hardware schedule.

2.09 DOOR STOPS:

- A. Doorstops shall be furnished for all doors to prevent damage to doors or hardware from striking adjacent walls or fixtures. Wall bumpers equal to IVES 407 Series are preferred, but where not practical furnish floor stops equal to IVES 436 or 438 series. Where conditions prohibit the use of either wall or floor type stops, furnish surface mounted overhead stops equal to Glynn Johnson, 450 Series.

2.10 THRESHOLDS AND WEATHERSTRIP:

- A. Thresholds and weather-strip shall be as listed in the hardware schedule.

2.11 DOOR SILENCERS:

- A. Furnish rubber door silencers equal to IVES 20 for all new interior hollow metal frames, (2) per pair and (3) per single door frame.

PART 3 - EXECUTION

3.01 INSTALLATION:

- A. All hardware shall be applied and installed in accordance with the Finish Hardware schedule. Care shall be exercised not to mar or damage adjacent work.
- B. Contractor to provide a 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.
- C. No hardware is to be installed until the hardware manufactures have provided a pre-installation class. To insure proper installation of the specified products a post-installation inspection is to be conducted.

3.02 ADJUSTING AND CLEANING:

- A. Contractor shall adjust all hardware in strict compliance with manufacturer's instructions. Prior to turning project to owner, contractor shall clean and make any final adjustments to the finish hardware.

3.03 PROTECTION:

- A. Contractor shall protect the hardware, as it is stored on construction site in a covered and dry place.



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B. Contractor shall protect exposed hardware installed on doors during the construction phase.

3.04 KEY CABINET:

A. Set up and index one (1) Key Cabinet that allows room for expansion for 150% of the number of keys for the project.

3.05 HARDWARE SCHEDULE:

A. The following schedule is furnished for whatever assistance it may afford the contractor; do not consider it as entirely inclusive. Should any particular door or item be omitted in any scheduled hardware group, provide door or item with hardware same as required for similar purposes. Quantities listed are for each pair of doors or for each single door.

B. This hardware schedule was prepared by.

IR - Security Technology  
 735 W. SR 434, Suite H  
 Longwood, FL 32750  
 Ph: 407-571-2000  
 Fax 407-571-2006

Hardware Group No. 01 – 101, 103, 104

Provide each SGL door(s) with the following:

Quantity	Description	Model Number	Finish	Mfr
3	EA HINGE	3CB1 4.5 X 4.5 NRP	630	IVE
2	EA SFIC EV B CORE ONLY	80-036	626	SCH
1	EA OFFICE LOCK	ND53BDC RHO	626	SCH
1	EA MORTISE CYLINDER	80-103-ICX	626	SCH
1	EA SURFACE CLOSER	4041 CUSH	689	LCN
1	EA KICK PLATE	8400 10" X 2" LDW	630	IVE
1	SET SEALS	188S	BRN	ZER
1	EA THRESHOLD	65A	AL	ZER

Hardware Group No. 02 – 102, 103A

Provide each SGL door(s) with the following:

Quantity	Description	Model Number	Finish	Mfr
3	EA HINGE	3PB1 4.5 X 4.5	652	IVE
1	EA STOREROOM LOCK	ND80BDC RHO	626	SCH
1	EA SFIC EV B CORE ONLY	80-036	626	SCH
3	EA SILENCERS	SR64	GRY	IVE

END OF SECTION 08 71 00



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SECTION 08 81 00  
GLAZING

PART 1 - GENERAL

1.1 SUMMARY

- A. This Section includes the following glazing products; including those glazing products referenced in other Sections where glazing requirements are specified by reference to this Section:
  - 1. ¼ inch clear tempered glass.
  - 2. Laminated glass.
- B. The following items are also specified herein:
  - 1. Glazing sealants, gaskets, and accessories.
  - 2. Miscellaneous glazing materials.

1.2 SUBMITTALS

- A. Submit in accordance with Division 1 requirements.
- B. Product data for each glass product and glazing material indicated.
- C. Samples for verification purposes of 12-inch-square samples of each type of glass indicated except for clear monolithic glass products, and 12-inch-long samples of each color required (except black) for each type of sealant or gasket exposed to view. Install sealant or gasket sample between two strips of material representative in color of the adjoining framing system.
- D. Product certificates signed by glazing materials manufacturers certifying that their products comply with specified requirements.
  - 1. Separate certifications are not required for glazing materials bearing manufacturer's permanent labels designating type and thickness of glass, provided labels represent a quality control program of a recognized certification agency or independent testing agency acceptable to authorities having jurisdiction.
- E. Compatibility and adhesion test reports from sealant manufacturer indicating that glazing materials were tested for compatibility and adhesion with glazing sealants. Include sealant manufacturer's interpretation of test results relative to sealant performance and recommendations for primers and substrate preparation needed for adhesion.
- F. Compatibility test report from manufacturer of insulating glass edge sealant indicating that glass edge sealants were tested for compatibility with other glazing materials including sealants, glazing tape, gaskets, setting blocks, and edge blocks.
- G. Product test reports for each type of glazing sealant and gasket indicated, evidencing compliance with requirements specified.



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- H. Maintenance data for glass and other glazing materials to include in Operating and Maintenance Manual specified in Division 1.
- I. Submit warranties as specified herein.

1.3 DEFINITIONS

- A. Manufacturer is used in this Section to refer to a firm that produces primary glass or fabricated glass as defined in the referenced glazing standard.
- B. Deterioration of Laminated Glass: Defects developed from normal use that are attributed to the manufacturing process and not to glass breakage and practices for maintaining and cleaning laminated glass contrary to manufacturer's directions. Defects include edge separation, delamination materially obstructing vision through glass, and blemishes exceeding those allowed by referenced laminated glass standard.

1.4 SYSTEM PERFORMANCE REQUIREMENTS

- A. Provide glazing systems that are produced, fabricated, and installed to withstand normal thermal movement, wind loading, and impact loading (where applicable), without failure including loss or glass breakage attributable to the following: defective manufacture, fabrication, and installation; failure of sealants or gaskets to remain watertight and airtight; deterioration of glazing materials; and other defects in construction.
- B. Glass Design: Glass thicknesses indicated on Drawings are for detailing only. Confirm glass thicknesses by analyzing Project loads and in-service conditions. Provide glass lites for the various size openings in the thicknesses and strengths (annealed or heat-treated) to meet or exceed the following criteria:
  - 1. Minimum glass thickness, nominally, of lites in exterior walls is 6.0 mm (0.23 inch).
  - 2. Tinted and heat-absorbing glass thicknesses for each tint indicated are the same throughout Project.
  - 3. Minimum glass thicknesses of lites, whether composed of annealed or heat-treated glass, are selected so the worst-case probability of failure does not exceed the following:
    - a. 8 lites per 1000 for lites set vertically or not over 15 degrees off vertical and under wind action. Determine minimum thickness of monolithic annealed glass according to ASTM E 1300. For other than monolithic annealed glass, determine thickness per glass manufacturer's standard method of analysis including applying adjustment factors to ASTM E 1300 based on type of glass.
    - b. 1 lite per 1000 for lites set over 15 degrees off vertical and under action of wind or snow.
- C. Normal thermal movement results from the following maximum change (range) in ambient and surface temperatures acting on glass-framing members and glazing



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components. Base engineering calculation on materials' actual surface temperatures due to both solar heat gain and nighttime sky heat loss.

1. Temperature Change (Range): 120 deg F (67 deg C), ambient; 180 deg F (100 deg C), material surfaces.

### 1.5 QUALITY ASSURANCE

- A. Comply with applicable codes and regulations and with the Consumer Product Safety Commission CPSC 16 CFR 1201 and with applicable recommendations of Flat Glass Marketing Association (FGMA) "Glazing Manual."
- B. Provide labels showing glass manufacturer's identity, type of glass, thickness, and quality. Labels shall remain on glass until it has been set and approved by the Architect.
- C. Glazing Publications: Comply with published recommendations of glass product manufacturers and organizations below, except where more stringent requirements are indicated. Refer to these publications for glazing terms not otherwise defined in this Section or in referenced standards.
  1. FGMA Publications: "FGMA Glazing Manual."
  2. AAMA Publications: AAMA TIR-A7 "Sloped Glazing Guidelines" and "Glass Design for Sloped Glazing."
  3. LSGA Publications: "LSGA Design Guide."
  4. SIGMA Publications: TM-3000 "Vertical Glazing Guidelines" and TB-3001 "Sloped Glazing Guidelines."
  5. Applicable requirements for the 2007 Florida Building Code with the 2009 Supplement.
- D. Safety Glass: Products complying with testing requirements of 16 CFR Part 1201 for Category II materials.
  1. Subject to compliance with requirements, provide safety glass permanently marked with certification label of Safety Glazing Certification Council (SGCC) or other certification agency acceptable to authorities having jurisdiction.
- E. Glazier Qualifications: Engage an experienced glazier who has completed glazing similar in material, design, and extent to that indicated for Project with a record of successful in-service performance.
- F. Single-Source Responsibility for Glass: Obtain glass from one source for each product indicated below:
  1. Primary glass of each (ASTM C 1036) type and class indicated.
  2. Heat-treated glass of each (ASTM C 1048) condition indicated.
  3. Laminated glass of each (ASTM C 1172) kind indicated.
- G. Single-Source Responsibility for Glazing Accessories: Obtain glazing accessories from one source for each product and installation method indicated.



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1.6 DELIVERY, STORAGE, AND HANDLING

- A. Deliver glass to site in suitable containers that will protect glass from the weather and from breakage. Carefully store material, as directed, in a safe place where breakage can be reduced to a minimum. Deliver sufficient glass to allow for normal breakage. Glazing compounds shall arrive at the project site in labeled containers which have not been opened.
- B. Protect glazing materials to comply with manufacturer's directions and as needed to prevent damage to glass and glazing materials from condensation, temperature changes, direct exposure to sun, or other causes.

1.7 PROJECT CONDITIONS

- A. Environmental Conditions: Do not proceed with glazing when ambient and substrate temperature conditions are outside the limits permitted by glazing materials manufacturer or when glazing channel substrates are wet from rain, frost, condensation, or other causes.
  - 1. Install liquid sealants at ambient and substrate temperatures above 40 deg F (4.4 deg C).

1.8 WARRANTY

- A. Warranties specified in this Article shall not deprive the Owner of other rights the Owner may have under other provisions of the Contract Documents and will be in addition to and run concurrent with other warranties made by the Contractor under requirements of the Contract Documents.
- B. Manufacturer's Warranty on Laminated Glass: Submit written warranty signed by insulating glass manufacturer agreeing to furnish replacements for those laminated glass units that deteriorate as defined in the "Definitions" article, f.o.b. point of manufacture, freight allowed Project site, within specified warranty period indicated below. Warranty covers only deterioration due to normal conditions of use and not to handling, installing, and cleaning practices contrary to glass manufacturer's published instructions.
  - 1. Warranty Period: Manufacturer's standard but not less than 5 years after date of Substantial Completion.

PART 2 - PRODUCTS

2.1 MANUFACTURERS

- A. Primary Glass: Provide products from one of the following:
  - 1. AFGD (American Flat Glass Distributors), Atlanta, GA; [www.afgd.com](http://www.afgd.com)
  - 2. Guardian Industries Corp. Auburn Hills, MI; [www.guardian.com](http://www.guardian.com)



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3. Pilkington Building Products, Toledo, OH; [www.pilkington.com](http://www.pilkington.com)
4. PPG, Pittsburgh, PA; [www.ppg.com](http://www.ppg.com)
5. Versalux Architectural Glass, [www.visteon.com/floatglass](http://www.visteon.com/floatglass)

B. Architectural Glass Fabricators: Provide products from one of the following:

1. All of the above primary glass manufacturers.
2. Arch Aluminum & Glass Co., Inc., Tamarac, FL; [www.amarlite.com](http://www.amarlite.com)
3. Globe-Amerada Glass Co., Elk Grove Village, IL; [www.globeamerada.com](http://www.globeamerada.com)
4. Interpane High-Performance Glass Products, Clinton, NC; [www.interpane.com](http://www.interpane.com)
5. Oldcastle Glass Group, Plano, TX; [www.oldcastleglass.com](http://www.oldcastleglass.com)
6. Viracon, Owatonna, MN; [www.viracon.com](http://www.viracon.com)

### 2.2 GLASS TYPES AND USAGE

A. Class for Exterior Windows: 9/16 inch thick laminated glass consisting of 1/4 inch thick tinted "Solar cool" outer panel, a .090 inch polyvinyl butyral inter-layer and 1/4 inch thick clear glass inner panel.

1. Color of Solar tint selected by Architect.

B. Interior: 1/4-inch thick clear tempered glass.

### 2.3 PRIMARY FLOAT GLASS PRODUCTS

A. Float Glass: ASTM C 1036, Type I (transparent glass, flat), Class as indicated below, and Quality q3 (glazing select).

1. Class 1 (clear) unless otherwise indicated.
2. Class 2 (tinted, heat-absorbing, and light-reducing) where indicated.

### 2.4 HEAT-TREATED FLOAT GLASS

A. Fabrication Process: By horizontal (roller-hearth) process with roll-wave distortion parallel to bottom edge of glass as installed, unless otherwise indicated.

B. Uncoated, Clear, Heat-Treated Float Glass: ASTM C 1048, Condition A (uncoated surfaces), Type I (transparent glass, flat), Class 1 (clear), Quality q3 (glazing select), kind as indicated below.

1. Kind FT (fully tempered).

C. Uncoated, Tinted, Heat-Treated Float Glass: ASTM C 1048, Condition A (uncoated surfaces), Type I (transparent glass, flat), Class 2 (tinted heat-absorbing and light-reducing), Quality q3 (glazing select), with tint color and performance characteristics for 6.0-mm-thick (0.23-inch-thick) glass matching those indicated for annealed primary tinted float glass; kind as indicated below:

1. Kind FT (fully tempered).



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## 2.5 LAMINATED GLASS PRODUCTS

- A. Laminated Glass Products: Comply with ASTM C 1172 for kinds of laminated glass indicated and other requirements specified, including those in Laminated Glass Product Data Sheet at the end of this Section. Refer to primary and heat-treated glass requirements relating to properties of glass products comprising laminated glass products.
- B. Interlayer: Interlayer material as indicated below, in clear or colors, and of thickness indicated with a proven record of no tendency to bubble, discolor, or lose physical and mechanical properties after laminating glass lites and installation.
1. Interlayer Material: Polyvinyl butyral sheets.
  2. Interlayer Material: Urethane acrylate resin.
  3. Interlayer Material: Polyvinyl butyral sheets or urethane acrylate resin.
  4. Products: Subject to compliance with requirements, provide one of the following:
    - a. Polyvinyl Butyral Interlayer:
      - 1) Saflex, Solutia, Inc.; [www.solutia.com](http://www.solutia.com)
      - 2) Butacite, E. I. du Pont de Nemours & Co., Inc.
    - b. Urethane Acrylate Resin:
      - 1) Uvekol, UCB Chemicals Corp.
- C. Laminating Process: Fabricate laminated glass to produce glass free of foreign substances and air or glass pockets as follows:
1. Laminate lites with polyvinyl butyral interlayer in autoclave with heat plus pressure.
  2. Laminate lites with urethane acrylate resin by exposing assembled units to ultraviolet light after pumping interlayer material into space between lites.

## 2.6 ELASTOMERIC GLAZING SEALANTS

- A. General: Provide materials as recommended by the manufacturer for the required application and condition of installation in each case. Provide only compounds which are proven to be fully compatible with surfaces contacted.
- B. Silicone Rubber Glazing Sealant: Shall be silicone rubber, one part elastomeric sealant complying with FS TT-S-001543, Class A. Provide acid type for nonporous channel surfaces and provide nonacid medium-modulus type for porous channel surfaces.
- C. Preformed Butyl Rubber Glazing Sealant: Shall be tape or ribbon (coiled on release paper) of polymerized butyl or mixture of butyl and polisobutylene, compounded with inert fillers and pigments, solven-based with minimum of 95 percent solids with thread or fabric reinforcement, tack-free within 24 hours, paintable, nonstaining.
1. Provide combination tape and encased continuous rubber shim of approximately 50 durometer hardness.



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2.7 GLAZING GASKETS

- A. Lock-Strip Gaskets: Neoprene extrusions in size and shape indicated, fabricated into frames with molded corner units and zipper lock strips, complying with ASTM C 542, black.
- B. Dense Compression Gaskets: Molded or extruded gaskets of material indicated below, complying with standards referenced with name of elastomer indicated below, and of profile and hardness required to maintain watertight seal:
  - 1. Neoprene, ASTM C 864.
  - 2. Silicone, ASTM C 1115.
  - 3. Thermoplastic polyolefin rubber, ASTM C 1115.
  - 4. Any material indicated above.
- A. Manufacturers: Subject to compliance with requirements, provide products by one of the following companies:
  - 1. Lock-Strip Gaskets:
    - a. Stanlock Div., Griffith Rubber Mills.
  - 2. Preformed Gaskets:
    - a. Advanced Elastomer Systems, L.P.
    - b. Schnee-Morehead, Inc.
    - c. Tremco, Inc.

2.8 MISCELLANEOUS GLAZING MATERIALS

- A. General: Provide products of material, size, and shape complying with referenced glazing standard, requirements of manufacturers of glass and other glazing materials involved for glazing application indicated, and with a proven record of compatibility with surfaces contacted in installation.
- B. Cleaners, Primers and Sealers: Type recommended by sealant or gasket manufacturer.
- C. Setting Blocks: Elastomeric material with a Shore A durometer hardness of 85 plus or minus 5.
- D. Spacers: Elastomeric blocks or continuous extrusions with a Shore A durometer hardness required by glass manufacturer to maintain glass lites in place for installation indicated.
- E. Edge Blocks: Elastomeric material of hardness needed to limit glass lateral movement (side-walking).
- F. Compressible Filler Rod: Shall be closed-cell or waterproof jacketed rod stock of synthetic rubber or plastic foam with proven compatibility with sealants used. Rod shall be flexible and resilient with 5-10 PSI compression strength for 25 percent deflection.



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2.9 FABRICATION OF GLASS

- A. Fabricate glass and other glazing products in sizes required to glaze openings indicated for Project, with edge and face clearances, edge and surface conditions, and bite complying with recommendations of product manufacturer and referenced glazing standard as required to comply with system performance requirements.
- B. Clean cut or flat grind vertical edges of butt-glazed monolithic lites in a manner that produces square edges with slight kerfs at junctions with indoor and outdoor faces.

PART 3 - EXECUTION

3.1 STANDARDS AND PERFORMANCE

- A. Watertight and airtight installation of each piece of glass required, except as otherwise shown. Each installation must withstand normal temperature changes, wind loading, impact loading (for operating sash and doors) without failure, including loss or breakage of glass, failure of sealants or gaskets to remain watertight and air tight, deterioration of glazing materials, and other defects in the Work.
- B. Protect glass from edge damage at all times during handling, installation, and operation of the building.
- C. Glazing channel dimensions as shown are intended to provide for necessary minimum bite on the glass, minimum edge clearance, and adequate sealant thicknesses with reasonable tolerances. The glazier is responsible for correct glass size for each opening within the tolerances and necessary dimensions established.
- D. Comply with combined recommendations of glass manufacturer and manufacturer of sealants and other materials used in glazing and their technical representatives except where more stringent requirements are shown or specified.
- E. Comply with "Glazing Manual" by Flat Glass Marketing Association and the manufacturers of the glass and glazing materials except as shown and specified otherwise.
- F. Inspect each piece of glass immediately before installation and eliminate those which have observable edge damage or face imperfections.
- G. Unify appearance of each series of lights by setting each piece to match others as nearly as possible. Inspect each piece and set with pattern, draw, and blow oriented in the same direction as other pieces.

3.2 EXAMINATION

- A. Examine glass framing, with glazier present, for compliance with the following:
  - 1. Manufacturing and installation tolerances, including those for size, squareness, offsets at corners.



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2. Presence and functioning of weep system.
  3. Minimum required face or edge clearances.
  4. Effective sealing between joints of glass-framing members.
- B. Do not proceed with glazing until unsatisfactory conditions have been corrected.

### 3.3 PREPARATION

- A. Clean glazing channels and other framing members receiving glass immediately before glazing. Remove coatings that are not firmly bonded to substrates.

### 3.4 GLAZING, GENERAL

- A. Comply with combined recommendations of manufacturers of glass, sealants, gaskets, and other glazing materials, except where more stringent requirements are indicated, including those in referenced glazing publications.
- B. Glazing channel dimensions as indicated on Drawings provide necessary bite on glass, minimum edge and face clearances, and adequate sealant thicknesses, with reasonable tolerances. Adjust as required by Project conditions during installation.
- C. Protect glass from edge damage during handling and installation as follows:
1. Use a rolling block in rotating glass units to prevent damage to glass corners. Do not impact glass with metal framing. Use suction cups to shift glass units within openings; do not raise or drift glass with a pry bar. Rotate glass lites with flares or bevells on bottom horizontal edges so edges are located at top of opening, unless otherwise indicated by manufacturer's label.
  2. Remove damaged glass from Project site and legally dispose of off site. Damaged glass is glass with edge damage or other imperfections that, when installed, weaken glass and impair performance and appearance.
- D. Apply primers to joint surfaces where required for adhesion of sealants, as determined by preconstruction sealant-substrate testing.
- E. Install elastomeric setting blocks in sill rabbets, sized and located to comply with referenced glazing standard, unless otherwise required by glass manufacturer. Set blocks in thin course of compatible sealant suitable for heel bead.
- F. Do not exceed edge pressures stipulated by glass manufacturers for installing glass lites.
- G. Provide spacers for glass sizes larger than 50 united inches (length plus height) as follows:
1. Locate spacers inside, outside, and directly opposite each other. Install correct size and spacing to preserve required face clearances, except where gaskets and glazing tapes are used that have demonstrated ability to maintain required face clearances and comply with system performance requirements.



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2. Provide 1/8-inch minimum bite of spacers on glass and use thickness equal to sealant width. With glazing tape, use thickness slightly less than final compressed thickness of tape.
- H. Provide edge blocking to comply with requirements of referenced glazing publications, unless otherwise required by glass manufacturer.
- I. Set glass lites in each series with uniform pattern, draw, bow, and similar characteristics.
- J. Where wedge-shaped gaskets are driven into one side of channel to pressurize sealant or gasket on opposite side, provide adequate anchorage so gasket cannot walk out when installation is subjected to movement.
- K. Square cut wedge-shaped gaskets at corners and install gaskets in manner recommended by gasket manufacturer to prevent corners from pulling away; seal corner joints and butt joints with sealant recommended by gasket manufacturer.

### 3.5 GASKET GLAZING (DRY)

- A. Fabricate compression gaskets in lengths recommended by gasket manufacturer to fit openings exactly, with stretch allowance during installation.
- B. Secure compression gaskets in place with joints located at corners to compress gaskets producing a weathertight seal without developing bending stresses in glass. Seal gasket joints with sealant recommended by gasket manufacturer.
- C. Install gaskets so they protrude past face of glazing stops.

### 3.6 SEALANT GLAZING (WET)

- A. Install continuous spacers between glass lites and glazing stops to maintain glass face clearances and to prevent sealant from extruding into glass channel weep systems until sealants cure. Secure spacers in place and in position to control depth of installed sealant relative to edge clearance for optimum sealant performance.
- B. Force sealants into glazing channels to eliminate voids and to ensure complete wetting or bond of sealant to glass and channel surfaces.
- C. Tool exposed surfaces of sealants to provide a substantial wash away from glass. Install pressurized gaskets to protrude slightly out of channel to eliminate dirt and moisture pockets.

### 3.7 LOCK-STRIP GASKET GLAZING

- A. Comply with ASTM C 716 and gasket manufacturer's printed recommendations. Provide supplementary wet seal and weep system unless otherwise indicated.



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3.8 PROTECTION AND CLEANING

- A. Protect exterior glass from breakage immediately after installation by attaching crossed streamers to framing held away from glass. Do not apply markers to glass surface. Remove nonpermanent labels, and clean surfaces.
- B. Protect glass from contact with contaminating substances resulting from construction operations including weld splatter. If, despite such protection, contaminating substances do come into contact with glass, remove them immediately as recommended by glass manufacturer.
- C. Examine glass surfaces adjacent to or below exterior concrete and other masonry surfaces at frequent intervals during construction, but not less than once a month, for build-up of dirt, scum, alkali deposits, or stains, and remove as recommended by glass manufacturer.
- D. Remove and replace glass that is broken, chipped, cracked, abraded, or damaged in any way, including natural causes, accidents and vandalism, during construction period.
- E. Wash glass on both faces in each area of Project not more than 4 days before date scheduled for inspections that establish Date of Substantial Completion. Wash glass as recommended by glass manufacturer.

3.9 GENERAL INSTALLATION PROVISIONS

- A. Inspection of Conditions: Require the Installer of each major component to inspect both the substrate and conditions under which Work is to be performed. Do not proceed until unsatisfactory conditions have been corrected in an acceptable manner.
- B. Manufacturer's Instructions: Comply with manufacturer's installation instructions and recommendations, to the extent that those instructions and recommendations are more explicit or stringent than requirements contained in Contract Documents.
- C. Inspect materials or equipment immediately upon delivery and again before installation. Reject damaged and defective items.
- D. Provide attachment and connection devices and methods necessary for securing Work. Secure Work true to line and level. Allow for expansion and building movement.
- E. Visual Effects: Provide uniform joint widths in exposed Work. Arrange joints in exposed Work to obtain the best visual effect. Refer questionable choices to the Architect for final decision.
- F. Recheck measurements and dimensions, before starting each installation.
- G. Install each component during weather conditions and Project status that will ensure the best possible results. Isolate each part of the completed construction from incompatible material as necessary to prevent deterioration.



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- H. Coordinate temporary enclosures with required inspections and tests, to minimize the necessity of uncovering completed construction for that purpose.

END OF SECTION 08 81 00

**Division 09**  
Finishes





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SECTION 09 20 16  
STUCCO

PART 1 - GENERAL

1.1 SUMMARY

- A. This Section includes 3-coat Portland cement stucco, 7/8" thick, installed over cementitious dampproofing.

1.2 SUBMITTALS

- A. Product Data: Specifications and installation instructions for each product, including material certificates for aggregate showing compliance with the Contract Documents.
- B. Samples for verification purposes in units at least 12 inches square of finish indicated, in sets for each color, texture, and pattern specified, showing full range of variations expected.

1.3 QUALITY ASSURANCE

- A. Comply with the current Specification Guide of the Metal Lath/Steel Framing Association for installation of lath and furring.
- A. Single-Source Responsibility: Obtain stucco (cement plaster), Portland cement plaster, and lath from a single manufacturer.
- C. Field-Constructed Mock-Up: Prior to installation of stucco work, fabricate panels for each type of finish required to verify and to demonstrate aesthetic effects of application as well as qualities of materials and erection. Build mock-ups to comply with the following requirements, using materials indicated for final unit of Work.
1. Locate mock-up on site in location as directed by Architect.
  2. Erect 4-foot-by-4-foot-by-full-thickness mock-up in presence of Architect using materials, including lath and support system, indicated for final work.
  3. Demonstrate the proposed range of aesthetic effects including color, texture, and workmanship to be expected in completed work.
  4. Obtain Architect's acceptance of mock-ups before start of plaster work.
  5. Retain and maintain mock-ups during construction in undisturbed condition as a standard for judging completed plaster work.
    - a. When directed, demolish and remove mock-ups from Project site.
- B. Coordination of Work: Coordinate layout and installation of suspension system components for suspended ceilings with other work supported by or penetrating through ceiling.

1.4 DELIVERY, STORAGE, AND HANDLING

- A. Deliver manufactured materials in the original packages, containers, or bundles and bearing the name of the manufacturer and the brand. Except as otherwise specified



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herein, the mixing, installation, and application of manufactured material shall be in strict accordance with the printed directions of the manufacturer.

- B. Store materials inside, under cover, and in manner to keep them dry, protected from weather, direct sunlight, surface contamination, aging, corrosion, and damage from construction traffic and other causes. Stack self-furring lath flat to prevent deformation.
- C. Handle self-furring lath to prevent damage to edges, ends, or surfaces. Protect metal corner beads and trim from being bent or damaged.

### 1.5 PROJECT CONDITIONS

- A. Environmental Requirements: Comply with requirements of referenced plaster application standards and recommendations of plaster manufacturer for environmental conditions before, during, and after application of plaster.
- B. Ventilation: Ventilate building spaces as required to remove water in excess of that required for hydration of plaster. Begin ventilation immediately after plaster is applied and continue until it sets.
- C. Protect contiguous work from soiling, spattering, moisture deterioration and other harmful effects that might result from plastering.

### 1.6 TESTING

- A. At Architect's discretion, performance testing for strength, fastening, thickness, framing, mixtures, code, standard requirements: Provided to assure specifications compliance. Initial costs will be by the Owner, unless test results are unsatisfactory.
- B. Replace unsatisfactory work at no additional cost.

## PART 2 - PRODUCTS

### 2.1 STUCCO (CEMENT PLASTER) MATERIALS

- A. Manufacturers: Subject to compliance with requirements, provide products by one of the following:
  - 1. Metal Supports:
    - a. Chicago Metallic Corp.
    - b. Dale Industries, Inc.
    - c. Dietrich Industries, Inc.
    - d. Marino Industries.
    - e. Unimast, Inc.
    - f. Gold Bond Building Products Div., National Gypsum Co.



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2. Expanded Metal Lath:
  - a. Alabama Metal Industries Corp. (AMICO)
  - b. Unimast, Inc.
  - c. Western Metal Lath Co.
  - d. Gold Bond Building Products Div., National Gypsum Co.
  
3. Accessories:
  - a. Fry Reglet Corp.
  - b. Keene Corp.
  - c. MM Systems Corp.
  - d. Unimast, Inc.
  - e. Western Metal Lath Co.
  - f. Gold Bond Building Products Div., National Gypsum Co.

## 2.2 LATH

- A. Expanded Metal Lath: Fabricate expanded metal lath from uncoated or zinc-coated (galvanized) steel sheet to produce lath complying with ASTM C 847, latest edition, for type, configuration, and other characteristics indicated below, with uncoated steel sheet painted after fabrication into lath.
  1. Diamond Mesh Lath: Comply with the following requirements:
    - a. Configuration: Flat.
    - b. Weight: 3.4 lbs. per sq. yd.
    - c. Paper Backing: Where paper-backed diamond mesh lath is indicated, provide asphalt-impregnated paper factory-bonded to back and complying with FS UU-B-790, for Type I, Grade D (vapor permeable), Style 2.
  
  - B. Lath Attachment Devices: Devices of material and type required by referenced standards and recommended by lath manufacturer for secure attachment of lath to framing members and of lath to lath.
    1. Lath attachment shall be designed by a structural engineer in the State of Florida. Submit loading requirements and fastening requirements with submittals.

## 2.3 ACCESSORIES

- A. Comply with material provisions of ASTM C 1063, latest edition; coordinate depth of accessories with thicknesses and number of coats required.
  1. PVC Components: ASTM D 4216, latest edition, high-impact polyvinyl chloride (PVC) for building products.
  
- B. Metal Corner Reinforcement: Expanded large-mesh diamond mesh lath fabricated from solid zinc-alloy 0.0475-inch-diameter wire and specially formed to reinforce external



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corners of Portland cement stucco on exterior exposures while allowing full plaster encasement.

- C. Corner Beads: Small nose corner beads, PVC, minimum 0.035 inch thick, with expanded flanges of large-mesh diamond lath to allow full encasement by plaster.
- D. Casing Beads: Square-edged style, with expanded flanges and removable protective tape, of PVC, minimum 0.035 inch thick.
- E. Prefabricated Control Joints:
  - 1. Material: PVC: Minimum 0.035 inch thick.
  - 2. One-Piece Type: Folded pair of non-perforated screeds in M-shaped configuration, with expanded flanges or
  - 3. Two-Piece Type: Pair of casing beads with back flanges formed to provide slip-joint action, adjustable for joint widths from 1/8 inch to 5/8 inch.
- F. Glass fiber mesh shall be Type 207A, Perma-Tite glass mesh 10 x 10 construction, white resin coated, conforming to ASTM D1668, latest edition, Type III, self-adhering. Manufacturer: Perma-Glass-Mesh Corporation, Dover, Ohio.

### 2.4 PORTLAND CEMENT PLASTER MATERIALS

- A. Comply with the provisions of the latest editions for the following codes, specifications, and standards, except as otherwise shown or specified.
- B. Base Coat Cements: Masonry cement, ASTM C 91, Type N.
- C. Factory-Prepared Finish Coat: Manufacturer's standard requiring addition of water only; white unless otherwise indicated.
- D. Lime: Special hydrated lime for finishing purposes, ASTM C 206, Type S, or special hydrated lime for masonry purposes, ASTM C 207, Type S.
- E. Sand Aggregate for Base Coats: ASTM C 897.
- F. Aggregate for Finish Coats: ASTM C 897, manufactured of natural white sand.
- G. Fiber for Base Coat: Alkaline-resistant (AR) glass or polypropylene fibers, 1/2 inch long, free of contaminates, manufactured for use in portland cement plaster.

### 2.5 MISCELLANEOUS MATERIALS

- A. Water for Mixing and Finishing Plaster: Drinkable and free of substances capable of affecting plaster set or of damaging plaster, lath, or accessories.
- B. Bonding Agent for Portland Cement Plaster: ASTM C 932, latest edition.



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2.6 PORTLAND CEMENT PLASTER MIXES AND COMPOSITIONS

- A. Comply with ASTM C 926 for portland cement plaster base and finish coat mixes as applicable to plaster bases, materials, and other requirements indicated.
- B. Portland Cement Plaster Base Coat Mixes and Compositions: Proportion materials for respective base coats in parts by volume for cementitious materials and in parts by volume per sum of cementitious materials for aggregates to comply with the following requirements for each method of application and plaster base indicated. Adjust mix proportions below within limits specified to attain workability.
  - 1. Fiber Content: Add fiber to following mixes after ingredients have mixed at least 2 minutes. Comply with fiber manufacturer's directions but do not to exceed 2 lbs. per cu. ft. of cementitious materials. Reduce aggregate quantities accordingly to maintain workability.
- C. Factory-Prepared Portland Cement Finish Coats: Add water only; comply with finish coat manufacturer's directions.

2.7 MIXING

- A. Mechanically mix cementitious and aggregate materials for plasters to comply with applicable referenced application standard and with recommendations of plaster manufacturer.

PART 3 - EXECUTION

3.1 INSPECTION

- A. Examine surfaces to be plastered. Do not begin application of plaster until unsatisfactory conditions have been corrected.

3.2 INSTALLATION OF LATHING, GENERAL

- A. Portland Cement Plaster Lathing and Furring Installation Standard: Install lathing and furring materials indicated for portland cement plaster to comply with ASTM C 1063, latest edition.
- B. Install supplementary framing, blocking, and bracing at terminations in the work and for support of fixtures, equipment services, heavy trim, grab bars, toilet accessories, furnishings, and similar work to comply with details indicated or, if not otherwise indicated, to comply with applicable published recommendations of gypsum plaster manufacturer or, if not available, of "Gypsum Construction Handbook" published by United States Gypsum Co.
- C. Isolation: Where lathing and metal support system abuts building structure horizontally and where partition/wall work abuts overhead structure, isolate the work from structural



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movement sufficiently to prevent transfer of loading into the work from the building structure. Install slip- or cushion-type joints to absorb deflections but maintain lateral support.

1. Frame both sides of control and expansion joints independently, and do not bridge joints with furring and lathing or accessories.

### 3.3 INSTALLATION OF PLASTERING ACCESSORIES

A. Comply with referenced lathing and furring installation standards for provision and location of plaster accessories of type indicated. Miter or cope accessories at corners; install with tight joints and in alignment. Attach accessories securely to plaster bases to hold accessories in place and alignment during plastering.

1. External Corners: Install corner reinforcement at external corners.
2. Terminations of Plaster: Install casing beads, unless otherwise indicated.
3. Control Joints: Install at locations indicated or, if not indicated, at locations complying with the following criteria and approved by Architect:
  - a. Where an expansion or contraction joint occurs in surface of construction directly behind plaster membrane.
  - b. Distance between Control Joints: Not to exceed 18 feet in either direction or a length-to-width ratio of 2-1/2 to 1.
  - c. Wall Areas: Not more than 144 sq. ft.
  - d. Horizontal Surfaces: Not more than 100 sq. ft. in area.
  - e. Where plaster panel sizes or dimensions change, extend joints full width or height of plaster membrane.

### 3.4 INSTALLATION (STUCCO)

- A. Portland Cement Plaster Lathing and Furring Installation Standard: ANSI A42.3.
- B. Comply with referenced lathing and furring installation standards for provisions and location of plaster accessories of type indicated. Miter or cope accessories at corners; install with tight joints, in alignment. Attach accessories securely to plaster bases to hold accessories in place and alignment during plastering.
- C. Self-Furring Metal Lath: Install lath with lapped and broken joints and well secured to adjoining work. Lath shall be folded around corners and angles 8 inches each way.
- D. Install glass fiber mesh at 45 degree angle at openings in the plane of the stucco surface such as doors and windows. Mesh strips shall be 4 inches wide and a minimum of 9 inches long, installed in accordance with manufacturers written installation instructions.

### 3.5 CEMENT (STUCCO) PLASTERING

- A. Cement (stucco) plastering shall be three coat work 7/8 inch thick.



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- B. Mixing: Use mechanical mixers of approved type. Keep mixer and tools clean. Re-tempering will not be permitted.
- C. Scratch Coat: Approximately 3/8 inch thick (or as required), applied with pressure and heavily cross scratched.
- D. Brown Coat: Approximately 3/8 inch thick (or as required), applied with pressure and brought to an even surface with wood float, then cross scratched.
- E. Finish Coat: Approximately 1/8 inch thick. Apply with wood float and stucco texture with steel trowel as required.
  - 1. Texture: Sand Finish
- F. Moisture Retention, Curing: Dampen previous plaster coats which have dried out prior to time for application of next coat. Dampen with water as required for uniform suction. Determine the most effective procedure for curing and time lapse between application of coats based on climatic and job conditions. Plaster which is cracked or crazed due to improper timing and curing will not be accepted. Remove and replace defective plaster base materials if damaged during removal of defective plaster (stucco).

### 3.6 CUTTING AND PATCHING AND REPAIRS

- A. Cut, patch, point up, and repair plaster as necessary to accommodate other work and to restore cracks, dents, and imperfections. Repair or replace work to eliminate blisters, buckles, excessive crazing and check cracking, dry outs, efflorescence, sweat outs, and similar defects and where bond to the substrate has failed.

### 3.7 CLEANING AND PROTECTION

- A. Remove temporary protection and enclosure of other work. Promptly remove plaster from door frames, windows, and other surfaces that are not to be plastered. Repair floors, walls, and other surfaces that have been stained, marred, or otherwise damaged during the plastering work. When plastering work is completed, remove unused materials, containers, and equipment and clean floors of plaster debris.
- B. Provide final protection and maintain conditions, in a manner suitable to Installer that ensures plaster work being without damage or deterioration at time of Substantial Completion.

END OF SECTION 09 20 16



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SECTION 09 29 00  
GYPSUM BOARD

PART 1 - GENERAL

1.1 SUMMARY

- A. This Section includes moisture resistant gypsum board and accessories.

1.2 DEFINITIONS

- A. Gypsum Board Construction Terminology: Refer to ASTM C11 and GA-505 for definitions of terms related to gypsum board assemblies not defined in this Section or in other referenced standards.

1.3 SUBMITTALS

- B. Submit in accordance with Division 01 requirements.
- C. Product data for each type of product specified, including wall boards, fasteners, and finishing materials.
- D. Product certificates signed by manufacturers of gypsum board assembly components certifying that their products comply with specified requirements.

1.4 QUALITY ASSURANCE

- A. Materials or operations specified by reference to the published specifications of a manufacturer or other published standards shall comply with the latest editions of the standards listed.
  - 1. Standards include ASTM C840 and GA216.
- B. Refer to "Recommended Specification on Levels of Gypsum Board Finish" as published by the Gypsum Association (and AWCI/CISCA/PDCA) for finish levels required herein.
- C. Fire-Test-Response Characteristics: Where fire-rated gypsum board assemblies are indicated, provide materials and construction identical to those of assemblies tested for fire resistance per ASTM E 119, latest edition, by an independent testing and inspecting agency acceptable to authorities having jurisdiction.
  - 1. Fire Resistance Ratings: As indicated by reference to GA File Numbers in GA-600 "Fire Resistance Design Manual", latest edition, or to design designations in UL "Fire Resistance Directory", latest edition, or in the listing of another nationally recognized testing and inspecting agency acceptable to authorities having jurisdiction.
- D. Single-Source Responsibility for Panel Products: Obtain each type of gypsum board and other panel products from a single manufacturer.



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- E. Single-Source Responsibility for Finishing Materials: Obtain finishing materials from either the same manufacturer that supplies gypsum board and other panel products or from a manufacturer acceptable to gypsum board manufacturer.
- F. Any board that has become wet at any point prior to the Date of Substantial Completion shall be replaced, including board that has been installed and finished.

### 1.5 DELIVERY, STORAGE, AND HANDLING

- A. Deliver materials in original packages, containers, or bundles bearing brand name and identification of manufacturer or supplier.
- B. Store materials inside under cover and keep them dry and protected against damage from weather, direct sunlight, surface contamination, corrosion, construction traffic, and other causes. Neatly stack gypsum panels flat to prevent sagging.
- C. Handle gypsum board to prevent damage to edges, ends, and surfaces. Do not bend or otherwise damage metal corner beads and trim.

### 1.6 PROJECT CONDITIONS

- A. Environmental Conditions: Establish and maintain environmental conditions for applying and finishing gypsum board to comply with ASTM C 840 and with gypsum board manufacturer's recommendations.
- B. Room Temperatures: For non-adhesive attachment of gypsum board to framing, maintain not less than 40 deg F (4 deg C). For adhesive attachment and finishing of gypsum board, maintain not less than 50 deg F (10 deg C) for 48 hours prior to application and continuously after until dry. Do not exceed 95 deg F (35 deg C) when using temporary heat sources.
- C. Ventilation: Ventilate building spaces, as required, for drying joint treatment materials. Avoid drafts during hot dry weather to prevent finishing materials from drying too rapidly.

## PART 2 - PRODUCTS

### 2.1 MANUFACTURERS

- A. Manufacturers: Subject to compliance with requirements, provide products by one of the following:
  - 1. Gypsum Board and Related Products:
    - a. Georgia-Pacific Corp. Atlanta, Georgia; <http://www.gp.com/>
    - b. Gold Bond Building Products Div., National Gypsum Co., Charlotte, North Carolina; <http://www.nationalgypsum.com/>
    - c. Fry Reglet; Alpharetta, Georgia; <http://www.fryreglet.com/>



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- d. Lafarge Gypsum, Herndon, Virginia; <http://www.lafargecorp.com/>
- e. Pittcon Industries, Riverdale, Maryland; <http://www.pittconindustries.com/>
- f. United States Gypsum Company <http://www.usg.com/>
- g. National Gypsum Co., Charlotte, NC; <http://www.nationalgypsum.com/>

### 2.2 GYPSUM BOARD PRODUCTS

- A. Provide gypsum board of types indicated in maximum lengths available to minimize end-to-end butt joints.
  1. Thickness: Provide gypsum board to comply with ASTM C840, latest edition, for application system and support spacing indicated.
- B. Gypsum Wallboard: ASTM C 36 and as follows:
  1. Type: Type X, moisture resistant gypsum board.
  2. Edges: Tapered.
  3. Thickness: 5/8 inch, unless otherwise noted.

### 2.3 TRIM ACCESSORIES

- A. Accessories for Interior Installation: Corner beads, edge trim, and control joints complying with ASTM C 1047, latest edition, and requirements indicated below:
  1. Material: Formed metal, complying with the following requirement:
    - a. Sheet steel zinc-coated by hot-dip process.
  2. Shapes indicated below by reference to Fig. 1 designations in ASTM C1047:
    - a. Cornerbead on outside corners, unless otherwise indicated.
    - b. LC-bead with both face and back flanges; face flange formed to receive joint compound. Use LC-beads for edge trim unless otherwise indicated.
    - c. L-bead with face flange only; face flange formed to receive joint compound. Use L-bead where indicated.
    - d. U-bead with face and back flanges; face flange formed to be left without application of joint compound. Use U-bead where indicated.
    - e. One-piece control joint formed with V-shaped slot, with removable strip covering slot opening.

### 2.4 JOINT TREATMENT MATERIALS

- A. Provide joint treatment materials complying with ASTM C475, latest edition, and the recommendations of both the manufacturers of sheet products and of joint treatment materials for each application indicated.
- B. Joint Tape for Gypsum Board: Paper reinforcing tape, unless otherwise indicated.



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- C. Setting-Type Joint Compounds for Gypsum Board: Factory-packaged, job-mixed, chemical-hardening powder products formulated for uses indicated.
  - 3. Where setting-type joint compounds are indicated as a taping compound only or for taping and filling only, use formulation that is compatible with other joint compounds applied over it.
  - 4. For prefilling gypsum board joints, use formulation recommended by gypsum board manufacturer for this purpose.
  - 5. For filling joints and treating fasteners of water-resistant gypsum backing board behind base for ceramic tile, use formulation recommended by the gypsum board manufacturer for this purpose.
  - 6. For topping compound, use sandable formulation.

### 2.5 MISCELLANEOUS MATERIALS

- A. Provide auxiliary materials for gypsum board construction that comply with referenced standards and recommendations of gypsum board manufacturer.
- B. Steel drill screws complying with ASTM C1002, latest edition.
- C. Steel drill screws complying with ASTM C954, latest edition, for fastening gypsum board to steel members from 0.033 to 0.112 inch thick.

## PART 3 - EXECUTION

### 3.1 EXAMINATION

- A. Examine substrates to which gypsum board assemblies attach or abut with Installer present for compliance with requirements for installation tolerances and other conditions affecting performance of assemblies specified in this Section. Do not proceed with installation until unsatisfactory conditions have been corrected.

### 3.2 APPLYING AND FINISHING GYPSUM BOARD, GENERAL

- A. Gypsum Board Application and Finishing Standards: Install and finish gypsum panels to comply with ASTM C 840 and GA-216.
- B. Install ceiling board panels across framing to minimize the number of abutting end joints and avoid abutting end joints in the central area of each ceiling. Stagger abutting end joints of adjacent panels not less than one framing member.
- C. Install gypsum panels with face side out. Do not install imperfect, damaged, or damp panels. Butt panels together for a light contact at edges and ends with not more than 1/16 inch of open space between panels. Do not force into place.
- D. Locate both edge or end joints over supports, except in ceiling applications where intermediate supports or gypsum board back-blocking is provided behind end joints. Position adjoining panels so that tapered edges abut tapered edges, and field-cut edges



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abut field-cut edges and ends. Do not place tapered edges against cut edges or ends. Stagger vertical joints over different studs on opposite sides of partitions. Avoid joints at corners of framed openings where possible.

- E. Do not attach gypsum panels across the flat grain of wide-dimension lumber including floor joists and headers. Instead, float gypsum panels over these members using resilient channels or provide control joints to counteract wood shrinkage.
- F. Spot grout hollow metal door frames for solid core wood doors, hollow metal doors, and doors over 32 inches wide. Apply spot grout at each jamb anchor clip and immediately insert gypsum panels into frames.
- G. Form control joints and expansion joints at locations indicated and as detailed, with space between edges of adjoining gypsum panels, as well as supporting framing behind gypsum panels. Provide vertical control joints spread not more than 30 feet on center in partitions.
  - 1. Control Joint: Apply over face of gypsum board where specified. Cut to length with a fine-toothed hacksaw (32 teeth per inch). Cut end joints square, butt together and align to provide neat fit. Attach control joint to gypsum board with fasteners spaced 6 inches o.c. maximum along each flange. Remove plastic tape after finishing with joint compound or veneer finish.
    - a. Leave a ½ inch continuous opening between gypsum boards for insertion of surface-mounted joint.
    - b. Interrupt wood floor and ceiling plates with a ½ inch gap, wherever there is a control joint in the structure.
    - c. Do not attach gypsum board to steel studs on one side of control joint.
    - d. Provide separate supports for each control joint flange.
    - e. Provide an adequate seal and an additional layer of Type "X" gypsum board behind control joints where sound or fire ratings are prime considerations.
- H. Space fasteners in gypsum panels according to referenced gypsum board application and finishing standard and manufacturer's recommendations.

### 3.3 GYPSUM BOARD APPLICATION METHODS

- A. Single-Layer Application: Install gypsum wallboard panels on ceilings.
- B. Single-Layer Fastening Methods: Fasten gypsum panels to supports with screws.

### 3.4 INSTALLING TRIM ACCESSORIES

- A. General: For trim accessories with back flanges, fasten to framing with the same fasteners used to fasten gypsum board. Otherwise, fasten trim accessories according to accessory manufacturer's directions for type, length, and spacing of fasteners.
- B. Install corner beads at external corners.
- C. Install edge trim where edge of gypsum panels would otherwise be exposed or semi-



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exposed. Provide edge trim type with face flange formed to receive joint compound except where other types are indicated.

1. Install LC-bead where gypsum panels are tightly abutted to other construction and back flange can be attached to framing or supporting substrate.
  2. Install L-bead where edge trims can only be installed after gypsum panels are installed.
  3. Install U-bead where indicated or required.
- D. Install control joints at locations indicated, and where not indicated according to ASTM C 840, and in locations approved by Architect for visual effect.
- E. All trim, accessories and corner beads shall be installed using screws. "Crimping" tool and staple attachment is not allowed.

### 3.5 FINISHING GYPSUM BOARD ASSEMBLIES

- A. Apply joint treatment at gypsum board joints (both directions); flanges of corner bead, edge trim, and control joints; penetrations; fastener heads, surface defects, and elsewhere as required to prepare gypsum board surfaces for decoration and levels of gypsum board finish indicated.
- B. Prefill open joints, rounded or beveled edges, and damaged areas using setting-type joint compound.
- C. Apply joint tape over gypsum board joints and to trim accessories with concealed face flanges as recommended by trim accessory manufacturer and as required to prevent cracks from developing in joint compound at flange edges.
- D. Levels of Gypsum Board Finish: Provide the following levels of gypsum board finish per GA-214.
1. Level 0: No taping, finishing, or accessories required. This level of finish shall be used in temporary construction only.
  2. Level 4: Joints and interior angles shall have tape embedded in joint compound and three separate coats of joint compound applied over joints, angles, fastener heads, and accessories. Joint compound shall be smooth and free of tool marks and ridges. Prepare surface to be coated with a primer/sealer prior to the application of final finishes. This finish level shall be used where painted finishes are to be applied.

### 3.3 CLEANING AND PROTECTION

- A. Promptly remove any residual joint compound from adjacent surfaces.
- B. Provide final protection and maintain conditions, in a manner suitable to Installer that ensures gypsum board assemblies remain without damage or deterioration at time of Substantial Completion.

END OF SECTION 09 29 00



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SECTION 09 67 00  
EPOXY FLOOR COATING

PART 1 - GENERAL

1.1 SUMMARY

- A. Furnish all necessary materials, labor and equipment required to prepare designated floor area and install an epoxy floor coating, as specified herein and as indicated on the Drawings.

1.2 SUBMITTAL

- A. **Product Data:** Submit manufacturer's specification or specific products of the epoxy flooring, including physical properties and performance properties and all tests described herein and submit all Material Safety Data sheets. Each individual component of the system will be evaluated on the basis of these standards. For any of the tests not listed in the manufacturer's standard nationally published data, the manufacturer must supply the missing data from an independent test laboratory tested according to the referenced standard. Manufacturer's standard color chart shall also be submitted and must afford the Architect color selection from at least 12 standard colors.
- B. The industrial epoxy flooring specialist shall submit a 6" x 6" system sample for verification purposes and finish texture approval.
- C. **Contractor Experience:** The industrial epoxy specialist shall furnish a list of three (3) projects using either specified material or another material pre-approved for this project that they have installed during the last five years. Information shall include: project name, square footage, contract name with owner's address and phone number. Also, the industrial epoxy flooring specialist shall furnish resumes detailing the experience of key project personnel including supervisors and technicians.
- D. Submit in accordance with Division 01 requirements.
- E. Submit warranty as specified herein.
- F. Submit pre-installation conference meeting minutes.

1.3 QUALITY ASSURANCE

- A. **Manufacturer's Qualifications:** Obtain epoxy flooring materials from a single manufacturer.
- B. **Applicator's Qualifications:** Installation shall be performed by an industrial epoxy flooring specialist with skilled mechanics having not less than three (3) years of satisfactory experience in the application of the type and complexity of system as specified in this section. The industrial epoxy flooring specialist shall be approved in writing by the manufacturer of the epoxy flooring as specified herein.
- C. Submit warranty as specified herein.



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- D. SSPC-SP 13/NACE 6 - Surface Preparation of Concrete.
- E. Conduct a pre-installation conference at the project site prior to installation of epoxy floor coating. Review the environmental requirements, protection of surfaces not scheduled to be coated, surface preparation, application methods and concerns, repair requirements, field quality control, cleaning, protection of completed flooring, one year inspection and coordination with other work.

1.4 MATERIAL DELIVERY, HANDLING AND STORAGE

- A. Primary system materials shall be delivered in the manufacturer's undamaged, unopened containers. Each container shall be clearly marked with the following:
  - 1. Product Name
  - 2. Manufacturer's Name
  - 3. Component designation (A or B, etc.)
  - 4. Ratio of component mixture
- B. Provide equipment and personnel to handle the materials by methods which prevent damage.
- C. The industrial epoxy flooring specialist shall promptly inspect all direct jobsite deliveries to assure that quantities are correct and that materials comply with requirements and are not damaged.
- D. The industrial epoxy flooring specialist shall be responsible for all materials furnished by him, and he shall replace, at his own expense, all such material that is found to be defective in manufacturing or that has become damaged in transit, handling or storage.
- E. Store materials in accordance with manufacturer's instructions, with seals and labels intact and legible.

1.5 JOB CONDITIONS

- A. The industrial epoxy flooring specialist shall visit jobsite prior to beginning the application of the epoxy flooring to evaluate substrate condition, including substrate moisture content, and the extent of repairs required, if any. Concrete subfloors shall be tested to verify that the moisture content of the substrate does not exceed that as recommended by the manufacturer.
- B. The industrial epoxy flooring specialist should exercise care during surface preparation and system application to protect surrounding substrates and surfaces, as well as in place equipment. The industrial epoxy flooring specialist shall use his discretion as to the physical means used for preparation and protection. Any costs incurred for resultant damage from negligence or inadequate protection shall be the sole responsibility of the industrial epoxy flooring specialist.
- C. Subfloor tolerances are specified in Section 03 30 00. All drains in the installation area must be working and raised or lowered to the actual finish elevation of the epoxy flooring system.



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- D. Job area shall be free of other trades during floor installation, and for a period of 24 hours upon completion.
- E. Where natural ventilation is inadequate, provide ventilation by use of fans or other devices.
- F. Maintain lighting at a minimum uniform level of 50-60 foot candles in all areas where epoxy flooring system is being installed. It is the recommendation of the Designer that permanent lighting be in place and working during the installation.

#### 1.6 WARRANTY

- A. The industrial epoxy floor specialist shall furnish a standard guarantee of the epoxy flooring for a period of one (1) year after installation. This labor guarantee shall include loss of bond and wear-through in the concrete substrate, through normal wear and tear.
- B. The manufacturer shall warrant that the product meets all published standards.

### PART 2 – PRODUCTS

#### 2.1 ACCEPTABLE MANUFACTURERS

- A. Basis of Design: Products and materials specified is “Series 222 - Deco-Tread” as manufactured by the Tnemec Company, Inc., Kansas City, Missouri. Products of the following manufacturers are approved provided compliance with all technical requirements as specified herein:
  - 1. Key Resin Company, Batavia, Ohio.
  - 2. Carboline Coatings, St. Louis, Missouri.
  - 3. MasterShield, Polymerica, Inc., Carrollton, Georgia.

#### 2.2 MATERIALS

- A. Primer:
  - 1. Basis of Design: Tnemec Series 201, “Epoxoprime”, two component, 96% solids, penetrating polyamine cured epoxy primer.
  - 2. Recommended Dry Film Thickness: 6.0 to 8.0 mils per coat; or as otherwise recommended by the manufacturer.
  - 3. Volatile Organic Compounds: .33 lbs/gallon, un-thinned; .68 lbs/gallon thinned 5%.
  - 4. Number of Components: Two (2)
  - 5. Net Weight Per Gallon: 8.88 lbs, mixed.
  - 6. Storage Temperature: 70° - 90° F for at least 48 hours prior to use.
- B. Epoxy Flooring:
  - 1. Basis of Design: Tnemec Series 222, “Deco-Tread”, broadcast laminated epoxy coating system, three component, 100% solids (mixed), ceramic filled polyamine epoxy.



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2. Recommended Dry Film Thickness: Minimum 1/8". Requires two broadcast applications at 1/16" each or applied as a slurry.
  3. Volatile Organic Compounds: 1.04 lbs/gallon, un-thinned.
  4. Number of Components: Three (3). Two liquid and one color quartz.
  5. Net Weight per Gallon: 9.06 lbs, mixed liquids.
  6. Storage Temperature: 40° - 90° F.
- C. Sealer Coat:
1. Basis of Design: Tnemec Series 284, "Deco-Clear", two component, 86% solids, polyamine epoxy.
  2. Recommended Dry Film Thickness: 14.0 to 16.0 mils per coat; or as otherwise recommended by the manufacturer.
  3. Volatile Organic Compounds: 1.04 lbs/gallon.
  4. Number of Components: Two (2).
  5. Net Weight per Gallon: 9.05 lbs, mixed.
  6. Storage Temperature: 40° - 90° F.
- D. Provide stainless steel termination strips and all accessories as required for a complete installation in every respect. Termination strips shall be provided where epoxy flooring abuts adjacent floor finish materials. Termination strip style shall be as recommended by the manufacturer.
- E. Provide continuous 4 inch high integral coved bases with 1/2 inch radius at floor. The top of base installed with stainless steel termination strip.
- F. Sawcut epoxy flooring directly over control joints in concrete slab on grade substrate. Fill sawcuts with self-leveling traffic grade sealant as specified in Section 07 92 00.

### PART 3 - EXECUTION

#### 3.1 INSTALLATION

- A. Install all items at thicknesses and in strict accordance with the manufacturers written installation instructions.
- B. Provide all items as required for a complete and watertight installation in every respect.
- C. Coordinate installation of floor drains with the Division 22 plumbing contractor.

END OF SECTION 09 67 00



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SECTION 09 91 00  
PAINTING

PART 1 - GENERAL

1.1 SUMMARY

- A. Provide labor, materials, and equipment necessary for complete painting and finishing work as detailed on the Drawings and as specified herein, of surfaces as scheduled throughout the building.
- B. The type of material to be used and the number of coats to be applied are listed in the "Painting Schedule" in Part 3 of this Section. Also, refer to Room Finish Schedule and Finish Plans.
- C. The term "paint" as used herein, includes enamels, paints, sealers, stains, fillers, emulsions, and other coatings, whether used as prime, intermediate, or finish coats.
- D. The Architect shall not be limited in the number of colors selected for single space or for the complete Project.
- E. The intent is to provide a finished building, interior and exterior, whether or not specifically indicated. Some items may not be specifically indicated to be painted; however, all items shall be finished as directed by the Architect.

1.2 SUBMITTALS

- A. Materials List: Prior to the start of work and before paint materials are delivered to the site, submit a list of materials proposed and the equivalent specified item proposed.
  - 1. This shall in no way be construed as permitting substitution of materials for those specified or approved for this Work by the Architect.
- B. Color Chip Catalog: Provide a current color chip catalog from which colors may be selected. Manufacturers may fulfill this requirement by updating that Architect's office catalog.
- C. Stain Samples: Submit sample of specified wood species with selected stain applied to specified wood types to Architect for approval. Resubmit additional samples as necessary to obtain color desired by Architect.
- D. Manufacturer's Recommendations: In each case where material proposed is not the material specified or specifically described as an acceptable manufacturer, submit for review the current recommended method of application published by the manufacturer.
- E. Certification: Submit written certification from each coating manufacturer attesting that coatings provided under this specification section are specifically formulated and manufactured for the environmental conditions encountered in the State of Florida subtropical regions including factory mixed mildewcides and fungicides of type and quantity to inhibit fungus and mildew growth. Further certify that mildewcides and fungicides do not contain compounds of mercury, lead or other heavy metals.



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- F. Material Safety Data Sheets: Submit Material Safety Data Sheets (MSDS) for each coating product. In hazardous ingredient section of the MSDS form, write in type and quantity of mildewcide incorporated in the coating specified.

### 1.3 QUALITY ASSURANCE

- A. **Qualifications of Painters:** Use only qualified journeyman painters for the mixing and application of paint on exposed surfaces. If installed painting is rejected, no allowance will be made for lack of mechanics skill.
- B. **Codes and Standards:** In addition to complying with pertinent codes and regulations, comply with "Standard (Type 1)" as defined by the Painting and Decorating Contractors of America in their "Modern Guide to Paint Specifications," current edition.

### 1.4 FIELD QUALITY CONTROL

- A. **Painting Contractor** shall completely paint and finish one complete room according to the Specifications, as designated by Architect, which will be used as quality standard for remainder of Project.

### 1.5 PRODUCT HANDLING

- A. **Delivery:** Deliver paint materials to the job site in their original unopened containers with labels intact and legible at time of use.
- B. **Protection**
1. Store only the approved materials at the job site and store only in a suitable and designated area restricted to the storage of paint materials and related equipment.
  2. Use means necessary to ensure the safe storage and use of paint materials and the prompt and safe disposal of waste.
  3. Use means necessary to protect paint materials before, during, and after application and to protect the installed work and materials of other trades.

### 1.6 EXTRA STOCK

- A. Upon completion of this portion of the Work, deliver to the Owner an extra stock of paint consisting of five gallons of each color used in each coating material used, with such extra stock tightly sealed in clearly labeled containers.

### 1.7 ENVIRONMENTAL REQUIREMENTS

- A. Conform to State and local V.O.C. (Volatile Organic Compound) Regulations. Notify Architect in writing if variations to Specifications are required.



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- B. Do not apply materials when the surface and ambient temperatures are outside the temperature ranges required by the paint product manufacturer.
- C. Do not apply exterior coating during rain, or when relative humidity is outside the humidity ranges required by the paint product manufacturer.
  - 1. Painting may be continued during inclement weather if areas and surfaces to be painted are enclosed and heated within temperature limits specified by paint manufacturer during application and drying periods.

### PART 2 - PRODUCTS

#### 2.1 PAINTING MATERIALS MANUFACTURER

- A. Painting materials shall be the products of the following manufacturers, specified as the type, function, and quality of products to be provided. Paint materials and specification numbers listed herein, unless otherwise designated, are the products of Sherwin-Williams and Tnemec Company, Inc and require no further approval as to manufacturer or catalog number.
- B. Products of the following manufacturers are acceptable as equal to Sherwin-Williams Paint Company, providing their products equal or exceed the quality specified, and the material types and composition are the same; and subject to approval by the Architect of the materials list required to be submitted under preceding Part 1 of this Section.
  - 1. Porter Paint, Louisville, Kentucky
  - 2. Glidden, Cleveland, Ohio
  - 3. ICI Devoe, Cleveland, Ohio
  - 4. MAB Paints, M.A. Bruder & Sons, Inc., Broomall, Pennsylvania
  - 5. Benjamin Moore & Company, Montvale, New Jersey
- C. Products of the following manufacturers are acceptable as equal to Tnemec, providing their products equal or exceed the quality specified.
  - 1. Induron Protective Coatings, Birmingham, Alabama.
  - 2. Ameron Protective Coatings Group, Brea, California.

#### 2.2 COMPATIBILITY

- A. Paint materials selected for coating systems for each type of surface shall be the product of a single manufacturer.
- B. Paint materials and equipment shall be compatible in use; finish coats shall be compatible with prime coats; prime coats shall be compatible with the surface to be coated; tools and equipment shall be compatible with the coating to be applied.
- C. Thinners, when used, shall be only those thinners recommended for that purpose by the manufacturer of the material to be thinned.



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2.3 ACCEPTANCE OF SPECIFICATIONS

- A. By submitting a proposal, the Contractor has reviewed the bidding documents with the painting subcontractor and accepts the Specifications as sufficient to produce approved painting results. If the painting subcontractor contends that the materials or number of coats specified will not produce satisfactory results, he shall so notify the Architect directly or indirectly through a Bidding Contractor 10 days prior to receipt of bids for proper action.

2.4 MATERIALS

- A. Coatings: Ready mixed, except field catalyzed coatings. Prepare pigments:
1. To a soft paste consistency, capable of being readily and uniformly dispersed to a homogeneous coating.
  2. For good flow and brushing properties.
  3. Capable of drying or curing free of streaks or sags.
- B. Accessory Materials: Linseed oil, shellac, turpentine, paint thinners and other materials not specifically indicated but required to achieve the finishes specified; commercial quality.
- C. Mildew Resistance: Provide coatings which are formulated and mixed at the point of manufacture with mildewcides and fungicides to inhibit growth of mildew as encountered in the subtropical regions of the State of Florida. Mildewcides and fungicides containing compounds of mercury, lead or other heavy metals are not acceptable.

PART 3 - EXECUTION

3.1 INSPECTION

- A. Examine areas and conditions under which painting work is to be applied and notify the Architect in writing of conditions detrimental to proper and timely completion of work. Do not proceed with work until unsatisfactory conditions have been corrected.
- B. Starting of painting work will be constructed as Applicator's acceptance of surfaces and conditions within any particular area.
- C. Do not paint over dirt, rust, scale, grease, moisture, scuffed surfaces, or conditions otherwise detrimental to formation of a durable paint surface.
- D. Test shop applied primers for compatibility with subsequent cover materials.
- E. Measure moisture content of surfaces using an electronic moisture meter. Do not apply finishes unless moisture content of surfaces are below the maximums as recommended, for the types of coatings to be used, by the manufacturer.



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3.2 SURFACE PREPARATION

A. General

1. Perform preparation and cleaning procedures in accordance with paint manufacturer's instructions, and as herein specified, for each particular substrate condition.
2. Remove hardware, hardware accessories, machined surfaces, plates, lighting fixtures, and similar items in place and not to be finish painted or provide surface applied protection prior to surface preparation and painting operations; remove, if necessary, for complete painting of items and adjacent surfaces. Following completion of painting of each space or area, reinstall removed items.
3. Clean surfaces to be painted before applying paint or surface treatments. Remove oil and grease prior to mechanical cleaning. Program cleaning and painting so that contaminates from cleaning process will not fall onto wet, newly painted surfaces.

B. Cementitious Materials

1. Prepare cementitious surfaces of concrete, concrete block, and cement plaster to be painted by removing efflorescence, chalk, dirt, grease, oils, and by roughening as required to remove glaze.
2. Determine alkalinity and moisture content of surfaces to be painted by performing appropriate tests. If surfaces are found to be sufficiently alkaline to cause blistering and burning of finish paint, correct this condition before application of paint. Do not paint over surfaces where moisture content exceeds that permitted in manufacturer's printed directions.
3. Clean concrete floor surfaces scheduled to be painted with a commercial solution of muriatic acid or other etching cleaner. Flush floor with clean water to neutralize acid and allow to dry before painting.

C. Wood

1. Clean wood surfaces to be painted of dirt, oil, or other foreign substances with scrapers, mineral spirits, and sandpaper, as required. Sandpaper smooth those finished surfaces exposed to view and dust off. Scrape and clean small, dry, seasoned knots and apply a thin coat of white shellac or other recommended knot sealer before application of priming coat. After priming fill holes and imperfections in finished surfaces with putty or plastic wood filler. Sandpaper smooth when dried.
2. Prime, stain, or seal wood required to be job painted immediately upon delivery to job. Prime edges, ends, faces, undersides, and backsides of such wood, including cabinets, counters, cases, and paneling.
3. When transparent finish is required, use spar varnish for backpriming.

D. Ferrous Metals

1. Clean ferrous surfaces, which are not galvanized or shop coated, of oil, grease, dirt, loose mill scale, and other foreign substances by solvent or mechanical cleaning.



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2. Touch-up shop applied prime coats wherever damaged or bare, where required by other Sections or these Specifications. Clean and touch-up with same type shop primer.
- E. Galvanized Surfaces: Clean free of oil and surface contaminants with non-petroleum based solvent.
- F. Aluminum Surfaces: Remove surface contamination by steam or high pressure water. Remove oxidation with acid etch and solvent washing. Apply etching primer immediately following cleaning.
- G. Gypsum Board Surfaces: Fill minor defects with filler compound and spot prime defects after repair.

### 3.3 MATERIALS PREPARATION

- A. Mix and prepare painting materials in accordance with manufacturer's direction.
- B. Store materials not in actual use in tightly covered containers. Maintain containers used in storage, mixing, and application of paint in a clean condition, free of foreign materials and residue.
- C. Stir materials before application to produce a mixture of uniform density and stir as required during application. Do not stir surface film into material. Remove film and, if necessary, strain material before using.

### 3.4 APPLICATION

- A. Paint during weather conditions and Project status that will ensure the best possible results.
- B. General: Apply paint in accordance with manufacturer's directions. Use applicators and techniques best suited for substrate and type of material being applied.
  1. Apply additional coats when undercoats, stains, or other conditions show through final coat of paint, until paint film is of uniform finish, color, and appearance. Give special attention to insure that surfaces, including edges, corners, crevices, welds, and exposed fasteners receive a dry film thickness equivalent to that of flat surfaces.
  2. Paint surfaces behind movable equipment and furniture same as similar exposed surfaces. Paint surfaces behind permanently-fixed equipment or furniture with prime coat only before final installation of equipment.
  3. Paint interior surfaces of ducts, where visible through registers or grilles, with a flat, nonspecular black paint.
  4. Paint back sides of access panels and removable or hinged covers to match exposed surfaces.
  5. Finish exterior doors on tops, bottoms, and side edges same as exterior faces unless otherwise indicated.
  6. Sand lightly between each succeeding enamel or varnish coat.



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- C. Scheduling Painting: Apply first coat material to surfaces that have been cleaned, pretreated, or otherwise prepared for painting as soon as practicable after preparation and before subsequent surface deterioration.
  - 1. Allow sufficient time between successive coatings to permit proper drying. Do not recoat until paint has dried to where it feels firm, does not deform or feel sticky under moderate thumb pressure, and application of another coat of paint does not cause lifting or loss of adhesion of the undercoat.
  - 2. Slightly vary the color of succeeding coats.
- D. Minimum Coating Thickness: Apply materials at not less than manufacturer's recommended spreading rate and as specified, to establish a total dry film thickness as indicated or, if not indicated, as recommended by the coating manufacturer.
- E. Mechanical and Electrical Work: Painting of mechanical and electrical work is limited to items exposed to view in interior occupied spaces and exterior walls and roof. Mechanical rooms and electrical rooms are not considered occupied spaces unless specifically noted as such.
- F. Prime Coats: Apply prime coat of material which is required to be painted or finished and which has not been prime coated by others.
  - 1. Recoat primed and sealed surfaces where there is evidence of suction spots or unsealed areas in first coat, to assure a finish coat with no burn through or other defects due to insufficient sealing.
  - 2. Coordinate manufacturer's prime coats with finish coats as specified herein. If compatibility is not ascertained during the bidding period, and verification submitted with the shop drawings, then prime coat paint system as specified herein shall be applied to the item prior to finish painting as specified herein.
- G. Pigmented (Opaque), Finishes: Completely cover to provide an opaque, smooth surface of uniform finish, color, appearance, and coverage. Cloudiness, spotting, holidays, laps, brush marks, runs, sags, ropiness, or other surface imperfections will not be acceptable.
- H. Transparent (Clear) Finishes: Use multiple coats to produce glass-smooth surface film of even luster. Provide a finish free of laps, cloudiness, color irregularity, runs, brush marks, orange peel, nail holes, or other surfaces imperfections.
- I. Completed Work: Match approved samples for color, texture, and coverage. Remove, refinish, or repaint work not in compliance with specified requirements.

### 3.5 CLEAN-UP AND PROTECTION

- A. Clean-Up: During progress of Work remove from site discarded paint materials, rubbish, cans, and rags at end of each work day.
- B. Upon completion of painting work clean window glass and other paint-spattered surfaces. Remove spattered paint by proper methods of washing and scraping, using care not to scratch or otherwise damage finished surfaces.



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- C. Protection: Protect work of other trades, whether to be painted or not, against damage by painting and finishing work. Correct damage by cleaning, repairing or replacing and repainting, as acceptable to Architect.
- D. Provide "Wet Paint" signs as required to protect newly painted finishes. Remove temporary protective wrappings provided by others for protection of their work, after completion of painting operations.
- E. At the completion of Work of other trades, touch-up and restore damaged or defaced painted surfaces.

### 3.6 PAINT TYPES AND NUMBER OF COATS

- A. The following painting schedules are intended to identify the type of finishes which are required for the various surfaces, and to identify the surfaces to which each finish is to be applied. Refer to Finish Schedule.
- B. To define requirements for quality, function, size, gages, textures, and color, the following list of materials designates the manufacturer's brand, types, and number of coats required; and other requirements that are to be furnished to conform to the requirements of this Project.
- C. Where specific finishes are called for on the Drawings and in the Finish Schedule by code designation, it shall specifically refer to the following identified types of coatings.
- D. The primer indicated under Material Identification is intended for the particular substrate surface specified. Where the same numbered finish is scheduled, but for another substrate, provide the proper primer compatible with substrate and the finish.
- E. Where the substrate has a compatible and satisfactory prime coat already on it, the prime coat specified for the numbered finish may be omitted. Test prime coat for compatibility before applying additional coats.

### 3.7 FIELD QUALITY CONTROL

- A. The right is reserved by Owner to invoke the following material testing procedure at any time, and any number of times during period of field painting:
  - 1. Engage services of an independent testing laboratory to sample paint being used. Samples of materials delivered to project site will be taken, identified and sealed, and certified in the presence of the Contractor.
  - 2. Testing laboratory will perform appropriate tests for any or all of the following characteristics: Abrasion resistance, apparent reflectivity, flexibility, washability, absorption, accelerated weathering, dry opacity, accelerated yellowness, recoating, skinning, color retention, alkali resistance and quantitative materials analysis.
- B. If test results show that material being used does not comply with specified requirements, Contractor may be directed to stop painting work, and remove non-complying paint; pay



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for testing; repaint surfaces coated with rejected paint; remove rejected paint from previously painted surfaces if, upon repainting with specified paint, the two coatings are non-compatible.

### 3.8 EXTERIOR PAINTING SCHEDULE

A. Provide the following exterior paint systems based on Sherwin-Williams and Tnemec for substrates indicated.

B. **Ferrous Metal:** Provide the following finish systems over exterior ferrous metal.

#### 1. **High-Build Acrylic Polyurethane Enamel:**

a. **Primer:** Metal primer applied at spreading rate recommended by the manufacturer.

1) Tnemec: "Poxiprime" Series 65

b. **Second Coat:** Epoxy intermediate coat applied at spreading rate recommended by the manufacturer.

1) Tnemec: Series 66 Hi-Build Expoxoline

c. **Third Coat: Semigloss,** acrylic polyurethane enamel applied at spreading rate recommended by the manufacturer.

1) Tnemec: Series 1075 Endura-Shield

d. Surfaces: Hollow metal doors and frames, miscellaneous steel fabrications, and all other exterior steel scheduled or indicated to painted or exposed to view.

e. Primer may not be required on shop primed items if compatibility is confirmed in writing with the manufacturer of the type of shop primer being applied. Contractor shall verify this during the bidding period, and if primer is not compatible, then primer shall be either field applied or shop applied with type as recommended by the finish coat manufacturer. Type of primer and surface preparation shall be as recommended by the painting materials manufacturer.

f. This paint system shall be spray applied only, brush application is not allowed.

C. **Cement Plaster (Stucco):** Provide the following finish systems over exterior cement plaster surfaces:

#### 1. **Acrylic-Latex Finish:**

a. **Primer:** Alkali-resistant, exterior, acrylic-latex primer applied at spreading rate recommended by the manufacturer.

1) Sherwin-Williams: Loxon Acrylic Masonry Primer (A24W300).



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- b. **First and Second Coats: Satin**, exterior, acrylic-latex enamel applied at spreading rate recommended by the manufacturer.
  - 1) Sherwin-Williams: A-100 Acrylic Satin (A82 Series)
- c. Surfaces: Concrete walls, columns, beams, window sills, and lintels. Other items as may be indicated, scheduled, or exposed to view.

### D. Stained Woodwork Option:

- 1. **Semi-Transparent Stain (Decks and Treads)**: Provide the following stained finishes over new exterior decks, stairs, which includes pressure treated lumber:
  - a. **First Coat:** S-W DeckScapes Ext. Waterborne Deck Stain, A15T15 Series (100-300 s/f per gal.)
  - b. **Second Coat:** S-W DeckScapes Ext. Waterborne Deck Stain, A15T15 Series (100-300 s/f per gal.)
  - c. Sand lightly between first and second coats.
- 2. **Stain - Water Reducible Systems (Railings and Trims)**: Provide the following stained finishes over new exterior wood handrails, guardrails, which include pressure treated lumber:
  - a. **First Coat:** S-W WoodScapes Polyurethane Stain, A15T5 (100-350 s/f per gal.)
  - b. **Second Coat:** S-W WoodScapes Polyurethane Stain, A15T5 (100-350 s/f per gal.)
  - c. Sand lightly between first and second coats.

### E. Painted Woodwork Option:

- 1. **Acrylic Water-Based Floor System (Decks and Treads)**: Provide the following painted finishes over new exterior decks, stairs, which includes pressure treated lumber:
  - a. **First Coat:** S-W Porch & Floor Enamel, A32-100 Series
  - b. **Second Coat:** S-W Porch & Floor Enamel, A32-100 Series (4mils wet; 1.4 mils dry per coat)
- 2. **Latex Satin Finish (Railings and Trims)**: Provide the following painted finishes over new exterior wood handrails, guardrails, which include pressure treated lumber:
  - a. **First Coat:** S-W Exterior Latex Wood Primer, B42W8041 (4 mils wet, 1.4 mils dry)
  - b. **Second Coat:** S-W A-100 Exterior Latex Satin, A82 Series (4mils wet; 1.4 mils dry per coat)
  - c. **Third Coat:** S-W A-100 Exterior Latex Satin, A82 Series (4mils wet; 1.4 mils dry per coat)



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**3.9 INTERIOR PAINTING SCHEDULE**

- A. Provide the following **interior** paint systems based on **Sherwin-Williams and Tnemec** for substrates indicated:
- B. **Concrete Masonry Units:** Provide the following finish systems over interior concrete masonry block units:
1. **Epoxy:**
    - a. **Block Filler:** Waterborne epoxy polyamide. Install block filler to a smooth finished surface.
      - 1) Sherwin-Williams: Loxon Block Surfacer A24W200, 1.6 mils DFT minimum.
    - b. **First and Second Coats:** Semi-gloss, waterborne epoxy polyamide.
      - 1) Sherwin-Williams: Water Based Catalyzed Epoxy B70/B60V25 Semi-Gloss, 2.5 to 3 mils DFT.
    - c. Surfaces: New and existing masonry walls.
- C. **Gypsum Board:** Provide the following finish systems over interior gypsum board surfaces:
1. **Epoxy:**
    - a. **Primer:** Waterborne epoxy polyamide.
      - 1) Sherwin-Williams: Moisture Vapor Barrier Primer B72W1, 1.8 to 2.4 mils DFT.
    - b. **First and Second Coats:** Semi-gloss waterborne epoxy polyamide.
      - 1) Sherwin-Williams: Water Based Catalyzed Epoxy B70/B60V25 Semi-Gloss, 2.5 to 3 mils DFT.
    - c. Surfaces: Gypsum board ceilings.
- D. **Ferrous Metal:** Provide the following finish systems over interior ferrous metal:
1. **Acrylic Polymer Satin:**
    - a. **Primer:** Metal primer applied at spreading rate recommended by the manufacturer.
      - 1) Tnemec: "Tneme-Fascure" Series 161
      - 2) S-W: "Recoatable Epoxy Primer" B67 Series.
      - 3) Porter Paints: Porter Coatings "Porter Mastic 7000" Epoxy



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- b. **First and Second Coats: Semigloss**, acrylic polyurethane enamel applied at spreading rate recommended by the manufacturer.
- 1) Tnemec: Series 75 Endura-Shield
  - 2) S-W: "Acrolon 218 HS" with SG Hardener, B65 Series
  - 3) Porter Paints: Porter Coatings "9200 PorterThane" Urethane
- c. Surfaces: Hollow metal doors and frames, miscellaneous steel, etc. where scheduled, noted to be painted, or exposed to view.

Note: When the manufacturing of paint supplied does not require or recommend a primer, and a single coat will provide required coverage, approval from the Architect must be obtained to delete second coat; and a credit shall be due the Owner.

END OF SECTION 09 91 00

**Division 10**  
Specialties





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SECTION 10 21 16  
SOLID PLASTIC TOILET COMPARTMENTS

PART 1 - GENERAL

1.1 SUMMARY

- A. The Work of this Section includes toilet partitions, and accessories indicated on Drawings, schedules, and in these Specifications. Refer to Drawings for location, size, and quantity required.

1.2 SUBMITTALS

- A. Submit in accordance with Division 01 requirements.
- B. Product Data: Submit manufacturer's standard technical data for all required types of products. Include manufacturer's recommendations for cleaning and maintenance methods for indicated types of units.
- C. Complete Shop Drawings by approved manufacturer for proposed toilet compartments. Detail fabrication and installation drawings. Include appurtenances, cutouts, and all accessories. Provide template layouts and installation instructions for anchorage devices built into other work.
- D. Complete suitable color selection materials for components (actual samples) in triplicate quantity, for all available color groups.
- E. Sample warranty.
- F. Submit warranty as specified herein.

1.3 ACCESSIBILITY REQUIREMENTS

- A. Toilet compartments shall be provided to conform with the Americans With Disabilities Act Accessibility Guidelines (ADAAG) and State and Local Regulations. These requirements supersede Technical Specifications in this Section.

1.4 WARRANTY

- A. Manufacturer's Warranty: Toilet compartment manufacturer shall warrant plastic panels to remain free from warping, breaking, and from material and manufacturing defects for indicated period of time. Products which become defective during warranty period shall be repaired to eliminate all evidence of damage. If such repairs to completely eliminate all evidence of damage cannot be made, defective units shall be removed and replaced with new units that comply with indicated requirements.
  - 1. Warranty Period: Fifteen (15) years from the Date of Substantial Completion.



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## 1.5 FLORIDA ACCESSIBILITY CODE FOR BUILDING CONSTRUCTION

- A. Compartment system shall conform with the Accessibility Requirements Manual from the Florida Department of Community Affairs, Florida Board of Building Codes and Standards.

## PART 2 - PRODUCTS

### 2.1 MANUFACTURER

- A. Basis of Design: Toilet compartments shall be the products of "Poly-Mar HD", solid one inch thick plastic as manufactured by Santana Products Company, Scranton, Pennsylvania; specified as the type, size, function, and quality of equipment; [www.hinyhider.com](http://www.hinyhider.com).
- B. Products of the following manufacturers are acceptable, providing their solid plastic toilet compartments equals or exceeds the quality specified; and they can provide equipment of the type, size, function, and arrangement required.
1. Accurate Partitions, Lyons, Illinois; [www.accuratepartitions.com](http://www.accuratepartitions.com)
  2. Comtec Industries, Inc., div. of Compression Polymers Group Corp., Moosic, Pennsylvania; [www.comtecindustries.com](http://www.comtecindustries.com)
  3. General Partitions Manufacturing Corp., Erie, PA; [www.genpartitions.com](http://www.genpartitions.com)
  4. Rockville Partitions, Inc, Rockville, Maryland; [www.rockvillepartitions.com](http://www.rockvillepartitions.com)
  5. Columbia Partitions by Partition Systems Incorporated of South Carolina, Columbia SC; [www.psisc.com](http://www.psisc.com)
  6. Sanymetal, Div. of Crane.
- C. Type: Floor supported with overhead top rail bracing, solid plastic compartments in colors as selected by the Architect.

### 2.2 MATERIALS

- A. Materials, panels, doors, pilasters, and screens shall be fabricated from polymer resins High Density Polyethylene (HDPE) containing a minimum of 75% recycled material manufactured under high pressure forming a single component section which is waterproof, corrosion-proof, impact resistant nonabsorbent, and has a self lubricating Poly-Glaze "280" surface that resists marking with pens, pencils, lipstick, and other writing or marking utensils.
1. Colors: As selected by Architect from manufacturer's full range.

### 2.3 CONSTRUCTION

- A. Partitions shall have edges machined to a radius of 0.250 inch and sharp corners removed. Dividing toilet partition panels and doors shall be 55 inches high and mounted 14 inches above finished floor.



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- B. Pilasters for the toilet partitions shall be 82 inches high and fastened to 3 inches high stainless steel shoes with theftproof stainless steel sex bolts.
  - 1. Pilaster Shoe: Formed, ASTM A167, latest edition, type 304 stainless steel with No. 4 finish, 3 inch high, with adjustable screw jack.
- C. Unless dimensioned otherwise on Drawings, toilet partitions are to be 60 inches deep and 36 inches wide.
  - 1. Outswinging doors (for handicapped) shall be 34 inches wide.
  - 2. Inswinging doors (for handicapped) are to be 34 inches wide (if compartment has side entry, minimum is 36 inches), and other (inswinging) doors to be either 24 inches or 26 inches wide for each run
- D. Provide internal reinforcement for all accessories.
- E. Refer to the Drawings for the heights and configurations of the toilet compartments.
- F. Properties:
  - 1. Dual component compression molded High Density Polyethylene (HDPE) of solid Poly-Mar HD, Poly-Marble HD, or Poly-Granite HD virgin resin materials in colors that extend throughout the surface; the panels, doors, and pilasters shall have combined recycled and/or virgin material (HDPE) as the core material.
  - 2. Doors, panels and pilasters shall be a minimum of 1 inch thick and all edges machined to a radius of 0.250 inch and all exposed surfaces to be free of saw marks.

### 2.4 TOILET PARTITION HARDWARE

- A. Door hardware shall be as follows:
  - 1. Hinges shall be stainless steel continuous hinges. Door closures to be factory set to accommodate all conditions and allow for a positive opening and closing action free of impediment.
  - 2. Each handicapped door to include: (1) stainless steel door pull (1) stainless steel wall stop.
  - 3. Door strike and keeper shall be fabricated from stainless steel with brushed satin finish with wrap around flange surface mounted and thru-bolted to pilaster with one-way sex bolts. Size of strike shall be 6 inches in length.
  - 4. Door latch housing shall be fabricated from stainless steel with brushed satin finish, surface mounted and thru-bolted to door with one-way sex bolts. Slide bolt and button shall be heavy aluminum with black anodized finish.
- B. Satin finish stainless steel pilaster shoes shall be anchored to finished floor with anchors and #14 x 1 ½ inch stainless steel Phillips head screws.
- C. Full length continuous wall brackets shall be satin finish stainless steel. Brackets shall be used for all panels to pilaster, pilasters to wall and panel to wall connections. Wall brackets shall be thru-bolted to panels and pilasters with one-way sex bolts. Attachment



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of brackets to adjacent wall construction shall be accomplished by #14 x 1 ½ inch stainless steel Phillips head screws anchored directly behind the vertical edge of panels and pilasters at 13 inch intervals along the full length of bracket and at each 13 inch interval alternately spaced between anchor connections.

- D. Headrail brackets shall be 18-gauge stainless steel.
- E. Stainless steel shall be Type 316 with satin finish.

### PART 3 - EXECUTION

#### 3.1 INSTALLATION

- A. Install units as shown in true and plumb condition.
- B. Anchor brackets securely with fasteners indicated on approved Shop Drawings.
- C. Install in accordance with manufacturer's written installation instructions and approved Shop Drawings.
- D. All parts shall be erected in a substantial manner, straight, level, and plumb.
- E. No evidence of drilling, cutting, or patching shall be visible in the finished work.
- F. Clearance at vertical edges of doors shall be uniform top to bottom and shall not exceed ¼ inch.
- G. Finished surfaces shall be cleaned after installation and left free of imperfections.
- H. Authorized factory installers to be utilized.
- I. Provide all items and accessories as required for a complete and total installation in every respect.

#### 3.2 ADJUSTMENT

- A. Doors are to be adjusted so that they are approximately 3 inches open when cubicle is unoccupied.
- B. Door at handicapped cubicles shall be easily removable from exterior side when locked.

#### 3.3 GENERAL INSTALLATION PROVISIONS

- A. Inspection of Conditions: Require the Installer of each major component to inspect both the substrate and conditions under which Work is to be performed. Do not proceed until unsatisfactory conditions have been corrected in an acceptable manner.



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- B. Manufacturer's Instructions: Comply with manufacturer's installation instructions and recommendations, to the extent that those instructions and recommendations are more explicit or stringent than requirements contained in Contract Documents.
- C. Inspect materials or equipment immediately upon delivery and again prior to installation. Reject damaged and defective items.
- D. Provide attachment and connection devices and methods necessary for securing Work. Secure Work true to line and level. Allow for expansion and building movement.
- E. Visual Effects: Provide uniform joint widths in exposed Work. Arrange joints in exposed Work to obtain the best visual effect. Refer questionable choices to the Architect for final decision.
- F. Recheck measurements and dimensions, before starting each installation.
- G. Install each component during weather conditions and Project status that will ensure the best possible results. Isolate each part of the completed construction from incompatible material as necessary to prevent deterioration.
- H. Coordinate temporary enclosures with required inspections and tests, to minimize the necessity of uncovering completed construction for that purpose.
- I. Mounting Heights: Where mounting heights are not indicated, install individual components at standard mounting heights recognized within the industry for the particular application indicated. Refer questionable mounting height decisions to the Architect for final decision.

END OF SECTION 10 21 16



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SECTION 10 28 13  
TOILET ACCESSORIES

PART 1 - GENERAL

1.1 SUMMARY

- A. This Section includes toilet accessory items as scheduled and specified. Refer to the Toilet Accessory Schedule on the Drawings for product numbers.

1.2 SUBMITTALS

- A. Submit in accordance with Division 01 requirements.
- B. Product data for each toilet accessory item specified, including construction details relative to materials, dimensions, gages, profiles, mounting method, specified options, and finishes.
- C. Samples of each toilet accessory item to verify design, operation, and finish requirements. Acceptable full-size samples will be returned and may be used in the Work.
- D. Schedule indicating types, quantities, sizes, and installation locations (by room) for each toilet accessory item to be provided for project.
- E. Setting Drawings where cutouts are required in other Work, including templates, substrate preparation instructions, and directions for preparing cutouts and installing anchorage devices.
- F. Maintenance instructions including replaceable parts and service recommendations.
- G. Submit warranty as specified herein.

1.3 QUALITY ASSURANCE

- A. Inserts and Anchorages: Furnish accessory Manufacturers' standard inserts and anchoring devices that must be set in concrete or built into masonry. Coordinate delivery with other Work to avoid delay.
- B. Single-Source Responsibility: Provide products of same Manufacturer for each type of accessory unit and for units exposed to view in same areas, unless otherwise acceptable to Architect.

1.4 PROJECT CONDITIONS

- A. Coordination: Coordinate accessory locations, installation, and sequencing with other Work to avoid interference with and ensure proper installation, operation, adjustment, cleaning, and servicing of toilet accessory items.



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## 1.5 WARRANTY

- A. Toilet Accessory Warranty: Provide manufacturers one (1) year warranty from the Date of Substantial Completion, against defects in material and workmanship.

## PART 2 - PRODUCTS

### 2.1 TOILET ACCESSORY MANUFACTURERS

- A. Manufacturers: Subject to compliance with requirements, provide toilet accessories by one of the following:
1. Basis of Design: Bobrick Washroom Equipment, Inc., Clifton Park, NY
  2. Bradley Corporation, Menomonee Falls, WI
  3. American Specialties, Inc., Yonkers, New York
  4. A&J Washroom Accessories, New Windsor, New York
- B. Products on the Toilet Accessory Schedule are based on Bobrick.

### 2.2 MATERIALS, GENERAL

- A. Stainless Steel: AISI Type 302/304, with polished No. 4 finish, 0.034-inch (22-gage) minimum thickness.
- B. Brass: Leaded and unleaded, flat products, ASTM B 19; rods, shapes, forgings, and flat products with finished edges, ASTM B 16; Castings, ASTM B 30.
- C. Sheet Steel: Cold-rolled, commercial quality ASTM A 366, 0.04-inch (20-gage) minimum. Surface preparation and metal pretreatment as required for applied finish.
- D. Galvanized Steel Sheet: ASTM A 527, G60.
- E. Chromium Plating: Nickel and chromium electro-deposited on base metal, ASTM B 456, Type SC 2.
- F. Baked Enamel Finish: Factory-applied, gloss white, baked acrylic enamel coating.
- G. Stainless Steel Mirror Surfaces: Not less than 0.04-inch (20-gage) AISI Type 302/304 stainless steel sheet, stretcher-leveled with No. 8 polished mirror finish. Bond to 1/4-inch minimum hardboard backing.
- H. Fasteners: Screws, bolts, and other devices of same material as accessory unit, or of stainless steel where concealed.

### 2.3 FABRICATION

- A. No names or labels are permitted on exposed faces of toilet and bath accessory units. On either interior surface not exposed to view or on back surface, provide identification of each accessory item either by a printed, waterproof label or a stamped nameplate indicating Manufacturer's name and product model number.



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- B. Surface-Mounted Toilet Accessories, General: Except where otherwise indicated, fabricate units with tight seams and joints, exposed edges rolled. Hang doors or access panels with continuous stainless steel piano hinge. Provide concealed anchorage wherever possible.
- C. Recessed Toilet Accessories, General: Except where otherwise indicated, fabricate units of all-welded construction, without mitered corners. Hang doors or access panels with full-length, stainless steel piano hinge. Provide anchorage that is fully concealed when unit is closed.
- D. Framed Mirror Units, General: Fabricate frames for glass mirror units to accommodate wood, felt, plastic, or other glass edge protection material. Provide mirror backing and support system that will permit rigid, tamperproof glass installation and prevent moisture accumulation, as follows:
  - 1. Provide galvanized-steel backing sheet, not less than 0.034 inch (22 gage) and full mirror size, with nonabsorptive filler material. Corrugated cardboard is not an acceptable filler material.
- E. Mirror Unit Hangers: Provide system for mounting mirror units that will permit rigid, tamperproof, and theftproof installation, as follows:
  - 1. One-piece, stainless steel, wall-hanger device with spring-action locking mechanism to hold mirror unit in position with no exposed screws or bolts.
  - 2. Heavy-duty wall brackets of stainless steel, equipped with concealed locking devices requiring a special tool to remove.
- F. Keys: Provide universal keys for access to toilet accessory units requiring internal access for servicing, resupply, etc. Provide minimum of six keys to Owner's representative.

### 2.4 MOP HOLDERS WITH SHELF AND RAG HOOKS

- A. Surface mounted utility shelf with holders with spring loaded rubber cam holders to accommodate mop or broom handles. Bobrick No. B-224 X 30"

### 2.5 UTILITY HOOKS

- A. Surface-mounted utility hook shall be type-304 stainless steel satin finish. Flange shall be 22 gauge and equipped with concealed, 16 gauge mounting bracket that is secured to concealed, 16-gauge wall plate with locking set screw: Bobrick No. B-6707.

### 2.6 HAND DRYER

- A. Hand Dryer: XLERATOR Model XL-BW as manufactured by Excel Dryer, Inc., East Longmeadow, MA; [www.exceldryer.com](http://www.exceldryer.com).
  - 1. Warranty Period: 5 years; limited warranty.
  - 2. Controls: Automatic, activated by infrared optical sensor. Operates while hands



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- are under blower. Shut-off within 2 seconds when hands removed, or in 35 seconds if hands not removed.
3. Cover: One piece, vandal resistant, reinforced white thermoplastic (Bulk Molding Compound).
4. Wall Plate: Injection molded, rib reinforced plate with metal L brackets to attach cover, with ten 5/16 inch (8 mm) diameter holes for surface mounting to wall and three 7/8 inch (22 mm) diameter holes for electrical wiring; bottom hole suitable for surface conduit.
5. Power Source: See Electrical Drawings.
6. Combination Motor and Blower: Series commutated, through-flow discharge, vacuum type; 5/8 HP, 20,000 RPM. Air flow rate: 19,000 linear feet per minute (97 meters per second) at air outlet, 16,000 linear feet per minute (81 meters per second) at average hand position of 4 inches below air outlet.
7. Heater: Nichrome wire element, mounted inside blower housing to be vandal proof.
8. Heater Safeguard: Automatic resetting thermostat to open when air flow is restricted and close when air flow is resumed.
9. Air Temperature: 135 degrees F (55 degrees C) measured at average hand position of 4 inches below air outlet. Air Heater Output: 900 watts.
10. All metal parts coated according to Underwriters Laboratories, Inc. requirements.
11. Mount dryers at heights indicated on Drawings.

### PART 3 - EXECUTION

#### 3.1 INSTALLATION

- A. Install toilet accessory units according to manufacturers' instructions, using fasteners appropriate to substrate as recommended by unit manufacturer. Install units plumb and level, firmly anchored in locations and at heights indicated.
- B. Secure mirrors to walls in concealed, tamperproof manner with special hangers, toggle bolts, or screws. Set units plumb, level, and square at locations indicated, according to Manufacturer's instructions for type of substrate involved.
- C. Install grab bars to withstand a downward load of at least 250 lbf, complying with ASTM F 446.
- D. Provide all items and accessories as required for a complete and total installation in every respect, whether or not specified or indicate don the Drawings.

#### 3.2 ADJUSTING AND CLEANING

- A. Adjust toilet accessories for proper operation and verify that mechanisms function smoothly. Replace damaged or defective items.
- B. Clean and polish all exposed surfaces strictly according to manufacturer's recommendations after removing temporary labels and protective coatings.



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3.3 GENERAL INSTALLATION PROVISIONS

- A. Inspection of Conditions: Require the Installer of each major component to inspect both the substrate and conditions under which Work is to be performed. Do not proceed until unsatisfactory conditions have been corrected in an acceptable manner.
- B. Manufacturer's Instructions: Comply with manufacturer's installation instructions and recommendations, to the extent that those instructions and recommendations are more explicit or stringent than requirements contained in Contract Documents.
- C. Inspect materials or equipment immediately upon delivery and again prior to installation. Reject damaged and defective items.
- D. Provide attachment and connection devices and methods necessary for securing Work. Secure Work true to line and level. Allow for expansion and building movement.
- E. Visual Effects: Provide uniform joint widths in exposed Work. Arrange joints in exposed Work to obtain the best visual effect. Refer questionable choices to the Architect for final decision.
- F. Recheck measurements and dimensions, before starting each installation.
- G. Install each component during weather conditions and Project status that will ensure the best possible results. Isolate each part of the completed construction from incompatible material as necessary to prevent deterioration.
- H. Mounting Heights: Where mounting heights are not indicated, install individual components at standard mounting heights recognized within the industry for the particular application indicated. Refer questionable mounting height decisions to the Architect for final decision.

END OF SECTION 10 28 13



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# **Division 12**

Furnishings





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SECTION 12 20 00  
WINDOW TREATMENT

PART 1 - GENERAL

1.1 SUMMARY

- A. Provide labor, materials, and equipment necessary for providing horizontal window blinds.
- B. Provide blinds for all exterior windows. Refer to plans for interior window locations.

1.2 SUBMITTALS

- A. Submit complete shop drawings for Architect's approval in accordance with Division 1 requirements.
- B. Product Data: Submit manufacturer's specifications and installation instructions for each type of unit required. Include methods of installation for each type of opening and supporting structure. Transmit copy of instructions and recommendations to the installer. Include maintenance instructions, including recommended cleaning materials, and operating hardware.
- C. Shop Drawings: Show location and extent of blinds. Include elevations, sections, details, and dimensions not shown in Product Data. Show installation details, mountings, attachments to other Work, operational clearances, and relationship to adjoining work.
- D. Samples for Initial Selection: For each colored component of each type of blind indicated.
- E. Window Treatment Schedule: Include blinds in schedule using same room designations indicated on Drawings.
- F. Maintenance Data: For blinds to include in maintenance manuals. Include the following:
  - 1. Methods for maintaining horizontal louver blinds and finishes.
  - 2. Precautions about cleaning materials and methods that could be detrimental to finishes and performance.
  - 3. Operating hardware.

1.3 QUALITY ASSURANCE

- A. Source Limitations: Obtain blinds through one source from a single manufacturer.
- B. Fire-Test-Response Characteristics: Provide blinds with the fire-test-response characteristics indicated, as determined by testing identical products per test method indicated below by UL or another testing and inspecting agency acceptable to authorities having jurisdiction:
  - 1. Flame-Resistance Ratings: Passes NFPA 701.
- C. Corded Window Covering Product Standard: Provide horizontal louver blinds complying with WCMA A 100.1.



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### 1.4 DELIVERY, STORAGE AND HANDLING

- A. Deliver blinds in factory packages, marked with manufacturer and product name, fire-test-response characteristics, and location of installation using same room designations indicated on Drawings and in a window treatment schedule.

### 1.5 PROJECT CONDITIONS

- A. Verify dimensions and conditions at jobsite. Dimensions noted on the Drawings and in the Specifications are for guidance only.
- B. Environmental Limitations: Do not install horizontal louver blinds until construction and wet and dirty finish work in spaces, including painting, is complete and ambient temperature and humidity conditions are maintained at the levels indicated for Project when occupied for its intended use.
- C. Field Measurements: Where horizontal louver blinds are indicated to fit to other construction, verify dimensions of other construction by field measurements before fabrication and indicate measurements on Shop Drawings. Allow clearances for operable glazed units' operation hardware throughout the entire operating range. Notify Architect of discrepancies. Coordinate fabrication schedule with construction progress to avoid delaying the Work.

## PART 2 - PRODUCTS

### 2.1 MANUFACTURERS

- A. The following manufacturers are specified as the type, size, function, and quality of products required to be provided:
  - 1. Horizontal window blinds
    - a) Levolor Corp., Newell Rubbermaid, Inc., Rockford, IL; [www.levolor.com/](http://www.levolor.com/)
    - b) Hunter Douglas, Inc., Maywood, New Jersey; [www.hunterdouglas.com/](http://www.hunterdouglas.com/)
    - c) Bali Horizontal Blinds, Springs Industries, Fort Mill, SC; [www.springs.com/ourproducts/windows/bali/](http://www.springs.com/ourproducts/windows/bali/)
    - d) Graber Blinds, Springs Industries, Fort Mill, SC; [www.springs.com/corporateinfo/ourbrands/graber.html](http://www.springs.com/corporateinfo/ourbrands/graber.html)

### 2.2 HORIZONTAL WINDOW BLINDS

- A. Headrail: Manufacturer's standard headrail, channel shaped section fabrication from minimum 0.024 inch thick sheet steel. Increase metal thickness as recommended by the manufacturer for larger blind units. Cross brace for extra rigidity. Furnish complete with tilting mechanism, top and end brace, top cradle, cord lock, and accessory items required for the type of blind and installation indicated.



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- B. Bottom Rail: Manufacturer's standard steel bottom rail, designed to withstand twisting or sagging. Contour top surface to match slat curvature, with flat or slightly curved bottom. Close ends with manufacturer's standard metal or plastic end caps, of the same color as rail. Finish rail the same color as slats, unless otherwise indicated.
- C. Slats: Manufacturer's standard, spring tempered, one inch narrow aluminum slats not less than 0.0085 inch thick, (louver blades), with rounded corners and forming burrs removed.
- D. Braided Ladders: Manufacturer's standard polyester support cords with integrally braided ladder rungs. Provide cord size and rung spacing as required for each type of blind.
- E. Tilter: Manufacturer's standard enclosed, lubricated, tilting mechanism which will tilt and securely hold the tilting rod, slats, and bottom rail at any set angle. Furnish wand (or rod) type tilter consisting of standard tilter mechanism adapted for rotating wand operation. Furnish manufacturer's standard plastic or aluminum rod of proper length of suit blind installation.
- F. Cords: Manufacturer's standard braided polyester or nylon cord, sized to suit blind type, equipped with soft molded plastic, rubber, or composition tassels securely attached to each cord end.
- G. Color by Architect.

### 2.3 ACCESSORIES

- A. Provide installation hardware, fasteners, hooks, and other miscellaneous items required for a finished and complete installation.

## PART 3 - EXECUTION

### 3.1 GENERAL INSTALLATION PROVISIONS

- A. Inspection of Conditions: Require the Installer of each major component to inspect both the substrate and conditions under which Work is to be performed. Do not proceed until unsatisfactory conditions have been corrected in an acceptable manner.
- B. Manufacturer's Instructions: Comply with manufacturer's installation instructions and recommendations, to the extent that those instructions and recommendations are more explicit or stringent than requirements contained in Contract Documents.
- C. Inspect materials or equipment immediately upon delivery and again prior to installation. Reject damaged and defective items.
- D. Provide attachment and connection devices and methods necessary for securing Work. Secure Work true to line and level. Allow for expansion and building movement.



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- E. Visual Effects: Provide uniform joint widths in exposed Work. Arrange joints in exposed Work to obtain the best visual effect. Refer questionable choices to the Architect for final decision.
- F. Recheck measurements and dimensions, before starting each installation.
- G. Install each component during weather conditions and Project status that will ensure the best possible results. Isolate each part of the completed construction from incompatible material as necessary to prevent deterioration.
- H. Coordinate temporary enclosures with required inspections and tests, to minimize the necessity of uncovering completed construction for that purpose.
- I. Mounting Heights: Where mounting heights are not indicated, install individual components at standard mounting heights recognized within the industry for the particular application indicated. Refer questionable mounting height decisions to the Architect for final decision.

### 3.2 INSTALLATION

- A. Position items accurately on the Drawings and true to plumb line and level. Provide additional supports or attachment as required for installation.
- B. Install track and all items and accessories in strict accordance with the manufacturer's written instructions and approved shop drawings.
- C. After complete installation, demonstrate to the Architect that components are fully operable and will perform as intended.
- D. Provide all items and accessories as required for a complete installation in every respect.

END OF SECTION 12 20 00

**Division 22**  
Plumbing





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SECTION 22 05 00  
COMMON WORK RESULTS FOR PLUMBING

## PART 1 - GENERAL

### 1.1 SUMMARY

A. This Section includes the following:

1. Piping materials and installation instructions common to most piping systems.
2. Dielectric fittings.
3. Mechanical sleeve seals.
4. Sleeves.
5. Escutcheons.
6. Grout.
7. Equipment installation requirements common to equipment sections.

### 1.2 DEFINITIONS

- A. Finished Spaces: Spaces other than plumbing and electrical equipment rooms, furred spaces, pipe chases, unheated spaces immediately below roof, spaces above ceilings, unexcavated spaces, crawlspaces, and tunnels.
- B. Exposed, Interior Installations: Exposed to view indoors. Examples include finished occupied spaces and plumbing equipment rooms.
- C. Exposed, Exterior Installations: Exposed to view outdoors or subject to outdoor ambient temperatures and weather conditions. Examples include rooftop locations.
- D. Concealed, Interior Installations: Concealed from view and protected from physical contact by building occupants. Examples include above ceilings and in chases.
- E. Concealed, Exterior Installations: Concealed from view and protected from weather conditions and physical contact by building occupants but subject to outdoor ambient temperatures. Examples include installations within unheated shelters.

### 1.3 SUBMITTALS

- A. Welding certificates.

### 1.4 QUALITY ASSURANCE

- A. Steel Support Welding: Qualify processes and operators according to AWS D1.1, "Structural Welding Code--Steel."
- B. Steel Pipe Welding: Qualify processes and operators according to ASME Boiler and Pressure Vessel Code: Section IX, "Welding and Brazing Qualifications."



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1. Comply with provisions in ASME B31 Series, "Code for Pressure Piping."
  2. Certify that each welder has passed AWS qualification tests for welding processes involved and that certification is current.
- C. Electrical Characteristics for Plumbing Equipment: Equipment of higher electrical characteristics may be furnished provided such proposed equipment is approved in writing and connecting electrical services, circuit breakers, and conduit sizes are appropriately modified. If minimum energy ratings or efficiencies are specified, equipment shall comply with requirements.

## PART 2 - PRODUCTS

### 2.1 PIPE, TUBE, AND FITTINGS

- A. Refer to individual Division 22 piping Sections for pipe, tube, and fitting materials and joining methods.
- B. Pipe Threads: ASME B1.20.1 for factory-threaded pipe and pipe fittings.

### 2.2 JOINING MATERIALS

- A. Refer to individual Division 22 piping Sections for special joining materials not listed below.
- B. Solder Filler Metals: ASTM B 32, lead-free alloys. Include water-flushable flux according to ASTM B 813.
- C. Solvent Cements for Joining Plastic Piping:
  1. ABS Piping: ASTM D 2235.
  2. CPVC Piping: ASTM F 493.
  3. PVC Piping: ASTM D 2564. Include primer according to ASTM F 656.
  4. PVC to ABS Piping Transition: ASTM D 3138.

### 2.3 DIELECTRIC FITTINGS

- A. Description: Combination fitting of copper alloy and ferrous materials with threaded, solder-joint, plain, or weld-neck end connections that match piping system materials.
- B. Insulating Material: Suitable for system fluid, pressure, and temperature.
- C. Dielectric Couplings: Galvanized-steel coupling with inert and noncorrosive, thermoplastic lining; threaded ends; and 300-psig minimum working pressure at 225 deg F.
- D. Dielectric Nipples: Electroplated steel nipple with inert and noncorrosive, thermoplastic lining; plain, threaded, or grooved ends; and 300-psig minimum working pressure at 225 deg F.



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### 2.4 SLEEVES

- A. Galvanized-Steel Sheet: 0.0239-inch minimum thickness; round tube closed with welded longitudinal joint.
- B. Steel Pipe: ASTM A 53, Type E, Grade B, Schedule 40, galvanized, plain ends.
- C. Cast Iron: Cast or fabricated "wall pipe" equivalent to ductile-iron pressure pipe, with plain ends and integral waterstop, unless otherwise indicated.
- D. Stack Sleeve Fittings: Manufactured, cast-iron sleeve with integral clamping flange. Include clamping ring and bolts and nuts for membrane flashing.
  - 1. Underdeck Clamp: Clamping ring with set screws.
- E. Molded PVC: Permanent, with nailing flange for attaching to wooden forms.
- F. PVC Pipe: ASTM D 1785, Schedule 40.
- G. Molded PE: Reusable, PE, tapered-cup shaped, and smooth-outer surface with nailing flange for attaching to wooden forms.

### 2.5 ESCUTCHEONS

- A. Description: Manufactured wall and ceiling escutcheons and floor plates, with an ID to closely fit around pipe, tube, and insulation of insulated piping and an OD that completely covers opening.
- B. One-Piece, Deep-Pattern Type: Deep-drawn, box-shaped brass with polished chrome-plated finish.
- C. One-Piece, Cast-Brass Type: With set screw.
  - 1. Finish: Polished chrome-plated and rough brass.
- D. Split-Casting, Cast-Brass Type: With concealed hinge and set screw.
  - 1. Finish: Polished chrome-plated and rough brass.

### 2.6 GROUT

- A. Description: ASTM C 1107, Grade B, nonshrink and nonmetallic, dry hydraulic-cement grout.
  - 1. Characteristics: Post-hardening, volume-adjusting, nonstaining, noncorrosive, nongaseous, and recommended for interior and exterior applications.
  - 2. Design Mix: 5000-psi, 28-day compressive strength.
  - 3. Packaging: Premixed and factory packaged.



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## PART 3 - EXECUTION

### 3.1 PIPING SYSTEMS - COMMON REQUIREMENTS

- A. Install piping according to the following requirements and Division 22 Sections specifying piping systems.
- B. Drawing plans, schematics, and diagrams indicate general location and arrangement of piping systems. Indicated locations and arrangements were used to size pipe and calculate friction loss, expansion, pump sizing, and other design considerations. Install piping as indicated unless deviations to layout are approved on Coordination Drawings.
- C. Install piping in concealed locations, unless otherwise indicated and except in equipment rooms and service areas.
- D. Install piping indicated to be exposed and piping in equipment rooms and service areas at right angles or parallel to building walls. Diagonal runs are prohibited unless specifically indicated otherwise.
- E. Install piping above accessible ceilings to allow sufficient space for ceiling panel removal.
- F. Install piping to permit valve servicing.
- G. Install piping at indicated slopes.
- H. Install piping free of sags and bends.
- I. Install fittings for changes in direction and branch connections.
- J. Install piping to allow application of insulation.
- K. Select system components with pressure rating equal to or greater than system operating pressure.
- L. Install escutcheons for penetrations of walls, ceilings, and floors.
- M. Install sleeves for pipes passing through concrete and masonry walls, gypsum-board partitions, and concrete floor and roof slabs.
- N. Aboveground, Exterior-Wall Pipe Penetrations: Seal penetrations using sleeves and mechanical sleeve seals. Select sleeve size to allow for 1-inch annular clear space between pipe and sleeve for installing mechanical sleeve seals.
  - 1. Install steel pipe for sleeves smaller than 6 inches in diameter.
  - 2. Install cast-iron "wall pipes" for sleeves 6 inches and larger in diameter.
  - 3. Mechanical Sleeve Seal Installation: Select type and number of sealing elements required for pipe material and size. Position pipe in center of sleeve. Assemble mechanical sleeve seals and install in annular space between pipe and sleeve. Tighten bolts against pressure plates that cause sealing elements to expand and make watertight seal.
- O. Verify final equipment locations for roughing-in.



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- P. Refer to equipment specifications in other Sections of these Specifications for roughing-in requirements.

## 3.2 PIPING JOINT CONSTRUCTION

- A. Join pipe and fittings according to the following requirements and Division 22 Sections specifying piping systems.
- B. Ream ends of pipes and tubes and remove burrs. Bevel plain ends of steel pipe.
- C. Remove scale, slag, dirt, and debris from inside and outside of pipe and fittings before assembly.
- D. Soldered Joints: Apply ASTM B 813, water-flushable flux, unless otherwise indicated, to tube end. Construct joints according to ASTM B 828 or CDA's "Copper Tube Handbook," using lead-free solder alloy complying with ASTM B 32.
- E. Plastic Piping Solvent-Cement Joints: Clean and dry joining surfaces. Join pipe and fittings according to the following:
  - 1. Comply with ASTM F 402, for safe-handling practice of cleaners, primers, and solvent cements.
  - 2. ABS Piping: Join according to ASTM D 2235 and ASTM D 2661 Appendixes.
  - 3. CPVC Piping: Join according to ASTM D 2846/D 2846M Appendix.
  - 4. PVC Pressure Piping: Join schedule number ASTM D 1785, PVC pipe and PVC socket fittings according to ASTM D 2672. Join other-than-schedule-number PVC pipe and socket fittings according to ASTM D 2855.
  - 5. PVC Nonpressure Piping: Join according to ASTM D 2855.
  - 6. PVC to ABS Nonpressure Transition Fittings: Join according to ASTM D 3138 Appendix.
- F. Plastic Pressure Piping Gasketed Joints: Join according to ASTM D 3139.
- G. Plastic Nonpressure Piping Gasketed Joints: Join according to ASTM D 3212.

## 3.3 PIPING CONNECTIONS

- A. Make connections according to the following, unless otherwise indicated:
  - 1. Dry Piping Systems: Install dielectric unions and flanges to connect piping materials of dissimilar metals.
  - 2. Wet Piping Systems: Install dielectric coupling and nipple fittings to connect piping materials of dissimilar metals.

## 3.4 EQUIPMENT INSTALLATION - COMMON REQUIREMENTS

- A. Install equipment to allow maximum possible headroom unless specific mounting heights are not indicated.
- B. Install equipment level and plumb, parallel and perpendicular to other building systems and components in exposed interior spaces, unless otherwise indicated.



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- C. Install plumbing equipment to facilitate service, maintenance, and repair or replacement of components. Connect equipment for ease of disconnecting, with minimum interference to other installations. Extend grease fittings to accessible locations.
- D. Install equipment to allow right of way for piping installed at required slope.

### 3.5 GROUTING

- A. Mix and install grout for plumbing equipment base bearing surfaces, pump and other equipment base plates, and anchors.
- B. Clean surfaces that will come into contact with grout.
- C. Provide forms as required for placement of grout.
- D. Avoid air entrapment during placement of grout.
- E. Place grout, completely filling equipment bases.
- F. Place grout on concrete bases and provide smooth bearing surface for equipment.
- G. Place grout around anchors.
- H. Cure placed grout.

END OF SECTION 22 05 00



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SECTION 22 05 23  
GENERAL-DUTY VALVES FOR PLUMBING PIPING

PART 1 - GENERAL

1.1 SUMMARY

A. Section Includes:

1. Brass ball valves.
2. Bronze ball valves.
3. Bronze swing check valves.

B. Related Sections:

1. Division 22 plumbing piping Sections for specialty valves applicable to those Sections only.
2. Division 22 Section "Identification for Plumbing Piping and Equipment" for valve tags and schedules.

1.2 SUBMITTALS

- A. Product Data: For each type of valve indicated.

1.3 QUALITY ASSURANCE

- A. ASME Compliance: ASME B16.10 and ASME B16.34 for ferrous valve dimensions and design criteria.
- B. NSF Compliance: NSF 61 for valve materials for potable-water service.

PART 2 - PRODUCTS

2.1 GENERAL REQUIREMENTS FOR VALVES

- A. Refer to valve schedule articles for applications of valves.
- B. Valve Pressure and Temperature Ratings: Not less than indicated and as required for system pressures and temperatures.
- C. Valve Sizes: Same as upstream piping unless otherwise indicated.
- D. Valve Actuator Types:
1. Handlever: For quarter-turn valves NPS 6 and smaller except plug valves.



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- E. Valves in Insulated Piping: With 2-inch stem extensions and the following features:
  - 1. Ball Valves: With extended operating handle of non-thermal-conductive material, and protective sleeve that allows operation of valve without breaking the vapor seal or disturbing insulation.
- F. Valve-End Connections:
  - 1. Flanged: With flanges according to ASME B16.1 for iron valves.
  - 2. Solder Joint: With sockets according to ASME B16.18.
  - 3. Threaded: With threads according to ASME B1.20.1.

## 2.2 BRASS BALL VALVES

- A. Two-Piece, Full-Port, Brass Ball Valves with Brass Trim:
  - 1. Manufacturers: Subject to compliance with requirements, provide products by one of the following:
    - a. Crane Co.; Crane Valve Group; Crane Valves.
    - b. Crane Co.; Crane Valve Group; Jenkins Valves.
    - c. Hammond Valve.
    - d. Milwaukee Valve Company.
    - e. NIBCO INC.
  - 2. Description:
    - a. Standard: MSS SP-110.
    - b. SWP Rating: 150 psig.
    - c. CWP Rating: 600 psig.
    - d. Body Design: Two piece.
    - e. Body Material: Forged brass.
    - f. Ends: Threaded.
    - g. Seats: PTFE or TFE.
    - h. Stem: Brass.
    - i. Ball: Chrome-plated brass.
    - j. Port: Full.

## 2.3 BRONZE BALL VALVES

- A. Two-Piece, Full-Port, Bronze Ball Valves with Bronze Trim:
  - 1. Manufacturers: Subject to compliance with requirements, provide products by one of the following:
    - a. Conbraco Industries, Inc.; Apollo Valves.
    - b. Crane Co.; Crane Valve Group; Crane Valves.
    - c. Hammond Valve.
    - d. Milwaukee Valve Company.
    - e. NIBCO INC.
    - f. Watts Regulator Co.; a division of Watts Water Technologies, Inc.



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2. Description:
  - a. Standard: MSS SP-110.
  - b. SWP Rating: 150 psig.
  - c. CWP Rating: 600 psig.
  - d. Body Design: Two piece.
  - e. Body Material: Bronze.
  - f. Ends: Threaded.
  - g. Seats: PTFE or TFE.
  - h. Stem: Bronze.
  - i. Ball: Chrome-plated brass.
  - j. Port: Full.

### 2.4 BRONZE SWING CHECK VALVES

#### A. Class 125, Bronze Swing Check Valves with Bronze Disc:

1. Manufacturers: Subject to compliance with requirements, provide products by one of the following:
  - a. Crane Co.; Crane Valve Group; Crane Valves.
  - b. Crane Co.; Crane Valve Group; Jenkins Valves.
  - c. Crane Co.; Crane Valve Group; Stockham Division.
  - d. Hammond Valve.
  - e. Milwaukee Valve Company.
  - f. NIBCO INC.
  - g. Watts Regulator Co.; a division of Watts Water Technologies, Inc.
2. Description:
  - a. Standard: MSS SP-80, Type 3.
  - b. CWP Rating: 200 psig.
  - c. Body Design: Horizontal flow.
  - d. Body Material: ASTM B 62, bronze.
  - e. Ends: Threaded.
  - f. Disc: Bronze.

#### B. Class 125, Bronze Swing Check Valves with Nonmetallic Disc:

1. Manufacturers: Subject to compliance with requirements, provide products by one of the following:
  - a. Crane Co.; Crane Valve Group; Crane Valves.
  - b. Crane Co.; Crane Valve Group; Jenkins Valves.
  - c. Crane Co.; Crane Valve Group; Stockham Division.
  - d. Hammond Valve.
  - e. Milwaukee Valve Company.
  - f. NIBCO INC.
  - g. Watts Regulator Co.; a division of Watts Water Technologies, Inc.
2. Description:



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- a. Standard: MSS SP-80, Type 4.
- b. CWP Rating: 200 psig.
- c. Body Design: Horizontal flow.
- d. Body Material: ASTM B 62, bronze.
- e. Ends: Threaded.
- f. Disc: PTFE or TFE.

## PART 3 - EXECUTION

### 3.1 VALVE INSTALLATION

- A. Install valves with unions or flanges at each piece of equipment arranged to allow service, maintenance, and equipment removal without system shutdown.
- B. Locate valves for easy access and provide separate support where necessary.
- C. Install valves in horizontal piping with stem at or above center of pipe.
- D. Install valves in position to allow full stem movement.

### 3.2 ADJUSTING

- A. Adjust or replace valve packing after piping systems have been tested and put into service but before final adjusting and balancing. Replace valves if persistent leaking occurs.

### 3.3 GENERAL REQUIREMENTS FOR VALVE APPLICATIONS

- A. If valve applications are not indicated, use the following:
  1. Shutoff Service: Ball valves.
  2. Throttling Service: Ball valves.
  3. Pump-Discharge Check Valves:
    - a. NPS 2 and Smaller: Bronze swing check valves with bronze or nonmetallic disc.
- B. If valves with specified SWP classes or CWP ratings are not available, the same types of valves with higher SWP class or CWP ratings may be substituted.
- C. Select valves, except wafer types, with the following end connections:
  1. For Copper Tubing, NPS 2 and Smaller: Threaded ends except where solder-joint valve-end option is indicated in valve schedules below.
  2. For Copper Tubing, NPS 2-1/2 to NPS 4: Flanged ends except where threaded valve-end option is indicated in valve schedules below.
  3. For Steel Piping, NPS 2 and Smaller: Threaded ends.
  4. For Steel Piping, NPS 2-1/2 to NPS 4: Flanged ends except where threaded valve-end option is indicated in valve schedules below.



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3.4 DOMESTIC COLD-WATER VALVE SCHEDULE

A. Pipe NPS 2 and Smaller:

1. Bronze Valves: May be provided with solder-joint ends instead of threaded ends.
2. Bronze Angle Valves: Class 125, nonmetallic disc.
3. Ball Valves: Two piece, full port, brass or bronze with bronze trim.
4. Bronze Swing Check Valves: Class 125, nonmetallic disc.
5. Bronze Globe Valves: Class 125, nonmetallic] disc.

END OF SECTION 22 05 23



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SECTION 22 05 29  
HANGERS AND SUPPORTS FOR PLUMBING PIPING AND EQUIPMENT

PART 1 - GENERAL

1.1 SUMMARY

- A. This Section includes the following:
1. Steel pipe hangers and supports.
  2. Fastener systems.

1.2 DEFINITIONS

- A. Terminology: As defined in MSS SP-90, "Guidelines on Terminology for Pipe Hangers and Supports."

1.3 PERFORMANCE REQUIREMENTS

- A. Design supports for multiple pipes capable of supporting combined weight of supported systems, system contents, and test water.
- B. Design equipment supports capable of supporting combined operating weight of supported equipment and connected systems and components.

1.4 SUBMITTALS

- A. Product Data: For the following:
1. Steel pipe hangers and supports.
  2. Powder-actuated fastener systems.
- B. Welding certificates.

1.5 QUALITY ASSURANCE

- A. Welding: Qualify procedures and personnel according to ASME Boiler and Pressure Vessel Code: Section IX.



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## PART 2 - PRODUCTS

### 2.1 MANUFACTURERS

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

### 2.2 STEEL PIPE HANGERS AND SUPPORTS

- A. Description: MSS SP-58, Types 1 through 58, factory-fabricated components. Refer to Part 3 "Hanger and Support Applications" Article for where to use specific hanger and support types.
- B. Manufacturers:
1. Bergen-Power Pipe Supports.
  2. B-Line Systems, Inc.; a division of Cooper Industries.
  3. Carpenter & Paterson, Inc.
  4. Empire Industries, Inc.
  5. ERICO/Michigan Hanger Co.
  6. Globe Pipe Hanger Products, Inc.
  7. Grinnell Corp.
  8. National Pipe Hanger Corporation.
  9. PHD Manufacturing, Inc.
  10. PHS Industries, Inc.
- C. Galvanized, Metallic Coatings: Pregalvanized or hot dipped.
- D. Nonmetallic Coatings: Plastic coating, jacket, or liner.
- E. Padded Hangers: Hanger with fiberglass or other pipe insulation pad or cushion for support of bearing surface of piping.

### 2.3 FASTENER SYSTEMS

- A. Powder-Actuated Fasteners: Threaded-steel stud, for use in hardened portland cement concrete with pull-out, tension, and shear capacities appropriate for supported loads and building materials where used.
1. Manufacturers:
    - a. Hilti, Inc.
    - b. ITW Ramset/Red Head.
    - c. Masterset Fastening Systems, Inc.
    - d. MKT Fastening, LLC.
    - e. Powers Fasteners.



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- B. Mechanical-Expansion Anchors: Insert-wedge-type zinc-coated steel, for use in hardened portland cement concrete with pull-out, tension, and shear capacities appropriate for supported loads and building materials where used.
1. Manufacturers:
    - a. B-Line Systems, Inc.; a division of Cooper Industries.
    - b. Empire Industries, Inc.
    - c. Hilti, Inc.
    - d. ITW Ramset/Red Head.
    - e. MKT Fastening, LLC.
    - f. Powers Fasteners.

### 2.4 MISCELLANEOUS MATERIALS

- A. Grout: ASTM C 1107, factory-mixed and -packaged, dry, hydraulic-cement, nonshrink and nonmetallic grout; suitable for interior and exterior applications.
1. Properties: Nonstaining, noncorrosive, and nongaseous.
  2. Design Mix: 5000-psi, 28-day compressive strength.

## PART 3 - EXECUTION

### 3.1 HANGER AND SUPPORT APPLICATIONS

- A. Specific hanger and support requirements are specified in Sections specifying piping systems and equipment.
- B. Comply with MSS SP-69 for pipe hanger selections and applications that are not specified in piping system Sections.
- C. Use hangers and supports with galvanized, metallic coatings for piping and equipment that will not have field-applied finish.
- D. Use nonmetallic coatings on attachments for electrolytic protection where attachments are in direct contact with copper tubing.
- E. Use padded hangers for piping that is subject to scratching.
- F. Horizontal-Piping Hangers and Supports: Unless otherwise indicated and except as specified in piping system Sections, install the following types:
1. Adjustable, Steel Clevis Hangers (MSS Type 1): For suspension of noninsulated or insulated stationary pipes, NPS 1/2 to NPS 30.
  2. Yoke-Type Pipe Clamps (MSS Type 2): For suspension of 120 to 450 deg F pipes, NPS 4 to NPS 16, requiring up to 4 inches of insulation.
  3. Carbon- or Alloy-Steel, Double-Bolt Pipe Clamps (MSS Type 3): For suspension of pipes, NPS 3/4 to NPS 24, requiring clamp flexibility and up to 4 inches of insulation.
  4. Adjustable, Steel Band Hangers (MSS Type 7): For suspension of noninsulated stationary pipes, NPS 1/2 to NPS 8.



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5. U-Bolts (MSS Type 24): For support of heavy pipes, NPS 1/2 to NPS 30.
  6. Pipe Saddle Supports (MSS Type 36): For support of pipes, NPS 4 to NPS 36, with steel pipe base stanchion support and cast-iron floor flange.
- G. Vertical-Piping Clamps: Unless otherwise indicated and except as specified in piping system Sections, install the following types:
1. Extension Pipe or Riser Clamps (MSS Type 8): For support of pipe risers, NPS 3/4 to NPS 20.
  2. Carbon- or Alloy-Steel Riser Clamps (MSS Type 42): For support of pipe risers, NPS 3/4 to NPS 20, if longer ends are required for riser clamps.
- H. Hanger-Rod Attachments: Unless otherwise indicated and except as specified in piping system Sections, install the following types:
1. Steel Turnbuckles (MSS Type 13): For adjustment up to 6 inches for heavy loads.
  2. Steel Clevises (MSS Type 14): For 120 to 450 deg F piping installations.
- I. Building Attachments: Unless otherwise indicated and except as specified in piping system Sections, install the following types:
1. Steel or Malleable Concrete Inserts (MSS Type 18): For upper attachment to suspend pipe hangers from concrete ceiling.
  2. Top-Beam C-Clamps (MSS Type 19): For use under roof installations with bar-joint construction to attach to top flange of structural shape.
  3. Side-Beam or Channel Clamps (MSS Type 20): For attaching to bottom flange of beams, channels, or angles.
  4. Center-Beam Clamps (MSS Type 21): For attaching to center of bottom flange of beams.
  5. Welded Beam Attachments (MSS Type 22): For attaching to bottom of beams if loads are considerable and rod sizes are large.
  6. C-Clamps (MSS Type 23): For structural shapes.
  7. Welded-Steel Brackets: For support of pipes from below, or for suspending from above by using clip and rod. Use one of the following for indicated loads:
    - a. Light (MSS Type 31): 750 lb.
    - b. Medium (MSS Type 32): 1500 lb.
    - c. Heavy (MSS Type 33): 3000 lb.
  8. Side-Beam Brackets (MSS Type 34): For sides of steel or wooden beams.
  9. Plate Lugs (MSS Type 57): For attaching to steel beams if flexibility at beam is required.
- J. Use powder-actuated fasteners or mechanical-expansion anchors instead of building attachments where required in concrete construction.

### 3.2 HANGER AND SUPPORT INSTALLATION

- A. Steel Pipe Hanger Installation: Comply with MSS SP-69 and MSS SP-89. Install hangers, supports, clamps, and attachments as required to properly support piping from building structure.
- B. Fastener System Installation:



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1. Install powder-actuated fasteners in concrete after concrete is placed and completely cured. Use operators that are licensed by powder-actuated tool manufacturer. Install fasteners according to powder-actuated tool manufacturer's operating manual.
  2. Install mechanical-expansion anchors in concrete after concrete is placed and completely cured. Install fasteners according to manufacturer's written instructions.
- C. Install hangers and supports complete with necessary inserts, bolts, rods, nuts, washers, and other accessories.
- D. Install lateral bracing with pipe hangers and supports to prevent swaying.
- E. Install building attachments within concrete slabs or attach to structural steel. Install additional attachments at concentrated loads, including valves, flanges, and strainers, NPS 2-1/2 and larger and at changes in direction of piping. Install concrete inserts before concrete is placed; fasten inserts to forms and install reinforcing bars through openings at top of inserts.
- F. Load Distribution: Install hangers and supports so piping live and dead loads and stresses from movement will not be transmitted to connected equipment.
- G. Pipe Slopes: Install hangers and supports to provide indicated pipe slopes and so maximum pipe deflections allowed by ASME B31.9 (for building services piping) are not exceeded.

### 3.3 ADJUSTING

- A. Hanger Adjustments: Adjust hangers to distribute loads equally on attachments and to achieve indicated slope of pipe.

### 3.4 PAINTING

- A. Touch Up: Clean field welds and abraded areas of shop paint. Paint exposed areas immediately after erecting hangers and supports. Use same materials as used for shop painting. Comply with SSPC-PA 1 requirements for touching up field-painted surfaces.
1. Apply paint by brush or spray to provide minimum dry film thickness of 2.0 mils.
- B. Galvanized Surfaces: Clean welds, bolted connections, and abraded areas and apply galvanizing-repair paint to comply with ASTM A 780.

END OF SECTION 22 05 29



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SECTION 22 05 53  
IDENTIFICATION FOR PLUMBING PIPING AND EQUIPMENT

PART 1 - GENERAL

1.1 SUMMARY

- A. Section Includes:
1. Equipment labels.
  2. Warning signs and labels.
  3. Pipe labels.

1.2 SUBMITTAL

- A. Product Data: For each type of product indicated.

PART 2 - PRODUCTS

2.1 EQUIPMENT LABELS

- A. Plastic Labels for Equipment:
1. Material and Thickness: Multilayer, multicolor, plastic labels for mechanical engraving, 1/8 inch thick, and having predrilled holes for attachment hardware.
  2. Letter Color: White.
  3. Background Color: Black.
  4. Maximum Temperature: Able to withstand temperatures up to 160 deg F.
  5. Minimum Label Size: Length and width vary for required label content, but not less than 2-1/2 by 3/4 inch.
  6. Minimum Letter Size: 1/4 inch for name of units if viewing distance is less than 24 inches, 1/2 inch for viewing distances up to 72 inches, and proportionately larger lettering for greater viewing distances. Include secondary lettering two-thirds to three-fourths the size of principal lettering.
  7. Fasteners: Stainless-steel self-tapping screws.
  8. Adhesive: Contact-type permanent adhesive, compatible with label and with substrate.
- B. Label Content: Include equipment's Drawing designation or unique equipment number, Drawing numbers where equipment is indicated (plans, details, and schedules), plus the Specification Section number and title where equipment is specified.
- C. Equipment Label Schedule: For each item of equipment to be labeled, on 8-1/2-by-11-inch bond paper. Tabulate equipment identification number and identify Drawing numbers where equipment is indicated (plans, details, and schedules), plus the Specification Section number and title where equipment is specified. Equipment schedule shall be included in operation and maintenance data.



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2.2 WARNING SIGNS AND LABELS

- A. Material and Thickness: Multilayer, multicolor, plastic labels for mechanical engraving, 1/8 inch thick, and having predrilled holes for attachment hardware.
- B. Letter Color: Red.
- C. Background Color: White.
- D. Maximum Temperature: Able to withstand temperatures up to 160 deg F.
- E. Minimum Label Size: Length and width vary for required label content, but not less than 2-1/2 by 3/4 inch.
- F. Minimum Letter Size: 1/4 inch for name of units if viewing distance is less than 24 inches, 1/2 inch for viewing distances up to 72 inches, and proportionately larger lettering for greater viewing distances. Include secondary lettering two-thirds to three-fourths the size of principal lettering.
- G. Fasteners: Stainless-steel self-tapping screws.
- H. Adhesive: Contact-type permanent adhesive, compatible with label and with substrate.
- I. Label Content: Include caution and warning information, plus emergency notification instructions.

2.3 PIPE LABELS

- A. General Requirements for Manufactured Pipe Labels: Preprinted, color-coded, with lettering indicating service, and showing flow direction.
- B. Pretensioned Pipe Labels: Precoiled, semirigid plastic formed to cover full circumference of pipe and to attach to pipe without fasteners or adhesive.
- C. Self-Adhesive Pipe Labels: Printed plastic with contact-type, permanent-adhesive backing.
- D. Pipe Label Contents: Include identification of piping service using same designations or abbreviations as used on Drawings, pipe size, and an arrow indicating flow direction.
  - 1. Flow-Direction Arrows: Integral with piping system service lettering to accommodate both directions, or as separate unit on each pipe label to indicate flow direction.
  - 2. Lettering Size: At least 1-1/2 inches high.

PART 3 - EXECUTION

3.1 PREPARATION

- A. Clean piping and equipment surfaces of substances that could impair bond of identification devices, including dirt, oil, grease, release agents, and incompatible primers, paints, and encapsulants.



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### 3.2 EQUIPMENT LABEL INSTALLATION

- A. Install or permanently fasten labels on each major item of mechanical equipment.
- B. Locate equipment labels where accessible and visible.

### 3.3 PIPE LABEL INSTALLATION

- A. Piping Color-Coding: Paint piping as specified.
- B. Locate pipe labels where piping is exposed or above accessible ceilings in finished spaces; machine rooms; accessible maintenance spaces such as shafts, tunnels, and plenums; and exterior exposed locations as follows:
  - 1. Near each valve and control device.
  - 2. Near each branch connection, excluding short takeoffs for fixtures and terminal units. Where flow pattern is not obvious, mark each pipe at branch.
  - 3. Near penetrations through walls, floors, ceilings, and inaccessible enclosures.
  - 4. At access doors, manholes, and similar access points that permit view of concealed piping.
  - 5. Near major equipment items and other points of origination and termination.
  - 6. Spaced at maximum intervals of 50 feet along each run. Reduce intervals to 25 feet in areas of congested piping and equipment.
  - 7. On piping above removable acoustical ceilings. Omit intermediately spaced labels.
- C. Pipe Label Color Schedule:
  - 1. Domestic Water Piping:
    - a. Background Color: White.
    - b. Letter Color: Blue.
  - 2. Sanitary Waste and Storm Drainage Piping:
    - a. Background Color: White.
    - b. Letter Color: Green.
  - 3. LP Gas Piping
    - a. Background Color: Yellow
    - b. Letter Color: Green.

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SECTION 22 07 19  
PLUMBING PIPING INSULATION

PART 1 - GENERAL

1.1 SUMMARY

- A. Section includes insulating the following plumbing piping services:
1. Domestic hot-water piping.
  2. Supplies and drains for handicap-accessible lavatories and sinks.

1.2 SUBMITTALS

- A. Product Data: For each type of product indicated.
- B. Shop Drawings: Include plans, elevations, sections, details, and attachments to other work.
1. Detail application of protective shields, saddles, and inserts at hangers for each type of insulation and hanger.
  2. Detail insulation application at elbows, fittings, flanges, valves, and specialties for each type of insulation.
- C. Field quality-control reports.

1.3 QUALITY ASSURANCE

- A. Surface-Burning Characteristics: For insulation and related materials, as determined by testing identical products according to ASTM E 84 by a testing agency acceptable to authorities having jurisdiction. Factory label insulation and jacket materials and adhesive, mastic, tapes, and cement material containers, with appropriate markings of applicable testing agency.
1. Insulation Installed Indoors: Flame-spread index of 25 or less, and smoke-developed index of 50 or less.
- B. Comply with the following applicable standards and other requirements specified for miscellaneous components:
1. Supply and Drain Protective Shielding Guards: ICC A117.1.

PART 2 - PRODUCTS

2.1 INSULATION MATERIALS

- A. Comply with requirements in "Piping Insulation Schedule, General," "Indoor Piping Insulation Schedule," "Outdoor, Aboveground Piping Insulation Schedule," and "Outdoor, Underground Piping Insulation Schedule" articles for where insulating materials shall be applied.



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- B. Products shall not contain asbestos, lead, mercury, or mercury compounds.
- C. Products that come in contact with stainless steel shall have a leachable chloride content of less than 50 ppm when tested according to ASTM C 871.
- D. Insulation materials for use on austenitic stainless steel shall be qualified as acceptable according to ASTM C 795.
- E. Mineral-Fiber, Preformed Pipe Insulation:
  - 1. Products: Subject to compliance with requirements, available products that may be incorporated into the Work include, but are not limited to, the following:
    - a. Fibrex Insulations Inc.; Coreplus 1200.
    - b. Johns Manville; Micro-Lok.
    - c. Knauf Insulation; 1000-Degree Pipe Insulation.
    - d. Manson Insulation Inc.; Alley-K.
    - e. Owens Corning; Fiberglas Pipe Insulation.
  - 2. Type I, 850 Deg F Materials: Mineral or glass fibers bonded with a thermosetting resin. Comply with ASTM C 547, Type I, Grade A, with factory-applied ASJ-SSL. Factory-applied jacket requirements are specified in "Factory-Applied Jackets" Article.

## 2.2 ADHESIVES

- A. Materials shall be compatible with insulation materials, jackets, and substrates and for bonding insulation to itself and to surfaces to be insulated, unless otherwise indicated.
- B. Mineral-Fiber Adhesive: Comply with MIL-A-3316C, Class 2, Grade A.
  - 1. Products: Subject to compliance with requirements, available products that may be incorporated into the Work include, but are not limited to, the following:
    - a. Childers Brand, Specialty Construction Brands, Inc., a business of H. B. Fuller Company; CP-127.
    - b. Eagle Bridges - Marathon Industries; 225.
    - c. Foster Brand, Specialty Construction Brands, Inc., a business of H. B. Fuller Company; 85-60/85-70.
    - d. Mon-Eco Industries, Inc.; 22-25.
  - 2. For indoor applications, use adhesive that has a VOC content of 80 g/L or less when calculated according to 40 CFR 59, Subpart D (EPA Method 24).
  - 3. Use adhesive that complies with the testing and product requirements of the California Department of Health Services' "Standard Practice for the Testing of Volatile Organic Emissions from Various Sources Using Small-Scale Environmental Chambers," including 2004 Addenda.
- C. ASJ Adhesive, and FSK Jacket Adhesive: Comply with MIL-A-3316C, Class 2, Grade A for bonding insulation jacket lap seams and joints.
  - 1. Products: Subject to compliance with requirements, available products that may be incorporated into the Work include, but are not limited to, the following:



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- a. Childers Brand, Specialty Construction Brands, Inc., a business of H. B. Fuller Company; CP-82.
  - b. Eagle Bridges - Marathon Industries; 225.
  - c. Foster Brand, Specialty Construction Brands, Inc., a business of H. B. Fuller Company; 85-20.
  - d. Mon-Eco Industries, Inc.; 22-25.
2. For indoor applications, use adhesive that has a VOC content of 50 g/L or less when calculated according to 40 CFR 59, Subpart D (EPA Method 24).
  3. Use adhesive that complies with the testing and product requirements of the California Department of Health Services' "Standard Practice for the Testing of Volatile Organic Emissions from Various Sources Using Small-Scale Environmental Chambers," including 2004 Addenda.

### 2.3 MASTICS

- A. Materials shall be compatible with insulation materials, jackets, and substrates; comply with MIL-PRF-19565C, Type II.
  1. For indoor applications, use mastics that have a VOC content of 50 g/L or less when calculated according to 40 CFR 59, Subpart D (EPA Method 24).

### 2.4 FACTORY-APPLIED JACKETS

- A. Insulation system schedules indicate factory-applied jackets on various applications. When factory-applied jackets are indicated, comply with the following:
  1. ASJ: White, kraft-paper, fiberglass-reinforced scrim with aluminum-foil backing; complying with ASTM C 1136, Type I.
  2. ASJ-SSL: ASJ with self-sealing, pressure-sensitive, acrylic-based adhesive covered by a removable protective strip; complying with ASTM C 1136, Type I.
  3. FSK Jacket: Aluminum-foil, fiberglass-reinforced scrim with kraft-paper backing; complying with ASTM C 1136, Type II.

### 2.5 TAPES

- A. ASJ Tape: White vapor-retarder tape matching factory-applied jacket with acrylic adhesive, complying with ASTM C 1136.
  1. Products: Subject to compliance with requirements, available products that may be incorporated into the Work include, but are not limited to, the following:
    - a. ABI, Ideal Tape Division; 428 AWF ASJ.
    - b. Avery Dennison Corporation, Specialty Tapes Division; Fasson 0836.
    - c. Compac Corporation; 104 and 105.
    - d. Venture Tape; 1540 CW Plus, 1542 CW Plus, and 1542 CW Plus/SQ.
  2. Width: 3 inches.
  3. Thickness: 11.5 mils.
  4. Adhesion: 90 ounces force/inch in width.



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5. Elongation: 2 percent.
6. Tensile Strength: 40 lbf/inch in width.
7. ASJ Tape Disks and Squares: Precut disks or squares of ASJ tape.

### 2.6 PROTECTIVE SHIELDING GUARDS

#### A. Protective Shielding Pipe Covers,:

1. Manufacturers: Subject to compliance with requirements, available manufacturers offering products that may be incorporated into the Work include, but are not limited to, the following:
  - a. Engineered Brass Company.
  - b. Insul-Tect Products Co.; a subsidiary of MVG Molded Products.
  - c. McGuire Manufacturing.
  - d. Plumberex.
  - e. Truebro; a brand of IPS Corporation.
  - f. Zurn Industries, LLC; Tubular Brass Plumbing Products Operation.
2. Description: Manufactured plastic wraps for covering plumbing fixture hot- and cold-water supplies and trap and drain piping. Comply with Americans with Disabilities Act (ADA) requirements.

## PART 3 - EXECUTION

### 3.1 PREPARATION

- A. Surface Preparation: Clean and dry surfaces to receive insulation. Remove materials that will adversely affect insulation application.
- B. Coordinate insulation installation with the trade installing heat tracing. Comply with requirements for heat tracing that apply to insulation.
- C. Mix insulating cements with clean potable water; if insulating cements are to be in contact with stainless-steel surfaces, use demineralized water.

### 3.2 GENERAL INSTALLATION REQUIREMENTS

- A. Install insulation materials, accessories, and finishes with smooth, straight, and even surfaces; free of voids throughout the length of piping including fittings, valves, and specialties.
- B. Install insulation materials, forms, vapor barriers or retarders, jackets, and thicknesses required for each item of pipe system as specified in insulation system schedules.
- C. Install accessories compatible with insulation materials and suitable for the service. Install accessories that do not corrode, soften, or otherwise attack insulation or jacket in either wet or dry state.
- D. Install insulation with longitudinal seams at top and bottom of horizontal runs.



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- E. Install multiple layers of insulation with longitudinal and end seams staggered.
- F. Do not weld brackets, clips, or other attachment devices to piping, fittings, and specialties.
- G. Keep insulation materials dry during application and finishing.
- H. Install insulation with tight longitudinal seams and end joints. Bond seams and joints with adhesive recommended by insulation material manufacturer.
- I. Install insulation with least number of joints practical.
- J. Apply adhesives, mastics, and sealants at manufacturer's recommended coverage rate and wet and dry film thicknesses.
- K. Install insulation with factory-applied jackets as follows:
  - 1. Draw jacket tight and smooth.
  - 2. Cover circumferential joints with 3-inch- wide strips, of same material as insulation jacket. Secure strips with adhesive and outward clinching staples along both edges of strip, spaced 4 inches o.c.
  - 3. Overlap jacket longitudinal seams at least 1-1/2 inches. Install insulation with longitudinal seams at bottom of pipe. Clean and dry surface to receive self-sealing lap. Staple laps with outward clinching staples along edge at 2 inches o.c.
    - a. For below-ambient services, apply vapor-barrier mastic over staples.
  - 4. Cover joints and seams with tape, according to insulation material manufacturer's written instructions, to maintain vapor seal.
  - 5. Where vapor barriers are indicated, apply vapor-barrier mastic on seams and joints and at ends adjacent to pipe flanges and fittings.
- L. Cut insulation in a manner to avoid compressing insulation more than 75 percent of its nominal thickness.
- M. Finish installation with systems at operating conditions. Repair joint separations and cracking due to thermal movement.
- N. Repair damaged insulation facings by applying same facing material over damaged areas. Extend patches at least 4 inches beyond damaged areas. Adhere, staple, and seal patches similar to butt joints.
- O. For above-ambient services, do not install insulation to the following:
  - 1. Vibration-control devices.
  - 2. Testing agency labels and stamps.
  - 3. Nameplates and data plates.
  - 4. Cleanouts.

### 3.3 PENETRATIONS

- A. Insulation Installation at Interior Wall and Partition Penetrations (That Are Not Fire Rated): Install insulation continuously through walls and partitions.



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- B. Insulation Installation at Fire-Rated Wall and Partition Penetrations: Install insulation continuously through penetrations of fire-rated walls and partitions.
  - 1. Comply with requirements in Division 07 Section "Penetration Firestopping" for firestopping and fire-resistive joint sealers.
- C. Insulation Installation at Floor Penetrations:
  - 1. Pipe: Install insulation continuously through floor penetrations.
  - 2. Seal penetrations through fire-rated assemblies. Comply with requirements in Division 07 Section "Penetration Firestopping."

### 3.4 GENERAL PIPE INSULATION INSTALLATION

- A. Requirements in this article generally apply to all insulation materials except where more specific requirements are specified in various pipe insulation material installation articles.
- B. Insulation Installation on Fittings, Valves, Strainers, Flanges, and Unions:
  - 1. Install insulation over fittings, valves, strainers, flanges, unions, and other specialties with continuous thermal and vapor-retarder integrity unless otherwise indicated.
  - 2. Insulate pipe elbows using preformed fitting insulation or mitered fittings made from same material and density as adjacent pipe insulation. Each piece shall be butted tightly against adjoining piece and bonded with adhesive. Fill joints, seams, voids, and irregular surfaces with insulating cement finished to a smooth, hard, and uniform contour that is uniform with adjoining pipe insulation.
  - 3. Insulate tee fittings with preformed fitting insulation or sectional pipe insulation of same material and thickness as used for adjacent pipe. Cut sectional pipe insulation to fit. Butt each section closely to the next and hold in place with tie wire. Bond pieces with adhesive.
  - 4. Insulate valves using preformed fitting insulation or sectional pipe insulation of same material, density, and thickness as used for adjacent pipe. Overlap adjoining pipe insulation by not less than two times the thickness of pipe insulation, or one pipe diameter, whichever is thicker. For valves, insulate up to and including the bonnets, valve stuffing-box studs, bolts, and nuts. Fill joints, seams, and irregular surfaces with insulating cement.

### 3.5 INSTALLATION OF MINERAL-FIBER PREFORMED PIPE INSULATION

- A. Insulation Installation on Straight Pipes and Tubes:
  - 1. Secure each layer of preformed pipe insulation to pipe with wire or bands and tighten bands without deforming insulation materials.
  - 2. Where vapor barriers are indicated, seal longitudinal seams, end joints, and protrusions with vapor-barrier mastic and joint sealant.
  - 3. For insulation with factory-applied jackets on above-ambient surfaces, secure laps with outward clinched staples at 6 inches o.c.
  - 4. For insulation with factory-applied jackets on below-ambient surfaces, do not staple longitudinal tabs. Instead, secure tabs with additional adhesive as recommended by insulation material manufacturer and seal with vapor-barrier mastic and flashing sealant.



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- B. Insulation Installation on Pipe Fittings and Elbows:
1. Install preformed sections of same material as straight segments of pipe insulation when available.
  2. When preformed insulation elbows and fittings are not available, install mitered sections of pipe insulation, to a thickness equal to adjoining pipe insulation. Secure insulation materials with wire or bands.
- C. Insulation Installation on Valves and Pipe Specialties:
1. Install preformed sections of same material as straight segments of pipe insulation when available.
  2. When preformed sections are not available, install mitered sections of pipe insulation to valve body.
  3. Arrange insulation to permit access to packing and to allow valve operation without disturbing insulation.
  4. Install insulation to flanges as specified for flange insulation application.

3.6 PIPING INSULATION SCHEDULE, GENERAL

- A. Acceptable preformed pipe and tubular insulation materials and thicknesses are identified for each piping system and pipe size range. If more than one material is listed for a piping system, selection from materials listed is Contractor's option.
- B. Items Not Insulated: Unless otherwise indicated, do not install insulation on the following:
1. Drainage piping located in crawl spaces.
  2. Underground piping.
  3. Chrome-plated pipes and fittings unless there is a potential for personnel injury.

3.7 INDOOR PIPING INSULATION SCHEDULE

- A. Domestic Hot Water: Insulation shall be the following:
1. Mineral-Fiber, Preformed Pipe Insulation, Type I: 1 inch thick.

3.8 UNDERGROUND, FIELD-INSTALLED INSULATION JACKET

- A. For underground direct-buried piping applications, install underground direct-buried jacket over insulation material.

END OF SECTION 22 07 19



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SECTION 22 11 16  
DOMESTIC WATER PIPING

PART 1 - GENERAL

1.1 SUMMARY

A. Section Includes:

1. Under-building slab and aboveground domestic water pipes, tubes, fittings, and specialties inside the building.
2. Escutcheons.
3. Sleeves and sleeve seals.

1.2 SUBMITTALS

- A. Product Data: For each type of product indicated.
- B. Field quality-control reports.

1.3 QUALITY ASSURANCE

- A. Piping materials shall bear label, stamp, or other markings of specified testing agency.
- B. Comply with NSF 14 for plastic, potable domestic water piping and components. Include marking "NSF-pw" on piping.
- C. Comply with NSF 61 for potable domestic water piping and components.

PART 2 - PRODUCTS

2.1 PIPING MATERIALS

- A. Comply with requirements in "Piping Schedule" Article for applications of pipe, tube, fitting materials, and joining methods for specific services, service locations, and pipe sizes.

2.2 CPVC PIPING

- A. CPVC Tubing System: ASTM D 2846/D 2846M, SDR 11, tube and socket fittings.

2.3 PVC PIPE AND FITTINGS

- A. PVC Pipe: ASTM D 1785, Schedule 40 and Schedule 80.



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1. PVC Socket Fittings: ASTM D 2466 for Schedule 40 and ASTM D 2467 for Schedule 80.

### 2.4 PIPING JOINING MATERIALS

- A. Solvent Cements for Joining CPVC Piping and Tubing: ASTM F 493.
  1. Use CPVC solvent cement that has a VOC content of 490 g/L or less when calculated according to 40 CFR 59, Subpart D (EPA Method 24).
  2. Use adhesive primer that has a VOC content of 550 g/L or less when calculated according to 40 CFR 59, Subpart D (EPA Method 24).
- B. Solvent Cements for Joining PVC Piping: ASTM D 2564. Include primer according to ASTM F 656.
  1. Use PVC solvent cement that has a VOC content of 510 g/L or less when calculated according to 40 CFR 59, Subpart D (EPA Method 24).
  2. Use adhesive primer that has a VOC content of 550 g/L or less when calculated according to 40 CFR 59, Subpart D (EPA Method 24).
- C. Plastic, Pipe-Flange Gaskets, Bolts, and Nuts: Type and material recommended by piping system manufacturer unless otherwise indicated.

### 2.5 SPECIALTY VALVES

- A. Comply with requirements in Division 22 Section "General-Duty Valves for Plumbing Piping" for general-duty metal valves.
- B. Comply with requirements in Division 22 Section "Domestic Water Piping Specialties" for balancing valves, drain valves, backflow preventers, and vacuum breakers.

### 2.6 TRANSITION FITTINGS

- A. Fitting-Type Transition Couplings: Manufactured piping coupling or specified piping system fitting.
- B. Sleeve-Type Transition Coupling: AWWA C219.
- C. Plastic-to-Metal Transition Fittings:
  1. Description: CPVC or PVC one-piece fitting with manufacturer's Schedule 80 equivalent dimensions; one end with threaded brass insert and one solvent-cement-socket or threaded end.
- D. Plastic-to-Metal Transition Unions:
  1. Description: CPVC or PVC four-part union. Include brass threaded end, solvent-cement-joint plastic end, rubber O-ring, and union nut.



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### 2.7 ESCUTCHEONS

- A. General: Manufactured ceiling, floor, and wall escutcheons and floor plates.
- B. One Piece, Stamped Steel: Chrome-plated finish with setscrew or spring clips.
- C. Split Plate, Stamped Steel: Chrome-plated finish with concealed hinge, setscrew or spring clips.
- D. One-Piece Floor Plates: Cast-iron flange with holes for fasteners.

### 2.8 SLEEVES

- A. Cast-Iron Wall Pipes: Fabricated of cast iron, and equivalent to ductile-iron pressure pipe, with plain ends and integral waterstop unless otherwise indicated.
- B. Galvanized-Steel-Sheet Sleeves: 0.0239-inch minimum thickness; round tube closed with welded longitudinal joint.
- C. PVC-Pipe Sleeves: ASTM D 1785, Schedule 40.
- D. Galvanized-Steel-Pipe Sleeves: ASTM A 53/A 53M, Type E, Grade B, Schedule 40, zinc-coated, with plain ends.

### 2.9 SLEEVE SEALS

- A. Description: Modular sealing element unit, designed for field assembly, used to fill annular space between pipe and sleeve.
  - 1. Sealing Elements: EPDM-rubber interlocking links shaped to fit surface of pipe. Include type and number required for pipe material and size of pipe.
  - 2. Pressure Plates: Stainless steel.
  - 3. Connecting Bolts and Nuts: Stainless steel of length required to secure pressure plates to sealing elements.

### 2.10 GROUT

- A. Standard: ASTM C 1107, Grade B, post-hardening and volume-adjusting, dry, hydraulic-cement grout.
- B. Characteristics: Nonshrink; recommended for interior and exterior applications.
- C. Design Mix: 5000-psi, 28-day compressive strength.
- D. Packaging: Premixed and factory packaged.



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PART 3 - EXECUTION

3.1 EARTHWORK

- A. Comply with requirements for excavating, trenching, and backfilling.

3.2 PIPING INSTALLATION

- A. Drawing plans, schematics, and diagrams indicate general location and arrangement of domestic water piping. Indicated locations and arrangements are used to size pipe and calculate friction loss, expansion, and other design considerations. Install piping as indicated unless deviations to layout are approved on Coordination Drawings.
- B. Install shutoff valve, hose-end drain valve, strainer, pressure gage, and test tee with valve, inside the building at each domestic water service entrance. Comply with requirements for pressure gages, drain valves and strainers.
- C. Install shutoff valve immediately upstream of each dielectric fitting.
- D. Install water-pressure-reducing valves downstream from shutoff valves. Comply with requirements in Division 22 Section "Domestic Water Piping Specialties" for pressure-reducing valves.
- E. Install domestic water piping level without pitch and plumb.
- F. Rough-in domestic water piping for water-meter installation according to utility company's requirements.
- G. Install piping concealed from view and protected from physical contact by building occupants unless otherwise indicated and except in equipment rooms and service areas.
- H. Install piping indicated to be exposed and piping in equipment rooms and service areas at right angles or parallel to building walls. Diagonal runs are prohibited unless specifically indicated otherwise.
- I. Install piping above accessible ceilings to allow sufficient space for ceiling panel removal, and coordinate with other services occupying that space.
- J. Install piping adjacent to equipment and specialties to allow service and maintenance.
- K. Install piping to permit valve servicing.
- L. Install nipples, unions, special fittings, and valves with pressure ratings the same as or higher than system pressure rating used in applications below unless otherwise indicated.
- M. Install piping free of sags and bends.
- N. Install fittings for changes in direction and branch connections.



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### 3.3 JOINT CONSTRUCTION

- A. Ream ends of pipes and tubes and remove burrs.
- B. Remove scale, slag, dirt, and debris from inside and outside of pipes, tubes, and fittings before assembly.
- C. Threaded Joints: Thread pipe with tapered pipe threads according to ASME B1.20.1. Cut threads full and clean using sharp dies. Ream threaded pipe ends to remove burrs and restore full ID. Join pipe fittings and valves as follows:
  - 1. Apply appropriate tape or thread compound to external pipe threads.
  - 2. Damaged Threads: Do not use pipe or pipe fittings with threads that are corroded or damaged.
- D. Flanged Joints: Select appropriate asbestos-free, nonmetallic gasket material in size, type, and thickness suitable for domestic water service. Join flanges with gasket and bolts according to ASME B31.9.
- E. Plastic Piping Solvent-Cement Joints: Clean and dry joining surfaces. Join pipe and fittings according to the following:
  - 1. Comply with ASTM F 402 for safe-handling practice of cleaners, primers, and solvent cements. Apply primer.
  - 2. CPVC Piping: Join according to ASTM D 2846/D 2846M Appendix.
  - 3. PVC Piping: Join according to ASTM D 2855.

### 3.4 VALVE INSTALLATION

- A. General-Duty Valves: Comply with requirements in Division 22 Section "General-Duty Valves for Plumbing Piping" for valve installations.
- B. Install shutoff valve close to water main on each branch and riser serving plumbing fixtures or equipment, on each water supply to equipment, and on each water supply to plumbing fixtures that do not have supply stops. Use ball or gate valves for piping NPS 2 and smaller. Use butterfly or gate valves for piping NPS 2-1/2 and larger.

### 3.5 TRANSITION FITTING INSTALLATION

- A. Install transition couplings at joints of dissimilar piping.
- B. Transition Fittings in Underground Domestic Water Piping:
  - 1. NPS 1-1/2 and Smaller: Fitting-type coupling.
  - 2. NPS 2 and Larger: Sleeve-type coupling.
- C. Transition Fittings in Aboveground Domestic Water Piping NPS 2 and Smaller: Plastic-to-metal transition fittings or unions.



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3.6 HANGER AND SUPPORT INSTALLATION

- A. Comply with requirements in Division 22 Section "Hangers and Supports for Plumbing Piping and Equipment" for pipe hanger and support products and installation.
  - 1. Vertical Piping: MSS Type 8 or 42, clamps.
  - 2. Individual, Straight, Horizontal Piping Runs:
    - a. 100 Feet and Less: MSS Type 1, adjustable, steel clevis hangers.
- B. Support vertical piping and tubing at base and at each floor.
- C. Rod diameter may be reduced one size for double-rod hangers, to a minimum of 3/8 inch.
- D. Install vinyl-coated hangers for CPVC piping with the following maximum horizontal spacing and minimum rod diameters:
  - 1. NPS 1 and Smaller: 36 inches with 3/8-inch rod.
  - 2. NPS 1-1/4 to NPS 2: 48 inches with 3/8-inch rod.
- E. Install supports for vertical CPVC piping every 60 inches for NPS 1 and smaller, and every 72 inches for NPS 1-1/4 and larger.
- F. Support piping and tubing not listed in this article according to MSS SP-69 and manufacturer's written instructions.

3.7 CONNECTIONS

- A. Drawings indicate general arrangement of piping, fittings, and specialties.
- B. Install piping adjacent to equipment and machines to allow service and maintenance.
- C. Connect domestic water piping to exterior water-service piping. Use transition fitting to join dissimilar piping materials.
- D. Connect domestic water piping to water-service piping with shutoff valve; extend and connect to the following:
  - 1. Plumbing Fixtures: Cold- and hot-water supply piping in sizes indicated, but not smaller than required by plumbing code. Comply with requirements in Division 22 plumbing fixture Sections for connection sizes.

3.8 ESCUTCHEON INSTALLATION

- A. Install escutcheons for penetrations of walls, ceilings, and floors.
- B. Escutcheons for New Piping:
  - 1. Piping with Fitting or Sleeve Protruding from Wall: One piece, deep pattern.



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2. Bare Piping at Wall and Floor Penetrations in Finished Spaces: One piece, stamped steel with set screw or spring clips.
3. Bare Piping at Ceiling Penetrations in Finished Spaces: One piece or split plate, stamped steel with set screw.
4. Bare Piping in Unfinished Service Spaces: One piece, stamped steel with set screw or spring clips.
5. Bare Piping in Equipment Rooms: One piece, stamped steel with set screw or spring clips.
6. Bare Piping at Floor Penetrations in Equipment Rooms: One-piece floor plate.

### 3.9 SLEEVE INSTALLATION

- A. General Requirements: Install sleeves for pipes and tubes passing through penetrations in floors, partitions, roofs, and walls.
- B. Sleeves are not required for core-drilled holes.
- C. Permanent sleeves are not required for holes formed by removable PE sleeves.
- D. Cut sleeves to length for mounting flush with both surfaces unless otherwise indicated.
- E. Install sleeves in new partitions, slabs, and walls as they are built.
- F. For interior wall penetrations, seal annular space between sleeve and pipe or pipe insulation using joint sealants appropriate for size, depth, and location of joint. Comply with requirements in Division 07 Section "Joint Sealants" for joint sealants.
- G. For exterior wall penetrations above grade, seal annular space between sleeve and pipe using joint sealants appropriate for size, depth, and location of joint. Comply with requirements in Division 07 Section "Joint Sealants" for joint sealants.
- H. For exterior wall penetrations below grade, seal annular space between sleeve and pipe using sleeve seals specified in this Section.
- I. Seal space outside of sleeves in concrete slabs and walls with grout.
- J. Install sleeves that are large enough to provide 1/4-inch annular clear space between sleeve and pipe or pipe insulation unless otherwise indicated.
- K. Install sleeve materials according to the following applications:
  1. Sleeves for Piping Passing through Concrete Floor Slabs: Steel pipe.
  2. Sleeves for Piping Passing through Concrete Floor Slabs of Mechanical Equipment Areas or Other Wet Areas: Steel pipe.
    - a. Extend sleeves 2 inches above finished floor level.
    - b. For pipes penetrating floors with membrane waterproofing, extend cast-iron sleeve fittings below floor slab as required to secure clamping ring if ring is specified. Secure flashing between clamping flanges. Install section of cast-iron soil pipe to extend sleeve to 2 inches above finished floor level. Comply with requirements in Division 07 Section "Flashing and Sheet Metal" for flashing.



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3. Sleeves for Piping Passing through Gypsum-Board Partitions:
  - a. PVC pipe sleeves for pipes smaller than NPS 6.
  - b. Galvanized-steel sheet sleeves for pipes NPS 6 and larger.
  - c. Exception: Sleeves are not required for water supply tubes and waste pipes for individual plumbing fixtures if escutcheons will cover openings.
4. Sleeves for Piping Passing through Concrete Roof Slabs: Steel pipe.
5. Sleeves for Piping Passing through Exterior Concrete Walls:
  - a. Steel pipe sleeves for pipes smaller than NPS 6.
  - b. Install sleeves that are large enough to provide 1-inch annular clear space between sleeve and pipe or pipe insulation when sleeve seals are used.

### 3.10 SLEEVE SEAL INSTALLATION

- A. Install sleeve seals in sleeves in exterior concrete walls at water-service piping entries into building.
- B. Select type and number of sealing elements required for pipe material and size. Position pipe in center of sleeve. Assemble sleeve seal components and install in annular space between pipe and sleeve. Tighten bolts against pressure plates that cause sealing elements to expand and make watertight seal.

### 3.11 IDENTIFICATION

- A. Identify system components. Comply with requirements in Division 22 Section "Identification for Plumbing Piping and Equipment" for identification materials and installation.
- B. Label pressure piping with system operating pressure.

### 3.12 FIELD QUALITY CONTROL

- A. Perform tests and inspections.
- B. Piping Inspections:
  1. Do not enclose, cover, or put piping into operation until it has been inspected and approved by authorities having jurisdiction.
  2. During installation, notify authorities having jurisdiction at least one day before inspection must be made. Perform tests specified below in presence of authorities having jurisdiction:
    - a. Roughing-in Inspection: Arrange for inspection of piping before concealing or closing-in after roughing-in and before setting fixtures.
    - b. Final Inspection: Arrange final inspection for authorities having jurisdiction to observe tests specified below and to ensure compliance with requirements.
  3. Reinspection: If authorities having jurisdiction find that piping will not pass tests or inspections, make required corrections and arrange for reinspection.



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4. Reports: Prepare inspection reports and have them signed by authorities having jurisdiction.

### C. Piping Tests:

1. Fill domestic water piping. Check components to determine that they are not air bound and that piping is full of water.
2. Test for leaks and defects in new piping and parts of existing piping that have been altered, extended, or repaired. If testing is performed in segments, submit a separate report for each test, complete with diagram of portion of piping tested.
3. Leave new, altered, extended, or replaced domestic water piping uncovered and unconcealed until it has been tested and approved. Expose work that was covered or concealed before it was tested.
4. Cap and subject piping to static water pressure of 50 psig above operating pressure, without exceeding pressure rating of piping system materials. Isolate test source and allow to stand for four hours. Leaks and loss in test pressure constitute defects that must be repaired.
5. Repair leaks and defects with new materials and retest piping or portion thereof until satisfactory results are obtained.
6. Prepare reports for tests and for corrective action required.

D. Domestic water piping will be considered defective if it does not pass tests and inspections.

E. Prepare test and inspection reports.

### 3.13 CLEANING

A. Clean and disinfect potable domestic water piping as follows:

1. Purge new piping and parts of existing piping that have been altered, extended, or repaired before using.
2. Use purging and disinfecting procedures prescribed by authorities having jurisdiction; if methods are not prescribed, use procedures described in either AWWA C651 or AWWA C652 or follow procedures described below:
  - a. Flush piping system with clean, potable water until dirty water does not appear at outlets.
  - b. Fill and isolate system according to either of the following:
    - 1) Fill system or part thereof with water/chlorine solution with at least 50 ppm of chlorine. Isolate with valves and allow to stand for 24 hours.
    - 2) Fill system or part thereof with water/chlorine solution with at least 200 ppm of chlorine. Isolate and allow to stand for three hours.
  - c. Flush system with clean, potable water until no chlorine is in water coming from system after the standing time.
  - d. Submit water samples in sterile bottles to authorities having jurisdiction. Repeat procedures if biological examination shows contamination.

B. Prepare and submit reports of purging and disinfecting activities.

C. Clean interior of domestic water piping system. Remove dirt and debris as work progresses.



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### 3.14 PIPING SCHEDULE

- A. Transition and special fittings with pressure ratings at least equal to piping rating may be used in applications below unless otherwise indicated.
- B. Flanges and unions may be used for aboveground piping joints unless otherwise indicated.
- C. Under-building-slab, domestic water, building service piping, NPS 3 and smaller, shall be the following:
  - 1. PVC, Schedule 40 pipe; PVC, Schedule 40 socket fittings; and solvent-cemented joints.
- D. Under-building-slab, domestic water piping, NPS 2 and smaller, shall be one of the following:
  - 1. PVC, Schedule 40 pipe; PVC, Schedule 40 socket fittings; and solvent-cemented joints.
- E. Aboveground domestic water piping, NPS 2 and smaller, shall be one of the following:
  - 1. CPVC Tubing System: CPVC tube; CPVC socket fittings; and solvent-cemented joints.

### 3.15 VALVE SCHEDULE

- A. Drawings indicate valve types to be used. Where specific valve types are not indicated, the following requirements apply:
  - 1. Shutoff Duty: Use ball valves for piping NPS 2 and smaller.
- B. Use check valves to maintain correct direction of domestic water flow to and from equipment.

END OF SECTION 22 11 16



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SECTION 22 11 19  
DOMESTIC WATER PIPING SPECIALTIES

PART 1 - GENERAL

1.1 SUMMARY

- A. This Section includes the following domestic water piping specialties:
  - 1. Vacuum breakers.
  - 2. Strainers.
  - 3. Hose bibbs.
  - 4. Wall hydrants.
  - 5. Water hammer arresters.
- B. See Division 22 Section "Water Fountains" for water filters for water coolers.

1.2 PERFORMANCE REQUIREMENTS

- A. Minimum Working Pressure for Domestic Water Piping Specialties: 125 psig, unless otherwise indicated.

1.3 SUBMITTALS

- A. Product Data: For each type of product indicated.
- B. Field quality-control test reports.
- C. Operation and maintenance data.

1.4 QUALITY ASSURANCE

- A. NSF Compliance:
  - 1. Comply with NSF 14, "Plastics Piping Components and Related Materials," for plastic domestic water piping components.
  - 2. Comply with NSF 61, "Drinking Water System Components - Health Effects; Sections 1 through 9."

PART 2 - PRODUCTS

2.1 VACUUM BREAKERS

- A. Hose-Connection Vacuum Breakers:



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1. Manufacturers: Subject to compliance with requirements, provide products by one of the following:
  - a. Arrowhead Brass Products, Inc.
  - b. Cash Acme.
  - c. Conbraco Industries, Inc.
  - d. Legend Valve.
  - e. MIFAB, Inc.
  - f. Prier Products, Inc.
  - g. Watts Industries, Inc.; Water Products Div.
  - h. Woodford Manufacturing Company.
  - i. Zurn Plumbing Products Group; Light Commercial Operation.
  - j. Zurn Plumbing Products Group; Wilkins Div.
2. Standard: ASSE 1001.
3. Body: Bronze, nonremovable, with manual drain.
4. Outlet Connection: Garden-hose threaded complying with ASME B1.20.7.
5. Finish: Rough bronze.

### 2.2 STRAINERS FOR DOMESTIC WATER PIPING

#### A. Y-Pattern Strainers:

1. Pressure Rating: 125 psig minimum, unless otherwise indicated.
2. Body: Bronze for NPS 2 and smaller; cast iron with interior lining complying with AWWA C550 or FDA-approved, epoxy coating and for NPS 2-1/2 and larger.
3. End Connections: Threaded for NPS 2 and smaller; flanged for NPS 2-1/2 and larger.
4. Screen: Stainless steel with round perforations, unless otherwise indicated.
5. Perforation Size:
  - a. Strainers NPS 2 and Smaller: 0.033 inch.
  - b. Strainers NPS 2-1/2 to NPS 4: 0.045 inch.
6. Drain: Factory-installed, hose-end drain valve.

### 2.3 HOSE BIBBS

#### A. Hose Bibbs:

1. Standard: ASME A112.18.1 for sediment faucets.
2. Body Material: Bronze.
3. Seat: Bronze, replaceable.
4. Supply Connections: NPS 1/2 or NPS 3/4 threaded or solder-joint inlet.
5. Outlet Connection: Garden-hose thread complying with ASME B1.20.7.
6. Pressure Rating: 125 psig.
7. Vacuum Breaker: Integral or field-installation, nonremovable, drainable, hose-connection vacuum breaker complying with ASSE 1011.
8. Finish for Equipment Rooms: Rough bronze, or chrome or nickel plated.
9. Finish for Service Areas: Rough bronze.
10. Finish for Finished Rooms: Chrome or nickel plated.
11. Operation for Equipment Rooms: Wheel handle or operating key.
12. Operation for Service Areas: Operating key.



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13. Operation for Finished Rooms: Operating key.
14. Include operating key with each operating-key hose bibb.
15. Include integral wall flange with each chrome- or nickel-plated hose bibb.

### 2.4 WALL HYDRANTS

#### A. Moderate-Climate Wall Hydrants:

1. Manufacturers: Subject to compliance with requirements, provide products by one of the following:
  - a. Josam Company.
  - b. MIFAB, Inc.
  - c. Prier Products, Inc.
  - d. Smith, Jay R. Mfg. Co.; Division of Smith Industries, Inc.
  - e. Tyler Pipe; Wade Div.
  - f. Watts Drainage Products Inc.
  - g. Woodford Manufacturing Company.
  - h. Zurn Plumbing Products Group; Light Commercial Operation.
  - i. Zurn Plumbing Products Group; Specification Drainage Operation.
2. Standard: ASME A112.21.3M for concealed outlet, self-draining wall hydrants.
3. Pressure Rating: 125 psig.
4. Operation: Loose key.
5. Inlet: NPS 3/4 or NPS 1.
6. Outlet: Concealed, with integral vacuum breaker or nonremovable hose-connection vacuum breaker complying with ASSE 1011 or backflow preventer complying with ASSE 1052; and garden-hose thread complying with ASME B1.20.7.
7. Box: Deep, flush mounting with cover.
8. Box and Cover Finish: Polished nickel bronze.
9. Operating Keys(s): Two with each wall hydrant.

#### B. Vacuum Breaker Wall Hydrants:

1. Manufacturers: Subject to compliance with requirements, provide products by one of the following:
  - a. Arrowhead Brass Products, Inc.
  - b. Mansfield Plumbing Products LLC.
  - c. McDonald, A. Y. Mfg. Co.
  - d. Prier Products, Inc.
  - e. Smith, Jay. R. Mfg. Co.; Division of Smith Industries, Inc.
  - f. Watts Industries, Inc.; Water Products Div.
  - g. Woodford Manufacturing Company.
  - h. Zurn Plumbing Products Group; Light Commercial Operation.
2. Standard: ASSE 1019, Type A or Type B.
3. Type: Freeze-resistant, automatic draining with integral air-inlet valve.
4. Classification: Type A, for automatic draining with hose removed or Type B, for automatic draining with hose removed or with hose attached and nozzle closed.
5. Pressure Rating: 125 psig.
6. Operation: Loose key.



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7. Casing and Operating Rod: Of length required to match wall thickness. Include wall clamp.
8. Inlet: NPS 1/2 or NPS 3/4.
9. Outlet: Exposed with garden-hose thread complying with ASME B1.20.7.

### 2.5 WATER HAMMER ARRESTERS

#### A. Water Hammer Arresters:

1. Manufacturers: Subject to compliance with requirements, provide products by one of the following:
  - a. AMTROL, Inc.
  - b. Josam Company.
  - c. MIFAB, Inc.
  - d. PPP Inc.
  - e. Sioux Chief Manufacturing Company, Inc.
  - f. Smith, Jay R. Mfg. Co.; Division of Smith Industries, Inc.
  - g. Tyler Pipe; Wade Div.
  - h. Watts Drainage Products Inc.
  - i. Zurn Plumbing Products Group; Specification Drainage Operation.
2. Standard: ASSE 1010 or PDI-WH 201.
3. Type: Copper tube with piston.
4. Size: ASSE 1010, Sizes AA and A through F or PDI-WH 201, Sizes A through F.

## PART 3 - EXECUTION

### 3.1 INSTALLATION

- A. Refer to Division 22 Section "Common Work Results for Plumbing" for piping joining materials, joint construction, and basic installation requirements.
- B. Install Y-pattern strainers for water on supply side of each control valve, water pressure-reducing valve, solenoid valve, and pump.
- C. Install water hammer arresters in water piping according to PDI-WH 201.
- D. Piping installation requirements are specified in other Division 22 Sections. Drawings indicate general arrangement of piping and specialties.

### 3.2 FIELD QUALITY CONTROL

- A. Remove and replace malfunctioning domestic water piping specialties and retest as specified above.

END OF SECTION 22 11 19



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SECTION 22 11 26  
FACILITY LIQUEFIED-PETROLEUM GAS PIPING

PART 1 - GENERAL

1.1 SUMMARY

A. Section Includes:

1. Pipes, tubes, and fittings.
2. Piping specialties.
3. Piping and tubing joining materials.
4. Valves.

1.2 PERFORMANCE REQUIREMENTS

A. Minimum Operating-Pressure Ratings:

1. For Piping Containing Only Vapor:
  - a. Piping and Valves: 125 psig unless otherwise indicated.

B. LPG System Pressure within Buildings: One pressure range. 0.5 psig or less.

1.3 ACTION SUBMITTALS

A. Product Data: For each type of product indicated.

B. Shop Drawings: For facility LPG piping layout. Include plans, piping layout and elevations, sections, and details for fabrication of pipe anchors, hangers, supports for multiple pipes, alignment guides, expansion joints and loops, and attachments of the same to building structure. Detail location of anchors, alignment guides, and expansion joints and loops.

C. Welding certificates.

D. Field quality-control reports.

1.4 CLOSEOUT SUBMITTALS

A. Operation and maintenance data.



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PART 2 - PRODUCTS

2.1 PIPES, TUBES, AND FITTINGS

- A. Steel Pipe: ASTM A 53/A 53M, black steel, Schedules 40 and 80, Type E or S, Grade B.
1. Malleable-Iron Threaded Fittings: ASME B16.3, Class 150, standard pattern.
  2. Unions: ASME B16.39, Class 150, malleable iron with brass-to-iron seat, ground joint, and threaded ends.

2.2 PIPING SPECIALTIES

- A. Flexible Piping Joints:
1. Approved for LPG service.
  2. Stainless-steel bellows with woven, flexible, bronze, wire-reinforcing protective jacket.
  3. Minimum working pressure of 250 psig and 250 deg F operating temperature.
  4. Threaded-end connections to match equipment connected and shall be capable of minimum 3/4-inch misalignment.
  5. Maximum 36-inch length for liquid LPG lines.
- B. Appliance Flexible Connectors:
1. Indoor, Fixed-Appliance Flexible Connectors: Comply with ANSI Z21.24.
  2. Indoor, Movable-Appliance Flexible Connectors: Comply with ANSI Z21.69.
  3. Outdoor, Appliance Flexible Connectors: Comply with ANSI Z21.75.
  4. Corrugated stainless-steel tubing with polymer coating.
  5. Operating-Pressure Rating: 0.5 psig.
  6. End Fittings: Zinc-coated steel.
  7. Threaded Ends: Comply with ASME B1.20.1.
  8. Maximum Length: 72 inches
- C. Quick-Disconnect Devices: Comply with ANSI Z21.41.
1. Copper-alloy convenience outlet and matching plug connector.
  2. Nitrile seals.
  3. Hand operated with automatic shutoff when disconnected.
  4. For indoor or outdoor applications.
  5. Adjustable, retractable restraining cable.
- D. Y-Pattern Strainers:
1. Body: ASTM A 126, Class B, cast iron with bolted cover and bottom drain connection.
  2. End Connections: Threaded ends for NPS 2 and smaller.
  3. Strainer Screen: 60-mesh startup strainer and perforated stainless-steel basket with 50 percent free area.
  4. CWP Rating: 125 psig.



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### 2.3 JOINING MATERIALS

- A. Joint Compound and Tape: Suitable for LPG.

### 2.4 MANUAL GAS SHUTOFF VALVES

- A. See "Aboveground Manual Gas Shutoff Valve Schedule" Articles for where each valve type is applied in various services.
- B. General Requirements for Metallic Valves, NPS 2 and Smaller for Vapor Service: Comply with ASME B16.33.
  - 1. CWP Rating: 125 psig.
  - 2. Threaded Ends: Comply with ASME B1.20.1.
  - 3. Dryseal Threads on Flare Ends: Comply with ASME B1.20.3.
  - 4. Tamperproof Feature: Locking feature for valves indicated in "Underground Manual Gas Shutoff Valve Schedule" and "Aboveground Manual Gas Shutoff Valve Schedule" Articles.
  - 5. Listing: Listed and labeled by an NRTL acceptable to authorities having jurisdiction for valves 1 inch and smaller.
  - 6. Service Mark: Valves 1-1/4 inch to NPS 2 shall have initials "WOG" permanently marked on valve body.
- C. Two-Piece, Full-Port, Bronze Ball Valves with Bronze Trim: MSS SP-110.
  - 1. Manufacturers: Subject to compliance with requirements, available manufacturers offering products that may be incorporated into the Work include, but are not limited to, the following:
    - a. BrassCraft Manufacturing Company; a Masco company.
    - b. Conbraco Industries, Inc.; Apollo Div.
    - c. Lyall, R. W. & Company, Inc.
    - d. McDonald, A. Y. Mfg. Co.
    - e. Perfection Corporation; a subsidiary of American Meter Company.
  - 2. Body: Bronze, complying with ASTM B 584.
  - 3. Ball: Chrome-plated bronze.
  - 4. Stem: Bronze; blowout proof.
  - 5. Seats: Reinforced TFE; blowout proof.
  - 6. Packing: Threaded-body packnut design with adjustable-stem packing.
  - 7. Ends: Threaded, flared, or socket as indicated in "Underground Manual Gas Shutoff Valve Schedule" and "Aboveground Manual Gas Shutoff Valve Schedule" Articles.
  - 8. CWP Rating: 600 psig.
  - 9. Listing: Valves NPS 1 and smaller shall be listed and labeled by an NRTL acceptable to authorities having jurisdiction.
  - 10. Service: Suitable for LPG service with "WOG" indicated on valve body.

### 2.5 DIELECTRIC UNIONS

- A. Dielectric Unions:



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1. Manufacturers: Subject to compliance with requirements, available manufacturers offering products that may be incorporated into the Work include, but are not limited to, the following:
  - a. Capitol Manufacturing Company.
  - b. Central Plastics Company.
  - c. Hart Industries International, Inc.
  - d. Jomar International Ltd.
  - e. Matco-Norca, Inc.
  - f. McDonald, A. Y. Mfg. Co.
  - g. Watts Regulator Co.; a division of Watts Water Technologies, Inc.
  - h. Wilkins; a Zurn company.
2. Description:
  - a. Standard: ASSE 1079.
  - b. Pressure Rating: 125 psig minimum at 180 deg F.
  - c. End Connections: Solder-joint copper alloy and threaded ferrous.

### PART 3 - EXECUTION

#### 3.1 INDOOR PIPING INSTALLATION

- A. Comply with NFPA 54 for installation and purging of LPG piping.
- B. Drawing plans, schematics, and diagrams indicate general location and arrangement of piping systems. Indicated locations and arrangements were used to size pipe and calculate friction loss, expansion, and other design considerations. Install piping as indicated unless deviations to layout are approved on Coordination Drawings.
- C. Arrange for pipe spaces, chases, slots, sleeves, and openings in building structure during progress of construction, to allow for mechanical installations.
- D. Install piping in concealed locations unless otherwise indicated and except in equipment rooms and service areas.
- E. Install piping indicated to be exposed and piping in equipment rooms and service areas at right angles or parallel to building walls. Diagonal runs are prohibited unless specifically indicated otherwise.
- F. Install piping above accessible ceilings to allow sufficient space for ceiling panel removal.
- G. Locate valves for easy access.
- H. Install LPG piping at uniform grade of 2 percent down toward drip and sediment traps.
- I. Install piping free of sags and bends.
- J. Install fittings for changes in direction and branch connections.
- K. Verify final equipment locations for roughing-in.



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- L. Comply with requirements in Sections specifying gas-fired appliances and equipment for roughing-in requirements.
- M. Drips and Sediment Traps: Install drips at points where condensate may collect, including service-meter outlets. Locate where readily accessible to permit cleaning and emptying. Do not install where condensate is subject to freezing.
  - 1. Construct drips and sediment traps using tee fitting with bottom outlet plugged or capped. Use nipple a minimum length of 3 pipe diameters, but not less than 3 inches long and same size as connected pipe. Install with space below bottom of drip to remove plug or cap.
- N. Extend relief vent connections for service regulators, line regulators, and overpressure protection devices to outdoors and terminate with weatherproof vent cap.
- O. Conceal pipe installations in walls, pipe spaces, utility spaces, above ceilings, below grade or floors, and in floor channels unless indicated to be exposed to view.
- P. Use eccentric reducer fittings to make reductions in pipe sizes. Install fittings with level side down.
- Q. Connect branch piping from top or side of horizontal piping.
- R. Install unions in pipes NPS 2 and smaller, adjacent to each valve, at final connection to each piece of equipment.
- S. Do not use LPG piping as grounding electrode.
- T. Install sleeves for piping penetrations of walls, ceilings, and floors. Comply with requirements for sleeves specified in Section 230517 "Sleeves and Sleeve Seals for HVAC Piping."
- U. Install sleeve seals for piping penetrations of concrete walls and slabs. Comply with requirements for sleeve seals specified in Section 230517 "Sleeves and Sleeve Seals for HVAC Piping."
- V. Install escutcheons for piping penetrations of walls, ceilings, and floors. Comply with requirements for escutcheons specified in Section 230518 "Escutcheons for HVAC Piping."

### 3.2 VALVE INSTALLATION

- A. Install manual gas shutoff valve for each gas appliance ahead of corrugated stainless-steel tubing, or copper connector.

### 3.3 PIPING JOINT CONSTRUCTION

- A. Ream ends of pipes and tubes and remove burrs.
- B. Remove scale, slag, dirt, and debris from inside and outside of pipe and fittings before assembly.
- C. Threaded Joints:



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1. Thread pipe with tapered pipe threads complying with ASME B1.20.1.
2. Cut threads full and clean using sharp dies.
3. Ream threaded pipe ends to remove burrs and restore full ID of pipe.
4. Apply appropriate tape or thread compound to external pipe threads unless dryseal threading is specified.
5. Damaged Threads: Do not use pipe or pipe fittings with threads that are corroded or damaged. Do not use pipe sections that have cracked or open welds.

3.4 HANGER AND SUPPORT INSTALLATION

- A. Comply with requirements for pipe hangers and supports specified in Section 230529 "Hangers and Supports for HVAC Piping and Equipment."
- B. Install hangers for horizontal steel piping with the following maximum spacing and minimum rod sizes:
  1. NPS 1 and Smaller: Maximum span, 96 inches; minimum rod size, 3/8 inch.
  2. NPS 1-1/4: Maximum span, 108 inches; minimum rod size, 3/8 inch.
  3. NPS 1-1/2 and NPS 2: Maximum span, 108 inches; minimum rod size, 3/8 inch.
- C. Install hangers for horizontal, corrugated stainless-steel tubing with the following maximum spacing and minimum rod sizes:
  1. NPS 3/8: Maximum span, 48 inches; minimum rod size, 3/8 inch.
  2. NPS 1/2: Maximum span, 72 inches; minimum rod size, 3/8 inch.
  3. NPS 3/4 and Larger: Maximum span, 96 inches; minimum rod, 3/8 inch.

3.5 CONNECTIONS

- A. Extend new piping as shown on the drawings from the existing LP gas piping service piping service entrance inside the building.
- B. Install LPG piping electrically continuous, and bonded to gas appliance equipment grounding conductor of the circuit powering the appliance according to NFPA 70.
- C. Install piping adjacent to appliances to allow service and maintenance of appliances.
- D. Connect piping to appliances using manual gas shutoff valves and unions. Install valve within 72 inches of each gas-fired appliances and equipment. Install union between valve and appliances or equipment.
- E. Sediment Traps: Install tee fitting with capped nipple in bottom to form drip, as close as practical to inlet of each appliance.

3.6 LABELING AND IDENTIFYING

- A. Comply with requirements in Section 220553 "Identification for Plumbing Piping and Equipment" for piping and valve identification.



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3.7 FIELD QUALITY CONTROL

- A. Test, inspect, and purge LPG according to NFPA 58 and NFPA 54 and requirements of authorities having jurisdiction.
- B. LPG piping will be considered defective if it does not pass tests and inspections.
- C. Prepare test and inspection reports.

3.8 INDOOR PIPING SCHEDULE FOR SYSTEM PRESSURES LESS THAN 0.5 PSIG

- A. Aboveground, branch piping NPS 1 and smaller shall be the following:
  - 1. Schedule 40, steel pipe with malleable-iron fittings and threaded joints.
- B. Aboveground, distribution piping shall be the following:
  - 1. Schedule 40, steel pipe with malleable-iron fittings and threaded joints.

3.9 ABOVEGROUND MANUAL GAS SHUTOFF VALVE SCHEDULE

- A. Distribution piping valves for pipe NPS 2 and smaller shall be the following:
  - 1. Two-piece, full port, bronze ball valves with bronze trim.
- B. Valves in branch piping for single appliance shall be the following:
  - 1. Two-piece, full port, bronze ball valves with bronze trim.

END OF SECTION 231126



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SECTION 22 13 16  
SANITARY WASTE AND VENT PIPING

PART 1 - GENERAL

1.1 SUMMARY

- A. This Section includes the following soil and waste, sanitary drainage and vent piping inside the building:
1. Pipe, tube, and fittings.
  2. Special pipe fittings.

1.2 PERFORMANCE REQUIREMENTS

- A. Components and installation shall be capable of withstanding the following minimum working pressure, unless otherwise indicated:
1. Soil, Waste, and Vent Piping: 10-foot head of water.

1.3 SUBMITTALS

- A. Field quality-control inspection and test reports.

1.4 QUALITY ASSURANCE

- A. Piping materials shall bear label, stamp, or other markings of specified testing agency.
- B. Comply with NSF 14, "Plastics Piping Systems Components and Related Materials," for plastic piping components. Include marking with "NSF-dwv" for plastic drain, waste, and vent piping; and "NSF-drain" for plastic drain piping.

PART 2 - PRODUCTS

2.1 PIPING MATERIALS

- A. Solid-Wall PVC Pipe: ASTM D 2665, solid-wall drain, waste, and vent.
1. PVC Socket Fittings: ASTM D 2665, socket type, made to ASTM D 3311, drain, waste, and vent patterns.
  2. Solvent Cement and Adhesive Primer:
    - a. Use PVC solvent cement that has a VOC content of 510 g/L or less when calculated according to 40 CFR 59, Subpart D (EPA Method 24).



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- b. Use adhesive primer that has a VOC content of 550 g/L or less when calculated according to 40 CFR 59, Subpart D (EPA Method 24).

### PART 3 - EXECUTION

#### 3.1 PIPING APPLICATIONS

- A. Special pipe fittings with pressure ratings at least equal to piping pressure ratings may be used in applications below, unless otherwise indicated.
- B. Flanges and unions may be used on aboveground pressure piping, unless otherwise indicated.
- C. Aboveground, soil, waste, and vent piping NPS 4 and smaller shall be any of the following:
  1. Solid-wall PVC pipe, PVC socket fittings, and solvent-cemented joints.
- D. Underground, soil, waste, and vent piping NPS 4 and smaller shall be any of the following:
  1. Solid-wall PVC pipe, PVC socket fittings, and solvent-cemented joints.

#### 3.2 PIPING INSTALLATION

- A. Sanitary sewer piping outside the building as specified.
- B. Basic piping installation requirements are specified in Division 22 Section "Common Work Results for Plumbing."
- C. Install cleanouts at grade and extend to where building sanitary drains connect to building sanitary sewers.
- D. Install wall penetration system at each service pipe penetration through foundation wall. Make installation watertight. Wall penetration systems are specified in Division 22 Section "Common Work Results for Plumbing."
- E. Make changes in direction for soil and waste drainage and vent piping using appropriate branches, bends, and long-sweep bends. Sanitary tees and short-sweep 1/4 bends may be used on vertical stacks if change in direction of flow is from horizontal to vertical. Use long-turn, double Y-branch and 1/8-bend fittings if 2 fixtures are installed back to back or side by side with common drain pipe. Straight tees, elbows, and crosses may be used on vent lines. Do not change direction of flow more than 90 degrees. Use proper size of standard increasers and reducers if pipes of different sizes are connected. Reducing size of drainage piping in direction of flow is prohibited.
- F. Lay buried building drainage piping beginning at low point of each system. Install true to grades and alignment indicated, with unbroken continuity of invert. Place hub ends of piping upstream. Install required gaskets according to manufacturer's written instructions for use of lubricants, cements, and other installation requirements. Maintain swab in piping and pull past each joint as completed.



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- G. Install soil and waste drainage and vent piping at the following minimum slopes, unless otherwise indicated:
  - 1. Building Sanitary Drain: 2 percent downward in direction of flow for piping NPS 3 and smaller; 1 percent downward in direction of flow for piping NPS 4 and larger.
  - 2. Horizontal Sanitary Drainage Piping: 2 percent downward in direction of flow.
  - 3. Vent Piping: 1 percent down toward vertical fixture vent or toward vent stack.
- H. Install PVC soil and waste drainage and vent piping according to ASTM D 2665.
- I. Install underground PVC soil and waste drainage piping according to ASTM D 2321.
- J. Do not enclose, cover, or put piping into operation until it is inspected and approved by authorities having jurisdiction.

### 3.3 JOINT CONSTRUCTION

- A. Basic piping joint construction requirements are specified in Division 22 Section "Common Work Results for Plumbing."
- B. PVC Nonpressure Piping Joints: Join piping according to ASTM D 2665.

### 3.4 HANGER AND SUPPORT INSTALLATION

- A. Pipe hangers and supports are specified in Division 22 Section "Hangers and Supports for Plumbing Piping and Equipment." Install the following:
  - 1. Vertical Piping: MSS Type 8 or Type 42, clamps.
  - 2. Individual, Straight, Horizontal Piping Runs: According to the following:
    - a. 100 Feet and Less: MSS Type 1, adjustable, steel clevis hangers.
- B. Install supports according to Division 22 Section "Hangers and Supports for Plumbing Piping and Equipment."
- C. Support vertical piping and tubing at base and at each floor.
- D. Rod diameter may be reduced 1 size for double-rod hangers, with 3/8-inch minimum rods.
- E. Install hangers for PVC piping with the following maximum horizontal spacing and minimum rod diameters:
  - 1. NPS 1-1/2 and NPS 2: 48 inches with 3/8-inch rod.
  - 2. NPS 3: 48 inches with 1/2-inch rod.
  - 3. NPS 4 and NPS 5: 48 inches with 5/8-inch rod.
- F. Install supports for vertical PVC piping every 48 inches.



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- G. Support piping and tubing not listed above according to MSS SP-69 and manufacturer's written instructions.

### 3.5 CONNECTIONS

- A. Connect soil and waste piping to exterior sanitary sewerage piping. Use transition fitting to join dissimilar piping materials.
- B. Connect drainage and vent piping to the following:
  - 1. Plumbing Fixtures: Connect drainage piping in sizes indicated, but not smaller than required by plumbing code.
  - 2. Plumbing Fixtures and Equipment: Connect atmospheric vent piping in sizes indicated, but not smaller than required by authorities having jurisdiction.
  - 3. Plumbing Specialties: Connect drainage and vent piping in sizes indicated, but not smaller than required by plumbing code
  - 4. Equipment: Connect drainage piping as indicated. Provide shutoff valve, if indicated, and union for each connection. Use flanges instead of unions for connections NPS 2-1/2 and larger.

### 3.6 FIELD QUALITY CONTROL

- A. During installation, notify authorities having jurisdiction at least 24 hours before inspection must be made. Perform tests specified below in presence of authorities having jurisdiction.
  - 1. Roughing-in Inspection: Arrange for inspection of piping before concealing or closing-in after roughing-in and before setting fixtures.
  - 2. Final Inspection: Arrange for final inspection by authorities having jurisdiction to observe tests specified below and to ensure compliance with requirements.
- B. Reinspection: If authorities having jurisdiction find that piping will not pass test or inspection, make required corrections and arrange for reinspection.
- C. Reports: Prepare inspection reports and have them signed by authorities having jurisdiction.
- D. Test sanitary drainage and vent piping according to procedures of authorities having jurisdiction.
  - 1. Repair leaks and defects with new materials and retest piping, or portion thereof, until satisfactory results are obtained.
  - 2. Prepare reports for tests and required corrective action.

### 3.7 CLEANING

- A. Clean interior of piping. Remove dirt and debris as work progresses.
- B. Protect drains during remainder of construction period to avoid clogging with dirt and debris and to prevent damage from traffic and construction work.
- C. Place plugs in ends of uncompleted piping at end of day and when work stops.



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3.8 PROTECTION

- A. Exposed PVC Piping: Protect plumbing vents exposed to sunlight with two coats of water-based latex paint.

END OF SECTION 22 13 16



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SECTION 22 13 19  
SANITARY WASTE PIPING SPECIALTIES

PART 1 - GENERAL

1.1 SUMMARY

A. This Section includes the following sanitary drainage piping specialties:

1. Cleanouts.
2. Floor drains.
3. Roof flashing assemblies.
4. Miscellaneous sanitary drainage piping specialties.
5. Flashing materials.

1.2 SUBMITTALS

A. Product Data: For each type of product indicated. Include rated capacities, operating characteristics, and accessories for grease interceptors.

1.3 QUALITY ASSURANCE

A. Drainage piping specialties shall bear label, stamp, or other markings of specified testing agency.

PART 2 - PRODUCTS

2.1 CLEANOUTS

A. Exposed Cast-Iron Cleanouts:

1. Manufacturers: Subject to compliance with requirements, provide products by one of the following:
  - a. Josam Company; Josam Div.
  - b. MIFAB, Inc.
  - c. Smith, Jay R. Mfg. Co.; Division of Smith Industries, Inc.
  - d. Tyler Pipe; Wade Div.
  - e. Watts Drainage Products Inc.
  - f. Zurn Plumbing Products Group; Specification Drainage Operation.
2. Standard: ASME A112.36.2M for cast iron for cleanout test tee.
3. Size: Same as connected drainage piping
4. Body Material: as required to match connected piping.
5. Closure: Countersunk, brass plug.



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6. Closure Plug Size: Same as or not more than one size smaller than cleanout size.

### B. Cast-Iron Floor Cleanouts:

1. Manufacturers: Subject to compliance with requirements, provide products by one of the following:
  - a. Josam Company; Josam Div.
  - b. Oatey.
  - c. Sioux Chief Manufacturing Company, Inc.
  - d. Smith, Jay R. Mfg. Co.; Division of Smith Industries, Inc.
  - e. Tyler Pipe; Wade Div.
  - f. Watts Drainage Products Inc.
  - g. Zurn Plumbing Products Group; Light Commercial Operation.
  - h. Zurn Plumbing Products Group; Specification Drainage Operation.
2. Standard: ASME A112.36.2M for heavy-duty, adjustable housing cleanout.
3. Size: Same as connected branch.
4. Type: Adjustable housing.
5. Body or Ferrule: Cast iron.
6. Clamping Device: As Required.
7. Outlet Connection: Inside caulk.
8. Closure: Brass plug with straight threads and gasket.
9. Adjustable Housing Material: Cast iron with threads.
10. Frame and Cover Material and Finish: Polished bronze.
11. Frame and Cover Shape: Round.
12. Top Loading Classification: Heavy Duty.
13. Riser: ASTM A 74, Extra-Heavy Service class, cast-iron drainage pipe fitting and riser to cleanout.

### C. Cast-Iron Wall Cleanouts:

1. Manufacturers: Subject to compliance with requirements, provide products by one of the following:
  - a. Josam Company; Josam Div.
  - b. MIFAB, Inc.
  - c. Smith, Jay R. Mfg. Co.; Division of Smith Industries, Inc.
  - d. Tyler Pipe; Wade Div.
  - e. Watts Drainage Products Inc.
  - f. Zurn Plumbing Products Group; Specification Drainage Operation.
2. Standard: ASME A112.36.2M. Include wall access.
3. Size: Same as connected drainage piping.
4. Body: as required to match connected piping.
5. Closure: Countersunk or raised-head, plug.
6. Closure Plug Size: Same as or not more than one size smaller than cleanout size.
7. Wall Access: Round, flat, chrome-plated brass or stainless-steel cover plate with screw.

## 2.2 FLOOR DRAINS

### A. Cast-Iron Floor Drains:



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1. Manufacturers: Subject to compliance with requirements, provide products by one of the following:
  - a. Commercial Enameling Co.
  - b. Josam Company; Josam Div.
  - c. MIFAB, Inc.
  - d. Prier Products, Inc.
  - e. Smith, Jay R. Mfg. Co.; Division of Smith Industries, Inc.
  - f. Tyler Pipe; Wade Div.
  - g. Watts Drainage Products Inc.
  - h. Zurn Plumbing Products Group; Light Commercial Operation.
  - i. Zurn Plumbing Products Group; Specification Drainage Operation.
2. Standard: ASME A112.6.3.
3. Pattern: Floor drain.
4. Body Material: Gray iron.
5. Seepage Flange: As required, see drawings.
6. Anchor Flange: As required, see drawings.
7. Clamping Device: As required, see drawings..
8. Outlet: Side.
9. Backwater Valve: Not required.
10. Coating on Interior and Exposed Exterior Surfaces: Not required.
11. Sediment Bucket: As required, see drawings.
12. Top or Strainer Material: Nickel bronze.
13. Top of Body and Strainer Finish: Nickel bronze.
14. Top Shape: Round.
15. Top Loading Classification: Heavy Duty.
16. Funnel: Not required.
17. Inlet Fitting: Gray iron, with threaded inlet and threaded or spigot outlet, and trap-seal primer valve connection.
18. Trap Material: Cast iron.
19. Trap Pattern: Deep-seal P-trap.
20. Trap Features: Cleanout and trap-seal primer valve drain connection.

### 2.3 ROOF FLASHING ASSEMBLIES

#### A. Roof Flashing Assemblies:

1. Available Manufacturers: Subject to compliance with requirements, manufacturers offering products that may be incorporated into the Work include, but are not limited to, the following:
  - a. Acorn Engineering Company; Elmdor/Stoneman Div.
  - b. Thaler Metal Industries Ltd.

#### B. Description: Manufactured assembly made of 6.0-lb/sq. ft., 0.0938-inch- thick, lead flashing collar and skirt extending at least 10 inches from pipe, with galvanized-steel boot reinforcement and counterflashing fitting.

1. Open-Top Vent Cap: Without cap.
2. Low-Silhouette Vent Cap: With vandal-proof vent cap.
3. Extended Vent Cap: With field-installed, vandal-proof vent cap.



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### 2.4 MISCELLANEOUS SANITARY DRAINAGE PIPING SPECIALTIES

#### A. Open Drains:

1. Description: Shop or field fabricate from ASTM A 74, Service class, hub-and-spigot, cast-iron, soil-pipe fittings. Include P-trap, hub-and-spigot riser section; and where required, increaser fitting joined with ASTM C 564, rubber gaskets.
2. Size: Same as connected waste piping with increaser fitting of size indicated.

#### B. Deep-Seal Traps:

1. Description: Cast-iron or bronze casting, with inlet and outlet matching connected piping and cleanout trap-seal primer valve connection.
2. Size: Same as connected waste piping.
  - a. NPS 2: 4-inch- minimum water seal.
  - b. NPS 2-1/2 and Larger: 5-inch- minimum water seal.

#### C. Floor-Drain, Trap-Seal Primer Fittings:

1. Description: Cast iron, with threaded inlet and threaded or spigot outlet, and trap-seal primer valve connection.
2. Size: Same as floor drain outlet with NPS 1/2 side inlet.

#### D. Sleeve Flashing Device:

1. Description: Manufactured, cast-iron fitting, with clamping device, that forms sleeve for pipe floor penetrations of floor membrane. Include galvanized-steel pipe extension in top of fitting that will extend 2 inches above finished floor and galvanized-steel pipe extension in bottom of fitting that will extend through floor slab.
2. Size: As required for close fit to riser or stack piping.

#### E. Stack Flashing Fittings:

1. Description: Counterflashing-type, cast-iron fitting, with bottom recess for terminating roof membrane, and with threaded or hub top for extending vent pipe.
2. Size: Same as connected stack vent or vent stack.

#### F. Vent Caps:

1. Description: Cast-iron body with threaded or hub inlet and vandal-proof design. Include vented hood and setscrews to secure to vent pipe.
2. Size: Same as connected stack vent or vent stack.

### 2.5 FLASHING MATERIALS

#### A. Lead Sheet: ASTM B 749, Type L51 121, copper bearing, with the following minimum weights and thicknesses, unless otherwise indicated:

1. General Use: 4.0-lb/sq. ft., 0.0625-inch thickness.
2. Vent Pipe Flashing: 3.0-lb/sq. ft., 0.0469-inch thickness.



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3. Burning: 6-lb/sq. ft., 0.0938-inch thickness.
- B. Fasteners: Metal compatible with material and substrate being fastened.
- C. Metal Accessories: Sheet metal strips, clamps, anchoring devices, and similar accessory units required for installation; matching or compatible with material being installed.
- D. Solder: ASTM B 32, lead-free alloy.
- E. Bituminous Coating: SSPC-Paint 12, solvent-type, bituminous mastic.

### PART 3 - EXECUTION

#### 3.1 INSTALLATION

- A. Refer to Division 22 Section "Common Work Results for Plumbing" for piping joining materials, joint construction, and basic installation requirements.
- B. Install backwater valves in building drain piping. For interior installation, provide cleanout deck plate flush with floor and centered over backwater valve cover, and of adequate size to remove valve cover for servicing.
- C. Install cleanouts in aboveground piping and building drain piping according to the following, unless otherwise indicated:
  1. Size same as drainage piping up to NPS 4. Use NPS 4 for larger drainage piping unless larger cleanout is indicated.
  2. Locate at each change in direction of piping greater than 45 degrees.
  3. Locate at minimum intervals of 50 feet for piping NPS 4 and smaller and 100 feet for larger piping.
  4. Locate at base of each vertical soil and waste stack.
- D. For floor cleanouts for piping below floors, install cleanout deck plates with top flush with finished floor.
- E. For cleanouts located in concealed piping, install cleanout wall access covers, of types indicated, with frame and cover flush with finished wall.
- F. Install floor drains at low points of surface areas to be drained. Set grates of drains flush with finished floor, unless otherwise indicated.
  1. Position floor drains for easy access and maintenance.
  2. Set floor drains below elevation of surrounding finished floor to allow floor drainage. Set with grates depressed according to the following drainage area radii:
    - a. Radius, 30 Inches or Less: Equivalent to 1 percent slope, but not less than 1/4-inch total depression.
    - b. Radius, 30 to 60 Inches: Equivalent to 1 percent slope.
    - c. Radius, 60 Inches or Larger: Equivalent to 1 percent slope, but not greater than 1-inch total depression.



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3. Install floor-drain flashing collar or flange so no leakage occurs between drain and adjoining flooring. Maintain integrity of waterproof membranes where penetrated.
  4. Install individual traps for floor drains connected to sanitary building drain, unless otherwise indicated.
- G. Install roof flashing assemblies on sanitary stack vents and vent stacks that extend through roof.
- H. Install flashing fittings on sanitary stack vents and vent stacks that extend through roof.
- I. Assemble open drain fittings and install with top of hub 1 inch above floor.
- J. Install deep-seal traps on floor drains and other waste outlets, if indicated.
- K. Install floor-drain, trap-seal primer fittings on inlet to floor drains that require trap-seal primer connection.
1. Exception: Fitting may be omitted if trap has trap-seal primer connection.
  2. Size: Same as floor drain inlet.
- L. Install sleeve flashing device with each riser and stack passing through floors with waterproof membrane.
- M. Install vent caps on each vent pipe passing through roof.
- N. Install traps on plumbing specialty drain outlets. Omit traps on indirect wastes unless trap is indicated.
- O. Install escutcheons at wall, floor, and ceiling penetrations in exposed finished locations and within cabinets and millwork. Use deep-pattern escutcheons if required to conceal protruding pipe fittings.
- 3.2 CONNECTIONS
- A. Piping installation requirements are specified in other Division 22 Sections. Drawings indicate general arrangement of piping, fittings, and specialties.
- B. Install piping adjacent to equipment to allow service and maintenance.
- 3.3 FLASHING INSTALLATION
- A. Fabricate flashing from single piece unless large pans, sumps, or other drainage shapes are required. Join flashing according to the following if required:
1. Lead Sheets: Burn joints of lead sheets 6.0-lb/sq. ft., 0.0938-inch thickness or thicker. Solder joints of lead sheets 4.0-lb/sq. ft., 0.0625-inch thickness or thinner.
- B. Install sheet flashing on pipes, sleeves, and specialties passing through or embedded in floors and roofs with waterproof membrane.
1. Pipe Flashing: Sleeve type, matching pipe size, with minimum length of 10 inches, and skirt or flange extending at least 8 inches around pipe.



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2. Sleeve Flashing: Flat sheet, with skirt or flange extending at least 8 inches around sleeve.
  3. Embedded Specialty Flashing: Flat sheet, with skirt or flange extending at least 8 inches around specialty.
- C. Set flashing on floors and roofs in solid coating of bituminous cement.
- D. Secure flashing into sleeve and specialty clamping ring or device.
- E. Install flashing for piping passing through roofs with counterflashing or commercially made flashing fittings, according to Division 07 Section "Flashing and Sheet Metal."
- F. Extend flashing up vent pipe passing through roofs and turn down into pipe, or secure flashing into cast-iron sleeve having calking recess.
- 3.4 LABELING AND IDENTIFYING
- A. Distinguish among multiple units, inform operator of operational requirements, indicate safety and emergency precautions, and warn of hazards and improper operations, in addition to identifying unit. Nameplates and signs are specified in Division 22 Section "Identification for Plumbing Piping and Equipment."
- 3.5 PROTECTION
- A. Protect drains during remainder of construction period to avoid clogging with dirt or debris and to prevent damage from traffic or construction work.
- B. Place plugs in ends of uncompleted piping at end of each day or when work stops.

END OF SECTION 22 13 19



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SECTION 22 33 00  
ELECTRIC, DOMESTIC-WATER HEATERS

PART 1 - GENERAL

1.1 SUMMARY

A. Section Includes:

1. Commercial, electric, storage, domestic-water heaters.
2. Domestic-water heater accessories.

1.2 ACTION SUBMITTALS

- A. Product Data: For each type and size of domestic-water heater indicated.
- B. Shop Drawings:
1. Wiring Diagrams: For power, signal, and control wiring.

1.3 INFORMATIONAL SUBMITTALS

- A. Domestic-Water Heater Labeling: Certified and labeled by testing agency acceptable to authorities having jurisdiction.
- B. Source quality-control reports.
- C. Field quality-control reports.
- D. Warranty: Sample of special warranty.

1.4 CLOSEOUT SUBMITTALS

- A. Operation and maintenance data.

1.5 QUALITY ASSURANCE

- A. Electrical Components, Devices, and Accessories: Listed and labeled as defined in NFPA 70, by a qualified testing agency, and marked for intended location and application.
- B. ASHRAE/IESNA Compliance: Applicable requirements in ASHRAE/IESNA 90.1.
- C. ASME Compliance: Where ASME-code construction is indicated, fabricate and label commercial, domestic-water heater storage tanks to comply with ASME Boiler and Pressure Vessel Code: Section VIII, Division 1.



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- D. NSF Compliance: Fabricate and label equipment components that will be in contact with potable water to comply with NSF 61, "Drinking Water System Components - Health Effects."

1.6 WARRANTY

- A. Special Warranty: Manufacturer's standard form in which manufacturer agrees to repair or replace components of electric, domestic-water heaters that fail in materials or workmanship within specified warranty period.
1. Warranty Periods: From date of Substantial Completion.
    - a. Commercial, Electric, Storage, Domestic-Water Heaters:
      - 1) Controls and Other Components: Three years.
      - b. Compression Tanks: Five years.

PART 2 - PRODUCTS

2.1 COMMERCIAL, ELECTRIC, DOMESTIC-WATER HEATERS

- A. Commercial, Electric, Storage, Domestic-Water Heaters:
1. Manufacturers: Subject to compliance with requirements, available manufacturers offering products that may be incorporated into the Work include, but are not limited to, the following:
    - a. American Water Heaters.
    - b. Bradford White Corporation.
    - c. Lochinvar Corporation.
    - d. Rheem Manufacturing Company.
    - e. Smith, A. O. Water Products Co.; a division of A. O. Smith Corporation.
    - f. State Industries.
  2. Standard: UL 1453.
  3. Storage-Tank Construction: Non-ASME-code, steel vertical arrangement.
    - a. Tappings: Factory fabricated of materials compatible with tank and piping connections. Attach tappings to tank before testing.
      - 1) NPS 2 and Smaller: Threaded ends according to ASME B1.20.1.
      - 2) NPS 2-1/2 and Larger: Flanged ends according to ASME B16.5 for steel and stainless-steel flanges, and according to ASME B16.24 for copper and copper-alloy flanges.
    - b. Pressure Rating: 150 psig.
    - c. Interior Finish: Comply with NSF 61 barrier materials for potable-water tank linings, including extending lining material into tappings.
  4. Factory-Installed Storage-Tank Appurtenances:



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- a. Anode Rod: Replaceable magnesium.
  - b. Drain Valve: Corrosion-resistant metal complying with ASSE 1005.
  - c. Insulation: Comply with ASHRAE/IESNA 90.1.
  - d. Jacket: Steel with enameled finish.
  - e. Heating Elements: Electric, screw-in or bolt-on immersion type arranged in multiples of three.
  - f. Temperature Control: Adjustable thermostat.
  - g. Safety Controls: High-temperature-limit and low-water cutoff devices or systems.
  - h. Relief Valves: ASME rated and stamped for combination temperature-and-pressure relief valves. Include one or more relief valves with total relieving capacity at least as great as heat input, and include pressure setting less than domestic-water heater working-pressure rating. Select one relief valve with sensing element that extends into storage tank.
5. Special Requirements: NSF 5 construction.
- B. Capacity and Characteristics:
1. Refer to Drawings for Scheduled Requirements.

### 2.2 DOMESTIC-WATER HEATER ACCESSORIES

- A. Domestic-Water Compression Tanks:
1. Manufacturers: Subject to compliance with requirements, available manufacturers offering products that may be incorporated into the Work include, but are not limited to, the following:
    - a. AMTROL Inc.
    - b. Flexcon Industries.
    - c. Honeywell International Inc.
    - d. Pentair Pump Group (The); Myers.
    - e. Smith, A. O. Water Products Co.; a division of A. O. Smith Corporation.
    - f. State Industries.
    - g. Taco, Inc.
  2. Description: Steel pressure-rated tank constructed with welded joints and factory-installed butyl-rubber diaphragm. Include air precharge to minimum system-operating pressure at tank.
  3. Construction:
    - a. Tappings: Factory-fabricated steel, welded to tank before testing and labeling. Include ASME B1.20.1 pipe thread.
    - b. Interior Finish: Comply with NSF 61 barrier materials for potable-water tank linings, including extending finish into and through tank fittings and outlets.
    - c. Air-Charging Valve: Factory installed.
  4. Capacity and Characteristics:
    - a. Working-Pressure Rating: 150 psig].
    - b. Capacity Acceptable: 2 gal. minimum.
    - c. Air Precharge Pressure: 50 psi.



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- B. Drain Pans: Corrosion-resistant metal with raised edge. Comply with ANSI/CSA LC 3. Include dimensions not less than base of domestic-water heater, and include drain outlet not less than NPS 3/4 with ASME B1.20.1 pipe threads or with ASME B1.20.7 garden-hose threads.
- C. Piping-Type Heat Traps: Field-fabricated piping arrangement according to ASHRAE/IESNA 90.1.
- D. Heat-Trap Fittings: ASHRAE 90.2.
- E. Pressure-Reducing Valves: ASSE 1003 for water. Set at 25-psig- maximum outlet pressure unless otherwise indicated.
- F. Combination Temperature-and-Pressure Relief Valves: ASME rated and stamped. Include relieving capacity at least as great as heat input, and include pressure setting less than domestic-water heater working-pressure rating. Select relief valves with sensing element that extends into storage tank.
- G. Pressure Relief Valves: ASME rated and stamped. Include pressure setting less than domestic-water heater working-pressure rating.
- H. Vacuum Relief Valves: ANSI Z21.22/CSA 4.4.
- I. Shock Absorbers: ASSE 1010 or PDI-WH 201, Size A water hammer arrester.
- J. Domestic-Water Heater Stands: Manufacturer's factory-fabricated steel stand for floor mounting, capable of supporting domestic-water heater and water. Include dimension that will support bottom of domestic-water heater a minimum of 18 inches above the floor.

### 2.3 SOURCE QUALITY CONTROL

- A. Factory Tests: Test and inspect domestic-water heaters specified to be ASME-code construction, according to ASME Boiler and Pressure Vessel Code.
- B. Hydrostatically test domestic-water heaters to minimum of one and one-half times pressure rating before shipment.
- C. Electric, domestic-water heaters will be considered defective if they do not pass tests and inspections. Comply with requirements in Division 01 Section "Quality Requirements" for retesting and reinspecting requirements and Division 01 Section "Execution" for requirements for correcting the Work.
- D. Prepare test and inspection reports.

## PART 3 - EXECUTION

### 3.1 DOMESTIC-WATER HEATER INSTALLATION

- A. Commercial, Electric, Domestic-Water Heater Mounting: Install commercial, electric, domestic-water heaters on concrete base.



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1. Exception: Omit concrete bases for commercial, electric, domestic-water heaters if installation on stand, bracket, suspended platform, or directly on floor is indicated.
  2. Maintain manufacturer's recommended clearances.
  3. Arrange units so controls and devices that require servicing are accessible.
  4. Install dowel rods to connect concrete base to concrete floor. Unless otherwise indicated, install dowel rods on 18-inch centers around the full perimeter of concrete base.
  5. For supported equipment, install epoxy-coated anchor bolts that extend through concrete base and anchor into structural concrete floor.
  6. Place and secure anchorage devices. Use setting drawings, templates, diagrams, instructions, and directions furnished with items to be embedded.
  7. Install anchor bolts to elevations required for proper attachment to supported equipment.
  8. Anchor domestic-water heaters to substrate.
- B. Install electric, domestic-water heaters level and plumb, according to layout drawings, original design, and referenced standards. Maintain manufacturer's recommended clearances. Arrange units so controls and devices needing service are accessible.
1. Install shutoff valves on domestic-water-supply piping to domestic-water heaters and on domestic-hot-water outlet piping. Comply with requirements for shutoff valves specified in Division 22 Section "General-Duty Valves for Plumbing Piping."
- C. Install combination temperature-and-pressure relief valves in top portion of storage tanks. Use relief valves with sensing elements that extend into tanks. Extend commercial-water-heater relief-valve outlet, with drain piping same as domestic-water piping in continuous downward pitch, and discharge by positive air gap onto closest floor drain.
- D. Install water-heater drain piping as indirect waste to spill by positive air gap into open drains or over floor drains. Install hose-end drain valves at low points in water piping for electric, domestic-water heaters that do not have tank drains. Comply with requirements for hose-end drain valves specified in Division 22 Section "Domestic Water Piping Specialties."
- E. Install thermometers on outlet piping of electric, domestic-water heaters. Comply with requirements for thermometers specified in Division 22 Section "Meters and Gages for Plumbing Piping."
- F. Install piping-type heat traps on inlet and outlet piping of electric, domestic-water heater storage tanks without integral or fitting-type heat traps.
- G. Fill electric, domestic-water heaters with water.
- H. Charge domestic-water compression tanks with air.
- 3.2 CONNECTIONS
- A. Comply with requirements for piping specified in Division 22 Section "Domestic Water Piping." Drawings indicate general arrangement of piping, fittings, and specialties.
  - B. Where installing piping adjacent to electric, domestic-water heaters, allow space for service and maintenance of water heaters. Arrange piping for easy removal of domestic-water heaters.



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3.3 IDENTIFICATION

- A. Identify system components. Comply with requirements for identification specified in Division 22 Section "Identification for Plumbing Piping and Equipment."

3.4 FIELD QUALITY CONTROL

- A. Perform tests and inspections.
1. Manufacturer's Field Service: Engage a factory-authorized service representative to inspect components, assemblies, and equipment installations, including connections, and to assist in testing.
  2. Leak Test: After installation, charge system and test for leaks. Repair leaks and retest until no leaks exist.
  3. Operational Test: After electrical circuitry has been energized, start units to confirm proper operation.
  4. Test and adjust controls and safeties. Replace damaged and malfunctioning controls and equipment.
- B. Electric, domestic-water heaters will be considered defective if they do not pass tests and inspections. Comply with requirements in Division 01 Section "Quality Requirements" for retesting and reinspecting requirements and Division 01 Section "Execution" for requirements for correcting the Work.
- C. Prepare test and inspection reports.

END OF SECTION 22 33 00



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SECTION 22 42 13.13  
COMMERCIAL WATER CLOSETS

PART 1 - GENERAL

1.1 SUMMARY

- A. Section Includes:
1. Water closets.
  2. Flushometer valves.
  3. Toilet seats.

1.2 ACTION SUBMITTALS

- A. Product Data: For each type of product.
- B. Shop Drawings: Include diagrams for power, signal, and control wiring.

1.3 CLOSEOUT SUBMITTALS

- A. Operation and Maintenance Data: For flushometer valves to include in operation and maintenance manuals.

PART 2 - PRODUCTS

2.1 FLOOR-MOUNTED WATER CLOSETS

- A. Water Closets: Floor mounted, top spud.
1. Manufacturers: Subject to compliance with requirements, provide products by the following:
    - a. Kohler Co.
  2. Bowl:
    - a. Standards: ASME A112.19.2/CSA B45.1 and ASME A112.19.5.
    - b. Material: Vitreous china.
    - c. Type: Siphon jet.
    - d. Style: Flushometer valve.
    - e. Height: Standard.
    - f. Rim Contour: Elongated.
    - g. Water Consumption: 1.28 gal. per flush.
    - h. Spud Size and Location: NPS 1-1/2; top.
  3. Flushometer Valve: As scheduled on drawings.
  4. Toilet Seat: As scheduled on drawings.



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5. Support: Existing to be revised

## 2.2 FLUSHOMETER VALVES

### A. Battery Powered Sensor, Piston Flushometer Valves:

1. Basis-of-Design Product: Subject to compliance with requirements, provide product indicated on Drawings or comparable product by one of the following:
  - a. Hydrotek
2. Standard: ASSE 1037.
3. Minimum Pressure Rating: 125 psig.
4. Features: Include integral check stop and backflow-prevention device.
5. Material: Brass body with corrosion-resistant components.
6. Exposed Flushometer-Valve Finish: Chrome plated.
7. Style: Exposed.
8. Consumption: 1.28 gal. per flush.
9. Minimum Inlet: NPS 1.
10. Minimum Outlet: NPS 1-1/4.

## 2.3 TOILET SEATS

### A. Toilet Seats:

1. Manufacturers: Subject to compliance with requirements, provide products by the following:
  - a. Kohler
2. Standard: IAPMO/ANSI Z124.5.
3. Material: Plastic.
4. Type: Commercial (Heavy duty).
5. Shape: Elongated rim, open front.
6. Hinge: Self-sustaining, check.
7. Hinge Material: Noncorroding metal.
8. Seat Cover: Not required.
9. Color: White.

## PART 3 - EXECUTION

### 3.1 INSTALLATION

#### A. Water-Closet Installation:

1. Install level and plumb according to roughing-in drawings.
2. Install floor-mounted water closets on bowl-to-drain connecting fitting attachments to piping or building substrate.
3. Install accessible, wall-mounted water closets at mounting height for handicapped/elderly, according to ICC/ANSI A117.1.



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- B. Flushometer-Valve Installation:
  - 1. Install flushometer-valve, water-supply fitting on each supply to each water closet.
  - 2. Attach supply piping to supports or substrate within pipe spaces behind fixtures.
  - 3. Install lever-handle flushometer valves for accessible water closets with handle mounted on open side of water closet.
  - 4. Install actuators in locations that are easy for people with disabilities to reach.
- C. Install toilet seats on water closets.
- D. Joint Sealing:
  - 1. Seal joints between water closets and walls and floors using sanitary-type, one-part, mildew-resistant silicone sealant.
  - 2. Match sealant color to water-closet color.
  - 3. Comply with sealant requirements specified in Division 07 Section "Joint Sealants."

### 3.2 CONNECTIONS

- A. Connect water closets with water supplies and soil, waste, and vent piping. Use size fittings required to match water closets.
- B. Comply with water piping requirements specified in Division 22 Section "Domestic Water Piping."
- C. Comply with soil and waste piping requirements specified in Division 22 Section "Sanitary Waste and Vent Piping."
- D. Where installing piping adjacent to water closets, allow space for service and maintenance.

### 3.3 ADJUSTING

- A. Operate and adjust water closets and controls. Replace damaged and malfunctioning water closets, fittings, and controls.
- B. Adjust water pressure at flushometer valves to produce proper flow.

### 3.4 CLEANING AND PROTECTION

- A. Clean water closets and fittings with manufacturers' recommended cleaning methods and materials.
- B. Install protective covering for installed water closets and fittings.
- C. Do not allow use of water closets for temporary facilities unless approved in writing by Owner.

END OF SECTION 22 42 13.13



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SECTION 22 42 13.16  
COMMERCIAL URINALS

PART 1 - GENERAL

1.1 SUMMARY

- A. Section Includes:
1. Urinals.
  2. Flushometer valves.

1.2 ACTION SUBMITTALS

- A. Product Data: For each type of product.
- B. Shop Drawings: Include diagrams for power, signal, and control wiring.

1.3 CLOSEOUT SUBMITTALS

- A. Operation and Maintenance Data: For flushometer valves to include in operation and maintenance manuals.

PART 2 - PRODUCTS

2.1 WALL-HUNG URINALS

- A. Urinals: Wall hung, back outlet, washout.
1. Manufacturers: Subject to compliance with requirements, provide products by the following:
    - a. Kohler Co.
  2. Fixture:
    - a. Standards: ASME A112.19.2/CSA B45.1 and ASME A112.19.5.
    - b. Material: Vitreous china.
    - c. Type: Washout with extended shields.
    - d. Strainer or Trapway: Manufacturer's standard strainer with integral trap.
    - e. Water Consumption: 0.5 gallons per flush.
    - f. Spud Size and Location: NPS 3/4, top.
    - g. Outlet Size and Location: NPS 2, back.
    - h. Color: White.
  3. Waste Fitting:
    - a. Standard: ASME A112.18.2/CSA B125.2 for coupling.
    - b. Size: NPS 2.



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4. Support: ASME A112.6.1M, Type I, urinal carrier with fixture support plates and coupling with seal and fixture bolts and hardware matching fixture. Include rectangular, steel uprights.

## 2.2 URINAL FLUSHOMETER VALVES

- A. Battery-Powered, Solenoid-Actuator, Piston Flushometer Valves:
  1. Basis-of-Design Product: Subject to compliance with requirements, provide product indicated on Drawings or comparable product by one of the following:
    - a. Hydrotek
  2. Standard: ASSE 1037.
  3. Minimum Pressure Rating: 125 psig.
  4. Features: Include integral check stop and backflow-prevention device.
  5. Material: Brass body with corrosion-resistant components.
  6. Exposed Flushometer-Valve Finish: Chrome plated.
  7. Style: Exposed.
  8. Actuator: Solenoid complying with UL 1951; listed and labeled as defined in NFPA 70, by a qualified testing agency; and marked for intended location and application.
  9. Trip Mechanism: Battery-powered electronic sensor complying with UL 1951; listed and labeled as defined in NFPA 70, by a qualified testing agency; and marked for intended location and application.
  10. Consumption: 0.5 gal. per flush.
  11. Minimum Inlet: NPS 3/4.
  12. Minimum Outlet: NPS 1-1/4.

## PART 3 - EXECUTION

### 3.1 EXAMINATION

- A. Examine roughing-in of water supply and sanitary drainage and vent piping systems to verify actual locations of piping connections before urinal installation.
- B. Examine walls and floors for suitable conditions where urinals will be installed.
- C. Proceed with installation only after unsatisfactory conditions have been corrected.

### 3.2 INSTALLATION

- A. Urinal Installation:
  1. Install urinals level and plumb according to roughing-in drawings.
  2. Install wall-hung, back-outlet urinals onto waste fitting seals and attached to supports.
  3. Install wall-hung, bottom-outlet urinals with tubular waste piping attached to supports.
  4. Install accessible, wall-mounted urinals at mounting height for the handicapped/elderly, according to ICC/ANSI A117.1.
- B. Support Installation:



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1. Install supports, affixed to building substrate, for wall-hung urinals.
2. Use off-floor carriers with waste fitting and seal for back-outlet urinals.
3. Use carriers without waste fitting for urinals with tubular waste piping.
4. Use chair-type carrier supports with rectangular steel uprights for accessible urinals.

C. Flushometer-Valve Installation:

1. Install flushometer-valve water-supply fitting on each supply to each urinal.
2. Attach supply piping to supports or substrate within pipe spaces behind fixtures.
3. Install lever-handle flushometer valves for accessible urinals with handle mounted on open side of compartment.
4. Install fresh batteries in battery-powered, electronic-sensor mechanisms.

D. Wall Flange and Escutcheon Installation:

1. Install wall flanges or escutcheons at piping wall penetrations in exposed, finished locations.
2. Install deep-pattern escutcheons if required to conceal protruding fittings.
3. Comply with escutcheon requirements specified in Division 22 Section "Escutcheons for Plumbing Piping."

E. Joint Sealing:

1. Seal joints between urinals and walls and floors using sanitary-type, one-part, mildew-resistant silicone sealant.
2. Match sealant color to urinal color.
3. Comply with sealant requirements specified in Division 07 Section "Joint Sealants."

### 3.3 CONNECTIONS

- A. Connect urinals with water supplies and soil, waste, and vent piping. Use size fittings required to match urinals.
- B. Comply with water piping requirements specified in Division 22 Section "Domestic Water Piping."
- C. Comply with soil and waste piping requirements specified in Division 22 Section "Sanitary Waste and Vent Piping."
- D. Where installing piping adjacent to urinals, allow space for service and maintenance.

### 3.4 ADJUSTING

- A. Operate and adjust urinals and controls. Replace damaged and malfunctioning urinals, fittings, and controls.
- B. Adjust water pressure at flushometer valves to produce proper flow.
- C. Install fresh batteries in battery-powered, electronic-sensor mechanisms.



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3.5 CLEANING AND PROTECTION

- A. Clean urinals and fittings with manufacturers' recommended cleaning methods and materials.
- B. Install protective covering for installed urinals and fittings.
- C. Do not allow use of urinals for temporary facilities unless approved in writing by Owner.

END OF SECTION 22 42 13.16



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SECTION 22 42 16.13  
COMMERCIAL LAVATORIES

PART 1 - GENERAL

1.1 SUMMARY

A. Section Includes:

1. Lavatories.
2. Faucets.

1.2 ACTION SUBMITTALS

- A. Product Data: For each type of product.
- B. Shop Drawings: Include diagrams for power, signal, and control wiring of automatic faucets.

1.3 INFORMATIONAL SUBMITTALS

- A. Coordination Drawings: Counter cutout templates for mounting of counter-mounted lavatories.

1.4 CLOSEOUT SUBMITTALS

- A. Operation and Maintenance Data: For lavatories and faucets to include in operation and maintenance manuals.
  1. In addition to items specified in Division 01 Section "Operation and Maintenance Data," include the following:
    - a. Servicing and adjustments of automatic faucets.

PART 2 - PRODUCTS

2.1 VITREOUS-CHINA, WALL-MOUNTED LAVATORIES

- A. Lavatory: Vitreous china, wall mounted, with back.
  1. Manufacturers: Subject to compliance with requirements, provide products by the following:
    - a. Kohler Co.
  2. Fixture:
    - a. Standard: ASME A112.19.2/CSA B45.1.
    - b. Type: For wall hanging.



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- c. Nominal Size: Rectangular, 21.5 by 18.25 inches.
- d. Faucet-Hole Punching: One holes.
- e. Faucet-Hole Location: Top.
- f. Color: White.
- g. Mounting Material: Chair carrier.
3. Faucet: Battery powered deck mounted sensor faucet. Faucet provide a single cold water supply, 0.5 gpm spray outlet.
4. Support: ASME A112.6.1M, Type II, concealed-arm lavatory carrier with escutcheons.

## 2.2 METAL CONSTRUCTION, BATTERY POWERED SENSOR FAUCETS

- A. NSF Standard: Comply with NSF/ANSI 61, "Drinking Water System Components - Health Effects," for faucet materials that will be in contact with potable water.
- B. Lavatory Faucets: Battery powered sensor-type, solid-metal valve.
  1. Manufacturers: Subject to compliance with requirements, provide products by the following:
    - a. Hydrotek
  2. Standard: ASME A112.18.1/CSA B125.1.
  3. General: Coordinate faucet inlets with supplies and fixture hole punchings; coordinate outlet with spout and fixture receptor.
  4. Body Type: Centerset.
  5. Body Material: Commercial, solid metal.
  6. Finish: Polished chrome plate.
  7. Maximum Flow Rate: 0.5 gpm.
  8. Mounting Type: Deck, exposed.
  9. Valve Handle(s): Battery powered sensor.
  10. Spout: Rigid type.
  11. Spout Outlet: Aerator.

## 2.3 SUPPLY FITTINGS

- A. NSF Standard: Comply with NSF/ANSI 61, "Drinking Water System Components - Health Effects," for supply-fitting materials that will be in contact with potable water.
- B. Standard: ASME A112.18.1/CSA B125.1.
- C. Supply Piping: Chrome-plated-brass pipe or chrome-plated copper tube matching water-supply piping size. Include chrome-plated-brass or stainless-steel wall flange.
- D. Supply Stops: Chrome-plated-brass, one-quarter-turn, ball-type or compression valve with inlet connection matching supply piping.
- E. Operation: Loose key.
- F. Risers:
  1. NPS 3/8.
  2. Chrome-plated, soft-copper flexible tube riser.



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2.4 WASTE FITTINGS

- A. Standard: ASME A112.18.2/CSA B125.2.
- B. Drain: Grid type with NPS 1-1/4 offset and straight tailpiece.
- C. Trap:
  - 1. Size: NPS 1-1/2 by NPS 1-1/4.
  - 2. Material: Chrome-plated, two-piece, cast-brass trap and swivel elbow with 0.032-inch-thick brass tube to wall; and chrome-plated, brass or steel wall flange.
  - 3. Material: Stainless-steel, two-piece trap and swivel elbow with 0.012-inch-thick stainless-steel tube to wall; and stainless-steel wall flange.

PART 3 - EXECUTION

3.1 EXAMINATION

- A. Examine roughing-in of water supply and sanitary drainage and vent piping systems to verify actual locations of piping connections before lavatory installation.
- B. Examine counters and walls for suitable conditions where lavatories will be installed.
- C. Proceed with installation only after unsatisfactory conditions have been corrected.

3.2 INSTALLATION

- A. Install lavatories level and plumb according to roughing-in drawings.
- B. Install supports, affixed to building substrate, for wall-mounted lavatories.
- C. Install accessible wall-mounted lavatories at handicapped/elderly mounting height for people with disabilities or the elderly, according to ICC/ANSI A117.1.
- D. Install wall flanges or escutcheons at piping wall penetrations in exposed, finished locations. Use deep-pattern escutcheons if required to conceal protruding fittings. Comply with escutcheon requirements specified in Division 22 Section "Escutcheons for Plumbing Piping."
- E. Seal joints between lavatories and counters and walls using sanitary-type, one-part, mildew-resistant silicone sealant. Match sealant color to fixture color. Comply with sealant requirements specified in Division 07 Section "Joint Sealants."
- F. Install protective shielding pipe covers and enclosures on exposed supplies and waste piping of accessible lavatories. Comply with requirements in Division 22 Section "Plumbing Piping Insulation."



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3.3 CONNECTIONS

- A. Connect fixtures with water supplies, stops, and risers, and with traps, soil, waste, and vent piping. Use size fittings required to match fixtures.
- B. Comply with water piping requirements specified in Division 22 Section "Domestic Water Piping."
- C. Comply with soil and waste piping requirements specified in Division 22 Section "Sanitary Waste and Vent Piping."

3.4 ADJUSTING

- A. Operate and adjust lavatories and controls. Replace damaged and malfunctioning lavatories, fittings, and controls.
- B. Adjust water pressure at faucets to produce proper flow.
- C. Install fresh batteries in battery-powered, electronic-sensor mechanisms.

3.5 CLEANING AND PROTECTION

- A. After completing installation of lavatories, inspect and repair damaged finishes.
- B. Clean lavatories, faucets, and other fittings with manufacturers' recommended cleaning methods and materials.
- C. Provide protective covering for installed lavatories and fittings.
- D. Do not allow use of lavatories for temporary facilities unless approved in writing by Owner.

END OF SECTION 22 42 16.13



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SECTION 22 42 16.16  
COMMERCIAL SINKS

PART 1 - GENERAL

1.1 SUMMARY

A. Section Includes:

1. Service basins.
2. Handwash sinks.
3. Sink faucets.
4. Laminar-flow, faucet-spout outlets.
5. Supply fittings.
6. Waste fittings.

1.2 ACTION SUBMITTALS

- A. Product Data: For each type of product.

1.3 INFORMATIONAL SUBMITTALS

- A. Coordination Drawings: Counter cutout templates for mounting of counter-mounted lavatories.

1.4 CLOSEOUT SUBMITTALS

- A. Maintenance data.

PART 2 - PRODUCTS

2.1 SERVICE BASINS

- A. Service Basins: Plastic, floor mounted.

1. Basis-of-Design Product: Subject to compliance with requirements, provide product indicated on Drawings or comparable product by one of the following:
  - a. Crane Plumbing, L.L.C.
  - b. Ferguson Enterprises, Inc.; ProFlo Brand.
  - c. Florestone Products Co., Inc.
  - d. Mustee, E. L., & Sons, Inc.
  - e. Swan Corporation (The).
  - f. Zurn Industries, LLC; Light Commercial Specialty Plumbing Products.
2. Fixture:



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- a. Standard: IAPMO/ANSI Z124.6.
  - b. Material: Cast polymer.
  - c. Nominal Size: 24 by 24 by 10 inches.
  - d. Tiling Flange: Not required.
  - e. Rim Guard: On all top surfaces.
  - f. Color: Not applicable.
  - g. Drain: Grid with NPS 3 outlet.
3. Mounting: On floor and flush to wall.
  4. Faucet: Refer to Plumbing Fixture Schedule on drawings.

### 2.2 HANDWASH SINKS

#### A. Handwash Sinks : Stainless steel, countertop mounted.

1. Manufacturers: Subject to compliance with requirements, provide products by one of the following:
  - a. Advance Tabco.
  - b. AERO Manufacturing Company.
  - c. Amtekco Industries, Inc.
  - d. Eagle Group; Foodservice Equipment Division.
  - e. Elkay Manufacturing Co.
  - f. Griffin Products, Inc.
  - g. Just Manufacturing.
2. Fixture:
  - a. Standards: ASME A112.19.3/CSA B45.4 and NSF/ANSI 2.
  - b. Refer to Plumbing Fixture Schedule in drawings for scheduled requirements.
3. Faucet: Refer to Plumbing Fixture Schedule in drawings for scheduled requirements.
4. Supply Fittings: Comply with requirements in "Supply Fittings" Article.
5. Waste Fittings: Comply with requirements in "Waste Fittings" Article.

### 2.3 SINK FAUCETS

- A. NSF Standard: Comply with NSF/ANSI 61, "Drinking Water System Components - Health Effects," for faucet-spout materials that will be in contact with potable water.
- B. Sink Faucets: Manual type. Refer to Plumbing Fixture Schedule for additional requirements.
  1. Basis-of-Design Product: Subject to compliance with requirements, provide product indicated on Drawings or comparable product by one of the following:
    - a. American Standard America.
    - b. Chicago Faucets.
    - c. Delta Faucet Company.
    - d. Elkay Manufacturing Co.
    - e. Just Manufacturing.



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- f. Kohler Co.
- g. Moen Incorporated.
- h. Speakman Company.
- i. T & S Brass and Bronze Works, Inc.
- j. Zurn Industries, LLC; Commercial Brass and Fixtures.
- k. Advance Tabco.

2.4 SUPPLY FITTINGS

- A. NSF Standard: Comply with NSF/ANSI 61, "Drinking Water System Components - Health Effects," for supply-fitting materials that will be in contact with potable water.
- B. Standard: ASME A112.18.1/CSA B125.1.
- C. Supply Piping: Chrome-plated brass pipe or chrome-plated copper tube matching water-supply piping size. Include chrome-plated brass or stainless-steel wall flange.
- D. Supply Stops: Chrome-plated brass, one-quarter-turn, ball-type or compression valve with inlet connection matching supply piping.
- E. Operation: Wheel handle.
- F. Risers:
  - 1. NPS 3/8
  - 2. ASME A112.18.6, braided or corrugated stainless-steel flexible hose.

2.5 WASTE FITTINGS

- A. Standard: ASME A112.18.2/CSA B125.2.
- B. Drain: Grid type with NPS 1-1/2 offset and straight tailpiece.
- C. Trap:
  - 1. Size: NPS 1-1/2.
  - 2. Material: Chrome-plated, two-piece, cast-brass trap and swivel elbow with 0.032-inch-thick brass tube to wall; and chrome-plated brass or steel wall flange.
  - 3. Material: Stainless-steel, two-piece trap and swivel elbow with 0.012-inch-thick stainless-steel tube to wall; and stainless-steel wall flange.

PART 3 - EXECUTION

3.1 EXAMINATION

- A. Examine roughing-in of water supply and sanitary drainage and vent piping systems to verify actual locations of piping connections before sink installation.
- B. Examine walls, floors, and counters for suitable conditions where sinks will be installed.



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

### 3.2 INSTALLATION

- A. Install sinks level and plumb according to roughing-in drawings.
- B. Install supports, affixed to building substrate, for wall-hung sinks.
- C. Install accessible wall-mounted sinks at handicapped/elderly mounting height according to ICC/ANSI A117.1.
- D. Set floor-mounted sinks in leveling bed of cement grout.
- E. Install water-supply piping with stop on each supply to each sink faucet.
  - 1. Exception: Use ball, gate, or globe valves if supply stops are not specified with sink. Comply with valve requirements specified in Division 22 Section "General-Duty Valves for Plumbing Piping."
  - 2. Install stops in locations where they can be easily reached for operation.
- F. Install wall flanges or escutcheons at piping wall penetrations in exposed, finished locations. Use deep-pattern escutcheons if required to conceal protruding fittings. Comply with escutcheon requirements specified in Division 22 Section "Escutcheons for Plumbing Piping."
- G. Seal joints between sinks and counters, floors, and walls using sanitary-type, one-part, mildew-resistant silicone sealant. Match sealant color to fixture color. Comply with sealant requirements specified in Division 07 Section "Joint Sealants."
- H. Install protective shielding pipe covers and enclosures on exposed supplies and waste piping of accessible sinks. Comply with requirements in Division 22 Section "Plumbing Piping Insulation."

### 3.3 CONNECTIONS

- A. Connect sinks with water supplies, stops, and risers, and with traps, soil, waste, and vent piping. Use size fittings required to match fixtures.
- B. Comply with water piping requirements specified in Division 22 Section "Domestic Water Piping."
- C. Comply with soil and waste piping requirements specified in Division 22 Section "Sanitary Waste and Vent Piping."

### 3.4 ADJUSTING

- A. Operate and adjust sinks and controls. Replace damaged and malfunctioning sinks, fittings, and controls.
- B. Adjust water pressure at faucets to produce proper flow.



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3.5 CLEANING AND PROTECTION

- A. After completing installation of sinks, inspect and repair damaged finishes.
- B. Clean sinks, faucets, and other fittings with manufacturers' recommended cleaning methods and materials.
- C. Provide protective covering for installed sinks and fittings.
- D. Do not allow use of sinks for temporary facilities unless approved in writing by Owner.

END OF SECTION 22 42 16.16



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**Division 23**  
Heating, Ventilating and Air Conditioning





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SECTION 23 05 00  
COMMON WORK RESULTS FOR HVAC

PART 1 - GENERAL

1.1 SUMMARY

- A. This Section includes the following:
1. Equipment installation requirements common to equipment sections.
  2. Supports and anchorages.

1.2 DEFINITIONS

- A. Finished Spaces: Spaces other than mechanical and electrical equipment rooms, furred spaces, pipe and duct chases, unheated spaces immediately below roof, spaces above ceilings, unexcavated spaces, crawlspaces, and tunnels.
- B. Exposed, Interior Installations: Exposed to view indoors. Examples include finished occupied spaces and mechanical equipment rooms.
- C. Exposed, Exterior Installations: Exposed to view outdoors or subject to outdoor ambient temperatures and weather conditions. Examples include rooftop locations.
- D. Concealed, Interior Installations: Concealed from view and protected from physical contact by building occupants. Examples include above ceilings and chases.
- E. Concealed, Exterior Installations: Concealed from view and protected from weather conditions and physical contact by building occupants but subject to outdoor ambient temperatures. Examples include installations within unheated shelters.

1.3 SUBMITTALS

- A. Welding certificates.

1.4 QUALITY ASSURANCE

- A. Electrical Characteristics for HVAC Equipment: Equipment of higher electrical characteristics may be furnished provided such proposed equipment is approved in writing and connecting electrical services, circuit breakers, and conduit sizes are appropriately modified. If minimum energy ratings or efficiencies are specified, equipment shall comply with requirements.



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PART 2 - PRODUCTS (Not Applicable)

PART 3 - EXECUTION

3.1 EQUIPMENT INSTALLATION - COMMON REQUIREMENTS

- A. Install equipment to allow maximum possible headroom unless specific mounting heights are not indicated.
- B. Install equipment level and plumb, parallel and perpendicular to other building systems and components in exposed interior spaces, unless otherwise indicated.
- C. Install HVAC equipment to facilitate service, maintenance, and repair or replacement of components. Connect equipment for ease of disconnecting, with minimum interference to other installations. Extend grease fittings to accessible locations.

3.2 ERECTION OF METAL SUPPORTS AND ANCHORAGES

- A. Refer to Division 05 Section "Metal Fabrications" for structural steel.
- B. Cut, fit, and place miscellaneous metal supports accurately in location, alignment, and elevation to support and anchor HVAC materials and equipment.
- C. Field Welding: Comply with AWS D1.1.

3.3 ERECTION OF WOOD SUPPORTS AND ANCHORAGES

- A. Cut, fit, and place wood grounds, nailers, blocking, and anchorages to support, and anchor HVAC materials and equipment.
- B. Select fastener sizes that will not penetrate members if opposite side will be exposed to view or will receive finish materials. Tighten connections between members. Install fasteners without splitting wood members.
- C. Attach to substrates as required to support applied loads.

END OF SECTION 23 05 00



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SECTION 23 05 29  
HANGERS AND SUPPORTS FOR  
HVAC PIPING AND EQUIPMENT

PART 1 - GENERAL

1.1 SUMMARY

- A. This Section includes the following:
  - 1. Equipment supports.
- B. See Division 23 Section " Metal Ducts" for duct hangers and supports.

1.2 DEFINITIONS

- A. Terminology: As defined in MSS SP-90, "Guidelines on Terminology for Pipe Hangers and Supports."

1.3 PERFORMANCE REQUIREMENTS

- A. Design supports for multiple pipes capable of supporting combined weight of supported systems, system contents, and test water.
- B. Design equipment supports capable of supporting combined operating weight of supported equipment and connected systems and components.

1.4 SUBMITTALS

- A. Shop Drawings: Show fabrication and installation details and include calculations for the following:
  - 1. Equipment supports.

PART 2 - PRODUCTS

2.1 MANUFACTURERS

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



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### 2.2 FASTENER SYSTEMS

- A. Powder-Actuated Fasteners: Threaded-steel stud, for use in hardened portland cement concrete with pull-out, tension, and shear capacities appropriate for supported loads and building materials where used.
  - 1. Available Manufacturers:
    - a. Hilti, Inc.
    - b. ITW Ramset/Red Head.
    - c. Masterset Fastening Systems, Inc.
    - d. Powers Fasteners.
  
- B. Mechanical-Expansion Anchors: Insert-wedge-type zinc-coated steel, for use in hardened portland cement concrete with pull-out, tension, and shear capacities appropriate for supported loads and building materials where used.
  - 1. Available Manufacturers:
    - a. B-Line Systems, Inc.; a division of Cooper Industries.
    - b. Empire Industries, Inc.
    - c. Hilti, Inc.
    - d. ITW Ramset/Red Head.
    - e. Powers Fasteners.

### 2.3 EQUIPMENT SUPPORTS

- A. Description: Welded, shop- or field-fabricated equipment support made from structural-steel shapes.

### 2.4 MISCELLANEOUS MATERIALS

- A. Structural Steel: ASTM A 36/A 36M, steel plates, shapes, and bars; black and galvanized.
- B. Grout: ASTM C 1107, factory-mixed and -packaged, dry, hydraulic-cement, nonshrink and nonmetallic grout; suitable for interior and exterior applications.
  - 1. Properties: Nonstaining, noncorrosive, and nongaseous.
  - 2. Design Mix: 5000-psi, 28-day compressive strength.

## PART 3 - EXECUTION

### 3.1 HANGER AND SUPPORT APPLICATIONS

- A. Specific hanger and support requirements are specified in Sections specifying piping systems and equipment.
- B. Use hangers and supports with galvanized, metallic coatings for piping and equipment that will not have field-applied finish.



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- C. Hanger-Rod Attachments: Unless otherwise indicated and except as specified in piping system Sections, install the following types:
1. Steel Turnbuckles (MSS Type 13): For adjustment up to 6 inches for heavy loads.
  2. Steel Clevises (MSS Type 14): For 120 to 450 deg F piping installations.
- D. Building Attachments: Unless otherwise indicated and except as specified in piping system Sections, install the following types:
1. Steel or Malleable Concrete Inserts (MSS Type 18): For upper attachment to suspend pipe hangers from concrete ceiling.
  2. Top-Beam C-Clamps (MSS Type 19): For use under roof installations with bar-joint construction to attach to top flange of structural shape.
  3. Side-Beam or Channel Clamps (MSS Type 20): For attaching to bottom flange of beams, channels, or angles.
  4. Center-Beam Clamps (MSS Type 21): For attaching to center of bottom flange of beams.
  5. Welded Beam Attachments (MSS Type 22): For attaching to bottom of beams if loads are considerable and rod sizes are large.
  6. C-Clamps (MSS Type 23): For structural shapes.
  7. Welded-Steel Brackets: For support of pipes from below, or for suspending from above by using clip and rod. Use one of the following for indicated loads:
    - a. Light (MSS Type 31): 750 lb.
    - b. Medium (MSS Type 32): 1500 lb.
    - c. Heavy (MSS Type 33): 3000 lb.
  8. Side-Beam Brackets (MSS Type 34): For sides of steel or wooden beams.
  9. Plate Lugs (MSS Type 57): For attaching to steel beams if flexibility at beam is required.
- E. Spring Hangers and Supports: Unless otherwise indicated and except as specified in piping system Sections, install the following types:
1. Spring Cushions (MSS Type 48): For light loads if vertical movement does not exceed 1-1/4 inches.
- F. Comply with MSS SP-69 for trapeze pipe hanger selections and applications that are not specified in piping system Sections.
- G. Use powder-actuated fasteners or mechanical-expansion anchors instead of building attachments where required in concrete construction.

### 3.2 HANGER AND SUPPORT INSTALLATION

- A. Fastener System Installation:
1. Install powder-actuated fasteners in concrete after concrete is placed and completely cured. Use operators that are licensed by powder-actuated tool manufacturer. Install fasteners according to powder-actuated tool manufacturer's operating manual.
  2. Install mechanical-expansion anchors in concrete after concrete is placed and completely cured. Install fasteners according to manufacturer's written instructions.
- B. Install hangers and supports complete with necessary inserts, bolts, rods, nuts, washers, and other accessories.



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- C. Equipment Support Installation: Fabricate from welded-structural-steel shapes.
- D. Install building attachments within concrete slabs or attach to structural steel. Install additional attachments at concentrated loads, including valves, flanges, and strainers, NPS 2-1/2 and larger and at changes in direction of piping. Install concrete inserts before concrete is placed; fasten inserts to forms and install reinforcing bars through openings at top of inserts.
- E. Load Distribution: Install hangers and supports so piping live and dead loads and stresses from movement will not be transmitted to connected equipment.

### 3.3 EQUIPMENT SUPPORTS

- A. Fabricate structural-steel stands to suspend equipment from structure overhead or to support equipment above floor.
- B. Provide lateral bracing, to prevent swaying, for equipment supports.

### 3.4 METAL FABRICATIONS

- A. Cut, drill, and fit miscellaneous metal fabrications for trapeze pipe hangers and equipment supports.
- B. Fit exposed connections together to form hairline joints. Field weld connections that cannot be shop welded because of shipping size limitations.

### 3.5 ADJUSTING

- A. Hanger Adjustments: Adjust hangers to distribute loads equally on attachments and to achieve indicated slope of pipe.

### 3.6 PAINTING

- A. Touch Up: Clean field welds and abraded areas of shop paint. Paint exposed areas immediately after erecting hangers and supports. Use same materials as used for shop painting. Comply with SSPC-PA 1 requirements for touching up field-painted surfaces.
  - 1. Apply paint by brush or spray to provide minimum dry film thickness of 2.0 mils.
- B. Galvanized Surfaces: Clean welds, bolted connections, and abraded areas and apply galvanizing-repair paint to comply with ASTM A 780.

END OF SECTION 23 05 29



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SECTION 23 05 53  
IDENTIFICATION FOR HVAC PIPING AND EQUIPMENT

PART 1 - GENERAL

1.1 SUMMARY

- A. Section Includes:
1. Equipment labels.
  2. Warning signs and labels.
  3. Duct labels.

1.2 SUBMITTAL

- A. Product Data: For each type of product indicated.

PART 2 - PRODUCTS

2.1 EQUIPMENT LABELS

- A. Metal Labels for Equipment:
1. Material and Thickness: Stainless steel, 0.025-inch minimum thickness, and having predrilled or stamped holes for attachment hardware.
  2. Minimum Label Size: Length and width vary for required label content, but not less than 2-1/2 by 3/4 inch.
  3. Minimum Letter Size: 1/4 inch for name of units if viewing distance is less than 24 inches, 1/2 inch for viewing distances up to 72 inches, and proportionately larger lettering for greater viewing distances. Include secondary lettering two-thirds to three-fourths the size of principal lettering.
  4. Fasteners: Stainless-steel rivets or self-tapping screws.
  5. Adhesive: Contact-type permanent adhesive, compatible with label and with substrate.
- B. Plastic Labels for Equipment:
1. Material and Thickness: Multilayer, multicolor, plastic labels for mechanical engraving, 1/8 inch thick, and having predrilled holes for attachment hardware.
  2. Letter Color: Black.
  3. Background Color: White.
  4. Maximum Temperature: Able to withstand temperatures up to 160 deg F.
  5. Minimum Label Size: Length and width vary for required label content, but not less than 2-1/2 by 3/4 inch.
  6. Minimum Letter Size: 1/4 inch for name of units if viewing distance is less than 24 inches, 1/2 inch for viewing distances up to 72 inches, and proportionately larger lettering for greater viewing distances. Include secondary lettering two-thirds to three-fourths the size of principal lettering.



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7. Fasteners: Stainless-steel rivets or self-tapping screws.
  8. Adhesive: Contact-type permanent adhesive, compatible with label and with substrate.
- C. Label Content: Include equipment's Drawing designation or unique equipment number, Drawing numbers where equipment is indicated (plans, details, and schedules), plus the Specification Section number and title where equipment is specified.
- D. Equipment Label Schedule: For each item of equipment to be labeled, on 8-1/2-by-11-inch bond paper. Tabulate equipment identification number and identify Drawing numbers where equipment is indicated (plans, details, and schedules), plus the Specification Section number and title where equipment is specified. Equipment schedule shall be included in operation and maintenance data.

### 2.2 WARNING SIGNS AND LABELS

- A. Material and Thickness: Multilayer, multicolor, plastic labels for mechanical engraving, 1/8 inch thick, and having predrilled holes for attachment hardware.
- B. Letter Color: White.
- C. Background Color: Red.
- D. Maximum Temperature: Able to withstand temperatures up to 160 deg F.
- E. Minimum Label Size: Length and width vary for required label content, but not less than 2-1/2 by 3/4 inch.
- F. Minimum Letter Size: 1/4 inch for name of units if viewing distance is less than 24 inches, 1/2 inch for viewing distances up to 72 inches, and proportionately larger lettering for greater viewing distances. Include secondary lettering two-thirds to three-fourths the size of principal lettering.
- G. Fasteners: Stainless-steel rivets or self-tapping screws.
- H. Adhesive: Contact-type permanent adhesive, compatible with label and with substrate.
- I. Label Content: Include caution and warning information, plus emergency notification instructions.

### 2.3 DUCT LABELS

- A. Material and Thickness: Multilayer, multicolor, plastic labels for mechanical engraving, 1/8 inch thick, and having predrilled holes for attachment hardware.
- B. Letter Color: Black.
- C. Background Color: As required by duct system.
- D. Maximum Temperature: Able to withstand temperatures up to 160 deg F.



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- E. Minimum Label Size: Length and width vary for required label content, but not less than 2-1/2 by 3/4 inch.
- F. Minimum Letter Size: 1/4 inch for name of units if viewing distance is less than 24 inches, 1/2 inch for viewing distances up to 72 inches, and proportionately larger lettering for greater viewing distances. Include secondary lettering two-thirds to three-fourths the size of principal lettering.
- G. Fasteners: Stainless-steel rivets or self-tapping screws.
- H. Adhesive: Contact-type permanent adhesive, compatible with label and with substrate.
- I. Duct Label Contents: Include identification of duct service using same designations or abbreviations as used on Drawings, duct size, and an arrow indicating flow direction.
  - 1. Flow-Direction Arrows: Integral with duct system service lettering to accommodate both directions, or as separate unit on each duct label to indicate flow direction.
  - 2. Lettering Size: At least 1-1/2 inches high.

### PART 3 - EXECUTION

#### 3.1 PREPARATION

- A. Clean piping and equipment surfaces of substances that could impair bond of identification devices, including dirt, oil, grease, release agents, and incompatible primers, paints, and encapsulants.

#### 3.2 EQUIPMENT LABEL INSTALLATION

- A. Install or permanently fasten labels on each major item of mechanical equipment.
- B. Locate equipment labels where accessible and visible.

#### 3.3 DUCT LABEL INSTALLATION

- A. Install self-adhesive duct labels with permanent adhesive on air ducts in the following color codes:
  - 1. Blue: For cold-air supply ducts.
  - 2. Yellow: For hot-air supply ducts.
  - 3. Green: For exhaust-, outside-, relief-, return-, and mixed-air ducts.
  - 4. ASME A13.1 Colors and Designs: For hazardous material exhaust.
- B. Locate labels near points where ducts enter into concealed spaces and at maximum intervals of 50 feet in each space where ducts are exposed or concealed by removable ceiling system.

END OF SECTION 23 05 53



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SECTION 23 31 13  
METAL DUCTS

PART 1 - GENERAL

1.1 SUMMARY

A. Section Includes:

1. Rectangular ducts and fittings.
2. Round ducts and fittings.
3. Sheet metal materials.
4. Sealants and gaskets.
5. Hangers and supports.

B. Related Section:

1. Division 23 Section "Air Duct Accessories" for dampers, sound-control devices, duct-mounting access doors and panels, turning vanes, and flexible ducts.

1.2 PERFORMANCE REQUIREMENTS

- A. Delegated Duct Design: Duct construction, including sheet metal thicknesses, seam and joint construction, reinforcements, and hangers and supports, shall comply with SMACNA's "HVAC Duct Construction Standards - Metal and Flexible" and performance requirements and design criteria indicated in "Duct Schedule" Article.
- B. Structural Performance: Duct hangers and supports shall withstand the effects of gravity loads and stresses within limits and under conditions described in SMACNA's "HVAC Duct Construction Standards - Metal and Flexible"
- C. Airstream Surfaces: Surfaces in contact with the airstream shall comply with requirements in ASHRAE 62.1-2004.

1.3 SUBMITTALS

A. Product Data: For each type of product indicated.

B. Shop Drawings:

1. Fabrication, assembly, and installation, including plans, elevations, sections, components, and attachments to other work.
2. Factory- and shop-fabricated ducts and fittings.
3. Duct layout indicating sizes, configuration, liner material, and static-pressure classes.
4. Elevation of top of ducts.
5. Dimensions of main duct runs from building grid lines.
6. Fittings.
7. Reinforcement and spacing.



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8. Seam and joint construction.
  9. Penetrations through fire-rated and other partitions.
  10. Equipment installation based on equipment being used on Project.
  11. Locations for duct accessories, including dampers, turning vanes, and access doors and panels.
  12. Hangers and supports, including methods for duct and building attachment and vibration isolation.
- C. Coordination Drawings: Plans, drawn to scale, on which the following items are shown and coordinated with each other, using input from installers of the items involved:
1. Duct installation in congested spaces, indicating coordination with general construction, building components, and other building services. Indicate proposed changes to duct layout.
  2. Suspended ceiling components.
  3. Structural members to which duct will be attached.
  4. Size and location of initial access modules for acoustical tile.
  5. Penetrations of smoke barriers and fire-rated construction.
  6. Items penetrating finished ceiling including the following:
    - a. Lighting fixtures.
    - b. Air outlets and inlets.
    - c. Speakers.
    - d. Sprinklers.
    - e. Access panels.
    - f. Perimeter moldings.
- D. Welding certificates.

### 1.4 QUALITY ASSURANCE

- A. Welding Qualifications: Qualify procedures and personnel according to the following:
1. AWS D1.1/D1.1M, "Structural Welding Code - Steel," for hangers and supports.
  2. AWS D9.1M/D9.1, "Sheet Metal Welding Code," for duct joint and seam welding.
- B. ASHRAE Compliance: Applicable requirements in ASHRAE 62.1-2004, Section 5 - "Systems and Equipment" and Section 7 - "Construction and System Start-Up."
- C. ASHRAE/IESNA Compliance: Applicable requirements in ASHRAE/IESNA 90.1-2004, Section 6.4.4 - "HVAC System Construction and Insulation."

## PART 2 - PRODUCTS

### 2.1 RECTANGULAR DUCTS AND FITTINGS

- A. General Fabrication Requirements: Comply with SMACNA's "HVAC Duct Construction Standards - Metal and Flexible" based on indicated static-pressure class unless otherwise indicated.



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- B. Transverse Joints: Select joint types and fabricate according to SMACNA's "HVAC Duct Construction Standards - Metal and Flexible," Figure 1-4, "Transverse (Girth) Joints," for static-pressure class, applicable sealing requirements, materials involved, duct-support intervals, and other provisions in SMACNA's "HVAC Duct Construction Standards - Metal and Flexible."
- C. Longitudinal Seams: Select seam types and fabricate according to SMACNA's "HVAC Duct Construction Standards - Metal and Flexible," Figure 1-5, "Longitudinal Seams - Rectangular Ducts," for static-pressure class, applicable sealing requirements, materials involved, duct-support intervals, and other provisions in SMACNA's "HVAC Duct Construction Standards - Metal and Flexible."
- D. Elbows, Transitions, Offsets, Branch Connections, and Other Duct Construction: Select types and fabricate according to SMACNA's "HVAC Duct Construction Standards - Metal and Flexible," Chapter 2, "Fittings and Other Construction," for static-pressure class, applicable sealing requirements, materials involved, duct-support intervals, and other provisions in SMACNA's "HVAC Duct Construction Standards - Metal and Flexible."

### 2.2 ROUND DUCTS AND FITTINGS

- A. General Fabrication Requirements: Comply with SMACNA's "HVAC Duct Construction Standards - Metal and Flexible," Chapter 3, "Round, Oval, and Flexible Duct," based on indicated static-pressure class unless otherwise indicated.
  - 1. Manufacturers: Subject to compliance with requirements, provide products by one of the following:
    - a. Lindab Inc.
    - b. McGill AirFlow LLC.
    - c. SEMCO Incorporated.
    - d. Hamlin Sheet Metal, Inc.
- B. Transverse Joints: Select joint types and fabricate according to SMACNA's "HVAC Duct Construction Standards - Metal and Flexible," Figure 3-2, "Transverse Joints - Round Duct," for static-pressure class, applicable sealing requirements, materials involved, duct-support intervals, and other provisions in SMACNA's "HVAC Duct Construction Standards - Metal and Flexible."
- C. Longitudinal Seams: Select seam types and fabricate according to SMACNA's "HVAC Duct Construction Standards - Metal and Flexible," Figure 3-1, "Seams - Round Duct and Fittings," for static-pressure class, applicable sealing requirements, materials involved, duct-support intervals, and other provisions in SMACNA's "HVAC Duct Construction Standards - Metal and Flexible."
  - 1. Fabricate round ducts larger Than 90 inches in diameter with butt-welded longitudinal seams.
- D. Tees and Laterals: Select types and fabricate according to SMACNA's "HVAC Duct Construction Standards - Metal and Flexible," Figure 3-4, "90 Degree Tees and Laterals," and Figure 3-5, "Conical Tees," for static-pressure class, applicable sealing requirements, materials involved, duct-support intervals, and other provisions in SMACNA's "HVAC Duct Construction Standards - Metal and Flexible."



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### 2.3 SHEET METAL MATERIALS

- A. General Material Requirements: Comply with SMACNA's "HVAC Duct Construction Standards - Metal and Flexible" for acceptable materials, material thicknesses, and duct construction methods unless otherwise indicated. Sheet metal materials shall be free of pitting, seam marks, roller marks, stains, discolorations, and other imperfections.
- B. Galvanized Sheet Steel: Comply with ASTM A 653/A 653M.
  - 1. Galvanized Coating Designation: G90.
  - 2. Finishes for Surfaces Exposed to View: Mill phosphatized.
- C. Carbon-Steel Sheets: Comply with ASTM A 1008/A 1008M, with oiled, matte finish for exposed ducts.
- D. Stainless-Steel Sheets: Comply with ASTM A 480/A 480M, Type 304 or 316, as indicated in the "Duct Schedule" Article; cold rolled, annealed, sheet. Exposed surface finish shall be No. 2B, No. 2D, No. 3, or No. 4 as indicated in the "Duct Schedule" Article.
- E. Reinforcement Shapes and Plates: ASTM A 36/A 36M, steel plates, shapes, and bars; black and galvanized.
- F. Tie Rods: Galvanized steel, 1/4-inch minimum diameter for lengths 36 inches or less; 3/8-inch minimum diameter for lengths longer than 36 inches.

### 2.4 SEALANT AND GASKETS

- A. General Sealant and Gasket Requirements: Surface-burning characteristics for sealants and gaskets shall be a maximum flame-spread index of 25 and a maximum smoke-developed index of 50 when tested according to UL 723; certified by an NRTL.
- B. Two-Part Tape Sealing System:
  - 1. Tape: Woven cotton fiber impregnated with mineral gypsum and modified acrylic/silicone activator to react exothermically with tape to form hard, durable, airtight seal.
  - 2. Tape Width: 4 inches.
  - 3. Sealant: Modified styrene acrylic.
  - 4. Water resistant.
  - 5. Mold and mildew resistant.
  - 6. Maximum Static-Pressure Class: 10-inch wg, positive and negative.
  - 7. Service: Indoor and outdoor.
  - 8. Service Temperature: Minus 40 to plus 200 deg F.
  - 9. Substrate: Compatible with galvanized sheet steel (both PVC coated and bare), stainless steel, or aluminum.
  - 10. For indoor applications, use sealant that has a VOC content of 250 g/L or less when calculated according to 40 CFR 59, Subpart D (EPA Method 24).
- C. Water-Based Joint and Seam Sealant:
  - 1. Application Method: Brush on.
  - 2. Solids Content: Minimum 65 percent.
  - 3. Shore A Hardness: Minimum 20.
  - 4. Water resistant.



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5. Mold and mildew resistant.
6. VOC: Maximum 75 g/L (less water).
7. Maximum Static-Pressure Class: 10-inch wg, positive and negative.
8. Service: Indoor or outdoor.
9. Substrate: Compatible with galvanized sheet steel (both PVC coated and bare), stainless steel, or aluminum sheets.

D. Flanged Joint Sealant: Comply with ASTM C 920.

1. General: Single-component, acid-curing, silicone, elastomeric.
2. Type: S.
3. Grade: NS.
4. Class: 25.
5. Use: O.
6. For indoor applications, use sealant that has a VOC content of 250 g/L or less when calculated according to 40 CFR 59, Subpart D (EPA Method 24).

### 2.5 HANGERS AND SUPPORTS

- A. Hanger Rods for Noncorrosive Environments: Cadmium-plated steel rods and nuts.
- B. Hanger Rods for Corrosive Environments: Electrogalvanized, all-thread rods or galvanized rods with threads painted with zinc-chromate primer after installation.
- C. Strap and Rod Sizes: Comply with SMACNA's "HVAC Duct Construction Standards - Metal and Flexible," Table 4-1, "Rectangular Duct Hangers Minimum Size," and Table 4-2, "Minimum Hanger Sizes for Round Duct."
- D. Steel Cable End Connections: Cadmium-plated steel assemblies with brackets, swivel, and bolts designed for duct hanger service; with an automatic-locking and clamping device.
- E. Duct Attachments: Sheet metal screws, blind rivets, or self-tapping metal screws; compatible with duct materials.
- F. Trapeze and Riser Supports:
  1. Supports for Galvanized-Steel Ducts: Galvanized-steel shapes and plates.
  2. Supports for Stainless-Steel Ducts: Stainless-steel shapes and plates.

## PART 3 - EXECUTION

### 3.1 DUCT INSTALLATION

- A. Drawing plans, schematics, and diagrams indicate general location and arrangement of duct system. Indicated duct locations, configurations, and arrangements were used to size ducts and calculate friction loss for air-handling equipment sizing and for other design considerations. Install duct systems as indicated unless deviations to layout are approved on Shop Drawings and Coordination Drawings.



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- B. Install ducts according to SMACNA's "HVAC Duct Construction Standards - Metal and Flexible" unless otherwise indicated.
- C. Install round ducts in maximum practical lengths.
- D. Install ducts with fewest possible joints.
- E. Install factory- or shop-fabricated fittings for changes in direction, size, and shape and for branch connections.
- F. Unless otherwise indicated, install ducts vertically and horizontally, and parallel and perpendicular to building lines.
- G. Install ducts close to walls, overhead construction, columns, and other structural and permanent enclosure elements of building.
- H. Install ducts with a clearance of 1 inch, plus allowance for insulation thickness.
- I. Where ducts pass through non-fire-rated interior partitions and exterior walls and are exposed to view, cover the opening between the partition and duct or duct insulation with sheet metal flanges of same metal thickness as the duct. Overlap openings on four sides by at least 1-1/2 inches.
- J. Protect duct interiors from moisture, construction debris and dust, and other foreign materials. Comply with SMACNA's "Duct Cleanliness for New Construction Guidelines."

### 3.2 INSTALLATION OF EXPOSED DUCTWORK

- A. Protect ducts exposed in finished spaces from being dented, scratched, or damaged.
- B. Trim duct sealants flush with metal. Create a smooth and uniform exposed bead. Do not use two-part tape sealing system.
- C. Maintain consistency, symmetry, and uniformity in the arrangement and fabrication of fittings, hangers and supports, duct accessories, and air outlets.
- D. Repair or replace damaged sections and finished work that does not comply with these requirements.

### 3.3 DUCT SEALING

- A. Seal ducts for duct static-pressure, seal classes, and leakage classes specified in "Duct Schedule" Article according to SMACNA's "HVAC Duct Construction Standards - Metal and Flexible."
- B. Seal ducts to the following seal classes according to SMACNA's "HVAC Duct Construction Standards - Metal and Flexible":
  - 1. Comply with SMACNA's "HVAC Duct Construction Standards - Metal and Flexible."
  - 2. Outdoor, Supply-Air Ducts: Seal Class A.
  - 3. Outdoor, Exhaust Ducts: Seal Class C.



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4. Outdoor, Return-Air Ducts: Seal Class C.
5. Unconditioned Space, Supply-Air Ducts in Pressure Classes 2-Inch wg and Lower: Seal Class B.
6. Unconditioned Space, Supply-Air Ducts in Pressure Classes Higher Than 2-Inch wg: Seal Class A.
7. Unconditioned Space, Exhaust Ducts: Seal Class C.
8. Unconditioned Space, Return-Air Ducts: Seal Class B.
9. Conditioned Space, Supply-Air Ducts in Pressure Classes 2-Inch wg and Lower: Seal Class C.
10. Conditioned Space, Supply-Air Ducts in Pressure Classes Higher Than 2-Inch wg: Seal Class B.
11. Conditioned Space, Exhaust Ducts: Seal Class B.
12. Conditioned Space, Return-Air Ducts: Seal Class C.

### 3.4 HANGER AND SUPPORT INSTALLATION

- A. Comply with SMACNA's "HVAC Duct Construction Standards - Metal and Flexible," Chapter 4, "Hangers and Supports."
- B. Building Attachments: Concrete inserts, powder-actuated fasteners, or structural-steel fasteners appropriate for construction materials to which hangers are being attached.
  1. Where practical, install concrete inserts before placing concrete.
  2. Install powder-actuated concrete fasteners after concrete is placed and completely cured.
  3. Use powder-actuated concrete fasteners for standard-weight aggregate concretes or for slabs more than 4 inches thick.
  4. Do not use powder-actuated concrete fasteners for lightweight-aggregate concretes or for slabs less than 4 inches thick.
  5. Do not use powder-actuated concrete fasteners for seismic restraints.
- C. Hanger Spacing: Comply with SMACNA's "HVAC Duct Construction Standards - Metal and Flexible," Table 4-1, "Rectangular Duct Hangers Minimum Size," and Table 4-2, "Minimum Hanger Sizes for Round Duct," for maximum hanger spacing; install hangers and supports within 24 inches of each elbow and within 48 inches of each branch intersection.
- D. Hangers Exposed to View: Threaded rod and angle or channel supports.
- E. Support vertical ducts with steel angles or channel secured to the sides of the duct with welds, bolts, sheet metal screws, or blind rivets; support at each floor and at a maximum intervals of 16 feet.
- F. Install upper attachments to structures. Select and size upper attachments with pull-out, tension, and shear capacities appropriate for supported loads and building materials where used.

### 3.5 CONNECTIONS

- A. Make connections to equipment with flexible connectors complying with Division 23 Section "Air Duct Accessories."
- B. Comply with SMACNA's "HVAC Duct Construction Standards - Metal and Flexible" for branch, outlet and inlet, and terminal unit connections.



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## 3.6 DUCT SCHEDULE

### A. Exhaust Ducts:

1. Ducts Connected to Fans Exhausting (ASHRAE 62.1, Class 1 and 2) Air:
  - a. Pressure Class: Negative 1-inch wg.
  - b. Minimum SMACNA Seal Class: C if negative pressure, and A if positive pressure.
  - c. SMACNA Leakage Class for Rectangular: 12.
  - d. SMACNA Leakage Class for Round and Flat Oval: 6.
2. Ducts Connected to Equipment Not Listed Above:
  - a. Pressure Class: Positive or negative 2-inch wg.
  - b. Minimum SMACNA Seal Class: B if negative pressure, and A if positive pressure.
  - c. SMACNA Leakage Class for Rectangular: 12.
  - d. SMACNA Leakage Class for Round and Flat Oval: 6.

### B. Intermediate Reinforcement:

1. Galvanized-Steel Ducts: Galvanized steel.

### C. Elbow Configuration:

1. Rectangular Duct: Comply with SMACNA's "HVAC Duct Construction Standards - Metal and Flexible," Figure 2-2, "Rectangular Elbows."
  - a. Velocity 1000 fpm or Lower:
    - 1) Radius Type RE 1 with minimum 0.5 radius-to-diameter ratio.
    - 2) Mitered Type RE 4 without vanes.
  - b. Velocity 1000 to 1500 fpm:
    - 1) Radius Type RE 1 with minimum 1.0 radius-to-diameter ratio.
    - 2) Radius Type RE 3 with minimum 0.5 radius-to-diameter ratio and two vanes.
    - 3) Mitered Type RE 2 with vanes complying with SMACNA's "HVAC Duct Construction Standards - Metal and Flexible," Figure 2-3, "Vanes and Vane Runners," and Figure 2-4, "Vane Support in Elbows."
  - c. Velocity 1500 fpm or Higher:
    - 1) Radius Type RE 1 with minimum 1.5 radius-to-diameter ratio.
    - 2) Radius Type RE 3 with minimum 1.0 radius-to-diameter ratio and two vanes.
    - 3) Mitered Type RE 2 with vanes complying with SMACNA's "HVAC Duct Construction Standards - Metal and Flexible," Figure 2-3, "Vanes and Vane Runners," and Figure 2-4, "Vane Support in Elbows."
2. Rectangular Duct: Comply with SMACNA's "HVAC Duct Construction Standards - Metal and Flexible," Figure 2-2, "Rectangular Elbows."
  - a. Radius Type RE 1 with minimum 1.5 radius-to-diameter ratio.
  - b. Radius Type RE 3 with minimum 1.0 radius-to-diameter ratio and two vanes.



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- c. Mitered Type RE 2 with vanes complying with SMACNA's "HVAC Duct Construction Standards - Metal and Flexible," Figure 2-3, "Vanes and Vane Runners," and Figure 2-4, "Vane Support in Elbows."
3. Round Duct: Comply with SMACNA's "HVAC Duct Construction Standards - Metal and Flexible," Figure 3-3, "Round Duct Elbows."
  - a. Minimum Radius-to-Diameter Ratio and Elbow Segments: Comply with SMACNA's "HVAC Duct Construction Standards - Metal and Flexible," Table 3-1, "Mitered Elbows." Elbows with less than 90-degree change of direction have proportionately fewer segments.
    - 1) Velocity 1000 fpm or Lower: 0.5 radius-to-diameter ratio and three segments for 90-degree elbow.
    - 2) Velocity 1000 to 1500 fpm: 1.0 radius-to-diameter ratio and four segments for 90-degree elbow.
    - 3) Velocity 1500 fpm or Higher: 1.5 radius-to-diameter ratio and five segments for 90-degree elbow.
    - 4) Radius-to Diameter Ratio: 1.5.
  - b. Round Elbows, 12 Inches and Smaller in Diameter: Stamped or pleated.
  - c. Round Elbows, 14 Inches and Larger in Diameter: Standing seam.

### D. Branch Configuration:

1. Rectangular Duct: Comply with SMACNA's "HVAC Duct Construction Standards - Metal and Flexible," Figure 2-6, "Branch Connections."
  - a. Rectangular Main to Rectangular Branch: 45-degree entry.
  - b. Rectangular Main to Round Branch: Spin in.
2. Round: Comply with SMACNA's "HVAC Duct Construction Standards - Metal and Flexible," Figure 3-4, "90 Degree Tees and Laterals," and Figure 3-5, "Conical Tees." Saddle taps are permitted in existing duct.
  - a. Velocity 1000 fpm or Lower: 90-degree tap.
  - b. Velocity 1000 to 1500 fpm: Conical tap.
  - c. Velocity 1500 fpm or Higher: 45-degree lateral.

END OF SECTION 23 31 13



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SECTION 23 33 00  
AIR DUCT ACCESSORIES

PART 1 - GENERAL

1.1 SUMMARY

- A. Section Includes:
1. Backdraft and pressure relief dampers.
  2. Manual volume dampers.
  3. Duct accessory hardware.

1.2 SUBMITTALS

- A. Product Data: For each type of product indicated.
- B. Shop Drawings: For duct accessories. Include plans, elevations, sections, details and attachments to other work.
1. Detail duct accessories fabrication and installation in ducts and other construction. Include dimensions, weights, loads, and required clearances; and method of field assembly into duct systems and other construction. Include the following:
    - a. Special fittings.
    - b. Manual volume damper installations.
    - c. Control damper installations.
    - d. Wiring Diagrams: For power, signal, and control wiring.
- C. Operation and maintenance data.

1.3 QUALITY ASSURANCE

- A. Comply with NFPA 90A, "Installation of Air Conditioning and Ventilating Systems," and with NFPA 90B, "Installation of Warm Air Heating and Air Conditioning Systems."
- B. Comply with AMCA 500-D testing for damper rating.

PART 2 - PRODUCTS

2.1 MATERIALS

- A. Comply with SMACNA's "HVAC Duct Construction Standards - Metal and Flexible" for acceptable materials, material thicknesses, and duct construction methods unless otherwise indicated. Sheet metal materials shall be free of pitting, seam marks, roller marks, stains, discolorations, and other imperfections.



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- B. Galvanized Sheet Steel: Comply with ASTM A 653/A 653M.
  - 1. Galvanized Coating Designation: G90.
  - 2. Exposed-Surface Finish: Mill phosphatized.
- C. Reinforcement Shapes and Plates: Galvanized-steel reinforcement where installed on galvanized sheet metal ducts; compatible materials for aluminum and stainless-steel ducts.
- D. Tie Rods: Galvanized steel, 1/4-inch minimum diameter for lengths 36 inches or less; 3/8-inch minimum diameter for lengths longer than 36 inches.

### 2.2 BACKDRAFT AND PRESSURE RELIEF DAMPERS

- A. Manufacturers: Subject to compliance with requirements, provide products by one of the following:
  - 1. Air Balance Inc.; a division of Mestek, Inc.
  - 2. Cesco Products; a division of Mestek, Inc.
  - 3. Greenheck Fan Corporation.
  - 4. Nailor Industries Inc.
  - 5. Ruskin Company.
  - 6. SEMCO Incorporated.
- B. Description: Gravity balanced.
- C. Maximum Air Velocity: 3000 fpm.
- D. Maximum System Pressure: 2-inch wg.
- E. Frame: 0.052-inch- thick, galvanized sheet steel, with welded corners and mounting flange.
- F. Blades: Multiple single-piece blades, center-pivoted, maximum 6-inch width, 0.050-inch- thick aluminum sheet with sealed edges.
- G. Blade Action: Parallel.
- H. Blade Seals: Neoprene, mechanically locked.
- I. Blade Axles:
  - 1. Material: Galvanized steel.
  - 2. Diameter: 0.20 inch.
- J. Tie Bars and Brackets: Galvanized steel.
- K. Return Spring: Adjustable tension.
- L. Bearings: Steel ball or synthetic pivot bushings.
- M. Accessories:
  - 1. Adjustment device to permit setting for varying differential static pressure.



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2. Counterweights and spring-assist kits for vertical airflow installations.
3. Electric actuators.
4. Chain pulls.
5. Screen Mounting: Front mounted in sleeve.
  - a. Sleeve Thickness: 20-gage minimum.
  - b. Sleeve Length: 6 inches minimum.
6. Screen Mounting: Rear mounted.
7. Screen Material: Galvanized steel.
8. Screen Type: Insect.
9. 90-degree stops.

### 2.3 MANUAL VOLUME DAMPERS

#### A. Standard, Steel, Manual Volume Dampers:

1. Manufacturers: Subject to compliance with requirements, provide products by one of the following:
  - a. Air Balance Inc.; a division of Mestek, Inc.
  - b. Flexmaster U.S.A., Inc.
  - c. McGill AirFlow LLC.
  - d. METALAIRE, Inc.
  - e. Nailor Industries Inc.
  - f. Ruskin Company.
  - g. Vent Products Company, Inc.
2. Standard leakage rating, with linkage outside airstream.
3. Suitable for horizontal or vertical applications.
4. Frames:
  - a. Hat-shaped, galvanized-steel channels, 0.064-inch minimum thickness.
  - b. Mitered and welded corners.
  - c. Flanges for attaching to walls and flangeless frames for installing in ducts.
5. Blades:
  - a. Multiple or single blade.
  - b. Parallel- or opposed-blade design.
  - c. Stiffen damper blades for stability.
  - d. Galvanized-steel, 0.064 inch thick.
6. Blade Axles: Galvanized steel.
7. Bearings:
  - a. Oil-impregnated bronze.
  - b. Dampers in ducts with pressure classes of 3-inch wg or less shall have axles full length of damper blades and bearings at both ends of operating shaft.
8. Tie Bars and Brackets: Galvanized steel.

#### B. Jackshaft:



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1. Size: 1-inch diameter.
2. Material: Galvanized-steel pipe rotating within pipe-bearing assembly mounted on supports at each mullion and at each end of multiple-damper assemblies.
3. Length and Number of Mountings: As required to connect linkage of each damper in multiple-damper assembly.

C. Damper Hardware:

1. Zinc-plated, die-cast core with dial and handle made of 3/32-inch- thick zinc-plated steel, and a 3/4-inch hexagon locking nut.
2. Include center hole to suit damper operating-rod size.
3. Include elevated platform for insulated duct mounting.

### 2.4 DUCT ACCESSORY HARDWARE

- A. Instrument Test Holes: Cast iron or cast aluminum to suit duct material, including screw cap and gasket. Size to allow insertion of pitot tube and other testing instruments and of length to suit duct-insulation thickness.
- B. Adhesives: High strength, quick setting, neoprene based, waterproof, and resistant to gasoline and grease.

## PART 3 - EXECUTION

### 3.1 INSTALLATION

- A. Install duct accessories according to applicable details in SMACNA's "HVAC Duct Construction Standards - Metal and Flexible" for metal ducts and in NAIMA AH116, "Fibrous Glass Duct Construction Standards," for fibrous-glass ducts.
- B. Install duct accessories of materials suited to duct materials; use galvanized-steel accessories in galvanized-steel and fibrous-glass ducts, stainless-steel accessories in stainless-steel ducts, and aluminum accessories in aluminum ducts.
- C. Install volume dampers at points on supply, return, and exhaust systems where branches extend from larger ducts, as required for air balancing. Where dampers are installed in ducts having duct liner, install dampers with hat channels of same depth as liner, and terminate liner with nosing at hat channel.
  1. Install steel volume dampers in steel ducts.
  2. Install aluminum volume dampers in aluminum ducts.
- D. Set dampers to fully open position before testing, adjusting, and balancing.
- E. Install test holes at fan inlets and outlets and elsewhere as indicated.
- F. Install duct test holes where required for testing and balancing purposes.



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3.2 FIELD QUALITY CONTROL

A. Tests and Inspections:

1. Operate dampers to verify full range of movement.
2. Inspect turning vanes for proper and secure installation.

END OF SECTION 23 33 00



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SECTION 23 34 23  
HVAC POWER VENTILATORS

PART 1 - GENERAL

1.1 SUMMARY

A. This Section includes the following:

1. Ceiling-mounting ventilators.
2. In-line centrifugal fans.

1.2 SUBMITTALS

- A. Product Data: Include rated capacities, furnished specialties, and accessories for each type of product indicated and include the following:
- B. Shop Drawings: Detail equipment assemblies and indicate dimensions, weights, loads, required clearances, method of field assembly, components, and location and size of each field connection.
- C. Field quality-control test reports.
- D. Operation and maintenance data.

1.3 QUALITY ASSURANCE

- A. Electrical Components, Devices, and Accessories: Listed and labeled as defined in NFPA 70, Article 100, by a testing agency acceptable to authorities having jurisdiction, and marked for intended use.
- B. NEMA Compliance: Motors and electrical accessories shall comply with NEMA standards.
- C. UL Standard: Power ventilators shall comply with UL 705.

PART 2 - PRODUCTS

2.1 CEILING-MOUNTING VENTILATORS

- A. Manufacturers: Subject to compliance with requirements, provide products by one of the following:
  1. Broan Mfg. Co., Inc.
  2. Carnes Company HVAC.
  3. Greenheck.
  4. Loren Cook Company.



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5. NuTone Inc.
  6. Penn Ventilation.
- B. Description: Centrifugal fans designed for installing in ceiling or wall or for concealed in-line applications.
- C. Housing: Steel, lined with acoustical insulation.
- D. Fan Wheel: Centrifugal wheels directly mounted on motor shaft. Fan shrouds, motor, and fan wheel shall be removable for service.
- E. Grille: Plastic, louvered grille with flange on intake and thumbscrew attachment to fan housing.
- F. Electrical Requirements: Junction box for electrical connection on housing and receptacle for motor plug-in.
- G. Accessories:
1. Manual Starter Switch: Single-pole rocker switch assembly with cover and pilot light.
  2. Time-Delay Switch: Assembly with single-pole rocker switch, timer, and cover plate.
  3. Ceiling Radiation Damper: Fire-rated assembly with ceramic blanket, stainless-steel springs, and fusible link.
  4. Manufacturer's standard roof jack or wall cap, and transition fittings.

### 2.2 IN-LINE CENTRIFUGAL FANS

- A. Manufacturers: Subject to compliance with requirements, provide products by one of the following:
1. Carnes Company HVAC.
  2. Greenheck.
  3. Loren Cook Company.
  4. Penn Ventilation.
- B. Description: In-line, direct or belt-driven centrifugal fans (as scheduled on the drawings) consisting of housing, wheel, outlet guide vanes, fan shaft, bearings, motor and disconnect switch, drive assembly, mounting brackets, and accessories.
- C. Housing: Split, spun aluminum with aluminum straightening vanes, inlet and outlet flanges, and support bracket adaptable to floor, side wall, or ceiling mounting.
- D. Direct-Driven Units: Motor mounted in airstream, factory wired to disconnect switch located on outside of fan housing.
- E. Belt-Driven Units: Motor mounted on adjustable base, with adjustable sheaves, enclosure around belts within fan housing, and lubricating tubes from fan bearings extended to outside of fan housing.
- F. Fan Wheels: Aluminum, airfoil blades welded to aluminum hub.
- G. Accessories:



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1. Volume-Control Damper: Manually operated with quadrant lock, located in fan outlet.
2. Companion Flanges: For inlet and outlet duct connections.
3. Fan Guards: 1/2- by 1-inch mesh of galvanized steel in removable frame. Provide guard for inlet or outlet for units not connected to ductwork.
4. Motor and Drive Cover (Belt Guard): Epoxy-coated steel.

### 2.3 MOTORS

- A. Enclosure Type: Totally enclosed, fan cooled.

## PART 3 - EXECUTION

### 3.1 INSTALLATION

- A. Install power ventilators level and plumb.
- B. Support units using elastomeric mounts or spring isolators having a static deflection of 1 inch.
  1. Secure vibration controls to concrete bases using anchor bolts cast in concrete base.
- C. Install floor-mounting units on concrete bases.
- D. Ceiling Units: Suspend units from structure; use steel wire or metal straps.
- E. Support suspended units from structure using threaded steel rods and elastomeric hangers or spring hangers having a static deflection of 1 inch.
- F. Install units with clearances for service and maintenance.
- G. Label units according to requirements specified in Division 23 Section "Identification for HVAC Piping and Equipment."
- H. Duct installation and connection requirements are specified in other Division 23 Sections. Drawings indicate general arrangement of ducts and duct accessories. Make final duct connections with flexible connectors. Flexible connectors are specified in Division 23 Section "Air Duct Accessories."
- I. Install ducts adjacent to power ventilators to allow service and maintenance.
- J. Ground equipment according to Division 26 Section "Grounding and Bonding for Electrical Systems."

### 3.2 FIELD QUALITY CONTROL

- A. Perform the following field tests and inspections and prepare test reports:
  1. Verify that shipping, blocking, and bracing are removed.



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2. Verify that unit is secure on mountings and supporting devices and that connections to ducts and electrical components are complete. Verify that proper thermal-overload protection is installed in motors, starters, and disconnect switches.
  3. Verify that cleaning and adjusting are complete.
  4. Disconnect fan drive from motor, verify proper motor rotation direction, and verify fan wheel free rotation and smooth bearing operation. Reconnect fan drive system, align and adjust belts, and install belt guards.
  5. Adjust belt tension.
  6. Adjust damper linkages for proper damper operation.
  7. Verify lubrication for bearings and other moving parts.
  8. Verify that manual and automatic volume control and fire and smoke dampers in connected ductwork systems are in fully open position.
  9. Disable automatic temperature-control operators, energize motor and adjust fan to indicated rpm, and measure and record motor voltage and amperage.
  10. Shut unit down and reconnect automatic temperature-control operators.
  11. Remove and replace malfunctioning units and retest as specified above.
- B. Test and adjust controls and safeties. Replace damaged and malfunctioning controls and equipment.

END OF SECTION 23 34 23



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SECTION 23 37 13  
DIFFUSERS, REGISTERS, AND GRILLES

PART 1 - GENERAL

1.1 SUMMARY

A. Section Includes:

1. Adjustable bar registers and grilles.
2. Fixed face registers and grilles.

B. Related Sections:

1. Division 23 Section "Air Duct Accessories" for fire and smoke dampers and volume-control dampers not integral to diffusers, registers, and grilles.

1.2 SUBMITTALS

A. Product Data: For each type of product indicated, include the following:

1. Data Sheet: Indicate materials of construction, finish, and mounting details; and performance data including throw and drop, static-pressure drop, and noise ratings.
2. Diffuser, Register, and Grille Schedule: Indicate drawing designation, room location, quantity, model number, size, and accessories furnished.

B. Samples: For each exposed product and for each color and texture specified.

PART 2 - PRODUCTS

2.1 REGISTERS AND GRILLES

A. Adjustable Bar Register:

1. Manufacturers: Subject to compliance with requirements, provide products by one of the following:
  - a. Anemostat Products; a Mestek company.
  - b. Carnes.
  - c. Hart & Cooley Inc.
  - d. Krueger.
  - e. METALAIRE, Inc.
  - f. Nailor Industries Inc.
  - g. Price Industries.
  - h. Titus.
  - i. Tuttle & Bailey.



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2. Material: Steel.
3. Finish: Baked enamel, white.
  - a. Refer to mechanical drawings for scheduled requirements.

### B. Fixed Face Register:

1. Manufacturers: Subject to compliance with requirements, provide products by one of the following:
  - a. Anemostat Products; a Mestek company.
  - b. Carnes.
  - c. Hart & Cooley Inc.
  - d. Krueger.
  - e. Nailor Industries Inc.
  - f. Price Industries.
  - g. Titus.
  - h. Tuttle & Bailey.
2. Material: Steel.
3. Finish: Baked enamel, white.
  - a. Refer to mechanical drawings for scheduled requirements.

### C. Fixed Face Grille:

- D. Manufacturers: Subject to compliance with requirements, provide products by one of the following:
  - a. Anemostat Products; a Mestek company.
  - b. Carnes.
  - c. Hart & Cooley Inc.
  - d. Krueger.
  - e. Nailor Industries Inc.
  - f. Price Industries.
  - g. Titus.
  - h. Tuttle & Bailey.
2. Material: Steel.
3. Finish: Baked enamel, white.
  - a. Refer to mechanical drawings for scheduled requirements.

## 2.2 SOURCE QUALITY CONTROL

- A. Verification of Performance: Rate diffusers, registers, and grilles according to ASHRAE 70, "Method of Testing for Rating the Performance of Air Outlets and Inlets."



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PART 3 - EXECUTION

3.1 INSTALLATION

- A. Install diffusers, registers, and grilles level and plumb.
- B. Ceiling-Mounted Outlets and Inlets: Drawings indicate general arrangement of ducts, fittings, and accessories. Air outlet and inlet locations have been indicated to achieve design requirements for air volume, noise criteria, airflow pattern, throw, and pressure drop. Make final locations where indicated, as much as practical. For units installed in lay-in ceiling panels, locate units in the center of panel. Where architectural features or other items conflict with installation, notify Architect for a determination of final location.
- C. Install diffusers, registers, and grilles with airtight connections to ducts and to allow service and maintenance of dampers, air extractors, and fire dampers.

3.2 ADJUSTING

- A. After installation, adjust diffusers, registers, and grilles to air patterns indicated, or as directed, before starting air balancing.

END OF SECTION 23 37 13



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SECTION 23 81 26  
SPLIT-SYSTEM AIR-CONDITIONERS

**PART 1 - GENERAL**

1. SUMMARY
  - a. Section includes split-system air-conditioning and heat-pump units consisting of separate evaporator-fan and compressor-condenser components.
2. ACTION SUBMITTALS
  - a. Product Data: For each type of product indicated.
  - b. Shop Drawings: Include plans, elevations, sections, details, and attachments to other work.
    - 1) Detail equipment assemblies and indicate dimensions, weights, loads, required clearances, method of field assembly, components, and location and size of each field connection.
3. INFORMATIONAL SUBMITTALS
  - a. Warranty: Sample of special warranty.
4. CLOSEOUT SUBMITTALS
  - a. Operation and maintenance data.
5. QUALITY ASSURANCE
  - a. Electrical Components, Devices, and Accessories: Listed and labeled as defined in NFPA 70, by a qualified testing agency, and marked for intended location and application.
  - b. ASHRAE Compliance:
    - 1) Fabricate and label refrigeration system to comply with ASHRAE 15, "Safety Standard for Refrigeration Systems."
    - 2) ASHRAE Compliance: Applicable requirements in ASHRAE 62.1, Section 4 - "Outdoor Air Quality," Section 5 - "Systems and Equipment," Section 6 - "Procedures," and Section 7 - "Construction and System Start-up."
  - c. ASHRAE/IESNA Compliance: Applicable requirements in ASHRAE/IESNA 90.1.



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### 6. WARRANTY

- a. Special Warranty: Manufacturer's standard form in which manufacturer agrees to repair or replace components of split-system air-conditioning units that fail in materials or workmanship within specified warranty period.
  - 1) Warranty Period:
    - a) For Compressor: Five years from date of Substantial Completion.
    - b) For Parts: Five years from date of Substantial Completion.
    - c) For Labor: Five years from date of Substantial Completion.

## PART 2 - PRODUCTS

### 1. MANUFACTURERS

- a. Basis-of-Design Product: Subject to compliance with requirements, provide comparable product by one of the following:
  - 1) Carrier Corporation; Home Comfort and HVAC Building & Industrial Systems.
  - 2) Lennox International Inc.
  - 3) Trane; a business of American Standard companies.
  - 4) YORK; a Johnson Controls company.
  - 5) McQuay.

### 2. INDOOR UNITS

- a. Concealed Evaporator-Fan Components:
  - 1) Chassis: Galvanized steel with flanged edges, removable panels for servicing, and insulation on back of panel.
  - 2) Insulation: Faced, glass-fiber duct liner.
  - 3) Refrigerant Coil: Copper tube, with mechanically bonded aluminum fins and thermal-expansion valve. Comply with ARI 210/240.
  - 4) Water Coil: Copper tube, with mechanically bonded aluminum fins spaced no closer than 0.1 inch; leak tested to 300 psig underwater; with a two-position control valve.
  - 5) Electric Coil: Helical, nickel-chrome, resistance-wire heating elements; with refractory ceramic support bushings, automatic-reset thermal cutout, built-in magnetic contactors, manual-reset thermal cutout, airflow proving device, and one-time fuses in terminal box for overcurrent protection.
  - 6) Fan: Forward-curved, double-width wheel of galvanized steel; directly connected to motor.
  - 7) Fan Motors:
    - a) Comply with NEMA designation, temperature rating, service factor, enclosure type, and efficiency requirements specified in Division 23 Section "Common Motor Requirements for HVAC Equipment."
    - b) Multitapped, multispeed with internal thermal protection and permanent lubrication.
    - c) Wiring Terminations: Connect motor to chassis wiring with plug connection.



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- 8) Airstream Surfaces: Surfaces in contact with the airstream shall comply with requirements in ASHRAE 62.1.
  - 9) Filters: Permanent, cleanable.
  - 10) Condensate Drain Pans:
    - a) Fabricated with one percent slope in at least two planes to collect condensate from cooling coils (including coil piping connections, coil headers, and return bends) and humidifiers, and to direct water toward drain connection.
      - 1) Length: Extend drain pan downstream from leaving face to comply with ASHRAE 62.1.
      - 2) Depth: A minimum of 2 inches deep.
    - b) Single-wall, galvanized-steel sheet.
    - c) Double-wall, galvanized-steel sheet with space between walls filled with foam insulation and moisture-tight seal.
    - d) Drain Connection: Located at lowest point of pan and sized to prevent overflow. Terminate with threaded nipple on one end of pan.
    - e) Pan-Top Surface Coating: Asphaltic waterproofing compound.
    - f) Units with stacked coils shall have an intermediate drain pan to collect condensate from top coil.
- b. Floor-Mounted, Evaporator-Fan Components:
- 1) Cabinet: Enameled steel with removable panels on front and ends.
    - a) Insulation: Faced, glass-fiber duct liner.
    - b) Drain Pans: Galvanized steel, with connection for drain; insulated.
  - 2) Refrigerant Coil: Copper tube, with mechanically bonded aluminum fins and thermal-expansion valve. Comply with ARI 210/240.
  - 3) Water Coil: Copper tube, with mechanically bonded aluminum fins spaced no closer than 0.1 inch; leak tested to 300 psig underwater; with a two-position control valve.
  - 4) Electric Coil: Helical, nickel-chrome, resistance-wire heating elements; with refractory ceramic support bushings, automatic-reset thermal cutout, built-in magnetic contactors, manual-reset thermal cutout, airflow proving device, and one-time fuses in terminal box for overcurrent protection.
  - 5) Fan: Direct drive, centrifugal.
  - 6) Fan Motors:
    - a) Comply with NEMA designation, temperature rating, service factor, enclosure type, and efficiency requirements specified in Division 23 Section "Common Motor Requirements for HVAC Equipment."
    - b) Multitapped, multispeed with internal thermal protection and permanent lubrication.
  - 7) Air Filtration Section:
    - a) General Requirements for Air Filtration Section:
      - 1) Comply with NFPA 90A.
      - 2) Minimum Arrestance: According to ASHRAE 52.1 and MERV according to ASHRAE 52.2.



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- 3) Filter-Holding Frames: Arranged for flat or angular orientation, with access doors on both sides of unit. Filters shall be removable from one side or lifted out from access plenum.
- b) Disposable Panel Filters:
  - 1) Factory-fabricated, viscous-coated, flat-panel type.
  - 2) Thickness: 2 inches.
  - 3) Merv according to ASHRAE 52.2.
  - 4) Media: Interlaced glass fibers sprayed with nonflammable adhesive.
  - 5) Frame: Galvanized steel, with metal grid on outlet side, steel rod grid on inlet side, and hinged; with pull and retaining handles.

### 3. OUTDOOR UNITS

#### a. Air-Cooled, Compressor-Condenser Components:

- 1) Casing: Steel, finished with baked enamel in color selected by Architect, with removable panels for access to controls, weep holes for water drainage, and mounting holes in base. Provide brass service valves, fittings, and gage ports on exterior of casing.
- 2) Compressor: Hermetically sealed with crankcase heater and mounted on vibration isolation device. Compressor motor shall have thermal- and current-sensitive overload devices, start capacitor, relay, and contactor.
  - a) Compressor Type: Scroll.
  - b) Two-speed compressor motor with manual-reset high-pressure switch and automatic-reset low-pressure switch.
  - c) Refrigerant Charge: R-410A.
  - d) Refrigerant Coil: Copper tube, with mechanically bonded aluminum fins and liquid subcooler. Comply with ARI 210/240.
- 3) Heat-Pump Components: Reversing valve and low-temperature-air cutoff thermostat.
- 4) Fan: Aluminum-propeller type, directly connected to motor.
- 5) Motor: Permanently lubricated, with integral thermal-overload protection.
- 6) Low Ambient Kit: Permits operation down to 45 deg F.
- 7) Mounting Base: Polyethylene.

### 4. ACCESSORIES

- a. Control equipment and sequence of operation are specified in Division 23 Sections "Instrumentation and Control for HVAC" and "Sequence of Operations for HVAC Controls."
- b. Thermostat: Low voltage with subbase to control compressor and evaporator fan.
- c. Thermostat: Wireless infrared functioning to remotely control compressor and evaporator fan, with the following features:
  - 1) Compressor time delay.
  - 2) 24-hour time control of system stop and start.
  - 3) Liquid-crystal display indicating temperature, set-point temperature, time setting, operating mode, and fan speed.
  - 4) Fan-speed selection including auto setting.



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- d. Automatic-reset timer to prevent rapid cycling of compressor.
- e. Refrigerant Line Kits: Soft-annealed copper suction and liquid lines factory cleaned, dried, pressurized, and sealed; factory-insulated suction line with flared fittings at both ends.
- f. Drain Hose: For condensate.
- g. Additional Monitoring:
  - 1) Monitor constant and variable motor loads.
  - 2) Monitor variable-frequency-drive operation.
  - 3) Monitor economizer cycle.
  - 4) Monitor cooling load.
  - 5) Monitor air distribution static pressure and ventilation air volumes.

### **PART 3 - EXECUTION**

#### 1. INSTALLATION

- a. Install units level and plumb.
- b. Install evaporator-fan components using manufacturer's standard mounting devices securely fastened to building structure.
- c. Install ground-mounted, compressor-condenser components on 4-inch- thick, reinforced concrete base that is 4 inches larger, on each side, than unit. Concrete, reinforcement, and formwork are specified in Division 03 Section "Cast-in-Place Concrete." Coordinate anchor installation with concrete base.
- d. Install ground-mounted, compressor-condenser components on polyethylene mounting base.
- e. Install roof-mounted, compressor-condenser components on equipment supports specified in Division 07 Section "Roof Accessories." Anchor units to supports with removable, cadmium-plated fasteners.
- f. Install seismic restraints.
- g. Install compressor-condenser components on restrained, spring isolators with a minimum static deflection of 1 inch. See Division 23 Section "Vibration and Seismic Controls for HVAC Piping and Equipment."
- h. Install and connect precharged refrigerant tubing to component's quick-connect fittings. Install tubing to allow access to unit.

#### 2. CONNECTIONS

- a. Piping installation requirements are specified in other Division 23 Sections. Drawings indicate general arrangement of piping, fittings, and specialties.



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- 1) Water Coil Connections: Comply with requirements specified in Division 23 Section "Hydronic Piping." Connect hydronic piping to supply and return coil connections with shutoff-duty valve and union or flange on the supply connection and with throttling-duty valve and union or flange on the return connection.
  - 2) Remote, Water-Cooled Condenser Connections: Comply with requirements specified in Division 23 Section "Hydronic Piping" Connect hydronic piping to supply and return connections with shutoff-duty valve and union or flange on the supply connection and with throttling-duty valve and union or flange on the return connection.
- b. Where piping is installed adjacent to unit, allow space for service and maintenance of unit.
- c. Duct Connections: Duct installation requirements are specified in Division 23 Section "Metal Ducts" Drawings indicate the general arrangement of ducts. Connect supply and return ducts to split-system air-conditioning units with flexible duct connectors. Flexible duct connectors are specified in Division 23 Section "Air Duct Accessories."
3. FIELD QUALITY CONTROL
- a. Perform tests and inspections.
- 1) Manufacturer's Field Service: Engage a factory-authorized service representative to inspect components, assemblies, and equipment installations, including connections, and to assist in testing.
- b. Tests and Inspections:
- 1) Leak Test: After installation, charge system and test for leaks. Repair leaks and retest until no leaks exist.
  - 2) Operational Test: After electrical circuitry has been energized, start units to confirm proper motor rotation and unit operation.
  - 3) Test and adjust controls and safeties. Replace damaged and malfunctioning controls and equipment.
- c. Remove and replace malfunctioning units and retest as specified above.
- d. Prepare test and inspection reports.
4. DEMONSTRATION
- a. Engage a factory-authorized service representative to train Owner's maintenance personnel to adjust, operate, and maintain units.

END OF SECTION 23 81 26

**Division 26**  
Electrical





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SECTION 26 05 00  
COMMON WORK RESULTS FOR ELECTRICAL CONSTRUCTION

PART 1 - GENERAL

1.1 The electrical work included in all other divisions are the responsibility of the contractor performing the Division 26 work unless noted otherwise.

1.2 PROJECT OVERVIEW

A. Provide power and lighting for the construction of a park building.

1.3 SCOPE

A. The work under this section includes basic electrical requirements, which are applicable to all Division 26 sections. This section includes information common to two or more technical specification sections or items that are of a general nature, not conveniently fitting into other technical sections. Included are the following topics:

B. Section Includes:

1. GENERAL

- a. Project Overview
- b. Scope
- c. Related Work
- d. Reference Standards
- e. Regulatory Requirements
- f. Quality Assurance
- g. Continuity of Existing Services and Systems
- h. Protection of Finished Surfaces
- i. Approved Electrical Testing Laboratories
- j. Sleeves for Raceways and Cables
- k. Sleeve Seals
- l. Grout
- m. Sealing
- n. Owner Furnished Equipment
- o. Work by Owner
- p. Provisions for Future Work
- q. Intent
- r. Omissions
- s. Submittals
- t. Project/Site Conditions
- u. Work Sequence and Scheduling
- v. Work by Other Trades
- w. Offsite Storage
- x. Request and Certificate for Payment
- y. Salvage Materials
- z. Certificates and Inspections



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- aa. Operating and Maintenance Data
  - bb. Training of Owner Personnel
  - cc. Record Drawings
2. PRODUCTS
- a. Access Panels and Doors
  - b. Identification
  - c. Sealing
3. EXECUTION
- a. Excavation and Backfill
  - b. Concrete Work
  - c. Cutting and Patching
  - d. Building Access
  - e. Equipment Access
  - f. Coordination
  - g. Sleeves: Installation for Electrical Penetrations
  - h. Sealing
  - i. Housekeeping and Clean Up
4. RELATED WORK
- a. Applicable provisions of Division 1 govern work under this Section.
5. REFERENCE STANDARDS
- a. Abbreviations of standards organizations referenced in this and other sections are as follows:
    - 1) ANSI American National Standards Institute
    - 2) ASTM American Society for Testing and Materials
    - 3) EPA Environmental Protection Agency
    - 4) ETL Electrical Testing Laboratories, Inc.
    - 5) IEEE Institute of Electrical and Electronics Engineers
    - 6) IES Illuminating Engineering Society
    - 7) ISA Instrument Society of America
    - 8) NBS National Bureau of Standards
    - 9) NEC National Electric Code
    - 10) NEMA National Electrical Manufacturers Association
    - 11) NESC National Electrical Safety Code
    - 12) NFPA National Fire Protection Association
    - 13) UL Underwriters Laboratories Inc.
6. REGULATORY REQUIREMENTS
- a. All work and materials are to conform in every detail to applicable rules and requirements of the National Electrical Code (ANSI/NFPA 70), other applicable National Fire Protection Association codes, the National Electrical Safety Code, and present manufacturing standards (including NEMA).
  - b. All Division 26 work shall be done under the direction of a currently certified State of Florida Certified Master Electrician.



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### 7. QUALITY ASSURANCE

- a. Where equipment or accessories are used which differ in arrangement, configuration, dimensions, ratings, or engineering parameters from those indicated on the contract documents, the contractor is responsible for all costs involved in integrating the equipment or accessories into the system and the assigned space and for obtaining the performance from the system into which these items are placed.
- b. Manufacturer references used herein are intended to establish a level of quality and performance requirements unless more explicit restrictions are stated to apply.
- c. All materials, except medium voltage equipment and components, shall be listed by and shall bear the label of an approved electrical testing laboratory. If none of the approved electrical testing laboratories has published standards for a particular item, then other national independent testing standards, if available, applicable, and approved by DSF, shall apply and such items shall bear those labels. Where one of the approved electrical testing laboratories has an applicable system listing and label, the entire system, except for medium voltage equipment and components, shall be so labeled.

### 8. CONTINUITY OF EXISTING SERVICES AND SYSTEMS

- a. No outages shall be permitted on existing systems except at the time and during the interval specified by the Owner and Architect. This will require written approval. Any outage must be scheduled when the interruption causes the least interference with normal institutional schedules and business routines. No extra costs will be paid to the Contractor for such outages which must occur outside of regular weekly working hours. If required by the serving utility, include these costs in bid.
- b. This Contractor shall restore any circuit interrupted as a result of this work to proper operation as soon as possible.

### 9. PROTECTION OF FINISHED SURFACES

- a. Furnish one can of touch-up paint for each different color factory finish furnished by the Contractor. Deliver touch-up paint with other "loose and detachable parts" as covered in the General Requirements.

### 10. APPROVED ELECTRICAL TESTING LABORATORIES

- a. The following laboratories are approved for providing electrical product safety testing and listing services as required in these specifications:
  - 1) Underwriters Laboratories Inc.
  - 2) Electrical Testing Laboratories, Inc.

#### 1.4 SLEEVES FOR RACEWAYS AND CABLES

- A. Steel Pipe Sleeves: ASTM A 53/A 53M, Type E, Grade B, Schedule 40, galvanized steel, plain ends.
- B. Cast-Iron Pipe Sleeves: Cast or fabricated "wall pipe," equivalent to ductile-iron pressure pipe, with plain ends and integral waterstop, unless otherwise indicated.



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- C. Sleeves for Rectangular Openings: Galvanized sheet steel.
  - 1. Minimum Metal Thickness:
    - a. For sleeve cross-section rectangle perimeter less than 50 inches and no side more than 16 inches, thickness shall be 0.052 inch.
    - b. For sleeve cross-section rectangle perimeter equal to, or more than, 50 inches and 1 or more sides equal to, or more than, 16 inches, thickness shall be 0.138 inch.

### 1.5 SLEEVE SEALS

- A. Description: Modular sealing device, designed for field assembly, to fill annular space between sleeve and raceway or cable.
  - 1. Manufacturers: Subject to compliance with requirements, provide products by one of the following:
    - a. Advance Products & Systems, Inc.
    - b. Calpico, Inc.
    - c. Metraflex Co.
    - d. Pipeline Seal and Insulator, Inc.
  - 2. Sealing Elements: EPDM interlocking links shaped to fit surface of cable or conduit. Include type and number required for material and size of raceway or cable.
  - 3. Pressure Plates: Stainless steel. Include two for each sealing element.
  - 4. Connecting Bolts and Nuts: Stainless steel of length required to secure pressure plates to sealing elements. Include one for each sealing element.

### 1.6 GROUT

- A. Nonmetallic, Shrinkage-Resistant Grout: ASTM C 1107, factory-packaged, nonmetallic aggregate grout, noncorrosive, nonstaining, mixed with water to consistency suitable for application and a 30-minute working time.

### 1.7 SEALING

- 1. Sealing of sleeves/openings between conduits, cable trays, wireways, troughs, cablebus, busduct, etc. and the structural or partition opening shall be the responsibility of the contractor whose work penetrates the opening.

### 1.8 WORK BY OWNER

- A. Asbestos abatement and PCB equipment (other than light fixture ballasts) removal and disposal, if required, will be by the Owner under separate contract.
- B. Electrical testing not described in these contract documents will be by the Owner under separate contract.



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### 1.9 INTENT

- A. The Contractor shall furnish and install all the necessary materials, apparatus, and devices to complete the electrical equipment and systems installation herein specified, except such parts as are specifically exempted herein.
- B. If an item is either called for in the specifications or shown on the plans, it shall be considered sufficient for the inclusion of said item in this contract. If a conflict exists within the Specifications or exists within the Drawings, the Contractor shall furnish the item, system, or workmanship, which is the highest quality, largest, or most closely fits the Owners intent). Refer to the General Conditions of the Contract for further clarification.
- C. It must be understood that the details and drawings are diagrammatic. The Contractor shall verify all dimensions at the site and be responsible for their accuracy.
- D. All sizes as given are minimum except as noted.
- E. Materials and labor shall be new (unless noted or stated otherwise), first class, and workmanlike, and shall be subject at all times to the Owner's and Architect's inspections, tests and approval from the commencement until the acceptance of the completed work.
- F. Whenever a particular manufacturer's product is named, it is intended to establish a level of quality and performance requirements unless more explicit restrictions are stated to apply.

### 1.10 OMISSIONS

- A. No later than ten (10) days before bid opening, the Contractor shall call the attention of the Owner and Architect to any materials or apparatus the Contractor believes to be inadequate and to any necessary items of work omitted.

### 1.11 SUBMITTALS

- A. Submit for all equipment and systems as indicated in the respective specification sections, marking each submittal with that specification section number. Mark general catalog sheets and drawings to indicate specific items being submitted and proper identification of equipment by name and/or number, as indicated in the contract documents. Failure to do this may result in the submittal(s) being returned to the Contractor for correction and resubmission. Failing to follow these instructions does not relieve the Contractor from the requirement of meeting the project schedule.
- B. On request from the Architect, the successful bidder shall furnish additional drawings, illustrations, catalog data, performance characteristics, etc.
- C. Submittals shall be grouped to include complete submittals of related systems, products, and accessories in a single submittal. Mark dimensions and values in units to match those specified. Include wiring diagrams of electrically powered equipment.
- D. The submittals must be approved before fabrication is authorized.
- E. Submit sufficient quantities of submittals to allow the following distribution:



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- |    |                                   |          |
|----|-----------------------------------|----------|
| 1. | Operating and Maintenance Manuals | 3 copies |
| 2. | Architect                         | 2 copies |
| 3. | Engineer                          | 1 copy   |

## 1.12 PROJECT/SITE CONDITIONS

- A. Install Work in locations shown on Drawings, unless prevented by Project conditions.
- B. Prepare drawings showing proposed rearrangement of Work to meet Project conditions, including changes to Work specified in other Sections. Obtain permission of Owner and Architect before proceeding.
- C. Tools, materials and equipment shall be confined to areas designated by the Owner and Architect.

## 1.13 WORK SEQUENCE AND SCHEDULING

- A. Install work in phases to accommodate user Owner's occupancy requirements. During the construction period coordinate electrical schedule and operations with the Owner and Architect.

## 1.14 WORK BY OTHER TRADES

- A. Every attempt has been made to indicate in this trade's specifications and drawings all work required of this Contractor. However, there may be additional specific paragraphs in other trade specifications and addenda, and additional notes on drawings for other trades which pertain to this Trade's work, and thus those additional requirements are hereby made a part of these specifications and drawings.
- B. Electrical details on drawings for equipment to be provided by others are based on preliminary design data only. This Contractor shall lay out the electrical work and shall be responsible for its correctness to match equipment actually provided by others.

## 1.15 OFFSITE STORAGE

- A. No material will be accepted for offsite storage unless submittals for the material have been approved.

## 1.16 REQUEST AND CERTIFICATE FOR PAYMENT

- A. Within 10 days after Notice to Proceed, the successful bidder will submit to the Owner and Architect in a form prescribed below and by the General Conditions of the Contract, Scheduling and Coordination of Work, Reports, Records and Data, and Payments to Contractor, a cost breakdown of the proposed values for work performed which, if approved by the Owner, will become the basis for construction progress and monthly payments. The cost breakdown items shall reflect actual work progress stages as closely as feasible.



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- B. In addition, if payment will be requested for approved off-site stored material, then that material shall be listed as a line item and the Contractor may be compensated by the Owner.

### 1.17 SALVAGE MATERIALS

- A. No materials removed from this project shall be reused. All materials removed shall become the property of and shall be disposed of by the Contractor.

### 1.18 CERTIFICATES AND INSPECTIONS

- A. Obtain and pay for all required installation inspections.

### 1.19 OPERATION AND MAINTENANCE DATA

- A. Assemble material in three-ring or post binders, using an index at the front of each volume and tabs for each system or type of equipment. In addition to the data indicated in the General Requirements, include the following information:
  1. Copies of all approved submittals.
  2. Manufacturer's wiring diagrams for electrically powered equipment.
  3. Records of tests performed to certify compliance with system requirements.
  4. Certificates of inspection by regulatory agencies.
  5. Parts lists for manufactured equipment.
  6. Preventative maintenance recommendations.
  7. Warranties.
  8. Additional information as indicated in the technical specification sections.

### 1.20 RECORD DRAWINGS

- A. The Contractor shall maintain at least one copy each of the specifications and drawings on the job site at all times.
- B. The Owner will provide the Contractor with a suitable set of contract drawings on which daily records of changes and deviations from contract shall be recorded. Dimensions and elevations on the record drawings shall locate all buried or concealed piping, conduit, or similar items.
- C. The daily record of changes shall be the responsibility of Contractor's field superintendent. No arbitrary mark-ups will be permitted.
- D. At completion of the project, the Contractor shall submit the marked-up record drawings to the Owner and Architect prior to final payment.



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## PART 2 - PRODUCTS

### 2.1 IDENTIFICATION

- A. See Electrical section 260553 – Identification for Electrical Systems.

### 2.2 NON-RATED PENETRATIONS:

- A. Conduit Penetrations Through Below Grade Walls:

- 1. In exterior wall openings below grade, use a modular mechanical type seal consisting of interlocking synthetic rubber links shaped to continuously fill the annular space between the uninsulated conduit and the cored opening or a water-stop type wall sleeve.

- B. Conduit and Cable Tray Penetrations:

- 1. At conduit and cable tray penetrations of non-rated interior partitions, floors and exterior walls above grade, use urethane caulk in annular space between conduit and sleeve, or the core drilled opening.

## PART 3 - EXECUTION

### 3.1 EXCAVATION AND BACKFILL

- A. Perform all excavation and backfill work to accomplish indicated electrical systems installation. Blasting will not be allowed.

### 3.2 CONCRETE WORK

- A. Confirm with the Construction Manager or General Contractor that the Division 3 Contractor will perform all cast-in-place concrete unless noted otherwise elsewhere. Provide all layout drawings, anchor bolts, metal shapes, and/or templates required to be cast into concrete or used to form concrete for the support of electrical equipment.

### 3.3 CUTTING AND PATCHING

- A. Refer to Division 1, General Requirements, Cutting and Patching.

### 3.4 BUILDING ACCESS

- A. Arrange for the necessary openings in the building to allow for admittance of all apparatus. When the building access was not previously arranged and must be provided by this contractor, restore any opening to its original condition after the apparatus has been brought into the building.



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### 3.5 EQUIPMENT ACCESS

- A. Install all piping, conduit, ductwork, and accessories to permit access to equipment for maintenance. Coordinate the exact location of wall and ceiling access panels and doors with the General Contractor, making sure that access is available for all equipment and specialties. Where access is required in plaster or drywall walls or ceilings, furnish the access doors to the General Contractor and reimburse the General Contractor for installation of those access doors.

### 3.6 COORDINATION

- A. The Contractor shall cooperate with other trades in locating work in a proper manner. Should it be necessary to raise or lower or move longitudinally any part of the electrical work to better fit the general installation, such work shall be done at no extra cost to the Owner, provided such decision is reached prior to actual installation. The Contractor shall check location of electrical outlets with respect to other installations before installing.
- B. The Contractor shall verify that all devices are compatible for the surfaces on which they will be used. This includes, but is not limited to light fixtures, panelboards, devices, etc. and recessed or semi-recessed units installed in/on architectural surfaces.
- C. Coordinate all work with other contractors prior to installation. Any installed work that is not coordinated and that interferes with other contractor's work shall be removed or relocated at the installing contractor's expense.
- D. Verify system completion to the testing consultant. Demonstrate the starting, interlocking and control features of each system so the testing contractor can perform its work.
- E. Comply with NECA 1.
- F. Measure indicated mounting heights to bottom of unit for suspended items and to center of unit for wall-mounting items.
- G. Headroom Maintenance: If mounting heights or other location criteria are not indicated, arrange and install components and equipment to provide maximum possible headroom consistent with these requirements.
- H. Equipment: Install to facilitate service, maintenance, and repair or replacement of components of both electrical equipment and other nearby installations. Connect in such a way as to facilitate future disconnecting with minimum interference with other items in the vicinity.
- I. Right of Way: Give to piping systems installed at a required slope.

### 3.7 SLEEVE INSTALLATION FOR ELECTRICAL PENETRATION

- A. Electrical penetrations occur when raceways, cables, wireways, cable trays, or busways penetrate concrete slabs, concrete or masonry walls, or fire-rated floor and wall assemblies.
- B. Concrete Slabs and Walls: Install sleeves for penetrations unless core-drilled holes or formed openings are used. Install sleeves during erection of slabs and walls.



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- C. Use pipe sleeves unless penetration arrangement requires rectangular sleeved opening.
- D. Fire-Rated Assemblies: Install sleeves for penetrations of fire-rated floor and wall assemblies unless openings compatible with firestop system used are fabricated during construction of floor or wall.
- E. Cut sleeves to length for mounting flush with both surfaces of walls.
- F. Extend sleeves installed in floors 2 inches (50 mm) above finished floor level.
- G. Size pipe sleeves to provide 1/4-inch (6.4-mm) annular clear space between sleeve and raceway or cable, unless indicated otherwise.
- H. Seal space outside of sleeves with grout for penetrations of concrete and masonry
  - 1. Promptly pack grout solidly between sleeve and wall so no voids remain. Tool exposed surfaces smooth; protect grout while curing.
- I. Interior Penetrations of Non-Fire-Rated Walls and Floors: Seal annular space between sleeve and raceway or cable, using joint sealant appropriate for size, depth, and location of joint. Comply with requirements in Division 07 Section "Joint Sealants."
- J. Roof-Penetration Sleeves: Seal penetration of individual raceways and cables with flexible boot-type flashing units applied in coordination with roofing work.
- K. Aboveground, Exterior-Wall Penetrations: Seal penetrations using steel pipe sleeves and mechanical sleeve seals. Select sleeve size to allow for 1-inch annular clear space between pipe and sleeve for installing mechanical sleeve seals.
- L. Underground, Exterior-Wall Penetrations: Install cast-iron pipe sleeves. Size sleeves to allow for 1-inch annular clear space between raceway or cable and sleeve for installing mechanical sleeve seals.
- M. Pipe sleeves for conduits 6" in diameter and smaller, in new poured concrete construction, shall be schedule 40 steel pipe, plastic removable sleeve or sheet metal sleeve, all cast in place.
- N. In wet area floor penetrations, top of sleeve to be 2 inches above the adjacent floor. In existing wet area floor penetrations, core drill sleeve openings large enough to insert schedule 40 sleeve and grout the area around the sleeve. If a pipe clamp resting on the sleeve supports the pipe penetrating the sleeve, weld a collar or struts to the sleeve that will transfer weight to the existing floor structure. Wet areas for this paragraph are rooms or spaces containing air handling unit coils, converters, pumps, chillers, boilers, and similar waterside equipment.
- O. Pipe penetrations in existing concrete floors that are not in wet areas may omit the use of schedule 40 sleeve and use the core drilled opening as the sleeve.

### 3.8 SEALING

- A. Non-Rated Surfaces:



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1. When the opening is through a non-fire rated wall, floor, ceiling or roof the opening must be sealed using an approved type of material.
2. Use galvanized sheet metal sleeves in hollow wall penetrations to provide a backing for the sealant. Grout area around sleeve in masonry construction.
3. Install escutcheons or floor/ceiling plates where conduit, penetrates non-fire rated surfaces in occupied spaces. Occupied spaces for this paragraph include only those rooms with finished ceilings and the penetration occurs below the ceiling.
4. In exterior wall openings below grade, assemble rubber links of mechanical seal to the proper size for the conduit and tighten in place, in accordance with the manufacturer's instructions. Install so that the bolts used to tighten the seal are accessible from the interior of the building or vault.
5. At interior partitions, conduit penetrations are required to be sealed for all clean rooms, laboratories, and most hospital spaces, computer rooms, dormitory rooms, tele/data/com rooms and similar spaces where the room pressure or odor transmission must be controlled. Apply sealant to both sides of the penetration in such a manner that the annular space between the conduit sleeve and the conduit is completely filled.

### 3.9 HOUSEKEEPING AND CLEAN UP

- A. The Contractor shall clean up and remove from the premises, on a daily basis, all debris and rubbish resulting from its work and shall repair all damage to new and existing equipment resulting from its work. When job is complete, this Contractor shall remove all tools, excess material and equipment, etc., from the site.

END OF SECTION 26 05 00



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SECTION 26 05 26  
GROUNDING AND BONDING FOR ELECTRICAL SYSTEMS

PART 1 - GENERAL

1.1 SUMMARY

- A. This Section includes methods and materials for grounding systems and equipment.

1.2 SUBMITTALS

- A. Product Data: For each type of product indicated.
- B. Field quality-control test reports.

1.3 QUALITY ASSURANCE

- A. Electrical Components, Devices, and Accessories: Listed and labeled as defined in NFPA 70, Article 100, by a testing agency acceptable to authorities having jurisdiction, and marked for intended use.
- B. Comply with UL 467 for grounding and bonding materials and equipment.

1.4 RECEIVING, STORING AND PROTECTING

- A. Receive, store, and protect, and handle products according to NECA 1 Standard Practices for Good Workmanship in Electrical Construction.

PART 2 - PRODUCTS

2.1 CONDUCTORS

- A. Insulated Conductors: Copper wire or cable insulated for 600 V unless otherwise required by applicable Code or authorities having jurisdiction.
- B. Bare Copper Conductors:
  - 1. Solid Conductors: ASTM B 3.
  - 2. Stranded Conductors: ASTM B 8.
  - 3. Tinned Conductors: ASTM B 33.
  - 4. Bonding Cable: 28 kcmil, 14 strands of No. 17 AWG conductor, 1/4 inch in diameter.
  - 5. Bonding Conductor: No. 4 or No. 6 AWG, stranded conductor.
  - 6. Bonding Jumper: Copper tape, braided conductors, terminated with copper ferrules; 1-5/8 inches wide and 1/16 inch thick.



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7. Tinned Bonding Jumper: Tinned-copper tape, braided conductors, terminated with copper ferrules; 1-5/8 inches wide and 1/16 inch thick.

### 2.2 EQUIPMENT GROUNDING CONDUCTORS

- A. Provide NRTL-listed THHN/THWN insulated copper wire.
- B. Use solid grounding conductors 10 AWG and smaller where not subject to vibration or repeated flexing.
- C. Use stranded grounding conductors for 8 AWG and larger.
- D. Use stranded grounding conductors where subject to vibration or repeated flexing. Use stranded grounding conductors in flexible conduit at motor connections.
- E. Color code grounding conductors as follows:
  1. Equipment ground:
    - a. Conductors 6 AWG and smaller: Green colored insulation.
    - b. Conductors 4 AWG and larger: Green colored insulation or black colored insulation with 3/4 inch wide band of water and oil-resistant green plastic adhesive tape.

### 2.3 CONNECTORS

- A. Listed and labeled by a nationally recognized testing laboratory acceptable to authorities having jurisdiction for applications in which used, and for specific types, sizes, and combinations of conductors and other items connected.
- B. Bolted Connectors for Conductors and Pipes: Copper or copper alloy, bolted pressure-type, with at least two bolts.
  1. Pipe Connectors: Clamp type, sized for pipe.
- C. Exothermic Weld Grounding Connections:
  1. Provide molds and welding material for making exothermic weld connections.
  2. In interior locations and in vaults, use low smoke emission type welding material.
  3. Match mold and weld material to material types, shapes and sizes to be joined.
  4. Manufacturer: ERICO Cadweld
- D. Compression Grounding Connections:
  1. Use two-hole heavy-duty compression lugs for bolted connections to ground bars, ground plates, and equipment ground pads.
  2. Manufacturer: Burndy "Hyground"

### 2.4 GROUNDING ELECTRODES

- A. Ground Rods: Copper-clad steel, 3/4 inch by 10 feet (19 mm by 3 m) in diameter.



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## PART 3 - EXECUTION

### 3.1 APPLICATIONS

- A. Conductors: Install solid conductor for No. 8 AWG and smaller, and stranded conductors for No. 6 AWG and larger, unless otherwise indicated.
- B. Underground Grounding Conductors: Install bare copper conductor, No. 2/0 AWG minimum. Bury at least 24 inches below grade.
- C. Conductor Terminations and Connections:
  - 1. Pipe and Equipment Grounding Conductor Terminations: Bolted connectors.
  - 2. Underground Connections: Welded connectors, except at test wells and as otherwise indicated.
  - 3. Connections to Ground Rods at Test Wells: Bolted connectors.
  - 4. Connections to Structural Steel: Welded connectors.

### 3.2 EQUIPMENT GROUNDING

- A. Install insulated equipment grounding conductors with the following items, in addition to those required by NFPA 70:
  - 1. Feeders and branch circuits.
  - 2. Lighting circuits.
  - 3. Receptacle circuits.
  - 4. Single-phase motor and appliance branch circuits.
  - 5. Flexible raceway runs.
  - 6. Armored and metal-clad cable runs.

### 3.3 INSTALLATION

- A. Grounding Conductors: Route along shortest and straightest paths possible, unless otherwise indicated or required by Code. Avoid obstructing access or placing conductors where they may be subjected to strain, impact, or damage.
- B. Ground Rods: Drive rods until tops are 2 inches below finished floor or final grade, unless otherwise indicated.
  - 1. Interconnect ground rods with grounding electrode conductor below grade and as otherwise indicated. Make connections without exposing steel or damaging coating, if any.
  - 2. For grounding electrode system, install at least three rods spaced at least one-rod length from each other and located at least the same distance from other grounding electrodes, and connect to the service grounding electrode conductor.
- C. Test Wells: Ground rod driven through drilled hole in bottom of handhole and shall be at least 12 inches deep, with cover.



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1. Test Wells: Install at least one test well for each service, unless otherwise indicated. Install at the ground rod electrically closest to service entrance. Set top of test well flush with finished grade or floor.
  - D. Bonding Straps and Jumpers: Install in locations accessible for inspection and maintenance, except where routed through short lengths of conduit.
    1. Bonding to Structure: Bond straps directly to basic structure, taking care not to penetrate any adjacent parts.
    2. Bonding to Equipment Mounted on Vibration Isolation Hangers and Supports: Install so vibration is not transmitted to rigidly mounted equipment.
    3. Use exothermic-welded connectors for outdoor locations, but if a disconnect-type connection is required, use a bolted clamp.
  - E. Grounding and Bonding for Piping:
    1. Metal Water Service Pipe: Install insulated copper grounding conductors, in conduit, from building's main service equipment, or grounding bus, to main metal water service entrances to building. Connect grounding conductors to main metal water service pipes, using a bolted clamp connector or by bolting a lug-type connector to a pipe flange, using one of the lug bolts of the flange. Where a dielectric main water fitting is installed, connect grounding conductor on street side of fitting. Bond metal grounding conductor conduit or sleeve to conductor at each end.
    2. Water Meter Piping: Use braided-type bonding jumpers to electrically bypass water meters. Connect to pipe with a bolted connector.
  - F. Bonding Bushings:
    1. Install bonding bushings on metallic conduit containing circuits rated 100 amperes and higher.
    2. Install bonding bushings on metallic conduits entering enclosures through concentric, eccentric or oversize knockouts.
    3. Install bonding bushings on metallic conduits that terminate to a metallic enclosure without effective electrical connection such as locknuts or threaded bushings.
    4. Bond conduit bonding bushing lug to the equipment ground bar or ground lug in switchgear, panelboards, transformers, motor control centers, starters, disconnect switches, cabinets, etc. Size bonding jumpers in accordance with the NEC.
- ### 3.4 FIELD QUALITY CONTROL
- A. Attach grounds permanently before permanent building service is energized.
  - B. Perform the following tests and inspections and prepare test reports:
    1. After installing grounding system but before permanent electrical circuits have been energized, test for compliance with requirements.
    2. Test completed grounding system at each location where a maximum ground-resistance level is specified, at service disconnect enclosure grounding terminal, and at ground test wells.
      - a. Measure ground resistance not less than two full days after last trace of precipitation and without soil being moistened by any means other than natural



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drainage or seepage and without chemical treatment or other artificial means of reducing natural ground resistance.

- b. Perform tests by fall-of-potential method according to IEEE 81.
- C. Report measured ground resistances that exceed the following values:
1. Power and Lighting Equipment or System with Capacity 500 kVA and Less: 10 ohms.
  2. Power and Lighting Equipment or System with Capacity 500 to 1000 kVA: 5 ohms.
  3. Power and Lighting Equipment or System with Capacity More Than 1000 kVA: 3 ohms.
  4. Power Distribution Units or Panelboards Serving Electronic Equipment: 1 ohm(s).
- D. Excessive Ground Resistance: If resistance to ground exceeds specified values, notify Architect promptly and include recommendations to reduce ground resistance.

END OF SECTION 26 05 26



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SECTION 26 05 29  
HANGERS AND SUPPORTS FOR ELECTRICAL SYSTEMS

PART 1 - GENERAL

1.1 SUMMARY

A. Section includes:

1. Hangers and supports for electrical equipment and systems.
2. Construction requirements for concrete bases.

1.2 PERFORMANCE REQUIREMENTS

- A. Delegated Design: Design supports for multiple raceways, including comprehensive engineering analysis by a qualified professional engineer, using performance requirements and design criteria indicated.
- B. Design supports for multiple raceways capable of supporting combined weight of supported systems and its contents.
- C. Design equipment supports capable of supporting combined operating weight of supported equipment and connected systems and components.
- D. Rated Strength: Adequate in tension, shear, and pullout force to resist maximum loads calculated or imposed for this Project, with a minimum structural safety factor of five times the applied force.
- E. Do not drill or otherwise compromise structural members.

1.3 SUBMITTALS

- A. Product Data: For steel slotted support systems.
- B. Shop Drawings: Show fabrication and installation details and include calculations for the following:
  1. Shop Drawings: Submit shop drawings showing details of fabricated hangers, and supports. Provide detail drawings along with catalog cuts, templates, and erection and installation details, as appropriate. Submittals shall be complete in detail; shall indicate thickness, type, grade, class of metal, and dimensions; and shall show construction details, reinforcement, anchorage, and installation with relation to the building construction.
- C. Welding certificates.



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### 1.4 QUALITY ASSURANCE

- A. Welding: Qualify procedures and personnel according to AWS D1.1/D1.1M, "Structural Welding Code - Steel."
- B. Comply with NFPA 70.

## PART 2 - PRODUCTS

### 2.1 SUPPORT, ANCHORAGE, AND ATTACHMENT COMPONENTS

- A. Steel Slotted Support Systems: Comply with MFMA-4, factory-fabricated components for field assembly.
  - 1. Available Manufacturers: Subject to compliance with requirements, manufacturers offering products that may be incorporated into the Work include, but are not limited to, the following:
    - a. Cooper B-Line, Inc.; a division of Cooper Industries.
    - b. ERICO International Corporation.
    - c. Thomas & Betts Corporation.
    - d. Unistrut; Tyco International, Ltd.
  - 2. Metallic Coatings: Hot-dip galvanized after fabrication and applied according to MFMA-4.
  - 3. Nonmetallic Coatings: Manufacturer's standard PVC, polyurethane, or polyester coating applied according to MFMA-4.
  - 4. Painted Coatings: Manufacturer's standard painted coating applied according to MFMA-4.
  - 5. Channel Dimensions: Selected for applicable load criteria.
- B. Raceway and Cable Supports: As described in NECA 1 and NECA 101.
- C. Conduit and Cable Support Devices: Steel hangers, clamps, and associated fittings, designed for types and sizes of raceway or cable to be supported.
- D. Support for Conductors in Vertical Conduit: Factory-fabricated assembly consisting of threaded body and insulating wedging plug or plugs for non-armored electrical conductors or cables in riser conduits. Plugs shall have number, size, and shape of conductor gripping pieces as required to suit individual conductors or cables supported. Body shall be malleable iron.
- E. Structural Steel for Fabricated Supports and Restraints: ASTM A 36/A 36M, steel plates, shapes, and bars; black and galvanized.
- F. Mounting, Anchoring, and Attachment Components: Items for fastening electrical items or their supports to building surfaces include the following:
  - 1. Powder-Actuated Fasteners: Threaded-steel stud, for use in hardened portland cement concrete, steel, or wood, with tension, shear, and pullout capacities appropriate for supported loads and building materials where used.



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- a. Available Manufacturers: Subject to compliance with requirements, manufacturers offering products that may be incorporated into the Work include, but are not limited to, the following:
  - 1) Hilti Inc.
  - 2) ITW Ramset/Red Head; a division of Illinois Tool Works, Inc.
  - 3) MKT Fastening, LLC.
  - 4) Simpson Strong-Tie Co., Inc.; Masterset Fastening Systems Unit.
2. Mechanical-Expansion Anchors: Insert-wedge-type, zinc-coated steel, for use in hardened portland cement concrete with tension, shear, and pullout capacities appropriate for supported loads and building materials in which used.
  - a. Available Manufacturers: Subject to compliance with requirements, manufacturers offering products that may be incorporated into the Work include, but are not limited to, the following:
    - 1) Cooper B-Line, Inc.; a division of Cooper Industries.
    - 2) Hilti Inc.
    - 3) ITW Ramset/Red Head; a division of Illinois Tool Works, Inc.
  3. Concrete Inserts: Steel or malleable-iron, slotted support system units similar to MSS Type 18; complying with MFMA-4 or MSS SP-58.
  4. Clamps for Attachment to Steel Structural Elements: MSS SP-58, type suitable for attached structural element.
  5. Through Bolts: Structural type, hex head, and high strength. Comply with ASTM A 325.
  6. Toggle Bolts: All-steel springhead type.
  7. Hanger Rods: Threaded steel.

### 2.2 FABRICATED METAL EQUIPMENT SUPPORT ASSEMBLIES

- A. Description: Welded or bolted, structural-steel shapes, shop or field fabricated to fit dimensions of supported equipment.
- B. Materials: Comply with requirements in Division 05 Section "Metal Fabrications" for steel shapes and plates.

### 2.3 COATINGS

- A. Provide products for use indoors protected with zinc coating or with treatment of equivalent corrosion resistance using approved alternative treatment, finish, or inherent material characteristic.
- B. Provide products for use outdoors or in damp or corrosive indoor locations with hot-dip galvanized coating or with treatment of equivalent corrosion resistance using approved alternative treatment, finish, or inherent material characteristic.

### 2.4 RACEWAY SUPPORTING DEVICES

- A. Provide supports as described below for the installation of raceway systems.



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- B. Use pressed steel, single bolt hangers to support individual RGS, IMC or EMT conduit runs from threaded rods or beam clamps. Manufacturer: Steel City "6H Series".
- C. For individual runs of EMT up to 1-inch trade size above accessible ceilings, use spring steel conduit clips with positive snap closure. Manufacturer: ERICO CADDY "M Series".
- D. Use malleable iron conduit clamps to secure individual RGS, IMC or EMT conduit runs across, parallel, or perpendicular to beams, channels and angle supports. Manufacturer: Steel City "RC, EC, and PC Series".
- E. Use two-piece carbon steel riser clamps for individual vertical conduits passing through floors. Manufacturer: Kindorf "C-210 Series".
- F. Use snap-on type one-hole steel straps to secure individual conduits up to 2-inch trade size to flat, dry interior surfaces. Manufacturer: T&B "1210 Series" for RGS and IMC and "4100 Series" for EMT.
- G. Use one-hole malleable iron straps to secure individual conduits up to 4-inch trade size to flat, dry interior surfaces. Manufacturer: T&B "1275 Series".
- H. Use one-hole malleable iron straps and conduit spacers to secure individual conduits to flat exterior or damp flat interior surfaces. Manufacturer: T&B "1275 Series" straps with 1350 Series" spacers.
- I. Support multiple parallel horizontal conduits with trapeze hangers fabricated from framing channel materials specified below.

### 2.5 OUTLET BOX SUPPORTING DEVICES

- A. Provide pre-fabricated sheet steel brackets to support outlet boxes from metal studs in dry-wall construction.
- B. Provide brackets for single-outlet boxes that are inset to allow for dry-wall ring and have a far-side support leg. Manufacturer: ERICO CADDY "H Series".
- C. Provide brackets for multiple outlet boxes that are inset to allow for dry-wall rings and span from stud to stud. Manufacturer: ERICO CADDY "RBS Series".

### 2.6 FASTENERS

- A. Provide fasteners of the types, materials, and construction features as follows:
  - 1. Pre-set concrete inserts:
    - a. Continuous inserts: Design load 2000 lbs per ft of insert length with safety factor of five (5) in 3000 psi concrete. Manufacturer: B-Line "B221"
    - b. Spot inserts: NRTL-listed with design load of 1000 lb. Manufacturer: B-Line "B2506"
    - c. Metal deck bolts: Adjustable with bolt sizes from 3/8 inch to 3/4 inch. Manufacturer: B-Line "B3019"



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2. Expansion anchors: NRTL listed carbon steel wedge type studs. Manufacturer: Hilti "Kwik Bolt III". Note restrictions on use of expansion bolts in Part 3 of this Section.
3. Toggle bolts: All steel-spring head type.
4. Masonry screw anchors: Case hardened steel. Manufacturer: Hilti "Kwik-Con II".
5. Powder-Driven Threaded Studs: Heat-treated steel, designed for the intended service. Note restrictions on use of powder-driven fasteners in Part 3 of this Section.
6. Beam clamps: NRTL-listed, or compliant with Federal Specification WW-H-171E, or compliant with Manufacturers' Standardization Society SP-69 and SP-58.

### 2.7 FRAMING CHANNEL SYSTEMS

- A. Provide U-channel framing systems that conform to the Metal Framing Manufacturers' Association standards publication MFMA-4 and are fabricated using minimum 12-gage steel, with 9/16-inch-diameter holes, from 1-1/2 to 1-7/8 inches on center, in the surface opposite the "U" opening.
- B. Provide fittings and accessories that mate and match with U-channel and are of the same manufacturer. Use two-piece, single bolt type conduit straps on U-channel supports.
- C. Manufacturers: Unistrut, B-Line, Superstrut.

### 2.8 FABRICATED SUPPORTING DEVICES

- A. Provide shop- or field-fabricated supports or manufactured supports assembled from U-channel components.
- B. Provide steel brackets fabricated from angles, channels, and other standard structural shapes. Connect with welds and machine bolts to form rigid supports.

### 2.9 SLEEVES AND SEALS

- A. Provide pipe sleeves of one of the following:
  1. Sheet Metal: Fabricate from galvanized sheet metal; round tube closed with snap-lock joint, welded spiral seams, or welded longitudinal joint. Fabricate sleeves from the following gage metal for sleeve diameter noted:
    - a. 3-inch and smaller: 20-gage.
    - b. 4-inch to 6-inch: 16-gage.
    - c. over 6-inch: 14-gage.
  2. Steel Pipe: Fabricate from Schedule 40 galvanized steel pipe two pipe sizes larger than the penetrating raceway.
  3. Plastic Pipe: Fabricate from Schedule 80 PVC plastic pipe two pipe sizes larger than the penetrating raceway.



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## PART 3 - EXECUTION

### 3.1 GENERAL

- A. Locate each item of rigid electrical equipment entirely on one side only of a building expansion joint.
- B. Piping, cable trays, etc., which cross an expansion joint to rigid electrical equipment, shall have flexible joints that are capable of accommodating calculated thermal and seismic displacements.
- C. Conform to manufacturer's instructions and recommendations for selection and installation of hangers, and supports.
- D. Do not use wire or perforated strap for permanent electrical supports.
- E. Attach each item of electrical equipment as shown.
- F. Provide and install electrical conduit, busways, cable trays, etc. which cross an expansion joint to rigid electrical equipment, with flexible joints as shown.
- G. Do not support conduits, busways, cable trays, etc. from ceiling suspension wires.

### 3.2 APPLICATION

- A. Comply with NECA 1 and NECA 101 for application of hangers and supports for electrical equipment and systems except if requirements in this Section are stricter.
- B. Maximum Support Spacing and Minimum Hanger Rod Size for Raceway: Space supports for EMT, IMC, and RMC as stated in NFPA 70. Minimum rod size shall be 1/4 inch in diameter.
- C. Multiple Raceways or Cables: Install trapeze-type supports fabricated with steel slotted support system, sized so capacity can be increased by at least 25 percent in future without exceeding specified design load limits.
  - 1. Secure raceways and cables to these supports with single-bolt conduit clamps using spring friction action for retention in support channel.
  - 2. Support three or more parallel runs of horizontal raceways together on trapeze hangers.
  - 3. Do not support conduits from ceiling suspension wires.
- D. Spring-steel clamps designed for supporting single conduits without bolts may be used for 1-1/2-inch and smaller raceways serving branch circuits and communication systems above suspended ceilings and for fastening raceways to trapeze supports.

### 3.3 SUPPORT INSTALLATION

- A. Comply with NECA 1 and NECA 101 for installation requirements except as specified in this Article.
- B. Raceway Support Methods: In addition to methods described in NECA 1, EMT, IMC, and RMC may be supported by openings through structure members, as permitted in NFPA 70.



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- C. Strength of Support Assemblies: Where not indicated, select sizes of components so strength will be adequate to carry present and future static loads within specified loading limits. Minimum static design load used for strength determination shall be weight of supported components plus 200 lb.
- D. Mounting and Anchorage of Surface-Mounted Equipment and Components: Anchor and fasten electrical items and their supports to building structural elements by the following methods unless otherwise indicated by code:
  - 1. To Wood: Fasten with lag screws or through bolts.
  - 2. To New Concrete: Bolt to concrete inserts.
  - 3. To Masonry: Approved toggle-type bolts on hollow masonry units and expansion anchor fasteners on solid masonry units.
  - 4. To Existing Concrete: Expansion anchor fasteners.
  - 5. Instead of expansion anchors, powder-actuated driven threaded studs provided with lock washers and nuts may be used in existing standard-weight concrete 4 inches thick or greater. Do not use for anchorage to lightweight-aggregate concrete or for slabs less than 4 inches thick.
  - 6. To Steel: Beam clamps (MSS Type 19, 21, 23, 25, or 27) complying with MSS SP-69.
  - 7. To Light Steel: Sheet metal screws.
  - 8. Items Mounted on Hollow Walls and Nonstructural Building Surfaces: Mount cabinets, panelboards, disconnect switches, control enclosures, pull and junction boxes, transformers, and other devices on slotted-channel racks attached to substrate.
- E. Drill holes for expansion anchors in concrete at locations and to depths that avoid reinforcing bars.

### 3.4 INSTALLATION OF FABRICATED METAL SUPPORTS

- A. Comply with installation requirements in Division 05 Section "Metal Fabrications" for site-fabricated metal supports.
- B. Cut, fit, and place miscellaneous metal supports accurately in location, alignment, and elevation to support and anchor electrical materials and equipment.
- C. Field Welding: Comply with AWS D1.1/D1.1M.

### 3.5 PAINTING

- A. Touchup: Clean field welds and abraded areas of shop paint. Paint exposed areas immediately after erecting hangers and supports. Use same materials as used for shop painting. Comply with SSPC-PA 1 requirements for touching up field-painted surfaces. Apply paint by brush or spray to provide minimum dry film thickness of 2.0 mils.
- B. Touchup: Comply with requirements in Division 09 for cleaning and touchup painting of field welds, bolted connections, and abraded areas of shop paint on miscellaneous metal.
- C. Galvanized Surfaces: Clean welds, bolted connections, and abraded areas and apply galvanizing-repair paint to comply with ASTM A 780.

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SECTION 26 05 33  
RACEWAY AND BOXES FOR ELECTRICAL SYSTEMS

PART 1 - GENERAL

1.1 SECTION INCLUDES

- A. Conduits and fittings
- B. Outlet boxes
- C. Pull and junction boxes
- D. Surface metal raceways
- E. Wireway

1.2 SUBMITTALS

- A. Product Data: For surface raceways, wireways and fittings, floor boxes, hinged-cover enclosures, and cabinets.
- B. Shop Drawings: For custom enclosures and cabinets. Include plans, elevations, sections, details, and attachments to other work.

1.3 QUALITY ASSURANCE

- A. Electrical Components, Devices, and Accessories: Listed and labeled as defined in NFPA 70, Article 100, by a testing agency acceptable to authorities having jurisdiction, and marked for intended use.
- B. Comply with NFPA 70.

1.4 RECEIVING, STORING, AND PROTECTING

- A. Receive, store, and protect, and handle products according to NECA 1 – *Standard Practices for Good Workmanship in Electrical Construction*.

PART 2 - PRODUCTS

2.1 COATINGS

- A. Provide products with zinc coating or with treatment of equivalent corrosion resistance using approved alternative treatment, finish, or inherent material characteristic that is suitable for the environment in which the product will be installed and used.



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- 2.2 INTERMEDIATE METAL CONDUIT AND FITTINGS (IMC)
- A. Furnish intermediate metal conduit (IMC) that meets the requirements of UL1242 – *Intermediate Metal Conduit*, ANSI C80.6 – *Electrical Intermediate Metal Conduit (EIMC)*.
  - B. Furnish zinc-plated, threaded, malleable iron fittings and conduit bodies that meet the requirements of UL514B – *Fittings for Conduit and Outlet Boxes*, and ANSI/NEMA FB1 – *Fittings, Cast Metal Boxes, and Conduit Bodies for Conduit and Cable Assemblies*.
- 2.3 RIGID METAL CONDUIT AND FITTINGS (RMC)
- A. Furnish rigid metal conduit (RMC) that meets the requirements of UL6 – *Rigid Metal Electrical Conduit*, NEMA C80.1 – *Electrical Rigid Steel Conduit (ERSC)*.
  - B. Furnish zinc-plated, threaded, malleable iron fittings and conduit bodies that meet the requirements of UL514B and ANSI/NEMA FB1.
- 2.4 PLASTIC-COATED STEEL CONDUIT AND FITTINGS
- A. Furnish PVC exterior coated, urethane interior coated, RMC or IMC that meets the requirements of NEMA RN 1 – *PVC Externally Coated Galvanized Rigid Steel Conduit and Intermediate Metal Conduit*.
  - B. Use factory-fabricated elbows.
  - C. Furnish 40 mil PVC exterior coated, urethane interior coated, zinc-plated, threaded, malleable iron fittings and conduit bodies meeting the requirements of UL514B – *Fittings for Conduit and Outlet Boxes* and NEMA RN 1 PVC.
- 2.5 RIGID NON-METALLIC CONDUIT AND FITTINGS (RNC)
- A. Furnish rigid non-metallic conduit (RNC) that meets the requirements of UL651 – *Schedule 40 and 80 Rigid PVC Conduit*, NEMA TC 2 – *Electrical Plastic Tubing and Conduit*.
  - B. Furnish non-metallic, solvent-welded socket fittings that meet the requirements of UL514C – *Non-Metallic Fittings for Conduit and Outlet Boxes*, and NEMA TC 3 – *PVC Fittings for Use with Rigid PVC Conduit and Tubing*.
- 2.6 ELECTRICAL METALLIC TUBING AND FITTINGS (EMT)
- A. Furnish galvanized electrical metallic tubing (EMT) that meets the requirements of UL797 – *Electrical Metallic Tubing*, NEMA C80.3 – *Steel Electrical Metallic Tubing (EMT)*.
  - B. Furnish compression or set-screw type fittings that meet the requirements of UL514B – *Fittings for Conduit and Outlet Boxes*, and ANSI/NEMA FB1 – *Fittings, Cast Metal Boxes, and Conduit Bodies for Conduit and Cable Assemblies*. Furnish insulated throat connectors.



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### 2.7 FLEXIBLE METAL CONDUIT AND FITTINGS

- A. Furnish galvanized steel flexible metal conduit that meets the requirements of UL1 – *Flexible Metal Electrical Conduit*.
- B. Furnish zinc-plated malleable iron fittings that meet the requirements of UL514B – *Fittings for Conduit and Outlet Boxes*, and ANSI/NEMA FB1 – *Fittings, Cast Metal Boxes, and Conduit Bodies for Conduit and Cable Assemblies*. Furnish insulated throat connectors.

### 2.8 LIQUID-TIGHT FLEXIBLE METAL CONDUIT AND FITTINGS

- A. Furnish liquid-tight flexible metal conduit that meets the requirements of UL360 – *Liquid-Tight Flexible Steel Conduit, Electrical*.
- B. Furnish zinc-plated malleable iron or zinc-plated steel liquid-tight fittings that meet the requirements of UL514B – *Fittings for Conduit and Outlet Boxes*, and ANSI/NEMA FB1 – *Fittings, Cast Metal Boxes, and Conduit Bodies for Conduit and Cable Assemblies*. Furnish insulated throat connectors.

### 2.9 INSULATING BUSHINGS

- A. Provide NRTL listed insulating bushings with 105 °C rated insulation.
- B. Manufacturer: O-Z/Gedney, Type IB.

### 2.10 GROUNDING BUSHINGS

- A. Provide NRTL listed, galvanized malleable iron, 150°C rated insulated throat grounding bushings with lay-in type ground cable lugs.
- B. Manufacturer: O-Z/Gedney, Type BLG.

### 2.11 EXPANSION FITTINGS

- A. Furnish NRTL listed expansion fittings with hot dipped galvanized malleable iron body, factory installed packing and a bonding jumper.
- B. Manufacturer: O-Z/Gedney, Type AX, TX or EXE with Type BJ bonding jumper.

### 2.12 CORROSION PROTECTION TAPE

- A. Furnish pressure-sensitive, 10 mil thick. PVC based tape for corrosion protection of metal conduit and fittings.
- B. Manufacturer: 3M, Type 50.



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### 2.13 RACEWAY MEASURING TAPE

- A. Furnish raceway measuring tape with permanently printed measurements in one-foot increments and minimum 1200 lb average breaking strength.
- B. Manufacturer: Greenlee "39243".

### 2.14 SURFACE METAL RACEWAY

- A. Furnish surface metal raceway that meets the requirements of UL5 – *Surface Metal Electrical Raceways and Fittings*.
- B. Furnish surface metal raceway fabricated from cold rolled galvanized steel with a thickness of not less than 0.040 inches and coated with a baked enamel finish.
- C. Furnish fittings required for a complete installation.
- D. Manufacturer: Wiremold "500" or "700" series.

### 2.15 OUTLET BOXES

- A. Provide outlet boxes selected for specific installations using the guidance in NEMA OS 3, *Selection and Installation Guidelines for Electrical Outlet Boxes*, and the requirements of this Section.
- B. For dry locations provide galvanized steel outlet boxes that comply with UL Standard 514-A – *Metallic Outlet Boxes* and ANSI/NEMA OS1 – *Sheet-Steel Outlet Boxes, Device Boxes, Covers, and Box Supports*.
  - 1. For luminaire outlets use 4 inch x 1-1/2 inch deep octagonal boxes with fixture stud attachment as required to support luminaires.
  - 2. For flush outlets in stud walls or above-grade cast-in-place concrete walls use 4 inch square x 1-1/2 inch deep boxes; provide deeper boxes or multiple gang boxes as required to fit devices. Provide raised device covers that match the thickness of the wallboard and the number of devices. Provide supplemental box supports to prevent movement of the box.
  - 3. For flush outlets in above-grade masonry walls use masonry boxes with conduit knockouts. Provide boxes with depth suitable for the masonry unit size. Provide multiple gang boxes as required by the number of devices.
  - 4. For surface outlet boxes in EMT raceway systems, use 4 inch x 2-1/8 inch deep square boxes. Provide deeper boxes or multiple gang boxes as required to fit devices. Provide square surface covers that match the installed device and have not less than two holes for securing the device to the cover.
- C. For damp or wet locations and for surface-mounted RMC or IMC raceway systems, provide outlet boxes that comply with UL Standard 498 and 514, ANSI/NEMA FB1.
  - 1. For lighting fixture outlets use 4 inch x 2-1/16 inch deep round cast malleable iron boxes with threaded hubs.
  - 2. For flush or surface wall-mounted outlets, use 4-11/16 square, 2-11/16 inch deep cast malleable iron boxes with threaded hubs. Provide multiple gang boxes as required to fit devices. Provide gasketed cast malleable iron or cast copper-free aluminum covers that



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match the installed device and have not less than two holes for securing the device to the cover.

### 2.16 PULL AND JUNCTION BOXES

- A. For dry locations in clean, non-contamination environments use galvanized sheet steel pull and junction boxes that comply with UL Standard 50 Type 1 and the NEC as to size and construction. Use boxes not less than 4 inches square x 1-1/2 inches deep with screw-secured covers. Provide larger boxes as required by the number and size of conduits and conductors.
- B. For dry locations in dusty or possible contamination (e.g. beryllium, explosives, or uranium) environments use galvanized steel pull and junction boxes that comply with UL Standard 50 Type 12 and the NEC as to size and construction. Use boxes not less than 6 inches square x 4 inches deep with gasketed covers. Provide larger boxes as required by the number and size of conduits and conductors.
- C. For damp or wet, non-corrosive locations, in conduit runs up to 3/4 inch trade size, provide 4-11/16 inches square, 2-11/16 inches deep cast malleable iron pull and junction boxes with threaded hubs and gasketed cast malleable iron or cast copper-free aluminum covers.
- D. For damp or wet, non-corrosive locations, in conduit runs 1 inch trade size and larger, provide galvanized sheet-steel pull and junction boxes and covers that comply with UL 50 Type 3R.
- E. For damp or wet, non-corrosive locations that are subject to hose-directed water, provide pull and junction boxes and covers that comply with UL 50 Type 4.
- F. For damp or wet, corrosive locations provide pull and junction boxes and covers that comply with UL 50 Type 4X.
- G. For locations subject to occasional submersion provide pull and junction boxes and covers that comply with UL 50 Type 6.
- H. Provide connection points for equipment grounding conductors in each box.

### PART 3 - EXECUTION

#### 3.1 GENERAL

- A. Install complete systems of raceways and boxes for wiring systems.
- B. Install raceways and boxes according to NECA 1 Standard Practices for Good Workmanship in Electrical Construction, NECA 101 Standard for Installing Steel Conduits (Rigid, IMC, EMT), NECA 111 Standard for Installing Nonmetallic Raceways (RNC, ENT, LFNC), the NEC, the manufacturer's instructions, and requirements in this Section.
- C. Raceway termination points and box locations shown on the Drawings are in approximate locations unless dimensioned. Verify locations before rough-in.



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- D. Raceway routing is shown on the Drawings in approximate locations unless dimensioned. Coordinate routing with structure and with work of other trades. Route as required for a complete wiring system.
- E. Ground and bond raceways and boxes as required in Section 260526 Grounding and Bonding for Electrical Systems.
- F. Support raceways and boxes in accordance with the requirements of Section 260529 Hangers and Supports for Electrical Systems and the NEC.
- G. Identify raceways and boxes as required in Section 260553, Identification for Electrical Systems.
- H. Arrange raceway and boxes to maintain headroom and present neat appearance.
- I. Install knockout closures in unused openings in boxes or raceways.

### 3.2 CONDUIT INSTALLATION

- A. For low-voltage wiring systems (less than 600 volts) use conduit materials according to the NEC and the following:
  - 1. Outdoors - underground:
  - 2. Direct buried: Use RNC, plastic-coated RMC, tape-wrapped RMC, or tape-wrapped IMC. Do not use RNC where subject to physical damage. Install with 24 inches minimum cover from top of conduit to finished grade or top of paving.
    - a. Concrete encased: Use RNC, plastic-coated RMC, RMC, or IMC for concrete encased underground work. Install with 24 inches minimum cover from top of encasement to finished grade or paving.
  - 3. Outdoors - exposed: Use RMC or IMC.
  - 4. Outdoor corrosive locations (including cooling towers): Use plastic-coated RMC and fittings.
  - 5. Outdoors - concealed: Use RMC or IMC for concealed outdoor work. Do not use bare RMC or IMC in direct contact with earth. EMT may be used for concealed outdoor work where not in contact with earth, not encased in concrete, and where not exposed to deteriorating agents.
  - 6. Indoors – exposed outside of designated electrical rooms or telecommunications rooms:
    - a. Located less than 8 ft above the floor: Use RMC or IMC.
    - b. Exposed to severe physical damage: Use RMC or IMC.
    - c. Exposed to moisture: Use RMC or IMC.
    - d. Exposed to corrosives: Use plastic-coated RMC and fittings.
    - e. Located more than 8 ft above the floor, not exposed to deteriorating agents, and not subject to severe physical damage: Use RMC, IMC, or EMT.
  - 7. Indoors – concealed:
    - a. Within drywall partitions and above false ceilings: Use RMC, IMC, or EMT.
    - b. Within masonry or cast-in-place concrete walls or floors: Use RMC or IMC.
    - c. Direct-buried under building floor slabs on grade: Use RNC, plastic-coated RMC, tape-wrapped RMC, or tape-wrapped IMC. Locate top of conduits not less than 12 inches below the bottom of the concrete slab. Install warning tape approximately 6



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- inches above the conduits; install multiple warning tapes above parallel conduit runs wider than 18 inches.
- d. Concrete encased under building floor slabs on grade: Use RNC, plastic-coated RMC, RMC, or IMC. Locate top of concrete encasement not less than 12 inches below the bottom of the concrete slab. Install warning tape approximately 6 inches above the concrete encasement; install multiple warning tapes above concrete encasements wider than 24 inches.
8. Connection to vibrating equipment (including transformers and hydraulic, pneumatic, or electric solenoid or motor-driven equipment) - Use a minimum of 18 inches; maximum length as determined by the NEC:
    - a. Outdoors: Use liquidtight flexible metal conduit.
    - b. In mechanical rooms: Use liquidtight flexible metal conduit.
    - c. Wet, damp, or corrosive indoor locations: Use liquidtight flexible metal conduit.
    - d. Dry indoor locations: Use flexible metal conduit.
  9. Connections to luminaires: Use 3/8 inch flexible metal conduit or metal-clad cable in 6 foot maximum lengths for tap conductors to luminaires above suspended ceilings.
- B. Use 3/4-inch or larger conduit to enclose multiple conductors larger than 12 AWG.
  - C. Conceal conduits, unless otherwise indicated on the Drawings, with finished walls, floors and ceilings. Unless otherwise indicated on the Drawings, install concealed conduits with a minimum of bends in the shortest practical distance considering the type of building construction and obstructions.
  - D. Position parallel underground conduits with not less than 7-1/2 inches center-to-center separation.
  - E. Install expansion fittings where embedded conduits cross building expansion joints.
  - F. Use conduit hubs to fasten conduit to boxes in damp and wet locations.
  - G. Use sealing locknuts, hubs, or similar water-resistant fittings on conduits entering the top of switchgear, switchboards, motor control centers, panelboards, cabinets, pull boxes, and similar enclosures that are exposed in structures with automatic fire sprinkler systems.
  - H. Install insulating bushings or connectors with an insulated throat to protect conductors or cables at conduit terminations.
  - I. Install conduits with the following limits of bends and distance between pull points:
    1. 50 ft with 3 equivalent 90 degree bends.
    2. 100 ft with 2 equivalent 90 degree bends.
    3. 150 ft with 1 equivalent 90 degree bend.
    4. 200 ft straight run with no bends.
    5. Provide large sweep radius elbows for 90 degree elbows (minimum) unless otherwise noted.
  - J. Stub-Up Connections:



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1. Extend conduits through concrete floor for connection to freestanding equipment with an adjustable top or coupling threaded inside for plugs, and set flush with the finished floor or equipment pad.
  2. Extend conductors to equipment with rigid steel conduit; flexible metal conduit may be used 6 inches above the floor.
  3. Where equipment connections are not made under this Subcontract, install threaded insert plugs set flush with the floor.
- K. Install conduit sealing fittings according to the manufacturer's written instructions. Locate fittings at suitable, approved, accessible locations and fill them with NRTL-listed conduit sealing compound. For concealed raceways, install each fitting in a flush steel box with a blank cover plate having a finish similar to that of adjacent plates or surfaces. Install raceway sealing fittings at the following points and elsewhere as indicated:
1. Where conduits enter or leave NEC Class I hazardous locations.
  2. Where conduits pass from warm locations to cold locations, such as the boundaries of refrigerated spaces and air-conditioned spaces.
  3. Where conduits go between areas where air pressure differential must be maintained.
  4. Where conduits enter an enclosure protected by a clean agent total flooding fire suppression system.
  5. Where otherwise required by the NEC.
- L. Join nonmetallic conduit using cement as recommended by manufacturer. Wipe nonmetallic conduits dry and clean before joining. Apply full even coat of cement to entire area inserted in fitting. Allow joint to cure for 20 minutes, minimum.
- M. Install plastic-coated RMC and fittings according to the NEC and manufacturer's instructions. Use only fittings approved for use with that material. Patch all nicks and scrapes in PVC coating after installing conduits.
- N. Do not use RNC 90 degree elbows larger than 2 inch trade size; use plastic-coated RMC, tape-wrapped RMC, or tape-wrapped IMC for 2-1/2 inch trade size and larger 90 degree elbows.
- O. Maintain the following minimum clearances between conduit and surfaces with temperatures exceeding 104 degrees F (40 degrees C):
1. 6" at perpendicular crossings.
  2. 12" between parallel runs.
- P. Avoid moisture traps in conduit system; provide junction boxes with drain fitting at low points in conduit system.
- Q. Install corrosion protection tape on metal conduits and fittings in contact with soil using half-lapped wrappings.
- R. Install grounding bushings at the following locations:
1. At every entry to enclosures on metallic conduits containing circuits rated 100 amperes and higher.
  2. On metallic conduits entering enclosures through concentric, eccentric or oversize knockouts.
  3. On metallic conduits that terminate to a metallic enclosure without effective electrical connection such as locknuts or threaded bushings.



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- S. Install conduit measuring tape in empty raceways. Leave not less than 12 inches of slack at each end of the tape. Secure each end of tape.
- T. Install exposed raceways parallel or at right angles to nearby surfaces or structural members and follow surface contours as much as possible.
  - 1. Run parallel or banked raceways together on common supports.
  - 2. Make parallel bends in parallel or banked runs. Use factory elbows only where elbows can be installed parallel; otherwise, provide field bends for parallel raceways.
- U. Join raceways with fittings designed and approved for that purpose and make joints tight.
  - 1. Use insulating bushings to protect conductors.
- V. Tighten set screws of threadless fittings with suitable tools.
- W. Terminations:
  - 1. Where raceways are terminated with locknuts and bushings, align raceways to enter squarely and install locknuts with dished part against box. Use two locknuts, one inside and one outside box.
  - 2. Where raceways are terminated with threaded hubs, screw raceways or fittings tightly into hub so end bears against wire protection shoulder. Where chase nipples are used, align raceways so coupling is square to box; tighten chase nipple so no threads are exposed.
- X. Install raceway sealing fittings at suitable, approved, and accessible locations and fill them with UL-listed sealing compound. For concealed raceways, install each fitting in a flush steel box with a blank cover plate having a finish similar to that of adjacent plates or surfaces. Install raceway sealing fittings at the following points:
  - 1. Where conduits pass from warm to cold locations, such as boundaries of refrigerated spaces.
  - 2. Where otherwise required by NFPA 70.
- Y. Install hinged-cover enclosures and cabinets plumb. Support at each corner.

### 3.3 OUTLET BOX INSTALLATION

- A. Install outlet boxes with centers at the following heights unless noted otherwise on the Drawings:
  - 1. Receptacle, telephone and data outlets:
    - a. Common Areas (such as conference and break rooms): 18 inches above finished floor.
    - b. Offices and Workstations: 18 inches above finished floor.
  - 2. Receptacle, telephone and data outlets at lab benches and counters -- center 44 inches maximum above finished floor; coordinate locations to be above, or completely within, bench and counter backsplashes.
  - 3. Light switches: center 48 inches above finished floor and within 6 inches of door frame.



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4. Thermostats: center 48 inches above finished floor.
  5. Wall mounted emergency lights: 80 inches above finished floor or 12 inches below the ceiling; whichever is lower.
- B. Coordinate outlet box locations with modular furniture and associated hangers.
- C. Where the Drawings show outlets as adjacent, align outlet boxes with each other and group them symmetrically.
- D. Orient boxes to accommodate wiring devices oriented as specified in Section 262726 Wiring Devices.
- E. Install a multi-gang box where more than one device is mounted together. Do not use sectional type boxes.
- F. Install box with plaster ring for single or multiple device outlets.
- G. Use flush mounted outlet boxes in finished areas.
1. Install flush outlet boxes and fittings in walls and ceilings so that front edge is flush with the finished surface. Repair broken wall or ceiling surfaces so no gaps or open spaces exceed 1/8 inch at the edge of boxes or fittings.
  2. Locate flush mounting box in masonry wall to require cutting of masonry unit corner only. Coordinate masonry cutting to achieve neat opening.
  3. Do not install flush mounting boxes back-to-back in walls; install with minimum 6 inches separation. Install with minimum 24 inches separation in acoustic rated walls.
  4. Secure flush mounting boxes to interior wall and partition studs. Accurately position to allow for surface finish thickness.
  5. Install stamped steel bridges to fasten multiple flush mounting outlet boxes between studs.
  6. Install flush mounting box without damaging wall insulation or reducing its effectiveness.
- H. Install adjustable steel channel fasteners for hung ceiling outlet box.
- I. Do not fasten boxes to ceiling support wires or other piping systems.
- J. Support boxes independently of conduit.
- K. Install partitions in boxes as follows:
1. Between 277 volt devices.
  2. Between 277 volt light switches devices and 120 volt devices.
  3. Between either 120 volt or 277 volt devices and low voltage control switches.
- L. Install a blank cover plate on each outlet box in which no device is installed.
- 3.4 PULL AND JUNCTION BOX INSTALLATION
- A. Install pull and junction boxes as shown on the Drawings and as required for splices, taps, wire pulling, and compliance with regulatory requirements.



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- B. Install indoor pull and junction boxes in accessible locations above accessible ceilings and in unfinished spaces. Position boxes so covers can be removed. Place boxes to maintain headroom.
- C. Install a concrete collar around handholes not placed in sidewalks or pavement.

### 3.5 WIREWAY INSTALLATION

- A. Install wireways at locations indicated on the Drawings.
- B. Mount plumb and level.

### 3.6 SURFACE METAL RACEWAY INSTALLATION

- A. Install surface metal raceway at locations indicated on the Drawings.
- B. Use flat-head screws, clips, and straps to fasten raceway channel to surfaces.
- C. Mount plumb and level.

### 3.7 ADJUSTING

- A. Adjust flush-mounted outlets to make front flush with finished floor, wall, or ceiling material.
- B. Install knockout closures in unused openings in boxes.

### 3.8 CLEANING

- A. Clean interior of boxes to remove dust, debris, and other material.
- B. Repair damage to galvanized finishes with zinc-rich paint recommended by manufacturer.
- C. Repair damage to paint or PVC finishes with matching touch-up coating recommended by the manufacturer.

### 3.9 FIELD QUALITY CONTROL

- A. Provide final protection and maintain conditions to ensure that coatings and finishes are without damage or deterioration at final inspection.

### 3.10 INSTALLATION

- A. Comply with NECA 1 for installation requirements applicable to products specified in Part 2 except where requirements on Drawings or in this Article are stricter.
- B. Keep raceways at least 6 inches away from parallel runs of flues and steam or hot-water pipes. Install horizontal raceway runs above water and steam piping.



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- C. Complete raceway installation before starting conductor installation.
- D. Support raceways as specified in Division 26 Section "Hangers and Supports for Electrical Systems."
- E. Arrange stub-ups so curved portions of bends are not visible above the finished slab.
- F. Conceal conduit and EMT within finished walls, ceilings, and floors, unless otherwise indicated.
- G. Raceways Embedded in Slabs:
  - 1. Run conduit larger than 1-inch trade size, parallel or at right angles to main reinforcement. Where at right angles to reinforcement, place conduit close to slab support.
  - 2. Arrange raceways to cross building expansion joints at right angles with expansion fittings.
  - 3. Change from ENT to RNC, Type EPC-40-PVC, rigid steel conduit, or IMC before rising above the floor.
- H. Raceway Terminations at Locations Subject to Moisture or Vibration: Use insulating bushings to protect conductors, including conductors smaller than No. 4 AWG.
- I. Install pull wires in empty raceways. Use polypropylene or monofilament plastic line with not less than 200-lb tensile strength. Leave at least 24 inches of slack at each end of pull wire.
- J. Install raceway sealing fittings at suitable, approved, and accessible locations and fill them with listed sealing compound. For concealed raceways, install each fitting in a flush steel box with a blank cover plate having a finish similar to that of adjacent plates or surfaces. Install raceway sealing fittings at the following points:
  - 1. Where conduits pass from warm to cold locations, such as boundaries of refrigerated spaces.
  - 2. Where otherwise required by NFPA 70.
- K. Expansion-Joint Fittings for RNC: Install in each run of aboveground conduit that is located where environmental temperature change may exceed 30 deg F, and that has straight-run length that exceeds 25 feet.
  - 1. Install expansion-joint fittings for each of the following locations, and provide type and quantity of fittings that accommodate temperature change listed for location:
    - a. Outdoor Locations Not Exposed to Direct Sunlight: 125 deg F temperature change.
    - b. Outdoor Locations Exposed to Direct Sunlight: 155 deg F temperature change.
    - c. Indoor Spaces: Connected with the Outdoors without Physical Separation: 125 deg F temperature change.
    - d. Attics: 135 deg F temperature change.
  - 2. Install fitting(s) that provide expansion and contraction for at least 0.00041 inch per foot of length of straight run per deg F of temperature change.
  - 3. Install each expansion-joint fitting with position, mounting, and piston setting selected according to manufacturer's written instructions for conditions at specific location at the time of installation.



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- L. Recessed Boxes in Masonry Walls: Saw-cut opening for box in center of cell of masonry block, and install box flush with surface of wall.

3.11 INSTALLATION OF UNDERGROUND CONDUIT

A. Direct-Buried Conduit:

1. Excavate trench bottom to provide firm and uniform support for conduit. Prepare trench bottom as specified for pipe less than 6 inches in nominal diameter.
2. Install backfill as specified.
3. After installing conduit, backfill and compact. Start at tie-in point, and work toward end of conduit run, leaving conduit at end of run free to move with expansion and contraction as temperature changes during this process. Firmly hand tamp backfill around conduit to provide maximum supporting strength. After placing controlled backfill to within 12 inches of finished grade, make final conduit connection at end of run and complete backfilling with normal compaction as specified.
4. Install manufactured duct elbows for stub-ups at poles and equipment and at building entrances through the floor, unless otherwise indicated. Encase elbows for stub-up ducts throughout the length of the elbow.
5. Install manufactured rigid steel conduit elbows for stub-ups at poles and equipment and at building entrances through the floor.
  - a. Couple steel conduits to ducts with adapters designed for this purpose, and encase coupling with 3 inches of concrete.
  - b. For stub-ups at equipment mounted on outdoor concrete bases, extend steel conduit horizontally a minimum of 60 inches from edge of equipment pad or foundation. Install insulated grounding bushings on terminations at equipment.
6. Warning Planks: Bury warning planks approximately 12 inches above direct-buried conduits, placing them 24 inches o.c. Align planks along the width and along the centerline of conduit.

END OF SECTION 26 05 33



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SECTION 26 05 53  
IDENTIFICATION FOR ELECTRICAL SYSTEMS

PART 1 - GENERAL

1.1 SUMMARY

A. Section Includes:

1. Identification for raceways.
2. Identification of power and control cables.
3. Identification for conductors.
4. Warning labels and signs.
5. Instruction signs.
6. Equipment identification labels.
7. Miscellaneous identification products.

1.2 SUBMITTALS

- A. Product Data: For each electrical identification product indicated.

1.3 QUALITY ASSURANCE

- A. Comply with ANSI A13.1.
- B. Comply with NFPA 70.
- C. Comply with 29 CFR 1910.144 and 29 CFR 1910.145.
- D. Comply with ANSI Z535.4 for safety signs and labels.
- E. Adhesive-attached labeling materials, including label stocks, laminating adhesives, and inks used by label printers, shall comply with UL 969.

PART 2 - PRODUCTS

2.1 POWER RACEWAY IDENTIFICATION MATERIALS

- A. Comply with ANSI A13.1 for minimum size of letters for legend and for minimum length of color field for each raceway size.
- B. Colors for Raceways Carrying Circuits at 600 V or Less:
1. Black letters on an orange field.
  2. Legend: Indicate voltage and system.



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- C. Self-Adhesive Vinyl Labels for Raceways Carrying Circuits at 600 V or Less: Preprinted, flexible label laminated with a clear, weather- and chemical-resistant coating and matching wraparound adhesive tape for securing ends of legend label.
- D. Snap-Around Labels for Raceways Carrying Circuits at 600 V or Less: Slit, pretensioned, flexible, preprinted, color-coded acrylic sleeve, with diameter sized to suit diameter of raceway or cable it identifies and to stay in place by gripping action.
- E. Snap-Around, Color-Coding Bands for Raceways Carrying Circuits at 600 V or Less: Slit, pretensioned, flexible, solid-colored acrylic sleeve, 2 inches long, with diameter sized to suit diameter of raceway or cable it identifies and to stay in place by gripping action.
- F. Write-On Tags: Polyester tag, 0.015 inch (0.38 mm) thick, with corrosion-resistant grommet and cable tie for attachment to conductor or cable.
  - 1. Marker for Tags: Machine-printed, permanent, waterproof, black ink marker recommended by printer manufacturer.

### 2.2 ARMORED AND METAL-CLAD CABLE IDENTIFICATION MATERIALS

- A. Comply with ANSI A13.1 for minimum size of letters for legend and for minimum length of color field for each raceway and cable size.
- B. Colors for Raceways Carrying Circuits at 600 V and Less:
  - 1. Black letters on an orange field.
  - 2. Legend: Indicate voltage and system.
- C. Self-Adhesive Vinyl Labels: Preprinted, flexible label laminated with a clear, weather- and chemical-resistant coating and matching wraparound adhesive tape for securing ends of legend label.
- D. Self-Adhesive Vinyl Tape: Colored, heavy duty, waterproof, fade resistant; 2 inches wide; compounded for outdoor use.

### 2.3 POWER AND CONTROL CABLE IDENTIFICATION MATERIALS

- A. Comply with ANSI A13.1 for minimum size of letters for legend and for minimum length of color field for each raceway and cable size.
- B. Self-Adhesive Vinyl Labels: Preprinted, flexible label laminated with a clear, weather- and chemical-resistant coating and matching wraparound adhesive tape for securing ends of legend label.
- C. Write-On Tags: Polyester tag, 0.015 inch (0.38 mm) thick, with corrosion-resistant grommet and cable tie for attachment to conductor or cable.
  - 1. Marker for Tags: Machine-printed, permanent, waterproof, black ink marker recommended by printer manufacturer.



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- D. Snap-Around Labels: Slit, pretensioned, flexible, preprinted, color-coded acrylic sleeve, with diameter sized to suit diameter of raceway or cable it identifies and to stay in place by gripping action.
- E. Snap-Around, Color-Coding Bands: Slit, pretensioned, flexible, solid-colored acrylic sleeve, 2 inches long, with diameter sized to suit diameter of raceway or cable it identifies and to stay in place by gripping action.

### 2.4 CONDUCTOR IDENTIFICATION MATERIALS

- A. Color-Coding Conductor Tape: Colored, self-adhesive vinyl tape not less than 3 mils thick by 1 to 2 inches wide.
- B. Self-Adhesive Vinyl Labels: Preprinted, flexible label laminated with a clear, weather- and chemical-resistant coating and matching wraparound adhesive tape for securing ends of legend label.
- C. Marker Tapes: Vinyl or vinyl-cloth, self-adhesive wraparound type, with circuit identification legend machine printed by thermal transfer or equivalent process.
- D. Write-On Tags: Polyester tag, 0.015 inch (0.38 mm) thick, with corrosion-resistant grommet and cable tie for attachment to conductor or cable.
  - 1. Marker for Tags: Machine-printed, permanent, waterproof, black ink marker recommended by printer manufacturer.

### 2.5 FLOOR MARKING TAPE

- A. 2-inch- wide, 5-mil pressure-sensitive vinyl tape, with black and white stripes and clear vinyl overlay.
  - 1. Manufacturer: 3M Safety Stripe Tape 5700.

### 2.6 WARNING LABELS AND SIGNS

- A. Comply with NFPA 70 and 29 CFR 1910.145.
- B. Self-Adhesive Warning Labels: Factory-printed, multicolor, pressure-sensitive adhesive labels, configured for display on front cover, door, or other access to equipment unless otherwise indicated.
- C. Baked-Enamel Warning Signs:
  - 1. Preprinted aluminum signs, punched or drilled for fasteners, with colors, legend, and size required for application.
  - 2. 1/4-inch grommets in corners for mounting.
  - 3. Nominal size, 7 by 10 inches.
- D. Metal-Backed, Butyrate Warning Signs:



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1. Weather-resistant, nonfading, preprinted, cellulose-acetate butyrate signs with 0.0396-inch galvanized-steel backing; and with colors, legend, and size required for application.
2. 1/4-inch grommets in corners for mounting.
3. Nominal size, 10 by 14 inches.

E. Warning label and sign shall include, but are not limited to, the following legends:

1. Multiple Power Source Warning: "DANGER - ELECTRICAL SHOCK HAZARD - EQUIPMENT HAS MULTIPLE POWER SOURCES."
2. Workspace Clearance Warning: "WARNING - OSHA REGULATION - AREA IN FRONT OF ELECTRICAL EQUIPMENT MUST BE KEPT CLEAR FOR 36 INCHES."

### 2.7 INSTRUCTION SIGNS

- A. Engraved, laminated acrylic or melamine plastic, minimum 1/16 inch thick for signs up to 20 sq. inches and 1/8 inch thick for larger sizes.
  1. Engraved legend with black letters on white face.
  2. Punched or drilled for mechanical fasteners.
  3. Framed with mitered acrylic molding and arranged for attachment at applicable equipment.
- B. Adhesive Film Label: Machine printed, in black, by thermal transfer or equivalent process. Minimum letter height shall be 3/8 inch.
- C. Adhesive Film Label with Clear Protective Overlay: Machine printed, in black, by thermal transfer or equivalent process. Minimum letter height shall be 3/8 inch. Overlay shall provide a weatherproof and UV-resistant seal for label.

### 2.8 EQUIPMENT IDENTIFICATION LABELS

- A. Adhesive Film Label with Clear Protective Overlay: Machine printed, in black, by thermal transfer or equivalent process. Minimum letter height shall be 3/8 inch. Overlay shall provide a weatherproof and UV-resistant seal for label.
- B. Self-Adhesive, Engraved, Laminated Acrylic or Melamine Label: Adhesive backed, with white letters on a dark-gray background. Minimum letter height shall be 3/8 inch.
- C. Stenciled Legend: In nonfading, waterproof, black ink or paint. Minimum letter height shall be 1 inch (25 mm).

### 2.9 MISCELLANEOUS IDENTIFICATION PRODUCTS

- A. Paint: Comply with requirements in Division 9 painting Sections for paint materials and application requirements. Select paint system applicable for surface material and location (exterior or interior).
- B. Fasteners for Labels and Signs: Self-tapping, stainless-steel screws or stainless-steel machine screws with nuts and flat and lock washers.



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## 2.10 OUTLET LABELS

- A. See Section 262726, Part 3.2 for all device labeling details. Submit details to Engineer prior to placing order.
- B. Provide black, 10 point minimum size lettering on a white background.

## PART 3 - EXECUTION

### 3.1 INSTALLATION

- A. Location: Install identification materials and devices at locations for most convenient viewing without interference with operation and maintenance of equipment.
- B. Apply identification devices to surfaces that require finish after completing finish work.
- C. Self-Adhesive Identification Products: Clean surfaces before application, using materials and methods recommended by manufacturer of identification device.
- D. Attach signs and plastic labels that are not self-adhesive type with mechanical fasteners appropriate to the location and substrate.
- E. System Identification Color-Coding Bands for Raceways and Cables: Each color-coding band shall completely encircle cable or conduit. Place adjacent bands of two-color markings in contact, side by side. Locate bands at changes in direction, at penetrations of walls and floors, at 50-foot maximum intervals in straight runs, and at 25-foot maximum intervals in congested areas. Color coding should be the same as the junction box color coding below.
- F. Painted Identification: Comply with requirements in Division 9 painting Sections for surface preparation and paint application.
- G. Install all signs and labels plumb and neatly on all equipment and wiring.
- H. Color Coding of Junction Boxes: Paint junction boxes inside and out before installation of the systems listed below:
  - 1. Apply the following colors to the systems listed below:
    - a. Fire Alarm System: Bright Red.
    - b. Intercom: Yellow.
    - c. TV: Green.
    - d. Security System: Orange
    - e. Emergency Power: Red
    - f. Telecommunication System: White
    - g. Energy Management System: Purple or as per Owner.
    - h. 480V Power: Blue
    - i. 208V Power: Black



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## 3.2 IDENTIFICATION SCHEDULE

- A. Accessible Raceways and Metal-Clad Cables, 600 V or Less, for Service, Feeder, and Branch Circuits More Than 30 A, and 120 V to ground: Install labels at 10-foot (3-m) maximum intervals.
- B. Accessible Raceways and Cables within Buildings: Identify the covers of each junction and pull box of the following systems with self-adhesive vinyl labels with the wiring system legend and system voltage. System legends shall be as follows:
  - 1. Emergency Power.
  - 2. Power.
  - 3. UPS.
- C. Power-Circuit Conductor Identification, 600 V or Less: For conductors in vaults, pull and junction boxes, manholes, and handholes, use color-coding conductor tape to identify the phase.
  - 1. Color-Coding for Phase and Voltage Level Identification, 600 V or Less: Use colors listed below for ungrounded service, feeder and branch-circuit conductors.
    - a. Color shall be factory applied or field applied for sizes larger than No. 8 AWG, if authorities having jurisdiction permit.
    - b. Colors for 208/120-V Circuits:
      - 1) Phase A: Black.
      - 2) Phase B: Red.
      - 3) Phase C: Blue.
    - c. Colors for 480/277-V Circuits:
      - 1) Phase A: Brown.
      - 2) Phase B: Orange.
      - 3) Phase C: Yellow.
    - d. Field-Applied, Color-Coding Conductor Tape: Apply in half-lapped turns for a minimum distance of 6 inches from terminal points and in boxes where splices or taps are made. Apply last two turns of tape with no tension to prevent possible unwinding. Locate bands to avoid obscuring factory cable markings.
- D. Install instructional sign including the color-code for grounded and ungrounded conductors using adhesive-film-type labels.
- E. Conductors to Be Extended in the Future: Attach marker tape to conductors and list source.
- F. Auxiliary Electrical Systems Conductor Identification: Identify field-installed alarm, control, and signal connections.
  - 1. Identify conductors, cables, and terminals in enclosures and at junctions, terminals, and pull points. Identify by system and circuit designation.
  - 2. Use system of marker tape designations that is uniform and consistent with system used by manufacturer for factory-installed connections.
  - 3. Coordinate identification with Project Drawings, manufacturer's wiring diagrams, and the Operation and Maintenance Manual.



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- G. Workspace Indication: Install floor marking tape to show working clearances in the direction of access to live parts. Workspace shall be as required by NFPA 70 and 29 CFR 1926.403 unless otherwise indicated. Do not install at flush-mounted panelboards and similar equipment in finished spaces.
- H. Warning Labels for Indoor Cabinets, Boxes, and Enclosures for Power and Lighting: Metal-backed, butyrate warning signs.
1. Comply with 29 CFR 1910.145.
  2. Identify system voltage with black letters on an orange background.
  3. Apply to exterior of door, cover, or other access.
  4. For equipment with multiple power or control sources, apply to door or cover of equipment including, but not limited to, the following:
    - a. Power transfer switches.
    - b. Controls with external control power connections.
- I. Operating Instruction Signs: Install instruction signs to facilitate proper operation and maintenance of electrical systems and items to which they connect. Install instruction signs with approved legend where instructions are needed for system or equipment operation.
- J. Emergency Operating Instruction Signs: Install instruction signs with white legend on a red background with minimum 3/8-inch- high letters for emergency instructions at equipment used for power transfer or load shedding.
- K. Equipment Identification Labels: On each unit of equipment, install unique designation label that is consistent with wiring diagrams, schedules, and the Operation and Maintenance Manual. Apply labels to disconnect switches and protection equipment, central or master units, control panels, control stations, terminal cabinets, and racks of each system. Systems include power, lighting, control, communication, signal, monitoring, and alarm systems unless equipment is provided with its own identification.
1. Labeling Instructions:
    - a. Indoor Equipment: Engraved, laminated acrylic or melamine label. Unless otherwise indicated, provide a single line of text with 1/2-inch- high letters on 1-1/2-inch- high label; where two lines of text are required, use labels 2 inches high.
    - b. Outdoor Equipment: Engraved, laminated acrylic or melamine label 4 inches (100 mm) high.
    - c. Elevated Components: Increase sizes of labels and letters to those appropriate for viewing from the floor.
    - d. Unless provided with self-adhesive means of attachment, fasten labels with appropriate mechanical fasteners that do not change the NEMA or NRTL rating of the enclosure.

### 3.3 OUTLET LABELS

- A. Outlet label shall be visible on outside of device cover for each receptacle outlet and light switch (all device cover plates).

END OF SECTION 26 05 53



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SECTION 26 09 23  
LIGHTING CONTROL DEVICES

PART 1 - GENERAL

1.1 SUMMARY

- A. This Section includes the following lighting control devices:
  - 1. Outdoor photoelectric switches.
- B. See Division 262726 Section "Wiring Devices" for manual light switches.

1.2 SUBMITTALS

- A. Product Data: For each type of product indicated.
- B. Field quality-control test reports.
- C. Operation and maintenance data.

1.3 QUALITY ASSURANCE

- A. Electrical Components, Devices, and Accessories: Listed and labeled as defined in NFPA 70, Article 100, by a testing agency acceptable to authorities having jurisdiction, and marked for intended use.

1.4 COORDINATION

- A. Coordinate layout and installation of ceiling-mounted devices with other construction that penetrates ceilings or is supported by them, including light fixtures, HVAC equipment, and partition assemblies.

PART 2 - PRODUCTS

2.1 OUTDOOR PHOTOELECTRIC SWITCHES

- A. Manufacturers: Subject to compliance with requirements, provide products by one of the following:
  - 1. Area Lighting Research, Inc.; Tyco Electronics.
  - 2. Intermatic, Inc.
  - 3. Novitas, Inc.
  - 4. Watt Stopper (The).
- B. Description: Solid state, with DPST dry contacts rated for 1800-VA tungsten or 1000-VA inductive, to operate connected relay, contactor coils, or microprocessor input; complying with UL 773A.
  - 1. Light-Level Monitoring Range: 1.5 to 10 fc, with an adjustment for turn-on and turn-off



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- levels within that range, and a directional lens in front of photocell to prevent fixed light sources from causing turn-off.
2. Time Delay: 15-second minimum, to prevent false operation.
  3. Surge Protection: Metal-oxide varistor, complying with IEEE C62.41.1, IEEE C62.41.2, and IEEE 62.45 for Category A1 locations.
  4. Mounting: Twist lock complying with IEEE C136.10, with base-and-stem mounting or stem-and-swivel mounting accessories as required to direct sensor to the north sky exposure.

### PART 3 - EXECUTION

#### 3.1 SENSOR INSTALLATION

- A. Install and aim sensors in locations to achieve not less than 90 percent coverage of areas indicated. Do not exceed coverage limits specified in manufacturer's written instructions.

#### 3.2 WIRING INSTALLATION

- A. Wiring within Enclosures: Comply with NECA 1. Separate power-limited and nonpower-limited conductors according to conductor manufacturer's written instructions.
- B. Size conductors according to lighting control device manufacturer's written instructions, unless otherwise indicated.
- C. Splices, Taps, and Terminations: Make connections only on numbered terminal strips in junction, pull, and outlet boxes; terminal cabinets; and equipment enclosures.

#### 3.3 IDENTIFICATION

- A. Identify components and power and control wiring according to Division 26 Section "Identification for Electrical Systems."
  1. Identify circuits or luminaries controlled by photoelectrics at each sensor.
- B. Label switches with a unique designation.

#### 3.4 FIELD QUALITY CONTROL

- A. Perform the following field tests and inspections and prepare test reports:
  1. After installing time switches and sensors, and after electrical circuitry has been energized, adjust and test for compliance with requirements.
  2. Operational Test: Verify operation of each lighting control device, and adjust time delays.
- B. Lighting control devices that fail tests and inspections are defective work.

END OF SECTION 26 09 23



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SECTION 26 24 16  
PANELBOARDS

PART 1 - GENERAL

1.1 SUMMARY

- A. Section includes distribution panelboards and lighting and appliance branch-circuit panelboards.

1.2 SUBMITTALS

- A. Product Data: For each type of product indicated.
- B. Shop Drawings: For each panelboard and related equipment.
  - 1. Include dimensioned plans, elevations, sections, and details. Show tabulations of installed devices, equipment features, and ratings.
  - 2. Detail enclosure types and details for types other than NEMA 250, Type 1.
  - 3. Detail bus configuration, current, and voltage ratings.
  - 4. Short-circuit current rating of panelboards and overcurrent protective devices.
  - 5. Include evidence of NRTL listing for series rating of installed devices.
  - 6. Detail features, characteristics, ratings, and factory settings of individual overcurrent protective devices and auxiliary components.
  - 7. Include wiring diagrams for power, signal, and control wiring.
  - 8. Include time-current coordination curves for each type and rating of overcurrent protective device included in panelboards.
- C. Field quality-control reports.
- D. Panelboard schedules for installation in panelboards.
- E. Operation and maintenance data.

1.3 QUALITY ASSURANCE

- A. Electrical Components, Devices, and Accessories: Listed and labeled as defined in NFPA 70, by a qualified testing agency, and marked for intended location and application.
- B. Comply with NEMA PB 1.
- C. Comply with NFPA 70.

1.4 WARRANTY

- A. Special Warranty: Manufacturer's standard form in which manufacturer agrees to repair or replace transient voltage suppression devices that fail in materials or workmanship within specified warranty period.
  - 1. Warranty Period: Five years from date of Substantial Completion.



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PART 2 - PRODUCTS

2.1 GENERAL REQUIREMENTS FOR PANELBOARDS

- A. Enclosures: Flush- and surface-mounted cabinets.
  - 1. Rated for environmental conditions at installed location.
    - a. Indoor Dry and Clean Locations: NEMA 250, Type 1.
    - b. Outdoor Locations: NEMA 250, Type 3R.
    - c. Kitchen Areas: NEMA 250, Type 4X.
    - d. Other Wet or Damp Indoor Locations: NEMA 250, Type 4.
  - 2. Front: Secured to box with concealed trim clamps. For surface-mounted fronts, match box dimensions; for flush-mounted fronts, overlap box.
  - 3. Hinged Front Cover: Entire front trim hinged to box and with standard door within hinged trim cover.
  - 4. Directory Card: Inside panelboard door, mounted in transparent card holder.
- B. Incoming Mains Location: Top and bottom.
- C. Phase, Neutral, and Ground Buses: Hard-drawn copper, 98 percent conductivity.
- D. Conductor Connectors: Suitable for use with conductor material and sizes.
  - 1. Material: Hard-drawn copper, 98 percent conductivity.
  - 2. Main and Neutral Lugs: Mechanical type.
  - 3. Ground Lugs and Bus Configured Terminators: Mechanical type.
  - 4. Feed-Through Lugs: Mechanical type, suitable for use with conductor material. Locate at opposite end of bus from incoming lugs or main device.
  - 5. Subfeed (Double) Lugs: Mechanical type suitable for use with conductor material. Locate at same end of bus as incoming lugs or main device.
- E. Service Equipment Label: NRTL labeled for use as service equipment for panelboards with one or more main service disconnecting and overcurrent protective devices.
- F. Future Devices: Mounting brackets, bus connections, filler plates, and necessary appurtenances required for future installation of devices.
- G. Panelboard Short-Circuit Current Rating: Rated for series-connected system with integral or remote upstream overcurrent protective devices and labeled by an NRTL. Include size and type of allowable upstream and branch devices, and listed and labeled for series-connected short-circuit rating by an NRTL.
- H. Panelboard Short-Circuit Current Rating: Fully rated to interrupt symmetrical short-circuit current available at terminals.



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2.2 DISTRIBUTION PANELBOARDS

- A. Manufacturers: Subject to compliance with requirements, provide products by one of the following:
  - 1. Siemens Energy & Automation, Inc.
  - 2. Square D; a brand of Schneider Electric.
- B. Panelboards: NEMA PB 1, power and feeder distribution type.
- C. Doors: Secured with vault-type latch with tumbler lock; keyed alike.
- D. Mains: Circuit breaker or Main Lugs only.
- E. Branch Overcurrent Protective Devices: For Circuit-Breaker Frame Sizes 125 A and Smaller: Bolt-on circuit breakers.
- F. Branch Overcurrent Protective Devices: For Circuit-Breaker Frame Sizes Larger than 125 A: Bolt-on circuit breakers; plug-in circuit breakers where individual positive-locking device requires mechanical release for removal.
- G. Branch Overcurrent Protective Devices: Fused switches.
- H. Do not use tandem circuit breakers.
- I. Lock on devices for Life Safety lighting, fire alarm and stairwell circuits (when present).

2.3 LIGHTING AND APPLIANCE BRANCH-CIRCUIT PANELBOARDS

- A. Manufacturers: Subject to compliance with requirements, provide products by one of the following:
  - 1. Siemens Energy & Automation, Inc.
  - 2. Square D; a brand of Schneider Electric.
- B. Panelboards: NEMA PB 1, lighting and appliance branch-circuit type.
- C. Mains: As indicated on drawings.
- D. Branch Overcurrent Protective Devices: Bolt-on circuit breakers, replaceable without disturbing adjacent units.
- E. Contactors in Main Bus: NEMA ICS 2, Class A, mechanically held, general-purpose controller, with same short-circuit interrupting rating as panelboard.
  - 1. External Control-Power Source: 120-V branch circuit.
- F. Doors: Concealed hinges; secured with flush latch with tumbler lock; keyed alike.
- G. Column-Type Panelboards: Narrow gutter extension, with cover, to overhead junction box equipped with ground and neutral terminal buses.



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2.4 DISCONNECTING AND OVERCURRENT PROTECTIVE DEVICES

- A. Manufacturers: Subject to compliance with requirements, provide products by one of the following:
1. Siemens Energy & Automation, Inc.
  2. Square D; a brand of Schneider Electric.
- B. Molded-Case Circuit Breaker (MCCB): Comply with UL 489, with interrupting capacity to meet available fault currents.
1. Thermal-Magnetic Circuit Breakers: Inverse time-current element for low-level overloads, and instantaneous magnetic trip element for short circuits. Adjustable magnetic trip setting for circuit-breaker frame sizes 250 A and larger.
  2. Adjustable Instantaneous-Trip Circuit Breakers: Magnetic trip element with front-mounted, field-adjustable trip setting.
  3. Electronic trip circuit breakers with rms sensing; field-replaceable rating plug or field-replicable electronic trip; and the following field-adjustable settings:
    - a. Instantaneous trip.
    - b. Long- and short-time pickup levels.
    - c. Long- and short-time time adjustments.
    - d. Ground-fault pickup level, time delay, and  $I^2t$  response.
  4. Current-Limiting Circuit Breakers: Frame sizes 400 A and smaller; let-through ratings less than NEMA FU 1, RK-5.
  5. GFCI Circuit Breakers: Single- and two-pole configurations with Class A ground-fault protection (6-mA trip).
  6. Ground-Fault Equipment Protection (GFEP) Circuit Breakers: Class B ground-fault protection (30-mA trip).
  7. Arc-Fault Circuit Interrupter (AFCI) Circuit Breakers: Comply with UL 1699; 120/240-V, single-pole configuration.
  8. Molded-Case Circuit-Breaker (MCCB) Features and Accessories:
    - a. Standard frame sizes, trip ratings, and number of poles.
    - b. Lugs: Mechanical style, suitable for number, size, trip ratings, and conductor materials.
    - c. Application Listing: Appropriate for application; Type SWD for switching fluorescent lighting loads; Type HID for feeding fluorescent and high-intensity discharge (HID) lighting circuits.
    - d. Ground-Fault Protection: Integrally mounted relay and trip unit with adjustable pickup and time-delay settings, push-to-test feature, and ground-fault indicator.
    - e. Communication Capability: Integral communication module with functions and features compatible with power monitoring and control system specified in Division 26.
    - f. Shunt Trip: 120-V trip coil energized from separate circuit, set to trip at 75 percent of rated voltage.
    - g. Handle Padlocking Device: Fixed attachment, for locking circuit-breaker handle in on or off position.
    - h. Handle Clamp: Loose attachment, for holding circuit-breaker handle in on position.



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- C. Fused Switch: NEMA KS 1, Type HD; clips to accommodate specified fuses; lockable handle.
  - 1. Fuses and Spare-Fuse Cabinet: Comply with requirements specified in Division 26 Section "Fuses."

### 2.5 ACCESSORY COMPONENTS AND FEATURES

- A. Portable Test Set: For testing functions of solid-state trip devices without removing from panelboard. Include relay and meter test plugs suitable for testing panelboard meters and switchboard class relays.

## PART 3 - EXECUTION

### 3.1 INSTALLATION

- A. Receive, inspect, handle, store and install panelboards and accessories according to NECA 407 and NEMA PB 1.1.

above finished floor or grade.

- B. Mount top of trim 90 inches above finished floor unless otherwise indicated.
- C. Mount panelboard cabinet plumb and rigid without distortion of box. Mount recessed panelboards with fronts uniformly flush with wall finish and mating with back box.
- D. Install overcurrent protective devices and controllers not already factory installed.
  - 1. Set field-adjustable, circuit-breaker trip ranges.
- E. Install filler plates in unused spaces.
- F. Stub four 1-inch empty conduits from panelboard into accessible ceiling space or space designated to be ceiling space in the future. Stub four 1-inch empty conduits into raised floor space or below slab not on grade.
- G. Arrange conductors in gutters into groups and bundle and wrap with wire ties.
- H. Comply with NECA 1.

### 3.2 IDENTIFICATION

- A. Identify field-installed conductors, interconnecting wiring, and components; provide warning signs complying with Division 26 Section "Identification for Electrical Systems."
- B. Create a directory to indicate installed circuit loads and incorporating Owner's final room designations. Obtain approval before installing. Use a computer or typewriter to create directory; handwritten directories are not acceptable.



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- C. Panelboard Nameplates: Label each panelboard with a nameplate complying with requirements for identification specified in Division 26 Section "Identification for Electrical Systems."
- D. Device Nameplates: Label each branch circuit device in distribution panelboards with a nameplate complying with requirements for identification specified in Division 26 Section "Identification for Electrical Systems."

### 3.3 FIELD QUALITY CONTROL

- A. Clean, inspect, test, and energize installed panelboards in accordance with NECA 407.
- B. After completing installation, cleaning, and testing, touch up scratches and mars on finish to match original finish.

### 3.4 LOAD BALANCING

- A. After Substantial Completion, but not more than two months after Final Acceptance, conduct load-balancing in accordance with NECA 407 and as follows:
  - 1. Do measurements during period of normal working loads as advised by the User.
  - 2. Make load-balancing circuit changes outside the normal occupancy/working schedule of the facility. Arrange with User to avoid disrupting critical services.
  - 3. Recheck loads after circuit changes during a normal load period. Record all load readings before and after changes and submit test records.

END OF SECTION 26 24 16



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SECTION 26 27 26  
WIRING DEVICES

PART 1 - GENERAL

1.1 SUMMARY

- A. This Section includes the following:
1. Receptacles, receptacles with integral GFCI, and associated device plates.
  2. Wall-switches.

1.2 SUBMITTALS

- A. Product Data: For each type of product indicated.
- B. Shop Drawings: List of legends and description of materials and process used for premarking wall plates.
- C. Samples: One for each type of device and wall plate specified, in each color specified.
- D. Operation and Maintenance Data: For wiring devices to include in all manufacturers' packing label warnings and instruction manuals that include labeling conditions.

1.3 QUALITY ASSURANCE

- A. Electrical Components, Devices, and Accessories: Listed and labeled as defined in NFPA 70, Article 100, by a testing agency acceptable to authorities having jurisdiction, and marked for intended use.
- B. Comply with NFPA 70.

1.4 RECEIVING, STORING, AND PROTECTING

- A. Receive, store, and protect, and handle products according to NECA 1, *Standard Practices for Good Workmanship in Electrical Construction*.

PART 2 - PRODUCTS

2.1 MANUFACTURERS

- A. Manufacturers' Names: Shortened versions (shown in parentheses) of the following manufacturers' names are used in other Part 2 articles:
1. Cooper Wiring Devices; a division of Cooper Industries, Inc. (Cooper).
  2. Hubbell Incorporated; Wiring Device-Kellems (Hubbell).
  3. Leviton Mfg. Company Inc. (Leviton).
  4. Pass & Seymour/Legrand; Wiring Devices & Accessories (Pass & Seymour).



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### 2.2 STRAIGHT BLADE RECEPTACLES

- A. Convenience Receptacles, 125 V, 20 A: Comply with NEMA WD 1, NEMA WD 6 configuration 5-20R, and UL 498.
  - 1. Products: Subject to compliance with requirements, provide one of the following:
    - a. Cooper; 5351 (single), 5352 (duplex).
    - b. Hubbell; HBL5351 (single), CR5352 (duplex).
    - c. Leviton; 5891 (single), 5352 (duplex).
    - d. Pass & Seymour; 5381 (single), 5352 (duplex).

### 2.3 GFCI RECEPTACLES

- A. General Description: Straight blade, feed-through type. Comply with NEMA WD 1, NEMA WD 6, UL 498, and UL 943, Class A, and include indicator light that is lighted when device is tripped.
- B. Duplex GFCI Convenience Receptacles, 125 V, 20 A:
  - 1. Products: Subject to compliance with requirements, provide one of the following:
    - a. Cooper; GF20.
    - b. Pass & Seymour; 2084.

### 2.4 WALL SWITCHES

- 1. Single and two pole: Provide hard, use specification grade, recess mounted single and two pole quiet toggle switches, 20 ampere, 120/277 volts ac. provide with mounting yoke insulated from mechanism, plaster ears, switch handle, and side-wired screw terminals.

### 2.5 WALL PLATES

- A. Single and combination types to match corresponding wiring devices.
  - 1. Plate-Securing Screws: Metal with head color to match plate finish.
  - 2. Material for Finished Spaces: 0.035-inch- thick, satin-finished stainless steel.
  - 3. Material for Unfinished Spaces: Galvanized steel.
  - 4. Material for Damp Locations: Cast aluminum with spring-loaded lift cover, and listed and labeled for use in "wet locations."
- B. Wet-Location, Weatherproof Cover Plates: NEMA 250, complying with type 3R weather-resistant, die-cast aluminum with lockable cover.

### 2.6 FINISHES

- A. Color: Wiring device catalog numbers in Section Text do not designate device color.



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1. Wiring Devices Connected to Normal Power System: As selected by Architect, unless otherwise indicated or required by NFPA 70 or device listing.
2. Wiring Devices Connected to Emergency Power System: Red.
3. TVSS Devices: Blue.

### PART 3 - EXECUTION

#### 3.1 INSTALLATION

- A. Comply with NECA 1, including the mounting heights listed in that standard, unless otherwise noted.
- B. Coordination with Other Trades:
  1. Take steps to insure that devices and their boxes are protected. Do not place wall finish materials over device boxes and do not cut holes for boxes with routers that are guided by riding against outside of the boxes.
  2. Keep outlet boxes free of plaster, drywall joint compound, mortar, cement, concrete, dust, paint, and other material that may contaminate the raceway system, conductors, and cables.
  3. Install device boxes in brick or block walls so that the cover plate does not cross a joint unless the joint is troweled flush with the face of the wall.
  4. Install wiring devices after all wall preparation, including painting, is complete.
- C. Conductors:
  1. Do not strip insulation from conductors until just before they are spliced or terminated on devices.
  2. Strip insulation evenly around the conductor using tools designed for the purpose. Avoid scoring or nicking of solid wire or cutting strands from stranded wire.
  3. The length of free conductors at outlets for devices shall meet provisions of NFPA 70, Article 300, without pigtails.
  4. Existing Conductors:
    - a. Cut back and pigtail, or replace all damaged conductors.
    - b. Straighten conductors that remain and remove corrosion and foreign matter.
    - c. Pigtailling existing conductors is permitted provided the outlet box is large enough.
- D. Device Installation:
  1. Replace all devices that have been in temporary use during construction or that show signs that they were installed before building finishing operations were complete.
  2. Keep each wiring device in its package or otherwise protected until it is time to connect conductors.
  3. Do not remove surface protection, such as plastic film and smudge covers, until the last possible moment.
  4. Connect devices to branch circuits using pigtails that are not less than 6 inches in length.
  5. When there is a choice, use side wiring with binding-head screw terminals. Wrap solid conductor tightly clockwise, 2/3 to 3/4 of the way around terminal screw.
  6. Use a torque screwdriver when a torque is recommended or required by the manufacturer.



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7. When conductors larger than No. 12 AWG are installed on 15- or 20-A circuits, splice No. 12 AWG pigtails for device connections.
8. Tighten unused terminal screws on the device.
9. When mounting into metal boxes, remove the fiber or plastic washers used to hold device mounting screws in yokes, allowing metal-to-metal contact.
10. Adjust devices and wall plates to be flush and level.

E. Receptacle Orientation:

1. Install ground pin of vertically mounted receptacles up, and on horizontally mounted receptacles to the right.

F. Device Plates: Do not use oversized or extra-deep plates. Repair wall finishes and remount outlet boxes when standard device plates do not fit flush or do not cover rough wall opening.

G. Arrangement of Devices: Unless otherwise indicated, mount flush, with long dimension vertical and with grounding terminal of receptacles on top. Group adjacent switches under single, multigang wall plates.

### 3.2 IDENTIFICATION

A. Comply with Division 26 Section "Identification for Electrical Systems."

1. Receptacles, Switches and all other device cover plates: Identify panelboard and circuit number from which served. Use factory applied hot, stamped or engraved machine printing with black-filled lettering on face of plate, and durable wire markers or tags inside outlet boxes. No field installation methods are permitted.

### 3.3 FIELD QUALITY CONTROL

A. Perform tests and inspections and prepare test reports.

1. Test Instruments: Use instruments that comply with UL 1436.
2. Test Instrument for Convenience Receptacles: Digital wiring analyzer with digital readout or illuminated LED indicators of measurement.

B. Tests for Convenience Receptacles:

1. Line Voltage: Acceptable range is 105 to 132 V.
2. Percent Voltage Drop under 15-A Load: A value of 6 percent or higher is not acceptable.
3. Ground Impedance: Values of up to 2 ohms are acceptable.
4. GFCI Trip: Test for tripping values specified in UL 1436 and UL 943.
5. Using the test plug, verify that the device and its outlet box are securely mounted.
6. The tests shall be diagnostic, indicating damaged conductors, high resistance at the circuit breaker, poor connections, inadequate fault current path, defective devices, or similar problems. Correct circuit conditions, remove malfunctioning units and replace with new, and retest as specified above.

END OF SECTION 26 27 26



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SECTION 26 28 13  
FUSES

PART 1 - GENERAL

1.1 SUMMARY

- A. Section Includes: Cartridge fuses rated 600-V ac and less for use in control circuits, enclosed switches, panelboards, switchboards and enclosed controllers.
- B. SUBMITTALS
- C. Product Data: For each type of product indicated.
- D. Operation and maintenance data.

1.2 QUALITY ASSURANCE

- A. Electrical Components, Devices, and Accessories: Listed and labeled as defined in NFPA 70, by a qualified testing agency, and marked for intended location and application.
- B. Comply with NEMA FU 1 for cartridge fuses.
- C. Comply with NFPA 70.

PART 2 - PRODUCTS

2.1 MANUFACTURERS

- A. Manufacturers: Subject to compliance with requirements, available manufacturers offering products that may be incorporated into the Work include, but are not limited to, the following:
  - 1. Cooper Bussmann, Inc.
  - 2. Edison Fuse, Inc.
  - 3. Ferraz Shawmut, Inc.
  - 4. Littelfuse, Inc.

2.2 CARTRIDGE FUSES

- A. Characteristics: NEMA FU 1, nonrenewable cartridge fuses with voltage ratings consistent with circuit voltages.



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PART 3 - EXECUTION

3.1 FUSE APPLICATIONS

- A. Service Entrance: Class RK1, time delay.
- B. Feeders: Class RK1, fast acting.
- C. Motor Branch Circuits: Class RK5, time delay.
- D. Other Branch Circuits: Class J, fast acting.
- E. Control Circuits: Class CC, fast acting.

3.2 INSTALLATION

- A. Install fuses in fusible devices, not until equipment is ready to be energized. Arrange fuses so rating information is readable without removing fuse.

3.3 IDENTIFICATION

- A. Install labels complying with requirements for identification specified in Division 26 Section "Identification for Electrical Systems" and indicating fuse replacement information on inside door of each fused switch and adjacent to each fuse block and holder.

END OF SECTION 26 28 13



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SECTION 26 43 13  
TRANSIENT-VOLTAGE SUPPRESSION FOR  
LOW-VOLTAGE ELECTRICAL POWER CIRCUITS

PART 1 - GENERAL

1.1 SUMMARY

- A. Secondary surge arresters (SSAs) on power circuits at facility entrances to protect the structure from lightning.
- B. Surge protective devices on signal, data, and control lines at facility entrances to protect the structure from lightning.

1.2 SUBMITTALS

- A. Drawings: Electrical and mechanical drawings shall be provided by the manufacturer which show unit dimensions, weights, mounting provisions, connection notes, wire size and wiring diagram. The manufacturer shall furnish an installation manual with installation notes, start-up and operating instructions for the specified system. Installation instructions shall clearly state whether the system requires an external overcurrent device to maintain the system's UL 1449 listing.
- B. Independent Testing:
  - 1. High exposure with the 10 x 1,000  $\mu$ s tests per IEEE C62.41.2 Section 7.2.
  - 2. Life Cycle/Repetitive Testing per C62.45-2002 section B.38 minimum of 2,000 times.
- C. National Electrical Code (NEC) 285 - Installation requirements for TVSS.
  - 1. Section 285.2, TVSS must limit transient voltage by diverting or limiting surge current; it also should prevent continued flow of follow current while remaining capable of repeating these functions. TVSS that utilize fuses must have repetitive surge capability that can survive its surge rating and meet UL 1449.
  - 2. Section 285.6, TVSS shall be marked with a short circuit current rating and shall not be installed at a point on the system (ex. service, distribution or branch panels) where the available fault current (AIC rating) is in excess of that rating.
- D. UL 1449 stipulation for fused TVSS - The manufacturer's authorized representative is required to submit the following:
  - 1. Certify that the TVSS system is UL 1449 listed (UL Card) with UL Card.
  - 2. Indicate the type of internal or external fusing that is incorporated in the TVSS system and what impact the fusing has on the performance of the device with respect to surge capacity and clamping levels.
- E. CBEMA (ITIC) & IEC - SVRs must meet voltage tolerance guidelines:
  - 1. SVR clamp levels for wye and single phase (L-N, L-G and N-G):  
400-600V for 120V systems, 800-1200V for 277V systems and 1200-1500V for 347V systems
  - 2. SVR clamp levels for delta circuits (L-L and L-G):



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1000-1200V for 240V systems, 1500-1800V for 480V systems and 1800-2000V for 600V systems

## 1.3 STANDARDS

- A. Underwriters Laboratories 1449 - (UL 1449 2<sup>nd</sup> Edition Rev 2.5)  
Underwriters laboratories 1283 - (UL 1283 listed as an electromagnetic interference filter that provides noise attenuation)  
Underwriters laboratories 67 - (UL 67 internal integration of TVSS in panelboard)
- B. National Electrical Code 2005 rev. - (NEC article 285 TVSS installation practice/NEC article 250.56 grounding)  
NFPA-78 and CSA - (National Fire Protection Association and Canadian Standards Association)  
ISO 9001:2000 - quality standard / military standards (mil-std 220a)
- C. IEEE (institute of electrical and electronic engineering Inc.) C62.41.1 and c62.41.2 – 2002 rev. - (system shall be designed to meet c62.41)
  - 1. IEEE C62.41.2-2002 section 7.2 long duration 10 x 1,000  $\mu$ sec test to be compliant if the device exhibits less than 10% deviation from initial readings. Units must be tested to withstand and pass the 10 x 1,000  $\mu$ sec test
  - 2. IEEE C62.45 – 2002 rev. - (system shall be tested to meet the C62.45)
  - 3. Category A & B - (0.5  $\mu$ s x 100 kHz ring wave)
  - 4. Category B3 bi-wave - (8 x 20  $\mu$ s at 3,000 amperes and 1.2 x 50  $\mu$ s at 6,000 volts)
  - 5. Category C3 bi-wave - (8 x 20  $\mu$ s at 10,000 amperes and 1.2 x 50  $\mu$ s at 20,000 volts)
- D. The fusing elements must be capable of allowing the suppressor's rated single impulse current to pass through the suppressor at least one time without failure. The system shall be tested to 1,000 sequential per C62.45-2002 section b.38 referencing C62.41.1 and C62.41.2 category c3 combination wave transients. The category c3 combination wave is defined as a 1.2 x 50 microsecond wave at 20,000 volt open circuit voltage waveform and 8 x 20 microsecond wave at 10,000 ampere short circuit current waveform. In addition, the system components shall be tested repetitively 1,000 times testing based on an IEEE c62.33 (MOV test) and c62.35 (sad test) without failure or degradation exceeding  $\pm$ 10%.
- E. CBEMA (ITIC) and IEC - (Computer Business Equipment Manufacturers Association or Information Technology Industry Council and International Electrotechnical Commission define clamping voltage tolerance guidelines for sensitive equipment)
- F. All manufacturers must comply with above listed standards and any additions current revisions of industry standards. All products that do not comply with current industry standards will not be accepted.

## 1.4 WARRANTY

- A. Special Warranty: Manufacturer's standard form in which manufacturer agrees to repair or replace components of surge suppressors that fails in materials or workmanship within specified warranty period.
  - 1. Warranty Period: Five years from date of Substantial Completion.



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### 1.5 RECEIVING, STORING AND PROTECTING

- A. Receive, store, protect, and handle products according to NECA 1 *Standard Practices for Good Workmanship in Electrical Construction*.

## PART 2 - PRODUCTS

### 2.1 DISTRIBUTION PANELBOARD SUPPRESSORS

- A. Manufacturers: Subject to compliance with requirements, provide products by one of the following:

1. Current Technology – TG125-L3
2. LEA International Inc. – LS200P
3. Liebert – LM 125-C

No other Manufacturers will be accepted.

- B. Device shall meet all specification requirements in section 2.1 except as follows:  
Equipment shall be a multi-stage parallel protector. Provide voltage configuration as required per contract documents. The equipment's minimum surge current capacity shall be 200kA per phase (L-N plus L-G) and 100kA per mode (L-N, L-G, L-L and N-G).

1. The system protection shall contain a technology that utilizes a symmetrical array of balanced metal oxide varistors (MOV). Each MOV will be individually coordinated to pass UL 1449. The unit shall be modular type with one large module.
2. Equipment shall provide the following monitoring features: dry contacts, surge counter and audible alarm with alarm disable switch. Equipment shall utilize a NEMA 4X enclosure.

### 2.2 BRANCH PANEL SUPPRESSORS

- A. Acceptable Manufacturers and Models:

1. Current Technology – TG80
2. LEA International Inc. – CFS
3. Liebert – LM080- S

No other Manufacturers will be accepted.

- B. Device shall meet all specification requirements in section 2.1 except as follows:  
Equipment shall be a multi-stage parallel protector. Provide voltage configuration as required per contract documents. The equipment's minimum surge current capacity shall be 120kA per phase (L-N plus L-G) and 60kA per mode (L-N, L-G, L-L and N-G).

1. The system protection shall contain a technology that utilizes a symmetrical array of balanced metal oxide varistors (MOV). Each MOV will be individually coordinated to pass UL 1449. The unit shall be non-modular.



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2. Equipment shall provide the following monitoring features: dry contacts and audible alarm with alarm disable switch. Equipment shall utilize a NEMA 4X enclosure.

### 2.3 ENCLOSURES

- A. Indoor Enclosures: NEMA 250 Type 12.
- B. Outdoor Enclosures: NEMA 250 Type 4X.

## PART 3 - EXECUTION

### 3.1 EXAMINATION

- A. Verify mounting area is ready for equipment. Allow adequate clearances for maintenance.
- B. Verify that circuit rough-in is at correct location.

### 3.2 INSTALLATION

- A. Install surge protective devices where indicated on the Drawings and according to manufacturer's instructions and the *National Electrical Code*. Have the manufacturer's installation instructions available at the construction site.
- B. Install Secondary Surge Arrester(s) (SSA) in the service equipment to protect each ungrounded conductor on the line side of the service entrance disconnecting means.
- C. Install SSA to protect each ungrounded conductor of power circuits that exits the structure to serve external detached equipment or other detached structures. Where such power circuits are longer than 100 ft install SSA to protect each ungrounded conductor at both ends of the circuit.
- D. Install UL 497B listed surge protective device for each for signal, data, control, and alarm line that enters the structure or exits the structure to serve external detached equipment or other detached structures. Where such signal, data, control, and alarm circuits are longer than 100 ft install UL 497B listed surge protective device at both ends of the circuit.
- E. Install UL 497C listed coaxial surge protective device for each for antenna and RF signal line that enters the structure or exits the structure to serve external detached equipment or other detached structures. Where such antenna and RF signal circuits are longer than 100 ft install UL 497C listed coaxial surge protective device at both ends of the circuit.
- F. Install each surge protective device so it will be accessible for inspection and maintenance and so the condition monitoring indicator will be visible without requiring the removal of cover plates.
- G. Install each surge protective device with minimum possible conductor length and a maximum conductor length of 18 inches.
  1. Twist conductors tightly together and keep runs as straight as possible with no sharp bends or kinks.



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2. Use approved means to make connections from the surge protective device to conductors to be protected.
- H. Provide low-impedance grounding for surge protective devices.
1. Use approved means to make connections from the surge protective device to the point where the electrical power system grounded conductor is bonded to the grounding electrode conductor.
  2. If the surge protective device is more than 20 ft away from the electrical system bonding point, make one or more supplementary grounding electrode connections at the surge protective device location. Use the building "main grounding electrode ground bar", "main grounding electrode ground bar extensions", effectively grounded building structural steel, and grounded water pipes as supplementary grounding electrodes.
  3. Do not use a lightning protection system down conductor to ground a surge protective device.

### 3.3 Field Quality Control

- A. Provide final protection and maintain conditions to ensure that coatings and finishes are without damage or deterioration at final inspection.
- B. Repair damage to galvanized finishes with zinc-rich paint recommended by manufacturer.
- C. Repair damage to paint finishes with matching touch-up coating recommended by the manufacturer.
- D. Verify that each surge protective device is correctly connected and that all condition monitoring indicators operate properly.

### 3.4 STARTUP SERVICE

- A. Do not energize or connect service entrance equipment and panelboards to their sources until TVSS devices are installed and connected.
- B. Do not perform insulation resistance tests of the distribution wiring equipment with the TVSS installed. Disconnect before conducting insulation resistance tests, and reconnect immediately after the testing is over.

END OF SECTION 26 43 13



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SECTION 26 51 00  
INTERIOR LIGHTING

PART 1 - GENERAL

1.1 SUMMARY

- A. This Section includes the following:
  - 1. Interior lighting fixtures, lamps, and ballasts.
  - 2. Lighting fixture supports.
- B. See Division 26 Section "Lighting Control Devices" for automatic control of lighting, including time switches, photoelectric relays, occupancy sensors, and multipole lighting relays and contactors.

1.2 SUBMITTALS

- A. Product Data: For each type of lighting fixture, arranged in order of fixture designation. Include data on features, accessories, finishes.
- B. Shop Drawings: Show details of nonstandard or custom lighting fixtures. Indicate dimensions, weights, methods of field assembly, components, features, and accessories.
- C. Product Certificates: For each type of ballast for bi-level and dimmer-controlled fixtures, signed by product manufacturer.
- D. Field quality-control test reports.

1.3 QUALITY ASSURANCE

- A. Electrical Components, Devices, and Accessories: Listed and labeled as defined in NFPA 70, Article 100, by a testing agency acceptable to authorities having jurisdiction, and marked for intended use.
- B. Comply with NFPA 70.

1.4 RECEIVING, STORING AND PROTECTING

- A. Receive, store, and protect, and handle products according to NECA 1- Standard Practices for Good Workmanship in Electrical Construction.



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PART 2 - PRODUCTS

2.1 MANUFACTURERS

- A. In Interior Lighting Fixture Schedule where titles below are column or row headings that introduce lists, the following requirements apply to product selection:
1. Available Manufacturers: Subject to compliance with requirements, manufacturers offering products that may be incorporated into the Work include, but are not limited to, manufacturers specified on drawings.

2.2 LIGHTING FIXTURES AND COMPONENTS, GENERAL REQUIREMENTS

- A. Recessed Fixtures: Comply with NEMA LE 4 for ceiling compatibility for recessed fixtures.
- B. Fluorescent Fixtures: Comply with UL 1598. Where LER is specified, test according to NEMA LE 5 and NEMA LE 5A as applicable.
- C. HID Fixtures: Comply with UL 1598. Where LER is specified, test according to NEMA LE 5B.
- D. Metal Parts: Free of burrs and sharp corners and edges.
- E. Sheet Metal Components: Steel, unless otherwise indicated. Form and support to prevent warping and sagging.
- F. Doors, Frames, and Other Internal Access: Smooth operating, free of light leakage under operating conditions, and designed to permit relamping without use of tools. Designed to prevent doors, frames, lenses, diffusers, and other components from falling accidentally during relamping and when secured in operating position.
- G. Reflecting surfaces shall have minimum reflectance as follows, unless otherwise indicated:
1. White Surfaces: 85 percent.
  2. Specular Surfaces: 83 percent.
  3. Diffusing Specular Surfaces: 75 percent.
  4. Laminated Silver Metalized Film: 90 percent.
- H. Plastic Diffusers, Covers, and Globes:
1. Acrylic Lighting Diffusers: 100 percent virgin acrylic plastic. High resistance to yellowing and other changes due to aging, exposure to heat, and UV radiation.
    - a. Lens Thickness: At least 0.125 inch minimum unless different thickness is indicated.
    - b. UV stabilized.
  2. Glass: Annealed crystal glass, unless otherwise indicated.



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### 2.3 BALLASTS

- A. Electronic Ballasts for Linear Fluorescent Lamps: Comply with ANSI C82.11; instant-start type, unless otherwise indicated, and designed for type and quantity of lamps served. Ballasts shall be designed for full light output unless dimmer or bi-level control is indicated.
1. Sound Rating: A.
  2. Total Harmonic Distortion Rating: Less than 10 percent.
  3. Transient Voltage Protection: IEEE C62.41, Category A or better.
  4. Operating Frequency: 20 kHz or higher.
  5. Lamp Current Crest Factor: 1.7 or less.
  6. BF: 0.85 or higher.
  7. Power Factor: 0.98 or higher.
- B. Ballasts for Compact Fluorescent Lamps: Electronic programmed rapid-start type, complying with ANSI C 82.11, designed for type and quantity of lamps indicated. Ballast shall be designed for full light output unless dimmer or bi-level control is indicated:
1. Lamp end-of-life detection and shutdown circuit.
  2. Automatic lamp starting after lamp replacement.
  3. Sound Rating: A.
  4. Total Harmonic Distortion Rating: Less than 20 percent.
  5. Transient Voltage Protection: IEEE C62.41, Category A or better.
  6. Operating Frequency: 20 kHz or higher.
  7. Lamp Current Crest Factor: 1.7 or less.
  8. BF: 0.95 or higher, unless otherwise indicated.
  9. Power Factor: 0.98 or higher.
  10. Interference: Comply with 47 CFR, Chapter 1, Part 18, Subpart C, for limitations on electromagnetic and radio-frequency interference for non consumer equipment.
- C. Electronic Ballast for Metal-Halide Lamps: Include the following features unless otherwise indicated:
1. Lamp end-of-life detection and shutdown circuit.
  2. Sound Rating: A.
  3. Total Harmonic Distortion Rating: Less than 15 percent.
  4. Transient Voltage Protection: IEEE C62.41, Category A or better.
  5. Lamp Current Crest Factor: 1.5 or less.
  6. Power Factor: .90 or higher.
  7. Interference: Comply with 47 CFR, Chapter 1, Part 18, Subpart C, for limitations on electromagnetic and radio-frequency interference for non consumer equipment.
  8. Protection: Class P thermal cutout.

### 2.4 LAMPS

- A. Low-Mercury Fluorescent Lamps: Comply with EPA's toxicity characteristic leaching procedure test; shall yield less than 0.2 mg of mercury per liter when tested according to NEMA LL 1.
- B. T8 Rapid-Start low-mercury Fluorescent Lamps: Rated 25 W maximum, nominal length 48 inches (1220 mm), CRI 81 (minimum), color temperature 4100 K, and average rated life 20,000 hours, unless otherwise indicated.



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- C. T8 Rapid-Start low-mercury Fluorescent Lamps: Rated 17 W maximum, nominal length of 24 inches, 1300 initial lumens (minimum), CRI 81 (minimum), color temperature 4100 K, and average rated life of 20,000 hours, unless otherwise indicated.
- D. Compact Fluorescent Lamps: 4-Pin, low mercury, CRI 81 (minimum), color temperature 4100 K, average rated life of 10,000 hours at 3 hours operation per start, unless otherwise indicated.
  - 1. 13 W: T4, double or triple tube, rated 900 initial lumens (minimum).
  - 2. 18 W: T4, double or triple tube, rated 1200 initial lumens (minimum).
  - 3. 26 W: T4, double or triple tube, rated 1800 initial lumens (minimum).
  - 4. 32 W: T4, triple tube, rated 2400 initial lumens (minimum).
  - 5. 42 W: T4, triple tube, rated 3200 initial lumens (minimum).
  - 6. 55 W: T4, triple tube, rated 4300 initial lumens (minimum).
- E. Metal-Halide Lamps: ANSI C78.1372, with a minimum CRI 65, and color temperature 4000 K.
- F. Pulse-Start, Metal-Halide Lamps: Minimum CRI 65, and color temperature 4000 K.
- G. Ceramic, Pulse-Start, Metal-Halide Lamps: Minimum CRI 80, and color temperature 4000 K.

### 2.5 LIGHTING FIXTURE SUPPORT COMPONENTS

- A. Comply with Division 26 Section "Hangers and Supports for Electrical Systems" for channel- and angle-iron supports and nonmetallic channel and angle supports.
- B. Single-Stem Hangers: 1/2-inch steel tubing with swivel ball fittings and ceiling canopy. Finish same as fixture.
- C. Twin-Stem Hangers: Two, 1/2-inch steel tubes with single canopy designed to mount a single fixture. Finish same as fixture.
- D. Wires: ASTM A 641/A 641M, Class 3, soft temper, zinc-coated steel, 10 gage.
- E. Wires for Humid Spaces: ASTM A 580/A 580M, Composition 302 or 304, annealed stainless steel, 10 gage.
- F. Rod Hangers: 1/4-inch minimum diameter, cadmium-plated, threaded steel rod.
- G. Hook Hangers: Integrated assembly matched to fixture and line voltage and equipped with threaded attachment, cord, and locking-type plug.

## PART 3 - EXECUTION

### 3.1 INSTALLATION

- A. Install interior lighting system in accordance with the NEC, manufacturer's instructions, approved shop drawings, and the following NECA National Electrical Installation Standards:



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1. NECA/IESNA 500, Recommended Practice for Installing Indoor Commercial Lighting Systems (ANSI)
  2. NECA/IESNA 502, Recommended Practice for Installing Industrial Lighting Systems (ANSI).
- B. Lighting fixtures: Set level, plumb, and square with ceilings and walls. Install lamps in each fixture.
- C. Comply with NFPA 70 for minimum fixture supports.
- D. Suspended Lighting Fixture Support:
1. Pendants and Rods: Where longer than 48 inches, brace to limit swinging.
  2. Stem-Mounted, Single-Unit Fixtures: Suspend with twin-stem hangers.
  3. Continuous Rows: Use tubing or stem for wiring at one point and tubing or rod for suspension for each unit length of fixture chassis, including one at each end.
- E. Install in accordance with manufacturers instructions.
- F. Install suspended luminaires and exit signs using pendants supported from swivel hangers. Provide pendant length required to suspend luminaire at indicated height.
- G. Support all luminaires independent of ceiling framing.
- H. Locate recessed ceiling luminaires as indicated on reflected ceiling plan.
- I. Install surface mounted luminaires and exit signs plumb and adjust to align with building lines and with each other. Secure to prohibit movement.
- J. Exposed Grid Ceilings: Support surface mounted luminaires on grid ceiling directly from building structure.
- K. Install recessed luminaires to prevent removal from below.
- L. Install recessed luminaires using accessories and firestopping materials to meet regulatory requirements for fire rating.
- M. Install wall mounted luminaires, emergency lights, and exit signs at height as indicated on Drawings.
- N. Install accessories furnished with each luminaire.
- O. Connect luminaires, emergency lighting units and exit signs to branch circuit outlets.
- P. Make wiring connections to branch circuit using building wire with insulation suitable for temperature conditions with luminaire.
- Q. Bond products and metal accessories to branch circuit equipment grounding conductor.
- R. Install specified lamps in each luminaire and exit sign.
- S. Fixtures are not to be used as a raceway unless stamped for use as raceway by Manufacturer. Single fixture in lay-in ceilings shall not be used for raceway and shall be connected to an outlet



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box located within 6'-0" of fixture with flexible 3/8" conduit or 3/8" MC cable. #14 THHN/THWN is acceptable for single fixture connections.

- T. Adjust aimable lighting fixtures to provide required light intensities.

### 3.2 FIELD QUALITY CONTROL

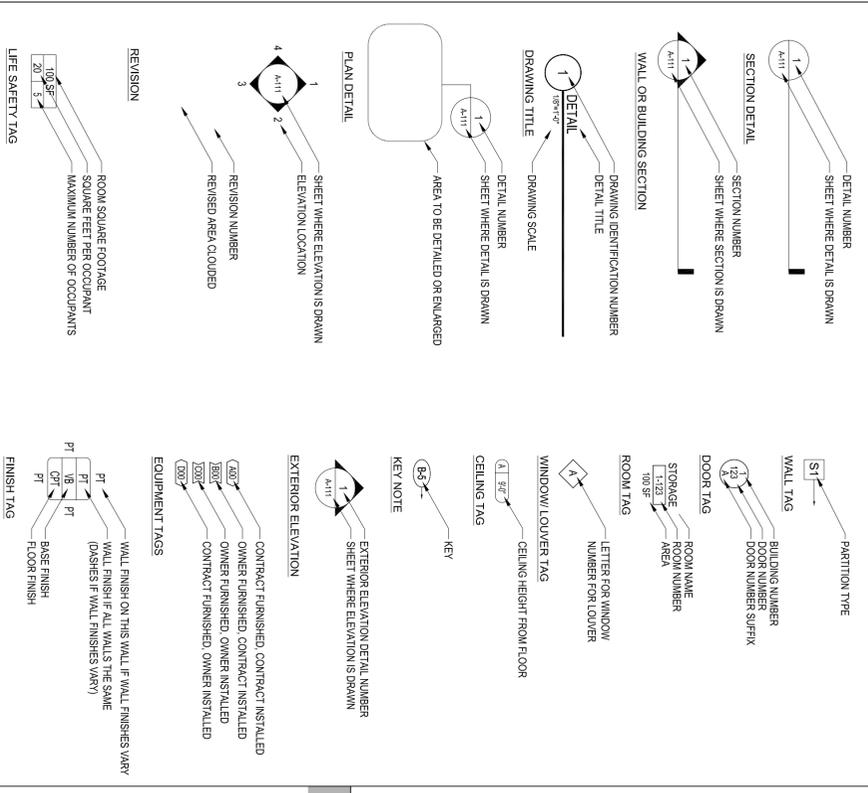
- A. Test for Emergency Lighting: Interrupt power supply to demonstrate proper operation. Verify transfer from normal power to battery and re-transfer to normal.
- B. Prepare a written report of tests, inspections, observations, and verifications indicating and interpreting results. If adjustments are made to lighting system, retest to demonstrate compliance with standards.

### 3.3 ADJUSTING AND CLEANING

- A. Align luminaires and clean lenses and diffusers at completion of work. Clean paint splatters, dirt, and debris from installed luminaires.
- B. Aim and adjust luminaires as indicated on Drawings or as directed by the A/E.
- C. Touch up luminaire finish at completion of work.

END OF SECTION 26 51 00

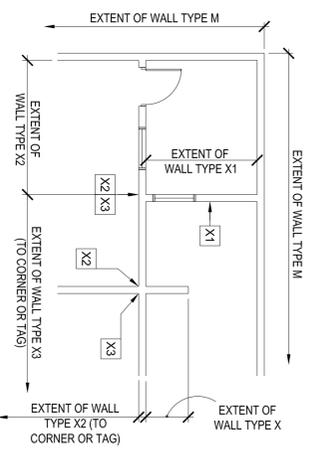
**SYMBOLS**



**ARCHITECTURAL GENERAL NOTES**

- EACH CONTRACTOR SHALL VERIFY ALL DIMENSIONS SHOWN ON THE DRAWINGS AND OBTAIN ALL MEASUREMENTS REQUIRED FOR PROPER EXECUTION OF WORK. DIMENSIONS SHALL BE TO FACE UNLESS OTHERWISE NOTED. DIMENSIONS SHALL BE TO FACE UNLESS OTHERWISE NOTED. DIMENSIONS SHALL BE TO FACE UNLESS OTHERWISE NOTED.
- PROVIDE ALL WOOD BLOCKING NECESSARY FOR THE ATTACHMENT OF MISCELLANEOUS EQUIPMENT INCLUDING BUT NOT LIMITED TO TOILET ACCESSORIES, DOOR HARDWARE, ELECTRICAL DEVICES, LABORATORY EQUIPMENT, GRAV BARS, HANDRAILS, CASSEROCK AND MILLWORK.
- THE TRANSITION OF DIFFERENT FLOORING MATERIALS AT A DOORWAY SHALL OCCUR AT THE CENTERLINE OF DOOR UNLESS INDICATED OTHERWISE.
- ALL WALL SURFACES, DOOR FRAMES, BULKHEADS AND CEILINGS SHALL RECEIVE PAINT WHEN PAINT IS INDICATED ON THE FINISH SCHEDULE OR FINISH PLANS. PAINT SURFACES BEHIND MOVABLE EQUIPMENT AND FURNITURE SHALL RECEIVE PRIME COAT ONLY. BEFORE FINAL INSTALLATION OF EQUIPMENT, PAINT ALL MECHANICAL AND ELECTRICAL EQUIPMENT EXPOSED IN FINISHED SPACES UNLESS INDICATED OTHERWISE.
- REPAIR ALL SURFACES DAMAGED BY RENOVATION AND NEW CONSTRUCTION TO MATCH EXISTING ADJACENT OR CONTIGUOUS FINISH.
- ALL CUTTING AND PATCHING AS A RESULT OF NEW CONSTRUCTION OR DEMOLITION SHALL BE PERFORMED IN A WORKMANLIKE MANNER AND SHALL MATCH IN COLOR, SHAPE, SIZE AND TEXTURE ADJACENT AND/OR CONTIGUOUS FINISHED SURFACES.
- FIGURED DIMENSIONS TAKE PRECEDENCE OVER SCALED MEASUREMENTS. DO NOT SCALE DRAWINGS.
- DETAILED DRAWINGS AND LARGER SCALE DRAWINGS TAKE PRECEDENCE OVER SMALL SCALE DRAWINGS.
- UNLESS OTHERWISE NOTED, PLAN DIMENSIONS ARE TAKEN FROM FACE OF CMU OR CONCRETE TO FACE OF FINISH, OR FACE OF FINISH TO FACE OF FINISH.
- DOORS NOT OTHERWISE DIMENSIONED SHALL BE 8" FROM FACE OF ADJACENT CMU OR CONCRETE WALL TO ROUGH DOOR OPENING, AND 1" FROM FACE OF ADJACENT STUD WALL TO ROUGH DOOR OPENING.
- FOR CONSTRUCTION DETAILS NOT SHOWN, USE THE PRODUCT MANUFACTURER'S WRITTEN INSTALLATION INSTRUCTIONS AND STANDARD DETAILS IN STRICT ACCORDANCE WITH THE PROJECT SPECIFICATION REQUIREMENTS AND DESIGN INTENT.
- PROVIDE FIRE EXTINGUISHERS FE AND PRE-EXTINGUISHER CABINETS FECS AS INDICATED ON THE PLANS. PROVIDE TYPE AND SIZE AS SPECIFIED. MOUNT AT 42" HGT TO TOP OF CABINET AND 4" TO TOP OF FECS.
- CONTRACTOR SHALL LAYOUT CHALK ALL INTERIOR WALLS TO ENSURE DIMENSIONAL ACCURACY PRIOR TO INTERIOR WALL CONSTRUCTION. ANY DISCREPANCIES SHALL BE BROUGHT TO THE ATTENTION OF THE ARCHITECT FOR CLARIFICATION.

**WALL TYPE IDENTIFICATION SYSTEM**



**GENERAL DEMOLITION NOTES**

- CONTRACTOR SHALL REVIEW FINAL CONDITIONS REQUIRED AND PROVIDE ALL DEMOLITION WORK, PATCHING AND REPAIRING AS NECESSARY.
- LOCATE EXISTING UNDERGROUND UTILITIES IN THE AREAS OF WORK. IF UTILITIES ARE TO REMAIN IN PLACE, PROVIDE ADEQUATE MEANS OF PROTECTION DURING BATHROOM OPERATIONS. UNLOCATED OR INCORRECTLY CHARTERED PIPING OR OTHER UTILITIES BE ENCOUNTERED DURING EXCAVATION, CONSULT THE ARCHITECT IMMEDIATELY FOR DIRECTIONS AS TO PROCEEDURE. COOPERATE WITH OWNER AND UTILITY COMPANIES IN KEEPING RESPECTIVE SERVICES AND FACILITIES IN CONJUNCTION WITH THE EXECUTION OF THE WORK. INACTIVE OR ABANDONED UTILITIES OR OTHER PROPERTY DAMAGED BY OPERATIONS IN CONJUNCTION WITH THE EXECUTION OF THE WORK, INACTIVE OR ABANDONED UTILITIES SHALL BE CAPPED IN ACCORDANCE WITH LOCAL REGULATIONS. REMOVE INACTIVE SERVICES (PLUMBING, MECHANICAL, ELECTRICAL, ETC.) AS REQUIRED TO MAINTAIN OPERATION.
- ALL ELECTRICAL, MECHANICAL AND PLUMBING SERVICES LOCATED IN WALLS, CEILING, OR FLOORS TO BE REMOVED SHALL BE CAPPED AND REROUTED AS REQUIRED FOR NEW CONDITIONS AND IN ACCORDANCE WITH APPLICABLE CODES.
- CONTRACTOR SHALL PROVIDE ALL NECESSARY DEMOLITION FOR NEW PLUMBING, MECHANICAL AND ELECTRICAL WORK AS REQUIRED. COORDINATE WITH CONSTRUCTION DOCUMENTS FOR NEW CONSTRUCTION.
- REMOVE ALL EXISTING FLOOR FINISHES AND PREPARE SLAB TO RECEIVE NEW FLOOR FINISHES IN ACCORDANCE WITH THE NEW FLOOR FINISH MANUFACTURER'S WRITTEN RECOMMENDATIONS UNLESS NOTED OTHERWISE.
- REMOVE ALL EXISTING WALL FINISHES ON PARTITIONS DESIGNATED TO REMAIN AND REPAIR ALL WALLS UNLESS NOTED OTHERWISE. COORDINATE WITH CONSTRUCTION DOCUMENTS FOR NEW CONSTRUCTION IN ACCORDANCE WITH SPECIFICATION SECTION 0904, CUTTING AND PATCHING UNLESS NOTED OTHERWISE.
- DEMOLITION/RESTORATION ITEMS MAY NOT BE ALL INCLUSIVE. THE DEMOLITION CONTRACTOR SHALL REVIEW THE REQUIREMENTS OF NEW CONSTRUCTION AND COMPLETE ALL DEMOLITION/RESTORATION CUTTING AND PATCHING NECESSARY TO ACHIEVE INTENDED NEW CONDITION AND QUALITY.
- REMOVE FROM BUILDING SITE DEBRIS, RUBBISH AND OTHER MATERIALS RESULTING FROM DEMOLITION OPERATIONS. TRANSPORT AND LEGALLY DISPOSE OF OFF-SITE. PROVIDE THE OWNER WITH THE RIGHT OF FIRST REFUSAL.
- ALL DEMOLITION WORK INDICATED ON THE DEMOLITION PLANS SHALL BE FIELD VERIFIED BY THE CONTRACTOR PRIOR TO COMMENCING WORK.
- RELOCATION OF ANY ITEMS INVOLVED IN THE WORK IS SUBJECT TO THE CONTRACTOR'S ABILITY TO DO SO WITHOUT PERMANENTLY DAMAGING OR HARMING THE ITEMS TO BE RELOCATED. IF THE CONTRACTOR IS UNABLE TO RELOCATE ANY ITEM AS PRESCRIBED HEREIN, SHE SHALL CONSULT ARCHITECT FOR DIRECTION. SCHED. STONE MATERIAL TO BE REUSED UNTIL THE OF INSTALLATION.
- CONTRACTOR SHALL PROTECT ALL STRUCTURAL MEMBERS FROM DAMAGE.

**ABBREVIATIONS**

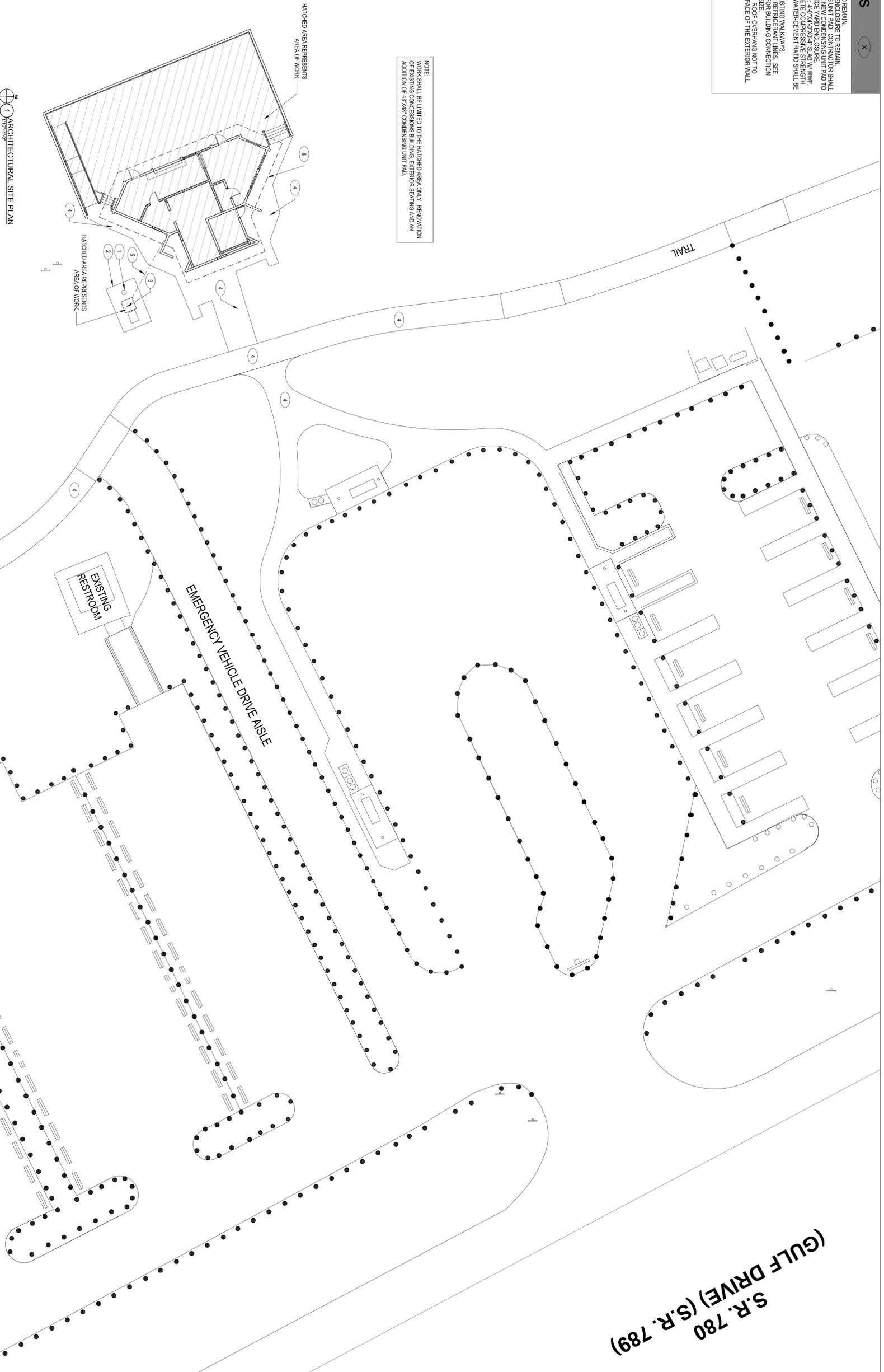
AB	ANCHOR BOLTS	GA	GAUGE	R	RESER
AC	AIR CONDITIONING	GR	GRADE	RD	ROOF DRAIN
AD	ACCESS DOOR	GYP	GYP	REF	REFERENCE
AE	ARCHITECT/ENGINEER	H	HIGH	REFL	REFLECTED
AF	ABOVE FINISHED FLOOR	HC	HARDWARE	REFR	REFRIGERATED
AG	ADJACENT	HD	HARDWOOD	RES	RESIDENT
AH	APPROXIMATELY	HM	HOLLOW METAL	RESL	RESILIENT
AI	APPROXIMATELY	HP	HORIZONTAL	RI	ROUGH
AL	ALUMINUM	HT	HIGH POINT	RO	ROUGH OPENING
AM	APPROXIMATELY	IB	INSIDE DIAMETER	SC	SOLID CORE
AN	APPROXIMATELY	ID	INSIDE DIAMETER	SECT	SECTION
AO	APPROXIMATELY	INF	INSULATION	SHT	SHEET
AP	APPROXIMATELY	INS	INSULATION	SIM	SIMILAR
AR	APPROXIMATELY	INT	INTERIOR	SIMU	SIMULATED
AS	APPROXIMATELY	INTL	INTERIOR	SI	STAINLESS
AT	APPROXIMATELY	INTL	INTERIOR	SS	STAINLESS
AV	APPROXIMATELY	INTL	INTERIOR	ST	STANDARD
AW	APPROXIMATELY	INTL	INTERIOR	STD	STANDARD
AX	APPROXIMATELY	INTL	INTERIOR	STL	STEEL
AY	APPROXIMATELY	INTL	INTERIOR	STR	STRUCTURAL
AZ	APPROXIMATELY	INTL	INTERIOR	STRG	STRUCTURAL
BA	APPROXIMATELY	INTL	INTERIOR	SUSP	SUSPENDED
BB	APPROXIMATELY	INTL	INTERIOR	SW	SYMMETRICAL
BC	APPROXIMATELY	INTL	INTERIOR	T&G	TREAD
BD	APPROXIMATELY	INTL	INTERIOR	T&G	TREAD
BE	APPROXIMATELY	INTL	INTERIOR	T&G	TREAD
BF	APPROXIMATELY	INTL	INTERIOR	T&G	TREAD
BG	APPROXIMATELY	INTL	INTERIOR	T&G	TREAD
BH	APPROXIMATELY	INTL	INTERIOR	T&G	TREAD
BI	APPROXIMATELY	INTL	INTERIOR	T&G	TREAD
BJ	APPROXIMATELY	INTL	INTERIOR	T&G	TREAD
BK	APPROXIMATELY	INTL	INTERIOR	T&G	TREAD
BL	APPROXIMATELY	INTL	INTERIOR	T&G	TREAD
BM	APPROXIMATELY	INTL	INTERIOR	T&G	TREAD
BN	APPROXIMATELY	INTL	INTERIOR	T&G	TREAD
BO	APPROXIMATELY	INTL	INTERIOR	T&G	TREAD
BP	APPROXIMATELY	INTL	INTERIOR	T&G	TREAD
BQ	APPROXIMATELY	INTL	INTERIOR	T&G	TREAD
BR	APPROXIMATELY	INTL	INTERIOR	T&G	TREAD
BS	APPROXIMATELY	INTL	INTERIOR	T&G	TREAD
BT	APPROXIMATELY	INTL	INTERIOR	T&G	TREAD
BV	APPROXIMATELY	INTL	INTERIOR	T&G	TREAD
BW	APPROXIMATELY	INTL	INTERIOR	T&G	TREAD
BX	APPROXIMATELY	INTL	INTERIOR	T&G	TREAD
BY	APPROXIMATELY	INTL	INTERIOR	T&G	TREAD
BZ	APPROXIMATELY	INTL	INTERIOR	T&G	TREAD
CA	APPROXIMATELY	INTL	INTERIOR	T&G	TREAD
CB	APPROXIMATELY	INTL	INTERIOR	T&G	TREAD
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ID	APPROXIMATELY	INTL	INTERIOR	T&G	TREAD
IE	APPROXIMATELY	INTL	INTERIOR	T&G	TREAD

# Key Notes

X

1. EXISTING LIFT STATION TO REMAIN.
2. NEW 48"x48" CONDENSING UNIT PAD. CONTRACTOR SHALL SURVEY AND LOCATE THE NEW CONDENSING UNIT PAD TO FIT IN THE EXISTING SERVICE YARD ENCLOSURE.
3. CONDENSING UNIT PAD SHALL BE 12" x 12" x 4" SLAB WITH A MINIMUM OF 4" CONCRETE OVER REINFORCING BARS. FINISH SHALL BE 5000 PSI MAX. WATER-CEMENT RATIO SHALL BE 0.40.
4. NO MODIFICATIONS TO EXISTING WALKWAYS. SEE MECHANICAL DRAWINGS FOR BUILDING CONNECTION LOCATION AND PVC PIPE SIZE.
5. ROOF OVERHANG ABOVE. ROOF OVERHANG NOT TO EXCEED 48" BEYOND THE FACE OF THE EXTERIOR WALL.
- 6.

NOTE:  
WORK SHALL BE LIMITED TO THE HATCHED AREA ONLY. RENOVATION OF EXISTING CONCESSIONS BUILDING, EXTERIOR SEATING AND AN ADDITION OF 48"x48" CONDENSING UNIT PAD.



ARCHITECTURAL SITE PLAN

**SCHENKELSHULTZ**  
 ARCHITECTURE  
 677 North Washington Blvd.  
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**Coquina Beach**  
 2650 Gulf Drive South  
 Bradenton, Florida 34217  
**Concessions Building Renovations**  
 Manatee County Government  
 1112 Manatee Avenue West  
 Bradenton, Florida 34208

drawn: da  
 checked: da  
 date: 10.22.2010  
 comm. no.: 0820829

ARCHITECTURAL SITE PLAN

**A011**

permit drawings





Architectural  
Drafter Amanda  
AR 34855

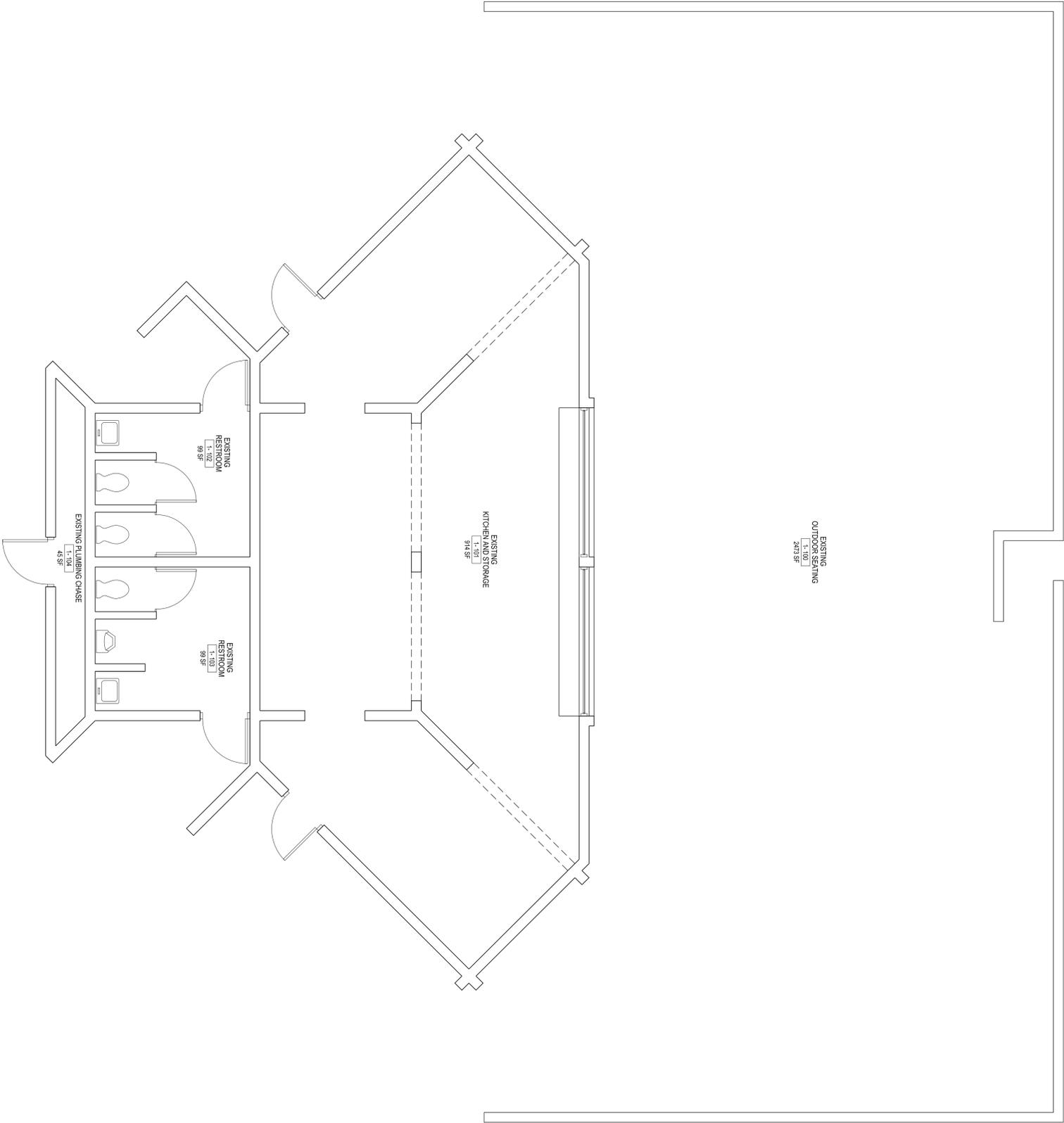
EXISTING  
OUTLET OPENING  
1'-0" DIA  
2473 SF

EXISTING  
KITCHEN AND STORAGE  
1'-3" DIA  
594 SF

EXISTING  
RESTROOM  
1'-0" DIA  
59 SF

EXISTING  
RESTROOM  
1'-0" DIA  
59 SF

EXISTING PLUMBING CHASE  
1'-0" DIA  
45 SF



**N**  
**1**  
1/4" = 1'-0"  
CONCESSION BUILDING EXISTING FLOOR PLAN

**EXISTING FLOOR PLAN**

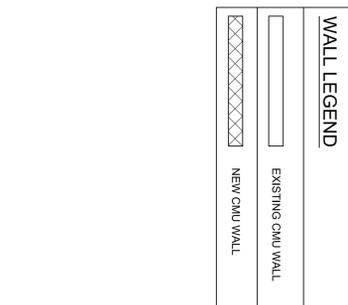
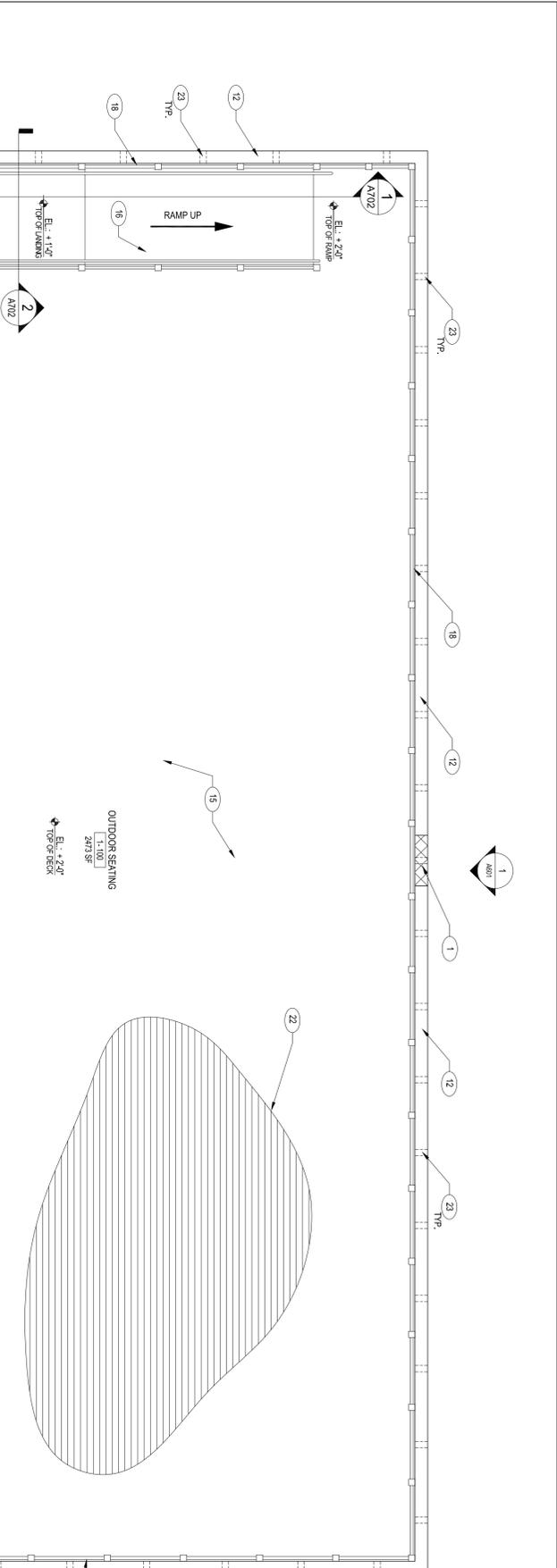
**A100**

permit drawings

drawn: da  
checked: da  
date: 10.22.2010  
comm. no.: 0820829

**Coquina Beach**  
2850 Gulf Drive South  
Bradenton, Florida 34217  
**Concessions Building Renovations**

Mantatee County Government  
1112 Manatee Avenue West  
Bradenton, Florida 34208



DOOR		FRAME		DETAILS		RATING		REMARKS			
NUMBER	SIZE WxHxT	TYPE	MATL	TYPE	MATL	HEAD	JAMB	SILL	MANUFACTURER	HWHR SET	REMARKS
101	3'-0" x 7'-0" x 1'-3/4"	A	HM	-	HM	2A/201	1A/201	5A/201 SIM	-	01	-
101A	10'-0" x 4'-0" x 1"	B	STL	-	HM	4A/201	3A/201	9A/201	-	-	COORDINATE WITH OWNER FOR LOCKING HARDWARE
102	3'-0" x 7'-0" x 1'-3/4"	A	HM	-	HM	2A/201 SIM	1A/201 SIM	5A/201 SIM	-	02	-
103	3'-0" x 7'-0" x 1'-3/4"	A	HM	-	HM	2A/201	1A/201	5A/201 SIM	-	02	-
103A	3'-0" x 7'-0" x 1'-3/4"	A	HM	-	HM	2A/201 SIM	1A/201 SIM	5A/201	-	02	-
104	3'-0" x 7'-0" x 1'-3/4"	A	HM	-	HM	2A/201	1A/201	5A/201	-	01	-



TAG	ACCESSORY	MTG HGT	MODEL NO.
T-1	HORIZONTAL GRAVE BAR -35"	33" TO $\epsilon$	B-8068
T-2	HORIZONTAL GRAVE BAR -42"	33" TO $\epsilon$	B-8068
T-3	TOILET TISSUE DISPENSER	19 1/2" TO TOP	B-2740
T-4	ELECTRIC HAND DRYER	54" TO TOP	SEE SPECS
T-5	SURFACE MOUNTED SOAP DISPENSER	50 1/2" TO TOP	B-112
T-6	CHANNEL FOAM MIRROR	40" TO BOTTOM	B-165
T-7	SAUNTRY MIRROR DISPENSER	25" TO 30" TOP	B-270
T-8	UTILITY SHELF W/ MOPROOM HOLDERS	72" AFF	B-239
T-9	TOILET PARTITION		SEE SPECS

- ### Key Notes
- NEW CMU EXTERIOR WALL. SEE STRUCTURAL DRAWINGS FOR WALL DESCRIPTION.
  - NEW WINDOW. SEE WINDOW SCHEDULE AND WINDOW DETAILS FOR MORE INFORMATION.
  - NEW TRANSACTION WINDOW. SEE SHEET A701 FOR ELEVATION & DETAILS.
  - NEW TRANSACTION COUNTER. SEE SHEET A701 FOR DETAILS.
  - NEW SECURITY GATE. SEE DOOR SCHEDULE AND DOOR DETAILS FOR MORE INFORMATION.
  - NEW PLUMBING SINK. SEE PLUMBING DRAWINGS FOR MORE INFORMATION.
  - ROOF OUTLINE. SEE ROOF PLAN FOR MORE INFORMATION.
  - NEW EXTERIOR DOORFRAME IN A NEW WALL OPENING. SEE DOOR SCHEDULE AND DOOR DETAILS FOR MORE INFORMATION.
  - NEW EXTERIOR DOORFRAME IN AN EXISTING WALL OPENING. SEE DOOR SCHEDULE AND DOOR DETAILS FOR MORE INFORMATION.
  - NEW INTERIOR DOORFRAME IN A NEW WALL. SEE DOOR SCHEDULE AND DOOR DETAILS FOR MORE INFORMATION.
  - NEW CMU INTERIOR WALL. SEE STRUCTURAL DRAWINGS FOR WALL DESCRIPTION.
  - EXISTING CMU WALL TO REMAIN. SEE STRUCTURAL DRAWINGS FOR MORE INFORMATION.
  - NEW ELECTRICAL PANEL. SEE ELECTRICAL DRAWINGS FOR MORE INFORMATION.
  - NEW MOP SINK. SEE PLUMBING DWGS.
  - NEW WOOD DECK ON WOOD RAILING. SEE STRUCTURAL DRAWINGS FOR MORE INFORMATION.
  - NEW WOOD DECK RAMP. SEE DETAILS FOR MORE INFORMATION.
  - NEW WOOD STAIRS. SEE DETAILS FOR MORE INFORMATION.
  - NEW WOOD RAILINGS. SEE DETAILS FOR MORE INFORMATION.
  - ALUMINUM THRESHOLD SET IN FULL BED OF EXTERIOR CONTINUE WOOD DECKING TO PROVIDE CONTINUOUS FLOORING SURFACE AT 2'-0" ABOVE THE EXISTING SLAB FLOORING SURFACE.
  - PORTION OF THE WOOD DECK SHOWN WITH HATCH TO DEMONSTRATE THE DIRECTION OF WOOD DECKING. FOR MORE INFORMATION SEE STRUCTURAL DRAWINGS.
  - EXISTING OUTDOOR SEATING AREAS SHALL RECEIVE WOOD DECKING. SEE STRUCTURAL DRAWINGS FOR MORE INFORMATION.
  - ALUMINUM THRESHOLD RAMP. 5'-0" x 5'-0" RAMP WITH 2" TOP TRANSITION RAMP TO BE INTO THE NEW WOOD RAMP. BASIS OF DESIGN SHALL BE ALUMINUM RAMP CONTRACTOR SHALL PROVIDE ALL NECESSARY SUPPORT AND MAINFOLDERS GUIDES AND CHAINERS AND CHAINERS. 2" Ø WEEP HOLES. STAGGER WITH 4X4 POSTS.

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**Concessions Building Renovations**  
 Manatee County Government  
 1112 Manatee Avenue West  
 Bradenton, Florida 34208

drawn: da  
 checked: da  
 date: 10.22.2010  
 comm. no.: 09202929

**FLOOR PLAN**

**A101**

permit drawings

ALL DATA, SPECIFICATIONS, DIMENSIONS, MATERIALS, FINISHES, AND CONDITIONS ARE SUBJECT TO CHANGE WITHOUT NOTICE. THE ARCHITECT SHALL BE RESPONSIBLE FOR OBTAINING ALL NECESSARY PERMITS AND APPROVALS FROM THE LOCAL, STATE, AND FEDERAL AUTHORITIES. THE CONTRACTOR SHALL BE RESPONSIBLE FOR OBTAINING ALL NECESSARY PERMITS AND APPROVALS FROM THE LOCAL, STATE, AND FEDERAL AUTHORITIES. THE CONTRACTOR SHALL BE RESPONSIBLE FOR OBTAINING ALL NECESSARY PERMITS AND APPROVALS FROM THE LOCAL, STATE, AND FEDERAL AUTHORITIES. THE CONTRACTOR SHALL BE RESPONSIBLE FOR OBTAINING ALL NECESSARY PERMITS AND APPROVALS FROM THE LOCAL, STATE, AND FEDERAL AUTHORITIES.



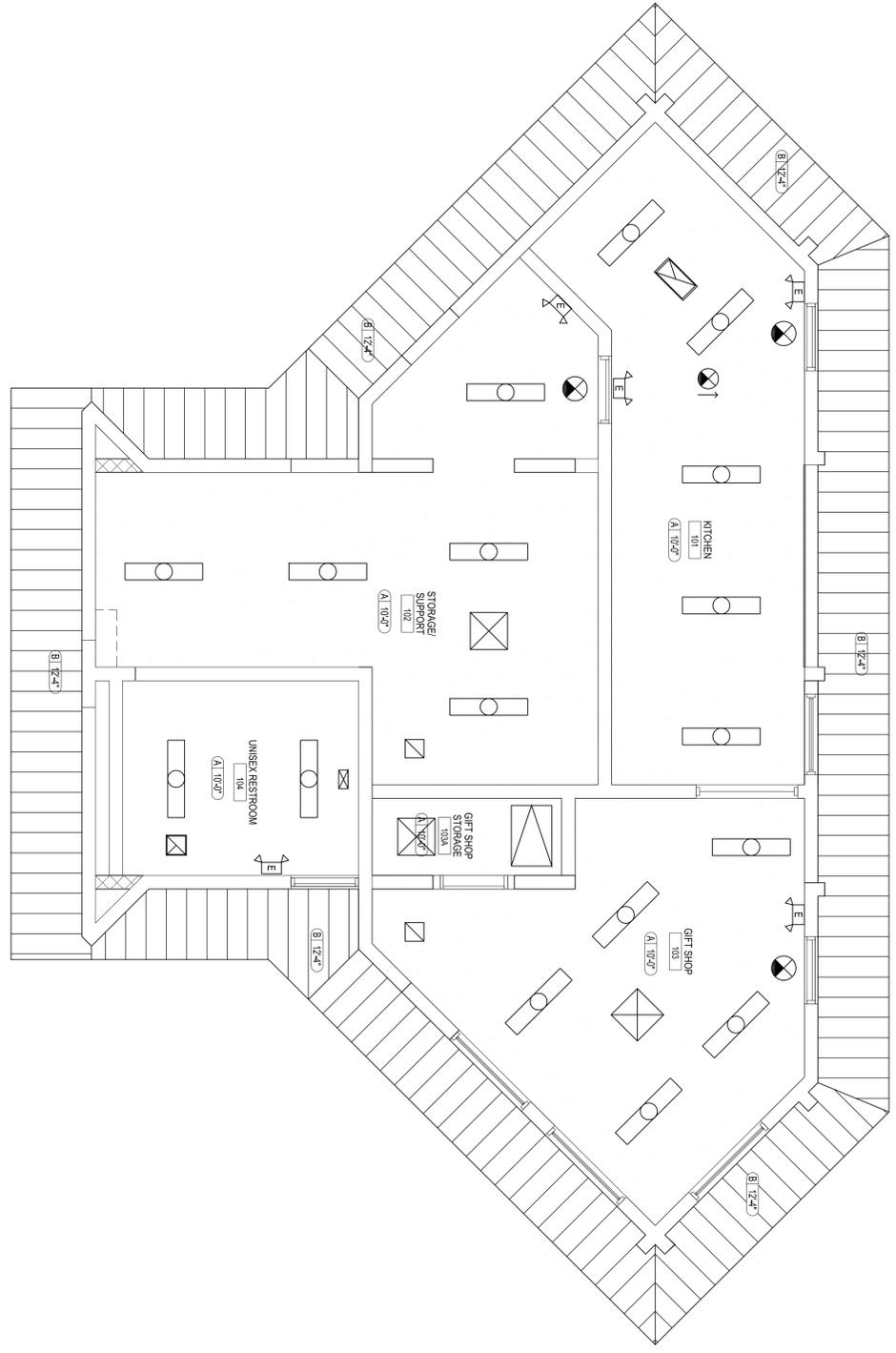
Coquina Beach

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 Renovations  
 Manatee County Government  
 1112 Manatee Avenue West  
 Bradenton, Florida 34208

drawn: Jr  
 checked: Da  
 date: 10.22.2010  
 comm. no.: 0820829

**REFLECTED CEILING PLAN**

**A401**  
 permit drawings



OUTDOOR SEATING  
 1-103

NOTE:  
 ALL CEILING SURFACES SHALL BE PAINTED WITH EPOXY GROUT PER SPECIFICATIONS. COORDINATE COLOR WITH OWNER.

**REFLECTED CEILING PLAN LEGEND**

SYMBOL	DESCRIPTION
(A1 102F)	CEILING MATERIAL - SEE SCHEDULE
(A1 94T)	CEILING HEIGHT
[ ]	SURFACE MOUNTED LIGHT FIXTURE - SEE ELECTRICAL
[ ]	SUPPLY AIR GRILLE - SEE MECHANICAL
[ ]	RETURN AIR GRILLE - SEE MECHANICAL
[ ]	24" x 36" CEILING ACCESS PANEL - SEE SPECIFICATIONS. PAINTED TO MATCH THE COLOR OF THE CEILING.
[ ]	EXHAUST AIR GRILLE - SEE MECHANICAL
[ ]	EXIT LIGHTS - SEE ELECTRICAL
[ ]	EMERGENCY LIGHTS - SEE ELECTRICAL

**REFLECTED CEILING PLAN SCHEDULE**

MATERIAL SYMBOL	CEILING CONSTRUCTION / TYPE
A	3/4" MOISTURE RESISTANT DRYWALL ON 3/4" METAL STUDS @ 16" O.C.
B	PERFORATED METAL SOFFIT PANELS

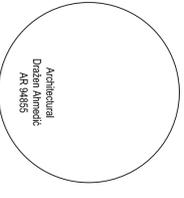
REFLECTED CEILING PLAN  
 1/4" = 1'-0"  
 N







ALL NOTES, SPECIFICATIONS AND CONDITIONS SHALL BE SUBJECT TO THE SUPPLEMENTARY NOTES AND SPECIFICATIONS TO THE PERMIT APPLICATION. THE CONTRACTOR SHALL BE RESPONSIBLE FOR OBTAINING ALL NECESSARY PERMITS AND APPROVALS FROM THE LOCAL, STATE AND FEDERAL AGENCIES. THE CONTRACTOR SHALL BE RESPONSIBLE FOR OBTAINING ALL NECESSARY PERMITS AND APPROVALS FROM THE LOCAL, STATE AND FEDERAL AGENCIES. THE CONTRACTOR SHALL BE RESPONSIBLE FOR OBTAINING ALL NECESSARY PERMITS AND APPROVALS FROM THE LOCAL, STATE AND FEDERAL AGENCIES.



**Coquina Beach**

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 Renovations

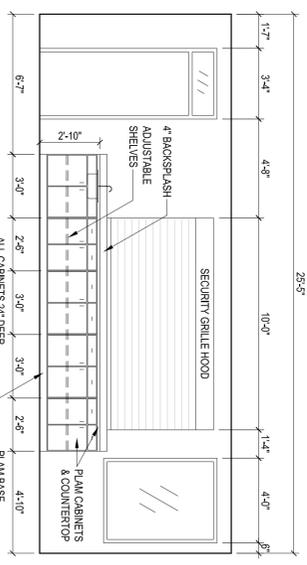
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 Bradenton, Florida 34208

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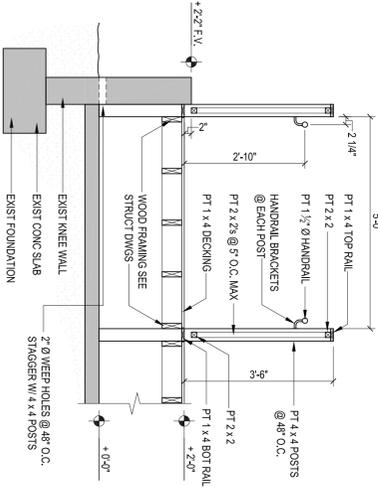
**MISCELLANEOUS DETAILS**

**A702**

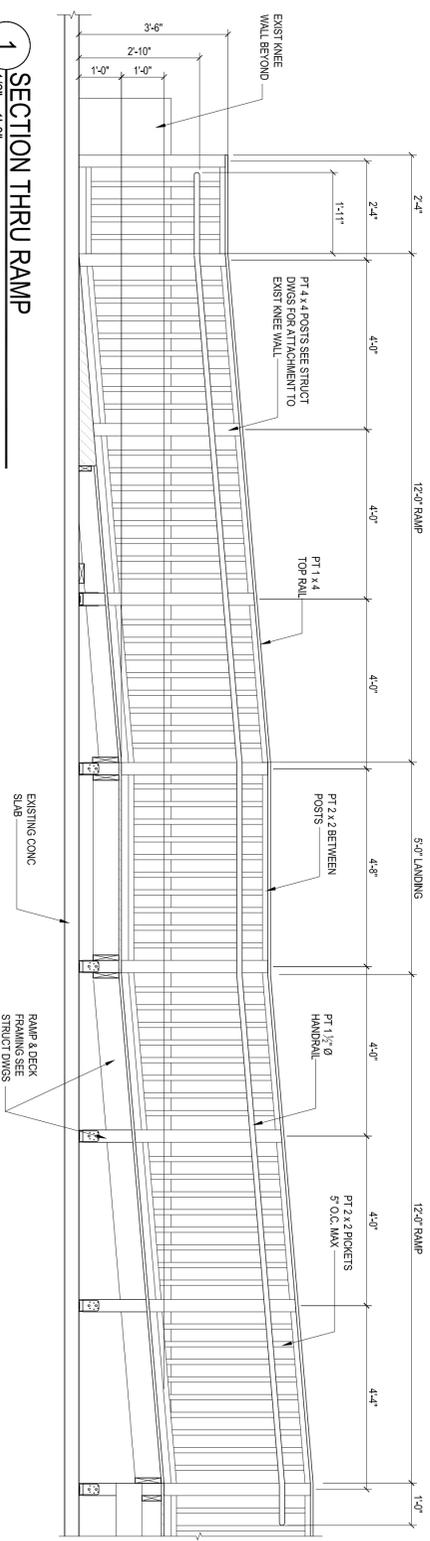
permit drawings



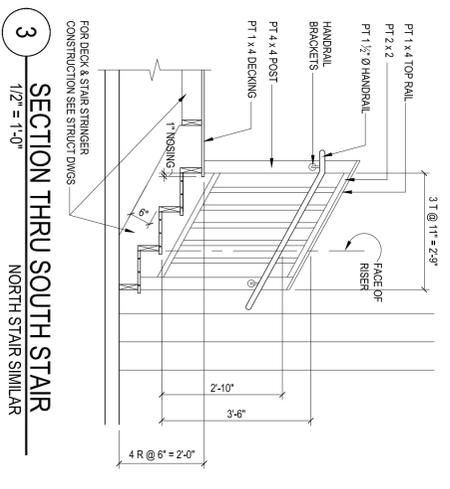
**4** INTERIOR ELEVATION - KITCHEN  
 1/4" = 1'-0"



**2** CROSS SECTION THRU RAMP  
 1/2" = 1'-0"



**1** SECTION THRU RAMP  
 1/2" = 1'-0"



**3** SECTION THRU SOUTH STAIR  
 NORTH STAIR SIMILAR  
 1/2" = 1'-0"



**RENOVATION NOTES:**

RENOVATION NOTES APPLY TO ALL ELECTRICAL DRAWINGS.

- R1. PROVIDE (DEFINED AS "FURNISH AND INSTALL") ALL LABOR, MATERIALS AND EQUIPMENT REQUIRED FOR COMPLETE AND PROPERLY OPERATING LIGHTING, POWER AND SPECIAL SYSTEMS.
- R2. ALL ITEMS SHOWN ARE NEW UNLESS NOTED OTHERWISE (U.N.O.). NO EXISTING CONDUIT, DEVICES, FIXTURES, ETC. MAY BE REUSED U.N.O. EVEN IF IT THEY ARE IN A SATISFACTORY CONDITION AND IN A CODE COMPLIANT CONDITION.
- R2. INFORMATION SHOWN ON THE DRAWINGS AS TO THE LOCATION AND QUANTITY OF EXISTING ELECTRICAL WORK HAVE BEEN PREPARED FROM AS-BUILT DRAWINGS, SITE SURVEYS AND THE MOST RELIABLE DATA AVAILABLE TO THE ENGINEER AT THE TIME OF DESIGN. HOWEVER, THE ACCURACY OF THIS INFORMATION IS NOT GUARANTEED AND IT SHALL BE THE CONTRACTOR'S RESPONSIBILITY TO FIELD VERIFY THE QUANTITY, LOCATION, AND CHARACTER OF EXISTING ELECTRICAL WORK PRIOR TO BID.
- R3. FLOOR PLANS, RISER DIAGRAMS AND SPECIFICATIONS REQUIRE CODE COMPLIANT MODIFICATIONS TO THE EXISTING LIGHTING, POWER AND SPECIAL SYSTEMS.
- R4. IF THE INTENT OF THE DRAWINGS AND SPECIFICATIONS WITH REGARD TO ANY DETAIL IS NOT CLEAR, OR IS CAPABLE OF MORE THAN ONE INTERPRETATION THEN IT IS THE OBLIGATION OF THE CONTRACTOR BIDDING THE ELECTRICAL WORK TO SUBMIT A WRITTEN REQUEST FOR INFORMATION (RFI) TO THE ARCHITECT / ENGINEER TEN (10) DAYS (MINIMUM) PRIOR TO BID. ALL RFIS SHALL INCLUDE A PROPOSED SOLUTION OR THE RFI WILL BE RETURNED TO THE CONTRACTOR FOR A PROPOSED SOLUTION.
- R5. DRAWINGS AND SPECIFICATIONS ARE INTENDED AS A GENERAL DESCRIPTION OF THE WORK TO BE PROVIDED. CONTRACTOR SHALL PROVIDE ALL ITEMS NOT SPECIFICALLY MENTIONED OR SHOWN, BUT NECESSARY FOR COMPLETE AND PROPERLY OPERATING LIGHTING, POWER AND SPECIAL SYSTEMS.
- R6. CONTRACTOR SHALL BECOME THOROUGHLY ACQUAINTED WITH THE PROJECT SITE (E.G. EXISTING CONDITIONS) AND THE ENTIRE CONSTRUCTION DOCUMENTS PACKAGE (E.G. ARCHITECTURAL, MECHANICAL, PLUMBING, ELECTRICAL DRAWINGS AND SPECIFICATIONS) BEFORE BID SUBMISSION. NO ADDITIONAL COMPENSATION WILL BE PROVIDED DUE TO THE CONTRACTOR'S FAILURE TO BECOME FAMILIAR WITH THE DRAWINGS, SPECIFICATIONS OR EXISTING CONDITIONS.
- R7. COORDINATE WITH ON-SITE BUILDING MANAGEMENT, LANDLORD, TELEPHONE, CABLE TELEVISION AND ELECTRICAL UTILITY COMPANIES, ETC. PRIOR TO BID TO DETERMINE EXTENT OF NEW WORK REQUIRED TO INTERFACE WITH EXISTING WORK. CONTRACTOR SHALL BE RESPONSIBLE FOR LOCATING, AVOIDING, REPAIRING AND PAYING TO CORRECT ALL EXISTING SERVICES DAMAGED DURING INSTALLATION OF NEW ELECTRICAL WORK.
- R8. PROVIDE ALL CONDUIT, BOTH NEW AND EXISTING, WITH PROTECTION AGAINST DAMAGE AND ENTRANCE OF WATER, DIRT, FOREIGN MATERIAL, ETC. WITH WATERTIGHT CAPS. PROVIDE WATERTIGHT ASSEMBLIES, SEALANTS, ETC. WHERE CONDUIT PASSES THROUGH INTERIOR/ EXTERIOR OF BUILDING AT BOTH ABOVE AND BELOW GROUND LOCATIONS.
- R9. IN ALL AREAS OF THE SCOPE OF WORK, IT WILL BE THE RESPONSIBILITY OF THE ELECTRICAL CONTRACTOR, COMMUNICATIONS CONTRACTOR, ETC. TO RELOCATE, BUT NOT LIMITED TO, ANY AND ALL EXISTING POWER, LIGHTING, CONDUITS, WIRING, CABLING, DEVICES, EQUIPMENT, STRUCT, ELECTRICAL ITEMS, ETC. SO THEY ARE NOT IN CONFLICT OR OBSTRUCT RELOCATED MECHANICAL SYSTEMS, DUCTWORK, ARCHITECTURAL IMPROVEMENTS, ETC. THE AFOREMENTIONED CONTRACTORS SHALL SURVEY THE EXISTING CONDITIONS PRIOR TO BID AND INCLUDE ALL NECESSARY COSTS (LABOR AND MATERIALS) IN THEIR BID. NO ADDITIONAL COMPENSATION WILL BE PROVIDED THE AFOREMENTIONED CONTRACTORS AFTER BIDS ARE RECEIVED BY THE OWNER.

**DEMOLITION NOTES:**

DEMOLITION NOTES APPLY TO ALL ELECTRICAL DRAWINGS.

- D1. ALL EXISTING ELECTRICAL DEVICES AND COMPONENTS WITHIN OR ATTACHED TO EXISTING WALLS SHALL BE REMOVED AND PROPERLY DISPOSED. THE CONTRACTOR SHOULD REVIEW THE EXTENT OF THE DEMOLITION AS SHOWN ON ALL OF THE DESIGN DRAWINGS/DOCUMENTS.
- D2. EXISTING ELECTRICAL WORK INCLUDING, BUT NOT LIMITED TO, DISCONNECT SWITCHES, LIGHTING CONTROL DEVICES, AND ASSOCIATED CONDUIT, WIRING, MOUNTING HARDWARE, ETC. THAT MUST BE REMOVED IN ORDER FOR NEW ELECTRICAL WORK TO BE INSTALLED SHALL BE REMOVED BY THE ELECTRICAL CONTRACTOR. THE ELECTRICAL CONTRACTOR SHALL COORDINATE EXTENT OF REQUIRED ELECTRICAL DEMOLITION WORK WITH GENERAL CONTRACTOR, OWNER AND ARCHITECT PRIOR TO BID.
- D3. WIRING DEVICES AND ASSOCIATED BRANCH CIRCUITRY IN WALLS, CEILINGS AND ON ROOFS BEING DEMOLISHED SHALL BE REMOVED AND MADE SAFE BY THE ELECTRICAL CONTRACTOR UNLESS REQUIRED TO REMAIN IN SERVICE. WIRING AND RACEWAY NO LONGER REQUIRED SHALL BE COMPLETELY REMOVED BACK TO ITS ORIGIN. RACEWAY NOT CAPABLE OF BEING REMOVED SHALL BE ABANDONED IN PLACE AND CAPPED AT EACH END (SURFACE MOUNTED CONDUIT DOES NOT QUALIFY FOR THIS EXCEPTION). DEVICES BEING REUSED/RELOCATED ARE NOTED ON THE FLOOR PLANS. PROVIDE BLANK COVERPLATE OVER ALL UNUSED OPENINGS. MAINTAIN EXISTING CIRCUITS (UPSTREAM AND DOWNSTREAM) FOR REUSE WHERE REQUIRED. PROVIDE ALL ELECTRICAL COMPONENTS (BOXES, CONDUIT, WIRING, ETC.) AS REQUIRED.
- D4. COMMUNICATIONS RACEWAY FOR TV, TELEPHONE, AND DATA SYSTEMS, ETC. IN WALLS AND CEILINGS BEING DEMOLISHED SHALL BE REMOVED BY ELECTRICAL CONTRACTOR UNLESS REQUIRED TO REMAIN IN SERVICE. DISCONNECT COVERPLATE/ JACK FROM EXISTING WIRING AND COIL WIRING ABOVE CEILING. RACEWAY SHALL BE COMPLETELY REMOVED. RACEWAY NOT CAPABLE OF BEING REMOVED SHALL BE ABANDONED IN PLACE AND CAPPED AT EACH END. OUTLETS BEING REUSED/ RELOCATED ARE NOTED ON THE FLOOR PLANS. PROVIDE BLANK COVERPLATE OVER ALL UNUSED OPENINGS. MAINTAIN EXISTING CIRCUITS (UPSTREAM AND DOWNSTREAM) FOR REUSE WHERE REQUIRED. PROVIDE ALL ELECTRICAL COMPONENTS (BOXES, CONDUIT, WIRING, ETC.) AS REQUIRED.
- D5. SECURITY SYSTEM DEVICES AND ASSOCIATED RACEWAY/ WIRING IN WALLS AND CEILINGS BEING DEMOLISHED SHALL BE REMOVED BY ELECTRICAL CONTRACTOR UNLESS REQUIRED TO REMAIN IN SERVICE. WIRING AND RACEWAY NOT LONGER REQUIRED SHALL BE COMPLETELY REMOVED FROM ITS ORIGIN. RACEWAY SHALL BE COMPLETELY REMOVED. RACEWAY NOT CAPABLE OF BEING REMOVED SHALL BE ABANDONED IN PLACE AND CAPPED AT EACH END. DEVICES BEING REUSED/ RELOCATED ARE NOTED ON THE FLOOR PLANS. PROVIDE BLANK COVERPLATE OVER ALL UNUSED OPENINGS. MAINTAIN EXISTING CIRCUITS (UPSTREAM AND DOWNSTREAM) FOR REUSE WHERE REQUIRED. PROVIDE ALL ELECTRICAL COMPONENTS (BOXES, CONDUIT, WIRING, ETC.) AS REQUIRED.
- D6. LIGHTING FIXTURES, SWITCHES AND ASSOCIATED CIRCUITRY, ETC. IN WALLS AND CEILINGS BEING DEMOLISHED SHALL BE REMOVED AND MADE SAFE BY THE ELECTRICAL CONTRACTOR UNLESS REQUIRED TO REMAIN IN SERVICE. WIRING AND RACEWAY NO LONGER REQUIRED SHALL BE COMPLETELY REMOVED BACK TO ITS ORIGIN. RACEWAY NOT CAPABLE OF BEING REMOVED SHALL BE ABANDONED IN PLACE AND CAPPED AT EACH END. FIXTURES BEING REUSED/ RELOCATED ARE NOTED ON THE FLOOR PLANS. PROVIDE BLANK COVERPLATE OVER ALL UNUSED OPENINGS. MAINTAIN EXISTING CIRCUITS (UPSTREAM AND DOWNSTREAM) FOR REUSE WHERE REQUIRED. PROVIDE ALL ELECTRICAL COMPONENTS (BOXES, CONDUIT, WIRING, ETC.) AS REQUIRED.
- D8. CONTRACTOR IS RESPONSIBLE FOR REMOVAL AND LEGAL OFF-SITE DISPOSAL OF FLUORESCENT LAMPS, BALLASTS, BATTERIES AND OTHER HAZARDOUS MATERIALS REMOVED AS PART OF THE ELECTRICAL DEMOLITION.

**GENERAL NOTES ELECTRICAL**

GENERAL NOTES APPLY TO ALL ELECTRICAL DRAWINGS.

- DO NOT SCALE FROM THESE DRAWINGS.
- ALL WORK SHALL BE DONE IN STRICT ACCORDANCE WITH THE NATIONAL ELECTRICAL CODE.
- THE DIVISION 16 CONTRACTOR SHALL COORDINATE WORK WITH ALL OTHER TRADES TO ASSURE PROPER CLEARANCES FOR EQUIPMENT AND TO KEEP THE JOB PROGRESSING.
- ALL CEILING MOUNTED ITEMS SHALL BE INSTALLED IN ACCORDANCE WITH THE ARCHITECTURAL REFLECTIVE CEILING PLANS. IF LOCATION FOR AN ITEM IS NOT SHOWN ON THE ARCHITECTURAL REFLECTIVE CEILING PLANS, VERIFY THE EXACT LOCATION OF THE ITEM WITH THE ARCHITECT PRIOR TO INSTALLATION. THESE REQUIREMENTS APPLY TO ALL CEILING TYPES IN ALL AREAS.
- RECEPTACLES IN MECHANICAL ROOM, ELECTRICAL ROOMS, STORAGE ROOMS AND CUSTODIAL/JANITOR CLOSETS TO BE MOUNTED 48" A.F.F. AND SHALL BE G.F.I. TYPE.
- ALL EXTERIOR WIRING DEVICES TO BE WEATHERPROOF AND SHALL BE G.F.I. TYPE.
- CONDUIT RUNS SHOWN ARE DIAGRAMMATIC IN NATURE. DIVISION 16 CONTRACTOR IS RESPONSIBLE FOR SIZING AND LOCATING PULL BOXES PER NEC AND FOR COORDINATION WITH OTHER DISCIPLINES.
- ALL H.I.D. AND FLUORESCENT LIGHT FIXTURES SHALL BE FURNISHED WITH INTEGRAL FUSING.
- PROVIDE 2#12AWG + 1#12AWG EQUIPMENT GROUND COPPER IN 3/4" CONDUIT FOR ALL 120V BRANCH CIRCUITS U.O.N.. PROVIDE #10AWG COPPER CONDUCTORS FOR 20 AMPERE, 120 VOLT BRANCH CIRCUITS LONGER THAN 75 FEET.
- ALL FREE-WIRED CABLING SHALL BE PLENUM-RATED UNLESS OTHERWISE NOTED.
- ALL ELECTRICAL DEVICES AND ASSOCIATED COVERPLATES SHALL BE WHITE UNLESS OTHERWISE NOTED.
- ALL EQUIPMENT ABOVE 49V SHALL BE INSTALLED ABOVE FEMA FLOOD PLAN ELEVATION. SEE ARCHITECTURAL DRAWINGS FOR DETAILS.

**ABBREVIATIONS**

NOTE: ALL ABBREVIATIONS MAY NOT BE USED.

1P	SINGLE POLE	MCA	MINIMUM CIRCUIT AMPS
1PH	SINGLE-PHASE	MCB	MAIN CIRCUIT BREAKER
3PH	THREE-PHASE	MDP	MAIN DISTRIBUTION PANEL
A OR AMP	AMPERE	MIN	MINIMUM
AF	ABOVE FINISHED FLOOR	MLO	MAIN LUGS ONLY
AFG	ABOVE FINISHED GRADE	MOCOP	MAXIMUM OVER CURRENT PROTECTION
AIC	AMPERE INTERRUPTING CAPACITY	NEC	NATIONAL ELECTRICAL CODE
AMP	AMPERE	[N]	NEW
AWG	AMERICAN WIRE GAUGE	[NL]	NEW LOCATION OF EXISTING
CB	CIRCUIT BREAKER	PH	PHASE
CKT	CIRCUIT	PNL	PANEL
CLG	CEILING (TYPICALLY CEILING MOUNTED)	[R]	EXISTING TO BE REMOVED
CM	CONSTRUCTION MANAGER	[RL]	EXISTING TO BE RELOCATED
CJ	COPPER	[RP]	EXISTING TO BE REPLACED
EQPT	EQUIPMENT	RMC	RIGID METAL CONDUIT
E	EXISTING TO REMAIN	SPD	SURGE PROTECTION DEVICE TO BE DETERMINED
EMT	ELECTRICAL METALLIC TUBING	TBD	TYPICAL
[E]	EXISTING TO REMAIN	UN OR UNO	UNLESS OTHERWISE NOTED
FA	FIRE ALARM	UPS	UNINTERRUPTIBLE POWER SUPPLY
FACP	FIRE ALARM CONTROL PANEL	V	VOLTS
FLA	FULL LOAD AMPS	VA	VOLT AMPERE
G OR GRD	GROUND	VFD	VARIABLE FREQUENCY DRIVE
GFCI	GROUND FAULT CIRCUIT INTERRUPTER	WF	WEATHERPROOF, FULLY GASKETED ALUMINUM BACKBOX WITH IMC RACEWAY AND THREADED FITTINGS. PROVIDE COMPONENTS WITH U.L. WET LABEL
HP	HORSE POWER	XFMR	TRANSFORMER
J-BOX	JUNCTION BOX		
KVA	KILOVOLT AMPERE		
kW	KILOWATT		
kWh	KILOWATT HOUR		
LC	LOAD CENTER		
LED	LIGHT EMITTING DIODE		
LFCM	LIQUID TIGHT FLEXIBLE METAL CONDUIT		

NOTE: NOT ALL SYMBOLS SHOWN ON LEGEND ARE USED ON FLOOR PLANS.

**ELECTRICAL LEGEND**

WIRING DEVICES – REFER TO THE SPECIFICATIONS

- NOTE: RECEPTACLES SHALL BE VERTICALLY MOUNTED WITH THE GROUND PIN HOLE LOCATED AT THE "TWELVE O'CLOCK" (TOP OF DEVICE) POSITION U.N.O.
- NOTE: THE FOLLOWING ABBREVIATIONS APPLY TO WIRING DEVICES WHERE INDICATED:
- "EW" INDICATES DEVICE MOUNTED BEHIND ELECTRIC WATER COOLER ENCLOSURE. COORDINATE DEVICE LOCATION WITH PLUMBING CONTRACTOR AND APPROVED PLUMBING SHOP DRAWINGS PRIOR TO ROUGH-IN.
- "WP" INDICATES WEATHERPROOF FULLY GASKETED CAST ALUMINUM BACKBOX, IMC RACEWAY WITH THREADED FITTINGS AND UL WET LABEL "IN-USE" COVER. PROVIDE THOMAS AND BETTS RED DOT CODE KEPPER No. OXSGV SERIES. PAINT TO MATCH BUILDING COLOR. ALL RECEPTACLE COVERS TO BE NEMA 3R RATED AND LOCKABLE.
- ☐ SPECIFICATION GRADE TAMPER-RESISTANT GFCI TYPE DUPLEX RECEPTACLE, 20 AMP, HEAVY DUTY, SURFACE MOUNT 36" AFF TO CENTER OF BACKBOX U.N.O.
- ☐ SPECIFICATION GRADE TAMPER-RESISTANT GFCI TYPE DUPLEX RECEPTACLE, 20 AMP, HEAVY DUTY, SURFACE MOUNT ABOVE SINK, COUNTER, CASEWORK, ETC. INSTALL AT 48" AFF U.O.N.. COORDINATE MOUNTING HEIGHT WITH ARCHITECTURAL ELEVATIONS AND/OR EXISTING CONDITIONS PRIOR TO ROUGH-IN.
- ☐ SPECIFICATION GRADE TAMPER-RESISTANT GFCI TYPE DOUBLE DUPLEX RECEPTACLE WITH COMMON COVERPLATE, 20 AMP, HEAVY DUTY, SURFACE MOUNT ABOVE SINK, COUNTER, CASEWORK, ETC. INSTALL AT 48" AFF U.O.N.. COORDINATE MOUNTING HEIGHT WITH ARCHITECTURAL ELEVATIONS AND/OR EXISTING CONDITIONS PRIOR TO ROUGH-IN.

POWER DISTRIBUTION – REFER TO THE RISER DIAGRAM AND SPECIFICATIONS

- PNL PANELBOARD, REFER TO THE "PANELBOARD SCHEDULE"
- FEEDER, BRANCH CIRCUIT OR SWITCH LEG CONCEALED IN WALL, CEILING OR FLOOR
- BRANCH CIRCUIT SERVING BOTH LIGHTING FIXTURES AND/OR WIRING DEVICES, ETC. FIXTURES ARE SWITCHED, DIMMED, ETC. AS INDICATED. RECEPTACLES ARE SERVED BY UN-SWITCHED PHASE CONDUCTOR OF BRANCH CIRCUIT INDICATED (I.E. FIXTURES AND RECEPTACLES ARE ON SAME CIRCUIT, BUT FIXTURES ARE SWITCHED AND RECEPTACLES ARE UN-SWITCHED).
- BRANCH CIRCUITRY (UNSWITCHED) IN BETWEEN SWITCHED LIGHTING FIXTURES, WIRING DEVICES, ETC.
- HOMERUN TO PANELBOARD WITH CIRCUIT(S) INDICATED. PROVIDE 2#12 CU, 1#12 CU GROUND IN 3/4" CONDUIT U.N.O. ON DRAWINGS AND/OR IN SPECIFICATIONS
- HOMERUN TO PANELBOARD WITH DIRECT ELECTRICAL CONNECTION TO EQUIPMENT.
- SERVICE GROUND. PROVIDE IN A TRIANGULAR PATTERN, A MINIMUM OF (3) 5/8" DIA, 10 FOOT LONG COPPER-CLAD STEEL GROUND RODS LOCATED AT LEAST 10 FEET APART. ALL CONNECTIONS SHALL BE EXOTHERMICALLY WELDED. PROVIDE NON-METALLIC TEST WELL AND COVER OVER EACH ROD WHEN ASSEMBLY IS LOCATED IN LANDSCAPE AREA (PREFERRED AREA). PROVIDE CONCRETE WELL WITH METAL TRAFFIC COVER OVER EACH ROD WHEN ASSEMBLY IS LOCATED IN HARD SURFACE AREAS, SUCH AS CONCRETE, ASPHALT, ETC. GROUND TO FOUNDATION STEEL AND METAL FRAME OF BUILDING WHEN ACCESSIBLE.
- SERVICE GROUND
- ⊙ INDICATES FEEDER SIZE ON ELECTRICAL RISER DIAGRAM. REFER TO THE "FEEDER SCHEDULE"
- ☐ TWO-POLE, 240V RATED, SERVICE DISCONNECT SWITCH. PROVIDE HEAVY DUTY, NON-FUSED, NEMA-1 SWITCH U.N.O.. REFER TO PLANS AND SCHEDULES FOR ADDITIONAL REQUIREMENTS. PROVIDE NEMA-3R WEATHERPROOF ENCLOSURE, IMC RACEWAY WITH THREADED FITTINGS, ETC. FOR DAMP AND WET LOCATIONS.

COMMUNICATIONS – REFER TO THE RISER DIAGRAM AND SPECIFICATIONS

- NOTE: THE FOLLOWING ABBREVIATIONS APPLY TO COMMUNICATIONS OUTLETS WHERE INDICATED:
- "H" INDICATES HORIZONTALLY MOUNTED OUTLET.
- "WP" INDICATES WEATHERPROOF BACKBOX, IMC RACEWAY WITH THREADED FITTINGS AND UL WET LABEL "IN-USE" COVER. PROVIDE COOPER No. 4960 SERIES WEATHERBOX POLYCARBONATE COVER.
- TV TELEVISION OUTLET, SURFACE MOUNT 36" AFF TO CENTER OF BACKBOX U.N.O.. PROVIDE 2-GANG BACKBOX WITH SINGLE GANG OPENING AND (1) 3/4" CONDUIT WITH BUSHINGS INTO AN ACCESSIBLE CEILING SPACE. PROVIDE RG-6 CABLE TO CATV DEMARC. COVERPLATES AND TERMINATIONS BY OWNER.
- ▼ COMMUNICATIONS OUTLET, SURFACE MOUNT 36" AFF TO CENTER OF BACKBOX U.N.O.. PROVIDE 2-GANG BACKBOX WITH SINGLE GANG OPENING AND (1) 3/4" CONDUIT WITH BUSHINGS AND PULL STRING STUBBED INTO ACCESSIBLE CEILING SPACE ABOVE BACKBOX U.N.O.. PROVIDE BUILDING STANDARD BLANK COVERPLATE OVER BACKBOX.
- ▼ COMMUNICATIONS OUTLET, SURFACE MOUNT ABOVE COUNTER, CASEWORK, ETC. COORDINATE MOUNTING HEIGHT WITH ARCHITECTURAL ELEVATIONS AND/OR EXISTING CONDITIONS PRIOR TO ROUGH-IN. PROVIDE 2-GANG BACKBOX WITH SINGLE GANG OPENING AND (1) 3/4" CONDUIT WITH BUSHINGS AND PULL STRING STUBBED INTO ACCESSIBLE CEILING SPACE ABOVE BACKBOX U.N.O.. PROVIDE BUILDING STANDARD BLANK COVERPLATE OVER BACKBOX.
- COMM PROVIDE COMMUNICATIONS EQUIPMENT BACKBOARD. PROVIDE 3/4" THICK PLYWOOD BACKBOARD(S) SEALED WITH FIRE RETARDANT PAINT U.N.O. PROVIDE GROUND BUS AND #6AWG COPPER CONDUCTOR TO ELECTRICAL SERVICE GROUND. COIL COPPER CONDUCTOR AT COMMUNICATIONS BACKBOARD FOR FUTURE USE.

LIGHTING FIXTURES – REFER TO THE LIGHTING FIXTURE SCHEDULE

- NOTE: THE FOLLOWING ABBREVIATIONS APPLY TO LIGHTING FIXTURES WHERE INDICATED:
- "NL" INDICATES NIGHT LIGHT
- UPPER CASE LETTER (I.E. "A") INDICATES FIXTURE TYPE. NUMBER (I.E. 1) INDICATES BRANCH CIRCUIT NUMBER. LOWER CASE LETTER (I.E. "a") INDICATES SWITCH CONTROLLING FIXTURE.
- ☒ FLUORESCENT LIGHTING FIXTURE, 1'x4', SURFACE MOUNT TO CEILING
- ☒ FLUORESCENT LIGHTING FIXTURE, 1'x4', WALL MOUNTED
- ☒ SINGLE FACE EXIT SIGN WITH BATTERY PACK. CONNECT TO UNSWITCHED PHASE CONDUCTOR OF GENERAL LIGHTING CIRCUIT USED IN SPACE WHERE FIXTURE IS SHOWN OR TO CIRCUIT INDICATED
- ☒ DUAL HEAD EMERGENCY LIGHTING FIXTURE WITH BATTERY PACK. WALL MOUNT 7"-6" AFF OR 6" BELOW CEILING TO TOP OF BACKBOX, WHICHEVER IS LOWER U.N.O.. CONNECT TO UNSWITCHED PHASE CONDUCTOR OF GENERAL LIGHTING CIRCUIT USED IN SPACE WHERE FIXTURE IS SHOWN OR TO CIRCUIT INDICATED

PC PHOTOCELL, PROVIDE WATTSTOPPER MODEL COMPATIBLE WITH LIGHTING CONTROL PANEL SPECIFIED. PROVIDE ALL REQUIRED MOUNTING BRACKETS, COMPONENTS, HARDWARE, ETC. FACE PHOTOCELL NORTH. PROVIDE WIRING TO LIGHTING CONTROL PANEL.

SWITCHES (FINAL COLOR SELECTION BY ARCHITECT)

§ SINGLE POLE SWITCH, RECESS MOUNT 44" AFF TO CENTER OF BACKBOX. LOWER CASE LETTER (I.E. "a") INDICATES THE FIXTURE(S) CONTROLLED BY THE SWITCH.

OCCUPANCY SENSOR (FINAL COLOR SELECTION BY ARCHITECT)

⊕ PROVIDE COMMERCIAL GRADE OCCUPANCY SENSOR FOR LIGHTING CONTROL. SEE LIGHTING CONTROL SCHEDULE FOR DEVICE DETAILS. BASIS OF DESIGN IS WATTSTOPPER.

WALL TIMER (FINAL COLOR SELECTION BY ARCHITECT)

⊕ PROVIDE COMMERCIAL GRADE TIMER FOR EXHAUST FAN CONTROL. SEE TIMER SCHEDULE FOR DEVICE DETAILS. BASIS OF DESIGN IS WATTSTOPPER.

MISCELLANEOUS

- Ⓐ DETAIL INDICATOR. REFER TO REFERENCED DETAIL
- Ⓜ NOTE INDICATOR. REFER TO THE "KEY NOTES" WHERE INDICATED
- EC EQUIPMENT CONNECTION. DESIGNATION INDICATES EQUIPMENT NAME. REFER TO THE "EQUIPMENT CONNECTION SCHEDULE" FOR REQUIRED ELECTRICAL SERVICE

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TO THE BEST OF MY KNOWLEDGE, SAID PLANS AND SPECIFICATIONS COMPLY WITH ALL APPLICABLE BUILDING CODES.

BRYAN P. ZAPP, P.E.  
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**Concessions Building Renovations**

Manatee County Government

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Bradenton, Florida 34208

revisions:

drawn: BZ  
checked: BZ  
date: 10.22.2010  
comm. no.: 0920829

**ELECTRICAL LEGEND**

**E001**

permit drawings

KEYED NOTES

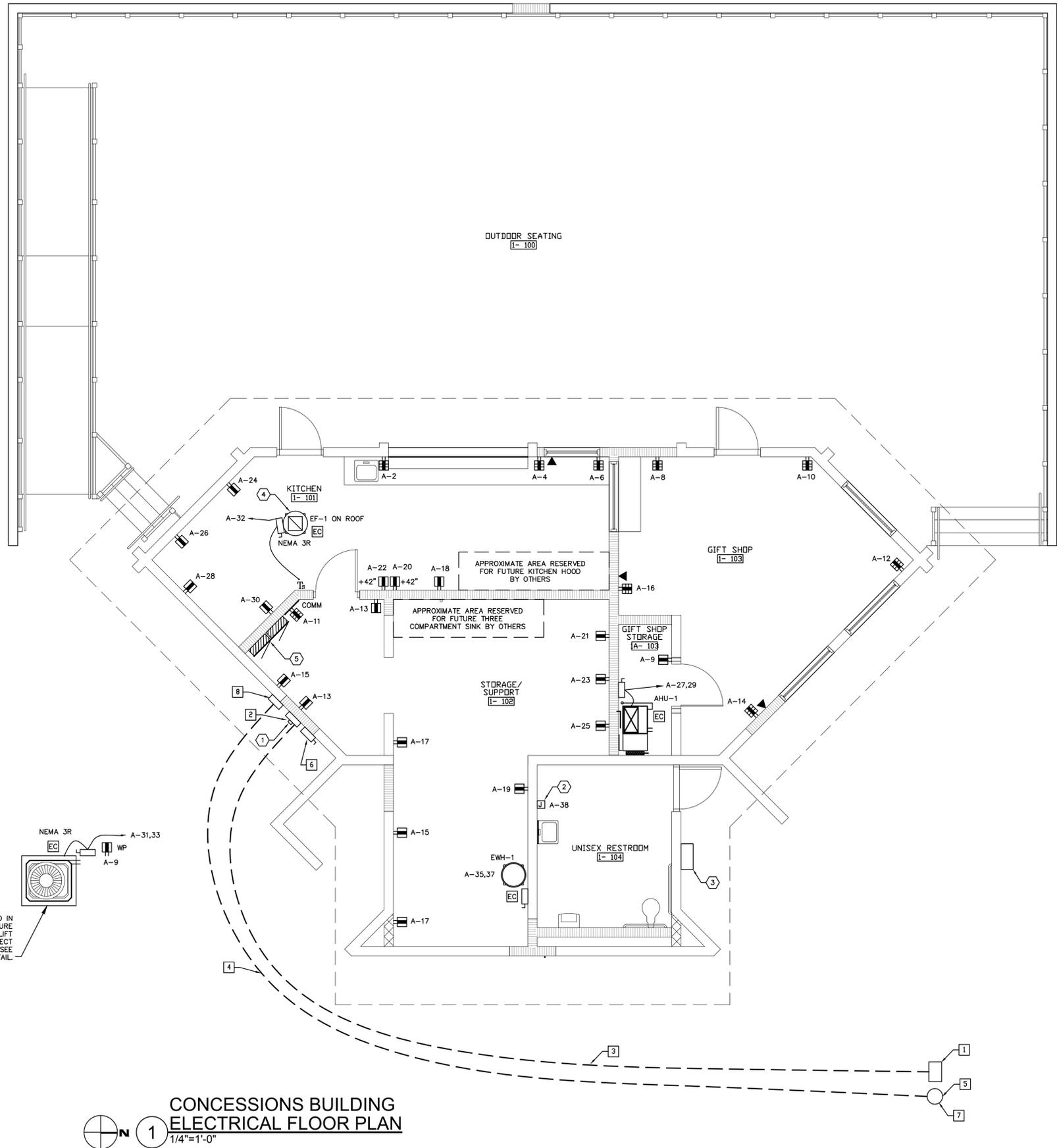
1. PROVIDE METER ON MASONRY WALL MAINTAIN THE CLEARANCES REQUIRED BY THE NEC AND FPL. ADJUST LOCATION AS REQUIRED. (EXPANSION JOINTS, ETC.) AS SHOWN.
2. PROVIDE 120V, 20AMP BRANCH CIRCUIT FOR ELECTRIC HAND DRYER. PROVIDE #12AWG COPPER CONDUCTORS. SEE PANEL SCHEDULE FOR OTHER DETAILS.
3. POWER IS NOT REQUIRED FOR HI-LO DRINKING FOUNTAIN.
4. PROVIDE 120V, 20AMP BRANCH CIRCUIT FOR EXHAUST FAN. SEE PANEL SCHEDULE AND WIRING SCHEMATIC FOR OTHER DETAILS.
5. PROVIDE PANELBOARDS. SEE RISER AND PANEL SCHEDULES FOR OTHER DETAILS.

GENERAL ELECTRICAL NOTES

1. PROVIDE MACHINE ENGRAVED DEVICE COVERPLATES ON ALL DEVICES WITH THE PANEL AND CIRCUIT NUMBER PRIOR TO SUBSTANTIAL COMPLETION. INCLUDE DETAILS IN SUBMITTALS. COVERPLATES SHALL NOT BE LABELED IN THE FIELD.
2. PROVIDE ALL POWER AND SPECIAL COMPONENTS/CIRCUITS SHOWN. ALL CONDUIT MUST BE CONCEALED IN THE WALLS OR ABOVE THE CEILING.
3. PROVIDE ALL OCCUPANCY SENSORS AND TIMER SWITCHES SHOWN. SEE WIRING DIAGRAMS FOR ADDITIONAL INFORMATION. PROVIDE SUBMITTALS TO ENGINEER IN AUTOCAD FORMAT TO INCLUDE ALL WIRING DIAGRAMS, DEVICE QUANTITIES AND COVERAGE AREAS. INCLUDE PROGRAMMING COSTS IN BID.

SITE RELATED KEY NOTES:

1. PROPOSED LOCATION OF NEW UTILITY COMPANY HANDHOLE(S). COORDINATE EXACT LOCATION WITH OWNER AND UTILITY COMPANY PRIOR TO BID. MODIFY LOCATION AS REQUIRED TO COMPLY WITH UTILITY COMPANY REQUIREMENTS. REFER TO THE "ELECTRICAL RISER DIAGRAM" FOR ADDITIONAL REQUIREMENTS. POLE IS APPROXIMATELY 70 FEET FROM NORTHWEST CORNER OF EXISTING STRUCTURE. FIELD VERIFY DIMENSIONS PRIOR TO BID.
2. PROPOSED LOCATION OF NEW UTILITY COMPANY METER, CURRENT TRANSFORMERS, ETC. COORDINATE EXACT LOCATION WITH OWNER AND UTILITY COMPANY PRIOR TO BID. MODIFY LOCATION AS REQUIRED TO COMPLY WITH UTILITY COMPANY REQUIREMENTS. REFER TO THE "ELECTRICAL RISER DIAGRAM" FOR ADDITIONAL REQUIREMENTS.
3. PROPOSED ROUTING OF NEW UNDERGROUND SECONDARY SERVICE LATERAL FROM NEW UTILITY COMPANY TRANSFORMER(S). COORDINATE EXACT ROUTING WITH GENERAL CONTRACTOR, OTHER TRADES AND EXISTING CONDITIONS PRIOR TO ROUGH-IN. REFER TO THE "ELECTRICAL RISER DIAGRAM" FOR ADDITIONAL REQUIREMENTS.
4. PROVIDE NEW UNDERGROUND CONDUIT FOR COMMUNICATIONS (VOICE/DATA AND CABLE TELEVISION) WIRING PROVIDED BY OTHERS. COORDINATE EXACT ROUTING WITH OTHER TRADES PRIOR TO ROUGH-IN. REFER TO THE COMMUNICATIONS RACEWAY RISER DIAGRAM FOR CONDUIT SIZE AND QUANTITY.
5. ROUTE CONDUIT TO LOCATION AS DIRECTED BY VOICE/DATA AND VIDEO SERVICE PROVIDERS. CAP AND STAKE END OF CONDUIT AT TERMINATION POINTS. COORDINATE EXACT LOCATION OF TERMINATION POINT(S) WITH VOICE/DATA AND VIDEO TELEVISION SERVICE PROVIDERS PRIOR TO BID.
6. PROVIDE MAIN SERVICE DISCONNECT SWITCH.
7. EXISTING UTILITY POLE WITH POLE MOUNTED TRANSFORMER(S). ALL CHARGES FROM THE SERVING UTILITY SHALL BE INCLUDED IN THE ELECTRICAL CONTRACTOR'S BID. ROUTE SHOWN IS FOR ILLUSTRATIVE PURPOSES ONLY.
8. PROPOSED COMMUNICATIONS DEMARC. EXTEND POWER GROUND TO THIS LOCATION WITH #4AWG COPPER CONDUCTOR.



CU-1 TO BE LOCATED IN EXISTING FENCED ENCLOSURE ADJACENT TO EXISTING LIFT STATION. PROVIDE DISCONNECT ON SUPPORT STRUCTURE. SEE DETAIL.

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Designed: B.P.Z. ME3 Job No: 10-0195-02  
Checked: S.T.P. Date: 10/22/2010  
Drawn: B.P.Z. C.O.A. 27252  
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TO THE BEST OF MY KNOWLEDGE, SAID PLANS AND SPECIFICATIONS COMPLY WITH ALL APPLICABLE BUILDING CODES.

BRYAN P. ZAPP, P.E.  
FL# 46141

**Coquina Beach**

2650 Gulf Drive South  
Bradenton, Florida 34217

**Concessions Building Renovations**

Manatee County Government

1112 Manatee Avenue West  
Bradenton, Florida 34208

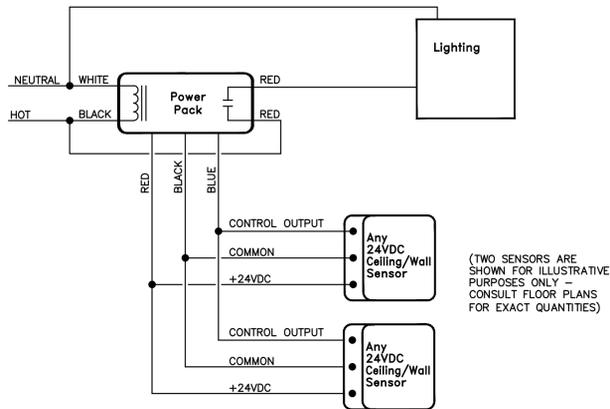
revisions:

drawn: BZ  
checked: BZ  
date: 10.22.2010  
comm. no.: 0920829

**ELECTRICAL FLOOR PLAN**

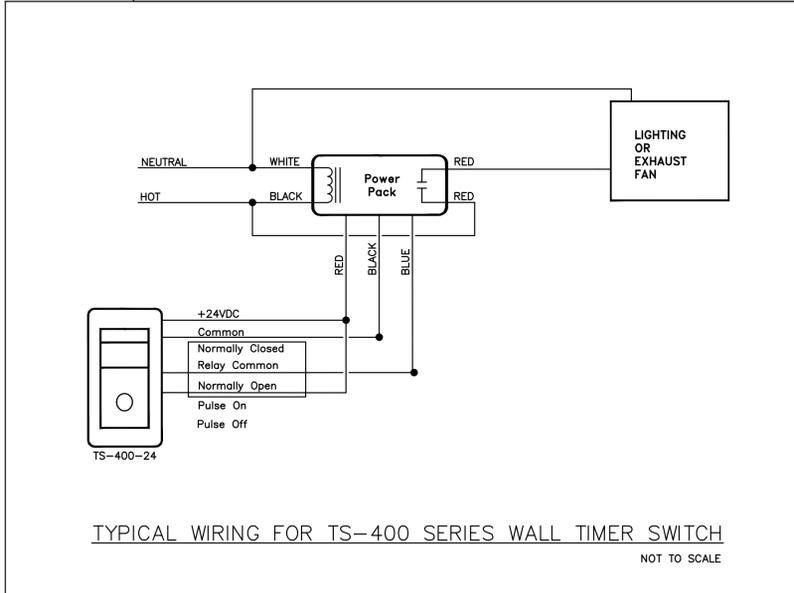
**E102**

permit drawings

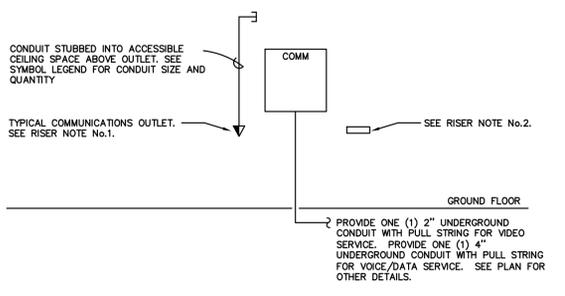


Note:  
Maximum number of sensors per power pack depends on the model of sensor. See the product data sheet to determine the specific current consumption of each sensor. Consult Factory for limitations.

TYPICAL WIRING FOR OCCUPANCY SENSOR W-500 SERIES  
NOT TO SCALE



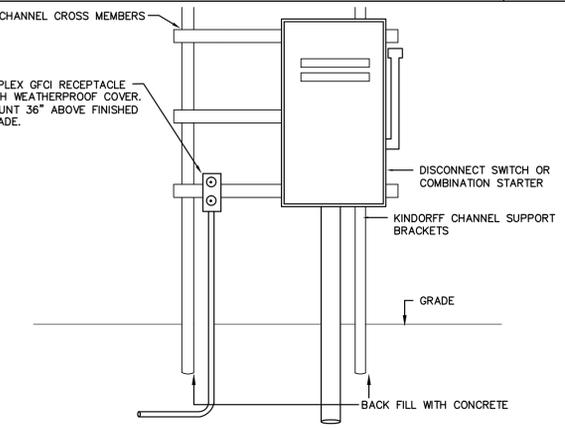
TYPICAL WIRING FOR TS-400 SERIES WALL TIMER SWITCH  
NOT TO SCALE



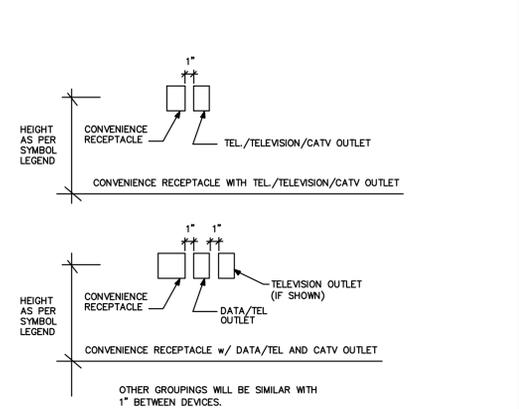
GENERAL NOTES:  
A. PROVIDE (DEFINED AS "FURNISH AND INSTALL") ALL LABOR AND MATERIALS REQUIRED TO CREATE A RACEWAY SYSTEM FOR WIRING AND COMPONENTS PROVIDED BY OTHERS.  
B. PROVIDE BACKBOX, COVERPLATE AND CONDUIT IN SIZE AND QUANTITY FOR EACH OUTLET AS INDICATED ON THE ELECTRICAL SYMBOL LEGEND.

RISER NOTES:  
1. TYPICAL OUTLET. SEE FLOOR PLANS AND SPECIFICATIONS FOR QUANTITY, TYPE AND LOCATION OF OUTLETS.  
2. PROVIDE GROUND BUS AT THE 'COMM' LOCATION. SEE DETAIL.

COMMUNICATIONS RACEWAY RISER DIAGRAM  
NO SCALE  
3

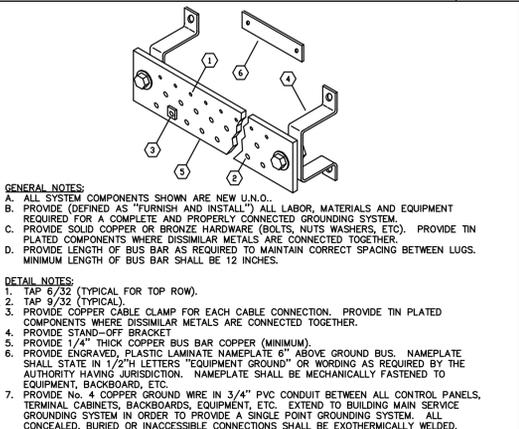


GROUND MOUNTED DISCONNECT SWITCH  
NO SCALE  
4

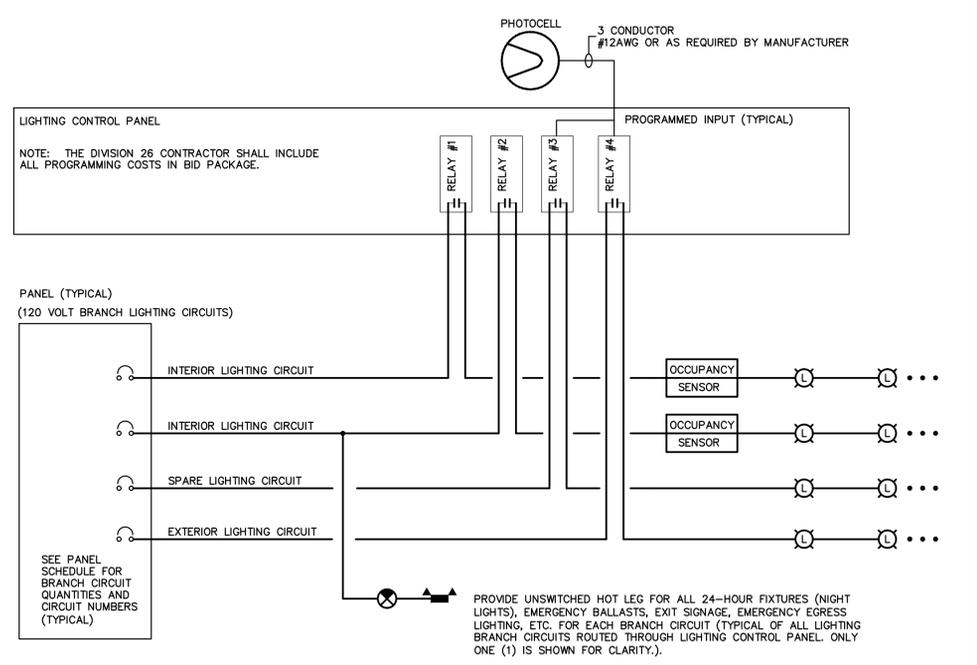


OTHER GROUPINGS WILL BE SIMILAR WITH 1" BETWEEN DEVICES.

TYPICAL DEVICE GROUPINGS  
NO SCALE  
1



TYPICAL GROUND BUS BAR DETAIL  
NO SCALE  
2



AUTOMATIC (SHUT-OFF) LIGHTING CONTROL SYSTEM DIAGRAM  
NOT TO SCALE

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ELECTRICAL  
DETAILS

**E501**

permit drawings

OCCUPANCY SENSOR LEGEND AND SCHEDULE MANATEE COUNTY PARKS AND RECREATION			
TYPE	DESCRIPTION	MANUFACTURER/ CATALOG NUMBER	SEE SCHEDULE NOTES
⑤	CEILING MOUNTED, ULTRASONIC OCCUPANCY SENSOR, 24V, TWO-SIDED, UP TO 360 DEGREES AND 500 SQUARE FEET OF DETECTION AND ADJUSTABLE "LIGHTS OFF" TIME SELECTION	WATTSTOPPER W-500A SERIES	1,2

- GENERAL NOTES:
- ALL SENSOR LOCATIONS ARE APPROXIMATE. REFER TO MANUFACTURER'S INSTALLATION INSTRUCTIONS PRIOR TO INSTALLATION.
  - ULTRASONIC CEILING MOUNTED SENSORS REQUIRE THEY BE LOCATED NO CLOSER THAN SIX FEET TO HVAC SUPPLY/RETURN REGISTERS.
  - THE DIVISION 26 CONTRACTOR IS RESPONSIBLE FOR THE FINAL PROPER SENSITIVITY AND TIME DELAY SETTINGS, VERIFICATION OF MANUFACTURER'S RECOMMENDED PLACEMENT, AND FIELD VERIFICATION OF CIRCUITS WITH RESPECT TO POWER PACK PLACEMENT. IF NO DIRECTION IS GIVEN AND UNLESS OTHERWISE DIRECTED BY THE OWNER/TENANT, SET THE SENSITIVITY TO MAXIMUM AND THE TIME DELAY TO 30 MINUTES FOR EACH SENSOR.
  - PROVIDE A COMPLETE SUBMITTAL PACKAGE TO THE ENGINEER INCLUDING .DWG FILES FOR WIRING DIAGRAMS.
  - PROVIDE ACCESS DOOR OR PANELS TO POWER PACKS ABOVE GYPBOARD CEILINGS.
  - PROVIDE A CIRCULAR ORANGE (DOT) STICKER ON THE GRID OR ACCESS DOOR TO MARK THE LOCATION(S) OF THE POWER PACK(S) FOR FUTURE OWNER/TENANT MAINTENANCE.

- SCHEDULE NOTES (APPLICABLE WHERE REFERENCED):
- THE DIVISION 26 CONTRACTOR IS RESPONSIBLE FOR THE FINAL FIELD VERIFICATION OF THE REQUIRED NUMBER OF POWER PACKS. THE DIVISION 26 CONTRACTOR SHOULD PROVIDE:
    - PROVIDE ONE POWER PACK PER SENSOR FOR EACH SPACE/AREA THAT IS TO BE CONTROLLED. PROVIDE AN ADDITIONAL POWER PACK FOR EACH EXHAUST FAN IN THE SAME SPACE AS THE SENSOR. WIRE THESE IN PARALLEL.
    - IF REQUIRED, PROVIDE ADDITIONAL POWER PACKS WHERE THE MAXIMUM NUMBER OF SENSORS THAT CAN BE WIRED IN PARALLEL TO A SINGLE POWER PACK IS DEPENDENT ON SENSOR MODEL (SEE INDIVIDUAL DATA SHEETS FOR mA CONSUMPTION).
  - DEVICE SHOULD BE WHITE IN COLOR - FINAL COLOR SELECTION BY ARCHITECT.

LIGHTING TIMER LEGEND AND SCHEDULE MANATEE COUNTY PARKS AND RECREATION			
TYPE	DESCRIPTION	MANUFACTURER/ CATALOG NUMBER	SEE SCHEDULE NOTES
TS	WALL MOUNTED TIMER, 120V, PROGRAMMABLE FROM 5 MINUTES TO 12 HOURS, UP TO 1200 WATTS CONTROLLED PER TIMER	WATTSTOPPER TS-400	1,2

- GENERAL NOTES:
- ALL SENSOR LOCATIONS ARE APPROXIMATE. REFER TO MANUFACTURER'S INSTALLATION INSTRUCTIONS PRIOR TO INSTALLATION.
  - ULTRASONIC CEILING MOUNTED SENSORS REQUIRE THEY BE LOCATED NO CLOSER THAN SIX FEET TO HVAC SUPPLY/RETURN REGISTERS.
  - THE DIVISION 26 CONTRACTOR IS RESPONSIBLE FOR THE FINAL PROPER SENSITIVITY AND TIME DELAY SETTINGS, VERIFICATION OF MANUFACTURER'S RECOMMENDED PLACEMENT, AND FIELD VERIFICATION OF CIRCUITS WITH RESPECT TO POWER PACK PLACEMENT. IF NO DIRECTION IS GIVEN AND UNLESS OTHERWISE DIRECTED BY THE OWNER/TENANT, SET THE SENSITIVITY TO MAXIMUM AND THE TIME DELAY TO 30 MINUTES FOR EACH SENSOR.
  - PROVIDE A COMPLETE SUBMITTAL PACKAGE TO THE ENGINEER INCLUDING .DWG FILES FOR WIRING DIAGRAMS.
  - PROVIDE ACCESS DOOR OR PANELS TO POWER PACKS ABOVE GYPBOARD CEILINGS.
  - PROVIDE A CIRCULAR ORANGE (DOT) STICKER ON THE GRID OR ACCESS DOOR TO MARK THE LOCATION(S) OF THE POWER PACK(S) FOR FUTURE OWNER/TENANT MAINTENANCE.

- SCHEDULE NOTES (APPLICABLE WHERE REFERENCED):
- THE DIVISION 26 CONTRACTOR IS RESPONSIBLE FOR THE FINAL FIELD VERIFICATION OF THE REQUIRED NUMBER OF POWER PACKS. THE DIVISION 26 CONTRACTOR SHOULD PROVIDE:
    - PROVIDE ONE POWER PACK PER SENSOR FOR EACH SPACE/AREA THAT IS TO BE CONTROLLED. PROVIDE AN ADDITIONAL POWER PACK FOR EACH EXHAUST FAN IN THE SAME SPACE AS THE SENSOR. WIRE THESE IN PARALLEL.
    - IF REQUIRED, PROVIDE ADDITIONAL POWER PACKS WHERE THE MAXIMUM NUMBER OF SENSORS THAT CAN BE WIRED IN PARALLEL TO A SINGLE POWER PACK IS DEPENDENT ON SENSOR MODEL (SEE INDIVIDUAL DATA SHEETS FOR mA CONSUMPTION).
  - DEVICE SHOULD BE WHITE IN COLOR - FINAL COLOR SELECTION BY ARCHITECT.

### LIGHTING FIXTURE SCHEDULE - MANATEE COUNTY PARKS & RECREATION

FIX. TYPE	DESCRIPTION	MANUFACTURER / CATALOG NUMBER	VOLTS	QTY	LAMP INFORMATION		TOTAL INPUT WATTS	SEE SCHEDULE NOTES
					TYPE			
A	4 FT LONG FLUORESCENT EXTREME ENVIRONMENT, VANDAL RESISTANT VAPORTIGHT, IP65 RATED, WITH ELECTRONIC BALLAST AND STAINLESS HARDWARE	COLUMBIA FNPS4-232-PADR-EPU-GLR-MUD	120	2	32W T8-4100K		60W	4
		DAY BRITE LIGHTING EQUIVALENT						
		COOPER LIGHTING EQUIVALENT						
B	4 FT LONG FLUORESCENT STRIP FIXTURE WITH ELECTRONIC BALLAST	COLUMBIA CS4-225-EU-GLR	120	2	25W T8-4100K		60W	2
		DAY BRITE LIGHTING EQUIVALENT						
		COOPER LIGHTING EQUIVALENT						
EL	VANDAL RESISTANT DUAL HEAD EMERGENCY LIGHTING FIXTURE WITH BATTERY PACK AND WIRE GUARD	DUAL LITE EZ-2I-VRS-WGEL	120	--	FACTORY INSTALLED LAMPS		20W	1
		DAY BRITE LIGHTING EQUIVALENT						
		COOPER LIGHTING EQUIVALENT						
X OR X1	VANDAL RESISTANT SINGLE FACE EXIT SIGN WITH GREEN LETTERS, BATTERY PACK AND WIRE GUARD	DUAL LITE SCSGWE-WGLX	120	--	FACTORY INSTALLED LAMPS		3.5W	1,3
		DAY BRITE LIGHTING EQUIVALENT						
		COOPER LIGHTING EQUIVALENT						

- GENERAL NOTES:
- FIXTURES PROPOSED AS EQUIVALENT TO SPECIFIED FIXTURES SHALL BE JUDGED ON EFFICIENCY, PERFORMANCE AND CONSTRUCTION, NOT FIXTURE CONSTRUCTION ALONE. THE ENGINEER WILL RESERVE THE RIGHT TO DETERMINE FIXTURE EQUIVALENTS BASED ON THE GRADE OF FIXTURES SUBMITTED AND THEIR CATALOG SERIES.
  - LIGHTING FIXTURE SUBMITTAL CUT SHEETS SHALL INCLUDE INFORMATION ON HOW THE FIXTURE CATALOG NUMBER IS COMPILED AND SHALL INCLUDE CUT SHEETS OF ALL OPTIONAL COMPONENTS, SUCH AS DRY WALL FRAME-IN-KITS, ETC. PROVIDE FIXTURE INPUT WATTS AND LUMEN OUTPUTS FOR EACH FIXTURE TYPE SUBMITTED.
  - LIGHTING FIXTURES SHALL BE SUPPORTED PER NEC ARTICLE 410 WHERE APPLICABLE.
  - PROVIDE PROGRAMMED START ELECTRONIC BALLAST(S) FOR FLUORESCENT LIGHTING FIXTURES FROM ONE OF THE FOLLOWING MANUFACTURERS: SYLVANIA #QHE2X32T8 SERIES OR ADVANCE #VGN2S32S35M SERIES. NO OTHER SUBSTITUTIONS ARE PERMITTED REGARDLESS OF FIXTURE CATALOG NUMBER NOMENCLATURE. PROVIDE UNIVERSAL BALLAST VOLTAGE REGARDLESS OF CATALOG NUMBER.
  - PROVIDE FLUORESCENT FIXTURES MOUNTED OUTSIDE BUILDING WITH A COLD WEATHER BALLAST REGARDLESS OF FIXTURE CATALOG NUMBER.
  - PROVIDE FLUORESCENT FIXTURES WITH INLINE FUSE(S) LOCATED ON LINE SIDE OF FIXTURE BALLAST REGARDLESS OF FIXTURE CATALOG NUMBER.
  - PROVIDE LAMPS FOR FLUORESCENT LIGHTING FIXTURES FROM ONE OF THE FOLLOWING MANUFACTURERS: OSRAM/SYLVANIA OR PHILLIPS. THE T8 LAMPS SPECIFIED ARE FOUR FEET IN LENGTH UNLESS NOTED OTHERWISE. NO OTHER SUBSTITUTIONS ARE PERMITTED. ALL FLUORESCENT LAMPS SHALL BE OF THE LOW MERCURY TYPE, SUCH THAT THE AVERAGE MERCURY CONTENT IS LESS THAN 70 PICOGRAMS OF MERCURY PER LUMEN-HOUR OF LIFE. LAMPS FOR H.I.D FIXTURES SHALL BE FROM THE SAME MANUFACTURER AS THE FLUORESCENT LAMPS.
  - MANUFACTURER'S REPRESENTATIVE FOR MOST OF THE ABOVE PRODUCT LINES IS WESTERN FLORIDA LIGHTING, TAMPA. CONTACT JEFF MORRIS FOR ASSISTANCE IN SUBMITTAL PREPARATION.
  - THE ONLY LIGHTING FIXTURE MANUFACTURERS (AND THEIR ASSOCIATED DOWNSTREAM PRODUCT LINES) APPROVED FOR THIS PROJECT INCLUDE DAY-BRITE, COOPER AND HUBBELL LIGHTING.
  - NOT ALL OF THE FIXTURES SCHEDULES MAY BE SPECIFIED FOR THIS PORTION OF THE PROJECT.
- SCHEDULE NOTES: (APPLICABLE WHERE REFERENCED)
- COORDINATE COLOR WITH ARCHITECT AT SHOP DRAWING STAGE. FINAL FIXTURE COLOR SELECTION BY ARCHITECT.
  - PROVIDE HARDWARE AS REQUIRED FOR THIS FIXTURE TO BE WALL MOUNTED.
  - CONTRACTOR SHALL COORDINATE DIRECTION OF ARROW(S) ON FACE OF EXIT SIGN(S) PRIOR TO ORDERING SIGNS. SEE LIGHTING FLOOR PLANS FOR QUANTITY AND DIRECTION OF ARROW(S).
  - PROVIDE THE METAL STRUT AND HARDWARE REQUIRED TO INSTALL THE FIXTURES FROM THE STRUCTURAL FRAMING.

EQUIPMENT CONNECTION SCHEDULE							
EQUIP. NAME	EQUIPMENT DESCRIPTION	EQUIP. LOAD	VOLT/PHASE	EQUIPMENT LOCATION	DISCONNECT SWITCH SIZE AND TYPE	WIRE AND CONDUIT INFORMATION	SEE SCHEDULE NOTES
AHU-1	AIR HANDLING UNIT	28.4 MCA	240/1	GIFT SHOP STORAGE	30A 2-POLE	3#10, 1#10 GND IN 3/4" C.	1,3
CU-1	CONDENSING UNIT	17.6 MCA	240/1	VERIFY	30A 3-POLE NEMA 3R	3#10, 1#10 GND IN 3/4" C.	2,3
EW-1	ELECTRIC WATER HEATER	9000W	240/1	STORAGE ROOM	60A 2-POLE	3#8, 1#10 GND IN 3/4" C.	4
EF-1	EXHAUST FAN	350W	120/1	JANITOR'S CEILING	MOTOR RATED SWITCH NEMA 3R	2#12, 1#12 GND IN 3/4" C.	-
EF-2	EXHAUST FAN	80W	120/1	TOILET ROOM CEILING	MOTOR RATED SWITCH	2#12, 1#12 GND IN 3/4" C.	-

- ELECTRICAL CONNECTION GENERAL NOTES:
- PROVIDE INTERCONNECTION OF ALL EQUIPMENT OPERATING COMPONENTS REQUIRING ELECTRICAL CONNECTION, SUCH AS MOTOR STARTERS, VARIABLE SPEED DRIVES, DISCONNECT SWITCHES, EQUIPMENT CONTROLLERS, ETC. AS REQUIRED BY ALL TRADES.
  - DISCONNECT SWITCHES FOR 208/240V EQUIPMENT SHALL BE RATED 240V.
  - DISCONNECT SWITCHES SHALL BE HEAVY DUTY, NON-FUSED, NEMA-1 UNLESS NOTED OTHERWISE. FUSED SWITCHES SHALL BE PROVIDED WITH DUAL-ELEMENT FUSES SIZED PER THE EQUIPMENT MANUFACTURERS RECOMMENDATION.
  - PROVIDE ELECTRICAL SERVICE TO SCHEDULED EQUIPMENT. RECOORDINATE EXACT SERVICE SIZE (I.E. CIRCUIT BREAKER, FEEDER, DISCONNECT SWITCH, ETC) WITH APPROVED EQUIPMENT SHOP DRAWINGS PRIOR TO ROUGH-IN. MODIFY ELECTRICAL SERVICE AS REQUIRED TO SERVE APPROVED EQUIPMENT.
  - PROVIDE ENGRAVED, PLASTIC LAMINATE NAMEPLATE ON ALL PANELBOARDS, CONTROL PANELS, TERMINAL CABINETS, DISCONNECT SWITCHES, EQUIPMENT, ETC. NAMEPLATE SHALL STATE EQUIPMENT NAME AS INDICATED ON THIS DRAWING, AS REQUIRED TO COMPLY WITH OWNERS STANDARD NAMING CONVENTION OR AS REQUIRED BY THE AUTHORITY HAVING JURISDICTION. NAMEPLATES SHALL BE FASTENED TO EQUIPMENT WITH RIVETS.
  - PROVIDE AN EQUIPMENT GROUNDING CONDUCTOR IN EACH CONDUIT TO FORM A CONTINUOUS GROUNDING PATH. CONDUIT SHALL NOT BE USED IN PLACE OF A GROUND CONDUCTOR.
  - THE 3% LIMITATION ON VOLTAGE DROP HAS BEEN INCLUDED IN THE BRANCH CIRCUIT WIRING SIZES ABOVE.
  - NEUTRAL CONDUCTORS MAY BE REMOVED IF NOT REQUIRED ON MECHANICAL EQUIPMENT IF CONFIRMED IN WRITING BY THE DIVISION 23 CONTRACTOR.
- SCHEDULE NOTES: (APPLICABLE WHERE REFERENCED)
- PROVIDE ELECTRICAL SERVICE AND ALL ELECTRICAL CONNECTIONS TO LINE SIDE OF DISCONNECT SWITCH (E.G. SINGLE POINT ELECTRICAL CONNECTION).
  - PROVIDE WEATHERPROOF ELECTRICAL SERVICE TO EQUIPMENT, INCLUDING, BUT NOT LIMITED TO CONDUIT, BACKBOX, FITTINGS, ETC.
  - PROVIDE COOPER B-LINE GALVANIZED STEEL STRUT RACK AND ALL ASSOCIATED HARDWARE REQUIRED TO LOCATE SERVICE DISCONNECT SWITCH ON OR ADJACENT TO UNIT.
  - WIRE AND CONNECT THE PLUMBING CONTRACTOR'S TIME CLOCK, ETC.

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checked: BZ  
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ELECTRICAL  
SCHEDULES

# E601

permit drawings

PANEL A															
PANEL: SQUARE-D or SIEMENS															
ENCLOSURE: NEMA-1															
MOUNTING: SURFACE															
240/120 V, 1 PHASE, 3 WIRE															
MAINS: 400AMP MAIN LUGS ONLY															
NEUTRAL BUS AMPACITY: 100%															
GROUND BUS AMPACITY: 50%															
AIC RATING: 42K															
CKT #	CIRCUIT IDENTIFICATION	LINE 1 VA	LINE 2 VA	DEMAND VA	BREAKER AMPS	BREAKER POLES	BREAKER POLES	DEMAND VA	LINE 2 VA	LINE 1 VA	CIRCUIT IDENTIFICATION	CKT #			
1	EXTERIOR LIGHTING	120	---	1.25 150	20	1	1	20	360	1.00	---	360	RECEPTACLES	2	
3	LIGHTING	---	600	1.25 750	20	1	1	20	360	1.00	---	360	RECEPTACLES	4	
5	LIGHTING	---	560	---	1.25 700	20	1	1	20	360	1.00	---	360	RECEPTACLES	6
7	ATTIC CIRCUIT	---	180	1.25 225	20	1	1	20	360	1.00	---	360	RECEPTACLES	8	
9	RECEPTACLES	---	360	---	1.00 360	20	1	1	20	360	1.00	---	360	RECEPTACLES	10
11	RECEPTACLES	---	360	---	1.00 360	20	1	1	20	360	1.00	---	360	RECEPTACLES	12
13	RECEPTACLES	---	360	---	1.00 360	20	1	1	20	360	1.00	---	360	RECEPTACLES	14
15	RECEPTACLES	---	360	---	1.00 360	20	1	1	20	360	1.00	---	360	RECEPTACLES	16
17	RECEPTACLES	---	360	---	1.00 360	20	1	1	20	1040	1.00	---	1040	RECEPTACLES	18
19	RECEPTACLES	---	1040	---	1.00 1040	20	1	1	20	1040	1.00	---	1040	RECEPTACLES	20
21	RECEPTACLES	---	1040	---	1.00 1040	20	1	1	20	1040	1.00	---	1040	RECEPTACLES	22
23	RECEPTACLES	---	1040	---	1.00 1040	20	1	1	20	1040	1.00	---	1040	RECEPTACLES	24
25	RECEPTACLES	---	1040	---	1.00 1040	20	1	1	20	1040	1.00	---	1040	RECEPTACLES	26
27	AIR HANDLER	---	3408	---	1.00 3408	30	2	1	20	1040	1.00	---	1040	RECEPTACLES	28
29	CONDENSING UNIT	---	3408	---	1.00 3408	---	---	1	20	1040	1.00	---	1040	RECEPTACLES	30
31	EXHAUST FAN	---	2112	---	1.00 2112	25	2	1	20	500	1.00	---	500	EXHAUST FAN	32
33	SPARE	---	2112	---	1.00 2112	---	---	1	20	0	1.00	---	0	SPARE	34
35	EVWH-1 (SIMULTANEOUS)	---	4500	---	1.00 4500	50	2	1	20	0	1.00	---	0	SPARE	36
37	HAND DRYER	---	1500	---	1.00 1500	---	---	1	20	1500	1.00	---	1500	HAND DRYER	38
39	SPD	---	0	---	1.00 0	100	2	2	30	0	1.00	---	0	SPD	40
41	SPD	---	0	---	1.00 0	---	---	---	0	1.00	---	---	0	SPD	42
TOTALS		13860	13600	27828				12160	5060	7100	TOTALS				
CONNECTED VA LINE 1:		20960		CONNECTED AMPERES:		165		39620		:TOTAL CONNECTED VA					
CONNECTED VA LINE 2:		18660		DEMAND AMPERES:		167		39985		:TOTAL DEMAND VA					

NOTE: MANY OF THE CONCESSION LOADS ARE FUTURE. SEE ELECTRICAL CONNECTION SCHEDULE FOR DETAILS. THEREFORE, DIVERSITY FACTORS FOR KITCHEN TYPE LOADS HAVE NOT BEEN APPLIED.

VOLTAGE DROP CALCULATIONS FROM: FPL HANDHOLE													
TO: PANEL A													
NUMBER OF SETS	WIRE SIZE	LENGTH	Z / 100 FT	Z / 100 CKT FT	TOTAL Z	VOLT DROP	% V.D.	FEEDER SIZED TO HAVE A					
2	3/0CU	60FEET	0.0190	0.0095	0.0057	0.350	0.40%	VOLT. DROP LESS THAN 2%					

COPPER WIRE SIZE	12	10	8	6	4	3	2	1	1/0	2/0	3/0	4/0
1-PH Z PER 100 FT	0.340	0.220	0.140	0.090	0.060	0.048	0.040	0.032	0.026	0.022	0.019	0.016

COPPER WIRE SIZE	250	300	350	400	500	600	750	1000
1-PH Z PER 100 FT	0.014	0.013	0.012	0.011	0.010	0.009	0.009	0.008

FAULT CURRENT CALCULATIONS FROM: FPL TRANSFORMER													
TO: PANEL A													
NUMBER OF SETS	WIRE SIZE	LENGTH	C	TOTAL C									
2	3/0CU	60FEET	12844	25688									

COPPER WIRE SIZE	12	10	8	6	4	3	2	1	1/0	2/0	3/0	4/0
C FACTOR	817	981	1557	2425	3806	4774	5907	7293	8925	10755	12844	15082

COPPER WIRE SIZE	250	300	350	400	500	600	750	1000
C FACTOR	16483	18177	19704	20566	22185	22965	24137	25278

TRANSFORMER KVA	100
VOLTAGE L-L	240
VOLTAGE L-N	120
TRANSFORMER %Z	1.0
TRANSFORMER FLC	417
MULTIPLIER	100
SHORT CIRCUIT @ UTIL	41667
F FACTOR	0.41
MULTIPLIER	0.71
SHORT CIRCUIT CURRENT	29645
MOTOR CONTRIBUTION	150
SHORT CIRCUIT CURRENT	29795
TOTAL	

CALCULATIONS ARE PERFORMED USING THE POINT-TO-POINT METHOD.

PANEL_B_FUTURE KITCHEN (AND UNDER HOOD) LOADS																
PANEL: SQUARE-D or SIEMENS																
ENCLOSURE: NEMA-1																
MOUNTING: SURFACE																
240/120 V, 1 PHASE, 3 WIRE																
MAINS: 100AMP MAIN CIRCUIT BREAKER WITH SHUNT TRIP																
NEUTRAL BUS AMPACITY: 100%																
AIC RATING: 42K																
CKT #	CIRCUIT IDENTIFICATION	LINE 1 VA	LINE 2 VA	DEMAND VA	BREAKER AMPS	BREAKER POLES	BREAKER POLES	DEMAND VA	LINE 2 VA	LINE 1 VA	CIRCUIT IDENTIFICATION	CKT #				
1	SPARE	---	0	---	1.00 0	20	1	1	20	0	1.00	---	0	SPARE	2	
3	SPARE	---	0	---	1.00 0	20	1	1	20	0	1.00	---	0	SPARE	4	
5	SPARE	---	0	---	1.00 0	20	1	1	20	0	1.00	---	0	SPARE	6	
7	SPARE	---	0	---	1.00 0	20	1	1	20	0	1.00	---	0	SPARE	8	
9	SPARE	---	0	---	1.00 0	20	1	1	20	0	1.00	---	0	SPARE	10	
11	SPARE	---	0	---	1.00 0	20	1	1	20	0	1.00	---	0	SPARE	12	
13	SPARE	---	0	---	1.00 0	20	1	1	20	0	1.00	---	0	SPARE	14	
15	SPARE	---	0	---	1.00 0	20	1	1	20	0	1.00	---	0	SPARE	16	
17	SPARE	---	0	---	1.00 0	20	1	1	20	0	1.00	---	0	SPARE	18	
19	SPARE	---	0	---	1.00 0	20	1	2	15	0	1.00	---	0	SPARE	20	
21	SPARE	---	0	---	1.00 0	20	1	---	0	1.00	---	---	0	SPARE	22	
23	SPARE	---	0	---	1.00 0	60	2	2	15	0	1.00	---	---	0	SPARE	24
25	SPARE	---	0	---	1.00 0	---	---	---	0	1.00	---	---	0	SPARE	26	
27	SPARE	---	0	---	1.00 0	60	2	2	30	0	1.00	---	---	0	SPD	28
29	SPARE	---	0	---	1.00 0	---	---	---	0	1.00	---	---	---	0	SPD	30
TOTALS		0	0	0				0	0	0	TOTALS					
CONNECTED VA LINE 1:		0		CONNECTED AMPERES:		0		0		:TOTAL CONNECTED VA						
CONNECTED VA LINE 2:		0		DEMAND AMPERES:		0		0		:TOTAL DEMAND VA						

VOLTAGE DROP CALCULATIONS FROM: FPL HANDHOLE													
TO: PANEL_B_FUTURE KITCHEN (AND UNDER HOOD) LOADS													
NUMBER OF SETS	WIRE SIZE	LENGTH	Z / 100 FT	Z / 100 CKT FT	TOTAL Z	VOLT DROP	% V.D.	FEEDER SIZED TO HAVE A					
1	3CU	2FEET	0.0480	0.0480	0.0010	0.000	0.00%	VOLT. DROP LESS THAN 2%					

COPPER WIRE SIZE	12	10	8	6	4	3	2	1	1/0	2/0	3/0	4/0
1-PH Z PER 100 FT	0.340	0.220	0.140	0.090	0.060	0.048	0.040	0.032	0.026	0.022	0.019	0.016

COPPER WIRE SIZE	250	300	350	400	500	600	750	1000
1-PH Z PER 100 FT	0.014	0.013	0.012	0.011	0.010	0.009	0.009	0.008

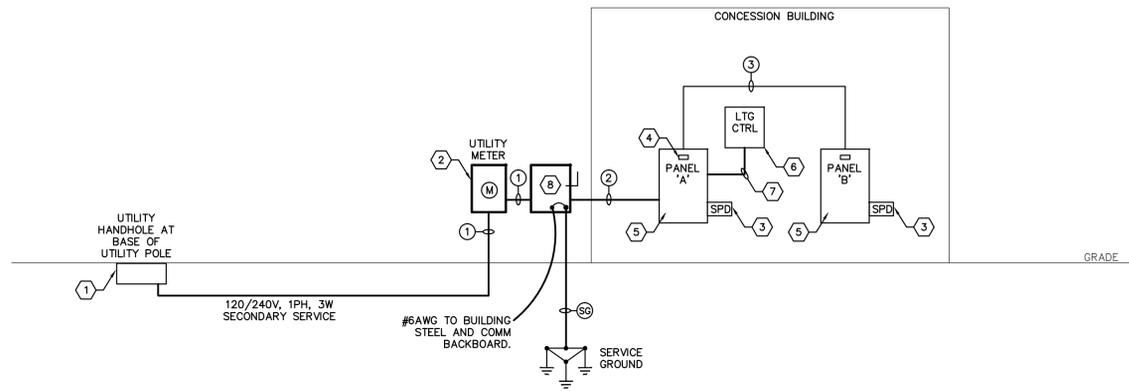
FAULT CURRENT CALCULATIONS FROM: FPL TRANSFORMER													
TO: PANEL_B_FUTURE KITCHEN (AND UNDER HOOD) LOADS													
NUMBER OF SETS	WIRE SIZE	LENGTH	C	TOTAL C									
1	3CU	2FEET	8925	8925									

COPPER WIRE SIZE	12	10	8	6	4	3	2	1	1/0	2/0	3/0	4/0
C FACTOR	817	981	1557	2425	3806	4774	5907	7293	8925	10755	12844	15082

COPPER WIRE SIZE	250	300	350	400	500	600	750	1000
C FACTOR	16483	18177	19704	20566	22185	22965	24137	25278

TRANSFORMER KVA	100
VOLTAGE L-L	240
VOLTAGE L-N	120
TRANSFORMER %Z	1.0
TRANSFORMER FLC	417
MULTIPLIER	100
SHORT CIRCUIT @ UTIL	41667
F FACTOR	0.41
MULTIPLIER	0.96
SHORT CIRCUIT CURRENT	40106
MOTOR CONTRIBUTION	150
SHORT CIRCUIT CURRENT	40256
TOTAL	

CALCULATIONS ARE PERFORMED USING THE POINT-TO-POINT METHOD.



### B ELECTRICAL RISER DIAGRAM

NOT TO SCALE

#### KEY NOTES:

- UTILITY COMPANY SERVICE POINT. SEE SITE PLAN FOR PROPOSED LOCATION. CONTRACTOR SHALL PROVIDE UNDERGROUND SECONDARY SERVICE LATERAL FROM UTILITY HANDHOLE TO SERVICE ENTRANCE EQUIPMENT IN ACCORDANCE WITH THE N.E.C. AND ALL UTILITY COMPANY REQUIREMENTS. PROVIDE LARGER HANDHOLE IF REQUIRED BY UTILITY OR LOCAL A.H.J. COORDINATE UTILITY CONNECTION POINT LOCATION AND ALL CONTRACTOR PROVIDED REQUIREMENTS WITH UTILITY COMPANY PRIOR TO BID.
- PROVIDE 400AMP UTILITY COMPLIANT METER BASE ON BUILDING WALL ACCORDING TO UTILITY COMPANY GUIDELINES. SEE SITE PLAN FOR PROPOSED LOCATION. MODIFY LOCATION AS REQUIRED TO COMPLY WITH UTILITY COMPANY REQUIREMENTS.
- PROVIDE 100KA PER PHASE (MINIMUM) SURGE PROTECTION DEVICE (SPD) CLOSE NIPPLED TO EQUIPMENT. PROVIDE LEA SP PLUS SERIES No. SP-240/1PH DEVICE. PROVIDE No.6 SOLID INSULATED COPPER CONDUCTORS IN 1-1/4" CONDUIT BETWEEN "SPD" AND EQUIPMENT. DO NOT EXTEND MANUFACTURERS WIRE LEADS. KEEP LEAD LENGTHS AS SHORT AS POSSIBLE. BRAID ALL LEADS TOGETHER AND BIND WITH THE WRAPS ON 3" CENTERS (MAX.). COORDINATE QUANTITY OF REQUIRED CONDUCTORS WITH MANUFACTURERS INSTALLATION INSTRUCTIONS AND WIRING DIAGRAMS.
- PROVIDE ENGRAVED, PLASTIC LAMINATE NAMEPLATE ON ALL PANELBOARDS, CONTROL PANELS, TERMINAL CABINETS, DISCONNECT SWITCHES, EQUIPMENT, ETC. NAMEPLATE SHALL STATE EQUIPMENT NAME AS INDICATED ON THIS DRAWING, AS REQUIRED TO COMPLY WITH OWNERS STANDARD NAMING CONVENTION OR AS REQUIRED BY THE AUTHORITY HAVING JURISDICTION.
- PROVIDE PANELBOARD.
- PROVIDE LIGHTING CONTROL PANEL: INTELLIGENT LIGHTING CONTROLS, LIGHTMASTER 4 WITH 4 RELAYS, OR GREENGATE LITEKEEPER 4 WITH 4 RELAYS, OR WATTSTOPPER OR HUBBELL EQUIVALENT. INCLUDE FACTORY STARTUP IN BID PRICE. MOUNT PANEL ON WALL.
- ROUTE ALL LIGHTING CIRCUITS THROUGH LIGHTING CONTROL PANEL.
- PROVIDE 400A/2P/400A FUSED, NEMA-3R SERVICE ENTRANCE RATED DISCONNECT SWITCH.

#### GENERAL NOTES:

- ALL POWER DISTRIBUTION COMPONENTS SHOWN ARE NEW UNLESS NOTED OTHERWISE (U.N.O.).
- PROVIDE (DEFINED AS "FURNISH AND INSTALL") ALL LABOR, MATERIALS AND EQUIPMENT REQUIRED TO CREATE A COMPLETE AND PROPERLY OPERATING ELECTRICAL DISTRIBUTION SYSTEM.
- FLOOR PLANS, RISER DIAGRAM AND SPECIFICATIONS REQUIRE A NEW CODE COMPLIANT POWER DISTRIBUTION SYSTEM.
- PROVIDE AN EQUIPMENT GROUNDING CONDUCTOR IN EACH CONDUIT TO FORM A CONTINUOUS GROUNDING PATH. CONDUIT SHALL NOT BE USED IN PLACE OF A GROUND CONDUCTOR.
- PROVIDE INSULATED PLASTIC BUSHINGS ON ENDS OF ALL CONDUIT.
- REFER TO PANELBOARD SCHEDULE(S) FOR ADDITIONAL ELECTRICAL REQUIREMENTS.
- PROVIDE LUGGING AT ALL ELECTRICAL GEAR TO MATCH CONDUCTOR SIZING, ETC. SHOWN ON RISER. DO NOT REMOVE CONDUCTOR STRANDS TO FIT UNDER LUGS. THE ELECTRICAL CONTRACTOR SHALL EITHER SPECIAL ORDER THE CORRECT LUGGING OR PROVIDE CODE COMPLIANT MEANS TO MAKE CONDUCTOR SIZE TRANSITIONS.
- PROVIDE GROUNDING OF THE NEW COMMUNICATIONS DEMARC AND THE POWER GROUND AS REQUIRED BY THE NEC.

FEEDER SCHEDULE						
NOTE: NOT ALL FEEDERS LISTED ON SCHEDULE MAY BE USED ON RISER DIAGRAM.						
FEEDER NUMBER	FEEDER AMPACITY	NUMBER OF SETS	NUMBER AND SIZE OF PHASE CONDUCTORS PER SET	NUMBER AND SIZE OF NEUTRAL CONDUCTORS PER SET	NUMBER AND SIZE OF GROUND CONDUCTORS PER SET	CONDUIT SIZE PER SET
M	-	-	PROVIDE NEW WIRING PER UTILITY CO. REQUIREMENTS	-	-	2
SG	-	1	SERVICE GROUND	-	1#3/0	3/4"
1	400 COPPER	2 SETS OF:	2#3/0	1#3/0	---	2-1/2"
2	400 COPPER	2 SETS OF:	2#3/0	1#3/0	1#3	2-1/2"
3	100 COPPER	1	3#3	1#3	1#8	1-1/2"

GENERAL NOTES:  
 A. FEEDER AMPACITY AND CONDUIT FILL BASED ON 167 DEGREE FAHRENHEIT TYPE THHW, THW, THWN, OR XHHW INSULATED CONDUCTORS RATED AT 600V UNLESS NOTED OTHERWISE.

- FEEDERS HAVE BEEN SIZED FOR VOLTAGE DROP AND SPECIFIC DISTANCES. PROVIDE NEW FEEDERS AT THEIR INDICATED LOCATIONS ONLY.
  - ALL FLOOR, WALL AND ROOF PENETRATIONS MADE FOR NEW ELECTRICAL WORK SHALL MAINTAIN THE INTEGRITY OF THE SURFACE PENETRATED.
  - THE LOCATION OF FEEDER PENETRATIONS MADE THROUGH EXISTING SURFACES SHALL BE COORDINATED WITH THE OWNER'S REPRESENTATIVE PRIOR TO INSTALLATION. ALL PENETRATIONS SHALL USE A U.L. APPROVED METHOD OR SYSTEM. PENETRATIONS THROUGH EXISTING SURFACES SHALL BE SEALED, PATCHED AND FINISHED TO MEET THE APPROVAL OF THE OWNER'S REPRESENTATIVE AND THE AUTHORITY HAVING JURISDICTION.
  - PROVIDE UNDERGROUND FEEDERS WITH A WARNING RIBBON PLACED IN TRENCH AT 12 INCHES ABOVE THE UNDERGROUND INSTALLATION. BURY UNDERGROUND FEEDERS, CIRCUITS, ETC. 30 INCHES BELOW FINISHED GRADE TO TOP OF CONDUIT.
  - ALL FEEDERS SHALL BE SIZED FOR A MAXIMUM 2% VOLTAGE DROP AT DESIGN LOAD AS PER THE 2007 FBC SUBCHAPTER 13-413.1.ABC.1.1.
- SCHEDULE NOTES: (APPLICABLE WHERE REFERENCED)  
 1. GROUND TO BUILDING FOUNDATION STEEL (WHEN AVAILABLE), MASONRY WALL REBAR AND METAL FRAME OF BUILDING. ALL CONCEALED, BURIED OR INACCESSIBLE CONNECTIONS SHALL BE EXOTHERMICALLY WELDED. SEE ELECTRICAL SYMBOL LEGEND FOR ADDITIONAL REQUIREMENTS.  
 2. PROVIDE WEATHERPROOF ELECTRICAL SERVICE TO EQUIPMENT, INCLUDING, BUT NOT LIMITED TO CONDUIT, FITTINGS, DISCONNECT, ETC.  
 3. PROVIDE GROUND WIRE IN 3/4" CONDUIT BETWEEN EQUIPMENT. EXTEND TO BUILDING MAIN SERVICE GROUNDING SYSTEM IN ORDER TO PROVIDE A SINGLE POINT GROUNDING SYSTEM.

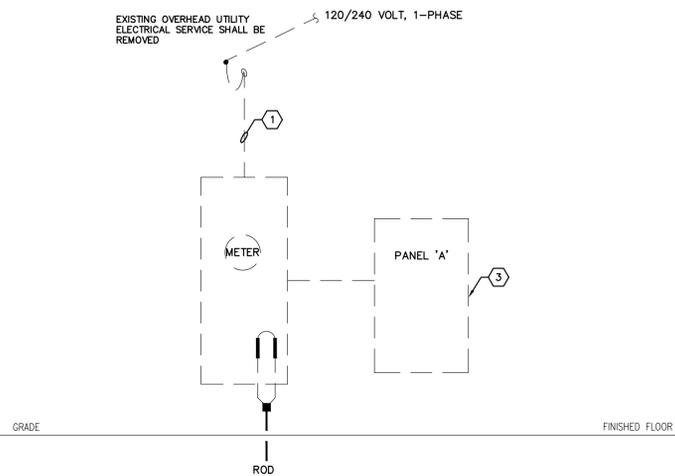
**ELECTRICAL KEYED NOTES**

- ① EXISTING ELECTRIC METER, SERVICE MAST, GROUNDING, ETC. TO BE REMOVED AND MADE SAFE.
- ② EXISTING COMMUNICATIONS DEMARC TO BE REMOVED.
- ③ EXISTING EXTERIOR LIGHTING FIXTURE AND ASSOCIATED CIRCUIT(S) TO REMAIN. MAINTAIN THE EXISTING LIGHTING FIXTURE AND THE ASSOCIATED CIRCUIT(S) FOR REUSE. SEE OTHER DETAILS.
- ④ EXISTING PANELBOARD TO BE REMOVED.
- ⑤ EXISTING KITCHEN HOOD, ROOF MOUNTED SUPPLY AND EXHAUST FANS TO BE REMOVED.
- ⑥ EXISTING SIDEWALL EXHAUST FAN TO BE REMOVED.
- ⑦ EXISTING GFI WIRING DEVICE TO REMAIN. MAINTAIN CIRCUIT AND PROVIDE WEATHERPROOF COVER AS SPECIFIED. REPLACE BACKBOX.
- ⑧ EXISTING ELECTRIC HAND DRYER TO BE REMOVED.

**GENERAL ELECTRICAL NOTES**

1. REMOVE ALL ELECTRICAL COMPONENTS WITHIN THE DEMOLITION SCOPE OF WORK. SEE AREA OF WORK SHOWN WITH THE DASHED DIVIDING LINE.
2. THE ELECTRICAL CONTRACTOR SHALL REMOVE AND MAKE SAFE THE BRANCH CIRCUITS, WIRING DEVICES, SURFACE MOUNTED CONDUIT, BOXES, RACEWAYS, CABLING, LIGHTING FIXTURES, SENSORS, SWITCHES, EXHAUST FANS, HOOD CONTROLS, HOOD SUPPLY AND EXHAUST FANS, TOILET EXHAUST, COMMUNICATION DROPS, ETC. WITHIN THE STRUCTURE.
3. A FEW OF THE SPECIFIC ITEMS TO BE REMOVED ARE LISTED IN THE KEYED NOTES AND ARE EXAMPLES OF THE ITEMS TO BE DEMOLISHED. THE ELECTRICAL CONTRACTOR IS NOT TO MISCONSTRUE THIS LIST AS COMPLETE. THE ELECTRICAL CONTRACTOR SHALL VISIT THE EXISTING SITE AND CONFIRM THE QUANTITY, CHARACTER, ETC. OF THE ITEMS TO BE REMOVED AND INCLUDE ALL COSTS IN BID. NO ADDITIONAL COMPENSATION WILL BE GRANTED FOR A PARTIAL ELECTRICAL DEMOLITION. THERE ARE MANY WIRING DEVICES IN THE EXISTING STRUCTURE.

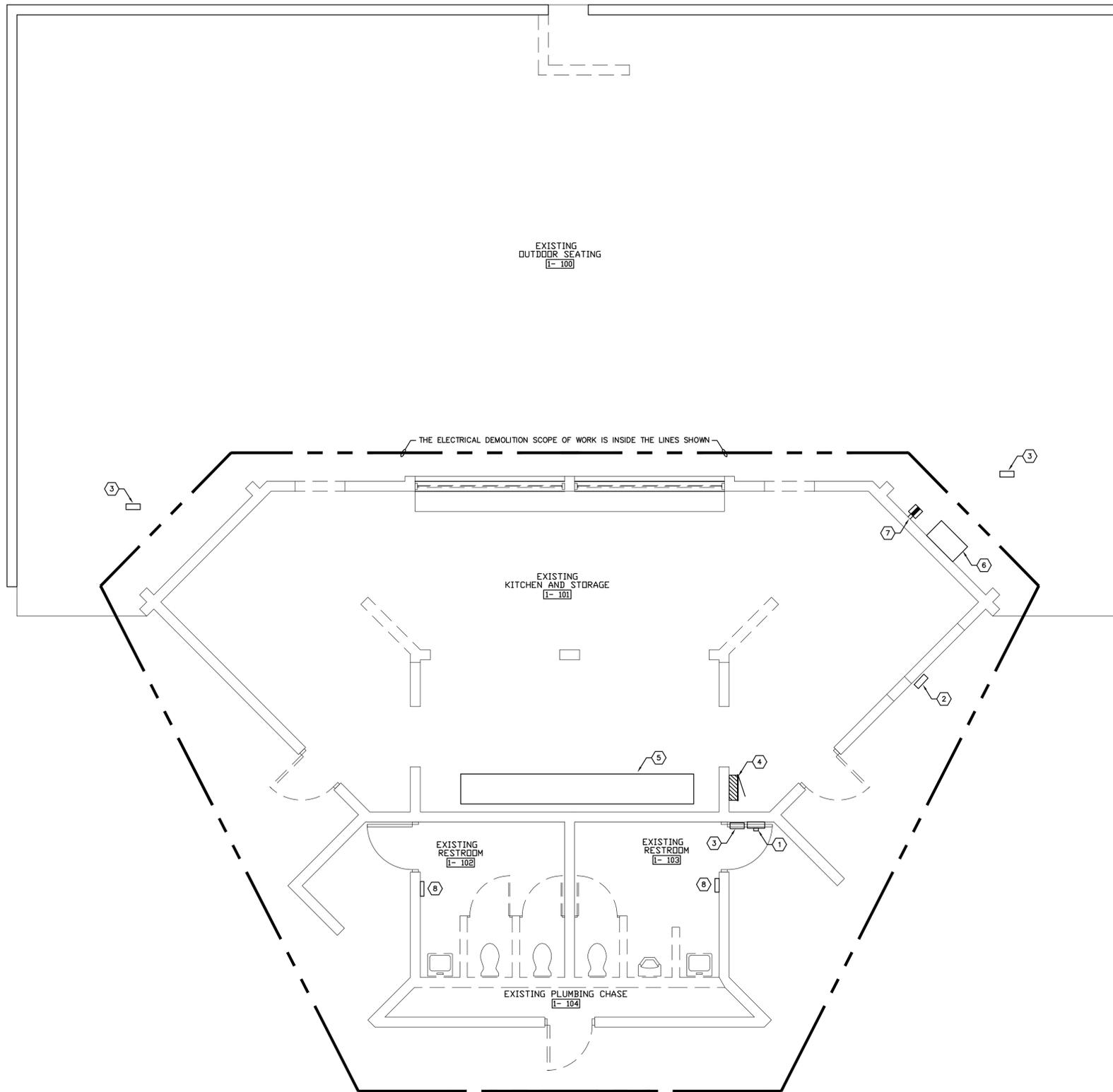
EXISTING OVERHEAD UTILITY ELECTRICAL SERVICE SHALL BE REMOVED



**PARTIAL ELECTRICAL RISER DIAGRAM - DEMOLITION**  
NOT TO SCALE

**KEY NOTES:**

1. THE EXISTING 200AMP OVERHEAD ELECTRICAL SERVICE AND ALL POWER DISTRIBUTION COMPONENTS TO INCLUDE THE MAST, POWER PANELS, SWITCHES, CONDUIT, CONDUCTORS, RACEWAYS, CONNECTORS, HARDWARE, GROUNDING SYSTEM, ETC. ARE TO BE REMOVED.
2. REMOVE LOADCENTER.
3. CONFIRM CIRCUIT BREAKER SIZES OF EXISTING LOADS TO REMAIN PRIOR TO DEMOLITION.



**CONCESSIONS BUILDING**  
**ELECTRICAL DEMOLITION FLOOR PLAN**  
1/4"=1'-0"

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Designed: B.P.Z. ME3 Job No: 10-0195-02  
Checked: S.T.P. Date: 10/22/2010  
Drawn: B.P.Z. C.O.A. 27252  
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TO THE BEST OF MY KNOWLEDGE, SAID PLANS AND SPECIFICATIONS COMPLY WITH ALL APPLICABLE BUILDING CODES.

BRYAN P. ZAPP, P.E.  
FL# 46141

**Coquina Beach**

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Bradenton, Florida 34217

**Concessions Building Renovations**

Manatee County Government

1112 Manatee Avenue West  
Bradenton, Florida 34208

revisions:

drawn: BZ  
checked: BZ  
date: 10.22.2010  
comm. no.: 0920829

**ELECTRICAL**  
**DEMOLITION**  
**FLOOR PLAN**

**ED101**

permit drawings

ALL IDEAL DESIGN, ARRANGEMENTS AND PLANS INDICATED OR REPRESENTED BY THIS DRAWING ARE OWNED BY AND THE PROPERTY OF SCHENKELSHULTZ AND WERE CREATED, DEVELOPED AND DESIGNED FOR USE ON AND IN CONNECTION WITH THE SPECIFIED PROJECT. NONE OF THE IDEAL DESIGN ARRANGEMENTS OR PLANS SHALL BE USED BY OR DISCLOSED TO ANY PERSON, FIRM OR CORPORATION FOR ANY PURPOSE WHATSOEVER WITHOUT THE WRITTEN PERMISSION OF SCHENKELSHULTZ. WRITTEN DIMENSIONS ON THESE DRAWINGS SHALL HAVE PRECEDENCE OVER SCALE. DIMENSIONS AND CONDITIONS ON THE JOB AND NOT SHOWN BY THESE DRAWINGS SHALL BE THE RESPONSIBILITY OF THE CONTRACTOR. CONTRACTORS SHALL VERIFY AND BE RESPONSIBLE FOR ALL DIMENSIONS AND CONDITIONS ON THE JOB AND NOT RELY ON THE CONTRACTOR FROM ANY VARIATION FROM THE DIMENSIONS AND CONDITIONS SHOWN BY THESE DRAWINGS. REVIEW OF SHOP DRAWINGS DOES NOT RELIEVE THE CONTRACTOR FROM THE REQUIREMENT OF MEETING OR EXCEEDING THE PLANS AND SPECIFICATIONS. CONSTRUCTION SHALL BE IN ACCORDANCE WITH THE PLANS AND SPECIFICATIONS. HEREOF IS A CRIMINAL OFFENSE UNDER 18 U.S.C. SEC. 561. UNAUTHORIZED DISCLOSURE MAY CONSTITUTE A VIOLATION OF FEDERAL STATE AND FEDERAL LAW. THE IDEAL ARRANGEMENTS AND DESIGNS DISCLOSED HEREIN MAY BE PATENTED OR BE THE SUBJECT OF PENDING PATENT APPLICATION.

**ME3**

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 Checked: K.C.C. Date: 10/22/2010  
 Drawn: S.T.P. C.O.A. 2/2002  
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TO THE BEST OF MY KNOWLEDGE, SAID PLANS AND SPECIFICATIONS COMPLY WITH ALL APPLICABLE BUILDING CODES.

KAY C. CLEM, P.E.  
 FL# 53270

**Coquina Beach**

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**Concessions Building Renovations**

Manatee County Government

1112 Manatee Avenue West  
 Bradenton, Florida 34208

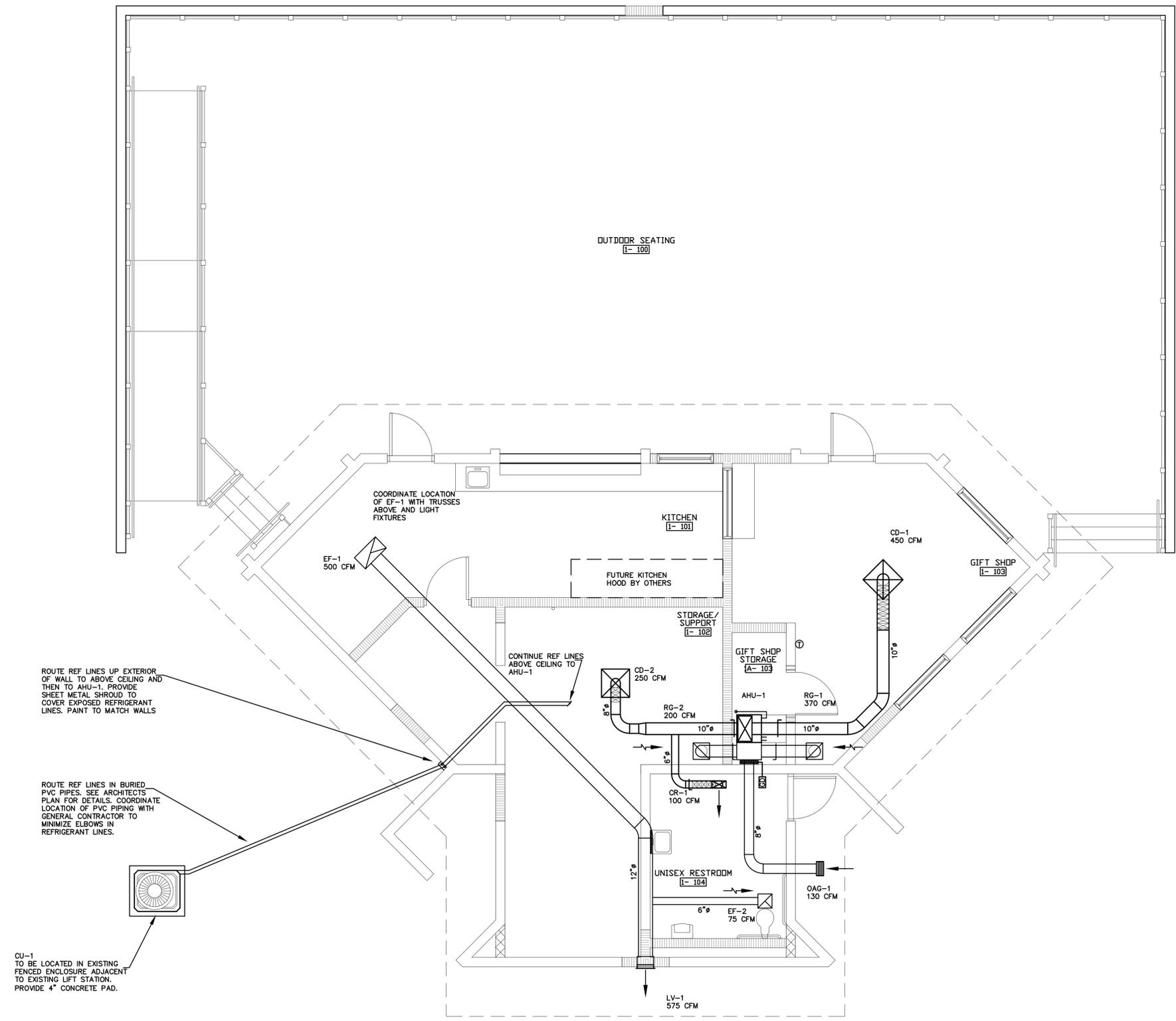
revisions:

drawn: sp  
 checked: kc  
 date: 10.22.2010  
 comm. no.: 0920829

**MECHANICAL FLOOR PLAN**

**M101**

permit drawings



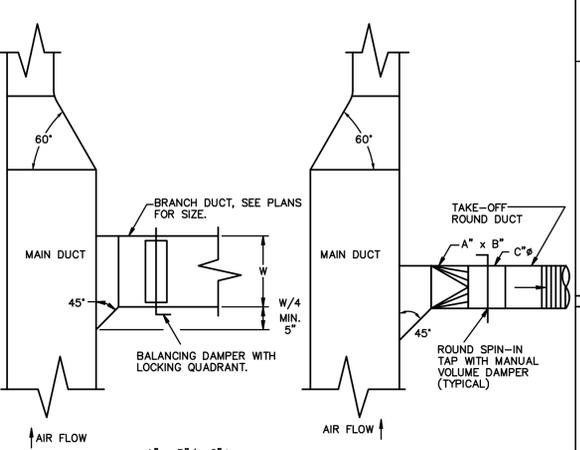
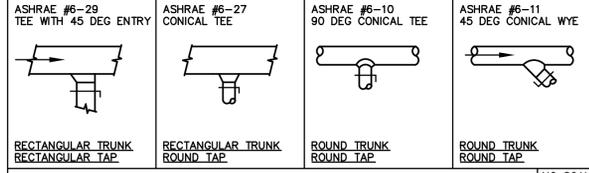
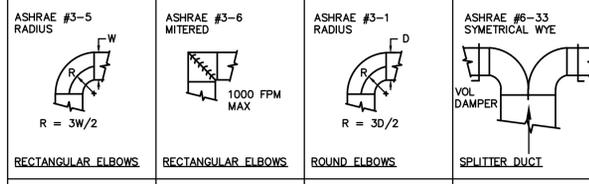
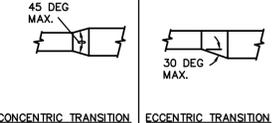
ROUTE REF LINES UP EXTERIOR OF WALL TO ABOVE CEILING AND THEN TO AHU-1. PROVIDE SHEET METAL SHROUD TO COVER EXPOSED REFRIGERANT LINES. PAINT TO MATCH WALLS

ROUTE REF LINES IN BURIED PVC PIPES. SEE ARCHITECTS PLAN FOR DETAILS. COORDINATE LOCATION OF PVC PIPING WITH GENERAL CONTRACTOR TO MINIMIZE ELBOWS IN REFRIGERANT LINES.

CU-1 TO BE LOCATED IN EXISTING FENCED ENCLOSURE ADJACENT TO EXISTING LIFT STATION. PROVIDE 4" CONCRETE PAD.

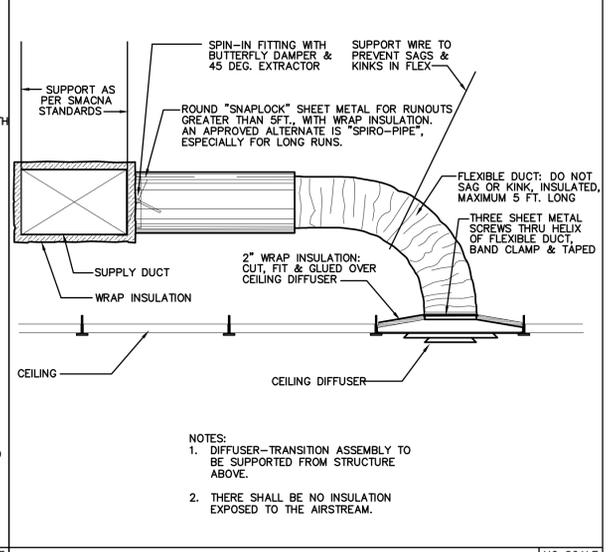
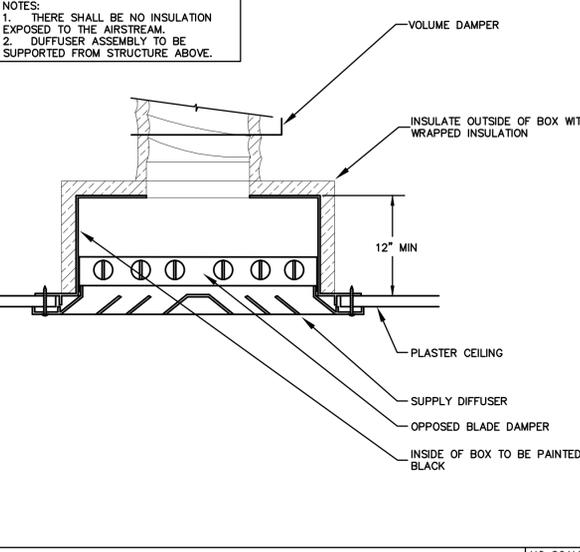
**CONCESSIONS BUILDING MECHANICAL FLOOR PLAN**  
 1/4"=1'-0"

NOTES:  
1. THESE DUCT FITTINGS SHALL BE USED UNLESS OTHERWISE NOTED.



A" x B"	C"Ø
12x8	10
12x10	12
16x10	14
22x10	16

NOTE:  
USE 45° BRANCH FITTING WHEN MAIN SUPPLY DUCT DEPTH IS EQUAL TO OR SMALLER THAN TAKE-OFF ROUND DUCT SIZE.

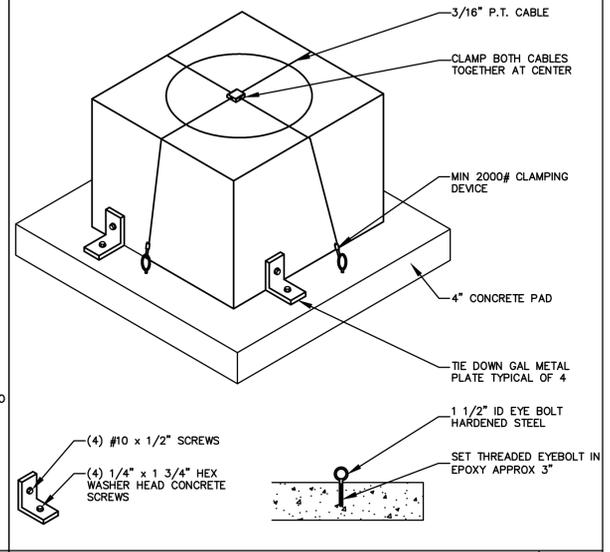
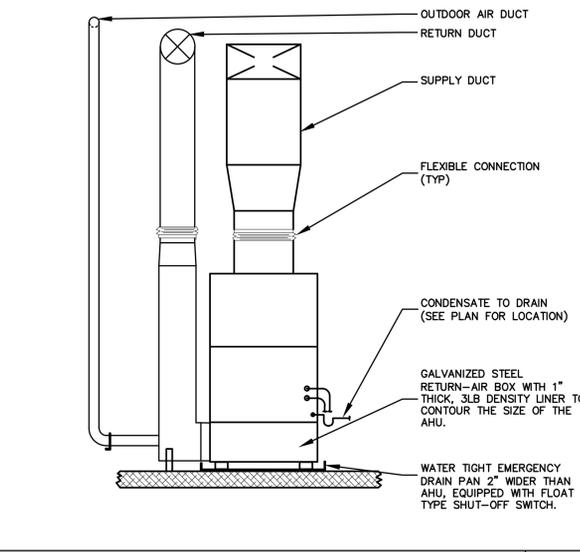
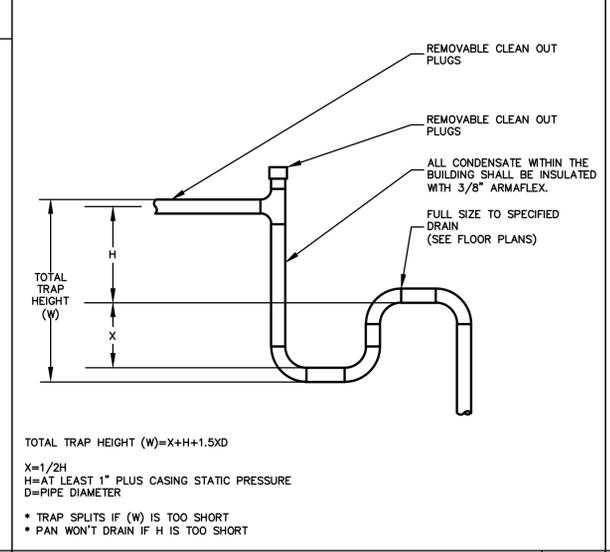
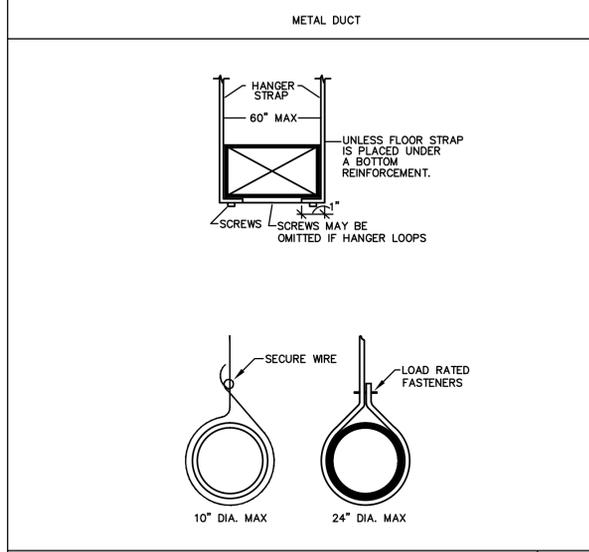


ACCEPTABLE DUCT FITTINGS NO SCALE 1

DUCT TAKEOFF DETAIL NO SCALE 2

SURFACE MOUNT SUPPLY DIFFUSER (TOP) NO SCALE 3

CEILING DIFFUSER RUNOUT DETAIL NO SCALE 4

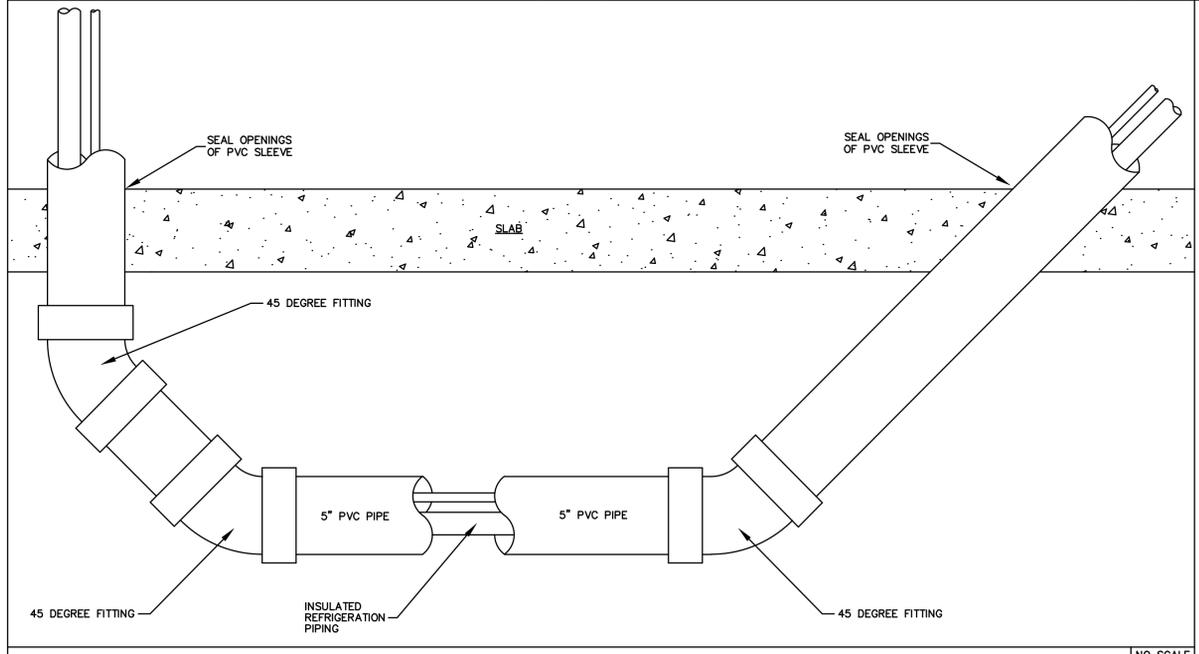


DUCT HANGARS NO SCALE 5

CONDENSATE DRAIN PIPING DETAIL NO SCALE 6

AHU DETAIL NO SCALE 7

CONDENSING UNIT TIE DOWN DETAIL NO SCALE 8



UNDERGROUND REFRIGERANT IN PVC SLEEVE NO SCALE 9

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TO THE BEST OF MY KNOWLEDGE, SAID PLANS AND SPECIFICATIONS COMPLY WITH ALL APPLICABLE BUILDING CODES.  
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revisions:  
drawn: sp  
checked: kc  
date: 10.22.2010  
comm. no.: 0920829

**MECHANICAL  
DETAILS**  
**M501**

permit drawings

EXHAUST FAN SCHEDULE												
MARK	SERVICE	MANUFACTURER	MODEL	CFM	S.P. (IN. W.C.)	RPM	MAX SONES	hp	WATTS	ELECTRICAL MOTOR VOLTZ/PH./HZ.	LOCATION	NOTES
EF-1	EXHAUST	GREENHECK	SP-A700	500	0.5	1100	5.5	1/4	350	115/1/60	CEILING	1, 2
EF-2	EXHAUST	GREENHECK	SP-B110	75	0.25	748	0.6	---	80	115/1/60	CEILING	1

- EXHAUST FAN NOTES:**  
1. PROVIDE AND INSTALL SPEED CONTROL.  
2. EF-1 WILL BE CONTROLLED BY A TIMER IN KITCHEN. PROVIDED BY ELECTRICAL CONTRACTOR.

INDOOR AIR QUALITY SCHEDULE -- ASHRAE 62.1-2004									
AHU	SERVICE	(A) # OF PEOPLE	OUTDOOR AIR PER PERSON	(B) OCC. CFM	(C) AREA SQFT	OUTDOOR AIR PER SQFT	(D) AREA CFM	(E) REQ CFM (B+D)	(F) DESIGN CFM
RTU-1	GIFT SHOP	5	7.5	37.5	282	0.12	33.84	71.34	75
	GIFT SHOP STORAGE	0	0	0	36	0.12	4.32	4.32	5
	STORAGE SUPPORT	0	0	0	388	0.12	46.56	46.56	50
TOTAL O/A									130

- IAQ DESIGN DOCUMENTATION NOTES:**  
1) THE VENTILATION RATE PROCEDURE DESCRIBED IN ASHRAE STANDARD 62.1-2007-6.2 HAS BEEN USED TO DETERMINE THE AMOUNT OF OUTSIDE AIR FOR THIS PROJECT.  
2) BUILDING ALTERATIONS OR CHANGE-OF-USE: VENTILATION SYSTEM DESIGN, OPERATION, AND MAINTENANCE SHALL BE REEVALUATED WHEN CHANGES IN BUILDING USE OR OCCUPANCY CATEGORY, SIGNIFICANT BUILDING ALTERATIONS, SIGNIFICANT CHANGES IN OCCUPANT DENSITY, OR OTHER CHANGES INCONSISTENT WITH SYSTEM DESIGN ASSUMPTIONS ARE MADE.  
3) THIS DESIGN IS BASED ON THE OUTDOOR AIR QUALITY BEING ACCEPTABLE FOR VENTILATION.  
4) THIS DESIGN IS BASED ON NO SMOKING BEING ALLOWED IN ANY PORTIONS OF THE BUILDING.  
5) RESTROOM VENTILATION REQUIREMENTS ARE MET VIA TRANSFER AIR AND MECHANICAL EXHAUST WITH NO RECIRCULATION OF RESTROOM SUPPLY AIR PER ASHRAE 62.1-2007-6.2.6.

PEOPLE OUTDOOR AIR RATE IS PER ASHRAE 62.1-2007, TABLE 6-1. AREA OUTDOOR AIR RATE IS PER ASHRAE 62.1-2004, TABLE 6-1  
\*\* -- REQ. CFM. = (OCC. CFM + AREA CFM)

AIR FIXTURE SCHEDULE												
MARK	SERVICE	MANUFACTURER	MODEL	NECK SIZE	MODULE SIZE	CFM	THROW FT	T. VEL	NC	PATTERN	MATERIAL	REMARKS
CD-1	SUPPLY	TITUS	OMNI-AA-12-1-24x24-01-D75	12"	24x24	450	12	600	12	4-WAY	ALUMINUM	
CD-2	SUPPLY	TITUS	OMNI-AA-8-1-24x24-01-D75	8"	24x24	250	10	700	12	4-WAY	ALUMINUM	
CR-1	SUPPLY	TITUS	301-F-L-6x6-1-26-AG-15-AA	---	6x6	100	8	500	15	1-WAY	ALUMINUM	
OAG-1	OUTDOOR AIR	TITUS	350-F-L-6x6-1-26	6x6	7.75x7.75	130	---	700	19	---	ALUMINUM	PROVIDE W/ INSECT SCREEN
RG-1	RETURN	TITUS	350-F-L-10x10-1-26-AG-15-AA	10x10	11.75X11.75	370	---	600	20	---	ALUMINUM	
RG-2	RETURN	TITUS	350-F-L-8x8-1-26-AG-15-AA	8x8	9.75x9.75	200	---	600	16	---	ALUMINUM	

- NOTES:**  
1. BORDER TYPES SHALL BE COMPATIBLE WITH ARCHITECTURAL CEILING TYPE FOR THE ROOM IN WHICH THE AIR DEVICE IS LOCATED.  
2. SEE THE FLOOR PLANS FOR LOCATION OF EACH DEVICE.  
3. ALL AIR DEVICES SHALL BE TESTED IN ACCORDANCE WITH ASHRAE 70-91.  
4. ALL THROW VALUES ARE ISOTHERMAL, AND MEASURED IN FEET.  
5. ALL PRESSURES ARE IN INCHES, W.G.  
6. FLOWRATE FOR CONTINUOUS LINEAR DEVICES IS IN CFM/FT.  
7. PROVIDE TRANSITION BOOTHS AS REQUIRED.  
8. ALL SUPPLY AIR DEVICES SHALL BE PROVIDED WITH OPPOSED BLADE DAMPERS.  
9. ALL SUPPLY DIFFUSERS ARE 4 WAY UNLESS OTHERWISE NOTED ON THE FLOOR PLANS.

CONTROLS SCHEDULE	
SEQUENCE OF OPERATIONS	
PROGRAM THERMOSTAT TEMPERATURE AND HUMIDITY SETTINGS FOR OCCUPIED/UNOCCUPIED PERIODS	
<b>OCCUPIED MODE (COOLING SEASON)</b>	
1.	AHU FAN SHALL BE ON.
<b>OCCUPIED MODE (HEATING SEASON)</b>	
1.	AHU FAN SHALL BE ON.
<b>UNOCCUPIED MODE (COOLING SEASON)</b>	
1.	AHU FAN SHALL BE IN AUTO MODE.
<b>UNOCCUPIED MODE (HEATING SEASON)</b>	
1.	AHU FAN SHALL BE IN AUTO MODE.

SPLIT SYSTEM AIR HANDLING UNIT SCHEDULE													
MARK	AREA SERVED	MANUF.	MODEL	CFM	O/A	E.S.P.	TOTAL COOLING	SENS. COOLING	ELECTRIC HEAT	MCA	MOP	POWER	NOTES
AHU-1	GIFT SHOP	CARRIER	FB4CNF024T00	800	130	0.5	22.85	15.63	5.0 / 17.06	28.4	30	240/1/60	1,2,3,4

- SPLIT SYSTEM AHU NOTES:**  
1. SINGLE POWER POINT CONNECTION.  
2. PROVIDE 1" THROW AWAY FILTERS IN AHU.  
3. PROVIDE THERMAL EXPANSION VALVE.  
4. PROVIDE ELECTRIC HEATER.

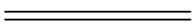
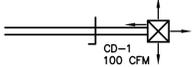
SPLIT SYSTEM CONDENSING UNIT SCHEDULE									
MARK	MANUFACTURER	MODEL	NOM. COOLING	AMBIENT TEMP	SEER	MCA	MAX FUSE	POWER	
CU-1	CARRIER	24AB324A003	24	95	14	17.6	25	240/1/60	

- SPLIT SYSTEM CU NOTES:**  
1. PROVIDE 150 MPH HURRICANE TIE DOWNS FOR CONDENSING UNIT.

AIR BALANCE SCHEDULE					
ZONE	SUPPLY AIR	OUTSIDE AIR	RETURN AIR	EXHAUST	PRESSURE
AHU-1	800	130	670	75	+55

LOUVER SCHEDULE						
MARK	MANUFACTURER	MODEL	SIZE (WxH)	CFM	FREE AREA	FACE VELOCITY
LV-1	RUSKIN	ELF63750XD	14x14	575	0.57 sqft	1015

- LOUVER NOTES:**  
1. PAINT TO ARCHITECTS SPECIFICATIONS.  
2. LOUVER TO BE IMPACT RESISTANT FOR USE IN HURRICANE ZONES.

MECHANICAL LEGEND		
ABBREVIATIONS	DRAWING SYMBOLS	
AC	AIR CONDITIONING	 SUPPLY DUCT
AFF	ABOVE FINISHED FLOOR	 EXHAUST DUCT
AHU	AIR HANDLING UNIT	 RETURN AIR DUCT
BTU	BRITISH THERMAL UNIT	 OUTDOOR AIR DUCT
CFM	CUBIC FEET PER MINUTE	
CLG	CEILING	
CX	CONDENSING UNIT	
DX	DIRECT EXPANSION	
EA	EXHAUST AIR	 SUPPLY CEILING DIFFUSER WITH MANUAL VOLUME DAMPER
EF	EXHAUST FAN	
LAT	LEAVING AIR TEMPERATURE	
LWT	LEAVING WATER TEMPERATURE	
MAX	MAXIMUM	
MIN	MINIMUM	
OA	OUTSIDE AIR	 RETURN CEILING DIFFUSER
REF	REFRIGERANT	
SP	STATIC PRESSURE	
TPY	TYPICAL	 THERMOSTAT
UG	UNDERGROUND	
VD	VOLUME DAMPER	 GRAVITY DAMPER

**NOTE:** THESE ARE STANDARD SYMBOLS AND MAY NOT ALL APPEAR ON THE PROJECT DRAWINGS; HOWEVER WHEREVER THE SYMBOL APPEARS ON THE PROJECT DRAWINGS, THE ITEM SHALL BE PROVIDED AND INSTALLED.

## GENERAL NOTES

- HVAC WORK CONSISTS OF PROVIDING AND INSTALLING AIR CONDITIONING SYSTEMS FOR A COMPLETE OPERATING SYSTEM AND AS INDICATED ON THE DRAWINGS. ALL WORK SHALL COMPLY WITH APPLICABLE CODES IN SPECIFICATIONS. IT IS THE INTENTION OF THE CONTRACT DRAWINGS AND SPECIFICATIONS TO CALL FOR COMPLETE, FINISHED WORK, TESTED, AND READY FOR OPERATION.
- TEST AND BALANCE SHALL BE PROVIDED BY A COMPANY SPECIALIZING IN THE TESTING AND BALANCING OF HVAC SYSTEMS AS SUBCONTRACTOR TO THE HVAC CONTRACTOR. THE TEST AND BALANCE CONTRACTOR SHALL BE A MEMBER OF EITHER AABC OR NEBB.
- DUCT DIMENSIONS SHOWN ON THE DRAWINGS ARE CLEAR INSIDE "FREE AREA" DIMENSIONS.
- PROVIDE SPIN-IN FITTINGS AT ALL FLEXIBLE DUCT RUNOUTS TO DIFFUSERS.
- MAXIMUM LENGTH OF FLEXIBLE DUCT SHALL BE 7'-0".
- ALL PIPING SUBJECT TO THERMAL EXPANSION AND/OR CONTRACTION THAT PENETRATES A SMOKE, FIRE, OR FIRE/SMOKE WALL, PARTITION, OR FLOOR SLAB SHALL BE SUITABLY SLEEVED AND FIRE SAFED.
- PROVIDE IDENTIFICATION OF THE LOCATION OF ALL FIRE AND BALANCING DAMPERS. IDENTIFICATION TAGS SHALL BE AFFIXED TO THE WALLS OR CEILINGS AND SHALL BE VISIBLE FROM THE OCCUPIED SPACE.
- ALL PIPING SHALL BE SUPPORTED WITH COMMERCIAL MANUFACTURED CLAMPS. PROVIDE ISOLATION SLEEVES TO PREVENT CONTACT OF DISSIMILAR METALS.
- INSTALL ALL EQUIPMENT IN STRICT ACCORDANCE WITH THE MANUFACTURERS' INSTRUCTIONS AND RECOMMENDATIONS.
- CONTRACTOR SHALL BE RESPONSIBLE FOR PROVIDING AND INSTALLING ALL NECESSARY, MISCELLANEOUS ANGLES, CHANNELS, RODS, UNISTRUT, ETC., AS MAY BE NECESSARY TO ADEQUATELY SUPPORT THE MECHANICAL PIPING, DUCTWORK, AND EQUIPMENT IN A MANNER APPROVED BY THE ARCHITECT THAT WILL NOT OVERLOAD THE BUILDING STRUCTURE SYSTEM.
- PENETRATIONS THROUGH FIRE RATED ASSEMBLIES, PENETRATIONS FOR PIPES, CONDUITS, OR OTHER PURPOSES THROUGH ASSEMBLIES (FLOORS, ROOF, WALLS, PARTITIONS, ETC.) WITH A REQUIRED FIRE RESISTANCE RATING FIRE STOP MATERIAL. FIRE STOP SEALANTS SHALL BE UL LISTED. APPLY FIRE STOP AS RECOMMENDED BY THE MANUFACTURER AND IN ACCORDANCE WITH ITS LISTING TO MEET OR EXCEED THE FIRE RATING OF THE ASSEMBLY IN WHICH IT IS INSTALLED.
- ALL INSULATION SHALL BE FIRE RATED IN ACCORDANCE WITH ASHRAE 90A 50/25 SMOKE DEVELOPMENT AND FLAME SPREAD REQUIREMENTS. INSULATION "R" VALUES SHALL COMPLY WITH THE FLORIDA ENERGY CODE.
- MOUNT THERMOSTATS AND TEMPERATURE SENSORS WHERE INDICATED ON PLANS, AT 48" CL. A.F.F. UNLESS NOTED OTHERWISE. SEE INTERIOR DRAWINGS AND MECHANICAL DRAWINGS FOR LOCATION WHERE THERE IS A CONFLICT OF LOCATIONS BETWEEN THE DRAWINGS. NOTIFY THE ARCHITECT IMMEDIATELY.
- INSTALL DUCT MOUNTED SMOKE DETECTORS IN SUPPLY AIR DUCTWORK CONNECTED TO REQUIRED A/C UNIT. WIRE DUCT MOUNTED SMOKE DETECTORS SUCH THAT ACTIVATION WILL DE-ENERGIZE AIR HANDLING UNIT FAN. LOCATE DUCT MOUNTED SMOKE DETECTORS THE REQUIRED DISTANCE DOWNSTREAM FROM BENDS OR INLETS AS RECOMMENDED BY THE MANUFACTURER.
- AIR HANDLING UNITS SHALL BE SHUT DOWN BY THE FIRE ALARM SYSTEM. WIRE THROUGH FIRE ALARM RELAY CONTACT TO SHUT DOWN AIR HANDLING UNITS UPON FIRE ALARM ACTIVATION. COORDINATE WITH FIRE ALARM CONTRACTOR ACCORDINGLY. WHEN AIR HANDLING UNITS SHUT DOWN FOR FIRE ALARM OR MAINTENANCE, INTERLOCKED EXHAUST FANS SHALL ALSO SHUT DOWN.
- PORTIONS OF DUCTWORK VISIBLE THROUGH GRILLS, REGISTERS, AND DIFFUSERS IN FINISHED AREAS SHALL BE PAINTED FLAT BLACK.
- COORDINATE THE TYPE AND LOCATION OF ALL DIFFUSERS, GRILLS, REGISTERS, ACCESS DOORS, ETC., WITH THE ARCHITECTURAL REFLECTED CEILING PLAN(S).
- ALL CEILING MOUNTED AIR DISTRIBUTION DEVICES LOCATED IN INACCESSIBLE CEILINGS SHALL HAVE FACE OPERATED BALANCING DAMPERS.
- SEE ELECTRICAL DRAWINGS FOR ELECTRICAL CHARACTERISTICS OF MECHANICAL EQUIPMENT.
- UNLESS OTHERWISE NOTED, INSTALL ALL DUCTWORK AS HIGH AS POSSIBLE, TIGHT TO THE BOTTOM OF THE STRUCTURE. COORDINATE ELEVATION AND LOCATION WITH RAIN LEADERS, WATER PIPING, PLUMBING VENTS, AND MAJOR ELECTRICAL CONDUITS OR CABLE TRAY.
- PROVIDE DRAIN P-TRAPS IN THE CONDENSATE LINES AT ALL AHU'S.
- ALL ROOF ATTACHED EQUIPMENT AND APPURTENANCES INCLUDED IN THE SCOPE OF THIS PROJECT ARE REQUIRED TO BE SECURED TO THE UNDERLYING BUILDING STRUCTURE. THE FASTENING SYSTEMS SHALL BE DESIGNED TO WITHSTAND A 150 MPH WIND LOAD. ALL ROOF MOUNTED EQUIPMENT SHALL BE MOUNTED ON FACTORY FABRICATED ROOF CURBS AND SHALL BE PROVIDED WITH VIBRATION ISOLATION AS RECOMMENDED BY THE MANUFACTURER. WATERTIGHT SEAL SHALL BE PROVIDED BY AN APPROVED ROOFING CONTRACTOR.
- THESE DRAWINGS ARE SCHEMATIC IN NATURE AND ARE NOT INTENDED TO SHOW ALL POSSIBLE CONDITIONS. IT IS INTENDED THAT A COMPLETE MECHANICAL SYSTEMS BE PROVIDED WITH ALL NECESSARY EQUIPMENT, APPURTENANCES, AND CONTROLS, COORDINATE WITH ALL OTHER DISCIPLINES. ALL PARAMETERS INDICATED IN THESE DOCUMENTS SHALL BE STRICTLY CONFORMED WITH. ANY ITEMS AND LABOR REQUIRED FOR COMPLETE MECHANICAL SYSTEMS IN ACCORDANCE WITH ALL APPLICABLE CODES STANDARDS, AND THESE CONTRACT DOCUMENTS SHALL BE PROVIDED WITHOUT ANY ADDITIONAL COST TO THE CONTRACT. THE CONTRACTOR SHALL REVIEW ALL CONTRACT DOCUMENTS AND SHALL COORDINATE WITH OTHER TRADES WHILE PREPARING THE MECHANICAL SHOP DRAWINGS.
- UPON COMPLETION OF THE WORK UNDER THIS CONTRACT, THE CONTRACTOR SHALL REMOVE ALL TOOLS, APPLIANCES, SURPLUS MATERIALS, AND SCRAP. ALL IDENTIFIED EXISTING EQUIPMENT TO BE REMOVED SHALL BE TURNED OVER TO THE OWNER.
- WHEN CONFLICTS OCCUR IN SPECIFICATIONS OR IN THE DRAWINGS, OR BETWEEN EITHER, THE ITEMS OF GREATER QUANTITY OR HIGHER COST SHALL BE PROVIDED.
- CONTRACTOR SHALL COORDINATE ALL DUCTWORK, PIPING AND PLUMBING WITH STRUCTURAL AND ELECTRICAL SYSTEMS INCLUDING ROOF/FLOOR PENETRATIONS AND SHALL PROVIDE AND INSTALL ALL NECESSARY OFFSETS OR FITTINGS REQUIRED TO AVOID CONFLICTS AND MAINTAIN EQUIPMENT ACCESS AND SERVICEABILITY.
- PROVIDE BALANCING DAMPER IN EACH SUPPLY AND RETURN BRANCH CONNECTION.

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1112 Manatee Avenue West  
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revisions:

drawn: sp  
checked: kc  
date: 10.22.2010  
comm. no.: 0920829

## MECHANICAL SCHEDULES

# M601

permit drawings

### GENERAL PLUMBING NOTES

- THE GENERAL CONDITIONS OF THE CONTRACT FOR CONSTRUCTION AND THESE SPECIFICATIONS ARE PART OF THIS CONTRACT.
- ALL APPLICABLE CODES, LAWS, AND REGULATIONS GOVERNING OR RELATING TO ANY PORTION OF THIS WORK ARE HEREBY INCORPORATED INTO AND MADE A PART OF THESE SPECIFICATIONS, AND THEIR PROVISIONS SHALL BE CARRIED OUT BY THE CONTRACTOR WHO SHALL INFORM THE OWNER PRIOR TO SUBMITTING A PROPOSAL, OF ANY WORK OR MATERIAL WHICH VIOLATES ANY OF THE ABOVE LAWS AND REGULATIONS. ANY WORK DONE BY THE CONTRACTOR CAUSING SUCH A VIOLATION SHALL BE CORRECTED BY THE CONTRACTOR.  
 APPLICABLE CODES INCLUDE:  
 FLORIDA BUILDING CODE - 2007  
 FLORIDA PLUMBING CODE - 2007  
 FLORIDA FUEL GAS CODE - 2007
- DRAWINGS ARE DIAGRAMMATIC AND INDICATE GENERAL ARRANGEMENT OF SYSTEMS AND WORK. PIPE ROUTING IS SHOWN DIAGRAMMATICALLY AND DOES NOT SHOW ALL OFFSETS, DROPS AND RISES OF RUNS. THE CONTRACTOR SHALL ALLOW IN HIS PRICE FOR ROUTING OF PIPE TO AVOID OBSTRUCTIONS. COORDINATION WITH UTILITY SERVICES, INCLUDING THOSE OF OTHER TRADES IS REQUIRED. MAINTAIN HEADROOM AND SPACE CONDITIONS.
- INSTALL WORK SO AS TO BE READILY ACCESSIBLE FOR OPERATION, MAINTENANCE AND REPAIR. MINOR DEVIATIONS FROM DRAWINGS MAY BE MADE TO ACCOMPLISH THIS, BUT CHANGES WHICH INVOLVE EXTRA COST SHALL NOT BE MADE WITHOUT APPROVAL.
- THE CONTRACTOR SHALL KEEP ALL EQUIPMENT AND MATERIALS, AND ALL PARTS OF THE BUILDING, EXTERIOR SPACES, AND ADJACENT STREETS, SIDEWALKS AND PAVEMENTS, FREE FROM MATERIAL AND DEBRIS RESULTING FROM THE EXECUTION OF THIS WORK. EXCESS MATERIALS WILL NOT BE PERMITTED TO ACCUMULATE EITHER ON THE INTERIOR OR THE EXTERIOR.
- THE LOCATIONS OF THE UTILITY SERVICES ARE BELIEVED TO BE AS INDICATED ON THE DRAWINGS. THE CONTRACTOR SHALL VERIFY THE ACTUAL LOCATIONS OF THESE SERVICES AND NOTIFY THE ENGINEER OF ANY DISCREPANCIES PRIOR TO COMMENCING ANY WORK.
- SEAL OPENINGS THROUGH PARTITIONS, WALLS, AND FLOORS WITH A U.L. LISTED FIRESTOPPING ASSEMBLY MATCHED TO THE RATING OF THE PENETRATED ELEMENT.
- PROVIDE ALL NECESSARY FLASHING AND COUNTERFLASHING TO MAINTAIN THE WATERPROOFING INTEGRITY OF THIS BUILDING AS REQUIRED BY THE INSTALLATION OR REMOVAL OF PIPING AND EQUIPMENT. PROVIDE EQUIPMENT CURBS AS REQUIRED.
- MATERIALS AND WORKMANSHIP, UNLESS OTHERWISE NOTED, SHALL BE IN ACCORDANCE WITH BUILDING STANDARDS.
- THE WORK IN THE BUILDING SHALL BE DONE WHEN AND AS DIRECTED, AND IN A MANNER SATISFACTORY TO THE OWNER. THE WORK SHALL BE PERFORMED SO AS TO CAUSE THE LEAST POSSIBLE INCONVENIENCE AND DISTURBANCE TO THE OWNER.
- ALL MATERIAL AND EQUIPMENT TO BE NEW UNLESS OTHERWISE NOTED AND SHALL BE IN ACCORDANCE WITH BUILDING STANDARDS. ALL MATERIAL AND EQUIPMENT ON SITE SHALL BE PROPERLY STORED SUCH THAT IT IS PROTECTED FROM DAMAGE AND EXPOSURE TO THE OUTSIDE ELEMENTS.
- INSURANCE: PROVIDE IN ACCORDANCE WITH BUILDING REQUIREMENTS AND POLICY SHALL INCLUDE A HOLD HARMLESS CLAUSE FOR THE OWNER AND ENGINEER.
- THE FINAL ACCEPTANCE WILL BE MADE AFTER THE CONTRACTOR HAS ADJUSTED HIS EQUIPMENT, TESTED THE VARIOUS SYSTEMS, DEMONSTRATED THAT IT FULFILLS THE REQUIREMENTS OF THE DRAWINGS AND SPECIFICATIONS, HAS FURNISHED ALL THE REQUIRED CERTIFICATES OF INSPECTION AND APPROVAL, AND SUBMITTED ALL THE NECESSARY CLOSE-OUT DOCUMENTS.

### PLUMBING FIXTURE SCHEDULE

MARK	DESCRIPTION	FIXTURE MANUFACTURER	CATALOG NO.	TRIM MANUFACTURER	CATALOG NO.	REMARKS	NOTE
P-1H	WATER CLOSET-ADA-FLOOR MOUNT-SENSOR FLUSH VALVE	KOHLER	K-4405	HYDROTEK	HB8-12B	FLOOR MOUNT WHITE VITREOUS CHINA TOILET, TOP SPUD, 10" ROUGH-IN, ADA, ELONGATED BOWL WITH KOHLER K-4731-C WHITE PLASTIC OPEN FRONT SEAT WITH CHECK HINGE, 1.28 GPF.	4
P-2H	LAVATORY-WALL HUNG-ADA-SENSOR FAUCET	KOHLER	K-2007	HYDROTEK	HB-5000EM	WALL HUNG VITREOUS CHINA LAVATORY, SINGLE FAUCET HOLE, PROVIDE CONCEALED ARM CARRIER AND GRID STRAINER.	1,2,3,4
P-3	URINAL-WALL HUNG-ADA-SENSOR FLUSH VALVE	KOHLER	K-4960-ET	HYDROTEK	HB-8000C-B1	WALL MOUNT VITREOUS CHINA URINAL, 0.5 GPF, PROVIDE WALL CARRIER.	4
P-4	HAND SINK	ELKAY	PSLVR1917	ELKAY	LKD2437BH	SINGLE BOWL COUNTERTOP STAINLESS STEEL SINK WITH OVERFLOW, PROVIDE GRID STRAINER ASSEMBLY, 20 GA. TYPE 304 STAINLESS STEEL, FULLY UNDERCOATED, WITH GOOSENECK FAUCET WITH WRISTBLADES. (HOT AND COLD WATER SUPPLY)	1,2
P-5	MOP SINK	MUSTEE	62M	ZURN	ZB41M1-RC	ONE PIECE MOLDED DURASTONE MOP SINK WITH INTEGRAL CENTER DRAIN, (2) WALL GUARDS, ROUGH CHROME FAUCET WITH 1/4 TURN HANDLES.	-
FD	FLOOR DRAIN	ZURN	Z-415B	-	-	W/ "B" TYPE STRAINER AND TRAP PRIMER AS PER DETAIL.	-
FS	FLOOR SINK	ZURN	Z-1900-2	-	-	W/ 12" X 12" 1/2 GRATE.	-
HB	HOSE BIBB	WOODFORD	MODEL 26	-	-	WITH LOOSE KEY OPERATING HANDLE.	-

**PLUMBING NOTES:**

- MCUIRE CAST BRASS P-TRAP WITH TUBULAR WALL BEND (SIZE AS REQUIRED). P-TRAPS IN CONCEALED SPACES MAY BE PVC.
- MCUIRE HEAVY DUTY PREMIER LINE SUPPLY STOP VALVES.
- TRUEBRO LAV GUARD: MODEL NO. 102W FOR P-TRAP AND ANGLE STOPS WITH SUPPLY ASSEMBLIES. MODEL NO. 102W WITH 105 ACCESSORY FOR OFFSET DRAIN.
- SET AT HANICAP HEIGHT.

**GENERAL NOTES:**

- PROVIDE ITEMS BY LISTED MANUFACTURER OR APPROVED EQUAL ONLY.
- SEE SEPARATE SPECIFICATIONS.
- AMERICAN WITH DISABILITIES ACT (ADA):
  - ALL HANICAP FIXTURES AND TRIM SHALL COMPLY WITH FEDERAL AND STATE ACCESSIBILITY CODES.
  - WATER CLOSET TANK FLUSH VALVE HANDLE SHALL BE MOUNTED ON THE WIDE SIDE OF TOILET AREA.

### FLORIDA BUILDING CODE 2007 - PLUMBING FIXTURE UNIT SCHEDULE

QUANTITY	DESCRIPTION	WATER DEMAND EACH FIXTURE UNIT (F.U.) COLD	WATER DEMAND EACH FIXTURE UNIT (F.U.) HOT	WATER DEMAND EACH FIXTURE UNIT (F.U.) COMBINED	WATER DEMAND TOTAL FIXTURE UNITS COLD	WATER DEMAND TOTAL FIXTURE UNITS HOT	WATER DEMAND TOTAL FIXTURE UNITS COMBINED	TOTAL GPM	SANITARY FIXTURE UNIT (F.U.) EACH	SANITARY FIXTURE UNIT (F.U.) TOTAL
1	DRINKING FOUNTAIN (FUTURE)	0.25	-	0.25	0.25	-	0.25	-	0.50	0.50
7	FLOOR DRAINS	-	-	-	-	-	-	-	2.00	14.00
1	KITCHEN SINK, COMMERCIAL (FUTURE 3-COMPARTMENT SINK)	3.00	3.00	4.00	3.00	3.00	4.00	-	2.00	2.00
1	LAVATORY, PUBLIC	1.50	1.50	2.00	1.50	1.50	2.00	-	1.00	1.00
1	SERVICE SINK	2.25	2.25	3.00	2.25	2.25	3.00	-	2.00	2.00
1	SINK	1.00	1.00	1.40	1.00	1.00	1.40	-	2.00	2.00
1	URINAL, PUBLIC 3/4" FLUSH VALVE	5.00	-	5.00	5.00	-	5.00	-	2.00	2.00
1	WATER CLOSET, PUBLIC FLUSH VALVE	10.00	-	10.00	10.00	-	10.00	-	6.00	6.00
				TOTAL:	23.00	7.75	25.65	38.52	-	29.50

**NOTES:**

- TOTAL OF 38.52 GPM DEMAND BASED ON SYSTEM PREDOMINANTLY FOR FLUSH VALVES.
- SYSTEM WILL REQUIRE 1.5" WATER MAIN.
- RECOMMENDED 1.5" METER SIZE PER FBC TABLE 603.1.
- SYSTEM WILL REQUIRE A MINIMUM 3" BUILDING DRAIN.

### ELECTRIC WATER HEATER SCHEDULE

EQUIPMENT NO.	MANUFACTURER	MODEL NO.	SERVICE	EFF (%)	ENTERING WATER TEMP (°F)	LEAVING WATER TEMP (°F)	RECOVERY RATE (GPH)	STORAGE CAPACITY (GAL)	TANK DIMENSIONS HEIGHT (INCHES)	TANK DIMENSIONS DIAMETER (INCHES)	ELECTRICAL HEATING ELEMENTS WATTAGE	ELECTRICAL HEATING ELEMENTS QUANTITY	ELECTRICAL VOLTS/PH/Hz	REMARKS
EW-1	A.O. SMITH	DE-52	CONCESSIONS AREA		70	110	46	50	54.875	20.5	4500	2	240/1/60	1,2,3,4

- REMARKS:**
- FLOOR MOUNTED WATER HEATER, MOUNT ON 4" CONCRETE HOUSEKEEPING PAD.
  - PROVIDE EXPANSION TANK - AMTOL ST-5 OR EQUAL.
  - PIPE PRESSURE/TEMPERATURE VALVE TO MOP SINK.
  - PROVIDE OPTIONAL SEVEN DAY PROGRAMMABLE TIME CLOCK FOR UP TO 14 ON/OFF OPERATIONS PER WEEK.

### PLUMBING LEGEND

DESCRIPTION	LINETYPE
COLD WATER	---
HOT WATER	----
HOT WATER RETURN	----
SANITARY BELOW GRADE	--- SAN ---
EXISTING BELOW GRADE SANITARY	--- SAN (E) ---
SANITARY VENT	---
LIQUID PROPANE GAS	---
BALANCING VALVE	
BALL VALVE	
SOLENOID VALVE	
VALVE IN VALVE BOX	
PRESSURE REDUCING VALVE	
UNION	
STRAINER	
PIPE UP	
PIPE DOWN	
TEE UP	
TEE DOWN	
AREA DRAIN AND TYPE	4" AD-1
FLOOR DRAIN AND TYPE	4" FD-A
FLOOR CLEANOUT	
CLEANOUT PLUG	
EXTERIOR CLEANOUT AND TYPE	3" ECO
CAP	
SHOCK ARRESTOR AND PDI SIZE	PDI-A
P-TRAP	
HOSE BIBB	HB
WALL HYDRANT	WH
REDUCED PRESSURE PRINCIPLE BACKFLOW PREVENTOR	
EXISTING WORK	
FLOW DIRECTION	
CONNECTION POINT OF NEW TO EXISTING	

### ABBREVIATIONS

AAV	AIR ADMITTANCE VALVE	IE	INVERT ELEVATION
ADA	AMERICANS WITH DISABILITIES ACT		
AD	AREA DRAIN	LPG	LIQUID PROPANE GAS
AFG	ABOVE FINISHED GRADE		
		MAX	MAXIMUM
BTUH	BRITISH THERMAL UNITS PER HOUR	MIN	MINIMUM
BWV	BACK WATER VALVE		
		NEC	NATIONAL ELECTRICAL CODE
CD	CONDENSATE DRAIN	NIC	NOT IN CONTRACT
CO	CLEAN OUT	NTS	NOT TO SCALE
CONN	CONNECTION		
CONT	CONTINUOUS	PDI	PLUMBING & DRAINAGE INSTITUTE POUNDS PER SQUARE INCH GAUGE
CW	COLD WATER	PSIG	POUND PER SQUARE INCH GAUGE
		POC	POINT OF CONNECTION
DIA	DIAMETER		
DN	DOWN	SPECS	SPECIFICATIONS
DWG	DRAWING	SAN	SANITARY SEWER
		S.F.	SQUARE FEET
ECO	EXTERIOR CLEANOUT		
		T & P	TEMPERATURE & PRESSURE
F	DEGREES FAHRENHEIT	TBD	TO BE DETERMINED
FCO	FLOOR CLEANOUT	TEMP	TEMPERATURE
FD	FLOOR DRAIN	TYP	TYPICAL
FT	FEET		
FBC	FLORIDA BUILDING CODE	UL	UNDERWRITER'S LABORATORIES, INC.
FPC	FLORIDA PLUMBING CODE	UNO	UNLESS NOTED OTHERWISE
GAL	GALLONS	VTR	VENT THRU ROOF
GPM	GALLONS PER MINUTE	V	VENT
HB	HOSE BIBB	W/	WITH
HP	HORSE POWER	WCO	WALL CLEAN OUT
HW	HOT WATER	WH	WALL HYDRANT
HWR	HOT WATER RETURN		

### PLUMBING DRAWING LIST

DRAWING NO.	DRAWING TITLE
P001	PLUMBING LEGEND & SCHEDULES
P101	PLUMBING - SANITARY WASTE & VENT PLAN
P102	PLUMBING - DOMESTIC WATER PLAN
P501	PLUMBING DETAILS

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KAY C. CLEM, P.E.  
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### Concessions Building Renovations

Manatee County Government

1112 Manatee Avenue West  
 Bradenton, Florida 34208

revisions:

drawn: kcc  
 checked: kcc  
 date: 10.22.2010  
 comm. no.: 0920829

### PLUMBING LEGEND

# P001

permit drawings

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Checked: S.T.P. Date: 10/22/2010  
Drawn: K.C.C. C.O.A. 27552  
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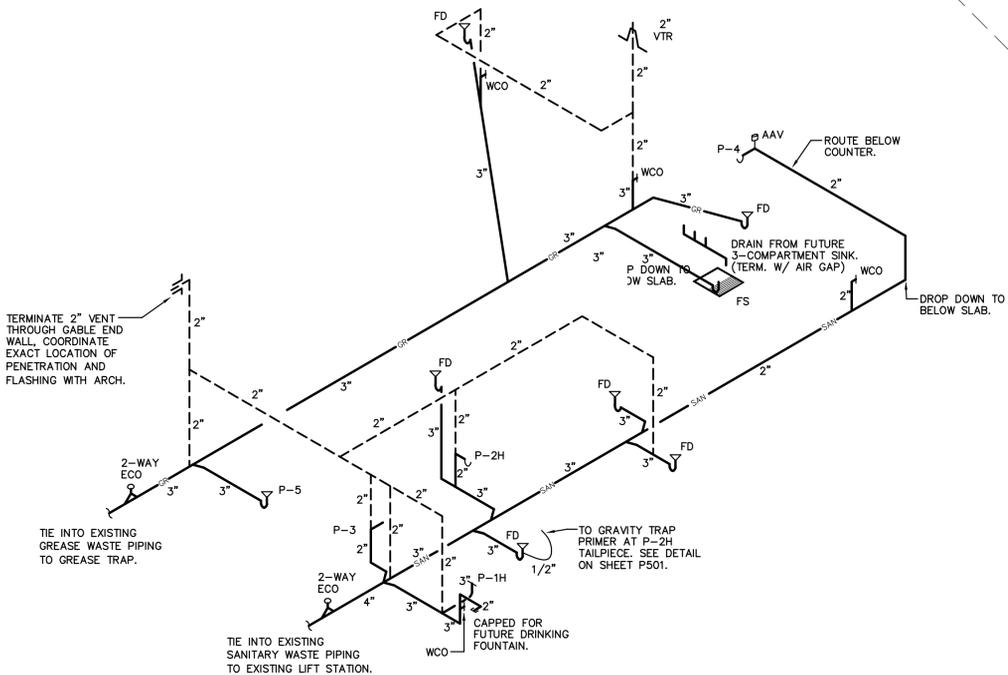
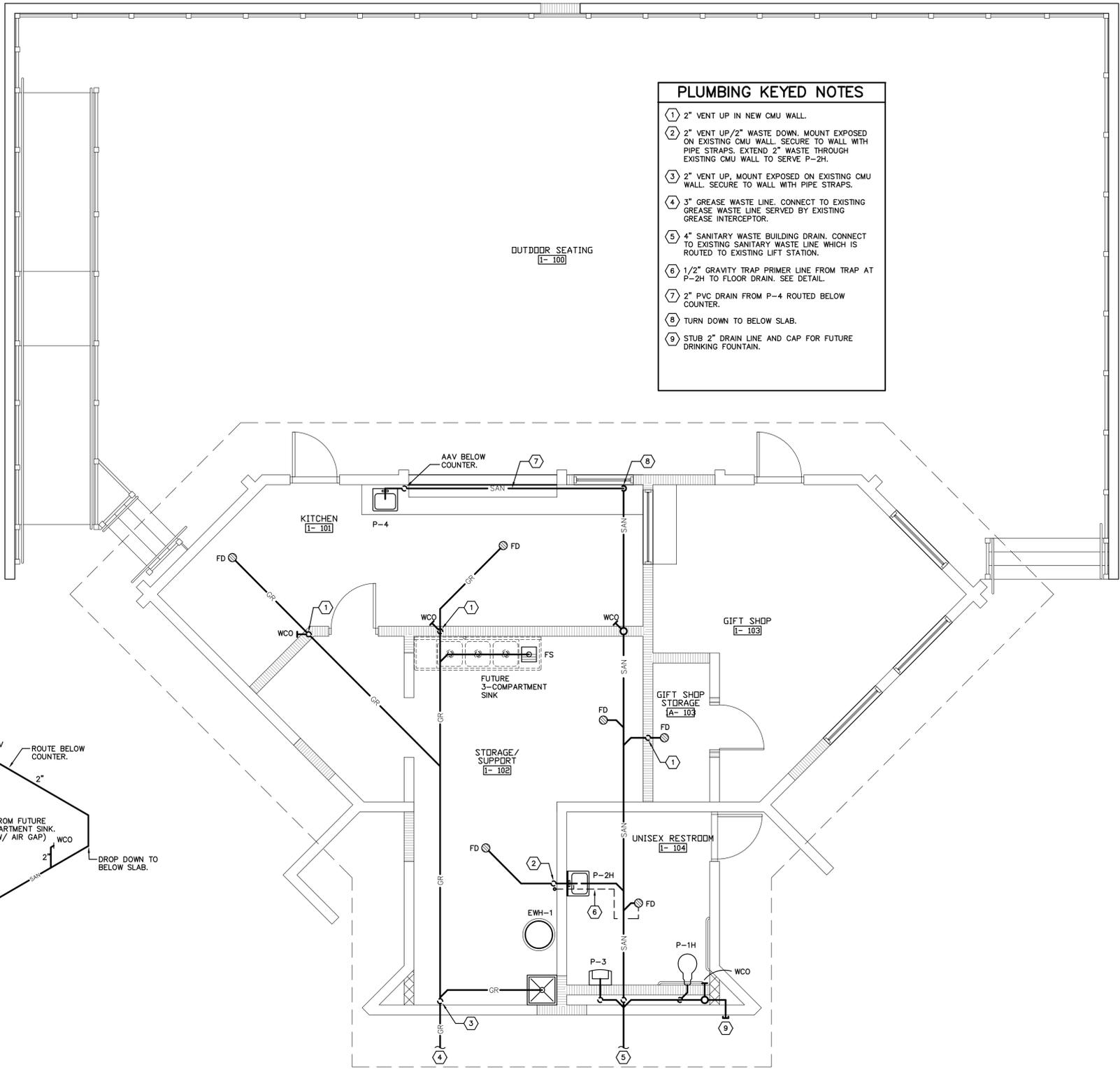
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checked: kcc  
date: 10.22.2010  
comm. no.: 0920829

**SANITARY WASTE AND VENT PLAN**

**P101**

permit drawings

- PLUMBING KEYED NOTES**
- 1 2" VENT UP IN NEW CMU WALL.
  - 2 2" VENT UP/2" WASTE DOWN. MOUNT EXPOSED ON EXISTING CMU WALL. SECURE TO WALL WITH PIPE STRAPS. EXTEND 2" WASTE THROUGH EXISTING CMU WALL TO SERVE P-2H.
  - 3 2" VENT UP. MOUNT EXPOSED ON EXISTING CMU WALL. SECURE TO WALL WITH PIPE STRAPS.
  - 4 3" GREASE WASTE LINE. CONNECT TO EXISTING GREASE WASTE LINE SERVED BY EXISTING GREASE INTERCEPTOR.
  - 5 4" SANITARY WASTE BUILDING DRAIN. CONNECT TO EXISTING SANITARY WASTE LINE WHICH IS ROUTED TO EXISTING LIFT STATION.
  - 6 1/2" GRAVITY TRAP PRIMER LINE FROM TRAP AT P-2H TO FLOOR DRAIN. SEE DETAIL.
  - 7 2" PVC DRAIN FROM P-4 ROUTED BELOW COUNTER.
  - 8 TURN DOWN TO BELOW SLAB.
  - 9 STUB 2" DRAIN LINE AND CAP FOR FUTURE DRINKING FOUNTAIN.



**CONCESSIONS BUILDING  
SANITARY WASTE & VENT RISER**  
NO SCALE

**CONCESSIONS BUILDING  
SANITARY WASTE & VENT PLAN**  
1/4"=1'-0"

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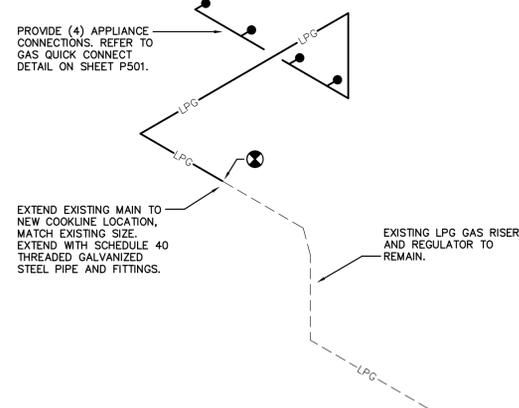
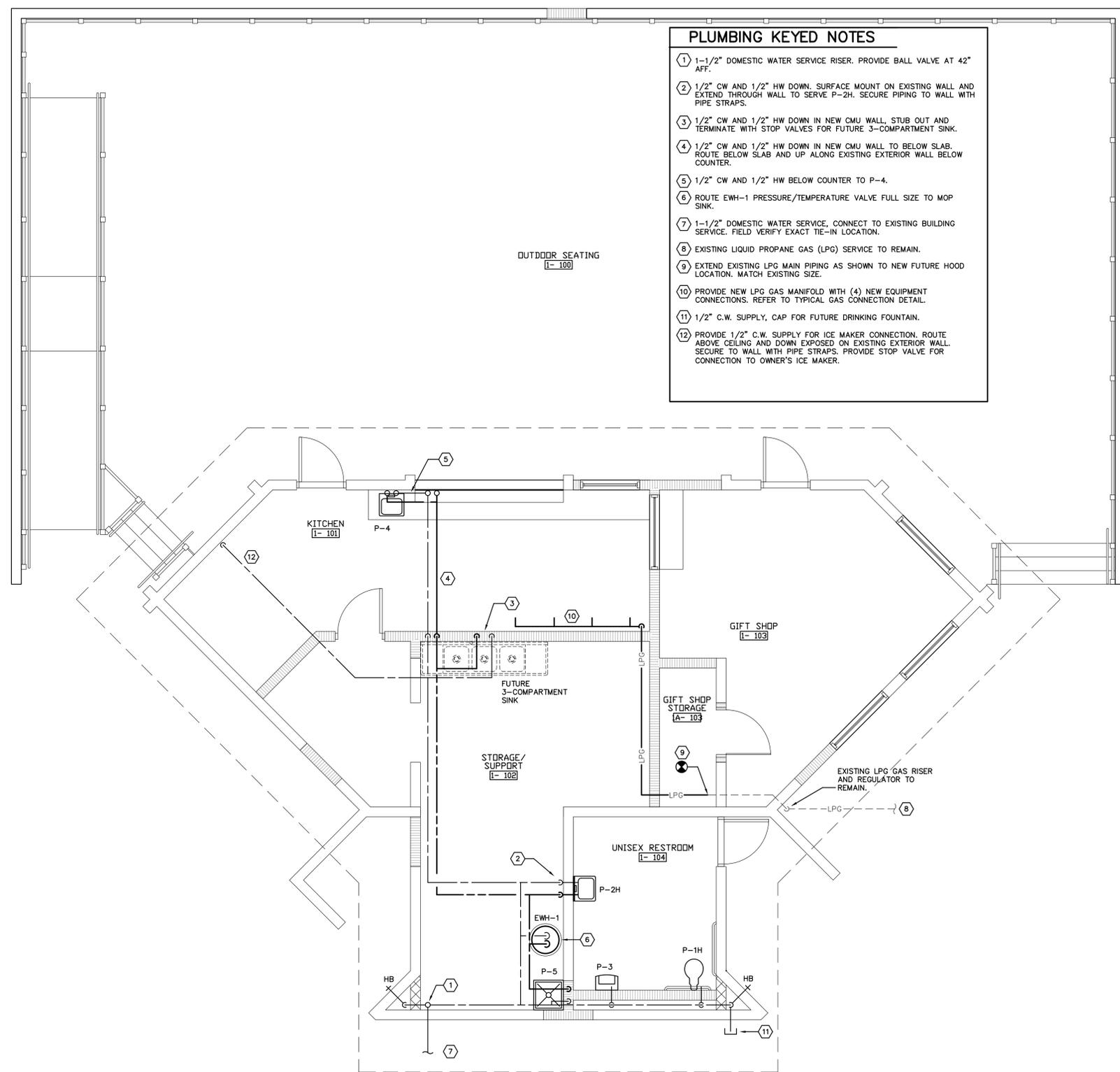
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checked: kcc  
date: 10.22.2010  
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**DOMESTIC WATER PLAN**

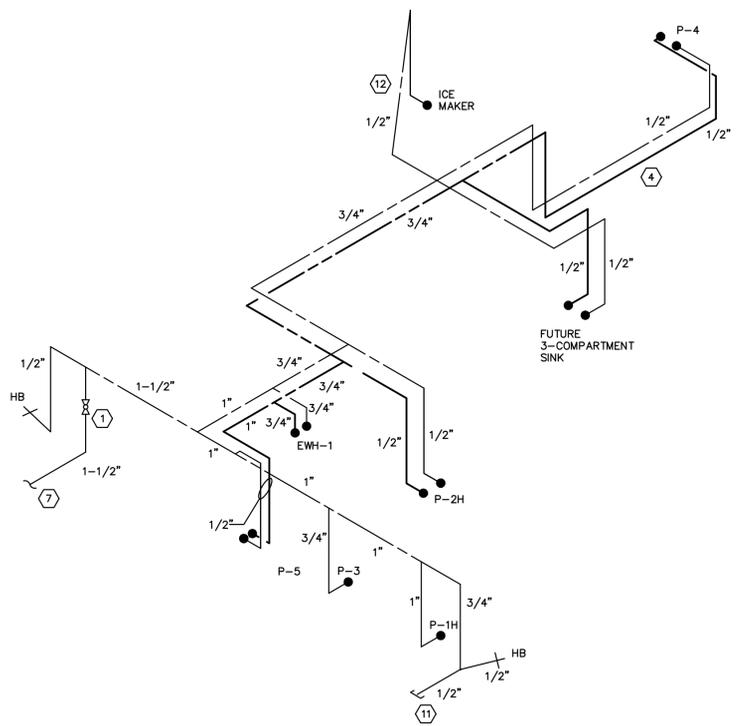
**P102**

permit drawings

- PLUMBING KEYED NOTES**
- 1) 1-1/2" DOMESTIC WATER SERVICE RISER. PROVIDE BALL VALVE AT 42" AFF.
  - 2) 1/2" CW AND 1/2" HW DOWN. SURFACE MOUNT ON EXISTING WALL AND EXTEND THROUGH WALL TO SERVE P-2H. SECURE PIPING TO WALL WITH PIPE STRAPS.
  - 3) 1/2" CW AND 1/2" HW DOWN IN NEW CMU WALL, STUB OUT AND TERMINATE WITH STOP VALVES FOR FUTURE 3-COMPARTMENT SINK.
  - 4) 1/2" CW AND 1/2" HW DOWN IN NEW CMU WALL TO BELOW SLAB. ROUTE BELOW SLAB AND UP ALONG EXISTING EXTERIOR WALL BELOW COUNTER.
  - 5) 1/2" CW AND 1/2" HW BELOW COUNTER TO P-4.
  - 6) ROUTE EWH-1 PRESSURE/TEMPERATURE VALVE FULL SIZE TO MOP SINK.
  - 7) 1-1/2" DOMESTIC WATER SERVICE, CONNECT TO EXISTING BUILDING SERVICE. FIELD VERIFY EXACT TIE-IN LOCATION.
  - 8) EXISTING LIQUID PROPANE GAS (LPG) SERVICE TO REMAIN.
  - 9) EXTEND EXISTING LPG MAIN PIPING AS SHOWN TO NEW FUTURE HOOD LOCATION. MATCH EXISTING SIZE.
  - 10) PROVIDE NEW LPG GAS MANIFOLD WITH (4) NEW EQUIPMENT CONNECTIONS. REFER TO TYPICAL GAS CONNECTION DETAIL.
  - 11) 1/2" C.W. SUPPLY, CAP FOR FUTURE DRINKING FOUNTAIN.
  - 12) PROVIDE 1/2" C.W. SUPPLY FOR ICE MAKER CONNECTION. ROUTE ABOVE CEILING AND DOWN EXPOSED ON EXISTING EXTERIOR WALL. SECURE TO WALL WITH PIPE STRAPS. PROVIDE STOP VALVE FOR CONNECTION TO OWNER'S ICE MAKER.

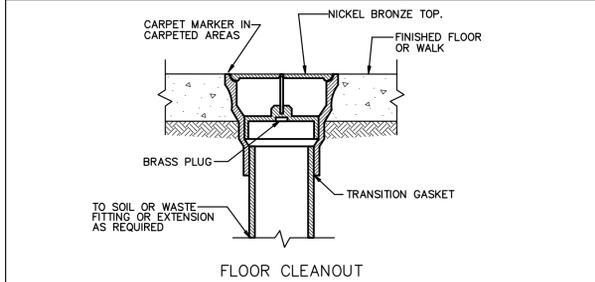
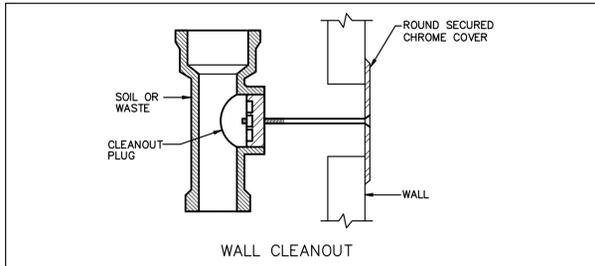


**CONCESSIONS BUILDING**  
**3 LP GAS RISER**  
NO SCALE

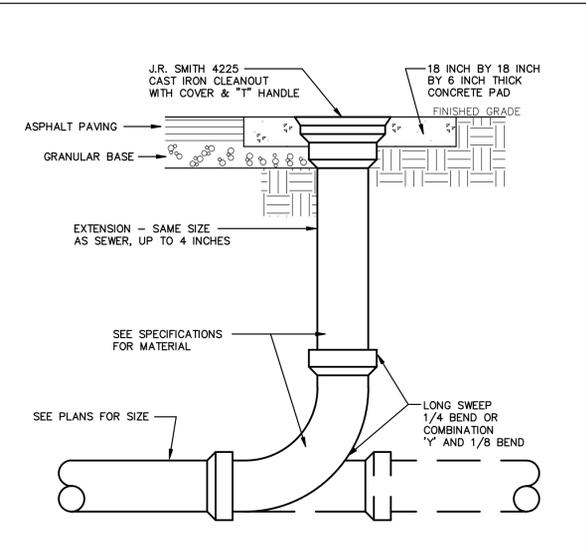


**CONCESSIONS BUILDING**  
**2 DOMESTIC WATER RISER**  
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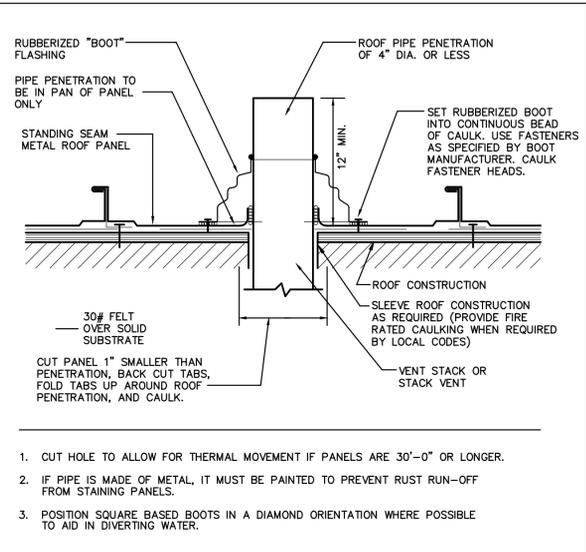
**CONCESSIONS BUILDING**  
**1 DOMESTIC WATER PLAN**  
1/4"=1'-0"



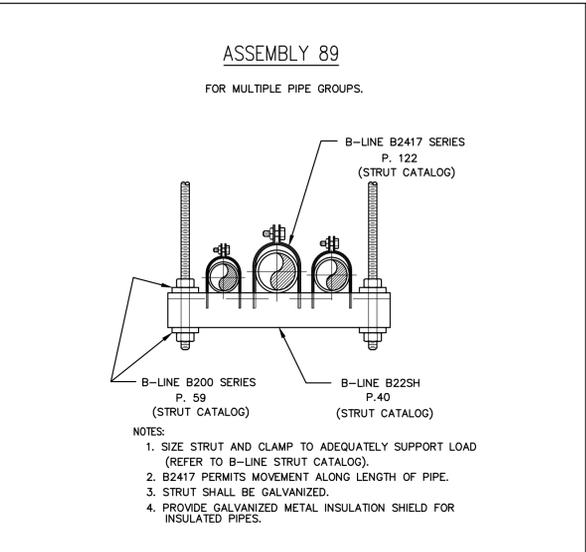
CLEANOUT DETAILS NO SCALE 1



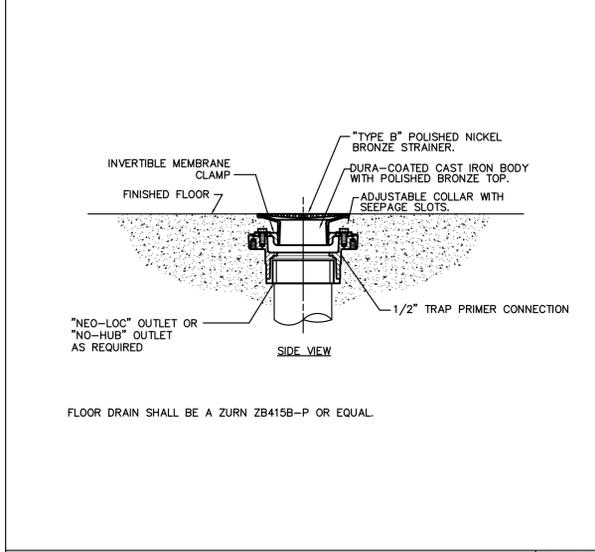
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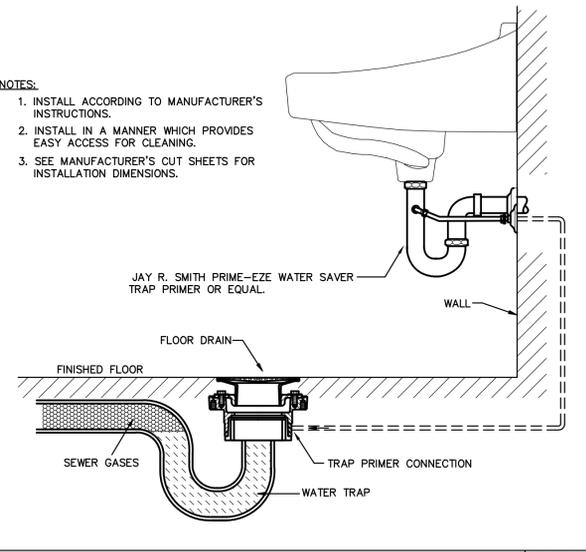
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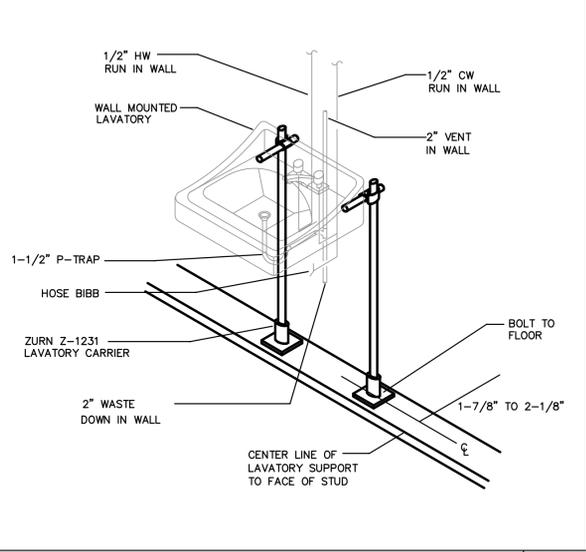
PIPE SUPPORT DETAIL NO SCALE 1



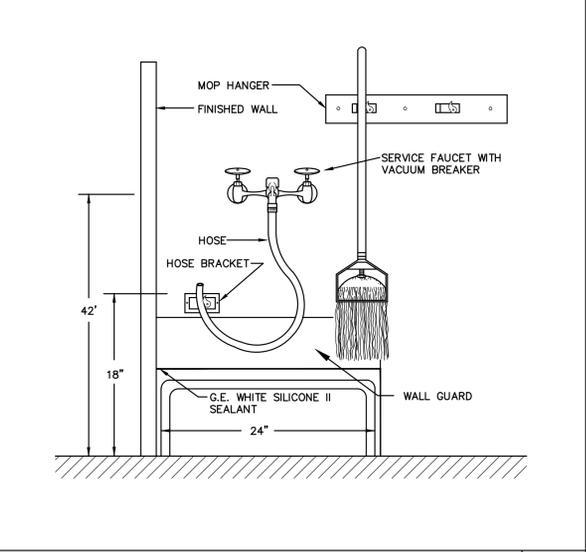
FLOOR DRAIN DETAIL - FD "A" NO SCALE 1



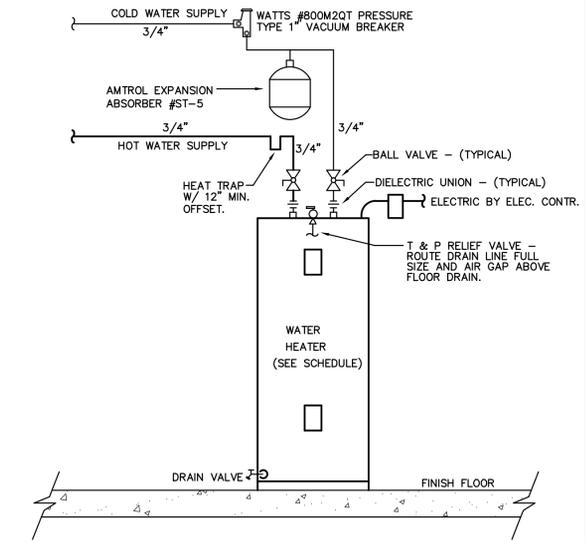
TRAP PRIMER DETAIL NO SCALE 5



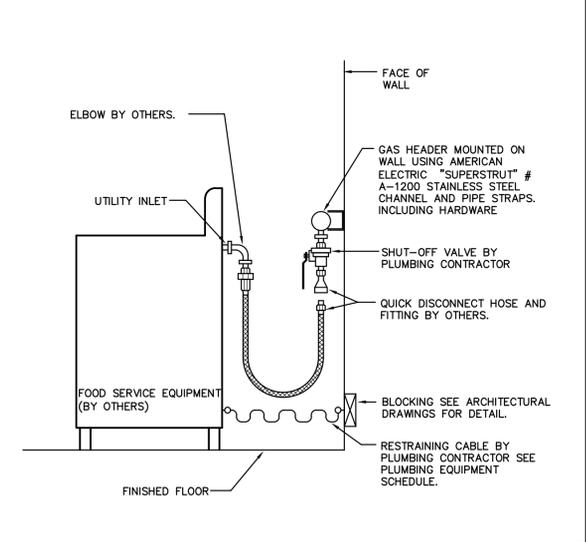
LAVATORY DETAIL NO SCALE 1



MOP SINK DETAIL NO SCALE 1



ELECTRIC WATER HEATER DETAIL NO SCALE 1



GAS QUICK CONNECT DETAIL NO SCALE 1

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PLUMBING  
DETAILS

**P501**

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## STRUCTURAL NOTES

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STRUCTURAL DRAWINGS SHALL BE USED IN CONJUNCTION WITH JOB SPECIFICATIONS AND ARCHITECTURAL, MECHANICAL, ELECTRICAL, PLUMBING, AND SITE DRAWINGS. CONSULT THESE DRAWINGS FOR SLEEVES, DEPRESSIONS, AND OTHER DETAILS NOT SHOWN ON STRUCTURAL DRAWINGS.

DIMENSIONS AND EXISTING CONDITIONS THROUGHOUT THE PROJECT SHALL BE FIELD VERIFIED. DISCREPANCIES SHALL BE BROUGHT TO THE ATTENTION OF THE ENGINEER-OF-RECORD BEFORE PROCEEDING WITH THE AFFECTED PART OF THE WORK.

MODIFIED STRUCTURAL MEMBERS ARE IN COMPLIANCE WITH FLORIDA BUILDING CODE 2007 EDITION OF THE FLORIDA BUILDING CODE W/ REVISION 2009. MEMBERS NOT DESIGNATED FOR ALTERATIONS WERE ASSUMED ADEQUATE. NO EXHAUSTIVE STUDIES WERE PERFORMED BY KARINS ENGINEERING GROUP, INC. (KEG) PRIOR TO THIS DESIGN TO UNCOVER ALL CONSTRUCTION DEFECTS OR CODE VIOLATIONS.

THE STRUCTURE IS DESIGNED TO BE SELF SUPPORTING AND STABLE AFTER THE BUILDING IS COMPLETE. IT IS THE CONTRACTOR'S SOLE RESPONSIBILITY TO DETERMINE ERECTION PROCEDURES AND SEQUENCE TO INSURE SAFETY OF THE BUILDING AND ITS COMPONENTS DURING ERECTION. THIS INCLUDES THE ADDITION OF NECESSARY SHORING, SHEETING, TEMPORARY BRACING, GUYS OR TIEDOWNS.

NO PENETRATIONS SHALL BE MADE IN ANY STRUCTURAL OR FOUNDATION MEMBERS OTHER THAN THOSE LOCATED ON THESE DRAWINGS WITHOUT PREVIOUS APPROVAL OF THE ENGINEER.

PROPOSED CHANGES AND REQUEST FOR INFORMATION OR SUBSTITUTION SHALL BE SUBMITTED TO THE ARCHITECT OF RECORD. ARCHITECT OF RECORD SHALL REVIEW AND APPROVE PROPOSAL OR REQUEST PRIOR TO SUBMITTING TO ENGINEERING OF RECORD. ENGINEER OF RECORD SHALL REVIEW AND RETURN TO ARCHITECT BEFORE CHANGES IN-FIELD PROCEED.

### DESIGN LOADS:

THE STRUCTURAL SYSTEM FOR BUILDING DEPICTED HEREON HAS BEEN DESIGNED ACCORDING TO THE 2007 EDITION AND 2009 SUPPLEMENTS OF THE FLORIDA BUILDING CODE.

THE STRUCTURE HAS BEEN DESIGNED TO RESIST THE FOLLOWING SUPERIMPOSED LOADS.

ROOF:  
LIVE LOAD: 40 psf  
ADDED DEAD LOAD: 20 psf  
DECK, RAMP & STAIRS:  
LIVE LOAD: 100 psf  
DEAD LOAD: 10 psf

### WIND:

ASCE 7: BASIC WIND SPEED 130 MPH 3-SEC. GUST, IMPORTANCE FACTOR 1.0, EXPOSURE CATEGORY C, ENCLOSED BUILDING  
DEAD LOAD AVAILABLE TO RESIST UPLIFT = 5 psf. GCpi = ±0.18

A CONTINUOUS LOAD PATH BETWEEN FOUNDATIONS, WALLS AND ROOFS ARE INTENDED BY THESE DRAWINGS AND SHALL BE FIELD VERIFIED.

### SHOP DRAWING REVIEW:

SHOP DRAWINGS WILL BE REVIEWED FOR GENERAL COMPLIANCE WITH THE DESIGN INTENT OF THE CONTRACT DOCUMENTS ONLY. IT SHALL BE THE RESPONSIBILITY OF THE CONTRACTOR TO VERIFY COMPLIANCE WITH THE CONTRACT DOCUMENTS AS TO QUANTITY, LENGTH, ELEVATIONS, DIMENSIONS, ETC. ALL SHOP DRAWINGS SHALL BE REVIEWED BY THE CONTRACTOR PRIOR TO SUBMITTAL TO THE ARCHITECT/ENGINEER. DRAWINGS SUBMITTED WITHOUT REVIEW WILL BE RETURNED UNCHECKED. SHOP DRAWING SUBMITTALS SHALL INCLUDE FOUR SETS. ONE SET OF PRINTS WILL BE RETAINED BY THE ENGINEER, ONE BY THE ARCHITECT, ONE BY THE LOCAL BUILDING DEPARTMENT (WHERE REQUIRED) AND THE CONTRACTOR SHALL MAKE COPIES FROM THE FOURTH SET AS REQUIRED FOR DISTRIBUTION. ADDITIONAL COPIES REQUIRED FOR DISTRIBUTION (IF ANY) SHALL BE MADE FROM THE CONTRACTORS SET. IN ALL INSTANCES, THE CONTRACT DOCUMENTS SHALL GOVERN OVER THE SHOP DRAWINGS, UNLESS OTHERWISE SPECIFIED IN WRITING BY THE ENGINEER-OF-RECORD.

SPECIALTY ENGINEERED MATERIALS (IE. POST TENSION SYSTEM, BAR JOIST SYSTEM, ROOF TRUSS SYSTEMS, ETC.) SHALL BE SUPPLIED ONLY BY FIRMS HAVING LOCAL REPRESENTATION, AND STAFFED WITH A STRUCTURAL ENGINEER HAVING A MINIMUM OF 3 YEARS DESIGN EXPERIENCE IN THE DESIGN AND CONSTRUCTION OF THE SPECIALTY ENGINEERED SYSTEM.

### FORM WORK AND SHORING (CONCRETE SLABS AND BEAMS):

DESIGN, ERECTION AND REMOVAL OF ALL FORM WORK, SHORES AND RESHORES SHALL MEET REQUIREMENTS SET FORTH IN ACI STANDARDS 347 AND 301. NO STRUCTURAL CONCRETE SHALL BE STRIPPED UNTIL IT HAS REACHED AT LEAST TWO-THIRDS OF THE 28 DAY DESIGN STRENGTH.

### CONCRETE REINFORCING:

SHALL BE ASTM A615 GRADE 60 DEFORMED BARS, U.N.O (SEE BEAM SCHEDULES), FREE FROM OIL, SCALE AND RUST AND PLACED IN ACCORDANCE WITH THE TYPICAL BENDING DIAGRAM AND PLACING DETAILS OF ACI STANDARDS AND SPECIFICATIONS. SHOP DRAWINGS DEPICTING QUANTITY AND INTENDED PLACEMENT LOCATION OF REINFORCING STEEL SHALL BE SUBMITTED PRIOR TO COMMENCEMENT OF FABRICATION.

### CONCRETE:

CONCRETE SHALL BE AN APPROVED MIX DESIGN PROPORTIONED TO ACHIEVE A STRENGTH AT 28 DAYS AS LISTED BELOW WITH A PLASTIC AND WORKABLE MIX: 3000 psi FOR SLAB ON GRADE  
5000 psi FOR BEAMS, COLUMNS & EXTERIOR ELEVATED FLATWORK OR DECKS.

CONCRETE SHALL COMPLY WITH THE REQUIREMENTS OF ASTM C-94 FOR MEASURING, MIXING, TRANSPORTING, ETC. MAXIMUM TIME ALLOWED FROM THE TIME THE MIXING WATER IS ADDED UNTIL IT IS DEPOSITED IN ITS FINAL POSITION SHALL NOT EXCEED ONE AND ONE HALF (1-1/2) HOURS. WATER/ CEMENT RATIO FOR CONCRETE AT EXPOSED TO CHLORIDES & DECKS SHALL NOT EXCEED 0.40 BY WEIGHT AND HAVE A MINIMUM COMPRESSIVE STRENGTH OF 5000psi.

CONCRETE SHALL COMPLY WITH ALL THE REQUIREMENTS OF ASTM STANDARD C94 FOR MEASURING, MIXING, TRANSPORTING, ETC. CONCRETE TICKETS SHALL BE TIME STAMPED WHEN CONCRETE IS BATCHED. CONCRETE SHALL BE PLACED IN ITS FINAL POSITION WITHIN 90 MINUTES AFTER THE ADDITION OF BATCH WATER. CONCRETE SHALL BE DISCARDED IF THE FOREGOING ELAPSED TIME IS EXCEEDED. THE ON-SITE REPRESENTATIVE OF THE TESTING LAB SHALL NOTIFY THE OWNER'S REPRESENTATIVE AND THE CONTRACTOR OF ANY NOTED NONCOMPLIANCE WITH THE ABOVE.

SLABS SHALL BE MOIST CURED OR CURED USING A DISSIPATING CURING COMPOUND MEETING ASTM STANDARD C309 TYPE 1 AND SHALL HAVE A FUGITIVE DYE. THE COMPOUND SHALL BE PLACED AS SOON AS THE FINISHING IS COMPLETED OR AS SOON AS THE WATER HAS LEFT THE UNFINISHED CONCRETE. ALL SCUFFED OR BROKEN AREAS IN THE CURING MEMBRANE SHALL BE RECOATED DAILY. CALCIUM CHLORIDES SHALL NOT BE UTILIZED; OTHER ADMIXTURES MAY BE USED ONLY WITH THE APPROVAL OF THE ENGINEER. PREPARATION SHALL BE IN ACCORDANCE WITH MANUFACTURER'S SPECIFICATIONS.

### CONCRETE TESTING:

AN INDEPENDENT TESTING LABORATORY SHALL BE RETAINED TO PERFORM THE FOLLOWING TESTS ON CAST IN PLACE CONCRETE:

a) ASTM C143 - "STANDARD TEST METHOD FOR SLUMP OF PORTLAND CEMENT CONCRETE." b) ASTM C39 - "STANDARD TEST METHOD FOR COMPRESSIVE STRENGTH OF CYLINDRICAL CONCRETE SPECIMENS." A SEPARATE TEST SHALL BE CONDUCTED FOR EACH CLASS, FOR EVERY 50 CUBIC YARDS (OR FRACTION THEREOF), PLACED PER DAY. REQUIRED CYLINDER(S) QUANTITIES AND TEST AGE AS FOLLOWS:  
1 AT 3 DAYS  
1 AT 7 DAYS  
2 AT 28 DAYS

ONE ADDITIONAL RESERVE CYLINDER TO BE TESTED UNDER THE DIRECTION OF THE ENGINEER, IF REQUIRED. IF 28 DAY STRENGTH IS ACHIEVED, THE ADDITIONAL CYLINDER(S) MAY BE DISCARDED.

### MACHINE AND LAG BOLTS:

MACHINE AND LAG BOLTS SHALL BE A-307 HOT DIPPED GALVANIZED WITH GALVANIZED WASHERS, U.N.O.

### CHEMICAL ANCHORS:

ALL CHEMICAL ANCHORS SHALL BE SUBMITTED FOR ENGINEER APPROVAL PRIOR TO INSTALLATION. CHEMICAL ANCHORS SHALL BE SUBMITTED FOR EACH SPECIFIC USE AND CONDITION.

### LINTELS:

MASONRY OPENINGS LESS THAN 12 FEET SHALL BE SPANNED WITH PRECAST 8"x8" CONCRETE LINTELS REINFORCED TO RESIST APPLIED LOADS. ALL PRECAST LINTELS SHALL BEAR A MINIMUM OF 8" AT EACH END. PROVIDE PRECAST 8"x8" CONCRETE UNTEL OVER ALL FLOW THRU'S.

MASONRY OPENINGS SPANNING FROM 12 FEET TO 18 FEET PROVIDE A MINIMUM OF PRESTRESSED/PRECAST 8"x12" CONCRETE LINTEL REINFORCED WITH 1#5 TOP AND BOTTOM AND SHALL BE FILLED WITH GROUT. LINTELS SHALL BEAR A MINIMUM OF 8" AT EACH END. LOAD SHALL NOT EXCEED 400 LBS PER FOOT.

OPENINGS SPANNING FROM CONCRETE COLUMN TO CONCRETE COLUMN LESS THAN 16 FEET, LINTELS SHALL C.I.P. 8"x16" WITH (2) #5 TOP AND BOTTOM AND #3 STIRRUPS AT 8" ON CENTER. LINTEL SHALL BE POURED MONOLITHIC WITH COLUMN & REINFORCEMENT SHALL NOT BE DRILLED AND EPOXIED.

### MASONRY WALLS:

MASONRY UNITS SHALL MEET ASTM C-90 FOR HOLLOW LOAD BEARING TYPE MASONRY WITH UNIT STRENGTH OF 1900 psi ON THE NET AREA (1"m = 1500 psi). MORTAR SHALL BE TYPE "M" OR "S" AND MEET ASTM C-270 WITH MINIMUM COMPRESSION STRENGTH OF 1900 psi OR TYPE "S" OR 2500 psi FOR TYPE "M". GROUT SHALL BE 2500 psi MINIMUM COMPRESSIVE STRENGTH AND MEET ASTM C-1019.

REINFORCED VERTICAL CELLS AS SHOWN ON PLANS SHALL BE GROUT FILLED WITH 1#5 REINFORCING BAR VERTICAL, UNLESS OTHERWISE NOTED. EXCEPT AS NOTED VERTICAL REINFORCEMENT SHALL BE PROVIDED AT CORNERS, INTERSECTIONS, WITHIN 16 IN. OF EACH SIDE OF OPENINGS, WITHIN 8 IN. OF EACH SIDE OF MOVEMENT JOINTS, WITHIN 8 IN. OF THE ENDS OF THE WALLS, AND AT A MAXIMUM SPACING OF 4 FEET ON CENTER. REINFORCEMENT ADJACENT TO OPENINGS NEED NOT BE PROVIDED FOR OPENINGS SMALLER THAN 16 IN. IN EITHER THE HORIZONTAL OR VERTICAL DIRECTION, UNLESS THE SPACING OF DISTRIBUTED REINFORCEMENT IS INTERRUPTED BY SUCH OPENINGS. HORIZONTAL JOINT REINFORCEMENT SHALL CONSIST OF AT LEAST TWO WIRES OF W1.7 SPACED NOT MORE THAN 16 IN. HORIZONTAL REINFORCEMENT SHALL ALSO BE PROVIDED AT THE BOTTOM AND TOP OF WALL OPENINGS AND SHALL EXTEND NOT LESS THAN 24 IN. NOR LESS THAN 48 BAR DIAMETERS PAST THE OPENING; CONTINUOUSLY AT STRUCTURALLY CONNECTED ROOF AND FLOOR LEVELS; AND WITHIN 16 IN. OF THE TOP OF WALLS. DOWELS SHALL BE USED TO PROVIDE CONTINUITY INTO THE STRUCTURE ABOVE AND/OR BELOW, UNLESS NOTED OTHERWISE. USE METAL LATH, MORTAR, OR SPECIAL UNITS TO CONFINE CONCRETE AND GROUT TO AREA REQUIRED.

### WOOD:

STRUCTURAL WOOD COMPONENTS (BEAMS, JOISTS, RAFTERS, SHEAR/BEARING WALLS, ETC.) SHALL BE CONSTRUCTED OF MINIMUM NO. 2 GRADE SOUTHERN PINE ACCORDING TO AF&PA NO. 1 WOOD IN CONTACT WITH CONCRETE OR MASONRY, AND AT OTHER LOCATIONS AS SHOWN ON THE DRAWINGS, SHALL BE PROTECTED OR PRESERVATIVE TREATED. MEMBER SIZES SHOWN ARE NOMINAL UNLESS NOTED OTHERWISE.

ENGINEERED WOOD TRUSS SYSTEMS SHALL BE DESIGNED BY SUPPLIER'S SPECIALTY ENGINEER TO CONFIGURATION AND LOAD-CARRYING CAPACITY SHOWN ON DRAWINGS AND SPECIFICATIONS. ALTERNATE TRUSS LAYOUTS ARE ACCEPTABLE ONLY AS A CHANGE ORDER WHICH WILL INCLUDE ENGINEERING CHARGES FOR REDESIGN OF THE STRUCTURE AND FOUNDATION BY THE ENGINEER OF RECORD. SUBMIT SHOP DRAWINGS FOR REVIEW PRIOR TO FABRICATION AND BEFORE CONSTRUCTION OF THE FOUNDATION. SHOP DRAWINGS SHALL SHOW AND SPECIFY ALL CONNECTOR TYPES UTILIZED WITHIN TRUSSES, AS WELL AS CONNECTORS UTILIZED IN ALL OTHER CONNECTIONS AND ATTACHMENTS BETWEEN TRUSSES OR COMPONENTS SUPPLIED AS PART OF THE ENGINEERED TRUSS SYSTEM. AN ERECTION DRAWING SHALL BE INCLUDED, IDENTIFYING ALL TRUSS SYSTEM COMPONENTS, AS WELL AS ALL PERMANENT BRACING REQUIRED FOR TRUSS DESIGN. ENGINEER OF RECORD MUST REVIEW/ APPROVE ALL TRUSS LAYOUTS BEFORE FOUNDATION IS CONSTRUCTED.

ENGINEERED SHOP DRAWINGS SHALL BEAR THE SIGNATURE AND IMPRESSED SEAL OF A FLORIDA REGISTERED PROFESSIONAL ENGINEER AS THE SPECIALTY ENGINEER. THE FOLLOWING LOAD DURATION FACTORS SHALL BE USED:

DEAD LOAD 0.90  
DEAD LOAD + FLOOR LIVE LOAD 1.00  
DEAD LOAD + ROOF LIVE LOAD 1.25  
DEAD LOAD + WIND LOAD 1.33

### MANUFACTURED WOOD STRUCTURAL COMPONENTS:

MEMBERS DESIGNATED 'LVL' (E.G., 1-3/4 X 14 LVL) SHALL BE LAMINATED VENEER LUMBER AS MANUFACTURED BY TRUSS JOIST CORPORATION (MICRO-LAM), ALPINE ENGINEERED PRODUCTS (ASI TIMBERMAX-LVL), OR ENGINEER APPROVED SUBSTITUTION. Fb = 2850 psi, E = 2,000,000 psi, Fv = 285 psi, U.N.O.

### DIAPHRAGMS:

PLYWOOD FLOOR, WALL AND ROOF SHEATHING ARE DESIGNED AS DIAPHRAGMS AND SHALL COMPLY WITH APPLICABLE PROVISIONS OF THE FLORIDA BUILDING CODE. UNLESS SHOWN OTHERWISE, SPAN RATED PANELS SHALL BE FASTENED TO SUPPORTING FRAMING AS FOLLOWS:

PANELS UP TO 1/2" THICK: 8d. COMMON NAILS AT 6" @ EDGES & INTERIOR, 4" @ CORNERS.  
PANELS FROM 1/2" THICK TO 3/4" THICK: 10d. COMMON NAILS AT 6" @ EDGES & INTERIOR, 4" @ CORNERS.  
INSTALL 1/2" DIAM. ANCHOR J-BOLTS OR ENGINEER APPROVED EXPANSION ANCHORS THROUGH BOTTOM PLATE TO SUPPORTING CONC. @ 32" O.C. W/ 6" MIN. EMBED. & 3" WASHERS  
ROOF SHEATHING SHALL BE BLOCKED AT RIDGE AND NAILED WITH 8d.

### CONNECTORS:

CONNECTOR MODEL NUMBERS SHOWN ARE Strong-tie CONNECTORS AS MANUFACTURED BY SIMPSON Strong-tie Company, U.N.O., AND SHALL BE INSTALLED ACCORDING TO THE MANUFACTURER'S DIRECTIONS TO RESIST THE SPECIFIED LOADS. ALL CONNECTORS SHALL BE STAINLESS STEEL.

### UPLIFT CONNECTIONS:

UPLIFT CONNECTIONS SHALL BE INSTALLED TO RESIST UPLIFT FORCES INDICATED BY THE SPECIALTY ENGINEER. AS FOLLOWS, U.N.O.:  
WOOD TO WOOD  
FOR UPLIFT LOADS UP TO 1000#, MTS12  
FOR UPLIFT LOADS OF 1000# TO 2000#, (2) MTS12  
FOR UPLIFT LOADS OF 2000# TO 2900#, (2) HTS 20

CONTRACTOR MAY USE APPROPRIATE SIMPSON CONNECTORS WITH LESS CAPACITY THAN SPECIFIED ABOVE WHEN LESS UPLIFT LOAD IS SHOWN ON THE INDIVIDUAL TRUSS DETAIL SHEETS (PROVIDED BY THE SPECIALTY ENGINEER)

### WINDOWS AND SLIDING DOORS (SHOP DRAWINGS REQUIRED):

WINDOWS AND SLIDING DOORS WITH CONNECTIONS TO THE STRUCTURE SHALL BE DESIGNED FOR LOADS AS PER FLORIDA BUILDING CODE OR SELECTED PRODUCT APPROVAL CERTIFICATE AND BE BASED ON LAYOUT AND CONFIGURATION AS SHOWN ON ARCHITECTURAL DRAWINGS. DESIGN AND DETAILING OF CONNECTIONS TO THE STRUCTURE SHALL BE BASED ON INFORMATION OBTAINED FROM THE STRUCTURAL DRAWINGS (TAKING INTO CONSIDERATION TYPE OF MATERIAL BEING FASTENED TO).

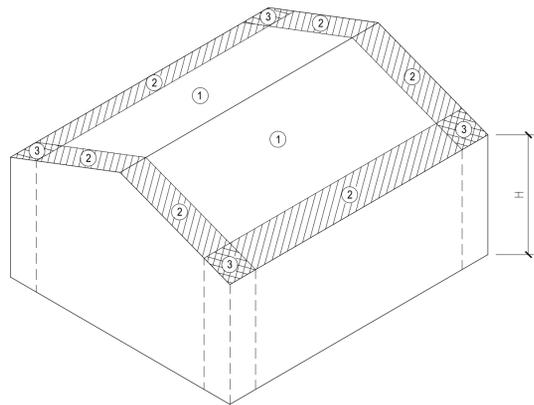
IF REQUIRED, MODIFICATIONS TO THE STRUCTURE RESULTING FROM REACTIONS IMPOSED AT THE CONNECTION POINTS (GROUTING OF MASONRY, ADDITIONAL BRACING OF STRUCTURAL MEMBERS, ETC.), SHALL BE DESIGNED AND CLEARLY DETAILED ON THE SHOP DRAWINGS. FABRICATOR AND CONTRACTOR SHALL ASSUME ALL COSTS OF ADDITIONAL LABOR AND MATERIALS ASSOCIATED WITH IMPLEMENTATION OF SUCH MODIFICATIONS. SHOP DRAWING SUBMITTAL, SIGNED AND SEALED BY A PROFESSIONAL ENGINEER REGISTERED IN THE STATE OF FLORIDA (WITH CALCULATIONS), SHALL INCLUDE PLANS AND DETAILS CLEARLY INDICATED DESIGN LOADS, MATERIALS USED, FINISHES, FASTENERS AS WELL AS LOADS IMPOSED BY THE WINDOW/ SLIDING GLASS DOOR ON THE STRUCTURE. SIDES OF ALL FULL-HEIGHT WINDOWS SHALL BE DESIGNED AS MULLIONS AND BE CAPABLE OF SPANNING FULL-HEIGHT WITHOUT ASSISTANCE FROM ADJACENT CONCRETE/ MASONRY (ALTHOUGH SUCH MULLIONS MAY BE DETAILED AS FASTENED TO SIDES OF OPENING USING OVERSIZED HOLES IN FRAME).

### SUPPLEMENTAL SKETCHES/ DRAWINGS:

IT SHALL BE THE RESPONSIBILITY OF THE CONTRACTOR TO FORWARD A COPY OF ALL CORRESPONDENCE AFFECTING THE STRUCTURE TO THE PROJECT'S INSPECTOR THROUGHOUT THE DURATION OF CONSTRUCTION.

TYPE	TRIBUTARY AREA	ZONE				
		ROOF			OVERHANG	
		1	2	3	2	3
ROOF UPLIFT ON	10	+34.6, -37.8	+34.6, -44.2	+34.6, -44.2	-69.8	-69.8
	20	+33.6, -35.9	+33.6, -42.3	+33.6, -42.3	-67.9	-67.9
COMPONENTS & CLADDING PRESSURES IN PSF	50	+32.3, -33.3	+32.3, -39.7	+32.3, -39.7	-65.3	-65.3
	100	+31.4, -31.4	+31.4, -37.8	+31.4, -37.8	-63.4	-63.4

ZONE 2 & 3 = 4 FT WITHIN EDGE OF BUILDING



## 1 WIND PRESSURE SCHEME

NOT TO SCALE

## STRUCTURAL DRAWING INDEX

S0.1 STRUCTURAL NOTES  
S1.0 FOUNDATION PLAN  
S2.0 ROOF PLAN  
S3.0 DETAILS

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SEAL

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## Coquina Beach

2650 Gulf Drive South  
Bradenton, Florida 34217

Concessions Building  
Renovation

Manatee County Government

1112 Manatee Avenue West  
Bradenton, Florida 34208

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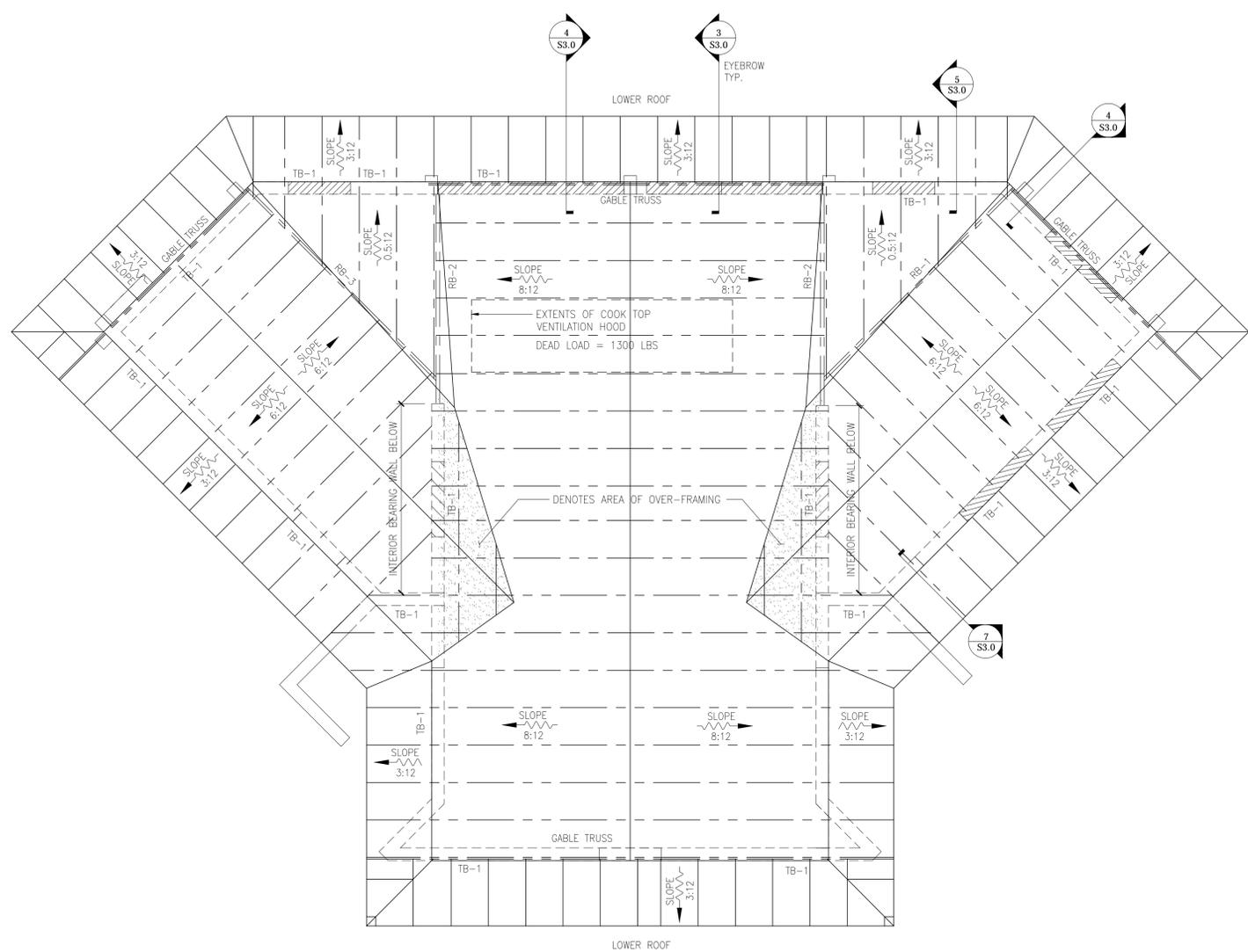
STRUCTURAL NOTES

# S0.1

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**ROOF PLAN NOTES:**

- SEE SHEET S0.1 FOR GENERAL STRUCTURAL NOTES.
- ROOF FRAMING SHALL CONSIST OF PRE-ENGINEERED WOOD TRUSSES @ 24" O.C., U.N.O. INTERIOR WALLS SHALL BE NON-LOAD BEARING, U.N.O.
- ROOF DIAPHRAGMS SHALL CONSIST OF 19/32 CDX APA RATED SHEATHING W/ 10d @ 6" @ PANEL EDGES AND INTERMEDIATE AND 4" @ CORNERS. 2X BLOCKING SHALL BE INSTALLED ON EDGE AND WITHIN 6" OF BEARING POINT, BETWEEN TRUSSES BEARING ON ALL WALLS.
- [---] DENOTES BEARING WALL BELOW.
- [//] DENOTES BEAM BELOW. SEE BEAM SCHEDULE.
- PROVIDE CONT. 2x4 BOTTOM CHORD BRACING @ 10'-0" O.C. PERPENDICULAR TO SPAN OF TRUSS.
- WHERE LINTELS OVER OPENING ARE NOT SPECIFIED, REFER TO GENERAL NOTES
- SPECIALTY ENGINEER REFER TO ARCHITECTURAL FOR REFLECTED CEILING PLAN.
- CONTRACTOR VERIFY ALL CONNECTOR SIZES WITH SPECIALTY ENGINEER TRUSS DRAWINGS.

R=# # = GRAVITY LOAD, LBS, U.N.O.  
 U=# # = UPLIFT, LBS, U.N.O.

ROOF CONCRETE BEAM SCHEDULE						
MARK	SIZE WxD: (IN)	REINFORCEMENT				NOTES
		TOP	MIDDLE	BOTTOM	STIRRUPS	
TB-1	8 x 16	(2) #5	-	(2) #5	#3 @ 18" O.C.	

ROOF WOOD BEAM SCHEDULE			
MARK	TYPE	SIZE	NOTES
RB-1	LVL 1.8E 2400 Fb	(2) 1.75" x 14"	HSUL414 TO RB-2; HU416MAX TO EXT. WALL
RB-2	LVL 1.8E 2400 Fb	(2) 1.75" x 14"	HHUS410 TO INT. WALL; HU416MIN TO EXT. WALL
RB-3	LVL 1.8E 2400 Fb	(2) 1.75" x 14"	HSUR414 TO RB-2; HU416MAX TO EXT. WALL

SCHEDULE NOTES:  
 1. TOP OF RB BEAM ELEVATION = TOP OF TB BEAM ELEVATION.

**1 CONCESSIONS BUILDING - ROOF PLAN**  
 SCALE: 1/4"=1'-0"

09DS-0395.02

SEAL

**Coquina Beach**

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 Bradenton, Florida 34217  
**Concessions Building  
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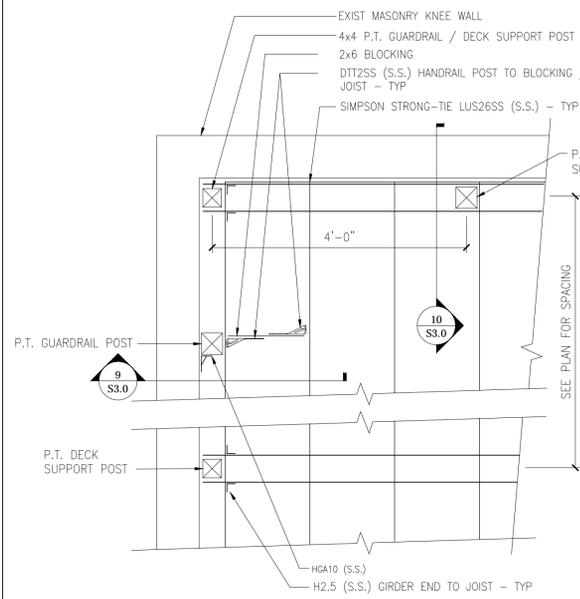
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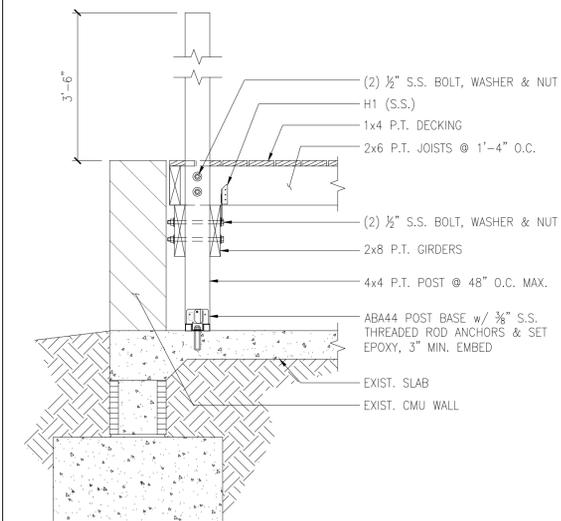
**ROOF PLAN**

**S2.0**

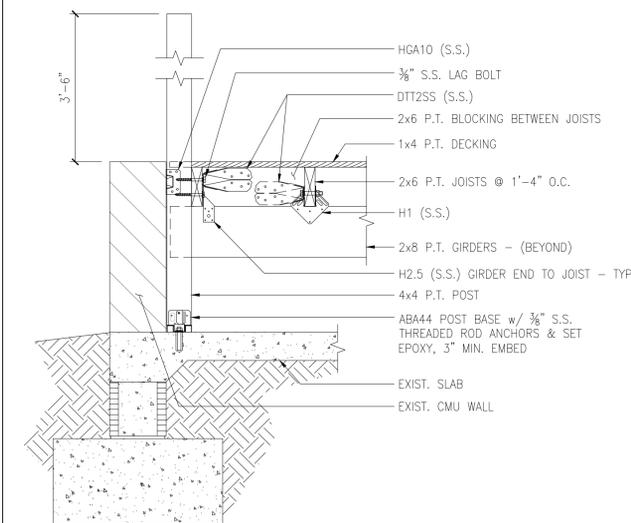
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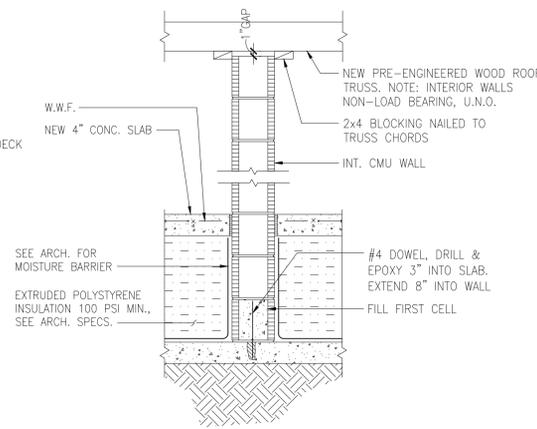
**11** GUARDRAIL / DECK POST PLAN  
SCALE: NTS



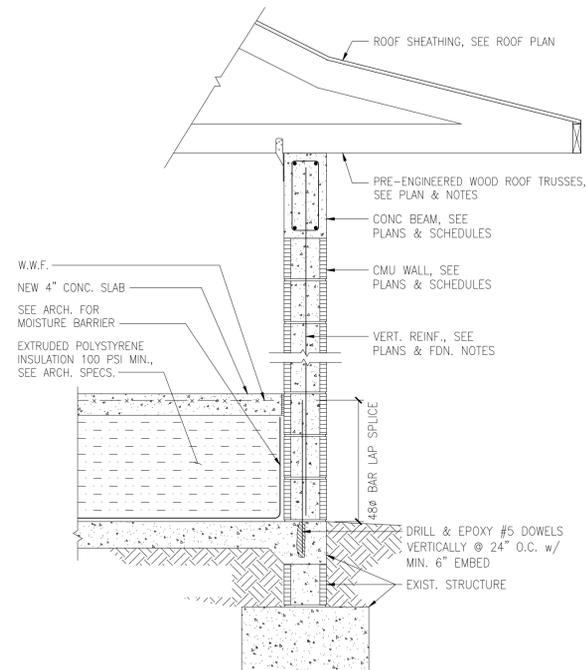
**10** GUARDRAIL / DECK POST DETAIL  
SCALE: NTS



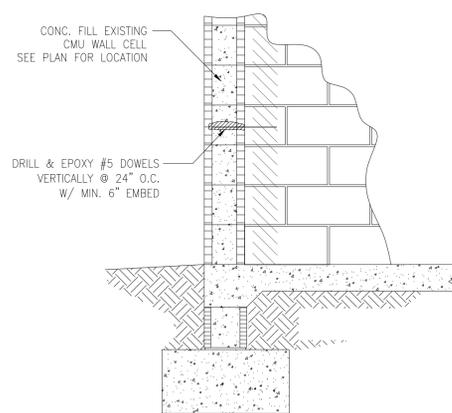
**9** GUARDRAIL / DECK POST DETAIL  
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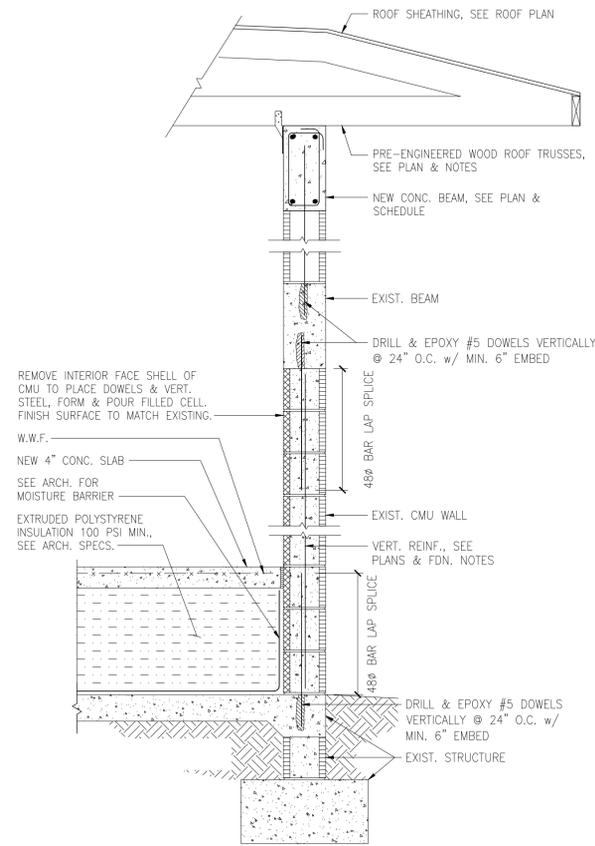
**8** TYP. INT. WALL DETAIL  
SCALE: NTS



**7** WALL REINF. @ NEW EXT. WALL  
SCALE: NTS



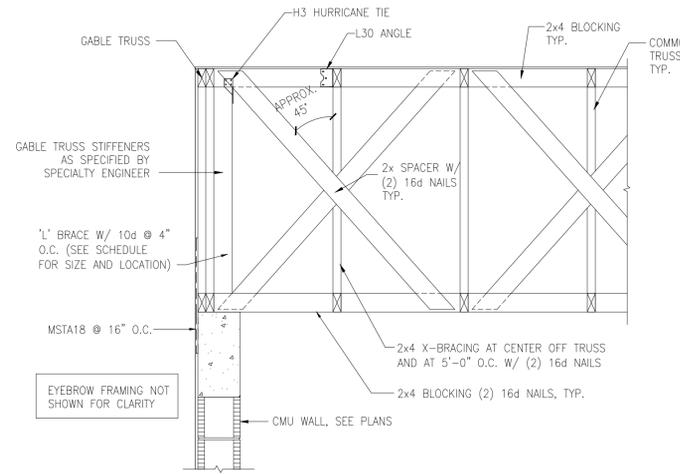
**6** TYP DOWEL DETAIL @ INTERSECTING WALLS  
SCALE: NTS



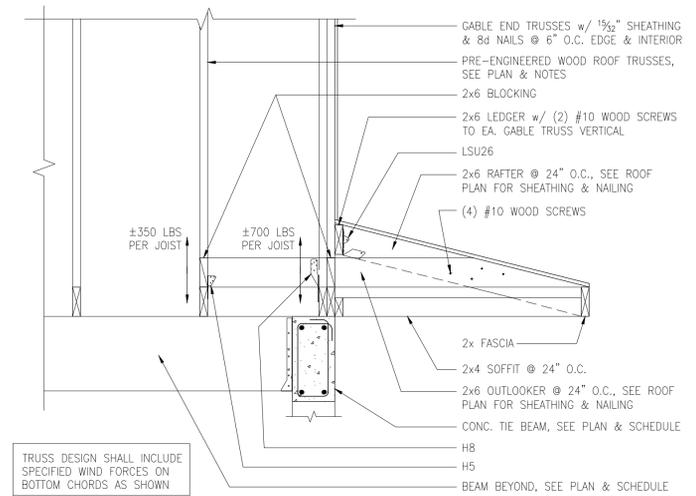
**5** WALL REINF. @ EXIST. EXTERIOR WALL  
SCALE: NTS

STUD SPACING	'L' BRACING REQUIREMENTS							
	NO 'L' BRACE	(1) 2" x 4" 'L' BRACE	(2) 2" x 4" 'L' BRACE	(2) 2" x 6" 'L' BRACE				
16"	0'-0" - 4'-5"	4'-5" - 8'-0"	8'-0" - 12'-0"	12'-0" - 16'-0"	16'-0" - 20'-0"	20'-0" - 24'-0"	24'-0" - 28'-0"	28'-0" - 32'-0"
24"	0'-0" - 4'-0"	4'-0" - 7'-0"	7'-0" - 10'-0"	10'-0" - 14'-0"	14'-0" - 18'-0"	18'-0" - 22'-0"	22'-0" - 26'-0"	26'-0" - 30'-0"

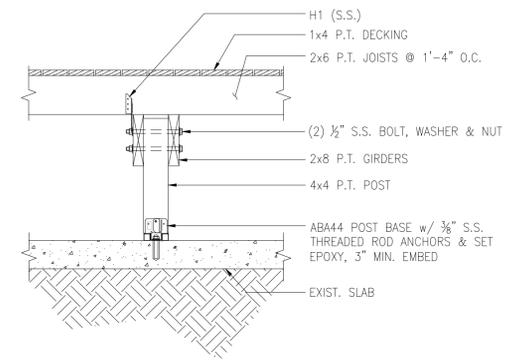
SPECIALTY ENGINEER VERIFY



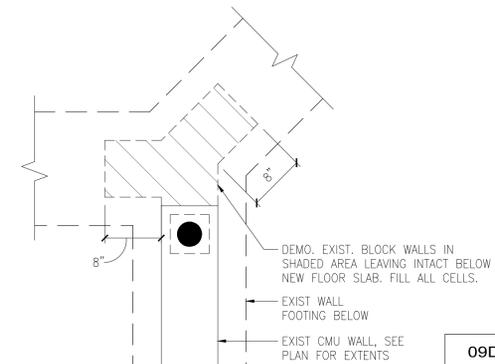
**4** GABLE END X BRACING DETAIL  
SCALE: NTS



**3** EYEBROW FRAMING DETAIL  
SCALE: 3/4"=1'-0"



**2** TYP. WOOD DECK FRAMING DETAIL  
SCALE: 1"=1'-0"



**1** WALL END DEMOLITION DETAIL  
SCALE: 1"=1'-0"

09DS-0395.02



DATE	10.22.2010
BY	
CHECKED	
SCALE	

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Manatee County Government

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Bradenton, Florida 34208

revisions:

drawn: -  
checked: -  
date: 10.22.2010  
comm. no.: 0920829

**DETAILS**

**S3.0**

dep permit drawings

